As confidentially submitted to the Securities and Exchange Commission on December 6, 2018

Registration No. 333-

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM S-1

REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

ShockWave Medical, Inc.

(Exact Name of Registrant as Specified in Its Charter)

Delaware	3841	27-0494101
(State or Other Jurisdiction of Incorporation or Organization)	(Primary Standard Industrial Classification Code Number)	(I.R.S. Employer Identification Number)

5403 Betsy Ross Drive
Santa Clara, California 95054
(510) 279-4262
(Address, Including Zip Code, and Telephone Number, Including Area Code, of Registrant's Principal Executive Offices)

Douglas Godshall
President & Chief Executive Officer
ShockWave Medical, Inc.
5403 Betsy Ross Drive
Santa Clara, California 95054
(510) 279-4262
(Name, Address, Including Zip Code, and Telephone Number, Including Area Code, of Agent For Service)

Copies to:

Alan Denenberg Steve Salmon Davis Polk & Wardwell LLP 1600 El Camino Real Menlo Park, California 94025 (650) 752-2000	Charles S. Kim David Peinsipp Kristin E. VanderPas Cooley LLP 4401 Eastgate Mall San Diego, California 92121-1909 (858) 550-6000

Approximate date of commencement of proposed sale to the public: As soon as practicable after the effective date of this Registration Statement.

If any of the securities being registered on this form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, check the following box. ☐

If this form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☐ Accelerated filer ☐ Non-accelerated filer ☑ Smaller reporting company ☐

Emerging growth company ☑

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act. ☑

CALCULATION OF REGISTRATION FEE

Title Of Each Class Of Securities To Be Registered	Proposed Maximum Aggregate Offering Price(1)(2)	Amount Of Registration Fee
Common Stock, par value $0.001 per share	$	$

(1) Includes shares that the underwriters have the right to purchase from us solely to cover over-allotments.
(2) Estimated solely for the purpose of computing the amount of the registration fee pursuant to Rule 457(o) under the Securities Act of 1933.

The Registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the registrant shall file a further amendment which specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933 or until the registration statement shall become effective on such date as the Commission, acting pursuant to said Section 8(a), may determine.

EXPLANATORY NOTE

Pursuant to the applicable provisions of the Fixing America's Surface Transportation Act, we are omitting our financial statements (and related financial information) as of and for the nine months ended September 30, 2017 and 2018 because they relate to historical periods that we believe will not be required to be included in the prospectus at the time of the contemplated offering. We intend to amend the registration statement to include all financial information required by Regulation S-X at the date of such amendment before distributing a preliminary prospectus to investors.

The information in this preliminary prospectus is not complete and may be changed. We may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This preliminary prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any state where the offer or sale is not permitted.

SUBJECT TO COMPLETION, DATED , 2019

Shares

Common Stock

This is the initial public offering of shares of common stock of ShockWave Medical, Inc.

We are offering shares of our common stock. Prior to this offering, there has been no public market for our common stock. It is currently estimated that the initial public offering price per share will be between $ and $. We intend to apply to list our common stock on the under the symbol "SWAV."

We are an emerging growth company under the federal securities laws and will be subject to reduced public company reporting requirements. See "Prospectus Summary—Implications of Being an Emerging Growth Company."

Investing in our common stock involves a high degree of risk. See "Risk Factors" beginning on page 12.

	Per Share	Total
Initial public offering price	$	$
Underwriting discounts and commissions(1)	$	$
Proceeds, before expenses, to us	$	$

(1) See "Underwriting" for additional disclosure regarding the estimated underwriting discounts and commissions and estimated offering expenses.

We have granted the underwriters the right to purchase up to an additional shares of common stock solely to cover over-allotments, if any.

The underwriters expect to deliver the shares against payment in New York, New York on , 2019.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities, or passed upon the accuracy or adequacy of this prospectus. Any representation to the contrary is a criminal offense.

Morgan Stanley **BofA Merrill Lynch**

Wells Fargo Securities **Canaccord Genuity**

, 2019

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We and the underwriters have not authorized anyone to provide any information or to make any representations other than those contained in this prospectus or in any free writing prospectuses we have prepared. We and the underwriters take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may provide you. We are offering to sell, and seeking offers to buy, shares of common stock only in jurisdictions where offers and sales are permitted. The information contained in this prospectus is accurate only as of the date of this prospectus, regardless of the time of delivery of this prospectus or of any sale of the common stock.

This prospectus includes industry and market data that we obtained from periodic industry publications, third-party studies and surveys, filings of public companies in our industry and internal company surveys. These sources may include government and industry sources. Industry publications and surveys generally state that the information contained therein has been obtained from sources believed to be reliable. Although we believe the industry and market data to be reliable as of the date of this prospectus, this information could prove to be inaccurate. Industry and market data could be wrong because of the method by which sources obtained their data and because information cannot always be verified with complete certainty due to the limits on the availability and reliability of raw data, the voluntary nature of the data gathering process and other limitations and uncertainties. In addition, we do not know all of the assumptions regarding general economic conditions or growth that were used in preparing the forecasts from the sources relied upon or cited herein.

Until , 2019 (25 days after the date of this prospectus), all dealers that buy, sell or trade our common stock, whether or not participating in this offering, may be required to deliver a prospectus. This is in addition to the dealers' obligation to deliver a prospectus when acting as underwriters and with respect to their unsold allotments or subscriptions.

PROSPECTUS SUMMARY

This summary highlights information contained elsewhere in this prospectus. This summary may not contain all of the information that you should consider before deciding to invest in our common stock. You should read this entire prospectus carefully, including the "Risk Factors" section and the consolidated financial statements and the notes to those statements. Except as otherwise indicated herein or as the context otherwise requires, "ShockWave Medical," "ShockWave Medical, Inc.," the "Company," "we," "us" and "our" refer to ShockWave Medical, Inc. and its consolidated subsidiary.

Company Overview

We are a medical device company focused on developing and commercializing products intended to transform the way calcified cardiovascular disease is treated. We aim to establish a new standard of care for medical device treatment of atherosclerotic cardiovascular disease through our differentiated and proprietary local delivery of sonic pressure waves for the treatment of calcified plaque, which we refer to as intravascular lithotripsy ("IVL"). Our IVL system (our "IVL System"), which leverages our IVL technology (our "IVL Technology"), is a minimally invasive, easy-to-use and safe way to significantly improve patient outcomes. Our Shockwave M5 IVL catheter ("M5 catheter") was CE-Marked in April 2018 and cleared by the U.S. Food and Drug Administration ("FDA") in July 2018 for use in our IVL System for the treatment of peripheral artery disease ("PAD"). Our Shockwave C2 IVL catheter ("C2 catheter"), which we are currently marketing in Europe, was CE-Marked in June 2018 for use in our IVL System for the treatment of coronary artery disease ("CAD"). We have ongoing clinical programs across several products and indications which, if successful, will allow us to expand commercialization of our products into new geographies and indications. Importantly, we are undertaking ongoing clinical trials of our C2 catheter intended to support a pre-market application ("PMA") in the United States and a Shonin submission in Japan for the treatment of CAD. We anticipate having final data from these ongoing clinical trials intended to support a U.S. launch of our C2 catheter in the first half of 2021.

The Opportunity

Atherosclerosis is a common disease of aging in which arteries become narrowed ("stenotic") and the supply of oxygenated blood to the affected organ is reduced by the progressive growth of plaque. Atherosclerotic plaque is comprised of fibrous tissue, lipids (fat) and when it progresses, calcium. This calcium is present both deep within the walls of the artery ("deep" or "medial" calcium) and close to the inner surface of the artery ("superficial" or "intimal" calcium).

The first two indications we are targeting with our IVL System are occlusive PAD, the narrowing or blockage of vessels that carry blood from the heart to the extremities, and CAD, the narrowing or blockage of the arteries that supply blood to the heart. In the future, we see significant opportunity in the potential treatment of Aortic Stenosis ("AS"), a condition in which the heart's aortic valve becomes increasingly calcified with age, causing it to narrow and obstruct blood flow from the heart.

The PAD population in the United States has been estimated to be at least eight million people, according to the National Institutes of Health. The global PAD device market size for treatment of occlusive disease is estimated at approximately $2.9 billion and is expected to grow approximately 3% annually due to the fundamental drivers of an aging population and increasing prevalence of diabetes. The "calcium" segment of the PAD market represents a significant percentage of the market, with 50% or more of the population having moderate-to-severe calcium in their vessels, according to our estimates. Current technologies are often not able to safely and effectively treat heavily calcified vessels. Accordingly, we believe our IVL System to treat PAD has a total addressable market opportunity of over $1.7 billion.

The global device market in coronary intervention for CAD is estimated to be nearly $10 billion, according to Decision Resources Group, Inc. ("DRG"). The most common treatment for patients is percutaneous coronary intervention ("PCI"). This involves a suite of devices to facilitate successful angioplasty and stenting, the most commonly used device being drug-eluting stents ("DES"). Moreover, there are nearly four million PCI procedures performed globally every year, and the number of PCI procedures is growing at a rate of more than 5% annually. A study published in the *American Journal of Cardiology* in 2014 demonstrated that more than 30% of patients undergoing PCI have calcified lesions and this percentage is growing. Minimizing complications is particularly important in the coronary vessels, but current plaque modification devices carry meaningful safety risks and are inherently challenging to use, which is why these devices are used very sparingly for PCI procedures in patients with calcified coronary disease. Despite significant under-penetration of the market, these devices still represented a market of nearly $100 million in 2018 within the United States alone, according to DRG; we believe this market is significantly larger globally. Due to the increasing prevalence of calcified cardiovascular disease, the market growth for plaque modification devices exceeds that of PCI procedure growth. We believe the safety, ease of use and efficient impact on calcium of our IVL System will result in rapid adoption and market expansion in markets in which our C2 catheter is introduced. We believe there is over a $2 billion total addressable market opportunity for our IVL System to treat CAD.

The global market for Aortic Valve Replacement ("AVR"), the main treatment for AS, is growing rapidly, and is dominated by the emergence of Transcatheter Aortic Valve Replacement ("TAVR") devices. According to an article published in the *Journal of Thoracic Disease* in 2017, the global market for TAVR is over 125,000 procedures performed worldwide in 2018 and is expected to grow to nearly 300,000 by 2025. We are currently developing an IVL catheter which we believe can safely and effectively treat patients with AS. If successful, this represents a potential total addressable market of over $3 billion for our IVL System to treat AS.

Current Challenges

The primary approaches to treat vascular disease are angioplasty balloons ("balloons"), drug-coated balloons ("DCB"), bare metal stents and DES. These devices all work by using pressurized balloons to expand the diseased blood vessels. Calcified plaque creates challenges for these therapies in achieving optimal outcomes in treating PAD and CAD because the calcified vessels fail to expand under safe pressures. This, in turn, can lead to acute failure, damage to the blood vessel, which increases the rate of restenosis (re-occlusion of the vessel following endovascular treatment) or complications requiring adjunctive tools, future re-interventions or conversion to bypass surgery. These complications are significantly increased when treating calcified cardiovascular disease and include dissections, embolization, restenosis, vessel perforations and vessel recoil.

Plaque modification devices (including atherectomy and specialty balloons) have enhanced the treatment of some moderately calcified cardiovascular lesions by improving the ability of stent and balloon therapies to effectively expand in the vessel. Atherectomy devices are designed to break or remove superficial calcium by cutting or sanding the calcium in order to improve vessel expansion. Specialty balloon devices incorporate metallic elements like wires and cutting blades onto standard angioplasty balloons; these devices are intended to make discreet cuts in the plaque and surrounding tissue in order to improve vessel expansion. Despite improvements in plaque modification devices, significant limitations remain, including being difficult to use and creating complications and inconsistent efficacy. Further, because medial calcium is encased in the vessel wall, the existing plaque modification devices are unable to impact medial calcium without damaging the vessel. Combined, these limitations decrease the utilization of plaque modification devices for treating calcified cardiovascular disease, thereby reducing the clinical benefit of angioplasty and stent therapies compared to their use in non-calcified anatomies.

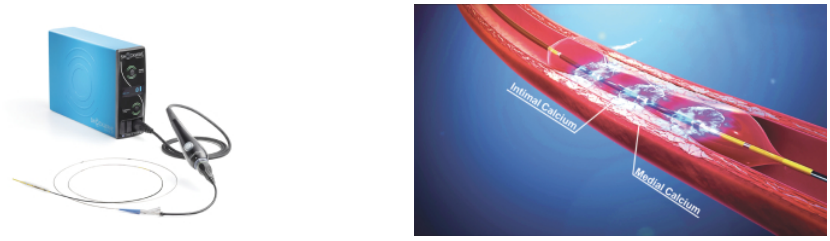
Calcified iliac and femoral arteries can hinder the delivery of large endovascular devices for other catheter-based procedures, including those that treat aortic aneurysms (Endovascular Aneurysm Repair and Thoracic

Endovascular Aneurysm Repair procedures), severe aortic stenosis treated with TAVR and cardiac support devices for high-risk PCI (e.g. Impella). The standard practice for these procedures is to gain vascular access in the femoral artery and insert large diameter sheaths that facilitate the delivery of the treatment devices to the aorta or the heart. However, when significant calcium is present in these arteries, it can prevent delivery of the devices, and thus may require more invasive treatments, increase complications or prevent the device from being used altogether. For example, in up to 20% of patients, the transfemoral approach through the iliac and femoral arteries is not viable for TAVR delivery or creates risk of vessel trauma due to the extent of vascular calcification, according to a 2018 study in the *Journal of the American College of Cardiology*.

Our Solution

We have adapted the use of lithotripsy to the cardiovascular field with the aim of creating what we believe can become the safest, most effective means of addressing the growing challenge of cardiovascular calcification. Lithotripsy has been used to successfully treat kidney stones (deposits of hardened calcium) for over 30 years. By integrating lithotripsy into a device that resembles a standard balloon catheter, physicians can prepare, deliver and treat calcified lesions using a familiar form factor, without disruption to their standard procedural workflow. Our differentiated IVL System works by delivering shockwaves through the entire depth of the artery wall, modifying calcium in the medial layer of the artery, not just at the superficial most intimal layer. The shockwaves crack this calcium and enable the stenotic artery to expand at low pressures, thereby minimizing complications inherent to traditional balloon dilations, such as dissections or tears. Preparing the vessel with IVL facilitates optimal outcomes with other therapies, including stents and drug-eluting technologies. Using IVL also avoids complications associated with atherectomy devices such as dissection, perforation and embolism. When followed by an anti-proliferative therapy such as a DCB or DES, the micro-fractures may enable better drug penetration into the arterial wall and improve drug uptake, thereby improving the effectiveness of the combination treatment.

Our IVL System



(Left) Our IVL System consisting of a generator, connector cable and IVL catheter
(Right) Our IVL System delivering lithotripsy directly to a calcified vessel

Our IVL System includes a generator, connector cable and a family of IVL catheters designed to treat PAD and CAD. Our IVL System employs our IVL Technology to crack calcium through short bursts of sonic pressure waves, which are generated within the IVL catheter, travel through the vessel and crack calcium with an effective pressure of up to 50 atmospheres (“atm”) (a unit of pressure) without harming the soft tissue. Our IVL catheters utilize multiple lithotripsy emitters that are integrated into a standard, semi-compliant balloon-catheter platform. The IVL catheter is advanced to the target lesion and the integrated balloon is inflated with fluid at a low pressure to make contact with the arterial wall. IVL is then activated through the generator with the touch of a button, creating a small bubble within the catheter balloon which rapidly expands and collapses. The rapid

expansion and collapse of the bubble creates sonic pressure waves that travel through the vessel and crack the calcium, allowing the blood vessel to expand under low static pressure.

We believe there is a significant opportunity to apply our IVL Technology as a platform to treat a wide array of indications throughout the cardiovascular system. Ultimately, our plan is to have a family of IVL catheters that can treat calcium-related diseases across a wide variety of vasculatures and structures.

Our Products and Ongoing Development

The interchangeability of specific catheters enables delivery of IVL therapy of diseased vasculature throughout the body. Our IVL catheters are cleared or approved for use in a number of geographies. Development programs are underway to expand indications and geographies:

- M5 catheters ("medium" vessel, five-emitters): for treating PAD in the United States and internationally.
- C2 catheters (coronary, two-emitters): for treating CAD in select international markets. We received an investigational device exemption ("IDE") to conduct a pivotal global study, which is intended to support U.S. FDA and Japanese Shonin approval of the device. We expect to commence enrollment of the study in early 2019.
- S4 catheter ("small" vessel, four-emitters): for treating PAD Below the Knee ("BTK") in the United States, Europe and select international markets. We have 510(k) clearance and CE Mark and we are currently engaged in a limited market evaluation of the product to test its performance in the heavily calcified and challenging BTK environment.

Our IVL catheters resemble in form and function a standard balloon angioplasty catheter, the device most commonly used by interventionalists. This familiarity makes our IVL System easy to learn, adopt and use on a day-to-day basis.

A development program and initial clinical work are also currently underway to explore the ability of our IVL Technology to directly treat calcified aortic valves to safely reduce the symptoms of and potentially delay or negate valve replacement treatment for AS.

Since inception, we have focused on generating clinical data to demonstrate the safety and effectiveness of our IVL Technology. These initial studies have consistently delivered exceptionally low rates of complications regardless of which vessel was being studied. In addition to gaining regulatory approvals or clearances, the data from our clinical studies strengthen our ability to drive adoption of IVL Technology across multiple therapies in existing and new market segments. Our past studies have demonstrated that our IVL Technology significantly reduces residual stenosis and vascular complications in infrapopliteal and femoropopliteal PAD, with outstanding durability and sustained improvement in functional outcome in 115 patients. Our past studies have also guided optimal IVL procedure technique and informed the design of our IVL System and future products in development. In the treatment of CAD, our past studies have demonstrated both safety and effectiveness of our IVL System in heavily calcified coronary lesions prior to stenting in 60 patients. Feasibility studies have shown the potential of our transcatheter aortic valve lithotripsy system (our "TAVL System") to safely improve the aortic valve area and reduce transvalvular gradients in AS. We are currently enrolling patients in multiple studies to support applications for and clearances in a variety of indications and geographies, as well as a randomized trial to assess the combination of IVL with DCB for treating PAD.

We market our IVL System to hospitals whose interventional cardiologists, vascular surgeons and interventional radiologists treat patients with PAD and CAD. We have dedicated meaningful resources to

establish direct sales capability in the United States, Germany, Austria and Switzerland, and we have complemented those direct teams with distributors, including in Australia, the Baltics, Canada, France, Italy, New Zealand, the Nordic region, Spain and the United Kingdom. We are actively expanding our international field presence through new distributors, additional sales and clinical personnel, and are adding new U.S. sales territories.

Why ShockWave?

Safe - Simple - Effective

- Treatment of both superficial and deep calcium.
- Improved safety through unique mechanism of action.
- Improved efficacy for angioplasty, stents and drug-eluting technologies.
- Seamless integration into interventional practice with exceptional ease-of-use.
- Expanded access to interventional techniques for patients.

Our Growth Strategy

Our mission is to provide safe, effective and easy-to-use treatments to optimize outcomes for calcified cardiovascular disease. We believe the following strategies will advance our mission and will contribute to our future success and growth.

- Address unmet clinical needs in multiple large markets.
- Advance our IVL System as a common treatment for calcified PAD and CAD.
- Grow our specialized sales force across indications and geographies to foster deep relationships with physicians and drive revenue growth.
- Execute on our clinical program to expand indications and build a robust body of clinical evidence.
- Leverage our IVL Technology to develop new products that satisfy significant unmet clinical needs.
- Drive profitability by scaling our business operations to achieve cost and production efficiencies.

Recent Developments

There are a number of recent events which we believe will serve as near-term catalysts for our business and position us for long-term success.

- We received IDE approval for our DISRUPT CAD III global study, and we expect to begin enrollment in 2019. This study is designed to support U.S. PMA approval for our C^2 catheters.
- In December 2018, we entered into a collaboration with Abiomed, a leading global provider of medical devices that provide circulatory support. Pursuant to this collaboration, we will work with Abiomed to integrate our products into Abiomed's physician training and education programs. In connection with the collaboration, Abiomed purchased shares of our Series D convertible preferred stock.

Risks Associated With Our Business

Our business is subject to numerous risks, as more fully described in the section titled "Risk Factors" immediately following this prospectus summary. You should read these risks before you invest in our common stock. In particular, risks associated with our business include, but are not limited to, the following:

- We have a history of net losses, and we expect to continue to incur losses for the foreseeable future. If we ever achieve profitability, we may not be able to sustain it.

- We currently have limited commercialization, sales or marketing experience. If we are unable to establish effective sales and marketing capabilities or if we are unable to enter into agreements with third parties to commercialize our products, we may not be able to effectively generate product revenue, sustain revenue growth and compete effectively.
- Our success depends in large part on our IVL Technology. If we are unable to successfully market and sell products incorporating our IVL Technology, our business prospects will be significantly harmed and we may be unable to achieve revenue growth.
- We currently manufacture and sell products used in a limited number of procedures, which could negatively affect our operations and financial condition.
- For our company to thrive, we must lead and benefit from a shift in thinking about the role of calcified lesions in our core disease areas.
- The continuing development of our products depends upon our maintaining strong working relationships with physicians.
- Reimbursement may not be available for the procedures that utilize our products, which could diminish our sales or affect our ability to sell our products profitably.
- If we fail to comply with U.S. federal and state fraud and abuse and other healthcare laws and regulations, including those relating to kickbacks and false claims for reimbursement, we could face substantial penalties and our business operations and financial condition could be adversely affected.
- If we are unable to obtain and maintain patent or other intellectual property protection for our products, or if the scope of the patent and other intellectual property protection obtained is not sufficiently broad, our competitors could develop and commercialize products and technology similar or identical to ours, and our ability to successfully commercialize any products we may develop, and our technology, may be adversely affected.
- Regulatory compliance is expensive, complex and uncertain, and a failure to comply could lead to enforcement actions against us and other negative consequences for our business.
- Our operating results may fluctuate significantly, which makes our future operating results difficult to predict and could cause our operating results to fall below expectations or our guidance.

Corporate Information

We were incorporated in 2009 as a Delaware corporation under the name ShockWave Medical, Inc. Our principal executive offices are located at 5403 Betsy Ross Drive, Santa Clara, California 95054, and our telephone number is (510) 279-4262. Our website address is www.shockwavemedical.com. The information on, or that can be accessed through, our website is not part of this prospectus. We have included our website address as an inactive textual reference only.

We use “Shockwave,” “Shockwave M5,” “Shockwave C2,” “Shockwave S4” and other marks as trademarks in the United States and other countries. This prospectus contains references to our trademarks and service marks and to those belonging to other entities. Solely for convenience, trademarks and trade names referred to in this prospectus, including logos, artwork, and other visual displays, may appear without the ® or ™ symbols, but such references are not intended to indicate in any way that we will not assert, to the fullest extent under applicable law, our right or the rights of the applicable licensor to these trademarks and trade names. We do not intend our use or display of other entities’ trade names, trademarks, or service marks to imply a relationship with, or endorsement or sponsorship of us by, any other entity.

Implications of Being an Emerging Growth Company

We are an "emerging growth company," as defined in the Jumpstart Our Business Startups Act of 2012. We will remain an emerging growth company until the earliest to occur of: the last day of the fiscal year in which we have more than $1.07 billion in annual revenue; the date we qualify as a "large accelerated filer," with at least $700 million of equity securities held by non-affiliates; the issuance, in any three-year period, by us of more than $1 billion in non-convertible debt securities; and the last day of the fiscal year ending after the fifth anniversary of our initial public offering. We refer to the Jumpstart Our Business Startups Act of 2012 herein as the "JOBS Act," and any reference herein to "emerging growth company" has the meaning ascribed to it in the JOBS Act.

An emerging growth company may take advantage of reduced reporting requirements that are otherwise applicable to public companies. These provisions include, but are not limited to:

- being permitted to present only two years of audited financial statements and only two years of related Management's Discussion and Analysis of Financial Condition and Results of Operations in this prospectus;
- not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, as amended;
- reduced disclosure obligations regarding executive compensation in our periodic reports, proxy statements and registration statements; and
- exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved.

We have elected to take advantage of certain of the reduced disclosure obligations in this prospectus and may elect to take advantage of other reduced reporting requirements in our future filings with the U.S. Securities and Exchange Commission (the "SEC"). As a result, the information that we provide to our stockholders may be different than you might receive from other public reporting companies in which you hold equity interests.

The JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. We have irrevocably elected not to avail ourselves of this exemption and, therefore, we will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

THE OFFERING

Common stock offered by us	shares.
Underwriters' over-allotment option	shares.
Common stock to be outstanding immediately after this offering	shares (shares, if the underwriters exercise their over-allotment option in full).
Use of proceeds	We estimate that the net proceeds to us from this offering will be approximately $ million, or approximately $ million if the underwriters exercise their over-allotment option in full, assuming an initial public offering price of $ per share (which is the midpoint of the estimated price range set forth on the cover page of this prospectus), after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. We expect to use the net proceeds from this offering for the expansion of our direct sales force and marketing of our products, to support clinical studies for new products and product enhancements, including expanded indications, and to support other research and development activities, working capital, and general corporate purposes. We may also use a portion of the net proceeds of this offering for acquisitions or strategic transactions, though we have not entered into any agreements or commitments with respect to any specific transactions and have no understandings or agreements with respect to any such transactions at this time. See the section titled "Use of Proceeds" for additional information.
Risk factors	You should read the section titled "Risk Factors" in this prospectus for a discussion of factors to consider carefully before deciding to invest in shares of our common stock.
Proposed symbol	"SWAV."

The number of shares of common stock to be outstanding immediately after this offering is based upon shares outstanding as of December 31, 2018, and excludes:

- shares of our common stock issuable upon the exercise of options outstanding as of December 31, 2018, with a weighted-average exercise price of $ per share;
- shares of our common stock issuable upon the exercise of options granted after December 31, 2018, with a weighted-average exercise price of $ per share;
- 669,817 shares of our Series A-1 convertible preferred stock issuable upon the exercise of our Series A-1 convertible preferred stock warrant outstanding as of December 31, 2018, with an exercise price of $0.2538 per share;

- 2,149,873 shares of our common stock issuable upon the exercise of our common stock warrants outstanding as of December 31, 2018, with a weighted-average exercise price of $0.21 per share;
- shares of our common stock reserved for future grant or issuance under our 2009 Equity Incentive Plan as of December 31, 2018; and
- shares of our common stock reserved for future issuance under our 2019 Equity Incentive Plan, which will become effective immediately prior to the completion of this offering, as well as any automatic increases in the number of shares of our common stock reserved for future issuance pursuant to this plan.

Unless otherwise indicated, this prospectus reflects and assumes the following:

- the automatic conversion of all of our outstanding shares of convertible preferred stock into an aggregate of shares of our common stock immediately prior to the completion of this offering;
- outstanding shares include shares of our common stock issued upon the early exercise of stock options and subject to repurchase;
- the automatic conversion of our outstanding Series A-1 convertible preferred stock warrant into a warrant to purchase 669,817 shares of our common stock upon the completion of this offering, with an exercise price of $0.2538 per share;
- the net exercise of outstanding warrants to purchase 1,729,699 shares of our common stock immediately prior to the completion of this offering that would otherwise expire upon completion of this offering, with an exercise price of $0.18 per share, which will result in the issuance of shares of our common stock based on an assumed initial public offering price of $ per share (which is the midpoint of the estimated price range set forth on the cover of this prospectus);
- no exercise of outstanding options or warrants, other than as described in the fourth bullet above;
- no exercise by the underwriters of their over-allotment option;
- the filing and effectiveness of our amended and restated certificate of incorporation and the adoption of our amended and restated bylaws immediately prior to the completion of this offering; and
- a one-for- reverse stock split of our common stock to be effected prior to the closing of this offering.

SUMMARY CONSOLIDATED FINANCIAL DATA

The following tables summarize our consolidated financial data. We have derived the summary consolidated statement of operations data for the years ended December 31, 2017 and 2018 from our audited consolidated financial statements included elsewhere in this prospectus. We have derived our balance sheet data as of December 31, 2018 from our audited consolidated financial statements included elsewhere in this prospectus. Our historical results are not necessarily indicative of the results that may be expected in the future. The following summary consolidated financial data should be read in conjunction with the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our consolidated financial statements and related notes included elsewhere in this prospectus.

	Years Ended December 31,	
	2017	2018
	(in thousands, except share and per share data)	
Consolidated Statement of Operations Data:		
Product revenue	$ 1,719	$
Operating expenses:		
Cost of product revenue	2,836	
Research and development	17,963	
Sales and marketing	6,363	
General and administrative	5,422	
Total operating expenses	32,584	
Loss from operations	(30,865)	
Interest and other income, net	276	
Net loss before taxes	(30,589)	
Income tax provision	26	
Net loss	(30,615)	
Net loss per share, basic and diluted(1)	$ (1.62)	$
Weighted-average shares used in computing net loss per share, basic and diluted(1)	18,951,047	
Pro forma net loss per share, basic and diluted (unaudited)(1)		$
Weighted-average shares used in computing pro forma net loss per share, basic and diluted (unaudited)(1)		

(1) See Notes 2 and 12 to our audited consolidated financial statements included elsewhere in this prospectus for an explanation of the calculations of our basic and diluted net loss per share and unaudited pro forma net loss per share and the weighted-average number of shares used in the computation of the per share amounts.

	As of December 31, 2017		
	Actual	Pro Forma(1)	Pro Forma as adjusted(2)(3)
	(in thousands)		
Consolidated Balance Sheet Data:			
Cash, cash equivalents and short-term investments	$ 53,729	$	$
Working capital	53,318		
Total assets	59,304		
Convertible preferred stock warrant liability	577		
Convertible preferred stock	137,469		
Accumulated deficit	(85,763)		
Total stockholders' (deficit) equity	(83,292)		

(1) The pro forma consolidated balance sheet data gives effect to: (i) the automatic conversion of all outstanding shares of our convertible preferred stock as of December 31, 2017 into an aggregate of shares of our common stock immediately prior to the completion of this offering; (ii) the issuance of shares of our common stock, based upon an assumed initial public offering price of $ per share (which is the midpoint of the estimated price range set forth on the cover page of this prospectus), upon the net exercise of warrants outstanding as of December 31, 2017 for the purchase of 1,729,699 shares of our common stock that would otherwise expire upon completion of this offering; (iii) the reclassification of the convertible preferred stock warrant liability to additional paid-in capital, a component of total stockholder's (deficit) equity, due to our convertible preferred stock warrant converting to a warrant to purchase our common stock immediately prior to the completion of this offering; and (iv) the filing and effectiveness of our amended and restated certificate of incorporation, which will be in effect immediately prior to the completion of this offering.

(2) The pro forma as adjusted balance sheet data gives effect to: (i) the pro forma adjustments set forth in footnote (1) above; and (ii) the issuance and sale of shares of our common stock in this offering at an assumed initial public offering price of $ per share (which is the midpoint of the estimated price range set forth on the cover page of this prospectus), after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. The pro forma information discussed above is illustrative only and will be adjusted based on the actual initial public offering price and other terms of our initial public offering determined at pricing.

(3) Each $1.00 increase (decrease) in the assumed initial public offering price of $ per share (which is the midpoint of the estimated price range set forth on the cover page of this prospectus), would increase (decrease) each of cash, cash equivalents and short-term investments, working capital, total assets and additional paid-in capital, a component of total stockholders' (deficit) equity, by $ million, assuming that the number of shares of common stock offered by us, as set forth on the cover page of this prospectus, remains the same, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us. Similarly, each increase (decrease) of 1,000,000 shares in the number of shares of common stock offered by us would increase (decrease) each of cash, cash equivalents and short-term investments, working capital, total assets and additional paid-in capital, a component of total stockholders' (deficit) equity, by $ million, assuming the assumed initial public offering price of $ per share remains the same, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

RISK FACTORS

Investing in our common stock involves a high degree of risk. You should carefully consider the risks described below, as well as all of the other information contained in this prospectus, including our financial statements and related notes, before investing in our common stock. While we believe that the risks and uncertainties described below are the material risks currently facing us, additional risks that we do not yet know of or that we currently think are immaterial may also arise and materially affect our business. If any of the following risks materialize, our business, financial condition and results of operations could be materially and adversely affected. In that case, the trading price of our common stock could decline, and you may lose some or all of your investment.

Risks Related to Our Business and Products

We have a history of net losses, and we expect to continue to incur losses for the foreseeable future. If we ever achieve profitability, we may not be able to sustain it.

We have incurred losses since our inception, and expect to continue to incur losses for the foreseeable future. We have reported net losses of $30.6 million and $ for the years ended December 31, 2017 and 2018, respectively. As a result of these losses, as of December 31, 2018, we had an accumulated deficit of approximately $. We expect to continue to incur significant sales and marketing, research and development, regulatory and other expenses as we expand our marketing efforts to increase adoption of our products, expand existing relationships with our customers, obtain regulatory clearances or approvals for our planned or future products, conduct clinical trials on our existing and planned or future products and develop new products or add new features to our existing products. In addition, we expect our general and administrative expenses to increase following this offering due to the additional costs associated with being a public company. The net losses that we incur may fluctuate significantly from period to period. We will need to generate significant additional revenue in order to achieve and sustain profitability. Even if we achieve profitability, we cannot be sure that we will remain profitable for any substantial period of time.

We have a limited commercialization experience.

We were incorporated in 2009 and began commercializing our Shockwave M5 IVL catheter (“M5 catheter”) for treating peripheral artery disease (“PAD”) in the United States and Europe in 2018 and our Shockwave C2 IVL catheter (“C2 catheter”) for treating coronary artery disease (“CAD”) in Europe in 2017. Our C2 catheter has not yet been approved or cleared for the treatment of CAD in the United States. Our limited commercialization experience and limited number of approved or cleared products make it difficult to evaluate our current business and predict our future prospects.

These factors also make it difficult for us to forecast our future financial performance and growth, and such forecasts are subject to a number of uncertainties, including our ability to successfully complete our Disrupt PAD III, Disrupt CAD II, Disrupt CAD III, Disrupt CAD IV and Transcatheter Aortic Valve Lithotripsy (“TAVR”) feasibility clinical trials and obtain U.S. Food and Drug Administration (“FDA”) pre-market approval for, and successfully commercialize, our C2 catheter for the treatment of CAD in the United States or future planned products in the United States or in key international markets. If our assumptions regarding the risks and uncertainties we face, which we use to plan our business, are incorrect or change due to circumstances in our business or our markets, or if we do not address these risks successfully, our operating and financial results could differ materially from our expectations and our business could suffer.

Our success depends in large part on our intravascular lithotripsy technology (our "IVL Technology"). If we are unable to successfully market and sell products incorporating our IVL Technology, our business prospects will be significantly harmed and we may be unable to achieve revenue growth.

Our future financial success will depend substantially on our ability to effectively and profitably market and sell our products incorporating our IVL Technology. The commercial success of our products and any of our planned or future products will depend on a number of factors, including the following:

- the actual and perceived effectiveness and reliability of our products, especially relative to alternative products;
- the prevalence and severity of any adverse patient events involving our products;
- the results of clinical trials relating to the use of our products;
- our ability to obtain regulatory approval to market our planned or future products for use in treating PAD, CAD and aortic stenosis ("AS") in the United States;
- the availability, relative cost and perceived advantages and disadvantages of alternative technologies or treatment methods for conditions treated by our products;
- the degree to which treatments using our products are covered and receive adequate reimbursement from third-party payors, including governmental and private insurers;
- the degree to which physicians adopt our products;
- our ability to obtain, maintain, protect and enforce our intellectual property rights in and to our IVL Technology and our products that incorporate our IVL Technology;
- achieving and maintaining compliance with all regulatory requirements applicable to our products;
- the extent to which we are successful in educating physicians about PAD, CAD and AS in general, and the benefits of our products in treating such conditions;
- the strength of our marketing and distribution infrastructure;
- the effectiveness of our and our distributors' marketing and sales efforts in the United States and abroad, including our efforts to build out our sales team;
- the level of education and awareness among physicians and hospitals concerning our products;
- our reputation among physicians and hospitals;
- our ability to continue to develop, validate and maintain a commercially viable manufacturing process that is compliant with current Good Manufacturing Practices ("cGMP") and Quality Systems Regulations ("QSR"); and
- whether we are required by the FDA or comparable non-U.S. regulatory authorities to conduct additional clinical trials for future or current indications.

If we fail to successfully market and sell our products, we will not be able to achieve profitability, which will have a material adverse effect on our business, financial condition and results of operations. Our ability to grow our revenue in future periods will depend on our ability to successfully penetrate our target markets and increase sales of our products and any new product or product indications that we introduce, which will, in turn, depend in part on our success in growing our user base and driving increased use of our products. New products or product indications will also need to be approved or cleared by the FDA and comparable non-U.S. regulatory agencies to drive revenue growth. If we cannot achieve revenue growth, it could have a material adverse effect on our business, financial condition and results of operations.

We currently manufacture and sell products that are used in a limited number of procedures, which could negatively affect our operations and financial condition.

Currently, our products consist primarily of our IVL System using M5 catheters for the treatment of PAD in the United States and internationally and C2 catheters for the treatment of CAD internationally. Therefore, we are dependent on widespread market adoption of these products and we will continue to be dependent on the success of these products for the foreseeable future. There can be no assurance that our products will gain a substantial degree of market acceptance among specialty physicians, patients or healthcare providers. Our failure to successfully increase sales of these products or any other event impeding our ability to sell these products would result in a material adverse effect on our business, financial condition and results of operations.

For our company to thrive, we must lead and benefit from a shift in thinking about the role of calcified lesions in our core disease areas.

A shift in thinking in the treatment of our core disease areas is needed for the successful market acceptance of our products. We will need to educate the medical community about the safety, efficacy, necessity and efficiency of our products. This will require educating them not only about the benefits of our technology, but also about the impact of calcified plaque on treatment choices and treatment outcomes. We believe that focusing on calcified plaque is a paradigm shift in the treatment of these diseases because other interventions have not specifically focused on this source of atherosclerosis. Additionally, we will need to convince the medical community that the additional cost and time of integrating the IVL procedure, designed to prepare the vessel for the subsequent stenting or angioplasty procedure, is worth the increased efficacy of the overall procedure and improvement in patient outcomes. The failure of our clinical, marketing and executive teams to drive this shift in thinking among doctors, patients, practitioners, third-party payors and regulators could adversely affect our ability to grow the business.

The continuing development of our products depends upon our maintaining strong working relationships with physicians.

The research, development, marketing and sale of our current products and potential new and improved products or future product indications for which we receive regulatory clearance or approval depend upon our maintaining working relationships with physicians. We rely on these professionals to provide us with considerable knowledge and experience regarding the development, marketing and sale of our products. Physicians assist us in clinical trials and in marketing, and as researchers, product consultants and public speakers. If we cannot maintain our strong working relationships with these professionals and continue to receive their advice and input, the development and marketing of our products could suffer, which could have a material adverse effect on our business, financial condition and results of operations. At the same time, the medical device industry's relationship with physicians is under increasing scrutiny by the U.S. Department of Health and Human Services Office of Inspector General (the "OIG"), the U.S. Department of Justice (the "DOJ"), the state attorney generals and other foreign and domestic government agencies. Our failure to comply with requirements governing the industry's relationships with physicians or an investigation into our compliance by the OIG, the DOJ, state attorney generals and other government agencies, could have a material adverse effect on our business, financial condition and results of operations. Additional information regarding the laws impacting our relationships with physicians and other healthcare professionals can be found below under "Risks Related to Government Regulation and Our Industry."

We currently have limited sales or marketing capabilities. If we are unable to establish effective sales and marketing capabilities or if we are unable to enter into agreements with third parties to commercialize our products, we may not be able to effectively generate product revenue, sustain revenue growth and compete effectively.

We currently have limited sales or marketing capabilities. Our sales were $1.72 million and $ million for the years ended December 31, 2017 and 2018, respectively. We launched our M5 catheters for the treatment

of PAD in the United States, Europe and select other countries in 2018, we launched our C^2 catheters for the treatment of CAD in Europe in 2018, and we expect to launch our C^2 catheters for the treatment of CAD in the United States in the first half of 2021, subject to FDA approval. Building the requisite sales, marketing or distribution capabilities will be expensive and time-consuming and will require significant attention from our leadership team to manage. Any failure or delay in the development of our sales, marketing or distribution capabilities would adversely impact the commercialization of our products. The competition for talented individuals experienced in selling and marketing medical device products is intense, and we cannot assure you that we can assemble or maintain an effective team. Additionally, we may choose to collaborate, either globally or on a territory-by-territory basis, with third parties on the commercialization of our products. If we are unable to enter into such arrangements on acceptable terms or at all, we may not be able to successfully commercialize our products.

We may expend our limited resources to pursue a particular product or indication and fail to capitalize on products or indications that may be more profitable or for which there is a greater likelihood of success.

Because we have limited financial and managerial resources, we focus on specific products, indications and discovery programs. As a result, we may forgo or delay pursuit of other opportunities with others that could have had greater commercial potential. Our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities. Our spending on current and future research and development programs for specific indications may not yield any commercially viable products. If we do not accurately evaluate the commercial potential or target market for a particular potential product, we may relinquish valuable rights to that potential product through future collaborations, licenses and other similar arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to such potential product.

In the future our products may become obsolete, which would negatively affect operations and financial condition.

The medical device industry is characterized by rapid and significant change. There can be no assurance that other companies will not succeed in developing or marketing devices and products that are more effective than our IVL System or that would render our IVL System obsolete or noncompetitive. Additionally, new surgical procedures, medications and other therapies could be developed that replace or reduce the importance of our products. Accordingly, our success will depend in part on our ability to respond quickly to medical and other changes through the development and introduction of new products. Product development involves a high degree of risk, and there can be no assurance that our new product development efforts will result in any commercially successful products.

The commercial success of our products will depend upon attaining significant market acceptance of these products among physicians, healthcare payors and the medical community.

Our success will depend, in part, on the acceptance of our products as safe, useful and, with respect to providers, cost effective. We cannot predict how quickly, if at all, physicians will accept our products or, if accepted, how frequently they will be used. Our products and planned or future products we may develop or market may never gain broad market acceptance among physicians and the medical community for some or all of our targeted indications. Healthcare providers must believe that our products offer benefits over alternative treatment methods. The degree of market acceptance of any of our products will depend on a number of factors, including:

- whether physicians and others in the medical community consider our products to be safe and cost effective treatment methods;
- the potential and perceived advantages of our products over alternative treatment methods;
- the prevalence and severity of any side effects associated with using our products;

- product labeling or product insert requirements by the FDA or other regulatory authorities;
- limitations or warnings contained in the labeling cleared or approved by the FDA or other authorities;
- the cost of treatment in relation to alternative treatments methods;
- the convenience and ease of use of our products relative to alternative treatment methods;
- pricing pressure, including from group purchasing organizations ("GPOs"), seeking to obtain discounts on our products based on the collective buying power of the GPO members;
- a substantial shift in the number of PAD procedures that are performed in office-based labs ("OBLs") compared to those performed in a hospital as OBLs tend to have higher price sensitivity than hospitals;
- the availability of coverage and adequate reimbursement for procedures using our products from third-party payors, including government authorities;
- the willingness of patients to pay out-of-pocket in the absence of coverage and adequate reimbursement by third-party payors, including government authorities;
- our ability to provide incremental clinical and economic data that show the safety, clinical efficacy and cost effectiveness of, and patient benefits from, our products; and
- the effectiveness of our sales and marketing efforts for our products.

For example, in July 2018, we initiated and subsequently completed a voluntary recall of our Shockwave S4 IVL catheters ("S4 catheter") after seeing a higher instance of leaks in the balloon, which prevented the balloon from staying inflated at 4 atmospheres ("atm") for the full course of lithotripsy application. Although there were no patient safety issues reported and no reports of adverse clinical events related to this issue, and the issue has been corrected, customer satisfaction problems early in a product's launch can have lasting negative impact on our ability to sell such product.

In addition, if we do not educate physicians about PAD and the existence of our products, they may not gain market acceptance, as many physicians do not routinely screen for PAD while screening for CAD. Additionally, even if our products achieve market acceptance, they may not maintain that market acceptance over time if competing products or technologies, which are more cost effective or received more favorably, are introduced. Failure to achieve or maintain market acceptance and/or market share would limit our ability to generate revenue and would have a material adverse effect on our business, financial condition and results of operations.

The sizes of the markets for our current and future products have not been established with precision, and may be smaller than we estimate.

Our estimates of the annual total addressable markets for our current products and products under development are based on a number of internal and third-party estimates, including, without limitation, the number of patients with calcified cardiovascular disease and the assumed prices at which we can sell tests for markets that have not been established. While we believe our assumptions and the data underlying our estimates are reasonable, these assumptions and estimates may not be correct and the conditions supporting our assumptions or estimates may change at any time, thereby reducing the predictive accuracy of these underlying factors. In addition, our estimates of the sizes of the PAD and CAD patient population include patients who are asymptomatic or in the early stages of disease; these patients might never progress to more advanced disease stages and, accordingly, might never be likely candidates for treatment with our products. As a result, our estimates of the annual total addressable market for our current or future products may prove to be incorrect. If the actual number of patients who would benefit from our products, the price at which we can sell future products, or the annual total addressable market for our products is smaller than we have estimated, it may impair our sales growth and have an adverse impact on our business.

We have limited commercial manufacturing experience and may experience development or manufacturing problems or delays in producing our products and planned or future products that could limit the potential growth of our revenue or increase our losses.

We have limited experience in commercially manufacturing our products and no experience manufacturing these products in the volume that we anticipate will be required if we achieve planned levels of commercial sales. The forecasts of demand we use to determine order quantities and lead times for components purchased from outside suppliers may be incorrect. Our failure to obtain required components or sub-assemblies when needed and at a reasonable cost would adversely affect our business. As a result, we may not be able to develop and implement efficient, low-cost manufacturing capabilities and processes that will enable us to manufacture our existing, planned or future products in significant volumes, while meeting the legal, regulatory, quality, price, durability, engineering, design and production standards required to market our products successfully.

We may encounter unforeseen situations in the manufacturing and assembly of our products that would result in delays or shortfalls in our production. For example, our production processes and assembly methods may have to change in order to accommodate any significant future expansion of our manufacturing capacity, which may increase our manufacturing costs, delay production of our products, reduce our product margin and adversely impact our business. Conversely, if demand for our products shifts such that a manufacturing facility is operated below its capacity for an extended period, we may adjust our manufacturing operations to reduce fixed costs, which could lead to uncertainty and delays in manufacturing times and quality during any transition period.

Since we produce substantially all of our IVL catheters at one facility, any contamination of the controlled environment, equipment malfunction or failure to strictly follow procedures can significantly reduce our yield. A drop in yield can increase our cost to manufacture our products or, in more severe cases, require us to halt the manufacture of our products until the problem is resolved. Identifying and resolving the cause of a drop in yield can require substantial time and resources.

If our manufacturing activities are adversely impacted or if we are otherwise unable to keep up with demand for our products by successfully manufacturing, assembling, testing and shipping our products in a timely manner, our revenue could be impaired, market acceptance for our products could be adversely affected and our customers might instead purchase our competitors' products, which would have a material adverse effect on our business, financial condition and results of operations.

We may be unable to compete successfully with larger companies in our highly competitive industry.

There are numerous approved products for treating vascular diseases in the indications in which we have received clearance or approval and those that we are pursuing or may pursue in the future. Many of these cleared or approved products are well-established and are widely accepted by physicians, patients and third-party payors. Third-party payors may encourage the use of competitors' products. In addition, many companies are developing products, and we cannot predict what the standard of care will be in the future.

The medical device industry is intensely competitive, subject to rapid change and significantly affected by new product introductions and other market activities of industry participants. We compete or plan to compete with manufacturers and distributors of cardiovascular medical devices. Our most notable competitors in the highly competitive cardiovascular field include Boston Scientific Corporation, Cardiovascular Systems, Inc., Medtronic plc and Philips. Many of these competitors are large, well-capitalized companies with significantly greater market share and resources than we have. As a consequence, they are able to spend more on product development, marketing, sales and other product initiatives than we can. We also compete with smaller medical device companies that have single products or a limited range of products. Some of our competitors have:

- significantly greater name recognition;
- broader or deeper relations with healthcare professionals, customers and third-party payors;

- more established distribution networks;
- additional lines of products and the ability to offer rebates or bundle products to offer greater discounts or other incentives to gain a competitive advantage;
- greater experience in conducting research and development, manufacturing, clinical trials, marketing and obtaining regulatory clearance or approval for products; and
- greater financial and human resources for product development, sales and marketing and patent litigation.

We believe that our proprietary IVL Technology, our focus on calcified cardiovascular disease and our organizational culture and strategy, will be important factors in our future success. We compete primarily on the basis that our products treat patients with calcified cardiovascular disease safely and effectively, with improved outcomes and procedural cost savings. Our continued success depends on our ability to:

- develop innovative, proprietary products that can cost-effectively address significant clinical needs;
- continue to innovate and develop scientifically advanced technology;
- obtain and maintain regulatory clearances or approvals;
- demonstrate efficacy in our sponsored and third-party clinical trials and studies;
- apply our technology across product lines and markets;
- attract and retain skilled research and development and sales personnel; and
- cost-effectively manufacture and successfully market and sell products.

In addition, competitors with greater financial resources than ours could acquire other companies to gain enhanced name recognition and market share, as well as new technologies or products that could effectively compete with our existing products, which may cause our revenue to decline and would harm our business.

Our competitors also compete with us in recruiting and retaining qualified scientific, management and commercial personnel, as well as in acquiring technologies complementary to, or necessary for, our products. Because of the complex and technical nature of our products and the dynamic market in which we compete, any failure to attract and retain a sufficient number of qualified employees could materially harm our ability to develop and commercialize our products, which would have a material adverse effect on our business, financial condition and results of operations.

Our operating results may fluctuate significantly, which makes our future operating results difficult to predict and could cause our operating results to fall below expectations or any guidance we may provide.

Our quarterly and annual operating results may fluctuate significantly, which makes it difficult for us to predict our future operating results. These fluctuations may occur due to a variety of factors, many of which are outside of our control, including, but not limited to:

- the level of demand for our products and any approved products, which may vary significantly;
- expenditures that we may incur to acquire, develop or commercialize additional products and technologies;
- the timing and cost of obtaining regulatory approvals or clearances for planned or future products or indications;
- the rate at which we grow our sales force and the speed at which newly hired salespeople become effective, and the cost and level of investment therein;

- the degree of competition in our industry and any change in the competitive landscape of our industry, including consolidation among our competitors or future partners;
- coverage and reimbursement policies with respect to our products, if approved, and potential future products that compete with our products;
- the timing and success or failure of preclinical studies or clinical trials for our products or any future products we develop or competing products;
- the timing of customer orders or medical procedures using our products and the number of available selling days in any quarterly period, which can be impacted by holidays, the mix of products sold and the geographic mix of where products are sold;
- seasonality, including the seasonal slowing of demand for our products we have experienced in the fourth quarter and summer months based on the elective nature of procedures performed using our products, and which we expect to become more pronounced in the future as our business grows;
- the timing and cost of, and level of investment in, research, development, regulatory approval and commercialization activities relating to our products, which may change from time to time;
- the cost of manufacturing our products, which may vary depending on the quantity of production and the terms of our agreements with third-party suppliers and manufacturers; and
- future accounting pronouncements or changes in our accounting policies.

The cumulative effects of these factors could result in large fluctuations and unpredictability in our quarterly and annual operating results. As a result, comparing our operating results on a period-to-period basis may not be meaningful. Investors should not rely on our past results as an indication of our future performance.

This variability and unpredictability could also result in our failing to meet the expectations of industry or financial analysts or investors for any period. If our revenue or operating results fall below the expectations of analysts or investors or below any forecasts we may provide to the market, it could have a material adverse effect on our business, financial condition and results or operations.

Reimbursement may not be available for the procedures that utilize our products, which could diminish our sales or affect our ability to sell our products profitably.

In both U.S. and non-U.S. markets, our ability to successfully commercialize and achieve market acceptance of our products depends, in significant part, on the availability of adequate financial coverage and reimbursement from third-party payors, including governmental payors (such as the Medicare and Medicaid programs in the United States), managed care organizations and private health insurers. Third-party payors decide which treatments they will cover and establish reimbursement rates for those treatments. Third-party payors in the United States generally do not provide reimbursement for our products. Rather, we expect certain components of our IVL System to continue to be purchased by hospitals and other providers who will then seek reimbursement from third-party payors for the procedures performed using our products. While third-party payors currently cover and provide reimbursement for procedures using our currently cleared or approved products, we can give no assurance that these third-party payors will continue to provide coverage and adequate reimbursement for the procedures using our products, to permit hospitals and doctors to offer procedures using our products to patients requiring treatment, or that current reimbursement levels for procedures using our products will continue. Third-party payors are increasingly examining the cost effectiveness of products, in addition to their safety and efficacy, when making coverage and payment decisions. Furthermore, although we believe there is potential to improve on the current reimbursement profile for our devices in the future, the overall amount of reimbursement available for PAD and CAD procedures could remain at current levels or decrease in the future. Additionally, we cannot be sure that the PAD and CAD procedure reimbursement amounts will not reduce or otherwise negatively affect the demand for our marketed products. Failure by hospitals and other users of our products to obtain coverage and adequate reimbursement for the procedures using our products would cause our business to suffer.

Third-party payors have also instituted initiatives to limit the growth of healthcare costs using, for example, price regulation or controls and competitive pricing programs. Some third-party payors also require demonstrated superiority, on the basis of randomized clinical trials, or pre-approval of coverage, for new or innovative devices or procedures before they will reimburse healthcare providers who use such devices or procedures. Additionally, no uniform policy for coverage and reimbursement exists in the United States, and coverage and reimbursement can differ significantly from payor to payor. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own reimbursement rates, but also have their own methods and approval process apart from Medicare determinations. It is uncertain whether our current products or any planned or future products will be viewed as sufficiently cost effective to warrant coverage and adequate reimbursement levels for procedures using such marketed products.

If our products are not approved for planned or new indications, our commercial opportunity will be limited.

We currently market and sell our M5 catheters for the treatment of calcified plaque in patients with PAD in the United States and international markets and our C2 catheters for the treatment of calcified plaque in patients with CAD in Europe. However, our strategy is to market and sell our products for the treatment of CAD in the United States, upon approval or clearance from the FDA, and also to pursue additional vascular indications for our products. Conducting clinical studies to obtain data for new or additional indications may require substantial additional funding beyond the net proceeds of this offering. We cannot assure you that we will be able to successfully obtain clearance or approval for any of these additional product indications.

Even if we obtain clearance or approval to market our products for additional indications in the United States or internationally, we cannot assure you that any such indications will be successfully commercialized, widely accepted in the marketplace or more effective than other commercially available alternatives. If we are unable to successfully develop our products for new or additional indications, our commercial opportunity will be limited, which would have a material adverse effect on our business, financial condition and results of operations.

We have limited data and experience regarding the safety and efficacy of our products. Results of earlier studies may not be predictive of future clinical trial results, and planned studies may not establish an adequate safety or efficacy profile for such products and other planned or future products, which would affect market acceptance of these products.

Because our IVL Technology is relatively new in the treatment of PAD and CAD, we have performed clinical trials only with limited patient populations. The long-term effects of using our products in a large number of patients have not been studied and the results of short-term clinical use of such products do not necessarily predict long-term clinical benefits or reveal long-term adverse effects. The results of preclinical studies and clinical trials of our products conducted to date and ongoing or future studies and trials of our current, planned or future products may not be predictive of the results of later clinical trials, and interim results of a clinical trial do not necessarily predict final results. Our interpretation of data and results from our clinical trials do not ensure that we will achieve similar results in future clinical trials in other patient populations. In addition, preclinical and clinical data are often susceptible to various interpretations and analyses, and many companies that have believed their products performed satisfactorily in preclinical studies and earlier clinical trials have nonetheless failed to replicate results in later clinical trials and subsequently failed to obtain marketing approval. Products in later stages of clinical trials may fail to show the desired safety and efficacy despite having progressed through nonclinical studies and earlier clinical trials.

If our clinical trials are unsuccessful or significantly delayed, or if we do not complete our clinical trials, our business may be harmed.

Clinical development is a long, expensive and uncertain process and is subject to delays and the risk that products may ultimately prove unsafe or ineffective in treating the indications for which they are designed.

Completion of clinical trials may take several years or more. Clinical trials can be delayed for a variety of reasons, including delays in obtaining regulatory approval to commence a trial, in reaching an agreement on acceptable clinical trial terms with prospective sites, in obtaining institutional review board approval at each site, in recruiting patients to participate in a trial or in obtaining sufficient supplies of clinical trial materials.

We cannot provide any assurance that we will successfully, or in a timely manner, enroll our clinical trials, that our clinical trials will meet their primary endpoints or that such trials or their results will be accepted by the FDA or foreign regulatory authorities.

We may experience numerous unforeseen events during, or because of, the clinical trial process that could delay or prevent us from receiving regulatory clearance or approval for new products or modifications of existing products, including new indications for existing products, including:

- enrollment in our clinical trials may be slower than we anticipate, or we may experience high screen failure rates in our clinical trials, resulting in significant delays;
- our clinical trials may produce negative or inconclusive results, and we may decide, or regulators may require us, to conduct additional clinical and/or preclinical testing which may be expensive and time-consuming;
- trial results may not meet the level of statistical significance required by the FDA or other regulatory authorities;
- the FDA or similar foreign regulatory authorities may find the product is not sufficiently safe for investigational use in humans;
- the FDA or similar foreign regulatory authorities may interpret data from preclinical testing and clinical trials in different ways than we do;
- there may be delays or failure in obtaining approval of our clinical trial protocols from the FDA or other regulatory authorities;
- there may be delays in obtaining institutional review board approvals or governmental approvals to conduct clinical trials at prospective sites;
- the FDA or similar foreign regulatory authorities may find our or our suppliers' manufacturing processes or facilities unsatisfactory;
- the FDA or similar foreign regulatory authorities may change their review policies or adopt new regulations that may negatively affect or delay our ability to bring a product to market or receive approvals or clearances to treat new indications;
- we may have trouble in managing multiple clinical sites;
- we may have trouble finding patients to enroll in our trials;
- we may experience delays in agreeing on acceptable terms with third-party research organizations and trial sites that may help us conduct the clinical trials; and
- we, or regulators, may suspend or terminate our clinical trials because the participating patients are being exposed to unacceptable health risks.

Failures or perceived failures in our clinical trials will delay and may prevent our product development and regulatory approval process, damage our business prospects and negatively affect our reputation and competitive position.

Clinical trials may be delayed, suspended or terminated for many reasons, which will increase our expenses and delay the time it takes to develop new products or seek new indications.

We may experience delays in our ongoing or future preclinical studies or clinical trials, and we do not know whether future preclinical studies or clinical trials will begin on time, need to be redesigned, enroll an adequate

number of patients on time or be completed on schedule, if at all. The commencement and completion of clinical trials for future products or indications may be delayed, suspended or terminated as a result of many factors, including:

- the FDA or other regulators disagreeing as to the design, protocol or implementation of our clinical trials;
- the delay or refusal of regulators or institutional review boards ("IRBs") to authorize us to commence a clinical trial at a prospective trial site;
- changes in regulatory requirements, policies and guidelines;
- delays or failure to reach agreement on acceptable terms with prospective clinical research organizations ("CROs") and clinical trial sites, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and trial sites;
- delays in patient enrollment and variability in the number and types of patients available for clinical trials;
- the inability to enroll a sufficient number of patients in trials to observe statistically significant treatment effects in the trial;
- having clinical sites deviate from the trial protocol or dropping out of a trial;
- negative or inconclusive results from ongoing preclinical studies or clinical trials, which may require us to conduct additional preclinical studies or clinical trials or to abandon projects that we expect to be promising;
- safety or tolerability concerns that could cause us to suspend or terminate a trial if we find that the participants are being exposed to unacceptable health risks;
- reports from preclinical or clinical testing of other similar therapies that raise safety or efficacy concerns;
- regulators or IRBs requiring that we or our investigators suspend or terminate clinical research for various reasons, including noncompliance with regulatory requirements or safety concerns, among others;
- lower than anticipated retention rates of patients and volunteers in clinical trials;
- our CROs or clinical trial sites failing to comply with regulatory requirements or meet their contractual obligations to us in a timely manner, or at all, deviating from the protocol or dropping out of a trial;
- delays relating to adding new clinical trial sites;
- difficulty in maintaining contact with patients after treatment, resulting in incomplete data;
- the quality of the products falling below acceptable standards;
- the inability to manufacture sufficient quantities of our products to commence or complete clinical trials; and
- exceeding budgeted costs due to difficulty in accurately predicting costs associated with clinical trials.

We could also encounter delays if a clinical trial is suspended or terminated by us, by the IRBs or the Ethics Committees of institutions at which such trials are being conducted, by the Data Safety Monitoring Board for such trial or by the FDA or other regulatory authorities. Such authorities may suspend or terminate a clinical trial due to a number of factors, including failure to conduct the clinical trial in accordance with regulatory requirements, including the FDA's current Good Clinical Practice ("GCP"), regulations, or our clinical protocols, inspection of the clinical trial operations or trial site by the FDA resulting in the imposition of a clinical hold, unforeseen safety issues or adverse side effects, failure to demonstrate safety and effectiveness, changes in governmental regulations or administrative actions or lack of adequate funding to continue the clinical trial.

In addition, we may encounter delays if the FDA concludes that our financial relationships with investigators result in a perceived or actual conflict of interest that may have affected the interpretation of a study, the integrity of the data generated at the applicable clinical trial site or the utility of the clinical trial itself. Principal investigators for our clinical trials may serve as scientific advisors or consultants to us from time to time and receive cash compensation and/or stock options in connection with such services. If these relationships and any related compensation to or ownership interest by the clinical investigator carrying out the study result in perceived or actual conflicts of interest, or if the FDA concludes that the financial relationship may have affected interpretation of the study, the integrity of the data generated at the applicable clinical trial site may be questioned and the utility of the clinical trial itself may be jeopardized, which could result in the delay or rejection by the FDA. Any such delay or rejection could prevent us from commercializing any of our products currently in development.

If we experience delays in the commencement or completion of any clinical trial of our products, or if any of our clinical trials are terminated, the commercial prospects of our products may be harmed, and our ability to generate revenue from sales may be delayed or materially diminished.

We do not know whether any of our future preclinical studies or clinical trials will begin as planned, will need to be restructured or will be completed on schedule, or at all. Any delays in completing our clinical trials will increase our costs, slow down our product development and approval process and jeopardize our ability to commence sales and generate associated revenue. Any of these occurrences may significantly harm our business, financial condition and prospects. In addition, many of the factors that cause, or lead to, a delay in the commencement or completion of clinical trials may also ultimately lead to the denial, suspension or revocation of expanded regulatory clearance or approval of our products. Significant preclinical study or clinical trial delays also could shorten any periods during which we may have the exclusive right to commercialize our products or allow our competitors to bring products to market before we do and impair our ability to successfully commercialize our products.

We may be required to suspend or discontinue clinical trials due to side effects or other safety risks that could preclude approval of our products.

Our clinical trials may be suspended at any time for a number of reasons. We may voluntarily suspend or terminate our clinical trials if at any time we believe that they present an unacceptable risk to participants. In addition, regulatory agencies may order the temporary or permanent discontinuation of our clinical trials at any time if they believe that the clinical trials are not being conducted in accordance with applicable regulatory requirements or that they present an unacceptable safety risk to participants.

Our ability to market our current products is limited to the treatment of PAD in the United States and internationally and limited to the treatment in CAD in certain countries outside of the United States. If we want to market our products for further uses in the United States, we will need to file for FDA clearances or approvals and may need to conduct trials in addition to our existing trials to support expanded use, which would be expensive and time-consuming and may not be successful. The use, misuse or off-label use of our products may also result in injuries that lead to product liability suits, which could be costly to our business.

Our current products are cleared in the United States solely for the treatment of PAD and in certain non-U.S. jurisdictions solely for the treatment of PAD and CAD. This prohibits our ability to market or advertise our products for any other indication, which restricts our ability to sell these products and could affect our growth. Additionally, our products are contra-indicated for use in the carotid or cerebrovascular arteries. Our promotional materials and training methods must comply with FDA and other applicable laws and regulations, including the prohibition on the promotion of a medical device for a use that has not been cleared or approved by the FDA.

Use of a device outside of its cleared or approved indication is known as “off-label” use. We cannot prevent a physician from using our products for off-label use, as the FDA does not restrict or regulate a physician’s

choice of treatment within the practice of medicine. However, we are not allowed to actively promote or advertise our products for off-label uses. In addition, we cannot make comparative claims regarding the use of our products against any alternative treatments without conducting head-to-head comparative clinical studies, which would be expensive and time-consuming. If the FDA determines that our promotional, reimbursement or training materials for sales representatives or physicians constitute promotion of an off-label use, the FDA could request that we modify our training, promotional or reimbursement materials or subject us to regulatory or enforcement actions, including the issuance of an untitled letter, a warning letter, injunction, seizure, disgorgement of profits, a civil fine and criminal penalties. Other federal, state or foreign governmental authorities also might take action if they consider our promotion, reimbursement or training materials to constitute promotion of an uncleared or unapproved use, which could result in significant fines or penalties under other statutory authorities, such as laws prohibiting false claims for reimbursement. For example, the government may take the position that off-label promotion resulted in inappropriate reimbursement for an off-label use in violation of the federal civil False Claims Act for which it might impose a civil fine and even pursue criminal action. In those possible events, our reputation could be damaged and adoption of the products would be impaired.

We currently require limited training in the use of our products incorporating our IVL Technology because we market primarily to physicians who are experienced in the interventional techniques required to use our devices. If demand for our products continues to grow, less experienced physicians will likely use our products, potentially leading to more injury and an increased risk of product liability claims. The use or misuse of our products may in the future result in complications, including damage to the treated artery, infection, internal bleeding and limb loss, potentially leading to product liability claims.

Although we train our sales force not to promote our products for off-label uses, and our instructions for use in all markets specify that our products are not intended for use outside of those indications cleared or approved for use, the FDA or another regulatory agency could conclude that we have engaged in off-label promotion.

We will require substantial additional capital to finance our planned operations, which may not be available to us on acceptable terms or at all. Our failure to obtain additional financing when needed on acceptable terms, or at all, could force us to delay, limit, reduce or eliminate our product development programs, commercialization efforts or other operations.

Since inception, we have incurred significant net losses and expect to continue to incur net losses for the foreseeable future. Since our inception, our operations have been financed primarily by net proceeds from the sale of our convertible preferred stock, indebtedness and, to a lesser extent, product revenue. As of December 31, 2017, we had $53.7 million in cash, cash equivalents and short-term investments, and an accumulated deficit of $85.8 million. Based on our current planned operations, we expect our cash, cash equivalents and short-term investments, together with available borrowings under our current Loan and Security Agreement with Silicon Valley Bank (“SVB Loan Agreement”) and the proceeds from this offering, will enable us to fund our operating expenses for at least the next 12 months. We have based this estimate on assumptions that may prove to be wrong, and we could use our capital resources sooner than we currently expect.

We have a number of ongoing clinical trials, and expect to continue to make substantial investments in these trials and in additional clinical trials that are designed to provide clinical evidence of the safety and efficacy of our products. We intend to continue to make significant investments in our sales and marketing organization by increasing the number of U.S. sales representatives and expanding our international marketing programs to help facilitate further adoption among existing hospital accounts as well as broaden awareness of our products to new hospitals. We also expect to continue to make investments in research and development, regulatory affairs and clinical studies to develop future generations of our products, support regulatory submissions and demonstrate the clinical efficacy of our products. Moreover, we expect to incur additional expenses associated with operating as a public company, including legal, accounting, insurance, exchange listing and SEC compliance, investor relations and other expenses. Because of these and other factors, we expect to continue to incur substantial net

losses and negative cash flows from operations for the foreseeable future. Our future capital requirements will depend on many factors, including:

- the cost, timing and results of our clinical trials and regulatory reviews;
- the cost and timing of establishing sales, marketing and distribution capabilities;
- the terms and timing of any other collaborative, licensing and other arrangements that we may establish;
- the timing, receipt and amount of sales from our current and potential products;
- the degree of success we experience in commercializing our products;
- the emergence of competing or complementary technologies;
- the cost of preparing, filing, prosecuting, maintaining, defending and enforcing any patent claims and other intellectual property rights; and
- the extent to which we acquire or invest in businesses, products or technologies, although we currently have no commitments or agreements relating to any of these types of transactions.

We will require additional financing to fund working capital and pay our obligations. We may seek to raise any necessary additional capital through a combination of public or private equity offerings and/or debt financings. There can be no assurance that we will be successful in acquiring additional funding at levels sufficient to fund our operations or on terms favorable to us. If adequate funds are not available on acceptable terms when needed, we may be required to significantly reduce operating expenses, which may have a material adverse effect on our business and/or results of operations and financial condition. If we do raise additional capital through public or private equity or convertible debt offerings, the ownership interest of our existing stockholders will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect our stockholders' rights. If we raise additional capital through debt financing, we may be subject to covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. Additional capital may not be available on reasonable terms, or at all.

The terms of the SVB Loan Agreement require us to meet certain operating and financial covenants and place restrictions on our operating and financial flexibility. If we raise additional capital through debt financing, the terms of any new debt could further restrict our ability to operate our business.

The SVB Loan Agreement, entered into in February 2018, provides for a $2.0 million revolving line of credit and a $15.0 million term loan. The loan is secured by all our assets, excluding intellectual property and certain other assets. Subject to the terms of the SVB Loan Agreement, amounts borrowed under the revolving line and term loan can be repaid at any time, subject to certain penalty payments, prior to the February 26, 2021 maturity date and December 1, 2021 maturity date, respectively, at which time all amounts borrowed will be due and payable. In connection with the SVB Loan Agreement, Silicon Valley Bank was concurrently issued a common stock warrants that entitles Silicon Valley Bank to purchase up to 420,174 of our common stock with an exercise price of $0.33 per share, with a term of ten years. The SVB Loan Agreement contains a number of restrictive covenants, and the terms may restrict our current and future operations, particularly our ability to respond to certain changes in our business or industry, or take future actions. See the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations—Liquidity and Capital Resources—Debt obligations."

The SVB Loan Agreement contains customary affirmative and restrictive covenants, including with respect to our ability to enter into fundamental transactions, incur additional indebtedness, grant liens, pay any dividend or make any distributions to our holders, make investments, merge or consolidate with any other person or engage in transactions with our affiliates, but does not include any financial covenants. If we fail to comply with

the covenants or payments specified in the SVB Loan Agreement, Silicon Valley Bank could declare an event of default, which would give it the right to terminate its commitment to provide additional loans and declare all borrowings outstanding, together with accrued and unpaid interest and fees, to be immediately due and payable. In addition, Silicon Valley Bank would have the right to proceed against the assets we provided as collateral pursuant to the loan. If the debt under the SVB Loan Agreement were accelerated, we may not have sufficient cash or be able to sell sufficient assets to repay this debt, which would harm our business and financial condition.

The report of our independent registered public accounting firm includes a "going concern" explanatory paragraph.

The report of our independent registered public accounting firm on our consolidated financial statements as of and for the year ended December 31, 2017 includes an explanatory paragraph indicating that there is substantial doubt about our ability to continue as a going concern. If we are unable to raise sufficient capital in this offering or otherwise when needed, our business, financial condition and results of operations will be materially and adversely affected, and we will need to significantly modify our operational plans to continue as a going concern. If we are unable to continue as a going concern, we might have to liquidate our assets and the values we receive for our assets in liquidation or dissolution could be significantly lower than the values reflected in our financial statements. The inclusion of a going concern explanatory paragraph by our auditors, our lack of cash resources and our potential inability to continue as a going concern may materially adversely affect our share price and our ability to raise new capital or to enter into critical contractual relations with third parties.

We are highly dependent on our senior management team and key personnel, and our business could be harmed if we are unable to attract and retain personnel necessary for our success.

We are highly dependent on our senior management and other key personnel. Our success will depend on our ability to retain senior management and to attract and retain qualified personnel in the future, including sales and marketing professionals, scientists, clinical specialists, engineers and other highly skilled personnel and to integrate current and additional personnel in all departments. The loss of members of our senior management, sales and marketing professionals, scientists, clinical and regulatory specialists and engineers could result in delays in product development and harm our business. If we are not successful in attracting and retaining highly qualified personnel, it would have a material adverse effect on our business, financial condition and results of operations.

Competition for skilled personnel in our market is intense and may limit our ability to hire and retain highly qualified personnel on acceptable terms, or at all. To induce valuable employees to remain at our company, in addition to salary and cash incentives, we have issued stock options that vest over time. The value to employees of stock options that vest over time may be significantly affected by movements in our stock price that are beyond our control, and may at any time be insufficient to counteract more lucrative offers from other companies. Despite our efforts to retain valuable employees, members of our management, scientific and development teams may terminate their employment with us on short notice. Our employment arrangements with our employees provide for at-will employment, which means that any of our employees could leave our employment at any time, with or without notice. We also do not maintain "key man" insurance policies on the lives of these individuals or the lives of any of our other employees.

We have increased the size of our organization and expect to further increase it in the future, and we may experience difficulties in managing this growth. If we are unable to manage the anticipated growth of our business, our future revenue and operating results may be adversely affected.

As of September 30, 2018, we had 153 full-time employees worldwide. We have significantly expanded the size of our organization over the past three years, particularly in the number of sales and marketing personnel, and expect to do so in the future. As our sales and marketing strategies develop and as we transition into operating as a public company, we expect to need additional managerial, operational, sales, marketing, financial

and other personnel. Future growth would impose significant added responsibilities on members of management, including:

- identifying, recruiting, integrating, maintaining and motivating additional employees;
- managing our internal development efforts effectively, while complying with our contractual obligations to contractors and other third parties; and
- improving our operational, financial and management controls, reporting systems and procedures.

Our future financial performance and our ability to successfully market and sell our products will depend, in part, on our ability to effectively manage any future growth, and our management may also have to divert a disproportionate amount of attention away from day-to-day activities in order to devote a substantial amount of time to managing these growth activities.

We expect to grow our sales force in anticipation of additional product approvals or clearances and increased entry into new markets. The growth we may experience in the future may provide challenges to our organization, requiring us to also rapidly expand other aspects of our business, including our manufacturing operations. Rapid expansion in personnel may result in less experienced people producing and selling our products, which could result in unanticipated costs and disruptions to our operations. If we are not able to effectively expand our organization by hiring new employees and expanding our groups of consultants and contractors, we may not be able to successfully implement the tasks necessary to further develop and commercialize our products and, accordingly, may not achieve our research, sales and marketing goals, which would have a material adverse effect on our business, financial condition and results of operations.

If we fail to grow our sales and marketing capabilities and develop widespread brand awareness cost effectively, our growth will be impeded and our business may suffer.

We are actively expanding our international field presence through new distributors, additional sales and clinical personnel and are adding new U.S. sales territories. We plan to continue to expand and optimize our sales infrastructure in order to grow our customer base and our business. Identifying and recruiting qualified personnel and training them on the use of our products, on applicable federal and state laws and regulations and on our internal policies and procedures, require significant time, expense and attention. It can take significant time before our sales representatives are fully trained and productive. Our business may be harmed if our efforts to expand and train our sales force do not generate a corresponding increase in revenue. In particular, if we are unable to hire, develop and retain talented sales personnel or if new sales personnel are unable to achieve desired productivity levels in a reasonable period of time, we may not be able to realize the expected benefits of this investment or increase our revenue.

Our ability to increase our customer base and achieve broader market acceptance of our products will depend to a significant extent on our ability to expand our marketing operations. We plan to dedicate significant financial and other resources to our marketing programs. Our business would be harmed if our marketing efforts and expenditures do not generate an increase in revenue.

In addition, we believe that developing and maintaining awareness of our brand in a cost-effective manner is critical to achieving broad acceptance of our products and attracting new customers. Brand promotion activities may not generate customer awareness or increase revenue and, even if they do, any increase in revenue may not offset the costs and expenses we incur in building our brand. If we fail to successfully promote, maintain and protect our brand, we may fail to attract or retain the customers necessary to realize a sufficient return on our brand-building efforts, or to achieve the widespread brand awareness that is critical for broad customer adoption of our technology.

We intend to expand sales of our products internationally in the future, but we may experience difficulties in obtaining regulatory clearance or approval or in successfully marketing our products internationally even if approved. A variety of risks associated with marketing our products internationally could materially adversely affect our business.

While most of our revenue has been in the United States, our current products are cleared in certain international markets for the treatment of PAD and CAD, and international sales comprised 43.6% of our revenue for the year ended December 31, 2017. We intend to increase our sales outside the United States, and our C2 catheters are currently only available outside the United States. Sales of our products outside of the United States are and will be subject to foreign regulatory requirements governing clinical trials and marketing approval. We will incur substantial expenses in connection with our international expansion. Additional risks related to operating in foreign countries include:

- differing regulatory requirements in foreign countries;
- differing reimbursement regimes in foreign countries, including price controls;
- unexpected changes in tariffs, trade barriers, price and exchange controls and other regulatory requirements;
- economic weakness, including inflation, or political instability in particular foreign economies and markets;
- compliance with tax, employment, immigration and labor laws for employees living or traveling abroad;
- foreign taxes, including withholding of payroll taxes;
- foreign currency fluctuations, which could result in increased operating expenses, reduced revenue and other obligations incident to doing business in another country;
- difficulties staffing and managing foreign operations;
- workforce uncertainty in countries where labor unrest is more common than in the United States;
- potential liability under the U.S. Foreign Corrupt Practices Act of 1977, as amended (the “FCPA”), or comparable foreign regulations;
- challenges enforcing our contractual and intellectual property rights, especially in those foreign countries that do not respect and protect intellectual property rights to the same extent as the United States;
- product shortages resulting from any events affecting raw material or finished good supply or distribution or manufacturing capabilities abroad; and
- business interruptions resulting from geopolitical actions, including war and terrorism.

These and other risks associated with our international operations may materially adversely affect our ability to attain or maintain profitable operations, which would have a material adverse effect on our business, financial condition and results of operations.

In addition, there can be no guarantee that we will receive approval to sell our products in every international market we target, nor can there be any guarantee that any sales would result even if such approval is received. Even if the FDA grants marketing approval for a product, comparable regulatory authorities of foreign countries must also approve the manufacturing or marketing of the product in those countries. Approval in the United States, or in any other jurisdiction, does not ensure approval in other jurisdictions. Obtaining foreign approvals could result in significant delays, difficulties and costs for us and require additional trials and additional expenses. Regulatory requirements can vary widely from country to country and could delay the introduction of our products in those countries. Clinical trials conducted in one country may not be accepted by

other countries, and regulatory approval in one country does not mean that regulatory approval will be obtained in any other country. If we fail to comply with these regulatory requirements or to obtain and maintain required approvals, our target market will be reduced and our ability to generate revenue will be diminished. Our inability to successfully enter all our desired international markets and manage business on a global scale could negatively affect our business, financial results and results of operations.

Our future growth may depend, in part, on our ability to operate in foreign markets, where we would be subject to additional regulatory burdens and other risks and uncertainties.

Our future growth may depend, in part, on our ability to develop and commercialize our planned and future products in foreign markets. We are not permitted to market or promote any of our planned or future products before we receive regulatory approval from applicable regulatory authorities in foreign markets, and we may never receive such regulatory approvals for any of our planned or future products. To obtain separate regulatory approval in many other countries we must comply with numerous and varying regulatory requirements regarding safety and efficacy and governing, among other things, clinical trials, commercial sales, pricing and distribution of our planned or future products. If we obtain regulatory approval of our products and ultimately commercialize our planned or future products in foreign markets, we would be subject to additional risks and uncertainties, including:

- different regulatory requirements for approval of medical devices in foreign countries;
- reduced protection for intellectual property rights;
- the existence of additional third-party patent rights of potential relevance to our business;
- unexpected changes in tariffs, trade barriers and regulatory requirements;
- economic weakness, including inflation or political instability in particular foreign economies and markets;
- compliance with tax, employment, immigration and labor laws for employees living or traveling abroad;
- foreign currency fluctuations, which could result in increased operating expenses, reduced revenue and other obligations incident to doing business in another country;
- foreign reimbursement, pricing and insurance regimes;
- workforce uncertainty in countries where labor unrest is common;
- production shortages resulting from any events affecting raw material supply or manufacturing capabilities abroad; and
- business interruptions resulting from geopolitical actions, including war and terrorism, or natural disasters, including earthquakes, typhoons, floods and fires.

We face additional credit and compliance risks related to our international sales using foreign distributors.

We partner with distributors for our products in select geographies outside of the United States. Specifically, in 2018 we sold to distributors located in Europe, Canada, Australia and New Zealand. For the year ended December 31, 2018, approximately % of our sales were outside of the United States. We may not be able to collect all of the funds owed to us by our foreign distributors. Some foreign distributors may experience financial difficulties, including bankruptcy, which may hinder our collection of accounts receivable. Where we extend credit terms to distributors, we periodically review the collectability and creditworthiness when determining the payment terms for such distributors. If our uncollectible accounts exceed our expectations, this could adversely impact our operating results. In addition, failure by our foreign distributors to comply with the FCPA, the United Kingdom Bribery Act 2010 (the “U.K. Bribery Act”) or similar laws, insurance requirements or other contract terms could have a negative impact on our business. Failure to manage the risks related to our foreign distributors would have a material adverse effect on our business, financial condition and results of operations.

Governmental export or import controls could limit our ability to compete in foreign markets and subject us to liability if we violate them.

Our products may be subject to U.S. export controls. Governmental regulation of the import or export of our products, or our failure to obtain any required import or export authorization for our products, when applicable, could harm our international sales and adversely affect our revenue. Compliance with applicable regulatory requirements regarding the export of our products may create delays in the introduction of our products in international markets or, in some cases, prevent the export of our products to some countries altogether. Furthermore, U.S. export control laws and economic sanctions prohibit the shipment of certain products and services to countries, governments and persons targeted by U.S. sanctions. If we fail to comply with export and import regulations and such economic sanctions, we may be fined or other penalties could be imposed, including a denial of certain export privileges. Moreover, any new export or import restrictions, new legislation or shifting approaches in the enforcement or scope of existing regulations, or in the countries, persons or technologies targeted by such regulations, could result in decreased use of our products by, or in our decreased ability to export our products to existing or potential customers with international operations. Any decreased use of our products or limitation on our ability to export or sell access to our products would likely materially and adversely affect our business, financial condition and results of operations.

Technological change may adversely affect sales of our products and may cause our products to become obsolete.

The medical device market is characterized by extensive research and development and rapid technological change. Technological progress or new developments in our industry could adversely affect sales of our products. Our products could be rendered obsolete because of future innovations by our competitors or others in the treatment of vascular diseases, which would have a material adverse effect on our business, financial condition and results of operations.

Consolidation in the medical device industry could have an adverse effect on our revenue and results of operations.

Many medical device companies are consolidating to create new companies with greater market power. As the medical device industry consolidates, competition to provide goods and services to industry participants will become more intense. These industry participants may try to use their market power to negotiate price concessions or reductions for our products. If we reduce our prices because of consolidation in the healthcare industry, our revenue would decrease, which could have a material adverse effect on our business, financial condition and results of operations.

If product liability lawsuits are brought against us, we may incur substantial liabilities and may be required to limit or halt the marketing and sale of our products. The expense and potential unavailability of insurance coverage for liabilities resulting from our products could harm us and our ability to sell our products.

We face an inherent risk of product liability as a result of the marketing and sale of our products. For example, we may be sued if our products cause or are perceived to cause injury or are found to be otherwise unsuitable during manufacturing, marketing or sale. Any such product liability claim may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product, negligence, strict liability or a breach of warranties. In addition, we may be subject to claims against us even if the apparent injury is due to the actions of others or the pre-existing health of the patient. For example, we rely on physicians in connection with the use of our products on patients. If these physicians are not properly trained or are negligent, the capabilities of our products may be diminished or the patient may suffer critical injury. We may also be subject to claims that are caused by the activities of our suppliers, such as those who provide us with components and sub-assemblies.

If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to limit or halt commercialization of our products. Even successful defense would

require significant financial and management resources. Regardless of the merits or eventual outcome, liability claims may result in:

- decreased demand for our products;
- injury to our reputation;
- initiation of investigations by regulators;
- costs to defend the related litigation;
- a diversion of management's time and our resources;
- substantial monetary awards to trial participants or patients;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;
- loss of revenue;
- exhaustion of any available insurance and our capital resources; and
- the inability to market and sell our products.

We believe we have adequate product liability insurance, but it may not prove to be adequate to cover all liabilities that we may incur. Insurance coverage is increasingly expensive. We may not be able to maintain or obtain insurance at a reasonable cost or in an amount adequate to satisfy any liability that may arise. Our insurance policy contains various exclusions, and we may be subject to a product liability claim for which we have no coverage. The potential inability to obtain sufficient product liability insurance at an acceptable cost to protect against product liability claims could prevent or inhibit the marketing and sale of products we develop. We may have to pay any amounts awarded by a court or negotiated in a settlement that exceed our coverage limitations or that are not covered by our insurance, and we may not have, or be able to obtain, sufficient capital to pay such amounts, which would have a material adverse effect on our business, financial condition and results of operations. In addition, any product liability claims brought against us, with or without merit, could increase our product liability insurance rates or prevent us from securing continuing coverage, harm our reputation in the industry, significantly increase our expenses and reduce product sales.

Some of our customers and prospective customers may also have difficulty in procuring or maintaining liability insurance to cover their operations and use of our products. Medical malpractice carriers are withdrawing coverage in certain states or substantially increasing premiums. If this trend continues or worsens, our customers may discontinue using our products and potential customers may opt against purchasing our products due to the cost or inability to procure insurance coverage.

Litigation and other legal proceedings may adversely affect our business.

From time to time we may become involved in legal proceedings relating to patent and other intellectual property matters, product liability claims, employee claims, tort or contract claims, federal regulatory investigations, securities class action and other legal proceedings or investigations, which could have an adverse impact on our reputation, business and financial condition and divert the attention of our management from the operation of our business. Litigation is inherently unpredictable and can result in excessive or unanticipated verdicts and/or injunctive relief that affect how we operate our business. We could incur judgments or enter into settlements of claims for monetary damages or for agreements to change the way we operate our business, or both. There may be an increase in the scope of these matters or there may be additional lawsuits, claims, proceedings or investigations in the future, which could have a material adverse effect on our business, financial condition and results of operations. Adverse publicity about regulatory or legal action against us could damage our reputation and brand image, undermine our customers' confidence and reduce long-term demand for our products, even if the regulatory or legal action is unfounded or not material to our operations.

If we experience significant disruptions in our information technology systems, our business may be adversely affected.

We depend on our information technology systems for the efficient functioning of our business, including the manufacture, distribution and maintenance of our products, as well as for accounting, data storage, compliance, purchasing and inventory management. We do not have redundant information technology systems at this time. Our information technology systems may be subject to computer viruses, ransomware or other malware, attacks by computer hackers, failures during the process of upgrading or replacing software, databases or components thereof, power outages, damage or interruption from fires or other natural disasters, hardware failures, telecommunication failures and user errors, among other malfunctions. We could be subject to an unintentional event that involves a third party gaining unauthorized access to our systems, which could disrupt our operations, corrupt our data or result in release of our confidential information. We address these data security concerns in more detail below. Technological interruptions would disrupt our operations, including our ability to timely ship and track product orders, project inventory requirements, manage our supply chain and otherwise adequately service our customers or disrupt our customers' ability use our products for treatments. In the event we experience significant disruptions, we may be unable to repair our systems in an efficient and timely manner. Accordingly, such events may disrupt or reduce the efficiency of our entire operation and have a material adverse effect on our business, financial condition and results of operations. Currently, we carry business interruption coverage to mitigate certain potential losses but this insurance is limited in amount, and we cannot be certain that such potential losses will not exceed our policy limits. We are increasingly dependent on complex information technology to manage our infrastructure. Our information systems require an ongoing commitment of significant resources to maintain, protect and enhance our existing systems. Failure to maintain or protect our information systems and data integrity effectively could have a material adverse effect on our business, financial condition and results of operations.

If we experience security or data privacy breaches or other unauthorized or improper access to, use of, or destruction of our proprietary or confidential data, employee data or personal data, or if customers, patients and other partners are reluctant to use our devices because of concerns about the privacy or security of their data, we may face additional costs, loss of revenue, significant liabilities, harm to our brand, decreased use of our platform and business disruption.

In connection with various facets of our business, we collect and use a variety of personal data, such as name, mailing address, email addresses, mobile phone number, location information and clinical trial information. Any failure to prevent or mitigate security breaches or improper access to, use of, or disclosure of our data or consumers' personal data could result in significant liability under state (e.g., state breach notification laws), federal (e.g. the Health Insurance Portability and Accountability Act ("HIPAA") and the Health Information Technology for Economic and Clinical Health Act ("HITECH Act")) and international law (e.g. the European Union's General Data Protection Regulation ("GDPR")). Such an incident may also cause a material loss of revenue from the potential adverse impact to our reputation and brand, affect our ability to retain or attract new users and potentially disrupt our business. We may also rely on third-party service providers to host or otherwise process some of our data and that of users, and any failure by such third party to prevent or mitigate security breaches or improper access to or disclosure of such information could have similarly adverse consequences for us.

Because the techniques used to obtain unauthorized access, disable or degrade service or sabotage systems change frequently and often are not recognized until launched against a target, we and our service providers may be unable to anticipate these techniques or to implement adequate preventative measures. Our servers and platforms may be vulnerable to computer viruses or physical or electronic break-ins that our security measures may not detect. Individuals able to circumvent our security measures may misappropriate our confidential or proprietary information, disrupt our operations, damage our computers or otherwise damage our reputation and business. We may need to expend significant resources and make significant capital investment to protect against security breaches or to mitigate the impact of any such breaches. If we are unable to prevent or mitigate the

impact of such security breaches, our ability to attract and retain new customers, patients and other partners could be harmed, and we could be exposed to litigation and governmental investigations, which could lead to a potential disruption to our business.

If we fail to identify, acquire and develop other products, we may be unable to grow our business.

As a significant part of our growth strategy, we intend to develop and commercialize additional products through our research and development program or by licensing or acquiring additional products and technologies from third parties. The success of this strategy depends upon our ability to identify, select and acquire the right to products and technologies on terms that are acceptable to us.

Any product we identify, license or acquire may require additional development efforts prior to commercial sale, including extensive clinical testing and approval or clearance by the FDA and applicable foreign regulatory authorities. All products are prone to the risks of failure inherent in medical device product development, including the possibility that the product will not be shown to be sufficiently safe and effective for approval or clearance by regulatory authorities. In addition, we cannot assure you that any such products that are approved or cleared will be manufactured or produced economically, successfully commercialized or widely accepted in the marketplace.

Proposing, negotiating and implementing an economically viable product or technology acquisition or license is a lengthy and complex process. Other companies, including those with substantially greater financial, marketing and sales resources, may compete with us for the acquisition or license of approved or cleared products. We may not be able to acquire or license the rights to additional approved or cleared products on terms that we find acceptable, or at all.

If we are unable to develop suitable potential products through internal research programs or by obtaining rights from third parties, it could have a material adverse effect on our business, financial condition and results of operations.

We may acquire other businesses which could require significant management attention, disrupt our business, dilute stockholder value and adversely affect our results of operations.

As part of our business strategy, we may in the future make acquisitions or investments in complementary companies, products or technologies that we believe fit within our business model and can address the needs of our customers and potential customers. In the future, we may not be able to acquire and integrate other companies, products or technologies in a successful manner. We may not be able to find suitable acquisition candidates, and we may not be able to complete such acquisitions on favorable terms, if at all. In addition, the pursuit of potential acquisitions may divert the attention of management and cause us to incur additional expenses in identifying, investigating and pursuing suitable acquisitions, whether or not they are consummated. If we do complete acquisitions, we may not ultimately strengthen our competitive position or achieve our goals, including increases in revenue, and any acquisitions we complete could be viewed negatively by our customers, investors and industry analysts.

Future acquisitions may reduce our cash available for operations and other uses and could result in amortization expense related to identifiable assets acquired. We may have to pay cash, incur debt or issue equity securities to pay for any such acquisition, each of which could adversely affect our financial condition or the value of our common stock. The sale or issuance of equity to finance any such acquisitions would result in dilution to our stockholders. The incurrence of indebtedness to finance any such acquisition would result in fixed obligations and could also include covenants or other restrictions that could impede our ability to manage our operations. In addition, our future results of operations may be adversely affected by the dilutive effect of an acquisition, performance earn-outs or contingent bonuses associated with an acquisition. Furthermore, acquisitions may require large, one-time charges and can result in increased debt or contingent liabilities, adverse

tax consequences, additional stock-based compensation expenses and the recording and subsequent amortization of amounts related to certain purchased intangible assets, any of which items could negatively affect our future results of operations. We may also incur goodwill impairment charges in the future if we do not realize the expected value of any such acquisitions.

Also, the anticipated benefit of any strategic alliance, joint venture or acquisition may not materialize, or such strategic alliance, joint venture or acquisition may be prohibited. In February 2018, we entered into the SVB Loan Agreement. The SVB Loan Agreement restricts our ability to pursue certain mergers, acquisitions, amalgamations or consolidations that we may believe to be in our best interest. Additionally, future acquisitions or dispositions could result in potentially dilutive issuances of our equity securities, the incurrence of debt, contingent liabilities or amortization expenses or write-offs of goodwill, any of which could harm our financial condition. We cannot predict the number, timing or size of future joint ventures or acquisitions, or the effect that any such transactions might have on our operating results.

Economic conditions may adversely affect our business.

Adverse worldwide economic conditions may negatively impact our business. A significant change in the liquidity or financial condition of our customers could cause unfavorable trends in their purchases and also in our receivable collections, and additional allowances may be required, which could adversely affect our business, financial condition and results of operations. Adverse worldwide economic conditions may also adversely impact our suppliers' ability to provide us with materials and components, which could have a material adverse effect on our business, financial condition and results of operations.

Business disruptions could seriously harm our future revenue and financial condition and increase our costs and expenses.

Our operations could be subject to earthquakes, power shortages, telecommunications failures, water shortages, floods, hurricanes, typhoons, fires, extreme weather conditions, medical epidemics and other natural or man-made disasters or business interruptions, for which we are predominantly self-insured. We rely on third-party manufacturers to produce our products. Our ability to obtain clinical supplies of our products could be disrupted if the operations of these suppliers were affected by a man-made or natural disaster or other business interruption. In addition, our corporate headquarters is located in Santa Clara, California, near major earthquake faults and fire zones, and the ultimate impact on us for being located near major earthquake faults and fire zones and being consolidated in a certain geographical area is unknown. The occurrence of any of these business disruptions could seriously harm our operations and financial condition and increase our costs and expenses.

Risks Related to Government Regulation and Our Industry

If we fail to comply with U.S. federal and state fraud and abuse and other healthcare laws and regulations, including those relating to kickbacks and false claims for reimbursement, we could face substantial penalties and our business operations and financial condition could be adversely affected.

Healthcare providers and third-party payors play a primary role in the distribution, recommendation, ordering and purchasing of any medical device for which we have or obtain marketing clearance or approval. Through our arrangements with principal investigators, healthcare professionals, third-party payors and customers, we are exposed to broadly applicable anti-fraud and abuse, anti-kickback, false claims and other healthcare laws and regulations that may constrain our business, our arrangements and relationships with customers, and how we market, sell and distribute our marketed medical devices. We have a compliance program, Code of Conduct and associated policies and procedures, but it is not always possible to identify and deter misconduct by our employees and other third parties, and the precautions we take to detect and prevent noncompliance may not be effective in protecting us from governmental investigations for failure to comply with applicable fraud and abuse or other healthcare laws and regulations.

In the United States, we are subject to various state and federal anti-fraud and abuse laws, including, without limitation, the federal healthcare Anti-Kickback Statute ("Anti-Kickback Statute") and federal civil False Claims Act. There are similar laws in other countries. Our relationships and our distributors' relationships with physicians, other health care professionals and hospitals are subject to scrutiny under these laws.

Healthcare fraud and abuse laws and related regulations are complex, and even minor irregularities can potentially give rise to claims that a statute or prohibition has been violated. The laws that may affect our ability to operate include:

- the Anti-Kickback Statute, which prohibits, among other things, knowingly and willingly soliciting, offering, receiving or paying remuneration, directly or indirectly, overtly or covertly, in cash or in kind, to induce or reward either the referral of an individual, or the purchase, order or recommendation of, items or services for which payment may be made, in whole or in part, under a federal healthcare program, such as the Medicare and Medicaid programs. The term "remuneration" has been broadly interpreted to include anything of value, and the government can establish a violation of the Anti-Kickback Statute without proving that a person or entity had actual knowledge of the law or a specific intent to violate. In addition, the government may assert that a claim, including items or services resulting from a violation of the Anti-Kickback Statute, constitutes a false or fraudulent claim for purposes of the federal civil False Claims Act. The Anti-Kickback Statute is subject to evolving interpretations and has been applied by government enforcement officials to a number of common business arrangements in the medical device industry. There are a number of statutory exceptions and regulatory safe harbors protecting certain business arrangements from prosecution under the Anti-Kickback Statute; however, those exceptions and safe harbors are drawn narrowly, and there is no exception or safe harbor for many common business activities, such as reimbursement support programs, educational and research grants or charitable donations. Practices that involve remuneration to those who prescribe, purchase or recommend medical devices, including discounts, providing items or services for free or engaging such individuals as consultants, advisors or speakers, may be subject to scrutiny if they do not fit squarely within an exception or safe harbor and would be subject to a facts and circumstances analysis to determine compliance with the Anti-Kickback Statute. Our practices, such as the loan, consignment, or purchase of certain components of our IVL System to customers, may not in all cases meet all of the criteria for statutory exception or regulatory safe harbor protection from anti-kickback liability.
- federal civil and criminal false claims laws and civil monetary penalties laws, including the federal civil False Claims Act, which prohibits, among other things, persons or entities from knowingly presenting, or causing to be presented, a false or fraudulent claim for payment of government funds and knowingly making, using or causing to be made or used, a false record or statement to get a false claim paid or to avoid, decrease or conceal an obligation to pay money to the federal government. A claim including items or services resulting from a violation of the Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the federal civil False Claims Act. Actions under the federal civil False Claims Act may be brought by the government or as a *qui tam* action by a private individual in the name of the government. These individuals, sometimes known as "relators" or, more commonly, as "whistleblowers," may share in any amounts paid by the entity to the government in fines or settlement. Many pharmaceutical and medical device manufacturers have been investigated and have reached substantial financial settlements with the federal government under the federal civil False Claims Act for a variety of alleged improper activities, including causing false claims to be submitted as a result of the marketing of their products for unapproved and thus non-reimbursable uses and interactions with prescribers and other customers, including those that may have affected their billing or coding practices and submission of claims to the federal government. Federal civil False Claims Act liability is potentially significant in the healthcare industry because the statute provides for treble damages and mandatory monetary penalties for each false or fraudulent claim or statement. Because of the potential for large monetary exposure, healthcare and medical device companies often resolve

allegations without admissions of liability for significant and material amounts to avoid the uncertainty of treble damages and per claim penalties that may be awarded in litigation proceedings.

- HIPAA, which imposes criminal and civil liability for, among other actions, knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program, including private third-party payors, or knowingly and willfully falsifying, concealing or covering up a material fact or making a materially false, fictitious or fraudulent statement or representation, or making or using any false writing or document knowing the same to contain any materially false, fictitious or fraudulent statement or entry in connection with the delivery of or payment for healthcare benefits, items or services;
- HIPAA, as amended by HITECH Act, and their implementing regulations, also impose obligations, including mandatory contractual terms, on covered entities subject to the rule, such as health plans, healthcare clearinghouses and certain healthcare providers, as well as their business associates that perform certain services for them or on their behalf involving the use or disclosure of individually identifiable health information with respect to safeguarding the privacy, security and transmission of individually identifiable health information. We believe we are not a covered entity for purposes of HIPAA, and we believe that we generally do not conduct our business in a manner that would cause us to be a business associate under HIPAA;
- the federal Physician Payment Sunshine Act, also known as Open Payments, which requires manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program to report annually, with certain exceptions to the Centers for Medicare & Medicaid Services ("CMS"), information related to payments or other "transfers of value" made to physicians and teaching hospitals, and requires applicable manufacturers and group purchasing organizations to report annually to CMS ownership and investment interests held by physicians and their immediate family members. Beginning in 2022, applicable manufacturers also will be required to report information regarding payments and transfers of value provided to physician assistants, nurse practitioners, clinical nurse specialists, certified nurse anesthetists and certified nurse-midwives; and
- analogous state and foreign law equivalents of each of the above federal laws, such as anti-kickback and false claims laws which may apply to items or services reimbursed by any third-party payor, including commercial insurers; state laws that require medical device companies to comply with the industry's voluntary compliance guidelines and the applicable compliance guidance promulgated by the federal government or otherwise restrict payments that may be made to healthcare providers and other potential referral sources; state beneficiary inducement laws, which are state laws that require medical device manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures; and state and foreign laws governing the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and may not have the same effect, thus complicating compliance efforts.

State and federal regulatory and enforcement agencies continue to actively investigate violations of healthcare laws and regulations, and the U.S. Congress continues to strengthen the arsenal of enforcement tools. Most recently, the Bipartisan Budget Act of 2018 ("BBA") increased the criminal and civil penalties that can be imposed for violating certain federal health care laws, including the Anti-Kickback Statute. Enforcement agencies also continue to pursue novel theories of liability under these laws. In particular, government agencies recently have increased regulatory scrutiny and enforcement activity with respect to manufacturer reimbursement support activities and patient support programs, including bringing criminal charges or civil enforcement actions under the Anti-Kickback Statute, federal civil False Claims Act and HIPAA's healthcare fraud and privacy provisions.

Because of the breadth of these laws and the narrowness of the statutory exceptions and regulatory safe harbors available under such laws, it is possible that some of our business activities, including certain sales and

marketing practices of our marketed IVL System, including the IVL generator, connector cable and catheter, and financial arrangements with physicians, other healthcare providers, and other customers, could be subject to challenge under one or more such laws. For example, in the United States, in many instances we generally loan for free to customers both the reusable IVL generator and connector cable so long as the customer is purchasing our single-use catheters. Customers also have the option to purchase the IVL generator and connector cable either at the initiation of the relationship or following the consignment period. Additionally, we consign catheters to our customers, free of charge, until a catheter is used at which time the customer is billed for the catheter. The Anti-Kickback Statute includes, among others, space and equipment rental safe harbors. These safe harbors require, among other things, that the aggregate payment between the parties is set in advance and consistent with fair market value. As the IVL generator and connector cable are provided for free, and no payment is made for storage of our catheters at customers' facilities, these arrangements will likely not satisfy these or other safe harbors or statutory exceptions. Therefore, if these arrangement were investigated, they would be subject to a facts and circumstances analysis to determine whether they include prohibited remuneration under the Anti-Kickback Statute. If an arrangement were deemed to violate the Anti-Kickback Statute, it may also subject us to violations under other fraud and abuse laws such as the federal civil False Claims Act and civil monetary penalties laws. Moreover, such arrangements could be found to violate comparable state fraud and abuse laws.

Achieving and sustaining compliance with applicable federal and state anti-fraud and abuse laws may prove costly. If we or our employees are found to have violated any of the above laws we may be subjected to substantial criminal, civil and administrative penalties, including imprisonment, exclusion from participation in federal healthcare programs, such as Medicare and Medicaid, and significant fines, monetary penalties, forfeiture, disgorgement and damages, contractual damages, reputational harm, administrative burdens, diminished profits and future earnings and the curtailment or restructuring of our operations, any of which could adversely affect our ability to operate our business and our financial results. Any action or investigation against us for the violation of these healthcare fraud and abuse laws, even if successfully defended, could result in significant legal expenses and could divert our management's attention from the operation of our business. Companies settling federal civil False Claims Act, Anti-Kickback Statute or civil monetary penalties law cases also may be required to enter into a Corporate Integrity Agreement with the OIG in order to avoid exclusion from participation (i.e., loss of coverage for their products) in federal healthcare programs such as Medicare and Medicaid. Corporate Integrity Agreements typically impose substantial costs on companies to ensure compliance. Defending against any such actions can be costly, time-consuming and may require significant personnel resources, and may have a material adverse effect on our business, financial condition and results of operations.

We are subject to numerous laws and regulations related to anti-bribery and anti-corruption laws, such as the FCPA and the U.K. Bribery Act, in which violations of these laws could result in substantial penalties and prosecution.

For our sales and operations outside the United States, we are similarly subject to various heavily-enforced anti-bribery and anti-corruption laws, such as the FCPA, U.K. Bribery Act and similar laws around the world. These laws generally prohibit U.S. companies and their employees and intermediaries from offering, promising, authorizing or making improper payments to foreign government officials for the purpose of obtaining or retaining business or gaining any advantage. We face significant risks if we, which includes our third-party business partners and intermediaries, fail to comply with the FCPA or other anti-corruption and anti-bribery laws.

We leverage various third parties to conduct our business and sell our products abroad, including to government owned universities and hospitals. We, our distributors and our other third-party intermediaries may have direct or indirect interactions with officials and employees of government agencies or state-owned or affiliated entities (such as in the context of obtaining government approvals, registrations or licenses or sales to government owned or controlled healthcare facilities, universities, institutes, clinics, etc.) and may be held liable for the corrupt or other illegal activities of these third-party business partners and intermediaries, our employees, representatives, contractors, partners and agents, even if we do not explicitly authorize such activities. In many

foreign countries, particularly in countries with developing economies, it may be a local custom that businesses engage in practices that are prohibited by the FCPA or other applicable laws and regulations. To that end, while we have adopted and implemented internal control policies and procedures and employee training and compliance programs to deter prohibited practices, such compliance measures ultimately may not be effective in prohibiting our employees, contractors, business partners, intermediaries or agents from violating or circumventing our policies and/or the law.

Responding to any enforcement action or related investigation may result in a materially significant diversion of management's attention and resources and significant defense costs and other professional fees. Any violation of the FCPA or other applicable anti-bribery, anti-corruption or anti-money laundering laws could result in whistleblower complaints, adverse media coverage, investigations, loss of export privileges, severe criminal or civil sanctions and, in the case of the FCPA, suspension or debarment from U.S. government contracts, which could have a material and adverse effect on our business, financial condition and results of operations.

Regulatory compliance is expensive, complex and uncertain, and a failure to comply could lead to enforcement actions against us and other negative consequences for our business.

The FDA and similar agencies regulate our products as medical devices. Complying with these regulations is costly, time-consuming, complex and uncertain. For instance, before a new medical device, or a new intended use for, an existing device can be marketed in the United States, a company must first submit and receive either 510(k) clearance or pre-marketing approval from the FDA, unless an exemption applies.

FDA regulations and regulations of similar agencies are wide-ranging and include, among other things, oversight of:

- product design, development, manufacture (including suppliers) and testing;
- laboratory, preclinical and clinical studies;
- product safety and effectiveness;
- product labeling;
- product storage and shipping;
- record keeping;
- pre-market clearance or approval;
- marketing, advertising and promotion;
- product sales and distribution;
- product changes;
- product recalls; and
- post-market surveillance and reporting of deaths or serious injuries and certain malfunctions.

Our current products are subject to extensive regulation by the FDA and non-U.S. regulatory agencies. Further, all of our potential products and improvements of our current products will be subject to extensive regulation and will likely require permission from regulatory agencies and ethics boards to conduct clinical trials and clearance or approval from the FDA and non-U.S. regulatory agencies prior to commercial sale and distribution. Failure to comply with applicable U.S. requirements regarding, for example, promoting, manufacturing or labeling our products, may subject us to a variety of administrative or judicial actions and sanctions, such as Form 483 observations, warning letters, untitled letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, civil penalties and criminal prosecution.

The FDA can also refuse to clear or approve pending applications. Any enforcement action by the FDA and other comparable non-U.S. regulatory agencies could have a material adverse effect on our business, financial condition and results of operations.

Our failure to comply with applicable regulatory requirements could result in enforcement action by the FDA or state agencies, which may include any of the following actions:

- untitled letters, warning letters, fines, injunctions, consent decrees and civil penalties;
- unanticipated expenditures to address or defend such actions;
- customer notifications for repair, replacement or refunds;
- recall, detention or seizure of our products;
- operating restrictions or partial suspension or total shutdown of production;
- refusing or delaying our requests for 510(k) clearance or PMA approval of new products or modified products;
- operating restrictions;
- withdrawing 510(k) clearances or PMA approvals that have already been granted;
- refusal to grant export approval for our products; or
- criminal prosecution.

If any of these events were to occur, it would have a material and adverse effect on our business, financial condition and results of operations.

We may not be able to obtain the necessary clearances or approvals or may be unduly delayed in doing so, which could harm our business. Furthermore, even if we are granted regulatory clearances or approvals, they may include significant limitations on the indicated uses for the product, which may limit the market for the product. Although we have obtained 510(k) clearance to market our M5 and S4 catheters, our clearance can be revoked if safety or efficacy problems develop.

The FDA also regulates the advertising and promotion of our products to ensure that the claims we make are consistent with our regulatory clearances and approvals, that there are adequate and reasonable data to substantiate the claims and that our promotional labeling and advertising is neither false nor misleading in any respect. If the FDA determines that any of our advertising or promotional claims are misleading, not substantiated or not permissible, we may be subject to enforcement actions, including warning letters, and we may be required to revise our promotional claims and make other corrections or restitutions.

Our medical device operations are subject to pervasive and continuing FDA regulatory requirements.

Medical devices regulated by the FDA are subject to “general controls” which include: registration with the FDA; listing commercially distributed products with the FDA; complying with cGMPs under QSR; filing reports with the FDA of and keeping records relative to certain types of adverse events associated with devices under the medical device reporting regulation; assuring that device labeling complies with device labeling requirements; reporting certain device field removals and corrections to the FDA; and obtaining pre-market notification 510(k) clearance for devices prior to marketing. Some devices known as “510(k)-exempt” devices can be marketed without prior marketing-clearance or approval from the FDA. In addition to the “general controls,” some Class II medical devices are also subject to “special controls,” including adherence to a particular guidance document and compliance with the performance standard. Instead of obtaining 510(k) clearance, most Class III devices are subject to PMA. Our C2 catheters for the treatment of CAD is designated as a Class III product and will follow the PMA process. As a Company, we do not have prior experience in obtaining PMA approval.

The medical device industry is now experiencing greater scrutiny and regulation by federal, state and foreign governmental authorities. Companies in our industry are subject to more frequent and more intensive reviews and investigations, often involving the marketing, business practices and product quality management. Such reviews and investigations may result in civil and criminal proceedings; the imposition of substantial fines and penalties; the receipt of warning letters, untitled letters, demands for recalls or the seizure of our products; the requirement to enter into corporate integrity agreements, stipulated judgments or other administrative remedies; and result in our incurring substantial unanticipated costs and the diversion of key personnel and management's attention from their regular duties, any of which may have a material and adverse effect on our business, financial condition and results of operations, and may result in greater and continuing governmental scrutiny of our business in the future.

Additionally, federal, state and foreign governments and entities have enacted laws and issued regulations and other standards requiring increased visibility and transparency of our interactions with healthcare providers. For example, Open Payments requires us to annually report to CMS payments and other transfers of value to all U.S. physicians and U.S. teaching hospitals, with the reported information made publicly available on a searchable website. Failure to comply with these legal and regulatory requirements could impact our business, and we have had and will continue to spend substantial time and financial resources to develop and implement enhanced structures, policies, systems and processes to comply with these legal and regulatory requirements, which may also impact our business and which could have a material adverse effect on our business, financial condition and results of operations.

Product clearances and approvals can often be denied or significantly delayed.

Under FDA regulations, unless exempt, a new medical device may only be commercially distributed after it has received 510(k) clearance, is authorized through the de novo classification process or is the subject of an approved PMA. The FDA will clear marketing of a medical device through the 510(k) process if it is demonstrated that the new product is substantially equivalent to another legally marketed product not subject to a PMA. Sometimes, a 510(k) clearance must be supported by preclinical and clinical data.

The PMA process typically is more costly, lengthy and stringent than the 510(k) process. Unlike a 510(k) review, which determines "substantial equivalence," a PMA requires that the applicant demonstrate reasonable assurance that the device is safe and effective by producing valid scientific evidence, including data from preclinical studies and human clinical trials. Therefore, to obtain regulatory clearance or approvals, we typically must, among other requirements, provide the FDA and similar foreign regulatory authorities with preclinical and clinical data that demonstrate to their satisfaction that our products satisfy the criteria for approval. Preclinical testing and clinical trials must comply with the regulations of the FDA and other government authorities in the United States and similar agencies in other countries.

We may be required to obtain PMAs, PMA supplements or additional 510(k) pre-market clearances to market modifications to our existing products. The FDA requires device manufacturers to make and document a determination of whether a modification requires approval or clearance; however, the FDA can review a manufacturer's decision. The FDA may not agree with our decisions not to seek approvals or clearances for particular device modifications. If the FDA requires us to obtain PMAs, PMA supplements or pre-market clearances for any modification to a previously cleared or approved device, we may be required to cease manufacturing and marketing of the modified device and perhaps also to recall such modified device until we obtain FDA clearance or approval. We may also be subject to significant regulatory fines or penalties.

The FDA may not approve our current or future PMA applications or supplements or clear our 510(k) applications on a timely basis or at all. Such delays or refusals could have a material adverse effect on our business, financial condition and results of operations.

The FDA may also change its clearance and approval policies, adopt additional regulations or revise existing regulations, or take other actions which may prevent or delay approval or clearance of our products

under development or impact our ability to modify our currently approved or cleared products on a timely basis. Any of these actions could have a material adverse effect on our business, financial condition and results of operations.

International regulatory approval processes may take more or less time than the FDA clearance or approval process. If we fail to comply with applicable FDA and comparable non-U.S. regulatory requirements, we may not receive regulatory clearances or approvals or may be subject to FDA or comparable non-U.S. enforcement actions. We may be unable to obtain future regulatory clearance or approval in a timely manner, or at all, especially if existing regulations are changed or new regulations are adopted. For example, the FDA clearance or approval process can take longer than anticipated due to requests for additional clinical data and changes in regulatory requirements. A failure or delay in obtaining necessary regulatory clearances or approvals would materially adversely affect our business, financial condition and results of operations.

Although we have obtained regulatory clearance for our M5 catheters for the treatment of PAD in the United States, and our M5 catheters for the treatment of PAD and our C2 catheter for the treatment of CAD in certain non-U.S. jurisdictions, they will remain subject to extensive regulatory scrutiny.

Although our M5 catheters for the treatment of PAD have obtained regulatory clearance in the United States, and our M5 catheters for the treatment of PAD and C2 catheters for the treatment of CAD in certain non-U.S. jurisdictions have obtained applicable regulatory approvals, they will be subject to ongoing regulatory requirements for manufacturing, labeling, packaging, storage, advertising, promotion, sampling, record-keeping, conduct of post-marketing studies and submission of safety, effectiveness and other post-market information, including both federal and state requirements in the United States and requirements of comparable non-U.S. regulatory authorities.

Our manufacturing facility is required to comply with extensive requirements imposed by the FDA and comparable foreign regulatory authorities, including ensuring that quality control and manufacturing procedures conform to the QSR or similar regulations set by foreign regulatory authorities. As such, we will be subject to continual review and inspections to assess compliance with the QSR and adherence to commitments made in any 510(k) application. Accordingly, we continue to expend time, money and effort in all areas of regulatory compliance, including manufacturing, production and quality control.

Any regulatory clearances or approvals that we have received for our products will be subject to limitations on the cleared or approved indicated uses for which the product may be marketed and promoted, will be subject to the conditions of approval, or will contain requirements for potentially costly post-marketing testing. We are required to report certain adverse events and production problems, if any, to the FDA and comparable foreign regulatory authorities. Any new legislation addressing product safety issues could result in increased costs to assure compliance. The FDA and other agencies, including the DOJ, closely regulate and monitor the post-clearance or approval marketing and promotion of products to ensure that they are marketed and distributed only for the cleared or approved indications and in accordance with the provisions of the cleared or approved labeling. We have to comply with requirements concerning advertising and promotion for our products.

Promotional communications with respect to devices are subject to a variety of legal and regulatory restrictions and must be consistent with the information in the products' cleared or approved labeling. As such, we may not promote our products for indications or uses for which they do not have clearance or approval. For certain changes to a cleared product, including certain changes to product labeling, the holder of a cleared 510(k) application may be required to submit a new application and obtain clearance. We will train our marketing and sales force against promoting our product candidates for uses outside of the cleared or approved indications for use, known as "off-label uses." However, physicians may use our products for off-label purposes and are allowed to do so when in the physician's independent professional medical judgment he or she deems it appropriate. If the FDA determines that our promotional materials or training constitute promotion of an off-label or other improper use, or that our internal policies and procedures are inadequate to prevent such off-label uses, it could subject us to regulatory or enforcement actions as discussed below.

If a regulatory agency discovers previously unknown problems with a product, such as adverse events of unanticipated severity or frequency, or problems with our facility where the product is manufactured or disagrees with the promotion, marketing or labeling of a product, such regulatory agency may impose restrictions on that product or us, including requiring withdrawal of the product from the market. If we fail to comply with applicable regulatory requirements, a regulatory agency or enforcement authority may, among other things:

- subject our facility to an adverse inspectional finding or Form 483, or other compliance or enforcement notice, communication or correspondence;
- issue warning or untitled letters that would result in adverse publicity or may require corrective advertising;
- impose civil or criminal penalties;
- suspend or withdraw regulatory clearances or approvals;
- refuse to clear or approve pending applications or supplements to approved applications submitted by us;
- impose restrictions on our operations, including closing our sub-assembly suppliers' facilities;
- seize or detain products; or
- require a product recall.

In addition, violations of the Federal Food, Drug and Cosmetic Act ("FD&C Act"), relating to the promotion of approved products may lead to investigations alleging violations of federal and state healthcare fraud and abuse and other laws, as well as state consumer protection laws.

Any government investigation of alleged violations of law could require us to expend significant time and resources in response, and could generate negative publicity. Any failure to comply with ongoing regulatory requirements may significantly and adversely affect our ability to commercialize and generate revenue from our products. If regulatory sanctions are applied or if regulatory clearance or approval is withdrawn, it would have a material adverse effect on our business, financial condition and results of operations.

Our products may be subject to recalls after receiving FDA or foreign approval or clearance, which could divert managerial and financial resources, harm our reputation and adversely affect our business.

The FDA and similar foreign governmental authorities have the authority to require the recall of our products because of any failure to comply with applicable laws and regulations, or defects in design or manufacture. A government mandated or voluntary product recall by us could occur because of, for example, component failures, device malfunctions or other adverse events, such as serious injuries or deaths, or quality-related issues, such as manufacturing errors or design or labeling defects. Any future recalls of our products could divert managerial and financial resources, harm our reputation and adversely affect our business.

If we initiate a correction or removal for one of our devices to reduce a risk to health posed by the device, we would be required to submit a publicly available Correction and Removal report to the FDA and, in many cases, similar reports to other regulatory agencies. This report could be classified by the FDA as a device recall which could lead to increased scrutiny by the FDA, other international regulatory agencies and our customers regarding the quality and safety of our devices. Furthermore, the submission of these reports has been and could be used by competitors against us in competitive situations and cause customers to delay purchase decisions or cancel orders and would harm our reputation. In July 2018, we initiated and subsequently completed a voluntary recall of our S4 catheters after seeing a higher instance of leaks in the balloon, which prevented the balloon from staying inflated at 4 atm for the full course of lithotripsy application. While there were no patient safety issues reported and no reports of adverse clinical events related to this issue and the issue has been corrected, we believe it was prudent to suspend utilization of the device and recall the product while we determined the cause of the leak.

In addition, we are subject to medical device reporting regulations that require us to report to the FDA or similar foreign governmental authorities if one of our products may have caused or contributed to a death or serious injury or if we become aware that it has malfunctioned in a way that would likely cause or contribute to a death or serious injury if the malfunction recurred. Failures to properly identify reportable events or to file timely reports, as well as failure to address each of the observations to the FDA's satisfaction, can subject us to sanctions and penalties, including warning letters and recalls. Physicians, hospitals and other healthcare providers may make similar reports to regulatory authorities. Any such reports may trigger an investigation by the FDA or similar foreign regulatory bodies, which could divert managerial and financial resources, harm our reputation and have a material adverse effect on our business, financial condition and results of operations.

If we or our suppliers fail to comply with the FDA's Quality System Regulation or any applicable state equivalent, our operations could be interrupted and our potential product sales and operating results could suffer.

Our manufacturing processes and those of our third-party suppliers are required to comply with the FDA's QSR, which covers the design controls, document controls, purchasing controls, identification and traceability, production and process controls, acceptance activities, nonconforming product requirements, corrective and preventive action requirements, labeling and packaging controls, handling, storage, distribution and installation requirements, complaint handling, records requirements, servicing requirements and statistical techniques potentially applicable to the production of our medical devices. We and our suppliers are also subject to the regulations of foreign jurisdictions regarding the manufacturing process where we market products overseas. In addition, we must engage in extensive recordkeeping and reporting and must make available our manufacturing facilities and records for periodic announced or unannounced inspections by governmental agencies, including the FDA, state authorities and comparable agencies in other countries. If we experience an unsuccessful Quality System inspection, our operations could be disrupted and our manufacturing could be interrupted. Failure to take adequate corrective action in response to an adverse Quality System inspection could result in, among other things, a shut-down of our manufacturing operations, significant fines, suspension of marketing clearances and approvals, seizures or recalls of our device, operating restrictions and criminal prosecutions, any of which would cause our business to suffer. Furthermore, our key component suppliers may not currently be or may not continue to be in compliance with applicable regulatory requirements, which may result in manufacturing delays for our product and cause our revenue to decline.

We have registered with the FDA as a medical device manufacturer and have obtained a manufacturing license from the California Department of Health Services ("CDHS"). We anticipate that we and certain of our third-party component suppliers will be subject to FDA and CDHS inspections.

We produce substantially all of our IVL catheters in-house at our facilities in Fremont, California which, together with our research and development, controlled environment room and office space, currently totals 12,000 square feet. We plan to move our production of IVL catheters to our new 35,000 square foot facility in Santa Clara, California in 2019. Our Santa Clara facility has not been inspected by the FDA to date. Our most recent audit by the British Standards Institution ("BSI") was held in 2018. There was one minor non-conformance and no major non-conformances. We can provide no assurance that we will continue to remain in compliance with QSR. If our facilities are found to be in noncompliance or fail to take satisfactory corrective action in response to adverse QSR inspectional findings, the FDA could take legal or regulatory enforcement actions against us and/or our products, including but not limited to the cessation of sales or the recall of distributed products, which could impair our ability to produce our products in a cost-effective and timely manner in order to meet our customers' demands. We may also be required to bear other costs or take other actions that may have a negative impact on our future sales and our ability to generate profits. Taking corrective action may be expensive, time-consuming and a distraction for management, and if we experience a shutdown or delay at our manufacturing facilities, we may be unable to produce our products, which would harm our business.

Current regulations depend heavily on administrative interpretation. If the FDA does not believe that we are in compliance with applicable FDA regulations, the agency could take legal or regulatory enforcement actions

against us and/or our products. We are also subject to periodic inspections by the FDA and other governmental regulatory agencies, as well as certain third-party regulatory groups. Future interpretations made by the FDA or other regulatory bodies made during the course of these inspections may vary from current interpretations and may adversely affect our business and prospects. The FDA's and other comparable non-U.S. regulatory agencies' statutes, regulations or policies may change, and additional government regulation or statutes may be enacted, which could increase post-approval regulatory requirements, or delay, suspend or prevent marketing of any cleared or approved products or necessitate the recall of distributed products. We cannot predict the likelihood, nature or extent of adverse governmental regulation that might arise from future legislative or administrative action, either in the United States or abroad.

The medical device industry has been under heightened FDA scrutiny as the subject of government investigations and enforcement actions. If our operations and activities are found to be in violation of any FDA laws or any other governmental regulations that apply to us, we may be subject to penalties, including civil and criminal penalties, damages, fines and other legal and/or agency enforcement actions. Any penalties, damages, fines or curtailment or restructuring of our operations or activities could adversely affect our ability to operate our business and our financial results. The risk of us being found in violation of FDA laws is increased by the fact that many of these laws are broad and their provisions are open to a variety of interpretations. Any action against us for violation of these laws, even if we successfully defend ourselves against that action and its underlying allegations, could cause us to incur significant legal expenses and divert management's attention from the operation of our business. Where there is a dispute with a federal or state governmental agency that cannot be resolved to the mutual satisfaction of all relevant parties, we may determine that the costs, both real and contingent, are not justified by the commercial returns to us from maintaining the dispute or the product.

Various claims, design features or performance characteristics of our medical devices that we may regard as permitted by the FDA without marketing clearance or approval, may be challenged by the FDA or state or foreign regulators. The FDA or state or foreign regulatory authorities may find that certain claims, design features or performance characteristics, in order to be made or included in the products, may have to be supported by further studies and marketing clearances or approvals, which could be lengthy, costly and possibly unobtainable.

If any of our products cause or contribute to a death or a serious injury or malfunction in certain ways, we will be required to report under applicable medical device reporting regulations, which can result in voluntary corrective actions or agency enforcement actions.

Under FDA medical device reporting regulations ("MDR regulations"), medical device manufacturers are required to report to the FDA information that a device has or may have caused or contributed to a death or serious injury or has malfunctioned in a way that would likely cause or contribute to death or serious injury if the malfunction of the device or one of our similar devices were to recur. If we fail to report events required to be reported to the FDA within the required timeframes, or at all, the FDA could take enforcement action and impose sanctions against us. Any such adverse event involving our products also could result in future voluntary corrective actions, such as recalls or customer notifications, or agency action, such as inspection or enforcement action. Any corrective action, whether voluntary or involuntary, as well as defending ourselves in a lawsuit, would require our time and capital, distract management from operating our business and may harm our reputation and have a material adverse effect on our business, financial condition and results of operations.

Healthcare reform initiatives and other administrative and legislative proposals may adversely affect our business, financial condition, results of operations and cash flows in our key markets.

There have been and continue to be proposals by the federal government, state governments, regulators and third-party payors to control or manage the increased costs of healthcare and, more generally, to reform the U.S. healthcare system. Certain of these proposals could limit the prices we are able to charge for our products or the coverage and reimbursement available for our products and could limit the acceptance and availability of our

products. The adoption of proposals to control costs could have a material adverse effect on our business, financial condition and results of operations.

For example, in the United States, in March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act of 2010, together, the Affordable Care Act ("ACA"), is a sweeping measure intended to expand healthcare coverage within the United States, primarily through the imposition of health insurance mandates on employers and individuals, the provision of subsidies to eligible individuals enrolled in plans offered on the health insurance exchanges and the expansion of the Medicaid program. Implementation of the ACA will impact existing government healthcare programs and will result in the development of new programs. For example, the ACA, among other things, imposes a deductible excise tax of 2.3% on the sale of most medical devices, including ours, and any failure to pay this amount could result in the imposition of an injunction on the sale of our products, fines and penalties.

There have been judicial and Congressional challenges to certain aspects of the ACA, as well as recent efforts by the Trump administration to repeal or replace certain aspects of the ACA, and we expect such challenges and amendments to continue. For example, since January 2017, President Trump has signed two Executive Orders and other directives designed to delay the implementation of certain provisions of the ACA or otherwise circumvent some of the requirements for health insurance mandated by the ACA. Concurrently, Congress has considered legislation that would repeal or repeal and replace all or part of the ACA. While Congress has not passed comprehensive repeal legislation, two bills affecting the implementation of certain taxes under the ACA have been signed into law. The Tax Cuts and Jobs Act of 2017 ("TCJA") includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the ACA on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate." Additionally, on January 22, 2018, President Trump signed a continuing resolution on appropriations for fiscal year 2018 (the "2018 Continuing Resolution"), that delayed the implementation of certain ACA-mandated fees, including the 2.3% excise tax imposed on manufacturers and importers for certain sales of medical devices through December 31, 2019. Further, the BBA, among other things, amends the ACA, effective January 1, 2019, to close the coverage gap in most Medicare drug plans, commonly referred to as the "donut hole". More recently, in July 2018, CMS published a final rule permitting further collections and payments to and from certain ACA qualified health plans and health insurance issuers under the ACA risk adjustment program in response to the outcome of federal district court litigation regarding the method CMS uses to determine this risk adjustment. Congress may consider additional legislation to repeal or replace all or certain other elements of the ACA, including the medical device excise tax. We continue to evaluate the impact of the ACA and its possible repeal or replacement on our business.

In addition, other legislative changes have been proposed and adopted since the ACA was enacted. On August 2, 2011, the Budget Control Act of 2011 was signed into law, which, among other things, includes reductions to Medicare payments to providers of 2% per fiscal year, which went into effect on April 1, 2013 and, due to subsequent legislative amendments to the statute, including the BBA, will remain in effect through 2027 unless additional Congressional action is taken. On January 2, 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, reduced Medicare payments to several providers, including hospitals, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

We cannot assure you that the ACA, as currently enacted or as amended in the future, will not harm our business and financial results, and we cannot predict how future federal or state legislative or administrative changes relating to healthcare reform will affect our business.

There likely will continue to be legislative and regulatory proposals at the federal and state levels directed at containing or lowering the cost of healthcare. We cannot predict the initiatives that may be adopted in the future or their full impact. The continuing efforts of the government, insurance companies, managed care organizations and other payors of healthcare services to contain or reduce costs of healthcare may harm:

- our ability to set a price that we believe is fair for our products;

- our ability to generate revenue and achieve or maintain profitability; and
- the availability of capital.

Further, recently there has been heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products, which has resulted in several U.S. Congressional inquiries and proposed and enacted federal legislation designed to bring transparency to product pricing and reduce the cost of products and services under government healthcare programs. Congress and the Trump administration have each indicated that it will continue to seek new legislative and/or administrative measures to control product costs. Additionally, individual states in the United States have also increasingly passed legislation and implemented regulations designed to control product pricing, including price or patient reimbursement constraints, discounts, restrictions on certain product access and marketing cost disclosure and transparency measures. Moreover, regional healthcare authorities and individual hospitals are increasingly using bidding procedures to determine what products to purchase and which suppliers will be included in their healthcare programs. Adoption of price controls and other cost-containment measures, and adoption of more restrictive policies in jurisdictions with existing controls and measures may prevent or limit our ability to generate revenue and attain profitability.

Various new healthcare reform proposals are emerging at the federal and state level. Any new federal and state healthcare initiatives that may be adopted could limit the amounts that federal and state governments will pay for healthcare products and services, and could have a material adverse effect on our business, financial condition and results of operations.

Our financial performance may be adversely affected by medical device tax provisions in the healthcare reform legislation.

The imposition of the 2.3% medical device excise tax enacted as part of the ACA could adversely affect our financial results. Although the suspension of the excise tax was extended to the end of 2019 by the 2018 Continuing Resolution, we do not know whether the suspension will continue beyond 2019. We may not be able to pass along the cost of the tax to our customers or offset the cost of the tax through higher sales volumes resulting from the expansion of health insurance coverage. Ongoing implementation of this legislation could have a material adverse effect on our business, financial condition and results of operations.

Material modifications to our products may require new 510(k) clearances or pre-market approvals or may require us to recall or cease marketing our products until clearances or approvals are obtained.

Modifications that could significantly affect the safety and effectiveness of our approved or cleared products, such as changes to the intended use or technological characteristics of our products, will require new 510(k) clearances or PMAs or require us to recall or cease marketing the modified devices until these clearances or approvals are obtained. Based on FDA published guidelines, the FDA requires device manufacturers to initially make and document a determination of whether or not a modification requires a new approval, supplemental approval or clearance; however, the FDA can review a manufacturer's decision. Any modification to an FDA-cleared device that could significantly affect its safety or efficacy or that would constitute a major change in its intended use would require a new 510(k) clearance or possibly a PMA. For Class III products, changes that affect safety and effectiveness will require the submission and approval of a PMA supplement. We may not be able to obtain additional 510(k) clearances or PMAs for new products or for modifications to, or additional indications for, our products in a timely fashion, or at all. Delays in obtaining required future clearances or approvals would adversely affect our ability to introduce new or enhanced products in a timely manner, which in turn would harm our future growth. We have made modifications to our products in the past and expect to make additional modifications in the future that we believe do not or will not require additional clearances or approvals. If the FDA disagrees and requires new clearances or approvals for these modifications, we may be required to recall and to stop selling or marketing such products as modified, which could harm our operating results and require us to redesign such products. In these circumstances, we may be subject to significant enforcement actions.

Our employees, independent contractors, consultants, commercial partners, distributors and vendors may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements.

We are exposed to the risk that our employees, independent contractors, consultants, commercial partners, distributors and vendors may engage in fraudulent or illegal activity. Misconduct by these parties could include intentional, reckless and/or negligent conduct or disclosure of unauthorized activities to us that violates: (i) the laws of the FDA and other similar foreign regulatory bodies, including those laws requiring the reporting of true, complete and accurate information to such regulators; (ii) manufacturing standards; (iii) healthcare fraud and abuse laws in the United States and similar foreign fraudulent misconduct laws; or (iv) laws that require the true, complete and accurate reporting of financial information or data. These laws may impact, among other things, future sales, marketing and education programs. In particular, the promotion, sales and marketing of healthcare items and services, as well as certain business arrangements in the healthcare industry, are subject to extensive laws designed to prevent fraud, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, structuring and commissions, certain customer incentive programs and other business arrangements generally. Activities subject to these laws also involve the improper use of information obtained in the course of patient recruitment for clinical trials.

We have adopted a code of business conduct and ethics, but it is not always possible to identify and deter misconduct by our employees and other third parties, and the precautions we take to detect and prevent these activities may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. If any such actions are instituted against us and we are not successful in defending ourselves or asserting our rights, those actions could result in the imposition of significant fines or other sanctions, including the imposition of civil, criminal and administrative penalties, damages, monetary fines, disgorgement, individual imprisonment, additional integrity reporting and oversight obligations, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, contractual damages, reputational harm, diminished profits and future earnings and curtailment of operations, any of which could adversely affect our ability to operate our business and our results of operations. Whether or not we are successful in defending against any such actions or investigations, we could incur substantial costs, including legal fees, and divert the attention of management in defending ourselves against any of these claims or investigations, which could have a material adverse effect on our business, financial condition and results of operations.

Environmental and health safety laws may result in liabilities, expenses and restrictions on our operations. Failure to comply with environmental laws and regulations could subject us to significant liability.

Federal, state, local and foreign laws regarding environmental protection, hazardous substances and human health and safety may adversely affect our business. Our research and development and manufacturing operations involve the use of hazardous substances and are subject to a variety of federal, state, local and foreign environmental laws and regulations relating to the storage, use, discharge, disposal and remediation of, as well as human exposure to, hazardous substances and the sale, labeling, collection, recycling, treatment and disposal of products containing hazardous substances. These operations are permitted by regulatory authorities, and the resultant waste materials are disposed of in material compliance with environmental laws and regulations. Using hazardous substances in our operations exposes us to the risk of accidental injury, contamination or other liability from the use, storage, importation, handling or disposal of hazardous materials. If our or our suppliers' operations result in the contamination of the environment or expose individuals to hazardous substances, we could be liable for damages and fines, and any liability could significantly exceed our insurance coverage and have a material adverse effect on our on our business, financial condition and results of operations. Liability under environmental laws and regulations can be joint and several and without regard to fault or negligence. Compliance with environmental laws and regulations may be expensive, and non-compliance could result in substantial liabilities, fines and penalties, personal injury and third-party property damage claims and substantial investigation and

remediation costs. Environmental laws and regulations could become more stringent over time, imposing greater compliance costs and increasing risks and penalties associated with violations. We cannot assure you that violations of these laws and regulations will not occur in the future or have not occurred in the past as a result of human error, accidents, equipment failure or other causes. The expense associated with environmental regulation and remediation could harm our business, financial condition and results of operation.

We face risks related to our collection and use of data, which could result in investigations, inquiries, litigation, fines, legislative and regulatory action and negative press about our privacy and data protection practices.

Our business processes personal data, including some data related to health. When conducting clinical trials, we face risks associated with collecting trial participants' data, especially health data, in a manner consistent with applicable laws and regulations, such as the Common Rule, GCP guidelines, or FDA human subject protection regulations. We also face risks inherent in handling large volumes of data and in protecting the security of such data. We could be subject to attacks on our systems by outside parties or fraudulent or inappropriate behavior by our service providers or employees. Third parties may also gain access to users' accounts using stolen or inferred credentials, computer malware, viruses, spamming, phishing attacks or other means, and may use such access to obtain users' personal data or prevent use of their accounts. Data breaches could result in a violation of applicable U.S. and international privacy, data protection and other laws, and subject us to individual or consumer class action litigation and governmental investigations and proceedings by federal, state and local regulatory entities in the United States and by international regulatory entities, resulting in exposure to material civil and/or criminal liability. Further, our general liability insurance and corporate risk program may not cover all potential claims to which we are exposed and may not be adequate to indemnify us for all liability that may be imposed.

This risk is enhanced in certain jurisdictions and, as we expand our operations domestically and internationally, we may be subject to additional laws in other jurisdictions. Any failure, or perceived failure, by us to comply with privacy and data protection laws, rules and regulations could result in proceedings or actions against us by governmental entities or others. These proceedings or actions may subject us to significant penalties and negative publicity, require us to change our business practices, increase our costs and severely disrupt our business. For example, in the United States, California recently adopted the California Consumer Privacy Act of 2018, which will come into effect beginning in January 2020. The GDPR became effective in May 2018. The GDPR applies extraterritorially and imposes several stringent requirements for controllers and processors of personal data, including, for example, higher standards for obtaining consent from individuals to process their personal data, more robust disclosures to individuals and a strengthened individual data rights regime, shortened timelines for data breach notifications, limitations on retention of information, increased requirements pertaining to special categories of personal data and pseudonymised (i.e., key-coded) data and additional obligations when we contract third-party processors in connection with the processing of the personal data. The GDPR provides that European Union ("EU") member states may make their own laws and regulations limiting the (i) processing of personal data, including special categories of data (e.g., racial or ethnic origin, political opinions, religious or philosophical beliefs) and (ii) profiling and automated individual decision-making of individuals, which could limit our ability to use and share personal data or other data and could cause our costs to increase, harming our business and financial condition. Non-compliance with GDPR is subject to significant penalties, including fines of up to €20 million or 4% of total worldwide revenue. The interpretations of the GDPR by local data protection authorities in EU member states, along with the complexity of the new data protection regime itself, will leave the interpretation and enforcement of the law unclear in the near term, with potential inconsistencies across the EU member states. The implementation and enforcement of the GDPR may subject us to enforcement risk and requirements to change certain of our data collection, processing and other policies and practices. We could incur significant costs investigating and defending such claims and, if we are found liable, significant damages. If any of these events were to occur, our business and financial results could be adversely affected. Other jurisdictions outside the EU are similarly introducing or enhancing laws and regulations relating to privacy and data security, which enhances risks relating to compliance with such laws.

Additionally, we are subject to laws and regulations regarding cross-border transfers of personal data, including laws relating to transfer of personal data outside of the European Economic Area ("EEA"). We rely on transfer mechanisms permitted under these laws, including EU Standard Contract Clauses. Such mechanisms have received heightened regulatory and judicial scrutiny in recent years. If we cannot rely on existing mechanisms for transferring personal data from the EEA, the United Kingdom or other jurisdictions, we could be prevented from transferring personal data of users or employees in those regions. This could adversely affect the manner in which we provide our services and thus materially affect our operations and financial results.

Legislative or regulatory reforms may make it more difficult and costly for us to obtain regulatory clearance or approval of our planned or future products and to manufacture, market and distribute our products after clearance or approval is obtained.

From time to time, legislation is drafted and introduced in Congress that could significantly change the statutory provisions governing the regulatory approval, manufacture and marketing of regulated products or the reimbursement thereof. In addition, FDA regulations and guidance are often revised or reinterpreted by the FDA in ways that may significantly affect our business and our products. Any new regulations or revisions or reinterpretations of existing regulations may impose additional costs or lengthen review times of planned or future products. It is impossible to predict whether legislative changes will be enacted or FDA regulations, guidance or interpretations changed, and what the impact of such changes, if any, may be.

Moreover, the policies of the Trump Administration and their impact on the regulation of our products in the United States remain uncertain. The outcome of the 2016 election and the 2018 Congressional mid-term elections resulting in a split in majority control between the House of Representatives and the Senate could result in significant legislative and regulatory reforms impacting the FDA's regulation of our products. Any change in the laws or regulations that govern the clearance and approval processes relating to our current, planned and future products could make it more difficult and costly to obtain clearance or approval for new products or to produce, market and distribute existing products. Significant delays in receiving clearance or approval or the failure to receive clearance or approval for our new products would have an adverse effect on our ability to expand our business.

In the EU, on May 25, 2017 the new Medical Devices Regulation ("2017/745" or "MDR") was adopted. Following its entry into application on May 26, 2020, the MDR will introduce substantial changes to the obligations with which medical device manufacturers must comply in the EU. High risk medical devices will be subject to additional scrutiny during the conformity assessment procedure.

Risks Related to Our Intellectual Property

If we are unable to obtain and maintain patent or other intellectual property protection for our products, or if the scope of the patent and other intellectual property protection obtained is not sufficiently broad, our competitors could develop and commercialize products and technology similar or identical to ours, and our ability to successfully commercialize any products we may develop, and our technology, may be adversely affected.

As with other medical device companies, our success depends in large part on our ability to maintain and solidify a proprietary position for our products, which will depend upon our success in obtaining effective patent claims that cover, and other intellectual property with respect to, such products, their manufacturing processes and their intended methods of use and enforcing those patent claims once granted as well as our other intellectual property. In some cases, we may not be able to obtain issued claims covering our technologies which are sufficient to prevent third parties, such as our competitors, from utilizing our technology. Any failure to obtain or maintain patent and other intellectual property protection with respect to our IVL products and technologies or other aspects of our business could have a material adverse effect on our business, financial condition and results of operations.

Changes in either the patent laws or their interpretation in the United States and other countries may diminish our ability to protect our inventions, obtain, maintain and enforce our intellectual property rights and, more generally, could affect the value of our intellectual property or narrow the scope of our issued patents. Additionally, we cannot predict whether the patent applications we are currently pursuing will issue as patents in any particular jurisdiction or whether the claims of any issued patents will provide sufficient protection from competitors or other third parties.

The patent prosecution process is expensive, time-consuming and complex, and we may not be able to file, prosecute, maintain, enforce or license all necessary or desirable patent applications at a reasonable cost or in a timely manner. It is also possible that we will fail to identify patentable aspects of our research and development output in time to obtain patent protection. Although we enter into non-disclosure and confidentiality agreements with parties who have access to confidential or patentable aspects of our research and development output, such as our employees, corporate collaborators, outside scientific collaborators, suppliers, consultants, advisors and other third parties, any of these parties may breach the agreements and disclose such output before a patent application is filed, thereby jeopardizing our ability to seek patent protection. In addition, our ability to obtain and maintain valid and enforceable patents depends on whether the differences between our inventions and the prior art allow our inventions to be patentable over the prior art. Furthermore, the publication of discoveries in scientific literature often lags behind the actual discoveries, and patent applications in the United States and other jurisdictions are typically not published until 18 months after filing, or in some cases not at all. Therefore, we cannot be certain that we were the first to make the inventions claimed in any of our patents or pending patent applications, or that we were the first to file for patent protection of such inventions. Moreover, in some circumstances, we may not have the right to control the preparation, filing and prosecution of patent applications, or to maintain the patents, covering technology that we license from or license to third parties and are therefore reliant on our licensors or licensees. Therefore, these and any of our patents and applications may not be prosecuted and enforced in a manner consistent with the best interests of our business. Defects of form in the preparation or filing of our patents or patent applications may exist, or may arise in the future, for example, with respect to proper priority claims, inventorship and the like, although we are unaware of any such defects that we believe are of material importance. If we or any current or future licensors or licensees fail to establish, maintain, protect or enforce such patents and other intellectual property rights, such rights may be reduced or eliminated. If any current or future licensors or licensees are not fully cooperative or disagree with us as to the prosecution, maintenance or enforcement of any patent rights, such patent rights could be compromised. If there are material defects in the form, preparation or prosecution of our patents or patent applications, such patents or applications may be invalid and unenforceable. Any of these outcomes could impair our ability to prevent competition from third parties, which may have an adverse impact on our business.

The strength of patent rights generally, and particularly the patent position of medical device companies, involves complex legal and scientific questions and can be uncertain, and has been the subject of much litigation in recent years. This uncertainty includes changes to the patent laws through either legislative action to change statutory patent law or court action that may reinterpret existing law or rules in ways affecting the scope or validity of issued patents. Our current or future patent applications may fail to result in issued patents in the United States or foreign countries with claims that cover our products. Even if patents do successfully issue from our patent applications, third parties may challenge the validity, enforceability or scope of such patents, which may result in such patents being narrowed, invalidated or held unenforceable. Any successful challenge to our patents could deprive us of exclusive rights necessary for the successful commercialization of our products. Furthermore, even if they are unchallenged, our patents may not adequately protect our products, provide exclusivity for our products or prevent others from designing around our claims. If the scope of any patent protection we obtain is not sufficiently broad, or if we lose any of our patent protection, our ability to prevent our competitors from commercializing similar or identical technology and products would be adversely affected. If the breadth or strength of protection provided by the patents we hold or pursue with respect to our products is challenged, it could dissuade companies from collaborating with us to develop, or threaten our ability to commercialize, our products.

Patents have a limited lifespan. In the United States, the natural expiration of a utility patent is generally 20 years after its effective filing date and the natural expiration of a design patent is generally 14 years after its issue date, unless the filing date occurred on or after May 13, 2015, in which case the natural expiration of a design patent is generally 15 years after its issue date. Various extensions may be available; however, the life of a patent, and the protection it affords, is limited. Without patent protection for our products and services, we may be open to competition. Further, if we encounter delays in our development efforts, the period of time during which we could market our products and services under patent protection would be reduced and, given the amount of time required for the development, testing and regulatory review of planned or future products, patents protecting such products might expire before or shortly after such products are commercialized. As a result, our intellectual property may not provide us with sufficient rights to exclude others from commercializing products similar or identical to ours.

Moreover, the coverage claimed in a patent application can be significantly reduced before the patent is issued, and its scope can be reinterpreted after issuance. Even if patent applications we license or own, currently or in the future, issue as patents, they may not issue in a form that will provide us with any meaningful protection, prevent competitors or other third parties from competing with us, or otherwise provide us with any competitive advantage. Any patents that we own may be challenged, narrowed, circumvented or invalidated by third parties. Consequently, we do not know whether our IVL products and technologies will be protectable or remain protected by valid and enforceable patents. Our competitors or other third parties may be able to circumvent our patents by developing similar or alternative technologies or products in a non-infringing manner which could materially adversely affect our business, financial condition and results of operations.

Some of our patents and patent applications may in the future be co-owned with third parties. If we are unable to obtain an exclusive license to any such third party co-owners' interest in such patents or patent applications, such co-owners may be able to license their rights to other third parties, including our competitors, and our competitors could market competing products and technology. In addition, we may need the cooperation of any such co-owners of our patents in order to enforce such patents against third parties, and such cooperation may not be provided to us. Any of the foregoing could have a material adverse effect on our business, financial condition and results of operations.

Patents covering our products could be found invalid or unenforceable if challenged in court or before administrative bodies in the United States or abroad.

The issuance of a patent is not conclusive as to its inventorship, scope, validity or enforceability, and our patents may be challenged in the courts or patent offices in the United States and abroad. We may be subject to a third-party preissuance submission of prior art to the U.S. Patent and Trademark Office (the "USPTO"), or become involved in opposition, derivation, revocation, reexamination, post-grant and *inter partes* review, or interference proceedings or other similar proceedings challenging our patent rights. An adverse determination in any such submission, proceeding or litigation could reduce the scope of, or invalidate or render unenforceable, our patent rights, allow third parties to commercialize our technology or products and compete directly with us, without payment to us, or result in our inability to manufacture or commercialize products without infringing third-party patent rights. Moreover, we may have to participate in interference proceedings declared by the USPTO to determine priority of invention or in post-grant challenge proceedings, such as oppositions in a foreign patent office, that challenge our priority of invention or other features of patentability with respect to our patents and patent applications. Such challenges may result in loss of patent rights, in loss of exclusivity or in patent claims being narrowed, invalidated or held unenforceable, which could limit our ability to stop others from using or commercializing similar or identical technology and products, or limit the duration of the patent protection of our technology or products. Such proceedings also may result in substantial cost and require significant time from our scientists and management, even if the eventual outcome is favorable to us. Any of the foregoing could have a material adverse effect on our business, financial condition and results of operations.

In addition, if we initiate legal proceedings against a third party to enforce a patent covering our products, the defendant could counterclaim that such patent is invalid or unenforceable. In patent litigation in the United

States, defendant counterclaims alleging invalidity or unenforceability are commonplace. Grounds for a validity challenge could be an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness or non-enablement. Grounds for an unenforceability assertion could be an allegation that someone connected with prosecution of the patent withheld relevant information from the USPTO or made a misleading statement during prosecution. Third parties may also raise claims challenging the validity or enforceability of our patents before administrative bodies in the United States or abroad, even outside the context of litigation, including through re-examination, post-grant review, *inter partes* review, interference proceedings, derivation proceedings and equivalent proceedings in foreign jurisdictions (e.g., opposition proceedings). Such proceedings could result in the revocation of, cancellation of or amendment to our patents in such a way that they no longer cover our products. The outcome following legal assertions of invalidity and unenforceability is unpredictable. With respect to the validity question, for example, we cannot be certain that there is no invalidating prior art, of which we and the patent examiner were unaware during prosecution. If a third party were to prevail on a legal assertion of invalidity or unenforceability, we would lose at least part, and perhaps all, of the patent protection on our products. Such a loss of patent protection would have a material adverse effect on our business, financial condition and results of operations.

Obtaining and maintaining our patent protection depends on compliance with various procedural, document submission, fee payment and other requirements imposed by government patent agencies, and our patent protection could be reduced or eliminated for non-compliance with these requirements.

Obtaining and maintaining our patent protection depends on compliance with various procedural measures, document submissions, fee payments and other requirements imposed by government patent agencies, and our patent protection could be reduced or eliminated for non-compliance with these requirements.

Periodic maintenance fees, renewal fees, annuity fees and various other government fees on patents and applications will be due to be paid to the USPTO and various government patent agencies outside of the United States over the lifetime of our patents and applications. The USPTO and various non-U.S. government agencies require compliance with several procedural, documentary, fee payment and other similar provisions during the patent application process. In some cases, an inadvertent lapse can be cured by payment of a late fee or by other means in accordance with the applicable rules. There are situations, however, in which non-compliance can result in the abandonment or lapse of the patent or patent application, resulting in a partial or complete loss of patent rights in the relevant jurisdiction. In such an event, potential competitors might be able to enter the market with similar or identical products or technology, which could have a material adverse effect on our business, financial condition and results of operations.

We may not be able to protect our intellectual property and proprietary rights throughout the world.

Third parties may attempt to commercialize competitive products or services in foreign countries where we do not have any patents or patent applications and/or where legal recourse may be limited. This may have a significant commercial impact on our foreign business operations.

Filing, prosecuting and defending patents on our products in all countries throughout the world would be prohibitively expensive, and the laws of foreign countries may not protect our rights to the same extent as the laws of the United States. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the United States, or from selling or importing products made using our inventions in and into the United States or other jurisdictions. Competitors may use our technologies in jurisdictions where we have not obtained patent protection to develop their own products and, further, may export otherwise infringing products to territories where we have patent protection but enforcement is not as strong as that in the United States. These products may compete with our products, and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of certain countries, particularly certain developing countries, do

not favor the enforcement of patents, trade secrets and other intellectual property protection, which could make it difficult for us to stop the infringement of our patents or marketing of competing products in violation of our intellectual property and proprietary rights generally. Proceedings to enforce our intellectual property and proprietary rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business, could put our patents at risk of being invalidated or interpreted narrowly, could put our patent applications at risk of not issuing and could provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate, and the damages or other remedies awarded, if any, may not be commercially meaningful. Accordingly, our efforts to enforce our intellectual property and proprietary rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license.

Many countries have compulsory licensing laws under which a patent owner may be compelled to grant licenses to third parties. In addition, many countries limit the enforceability of patents against government agencies or government contractors. In these countries, the patent owner may have limited remedies, which could materially diminish the value of such patent. If we are forced to grant a license to third parties with respect to any patents relevant to our business, our competitive position may be impaired, and our business, financial condition and results of operations may be adversely affected.

Changes in U.S. patent law could diminish the value of patents in general, thereby impairing our ability to protect our products.

Changes in either the patent laws or interpretation of the patent laws in the United States could increase the uncertainties and costs surrounding the prosecution of patent applications and the enforcement or defense of issued patents. Assuming that other requirements for patentability are met, prior to March 2013, in the United States, the first to invent the claimed invention was entitled to the patent, while outside the United States, the first to file a patent application was entitled to the patent. After March 2013, under the Leahy-Smith America Invents Act (the "America Invents Act"), enacted in September 2011, the United States transitioned to a first inventor to file system in which, assuming that other requirements for patentability are met, the first inventor to file a patent application will be entitled to the patent on an invention regardless of whether a third party was the first to invent the claimed invention. A third party that files a patent application in the USPTO after March 2013, but before us could therefore be awarded a patent covering an invention of ours even if we had made the invention before it was made by such third party. This will require us to be cognizant of the time from invention to filing of a patent application. Since patent applications in the United States and most other countries are confidential for a period of time after filing or until issuance, we cannot be certain that we were the first to file any patent application related to our products or invent any of the inventions claimed in our patents or patent applications.

The America Invents Act also includes a number of significant changes that affect the way patent applications will be prosecuted and also may affect patent litigation. These include allowing third-party submission of prior art to the USPTO during patent prosecution and additional procedures to attack the validity of a patent by USPTO administered post-grant proceedings, including post-grant review, *inter partes* review and derivation proceedings. Because of a lower evidentiary standard in USPTO proceedings compared to the evidentiary standard in U.S. federal courts necessary to invalidate a patent claim, a third party could potentially provide evidence in a USPTO proceeding sufficient for the USPTO to hold a claim invalid even though the same evidence would be insufficient to invalidate the claim if first presented in a district court action. Accordingly, a third party may attempt to use the USPTO procedures to invalidate our patent claims that would not have been invalidated if first challenged by the third party as a defendant in a district court action. Therefore, the America Invents Act and its implementation could increase the uncertainties and costs surrounding the prosecution of our patent applications and the enforcement or defense of our issued patents. In addition, future actions by the U.S. Congress, the federal courts and the USPTO could cause the laws and regulations governing patents to change in unpredictable ways. Any of the foregoing could have a material adverse effect on our business, financial condition and results of operations.

Our reliance on third parties requires us to share our trade secrets, which increases the possibility that a competitor will discover them or that our trade secrets will be misappropriated or disclosed. If we are unable to protect the confidentiality of our trade secrets, our business and competitive position would be harmed.

In addition to seeking patent protection for our products, we also rely upon unpatented trade secrets, know-how and continuing technological innovation to develop and maintain a competitive position. We seek to protect such proprietary information, in part, through confidentiality agreements with our employees, collaborators, contractors, advisors, consultants and other third parties and invention assignment agreements with our employees. We also have agreements with some of our consultants that require them to assign to us any inventions created as a result of their working with us. The confidentiality agreements are designed to protect our proprietary information and, in the case of agreements or clauses containing invention assignment, to grant us ownership of technologies that are developed through a relationship with employees or third parties.

We cannot guarantee that we have entered into such agreements with each party that has or may have had access to our trade secrets or proprietary information. Additionally, despite these efforts, any of these parties may breach the agreements and disclose our proprietary information, including our trade secrets, and we may not be able to obtain adequate remedies for such breaches. Enforcing a claim that a party illegally disclosed or misappropriated a trade secret is difficult, expensive and time-consuming, and the outcome is unpredictable. In addition, some courts inside and outside the United States are less willing or unwilling to protect trade secrets. If any of our trade secrets were to be lawfully obtained or independently developed by a competitor or other third party, we would have no right to prevent them from using that technology or information to compete with us. If any of our trade secrets were to be disclosed to, or independently developed by, a competitor or other third party, our competitive position would be materially and adversely harmed. Furthermore, we expect these trade secrets, know-how and proprietary information to over time be disseminated within the industry through independent development, the publication of journal articles describing the methodology and the movement of personnel from academic to industry scientific positions.

We also seek to preserve the integrity and confidentiality of our data and trade secrets by maintaining physical security of our premises and physical and electronic security of our information technology systems. While we have confidence in these individuals, organizations and systems, agreements or security measures may be breached, and we may not have adequate remedies for any breach. In addition, our trade secrets may otherwise become known, or be independently discovered by, competitors. To the extent that our employees, consultants, contractors or collaborators use intellectual property owned by others in their work for us, disputes may arise as to the rights in related or resulting know-how and inventions, which could have a material adverse effect on our business, financial condition and results of operations.

We may be subject to claims challenging the ownership or inventorship of our patents and other intellectual property and, if unsuccessful in any of these proceedings, we may be required to obtain licenses from third parties, which may not be available on commercially reasonable terms, or at all, or to cease the development, manufacture and commercialization of one or more of our products.

We may be subject to claims that current or former employees, collaborators or other third parties have an interest in our patents, trade secrets or other intellectual property as an inventor or co-inventor. For example, we may have inventorship disputes arise from conflicting obligations of employees, consultants or others who are involved in developing our products. Litigation may be necessary to defend against these and other claims challenging inventorship of our patents, trade secrets or other intellectual property. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights, such as exclusive ownership of, or right to use, intellectual property that is important to our products. If we were to lose exclusive ownership of such intellectual property, other owners may be able to license their rights to other third parties, including our competitors. We also may be required to obtain and maintain licenses from third parties, including parties involved in any such disputes. Such licenses may not be available on commercially reasonable terms, or at all, or may be non-exclusive. If we are unable to obtain and maintain such licenses, we may need to

cease the development, manufacture and commercialization of one or more of our products. The loss of exclusivity or the narrowing of our patent claims could limit our ability to stop others from using or commercializing similar or identical technology and products. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees. Any of the foregoing could have a material adverse effect on our business, financial condition and results of operations.

Third-party claims of intellectual property infringement, misappropriation or other violation against us or our collaborators may prevent or delay the sale and marketing of our products.

The medical device industry is highly competitive and dynamic. Due to the focused research and development that is taking place by several companies, including us and our competitors, in this field, the intellectual property landscape is in flux, and it may remain uncertain in the future. As such, we could become subject to significant intellectual property-related litigation and proceedings relating to our or third-party intellectual property and proprietary rights.

Our commercial success depends in part on our and any potential future collaborators' ability to develop, manufacture, market and sell any products that we may develop and use our proprietary technologies without infringing, misappropriating and otherwise violating the patents and other intellectual property rights of third parties. It is uncertain whether the issuance of any third-party patent would require us or any potential collaborators to alter our development or commercial strategies, obtain licenses or cease certain activities. The medical device industry is characterized by extensive litigation regarding patents and other intellectual property rights, as well as administrative proceedings for challenging patents, including interference, *inter partes* or post-grant review, derivation and reexamination proceedings before the USPTO or oppositions and other comparable proceedings in foreign jurisdictions.

Third parties, including our competitors, may currently have patents or obtain patents in the future and claim that the manufacture, use or sale of our products infringes upon these patents. We have not conducted an extensive search of patents issued or assigned to other parties, including our competitors, and no assurance can be given that patents containing claims covering our products, parts of our products, technology or methods do not exist, have not been filed or could not be filed or issued. In addition, because patent applications can take many years to issue and because publication schedules for pending applications vary by jurisdiction, there may be applications now pending of which we are unaware and which may result in issued patents which our current or future products infringe. Also, because the claims of published patent applications can change between publication and patent grant, there may be published patent applications that may ultimately issue with claims that we infringe. As the number of competitors in our market grows and the number of patents issued in this area increases, the possibility of patent infringement claims against us escalates. Moreover, we may face claims from non-practicing entities ("NPEs"), which have no relevant product revenue and against whom our own patent portfolio may have no deterrent effect. Third parties, including NPEs, have claimed, and may in the future claim, that our products infringe or violate their patents or other intellectual property rights.

In the event that any third party claims that we infringe their patents or that we are otherwise employing their proprietary technology without authorization and initiates litigation against us, even if we believe such claims are without merit, there is no assurance that a court would find in our favor on questions of infringement, validity, enforceability or priority. A court of competent jurisdiction could hold that these third-party patents are valid, enforceable and infringed by our products. In order to successfully challenge the validity of any such U.S. patent in federal court, we would need to overcome a presumption of validity. As this burden is a high one requiring us to present clear and convincing evidence as to the invalidity of any such U.S. patent claim, there is no assurance that a court of competent jurisdiction would invalidate the claims of any such U.S. patent. If we are found to infringe third-party patents, and we are unsuccessful in demonstrating that such patents are invalid or unenforceable, such third parties may be able to block our ability to commercialize the applicable products or technology unless we obtain a license under the applicable patents, or until such patents expire or are finally

determined to be held invalid or unenforceable. Such a license may not be available on commercially reasonable terms, or at all. Even if we are able to obtain a license, the license would likely obligate us to pay significant license fees and/or royalties, and the rights granted to us might be non-exclusive, which could result in our competitors gaining access to the same technology. If we are unable to obtain a necessary license to a third-party patent on commercially reasonable terms, or at all, we may be unable to commercialize our products, or such commercialization efforts may be significantly delayed, which could in turn significantly harm our business.

Defense of infringement claims, regardless of their merit or outcome, would involve substantial litigation expense and would be a substantial diversion of management and other employee resources from our business, and may impact our reputation. In the event of a successful claim of infringement against us, we may be enjoined from further developing or commercializing the infringing products and/or have to pay substantial damages for use of the asserted intellectual property, including treble damages and attorneys' fees were we found to willfully infringe such intellectual property. We also might have to redesign our infringing products or technologies, which may be impossible or require substantial time and monetary expenditure.

Engaging in litigation to defend against third-party infringement claims is very expensive, particularly for a company of our size, and time-consuming. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments, and if securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on our common stock price. Such litigation or proceedings could substantially increase our operating losses and reduce the resources available for development activities or any future sales, marketing or distribution activities. We may not have sufficient financial or other resources to conduct such litigation or proceedings adequately. Some of our competitors may be able to sustain the costs of litigation or administrative proceedings more effectively than we can because of greater financial resources and more mature and developed intellectual property portfolios. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings against us could impair our ability to compete in the marketplace. The occurrence of any of the foregoing could have a material adverse effect on our business, financial condition or results of operations.

We may become involved in lawsuits to protect or enforce our patents and other intellectual property rights, which could be expensive, time-consuming and unsuccessful.

Competitors may infringe our patents, or we may be required to defend against claims of infringement. In addition, our patents also may become involved in inventorship, priority or validity disputes. To counter or defend against such claims can be expensive and time-consuming. In an infringement proceeding, a court may decide that a patent owned by us is invalid or unenforceable, or may refuse to stop the other party from using the technology at issue on the grounds that our patents do not cover such technology. An adverse result in any litigation proceeding could put one or more of our patents at risk of being invalidated or interpreted narrowly. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during litigation.

Even if resolved in our favor, litigation or other legal proceedings relating to intellectual property claims may cause us to incur significant expenses and could distract our management and other personnel from their normal responsibilities. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments, and if securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on our common stock price. Such litigation or proceedings could substantially increase our operating losses and reduce the resources available for development activities or any future sales, marketing or distribution activities. We may not have sufficient financial or other resources to conduct such litigation or proceedings adequately. Some of our competitors may be able to sustain the costs of such litigation or proceedings more effectively than we can because of their greater financial resources and more mature and developed intellectual property portfolios. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could have a material adverse effect on our ability to compete in the

marketplace. Any of the foregoing could have a material adverse effect on our business, financial condition or results of operations.

We may not be successful in obtaining necessary rights to any products we may develop through acquisitions and in-licenses.

Many medical device companies and academic institutions are competing with us and filing patent applications potentially relevant to our business. We may find it necessary or prudent to obtain licenses from such third-party intellectual property holders. In addition, with respect to any patents we may in the future co-own with third parties, we may require licenses to such co-owners' interest to such patents. However, we may be unable to secure such licenses or otherwise acquire or in-license any intellectual property rights from third parties that we identify as necessary for planned or future products. The licensing or acquisition of third-party intellectual property rights is a competitive area, and more established companies may pursue strategies to license or acquire third-party intellectual property rights that we may consider attractive or necessary. These established companies may have a competitive advantage over us due to their size, capital resources and greater clinical development and commercialization capabilities. In addition, companies that perceive us to be a competitor may be unwilling to assign or license rights to us. We also may be unable to license or acquire third-party intellectual property rights on terms that would allow us to make an appropriate return on our investment or at all. If we are unable to successfully obtain rights to required third-party intellectual property rights or maintain the existing intellectual property rights we have, we may have to abandon development of the relevant products, which could have a material adverse effect on our business, financial condition and results of operations.

We may be subject to claims that our employees, consultants or advisors have wrongfully used or disclosed alleged trade secrets of their current or former employers or claims asserting ownership of what we regard as our own intellectual property.

Our employees, consultants and scientific advisors may be currently or previously employed or engaged at universities or other medical device or healthcare companies, including our competitors and potential competitors. Although we try to ensure that our employees, consultants and advisors do not use the proprietary information or know-how of others in their work for us, we may in the future become subject to claims that we or these individuals have, inadvertently or otherwise, used or disclosed intellectual property, including trade secrets or other proprietary information, of their current or former employer. Litigation may be necessary to defend against these claims. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel, which could have a material adverse effect on our business, financial condition and results of operations. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management.

In addition, while it is our policy to require our employees and contractors who may be involved in the conception or development of intellectual property to execute agreements assigning such intellectual property to us, we may be unsuccessful in executing such an agreement with each party who, in fact, conceives or develops intellectual property that we regard as our own. The assignment of intellectual property rights may not be self-executing, or the assignment agreements may be breached, and we may be forced to bring claims against third parties, or defend claims that they may bring against us, to determine the ownership of what we regard as our intellectual property. Such claims could have a material adverse effect on our business, financial condition and results of operations.

If our trademarks and trade names are not adequately protected, then we may not be able to build name recognition in our markets of interest and our business may be adversely affected.

Our trademarks or trade names may be challenged, infringed, circumvented, declared generic or determined to be violating or infringing on other marks. We may not be able to protect our rights to these trademarks and trade names, which we need to build name recognition among potential partners and customers in our markets of

interest. At times, competitors or other third parties may adopt trade names or trademarks similar to ours, thereby impeding our ability to build brand identity and possibly leading to market confusion. In addition, there could be potential trade name or trademark infringement or dilution claims brought by owners of other trademarks. Over the long term, if we are unable to establish name recognition based on our trademarks and trade names, then we may not be able to compete effectively and our business may be adversely affected. Our efforts to enforce or protect our proprietary rights related to trademarks, trade secrets, domain names or other intellectual property may be ineffective, could result in substantial costs and diversion of resources and could adversely affect our business, financial condition and results of operations.

Our use of "open source" software could subject our proprietary software to general release, adversely affect our ability to sell our products and subject us to possible litigation.

A portion of the products or technologies licensed, developed and/or distributed by us incorporate so-called "open source" software and we may incorporate open source software into other products in the future. Such open source software is generally licensed by its authors or other third parties under open source licenses. Some open source licenses contain requirements that we disclose source code for modifications we make to the open source software and that we license such modifications to third parties at no cost. In some circumstances, distribution of our software in connection with open source software could require that we disclose and license some or all of our proprietary code in that software, as well as distribute our products that use particular open source software at no cost to the user. We monitor our use of open source software in an effort to avoid uses in a manner that would require us to disclose or grant licenses under our proprietary source code; however, there can be no assurance that such efforts will be successful. Open source license terms are often ambiguous and such use could inadvertently occur. There is little legal precedent governing the interpretation of many of the terms of these licenses, and the potential impact of these terms on our business may result in unanticipated obligations regarding our products and technologies. Companies that incorporate open source software into their products have, in the past, faced claims seeking enforcement of open source license provisions and claims asserting ownership of open source software incorporated into their product. If an author or other third party that distributes such open source software were to allege that we had not complied with the conditions of an open source license, we could incur significant legal costs defending ourselves against such allegations. In the event such claims were successful, we could be subject to significant damages or be enjoined from the distribution of our products. In addition, if we combine our proprietary software with open source software in certain ways, under some open source licenses, we could be required to release the source code of our proprietary software, which could substantially help our competitors develop products that are similar to or better than ours and otherwise adversely affect our business. These risks could be difficult to eliminate or manage, and, if not addressed, could harm our business, financial condition and results of operations.

Intellectual property rights do not necessarily address all potential threats.

The degree of future protection afforded by our intellectual property rights is uncertain because intellectual property rights have limitations and may not adequately protect our business or permit us to maintain our competitive advantage. For example:

- others may be able to make products that are similar to our products or utilize similar technology but that are not covered by the claims of our patents or that incorporate certain technology in our products that is in the public domain;
- we, or our future licensors or collaborators, might not have been the first to make the inventions covered by the applicable issued patent or pending patent application that we own now or may own or license in the future;
- we, or our future licensors or collaborators, might not have been the first to file patent applications covering certain of our or their inventions;
- others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our intellectual property rights;

- it is possible that our current or future pending patent applications will not lead to issued patents;
- issued patents that we hold rights to may be held invalid or unenforceable, including as a result of legal challenges by our competitors or other third parties;
- our competitors or other third parties might conduct research and development activities in countries where we do not have patent rights and then use the information learned from such activities to develop competitive products for sale in our major commercial markets;
- we may not develop additional proprietary technologies that are patentable;
- the patents of others may harm our business; and
- we may choose not to file a patent in order to maintain certain trade secrets or know-how, and a third party may subsequently file a patent covering such intellectual property.

Any of the foregoing could have a material adverse effect on our business, financial condition and results of operations.

Risks Related to Our Reliance on Third Parties

From time to time, we engage outside parties to perform services related to certain of our clinical studies and trials. If these third parties do not successfully carry out their contractual duties or meet expected deadlines, we may not be able to obtain regulatory approval for or commercialize our products.

From time to time, we engage consultants to help design, monitor and analyze the results of certain of our clinical studies and trials. The consultants we engage interact with clinical investigators to enroll patients in our clinical trials. We depend on these consultants and clinical investigators to conduct clinical studies and trials and monitor and analyze data from these studies and trials under the investigational plan and protocol for the study or trial and in compliance with applicable regulations and standards, such as GCP guidelines, the Common Rule, and FDA human subject protection regulations. We may face delays in our regulatory approval process if these parties do not perform their obligations in a timely, compliant or competent manner. If these third parties do not successfully carry out their duties or meet expected deadlines, or if the quality, completeness or accuracy of the data they obtain is compromised due to the failure to adhere to our clinical trial protocols or for other reasons, our clinical studies or trials may be extended, delayed or terminated or may otherwise prove to be unsuccessful, and we may have to conduct additional studies, which would significantly increase our costs, in order to obtain the regulatory clearances or approvals that we need to commercialize our products

We may need to depend on third parties to manufacture our products. If these manufacturers fail to meet our requirements and strict regulatory standards, we may be unable to develop, commercialize or market our products.

We may in the future need to depend upon third parties to manufacture our products. Reliance on a third-party manufacturer entails risks to which we would not be subject if we manufactured products ourselves, including:

- reliance on the third party for regulatory compliance and quality assurance;
- the possible breach of the manufacturing agreement by the third party because of factors beyond our control; and
- the possibility of termination or nonrenewal of the agreement by the third party because of our breach of the manufacturing agreement or based on its own business priorities.

Any of these factors could cause delay or suspension of clinical trials, regulatory submissions, required approvals, commercialization or marketing of our products or cause us to incur higher costs. Furthermore, if our

contract manufacturers fail to deliver the required commercial quantities of finished products on a timely basis and at commercially reasonable prices and we are unable to find one or more replacement manufacturers capable of production at a substantially equivalent cost, in substantially equivalent volumes and quality, and on a timely basis, we would likely be unable to meet demand for our products and we would lose potential revenue. Any difficulties in locating and hiring third-party manufacturers, or in the ability of third-party manufacturers to supply quantities of our products at the times and in the quantities we need, could have a material adverse effect on our business. It may take a significant amount of time to establish an alternative source of supply for our products and to have any such new source approved by the FDA.

We depend upon third-party suppliers, including single source suppliers, making us vulnerable to supply problems and price fluctuations.

We rely on third-party suppliers to provide us with certain components of our products. We rely on single source suppliers for certain components of our products. In some cases, we do not have long-term supply agreements with, or guaranteed commitments from, our suppliers, including single source suppliers. We depend on our suppliers to provide us and our customers with materials in a timely manner that meet our and their quality, quantity and cost requirements. These suppliers may encounter problems during manufacturing for a variety of reasons, any of which could delay or impede their ability to meet our demand. These suppliers may cease producing the components we purchase from them or otherwise decide to cease doing business with us.

Any supply interruption from our suppliers or failure to obtain additional suppliers for any of the components used in our products would limit our ability to manufacture our products and could have a material adverse effect on our business, financial condition and results of operations.

We and our component suppliers may not meet regulatory quality standards applicable to our manufacturing processes, which could have an adverse effect on our business, financial condition and results of operations.

As a medical device manufacturer, we must register with the FDA and non-U.S. regulatory agencies, and we are subject to periodic inspection by the FDA and foreign regulatory agencies, for compliance with certain good manufacturing practices, including design controls, product validation and verification, in process testing, quality control and documentation procedures. Compliance with applicable regulatory requirements is subject to continual review and is rigorously monitored through periodic inspections by the FDA and foreign regulatory agencies. Our component suppliers are also required to meet certain standards applicable to their manufacturing processes.

We cannot assure you that we or our component suppliers comply or can continue to comply with all regulatory requirements. The failure by us or one of our component suppliers to achieve or maintain compliance with these requirements or quality standards may disrupt our ability to supply products sufficient to meet demand until compliance is achieved or, with a component supplier, until a new supplier has been identified and evaluated. Our, or any of our component supplier's, failure to comply with applicable regulations could cause sanctions to be imposed on us, including warning letters, fines, injunctions, civil penalties, failure of regulatory authorities to grant marketing approval of our products, delays, suspension or withdrawal of approvals or clearances, license revocation, seizures or recalls of products, operating restrictions and criminal prosecutions, which could harm our business. We cannot assure you that if we need to engage new suppliers to satisfy our business requirements, we can locate new suppliers in compliance with regulatory requirements at a reasonable cost and in an acceptable timeframe. Our failure to do so could have a material adverse effect on our business, financial condition and results of operations.

In the EU, we must maintain certain International Organization for Standardization ("ISO") certifications to sell our products and must undergo periodic inspections by notified bodies, including the BSI, to obtain and maintain these certifications. If we fail these inspections or fail to meet these regulatory standards, it could have a material adverse effect on our business, financial condition and results of operations.

We may seek strategic alliances or enter into licensing arrangements in the future and may not be successful in doing so, and even if we are, we may not realize the benefits or costs of such relationships.

We may form or seek strategic alliances, create joint ventures or collaborations or enter into additional licensing arrangements with third parties that we believe will complement or augment our sales and marketing efforts with respect to our products and any planned or future products that we may develop. For example, in December 2018, we entered into a collaboration with Abiomed Inc., pursuant to which we will work with Abiomed to integrate our products into Abiomed's physician training and education programs. We may not be successful in our efforts to establish such collaborations for our products. Any of these relationships may require us to incur non-recurring and other charges, increase our near and long-term expenditures, issue securities that dilute our existing stockholders or disrupt our management and business. In addition, we face significant competition in seeking appropriate strategic partners and the negotiation process is time-consuming and complex. Moreover, we may not be successful in our efforts to establish a strategic partnership or other alternative arrangements for our products. If we license products or businesses, we may not be able to realize the benefit of such transactions if we are unable to successfully integrate them with our existing operations and company culture. We cannot be certain that, following a strategic transaction or license, we will achieve the revenue or specific net income that justifies such transaction. Any delays in entering into new strategic partnership agreements related to our products could delay the commercialization of our products in certain geographies for certain indications, which would harm our business prospects, financial condition and results of operations.

In addition, any potential future collaborations may be terminable by our strategic partners, and we may not be able to adequately protect our rights under these agreements. Furthermore, strategic partners may negotiate for certain rights to control decisions regarding the development and commercialization of our products, if approved, and may not conduct those activities in the same manner as we do. Any termination of collaborations we enter into in the future, or any delay in entering into collaborations related to our products, could delay the development and commercialization of our products and reduce their competitiveness if they reach the market, which could have a material adverse effect on our business, financial condition and results of operations.

Risks Related to This Offering and Ownership of Our Common Stock

An active, liquid and orderly market for our common stock may not develop, and you may not be able to resell your common stock at or above the public offering price. The market price of our common stock may be highly volatile, and you may not be able to resell your shares at or above the initial public offering price.

Prior to this offering, there has not been a public market for our common stock. We cannot assure you that an active trading market for our common stock will develop following this offering. You may not be able to sell your shares quickly or at the market price if trading in our common stock is not active. The initial public offering price for the shares will be determined by negotiations between us and representatives of the underwriters and may not be indicative of prices that will prevail in the trading market.

The trading price of our common stock is likely to be highly volatile and could be subject to wide fluctuations in price in response to various factors, many of which are beyond our control, including:

- our failure to increase the sales of our products;
- the failure by our customers to obtain coverage and adequate reimbursements or reimbursement levels that would be sufficient to support product sales to our customers;
- unanticipated serious safety concerns related to the use of our products;
- introduction of new products or services offered by us or our competitors;
- announcements of significant acquisitions, strategic partnerships, joint ventures or capital commitments by us or our competitors;
- announcements of technological or medical innovations for the treatment of vascular disease;

- our ability to effectively manage our growth;
- the size and growth of our target markets;
- actual or anticipated quarterly variations in our or our competitors' results of operations;
- failure to meet estimates or recommendations by securities analysts who cover our stock;
- failure to meet our own financial estimates;
- accusations that we have violated a law or regulation;
- recalls of our products;
- disputes or other developments relating to proprietary rights, including patents, litigation matters and our ability to obtain, maintain, protect and enforce patent protection and other intellectual property rights for our technologies and products;
- significant litigation, including stockholder litigation or litigation related to intellectual property;
- our cash position;
- any delay in any regulatory filings for our planned or future products and any adverse development or perceived adverse development with respect to the applicable regulatory authority's review of such products;
- adverse regulatory decisions, including failure to receive regulatory approval or clearance of our planned and future products or maintain regulatory approval or clearance for our existing products;
- changes in laws or regulations applicable to our products;
- adverse developments concerning our suppliers or distributors;
- our inability to obtain adequate supplies and components for our products or inability to do so at acceptable prices;
- our inability to establish and maintain collaborations if needed;
- changes in the market valuations of similar companies;
- overall performance of the equity markets;
- sales of large blocks of our common stock, including sales by our executive officers, directors and significant stockholders;
- trading volume of our common stock;
- additions or departures of key scientific or management personnel;
- changes in accounting principles;
- ineffectiveness of our internal controls;
- actual or anticipated changes in healthcare policy and reimbursement levels;
- general market conditions and other factors, including factors unrelated to our operating performance or the operating performance of our competitors; and
- other events or factors, many of which are beyond our control.

In addition, the stock market in general and the market for medical device companies in particular have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of those companies. These broad market and industry factors may seriously harm the market price of our common stock, regardless of our operating performance. In the past, following periods of

volatility in the market, securities class action litigation has often been instituted against companies. Such litigation, if instituted against us, could result in substantial costs and diversion of management's attention and resources, which could materially adversely affect our business, financial condition and results of operations.

We do not intend to pay dividends on our common stock, so any returns will be limited to increases, if any, in our stock's value. Your ability to achieve a return on your investment will depend on appreciation, if any, in the price of our common stock.

We currently anticipate that we will retain future earnings for the development, operation and expansion of our business and do not anticipate declaring or paying any cash dividends for the foreseeable future. Any future determination to declare dividends will be made at the discretion of our board of directors and will depend on, among other factors, our financial condition, operating results, capital requirements, general business conditions and other factors that our board of directors may deem relevant. Any return to stockholders will therefore be limited to the appreciation in the value of their stock, if any.

Our ability to utilize our net operating loss carryforwards and certain other tax attributes may be limited.

As of December 31, 2018, we had net operating loss ("NOL") carryforwards of approximately $ for federal income tax purposes, and $ for state income tax purposes. These federal (generated prior to 2018) and state NOL carryforwards begin expiring in 2030. Utilization of these NOLs depends on many factors, including our future income, which cannot be assured. Some of these NOLs could expire unused and be unavailable to offset our future income tax liabilities. In addition, under Section 382 of the Internal Revenue Code of 1986, as amended (the "Code"), and corresponding provisions of state law, if a corporation undergoes an "ownership change," which is generally defined as a greater than 50% change, by value, in its equity ownership by 5% stockholders over a three-year period, the corporation's ability to use its pre-change NOLs and other pre-change tax attributes to offset its post-change income may be limited. We have not determined if we have experienced Section 382 ownership changes in the past and if a portion of our NOLs is subject to an annual limitation under Section 382. In addition, we may experience ownership changes in the future as a result of subsequent changes in our stock ownership, including this offering, some of which may be outside of our control. If we determine that an ownership change has occurred and our ability to use our historical NOLs is materially limited, it could harm our future operating results by effectively increasing our future tax obligations. In addition, under the TCJA, federal NOLs incurred in 2018 and in future years may be carried forward indefinitely but generally may not be carried back and the deductibility of such NOLs is limited to 80% of taxable income.

Changes in tax laws or regulations that are applied adversely to us or our customers may have a material adverse effect on our business, cash flow, financial condition or results of operations.

The TCJA enacted many significant changes to the U.S. tax laws, the consequences of which have not yet been fully determined. Changes in corporate tax rates, the realization of net deferred tax assets relating to our U.S. operations, the taxation of foreign earnings and the deductibility of expenses contained in the TCJA or other tax reform legislation could have a material impact on the value of our deferred tax assets, could result in significant one-time charges in the current or future taxable years and could increase our future U.S. tax expense. The foregoing items, as well as any future changes in tax laws, could have a material adverse effect on our business, cash flow, financial condition or results of operations. In addition, it is uncertain if and to what extent various states will conform to the newly enacted federal tax legislation.

After this offering, our principal stockholders and management will own a significant percentage of our stock and will be able to exercise significant influence over matters subject to stockholder approval.

As of September 30, 2018, our executive officers, directors and 5% stockholders beneficially owned approximately 60% of the outstanding shares of capital stock, and, upon the closing of this offering, that same group will hold approximately % of our outstanding shares of common stock (assuming no exercise of the

underwriters' over-allotment option). In addition, as of September 30, 2018, our officers and directors held options to purchase an aggregate of 19,930,989 shares of our common stock at a weighted-average exercise price of $0.28 per share; and (ii) 501,613 warrants to purchase shares of our common stock, which would give our officers and directors ownership of approximately % of our outstanding common stock following this offering if such awards are fully vested and are exercised in full (assuming no exercise of the underwriters' over-allotment option). Therefore, even after this offering, these stockholders will have the ability to influence us through this ownership position.

A significant portion of our outstanding shares of common stock is restricted from immediate resale but may be sold into the market in the near future. This could cause the market price of our common stock to drop significantly, even if our business is doing well.

Sales of a substantial number of shares of our common stock in the public market could occur at any time, subject to the 180-day lock-up periods under the lock-up agreements and market standoff provisions described in the sections of this prospectus titled "Shares Eligible for Future Sale" and "Underwriting." These sales, or the perception in the market that the holders of a large number of shares of common stock intend to sell shares, could reduce the market price of our common stock. As of September 30, 2018, our directors, executive officers and holders of 5% or more of our outstanding stock beneficially owned approximately 60% of our outstanding stock in the aggregate. If one or more of them were to sell a substantial portion of the shares they hold, it could cause our stock price to decline. Furthermore, the lock-up agreements mentioned above may be waived by the underwriters at any time which could lead to these shares being sold in the market prior to the expiration of this 180-day lock-up period.

In addition, as of December 31, 2018, there were shares of our common stock subject to outstanding options that will become eligible for sale in the public market upon exercise of such options to the extent permitted by any applicable vesting requirements, the lock-up agreements, market standoff provisions and Rules 144 and 701 under the Securities Act of 1933, as amended (the "Securities Act"). Moreover, after this offering, holders of an aggregate of shares of our common stock will have rights, subject to some conditions, to require us to file registration statements covering their shares or to include their shares in registration statements that we may file for ourselves or other stockholders.

We also intend to register all shares of our common stock that will be initially reserved for issuance under our 2019 Equity Incentive Plan. Once we register these shares, they can be freely sold in the public market upon issuance and once vested and exercised, as applicable, subject to the 180-day lock-up periods under the lock-up agreements described in the section of this prospectus titled "Underwriting."

Sales of our common stock as restrictions end or pursuant to registration rights may make it more difficult for us to sell equity securities in the future at a time and at a price that we deem appropriate. These sales also could cause the price of our common stock to fall and make it more difficult for you to sell shares of our common stock.

We are an emerging growth company, and we cannot be certain if the reduced reporting requirements applicable to emerging growth companies will make our common stock less attractive to investors.

We are an emerging growth company, as defined in the Jumpstart Our Business Startups Act of 2012 (the "JOBS Act"). For as long as we continue to be an emerging growth company, we may take advantage of exemptions from various reporting requirements that are applicable to other public companies that are not emerging growth companies, including not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act, reduced disclosure obligations regarding executive compensation in this prospectus and our periodic reports and proxy statements and exemptions from the requirements of holding nonbinding advisory votes on executive compensation and stockholder approval of any golden parachute payments not previously approved. We could be an emerging growth company for up to five years following the

year in which we complete this offering, although circumstances could cause us to lose that status earlier. We will remain an emerging growth company until the earlier of (i) the last day of the fiscal year (a) following the fifth anniversary of the completion of this offering, (b) in which we have total annual gross revenue of at least $1.07 billion or (c) in which we are deemed to be a large accelerated filer, which requires the market value of our common stock that is held by non-affiliates to exceed $700.0 million as of the prior June 30th, and (ii) the date on which we have issued more than $1.0 billion in non-convertible debt during the prior three-year period.

We will incur significant increased costs as a result of operating as a public company, and our management will be required to devote substantial time to new compliance initiatives.

As a public company, we will incur significant legal, accounting and other expenses that we did not incur as a private company. We will be subject to the reporting requirements of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), which will require, among other things, that we file with the SEC, annual, quarterly and current reports with respect to our business and financial condition. In addition, the Sarbanes-Oxley Act of 2002, as amended (the "Sarbanes-Oxley Act"), as well as rules subsequently adopted by the SEC and the to implement provisions of the Sarbanes-Oxley Act, impose significant requirements on public companies, including requiring that we evaluate and determine the effectiveness of our internal control over financial reporting, beginning with our annual report for the year ending December 31, 2020, which must be attested to by our independent registered public accounting firm to the extent we are no longer an "emerging growth company," as defined by the JOBS Act, or a smaller reporting company under the Securities Act. Further, in July 2010, the Dodd-Frank Wall Street Reform and Consumer Protection Act (the "Dodd-Frank Act"), was enacted. There are significant corporate governance and executive compensation related provisions in the Dodd-Frank Act that require the SEC to adopt additional rules and regulations in these areas such as "say on pay" and proxy access. Emerging growth companies are permitted to implement many of these requirements over a longer period and up to five years from the pricing of this offering. We intend to take advantage of this legislation but cannot guarantee that we will not be required to implement these requirements sooner than anticipated or planned and thereby incur unexpected expenses. Stockholder activism, the current political environment and the current high level of government intervention and regulatory reform may lead to substantial new regulations and disclosure obligations, which may lead to additional compliance costs and impact the manner in which we operate our business in ways we cannot currently anticipate.

We expect the rules and regulations applicable to public companies to substantially increase our legal and financial compliance costs and to make some activities more time-consuming and costly. If these requirements divert the attention of our management and personnel from other business concerns, they could have a material adverse effect on our business, financial condition and results of operations. The increased costs will decrease our net income or increase our net loss, and may require us to reduce costs in other areas of our business or increase the prices of our products or services. For example, we expect these rules and regulations to make it more difficult and more expensive for us to obtain director and officer liability insurance, and we may be required to incur substantial costs to maintain the same or similar coverage. We cannot predict or estimate the amount or timing of additional costs we may incur to respond to these requirements. The impact of these requirements could also make it more difficult for us to attract and retain qualified persons to serve on our board of directors, our board committees or as executive officers.

If we have material weaknesses in our internal control over financial reporting, we may not detect errors on a timely basis and our financial statements may be materially misstated. We are in the process of designing and implementing our internal control over financial reporting in which the process will be time-consuming, costly and complicated. Until such time as we are no longer an "emerging growth company," our auditors will not be required to attest as to our internal control over financial reporting. If we identify material weaknesses in our internal control over financial reporting, if we are unable to comply with the requirements of Section 404 of the Sarbanes-Oxley Act in a timely manner, if we are unable to assert that our internal control over financial reporting is effective or, once required, if our independent registered public accounting firm is unable to attest that our internal control over financial reporting is effective, investors may lose confidence in the accuracy and

completeness of our financial reports and the market price of our common stock could decrease. We could also become subject to stockholder or other third-party litigation, as well as investigations by the stock exchange on which our securities are listed, the SEC or other regulatory authorities, which could require additional financial and management resources and could result in fines, trading suspensions or other remedies.

If you purchase our common stock in this offering, you will incur immediate and substantial dilution in the book value of your shares. You will likely experience further dilution if we issue shares in future financing transactions or upon exercise of options or warrants.

The initial public offering price is substantially higher than the net tangible book value per share of our common stock. Investors purchasing common stock in this offering will pay a price per share that substantially exceeds the book value of our tangible assets after subtracting our liabilities. As a result, investors purchasing common stock in this offering will incur immediate dilution of $ per share, based on an assumed initial public offering price of $ per share (which is the midpoint of the estimated price range set forth on the cover page of this prospectus). Further, investors purchasing common stock in this offering will contribute approximately % of the total amount invested by stockholders since our inception, but will own only approximately % of the shares of common stock outstanding after giving effect to this offering.

This dilution is due to our investors who purchased shares prior to this offering having paid substantially less when they purchased their shares than the price offered to the public in this offering. To the extent outstanding options or warrants are exercised, there will be further dilution to new investors. As a result of the dilution to investors purchasing shares in this offering, investors may receive significantly less than the purchase price paid in this offering, if anything, in the event of our liquidation. For a further description of the dilution that you will experience immediately after this offering, see section titled “Dilution.”

If we raise additional funds by issuing additional common stock, or securities convertible into or exchangeable or exercisable for common stock, our stockholders will experience additional dilution, and new investors could have rights superior to existing stockholders.

Pursuant to our 2009 Equity Incentive Plan, our management is authorized to grant stock options to our employees, directors and consultants. In addition, we also have warrants outstanding to purchase shares of our common stock. You will incur dilution upon exercise of any outstanding stock options or warrants.

We have broad discretion to use the net proceeds from this offering and our investment of these proceeds may not yield a favorable return.

Our management will have broad discretion in the application of the net proceeds from this offering, including for any of the purposes described in the section titled “Use of Proceeds,” and you will not have the opportunity as part of your investment decision to assess whether the net proceeds are being used appropriately. Because of the number and variability of factors that will determine our use of the net proceeds from this offering, their ultimate use may vary substantially from their currently intended use. Our management might not apply our net proceeds in ways that ultimately increase the value of your investment. We expect to use the net proceeds from this offering to expand our direct sales force and marketing of our products, to support clinical studies for new products and product enhancements, including expanded indications, and to support other research and development activities, working capital and general corporate purposes. We may also use a portion of the net proceeds of this offering for acquisitions or strategic transactions. We have not entered into any agreements or commitments with respect to any specific transactions and have no understandings or agreements with respect to any such transactions at this time. The failure by our management to apply these funds effectively could harm our business. Pending their use, we may invest the net proceeds from this offering in short-term, investment-grade or interest-bearing securities. These investments may not yield a favorable return to our stockholders. If we do not invest or apply the net proceeds from this offering in ways that enhance stockholder value, we may fail to achieve expected financial results, which could cause our stock price to decline.

We are at risk of securities class action litigation.

In the past, securities class action litigation has often been brought against a company following a decline in the market price of its securities. This risk is especially relevant for us because medical device companies have experienced significant stock price volatility in recent years. If we face such litigation, it could result in substantial costs and a diversion of management's attention and resources, which could harm our business.

If securities or industry analysts do not publish research or publish inaccurate or unfavorable research about our business, our stock price and trading volume could decline.

The trading market for our common stock will depend in part on the research and reports that securities or industry analysts publish about us or our business. Securities and industry analysts do not currently, and may never, publish research on our company. If no securities or industry analysts commence coverage of our company, the trading price for our stock would likely be negatively impacted. In the event securities or industry analysts initiate coverage, if one or more of the analysts who covers us downgrades our stock or publishes inaccurate or unfavorable research about our business, our stock price may decline. If one or more of these analysts ceases coverage of our company or fails to publish reports on us regularly, demand for our stock could decrease, which might cause our stock price and trading volume to decline.

Our amended and restated certificate of incorporation, our amended and restated bylaws and Delaware law contain provisions that could discourage another company from acquiring us and may prevent attempts by our stockholders to replace or remove our current management.

Provisions of Delaware law (where we are incorporated), our amended and restated certificate of incorporation and amended and restated bylaws may discourage, delay or prevent a merger or acquisition that stockholders may consider favorable, including transactions in which you might otherwise receive a premium for your shares. In addition, these provisions may frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace or remove our board of directors. These provisions include:

- authorizing the issuance of "blank check" preferred stock without any need for action by stockholders;
- requiring supermajority stockholder voting to effect certain amendments to our amended and restated certificate of incorporation and amended and restated bylaws;
- eliminating the ability of stockholders to call and bring business before special meetings of stockholders;
- prohibiting stockholder action by written consent;
- establishing advance notice requirements for nominations for election to the board of directors or for proposing matters that can be acted on by stockholders at stockholder meetings;
- dividing our board of directors into three classes so that only one third of our directors will be up for election in any given year; and
- providing that our directors may be removed by our stockholders only for cause.

In addition, we are subject to Section 203 of the Delaware General Corporation Law, which may have an anti-takeover effect with respect to transactions not approved in advance by our board of directors, including discouraging takeover attempts that could have resulted in a premium over the market price for shares of our common stock.

These provisions apply even if a takeover offer may be considered beneficial by some stockholders and could delay or prevent an acquisition that our board of directors determines is not in our and our stockholders' best interests and could also affect the price that some investors are willing to pay for our common stock. See the section titled "Description of Capital Stock."

Our amended and restated certificate of incorporation will provide that the Court of Chancery of the State of Delaware will be the exclusive forum for substantially all disputes between us and our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers or employees.

Our amended and restated certificate of incorporation provides that the Court of Chancery of the State of Delaware is the exclusive forum for: any derivative action or proceeding brought on our behalf; any action asserting a breach of fiduciary duty; any action asserting a claim against us arising pursuant to the Delaware General Corporation Law, our amended and restated certificate of incorporation or our amended and restated bylaws; or any action asserting a claim against us that is governed by the internal affairs doctrine. The choice of forum provision may limit a stockholder's ability to bring a claim in a judicial forum that it finds favorable for disputes with us or our directors, officers or other employees, which may discourage such lawsuits against us and our directors, officers and other employees. If a court were to find the choice of forum provision contained in our amended and restated certificate of incorporation to be inapplicable or unenforceable in an action, we may incur additional costs associated with resolving such action in other jurisdictions, which could harm our business and financial condition. This exclusive forum provision will not apply to suits brought to enforce a duty or liability created by the Exchange Act or any other claim for which the federal courts have exclusive jurisdiction.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

We have made statements under the captions "Prospectus Summary," "Risk Factors," "Management's Discussion and Analysis of Financial Condition and Results of Operations," "Business" and in other sections of this prospectus that are forward-looking statements. In some cases, you can identify these statements by forward-looking words such as "may," "might," "will," "should," "expects," "plans," "anticipates," "believes," "estimates," "predicts," "potential" or "continue," the negative of these terms and other comparable terminology. These forward-looking statements, which are subject to risks, uncertainties and assumptions about us, may include projections of our future financial performance, our anticipated growth strategies and anticipated trends in our business. Forward-looking statements contained in this prospectus include, but are not limited to statements about:

- our ability to design, develop, manufacture and market innovative products to treat patients with challenging medical conditions, particularly in PAD, CAD and AS;
- our expected future growth, including growth in international sales;
- the size and growth potential of the markets for our products, and our ability to serve those markets;
- the rate and degree of market acceptance of our products;
- coverage and reimbursement for procedures performed using our products;
- the performance of third parties in connection with the development of our products, including third-party suppliers;
- regulatory developments in the United States and foreign countries;
- our ability to obtain and maintain regulatory approval or clearance of our products on expected timelines;
- our plans to research, develop and commercialize our products and any other approved or cleared product;
- our ability to scale our organizational culture of cooperative product development and commercial execution;
- the development, regulatory approval, efficacy and commercialization of competing products;
- the loss of key scientific or management personnel;
- our expectations regarding the period during which we qualify as an emerging growth company under the JOBS Act;
- our ability to develop and maintain our corporate infrastructure, including our internal controls;
- our use of the proceeds from this offering;
- our financial performance and capital requirements; and
- our expectations regarding our ability to obtain and maintain intellectual property protection for our products, as well as our ability to operate our business without infringing the intellectual property rights of others.

These statements are only predictions based on our current expectations and projections about future events. There are important factors that could cause our actual results, level of activity, performance or achievements to differ materially from the results, level of activity, performance or achievements expressed or implied by the forward-looking statements, including those factors discussed in the section titled "Risk Factors." You should specifically consider the numerous risks outlined under "Risk Factors."

Although we believe the expectations reflected in the forward-looking statements are reasonable, we cannot guarantee future results, level of activity, performance or achievements. We undertake no obligation to update any of these forward-looking statements after the date of this prospectus to conform our prior statements to actual results or revised expectations.

MARKET, INDUSTRY AND OTHER DATA

Unless otherwise indicated, information contained in this prospectus concerning our industry and the market in which we operate, including our general expectations and market position, market opportunity and market size, is based on information from various third-party industry and research sources, on assumptions that we have made based on that data and other similar sources, and on our knowledge of the markets for our current and planned or future products. This information involves a number of assumptions and limitations, and you are cautioned not to give undue weight to such estimates.

In addition, industry publications, studies and surveys generally state that they have been obtained from sources believed to be reliable, although we do not guarantee the accuracy or completeness of such information. The industry in which we operate is subject to a high degree of uncertainty and risk due to a variety of factors, including those described in the section titled “Risk Factors” and elsewhere in this prospectus. These and other factors could cause our actual results to differ materially from those expressed in the estimates made by the independent parties and by us.

USE OF PROCEEDS

We estimate that the net proceeds to us from this offering will be approximately $ million, or approximately $ million if the underwriters exercise their over-allotment option in full, assuming an initial public offering price of $ per share (which is the midpoint of the estimated price range set forth on the cover page of this prospectus), after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

Each $1.00 increase (decrease) in the assumed initial public offering price of $ per share would increase (decrease) our net proceeds from this offering by $ million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same, and after deducting the estimated underwriting discounts and commissions payable by us. Similarly, each increase (decrease) of 1,000,000 shares in the number of shares offered by us would increase (decrease) our net proceeds from this offering by $ million, assuming an initial public offering price of $ per share, and after deducting the estimated underwriting discounts and commissions payable by us.

We expect to use the net proceeds from this offering for the expansion of our direct sales force and marketing of our products, to support clinical studies for new products and product enhancements, including for expanded indications, and to support other research and development activities, working capital and general corporate purposes. We may also use a portion of the net proceeds of this offering for acquisitions or strategic transactions, though we have not entered into any agreements or commitments with respect to any specific transactions and have no understandings or agreements with respect to any such transactions at this time.

We cannot specify with certainty the particular uses of the net proceeds that we will receive from this offering. Accordingly, we will have broad discretion in using these proceeds. Pending the use of proceeds from this offering as described above, we plan to invest the net proceeds that we receive in this offering in short-term and long-term interest-bearing obligations, including government and investment-grade debt securities and money market funds.

DIVIDEND POLICY

We have never paid any dividends on our common shares or any of our other securities. We currently anticipate that we will retain all available funds for use in the operation and expansion of our business, and do not anticipate paying any cash dividends in the foreseeable future. Any future determination to pay cash dividends will be at the discretion of our board of directors and will be dependent upon our financial condition, results of operations, capital requirements, restrictions under any future indebtedness and other factors the board of directors deems relevant. In addition, the terms of our 2018 Loan and Security Agreement with Silicon Valley Bank restrict our ability to pay dividends to limited circumstances.

CAPITALIZATION

The following table sets forth our cash, cash equivalents and short-term investments and capitalization as of December 31, 2018:

- on an actual basis;
- on a pro forma basis, giving effect to: (i) the automatic conversion of all outstanding shares of our convertible preferred stock as of December 31, 2018 into an aggregate of shares of our common stock immediately prior to the completion of this offering, as if such conversion had occurred on December 31, 2018; (ii) the issuance of shares of our common stock, based upon an assumed initial public offering price of $ per share (which is the midpoint of the estimated price range set forth on the cover page of this prospectus), upon the net exercise of warrants outstanding as of December 31, 2018 for the purchase of 1,729,699 shares of our common stock that would otherwise expire upon completion of this offering; (iii) the reclassification of the convertible preferred stock warrant liability to additional paid-in capital, a component of total stockholders' (deficit) equity, due to our convertible preferred stock warrant converting to a warrant to purchase our common stock immediately prior to the completion of this offering; and (iv) the filing and effectiveness of our amended and restated certificate of incorporation, which will be in effect immediately prior to the completion of this offering; and
- on a pro forma as adjusted basis to give further effect to the sale by us of shares of our common stock in this offering, at an assumed initial public offering price of $ per share (which is the midpoint of the estimated price range set forth on the cover page of this prospectus).

This table should be read in conjunction with the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations" and the consolidated financial statements and the related notes appearing elsewhere in this prospectus.

	December 31, 2018 (in thousands, except share and per share data)		
	Actual	Pro Forma	Pro Forma as adjusted
Cash, cash equivalents and short-term investments	$	$	$
Long-term debt	$	$	$
Convertible preferred stock warrant liability			
Convertible preferred stock, $0.001 par value per share; shares authorized, shares issued and outstanding, actual; no shares authorized, issued or outstanding, pro forma and pro forma as adjusted			
Stockholders' (deficit) equity:			
Preferred stock, $0.001 par value per share; no shares authorized, issued or outstanding, actual; shares authorized, no shares issued and outstanding, pro forma and pro forma as adjusted			
Common stock, $0.001 par value per share, shares authorized, shares issued and outstanding, actual, shares authorized, issued and outstanding, pro forma; shares authorized, shares issued and outstanding, pro forma as adjusted			
Additional paid-in capital			
Total stockholders' (deficit) equity	$	$	$
Total capitalization	$	$	$

Each $1.00 increase (decrease) in the initial public offering price per share would increase (decrease) our cash and cash equivalents, additional paid-in capital, a component of total stockholders' (deficit) equity, and total capitalization by $ million (assuming no exercise of the underwriters' over-allotment option). Similarly, each increase (decrease) of 1,000,000 shares in the number of shares offered by us would increase (decrease) our cash and cash equivalents, additional paid-in capital, a component of total stockholders' (deficit) equity, and total capitalization by $ million (assuming no exercise of the underwriters' over-allotment option).

If the underwriters' over-allotment option were exercised in full, pro forma as adjusted cash, cash equivalents and short-term investments, additional paid-in capital, a component of total stockholders' (deficit) equity, and shares outstanding as of December 31, 2018, would be $ million, $ million, $ million and , respectively.

The pro forma and pro forma as adjusted columns in the table above are based on shares of our common stock (including our convertible preferred stock on an as-converted basis) outstanding as of December 31, 2018, which excludes the following:

- shares of our common stock issuable upon the exercise of options outstanding as of December 31, 2018, with a weighted-average exercise price of $ per share;
- shares of our common stock issuable upon the exercise of options granted after December 31, 2018, with a weighted-average exercise price of $ per share;
- 669,817 shares of our Series A-1 convertible preferred stock issuable upon the exercise of our Series A-1 convertible preferred stock warrant outstanding as of December 31, 2018, with an exercise price of $0.2538 per share;
- 2,149,873 shares of our common stock issuable upon the exercise of our common stock warrants outstanding as of December 31, 2018, with a weighted-average exercise price of $0.21 per share;
- shares of our common stock reserved for future grant or issuance under our 2009 Equity Incentive Plan as of December 31, 2018; and
- shares of our common stock reserved for future issuance under our 2019 Equity Incentive Plan, which will become effective immediately prior to the completion of this offering, as well as any automatic increases in the number of shares of our common stock reserved for future issuance pursuant to this plan.

DILUTION

If you invest in our common stock you will experience immediate and substantial dilution in the pro forma net tangible book value of your shares of common stock. Dilution in pro forma net tangible book value represents the difference between the public offering price per share of our common stock and the pro forma as adjusted net tangible book value per share of our common stock.

As of December 31, 2018, we had a historical net tangible book value of $ million, or $ per share of common stock, based on shares of our common stock outstanding. Our historical net tangible book value per share represents the amount of our tangible assets, less liabilities and convertible preferred stock, divided by the total number of shares of our common stock outstanding at December 31, 2018.

Our pro forma net tangible book value as of December 31, 2018, was $ million, or $ per share of common stock. Pro forma net tangible book value per share represents tangible assets, less liabilities and convertible preferred stock, divided by the aggregate number of shares of common stock outstanding, after giving effect to: (i) the automatic conversion of all outstanding shares of our convertible preferred stock as of December 31, 2018 into an aggregate of shares of our common stock immediately prior to the completion of this offering, (ii) the issuance of shares of our common stock, based upon an assumed initial public offering price of $ per share (which is the midpoint of the estimated price range set forth on the cover page of this prospectus), upon the net exercise of warrants outstanding as of December 31, 2018 for the purchase of 1,729,699 shares of our common stock that would otherwise expire upon completion of this offering; (iii) the reclassification of the convertible preferred stock warrant liability to additional paid-in capital, a component of total stockholders' (deficit) equity, due to our convertible preferred stock warrant converting to a warrant to purchase our common stock immediately prior to the completion of this offering; and (iv) the filing and effectiveness of our amended and restated certificate of incorporation, which will be in effect immediately prior to completion of this offering.

After giving further effect to the sale and issuance by us of the shares of our common stock in this offering at the assumed initial public offering price of $ per share (which is the midpoint of the estimated price range set forth on the cover page of this prospectus) and the receipt and application of the net proceeds, our pro forma as adjusted net tangible book value as of December 31, 2018 would be $ million, or $ per share. This represents an immediate increase in pro forma net tangible book value to our existing stockholders of $ per share and an immediate dilution to new investors of $ per share. Dilution per share to new investors represents the difference between the price per share to be paid by new investors for the shares of common stock sold in this offering and the pro forma as adjusted net tangible book value per share immediately after this offering. The following table illustrates this per share dilution:

Assumed initial public offering price per share		$
Historical net tangible book value per share as of December 31, 2018	$	
Pro forma increase in historical net tangible book value per share as of December 31, 2018		
Pro forma net tangible book value per share as of December 31, 2018		
Increase in pro forma net tangible book value per share attributable to new investors participating in this offering		
Pro forma as adjusted net tangible book value per share		
Dilution per share to new investors participating in this offering		$

Each $1.00 increase (decrease) in the assumed initial public offering price of $ per share (which is the midpoint of the estimated price range set forth on the cover page of this prospectus) would increase (decrease) pro forma as adjusted net tangible book value per share to new investors by $, and would increase

(decrease) dilution per share to new investors in this offering by $, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. Similarly, each increase or decrease of 1,000,000 shares in the number of shares offered by us would increase (decrease) our pro forma as adjusted net tangible book value by approximately $ per share and increase (decrease) the dilution to new investors by $ per share, assuming the assumed initial public offering price remains the same, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

If the underwriters' over-allotment option is exercised in full, the pro forma as adjusted net tangible book value per share of our common stock would be $ per share, and the dilution in pro forma net tangible book value per share to new investors in this offering would be $ per share.

The following table sets forth, on a pro forma as adjusted basis, as of December 31, 2018, the number of shares of common stock purchased from us, the total consideration paid, or to be paid, and the average price per share paid, or to be paid, by existing stockholders and by the new investors, at an assumed initial public offering price of $ per share, the midpoint of the estimated initial public offering range set forth on the cover page of this prospectus, before deducting the estimated underwriting discounts and commissions and offering expenses payable by us:

	Shares Purchased		Total Consideration		Average Price Per Share
	Number	Percent	Amount	Percent	
Existing stockholders		%	$	%	$
New investors					$
Total		100%	$	100%	

Each $1.00 increase (decrease) in the assumed initial public offering price of $ per share (which is the midpoint of the estimated initial public offering price range set forth on the cover page of this prospectus), would increase (decrease) the total consideration paid by new investors and total consideration paid by all stockholders by approximately $ million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

The above table assumes no exercise of the underwriters' over-allotment option. If the underwriters' over-allotment option were exercised in full, our existing stockholders would own % and our new investors would own % of the total number of shares of our common stock outstanding upon completion of this offering.

The foregoing tables and calculations are based on shares of our common stock (including our convertible preferred stock on an as-converted basis) outstanding as of December 31, 2018, which excludes:

- shares of our common stock issuable upon the exercise of options outstanding as of December 31, 2018, with a weighted-average exercise price of $ per share;
- shares of our common stock issuable upon the exercise of options granted after December 31, 2018, with a weighted-average exercise price of $ per share;
- 669,817 shares of our Series A-1 convertible preferred stock issuable upon the exercise of our Series A-1 convertible preferred stock warrant outstanding as of December 31, 2018, with an exercise price of $0.2538 per share;
- 2,149,873 shares of our common stock issuable upon the exercise of our common stock warrants outstanding as of December 31, 2018, with a weighted-average exercise price of $0.21 per share;
- shares of our common stock reserved for future grant or issuance under our 2009 Equity Incentive Plan as of December 31, 2018; and

- shares of our common stock reserved for future issuance under our 2019 Equity Incentive Plan, which will become effective immediately prior to the completion of this offering, as well as any automatic increases in the number of shares of our common stock reserved for future issuance pursuant to this plan.

To the extent that any outstanding options or warrants are exercised, new investors will experience further dilution.

SELECTED CONSOLIDATED FINANCIAL DATA

The following tables summarize our consolidated financial data. We have derived the summary consolidated statement of operations data for the years ended December 31, 2017 and 2018 from our audited consolidated financial statements included elsewhere in this prospectus. We have derived our balance sheet data as of December 31, 2018 from our audited consolidated financial statements included elsewhere in this prospectus. Our historical results are not necessarily indicative of the results that may be expected in the future. The following summary consolidated financial data should be read in conjunction with the section titled "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our consolidated financial statements and related notes included elsewhere in this prospectus.

	Years Ended December 31,	
	2017	2018
	(in thousands, except share and per share data)	
Consolidated Statement of Operations Data:		
Product revenue	$ 1,719	$
Operating expenses:		
Cost of product revenue	2,836	
Research and development	17,963	
Sales and marketing	6,363	
General and administrative	5,422	
Total operating expenses	32,584	
Loss from operations	(30,865)	
Interest and other income, net	276	
Net loss before taxes	(30,589)	
Income tax provision	26	
Net loss	(30,615)	
Net loss per share, basic and diluted(1)	$ (1.62)	$
Weighted-average shares used in computing net loss per share, basic and diluted(1)	18,951,047	
Pro forma net loss per share, basic and diluted (unaudited)(1)		
Weighted-average shares used in computing pro forma net loss per share, basic and diluted (unaudited)(1)		

(1) See Notes 2 and 12 to our audited consolidated financial statements included elsewhere in this prospectus for an explanation of the calculations of our basic and diluted net loss per share and unaudited pro forma net loss per share and the weighted-average number of shares used in the computation of the per share amounts and unaudited pro forma information.

	As of December 31,	
	2017	2018
	(in thousands)	
Consolidated Balance Sheet Data:		
Cash, cash equivalents and short-term investments	$ 53,729	$
Working capital	53,318	
Total assets	59,304	
Convertible preferred stock warrant liability	577	
Convertible preferred stock	137,469	
Accumulated deficit	(85,763)	
Total stockholders' (deficit) equity	(83,292)	

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

You should read the following discussion and analysis of our financial condition and results of operations together with our consolidated financial statements and the related notes appearing elsewhere in this prospectus. Some of the information contained in this discussion and analysis or set forth elsewhere in this prospectus, including information with respect to our plans and strategy for our business, includes forward-looking statements that involve risks, uncertainties and assumptions. You should read the "Special Notes Regarding Forward-Looking Statements" and "Risk Factors" sections of this prospectus for a discussion of important factors that could cause actual results to differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis.

Company Overview

We are a medical device company focused on developing and commercializing products intended to transform the way calcified cardiovascular disease is treated. We aim to establish a new standard of care for medical device treatment of atherosclerotic cardiovascular disease through our differentiated and proprietary local delivery of sonic pressure waves for the treatment of calcified plaque, which we refer to as IVL. Our IVL System, which leverages our IVL Technology, is a minimally invasive, easy-to-use and safe way to significantly improve patient outcomes. Our M5 catheter was CE-Marked in April 2018 and cleared by the FDA in July 2018 for use in our IVL System for the treatment of PAD. Our C2 catheter, which we are currently marketing in Europe, was CE-Marked in June 2018 for use in our IVL System for the treatment of CAD. We have ongoing clinical programs across several products and indications which, if successful, will allow us to expand commercialization of our products into new geographies and indications. Importantly, we are undertaking ongoing clinical trials of our C2 catheter intended to support a PMA within the United States and a Shonin submission in Japan for the treatment of CAD. We anticipate having final data from these ongoing clinical trials intended to support a U.S. launch of our C2 catheter in the first half of 2021.

The first two indications we are targeting with our IVL System are PAD, the narrowing or blockage of vessels that carry blood from the heart to the extremities, and CAD, the narrowing or blockage of the arteries that supply blood to the heart. In the future, we see significant opportunity in the potential treatment of AS, a condition where the heart's aortic valve becomes increasingly calcified with age, causing it to narrow and obstruct blood flow from the heart.

We have adapted the use of lithotripsy to the cardiovascular field with the aim of creating what we believe can become the safest, most effective means of addressing the growing challenge of cardiovascular calcification. Lithotripsy has been used to successfully treat kidney stones (deposits of hardened calcium) for over 30 years. By integrating lithotripsy into a device that resembles a standard balloon catheter, physicians can prepare, deliver and treat calcified lesions using a familiar form factor, without disruption to their standard procedural workflow. Our differentiated IVL System works by delivering shockwaves through the entire depth of the artery wall, modifying calcium in the medial layer of the artery, not just at the superficial most intimal layer. The shockwaves crack this calcium and enable the stenotic artery to expand at low pressures, thereby minimizing complications inherent to traditional balloon dilations, such as dissections or tears. Preparing the vessel with IVL facilitates optimal outcomes with other therapies, including stents and drug-eluting technologies. Using IVL also avoids complications associated with atherectomy devices such as dissection, perforation and embolism. When followed by an anti-proliferative therapy such as a DCB or DES, the micro-fractures may enable better drug penetration into the arterial wall and improve drug uptake, thereby improving the effectiveness of the combination treatment.

Our IVL System includes a generator, connector cable and a family of IVL catheters designed to treat PAD and CAD.

We have completed five clinical studies with a total of 179 patients, across 22 centers in multiple countries, for peripheral and coronary artery and cardiac valve diseases. We are currently conducting or planning five other studies, involving nearly 2,000 patients in up to 190 centers in the United States and internationally.

We market our products to hospitals whose interventional cardiologists, vascular surgeons and interventional radiologists treat patients with PAD and CAD. We have dedicated meaningful resources to establish a direct sales capability in the United States, Germany, Austria and Switzerland, which we have complemented with distributors, including in Australia, the Baltics, Canada, France, Italy, New Zealand, the Nordic region, Spain and the United Kingdom. We are actively expanding our international field presence through new distributors, additional sales and clinical personnel and are adding new U.S. sales territories.

We produce substantially all of our IVL catheters in-house at our facilities in Fremont, California which, together with our research and development, controlled environment room and office space, currently totals 12,000 square feet. We stock inventory of raw materials, components and finished goods at our facilities in Fremont and with our direct sales representatives, who travel to our hospital customers' locations as part of their sales efforts. Our electronics (*i.e.*, our generators and connector cables) are produced by original equipment manufacturing ("OEM") partners using our design specifications. We plan to move our production of IVL catheters to our new 35,000 square foot facility in Santa Clara, California in 2019. We rely on a single or limited number of suppliers for certain raw materials and components, and we generally have no long-term supply arrangements with our suppliers, as we order on a purchase order basis. In the United States, we generally ship our IVL products from Fremont to our hospital customers in the United States on a consignment basis, but also may sell our IVL products directly to our hospital customers through our direct sales representatives, who deliver such products to hospital customers in the field. Internationally, we ship our IVL products from Fremont to either our third-party logistic provider located in the Netherlands who then ships directly to hospital customers and distributors pursuant to purchase orders or from Fremont directly to hospital customers and distributors pursuant to purchase orders. We also ship to some customers in Germany, Austria and Switzerland on a consignment basis from our third-party logistic provider located in the Netherlands.

For products sold through direct sales representatives, revenue is recognized upon delivery to customers. For consignment inventory, revenue is recognized at the time the product is used in a clinical procedure. For products sold to distributors internationally, revenue is recognized upon transfer of title and risk of loss to the distributor, generally upon delivery. Currently, our product sales consist predominantly of sales of our M5 catheters and our C2 catheters, as we generally loan our generator kits, which include a generator and a connector cable, to our customers without charge to facilitate the use of our IVL catheters.

In 2018, we generated product revenue of $ million, which represents a % increase over 2017, and a $ million operating loss as compared to an operating loss of $30.9 million in 2017. In 2018, % of our product revenue was generated from customers located outside of the United States. Our sales outside of the United States are denominated principally in Euros. As a result, we have foreign exchange exposure. We have not entered into any material foreign currency hedging contracts, although we may do so in the future.

Since inception, we have incurred significant net losses and expect to continue to incur net losses for the foreseeable future. Since our inception, our operations have been financed primarily by net proceeds from the sale of our convertible preferred stock, indebtedness, and, to a lesser extent, product revenue. As of December 31, 2017, we had $53.7 million in cash, cash equivalents and short-term investments, and an accumulated deficit of $85.8 million. In December 2018, we received $15.0 million in gross cash proceeds from the sale of our Series D convertible preferred stock.

We have a number of on-going clinical trials, and expect to continue to make substantial investments in these trials and in additional clinical trials that are designed to provide clinical evidence of the safety and efficacy of our products. We intend to continue to make significant investments in our sales and marketing organization by increasing the number of U.S. sales representatives and expanding our international marketing programs to

help facilitate further adoption among existing hospital accounts as well as broaden awareness of our products to new hospital accounts. We also expect to continue to make investments in research and development, regulatory affairs and clinical studies to develop future generations of products based on our IVL Technology, support regulatory submissions and demonstrate the clinical efficacy of our products. Moreover, we expect to incur additional expenses associated with operating as a public company, including legal, accounting, insurance, exchange listing and SEC compliance, investor relations and other expenses. Because of these and other factors, we expect to continue to incur substantial net losses and negative cash flows from operations for the foreseeable future. In addition, we will require additional financing to fund working capital and pay our obligations. We may seek to raise any necessary additional capital through a combination of public or private equity offerings and/or debt financings.

Factors Affecting Our Business

There are a number of factors that have impacted, and we believe will continue to impact, our results of operations and growth. These factors include:

- ***Market acceptance***. The growth of our business depends on our ability to gain broader acceptance of our current products by continuing to make physicians and other hospital staff aware of the benefits of our products to generate increased demand and frequency of use, and thus increase sales to our hospital customers. Our ability to grow our business will also depend on our ability to expand our customer base in existing or new target end markets. Although we are attempting to increase the number of patients treated with procedures that use our products through our established relationships and focused sales efforts, we cannot provide assurance that our efforts will increase the use of our products.
- ***Regulatory approvals/clearances and timing and efficiency of new product introductions***. We must successfully obtain timely approvals or clearances and introduce new products that gain acceptance with physicians, ensuring adequate supply while avoiding excess inventory of older products and resulting inventory write-downs or write-offs. For our sales to grow, we will also need to receive FDA approval for the use of our C2 catheters in our IVL System for the treatment of CAD in the United States, and will need to obtain regulatory clearance or approval of our other pipeline products in the United States and in international markets. In addition, as we introduce new products, we expect to build our inventory of components and finished goods in advance of sales, which may cause quarterly fluctuations in our results of operations.
- ***Sales force size and effectiveness***. The rate at which we grow our sales force and the speed at which newly hired salespeople become effective can impact our revenue growth or our costs incurred in anticipation of such growth. We intend to continue to make significant investments in our sales and marketing organization by increasing the number of U.S. sales representatives and expanding our international marketing programs to help facilitate further adoption among existing hospital accounts as well as broaden awareness of our products to new hospital accounts.
- ***Competition***. Our industry is intensely competitive and, in particular, we compete with a number of large, well-capitalized companies. We must continue to successfully compete in light of our competitors' existing and future products and related pricing and their resources to successfully market to the physicians who use our products.
- ***Reimbursement***. The level of reimbursement from third-party payors for procedures performed using our products could have a substantial impact on the prices we are able to charge for our products and how widely our products are accepted. The level at which reimbursement is set for procedures using our products, and any increase in reimbursement for procedures using our products, will depend substantially on our ability to generate clinical evidence, to gain advocacy in the respective physician societies and to work with the Centers for Medicare & Medicaid Services and payors.
- ***Clinical results***. Publications of clinical results by us, our competitors and other third parties can have a significant influence on whether, and the degree to which, our products are used by physicians and the procedures and treatments those physicians choose to administer for a given condition.

- ***Product and Geographic Mix; Timing***. Our financial results, including our gross margins, may fluctuate from period to period based on the timing of customer orders or medical procedures, the number of available selling days in a particular period, which can be impacted by a number of factors, such as holidays or days of severe inclement weather in a particular geography, the mix of products sold and the geographic mix of where products are sold. In particular, our distributors for international sales receive a distribution margin on sales of our IVL catheters, which affects our gross margin.
- ***Seasonality***. We expect to experience a seasonal slowing of demand for our products in our fourth quarters due to year-end clinical treatment patterns, such as the postponement of elective surgeries around the winter holidays. In addition, we have experienced some seasonality during summer months, which we believe is attributable to the postponement of elective surgeries for summer vacation plans of physicians and patients. We expect these seasonal factors to become more pronounced in the future as our business grows.

In addition, we have experienced and expect to continue to experience meaningful variability in our quarterly revenue and gross profit/loss as a result of a number of factors, including, but not limited to: inventory write-offs and write-downs; costs, benefits and timing of new product introductions; the availability and cost of components and raw materials; and fluctuations in foreign currency exchange rates. Additionally, we experience quarters in which operating expenses, in particular research and development expenses, fluctuate depending on the stage and timing of product development.

While these factors may present significant opportunities for us, they also pose significant risks and challenges that we must address. See the section titled “Risk Factors” for more information.

Components of Our Results of Operations

Product revenue

Product revenue consists principally of the sale of our IVL catheters.

We sell our products to hospitals, primarily through direct sales representatives, as well as through distributors in select international markets. Additionally, a significant portion of our revenue is generated when our IVL catheters are removed from consignment inventory maintained at hospitals and used in a procedure.

We recognize revenue when persuasive evidence of an arrangement exists, delivery has occurred or services have been rendered, the price to the customer is fixed or determinable and collectability is reasonably assured. For products sold through direct sales representatives, revenue is recognized upon delivery to customers. For consignment inventory, revenue is recognized at the time the product has been used in a clinical procedure. For products sold to distributors, revenue is recognized upon transfer of title and risk of loss to the distributor.

Cost of product revenue

Cost of product revenue consists primarily of costs of components for use in our products, the materials and labor that are used to produce our products, the manufacturing overhead that directly supports production and depreciation relating to the equipment used in our IVL System that we loan to our hospital customers without charge to facilitate the use of our IVL catheters in their procedures. We depreciate equipment over a three-year period. We expect cost of product revenue to increase in absolute terms as our revenue grows.

Gross profit/loss and gross margin

Gross profit/loss is total product revenue less total cost of product revenue. We calculate our gross margin percentage as gross loss divided by total product revenue. Our gross margin has been and will continue to be

affected by a variety of factors, primarily production volumes, the cost of direct materials, products mix, geographic mix, discounting practices, manufacturing costs, product yields, headcount and cost-reduction strategies. We expect our gross margin to increase over the long term to the extent we are successful in increasing our sales volume and are therefore able to leverage our fixed costs. We intend to use our design, engineering and manufacturing capabilities to further advance and improve the efficiency of our manufacturing processes, which, if successful, we believe will reduce costs and enable us to increase our gross margin. While we expect gross margin to increase over the long term, it will likely fluctuate from quarter to quarter as we continue to introduce new products and adopt new manufacturing processes and technologies.

Research and development expenses

Research and development ("R&D") expenses consist of applicable personnel, consulting, materials and clinical trial expenses. R&D expenses include:

- certain personnel-related expenses, including salaries, benefits, bonus, travel and stock-based compensation;
- cost of clinical studies to support new products and product enhancements, including expenses for clinical research organizations ("CROs") and site payments;
- materials and supplies used for internal R&D and clinical activities;
- allocated overhead including facilities and information technology expenses; and
- cost of outside consultants who assist with technology development, regulatory affairs, clinical affairs and quality assurance.

R&D costs are expensed as incurred. In the future, we expect R&D expenses to increase in absolute dollars as we continue to develop new products, enhance existing products and technologies and perform activities related to obtaining additional regulatory approval.

Sales and marketing expenses

Sales and marketing expenses consist of personnel-related expenses, including salaries, benefits, sales commissions, travel and stock-based compensation. Other sales and marketing expenses include marketing and promotional activities, including trade shows and market research, and cost of outside consultants. We expect to continue to grow our sales force and increase marketing efforts as we continue commercializing products based on our IVL Technology. As a result, we expect sales and marketing expenses to increase in absolute dollars in future periods.

General and administrative expenses

General and administrative expenses consist of personnel-related expenses, including salaries, benefits, bonus, travel and stock-based compensation. Other general and administrative expenses include professional services fees, including legal, audit and tax fees, insurance costs, cost of outside consultants and employee recruiting and training costs. Moreover, we expect to incur additional expenses associated with operating as a public company, including legal, accounting, insurance, exchange listing and SEC compliance and investor relations. As a result, we expect general and administrative expenses to increase in absolute dollars in future periods.

Interest expense

Interest expense consists of interest on our debt and amortization of associated debt discount. In February 2018, we entered into a Loan and Security Agreement with Silicon Valley Bank as described in Note 14 to our consolidated financial statements appearing elsewhere in this prospectus (the "SVB Loan Agreement"). As a result, we expect interest expense to increase in absolute dollars in future periods.

Change in fair value of warrant liability

We have accounted for our freestanding warrants to purchase shares of our convertible preferred stock as liabilities at fair value primarily because the shares underlying the warrants contain contingent redemption features outside our control. The warrants are subject to re-measurement at each balance sheet date with gains and losses reported through our consolidated statements of operations and comprehensive loss.

Other income, net

Other income consists primarily of interest earned on our cash equivalents and short-term investments.

Income tax provision

Income tax provision consists primarily of income taxes in certain foreign jurisdictions in which we conduct business. We have a full valuation allowance for deferred tax assets, including net operating loss carryforwards and tax credits related primarily to R&D.

Results of Operations

Year Ended December 31, 2017

The following table shows our results of operations for the year ended December 31, 2017:

	Year Ended December 31, 2017 (in thousands)
Product revenue	$ 1,719
Operating expenses:	
Cost of product revenue	2,836
Research and development	17,963
Sales and marketing	6,363
General and administrative	5,422
Total operating expenses	$ 32,584
Loss from operations	(30,865)
Interest expense	(58)
Change in fair value of warrant liability	(32)
Other income, net	366
Net loss before taxes	(30,589)
Income tax provision	26
Net loss	$ (30,615)

Product revenue

Product revenue was $1.7 million for the year ended December 31, 2017. Product revenue consisted primarily of the sale of our IVL catheters. Product revenue, classified by the major geographic areas in which our products are shipped, was $1.0 million within the United States and $0.7 million for all other countries. For the year ended December 31, 2017, one customer accounted for 19% of our revenue.

Cost of product revenue and gross margin

Cost of product revenue was $2.8 million for the year ended December 31, 2017, resulting in gross loss of $1.1 million and negative gross margin of 65%. Prior to achieving anticipated normal production capacity, excess capacity costs were expensed in cost of product revenue as period costs.

Research and development expenses

The following table summarizes our R&D expenses incurred during the year ended December 31, 2017:

	December 31, 2017 (in thousands)
Compensation and related personnel costs	$ 10,263
Clinical-related costs	3,358
Materials and supplies	1,805
Facilities and other allocated costs	1,153
Outside consultants	788
Other research and development costs	596
Total research and development expenses	$ 17,963

R&D expenses were $18.0 million for the year ended December 31, 2017. R&D expenses consisted primarily of personnel-related costs and expenses associated with our on-going clinical trials.

Sales and marketing expenses

Sales and marketing expenses were $6.4 million for the year ended December 31, 2017. Sales and marketing expenses consisted primarily of $4.7 million for personnel-related costs, $0.8 million for marketing and promotional activities and $0.4 million for outside consultants.

General and administrative expenses

General and administrative expenses were $5.4 million for the year ended December 31, 2017. General and administrative expenses consisted primarily of $3.2 million for personnel-related costs, $0.9 million for professional services, $0.6 million for outside consultants and $0.4 million for employee recruiting and training.

Interest expense

Interest expense was $58,000 for the year ended December 31, 2017. Interest expense was related to our prior Loan and Security Agreement with Silicon Valley Bank entered into in June 2014 that was repaid in 2017.

Change in fair value of warrant liability

The change in fair value of warrant liability was $32,000 for the year ended December 31, 2017, reflecting changes to the Black-Scholes option pricing model assumptions used to value the warrant liability.

Other income, net

Other income, net was $0.4 million for the year ended December 31, 2017. Other income, net consisted primarily of interest received on our short-term investments.

Income tax provision

Income tax provision was $26,000 for the year ended December 31, 2017. Income tax provision related primarily to our foreign tax provision.

Liquidity and Capital Resources

Sources of liquidity

Since our inception through December 31, 2017, our operations have been financed primarily by net proceeds from the sale of our convertible preferred stock, indebtedness and, to a lesser extent, product revenue. As of December 31, 2017, we had $53.7 million in cash, cash equivalents and short-term investments and an accumulated deficit of $85.8 million.

In December 2018, we received $15.0 million in gross cash proceeds from the sale of our Series D convertible preferred stock.

Debt obligations

In June 2014, we entered into a Loan and Security Agreement with Silicon Valley Bank (the "Prior Loan Agreement"), under which a total of $4.0 million was borrowed. The Company made monthly payments of principal and interest through the maturity date of October 1, 2017, and a one-time payment of $0.2 million on the maturity date of the Prior Loan Agreement. All the borrowings under the Prior Loan Agreement were fully repaid as of December 31, 2017. In connection with our entry into the Prior Loan Agreement, we issued Silicon Valley Bank a convertible preferred stock warrant to purchase 669,817 shares of our Series A-1 convertible preferred stock.

In February 2018, we entered into the SVB Loan Agreement with Silicon Valley Bank. The terms of the SVB Loan Agreement include a term loan of $15.0 million and a revolving line of credit of $2.0 million. The term loan is available in two tranches. We drew down on the first tranche of the term loan in the amount of $10.0 million in June 2018. The second tranche of $5.0 million is available to draw upon the achievement of certain milestones through March 31, 2019. In connection with the execution of the SVB Loan Agreement, we issued Silicon Valley Bank common stock warrants to purchase 420,174 shares of our common stock.

The term loan is due in monthly installments from July 2018 through its repayment in December 2021, with interest-only monthly payments until March 2019. The interest-only period will extend through September 2019 if we draw on the second tranche and December 2019 if certain financing milestones are met. The term loan accrues interest at a floating per annum rate equal to the greater of the Wall Street Journal prime rate minus 1.75% and 2.75% (3.50% as of September 30, 2018). There is a final payment equal to 6.75% of the original aggregate principal amount of the term loan advances. The line of credit accrues interest at the Wall Street Journal prime rate.

The term loan is secured by all our assets, excluding intellectual property and certain other assets. The loan contains customary affirmative and restrictive covenants, including with respect to our ability to enter into fundamental transactions, incur additional indebtedness, grant liens, pay any dividend or make any distributions to our holders, make investments and merge or consolidate with any other person or engage in transactions with our affiliates, but does not include any financial covenants.

Funding requirements

Based on our planned operations, we do not expect that our current cash, cash equivalents and short-term investments, together with available borrowings under our SVB Loan Agreement with Silicon Valley Bank, will be sufficient to fund our operations for at least 12 months after the date our most recent consolidated financial statements were issued without raising additional capital through equity or debt financing. These conditions raise substantial doubt about our ability to continue as a going concern for a period of one year from the date of the issuance of our most recent consolidated financial statements. Our ability to continue as a going concern is dependent upon our ability to successfully secure sources of financing and ultimately achieve profitable

operations. However, based on our planned operations, we expect our cash, cash equivalents and short-term investments, together with available borrowings under our SVB Loan Agreement and the proceeds from this offering, will be sufficient to fund our operating expenses for at least the next 12 months.

We have a number of ongoing clinical trials, and expect to continue to make substantial investments in these trials and in additional clinical trials that are designed to provide clinical evidence of the safety and efficacy of our products. We intend to continue to make significant investments in our sales and marketing organization by increasing the number of U.S. sales representatives and expanding our international marketing programs to help facilitate further adoption among existing hospital accounts as well as broaden awareness of our products to new hospitals. We also expect to continue to make investments in research and development, regulatory affairs and clinical studies to develop future generations of products based on our IVL Technology, support regulatory submissions and demonstrate the clinical efficacy of our products. Moreover, we expect to incur additional expenses associated with operating as a public company, including legal, accounting, insurance, exchange listing and SEC compliance, investor relations and other expenses. Because of these and other factors, we expect to continue to incur substantial net losses and negative cash flows from operations for the foreseeable future. Our future capital requirements will depend on many factors, including:

- the cost, timing and results of our clinical trials and regulatory reviews;
- the cost and timing of establishing sales, marketing and distribution capabilities;
- the terms and timing of any other collaborative, licensing and other arrangements that we may establish;
- the timing, receipt and amount of sales from our current and potential products;
- the degree of success we experience in commercializing our products;
- the emergence of competing or complementary technologies;
- the cost of preparing, filing, prosecuting, maintaining, defending and enforcing any patent claims and other intellectual property rights; and
- the extent to which we acquire or invest in businesses, products or technologies, although we currently have no commitments or agreements relating to any of these types of transactions.

We will require additional financing to fund working capital and pay our obligations. We may seek to raise any necessary additional capital through a combination of public or private equity offerings and/or debt financings. There can be no assurance that we will be successful in acquiring additional funding at levels sufficient to fund our operations or on terms favorable to us, if at all. If adequate funds are not available on acceptable terms when needed, we may be required to significantly reduce operating expenses, which may have a material adverse effect on our business and/or results of operations and financial condition. If we do raise additional capital through public or private equity or convertible debt offerings, the ownership interest of our existing stockholders will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect our existing stockholders' rights. If we raise additional capital through debt financing, we may be subject to covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. Additional capital may not be available on reasonable terms, or at all.

Cash Flows

The following table summarizes our cash flows for the periods indicated:

	Year Ended December 31, 2017
	(in thousands)
Net cash used in operating activities	$ (30,347)
Net cash used in investing activities	(2,232)
Net cash provided by financing activities	33,687
Net increase in cash	$ 1,108

Operating activities

In 2017, cash used in operating activities was $30.3 million, attributable to a net loss of $30.6 million and a net change in our net operating assets and liabilities of $1.7 million, partially offset by non-cash charges of $1.9 million. Non-cash charges primarily consisted of $1.0 million in stock-based compensation, $0.5 million in depreciation and amortization and $0.4 million in loss on write down of obsolete inventory. The change in our net operating assets and liabilities was primarily due to a $2.3 million increase in inventory for anticipated growth in our business, a $0.6 million increase in accounts receivable due to increase in sales, and a $0.4 million increase in prepaid expenses and other current assets. These changes were partially offset by a $1.6 million increase in accrued and other current liabilities and accounts payable resulting primarily from increases in our operating activities.

Investing activities

In 2017, cash used in investing activities was $2.2 million, attributable to purchases of investments of $17.7 million and purchase of property and equipment of $0.4 million, partially offset by maturity of available-for-sale investments of $15.9 million.

Financing activities

In 2017, cash provided by financing activities was $33.7 million, attributable to net proceeds of $34.9 million from the issuance of our Series C convertible preferred stock and proceeds from stock option exercises and warrant exercises of $0.3 million, partially offset by the principal payment of our term loan of $1.6 million.

Contractual Obligations and Commitments

The following table summarizes our contractual obligations and commitments as of September 30, 2018:

	Payments Due by Period				
	Total	Remainder of 2018	2019 – 2020	2021 – 2022	2023 and After
			(in thousands)		
Operating lease obligations(1)	$ 3,397	$ 212	$1,748	$1,437	$ —
Debt, principal and interest(2)	11,395	88	6,927	4,380	—
Total	$14,792	$ 300	$8,675	$5,817	$ —

(1) In May 2018, we entered into a lease agreement to lease a new office facility. The new lease commenced on September 1, 2018 and ends on August 31, 2022. Payments associated with this operating lease agreement are included in the above table.

(2) In June 2018, we borrowed $10.0 million pursuant to a term loan under the SVB Loan Agreement. The term loan matures in December 2021. Principal payments associated with the term loan are included in the above table. Interest expense incurred on the term loan is included in the above table based on obligations outstanding and rates effective as of September 30, 2018, including a final one-time payment of $0.7 million in December 2021.

In addition, we enter into agreements in the normal course of business with contract research organizations for clinical trials and with vendors for preclinical studies and other services and products for operating purposes which are cancelable at any time by us, generally upon 30 days prior written notice. These payments are not included in this table of contractual obligations.

Off-Balance Sheet Arrangements

As of December 31, 2017, we did not have any off-balance sheet arrangements as defined in the rules and regulations of the SEC.

Critical Accounting Policies and Estimates

Management's discussion and analysis of our financial condition and results of operations is based on our consolidated financial statements, which have been prepared in accordance with U.S. generally accepted accounting principles ("GAAP"). The preparation of these consolidated financial statements requires us to make estimates and assumptions for the reported amounts of assets, liabilities, revenue, expenses and related disclosures. Our estimates are based on our historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions and any such differences may be material.

While our significant accounting policies are more fully described in the Note 2 to our consolidated financial statements appearing elsewhere in this prospectus, we believe the following discussion addresses our most critical accounting policies, which are those that are most important to our financial condition and results of operations and require our most difficult, subjective and complex judgments.

Revenue recognition

We sell our products to hospitals, primarily through direct sales representatives, as well as through distributors in select international markets. Additionally, a significant portion of our revenue is generated when our IVL catheters are removed from consignment inventory maintained at hospitals and used in a procedure.

We recognize revenue when persuasive evidence of an arrangement exists, delivery has occurred or services have been rendered, the price to the customer is fixed or determinable and collectability is reasonably assured. For products sold through direct sales representatives, revenue is recognized upon delivery to customers. For consignment inventory, revenue is recognized at the time the product has been used in a clinical procedure. For products sold to distributors, revenue is recognized upon transfer of title and risk of loss to the distributor.

Convertible preferred stock warrant liability

We have accounted for our freestanding warrants to purchase shares of our convertible preferred stock as liabilities at fair value upon issuance primarily because the shares underlying the warrants contain contingent redemption features outside our control. The warrants are subject to re-measurement at each balance sheet date and any change in fair value is recognized as the change in fair value of warranty liability. We will continue to adjust the carrying value of the warrants until such time as these instruments are exercised, expire or convert into warrants to purchase shares of our common stock. At that time, the liabilities will be reclassified to additional paid-in capital, a component of stockholders' equity (deficit). The consummation of this offering will result in this reclassification.

Accrued research and development costs

We accrue liabilities for estimated costs of R&D activities conducted by our third-party service providers, which include the conduct of preclinical and clinical studies. We record the estimated costs of R&D activities based upon the estimated amount of services provided but not yet invoiced, and include these costs in accrued liabilities on the consolidated balance sheet and within R&D expense on the consolidated statement of operations and comprehensive loss.

We accrue for these costs based on factors, such as estimates of the work completed and budget provided and in accordance with agreements established with our third-party service providers. We make significant judgments and estimates in determining the accrued liabilities balance in each reporting period. As actual costs become known, we adjust our accrued liabilities. We have not experienced any material differences between accrued costs and actual costs incurred since our inception.

Stock-based compensation

We account for share-based payments at fair value. The fair value of stock options is measured using the Black-Scholes option-pricing model. For share-based awards that vest subject to the satisfaction of a service requirement, the fair value measurement date for employee stock-based compensation awards is the date of grant and the expense is recognized on a straight-line basis, over the vesting period. We account for forfeitures as they occur.

Stock-based compensation arrangements with nonemployees are recognized at the grant date and re-measured to fair value at each reporting period until the award is vested. The expense is recognized over the vesting period, which is generally the service period.

The fair value of each stock option grant was determined using the methods and assumptions discussed below (see "—Fair value of common stock"). Each of these inputs is subjective and generally requires significant judgment and estimation by management.

- *Expected Term*—The expected term represents the period that stock-based awards are expected to be outstanding. Our historical share option exercise information is limited due to a lack of sufficient data points and does not provide a reasonable basis upon which to estimate an expected term. The expected term for option grants is therefore determined using the simplified method. The simplified method deems the expected term to be the midpoint between the vesting date and the contractual life of the stock-based awards. The expected term for options issued to nonemployees is the contractual term.
- *Expected Volatility*—The expected volatility was derived from the historical stock volatilities of comparable peer public companies within our industry that are considered to be comparable to our business over a period equivalent to the expected term of the stock-based awards, since there has been no trading history of our common stock.
- *Risk-Free Interest Rate*—The risk-free interest rate is based on the U.S. Treasury yield curve in effect at the date of grant for zero-coupon U.S. Treasury notes with maturities approximately equal to the stock-based awards' expected term.
- *Expected Dividend Yield*—The expected dividend yield is zero as we have not paid nor do we anticipate paying any dividends on our common stock in the foreseeable future.

During the year ended December 31, 2017, stock-based compensation was $1.0 million. As of December 31, 2017, we had $2.7 million of total unrecognized stock-based compensation, which we expect to recognize over a weighted-average period of three years. Based upon the assumed initial public offering price of $ per share (which is the midpoint of the estimated price range set forth on the cover of this prospectus), the aggregate intrinsic value of options outstanding as of December 31, 2017 was $ million, of which $ million related to vested options and $ million related to unvested options.

Fair value of common stock

Historically, for all periods prior to this initial public offering, the fair values of the shares of our common stock underlying our share-based awards were estimated on each grant date by our board of directors. In order to determine the fair value of our common stock underlying option grants, our board of directors considered, among other things, valuations of our common stock prepared by an independent third-party valuation firm in accordance with the guidance provided by the American Institute of Certified Public Accountants Practice Guide, *Valuation of Privately-Held-Company Equity Securities Issued as Compensation*.

The fair value of our common stock was estimated using the option pricing model ("OPM") with a backsolve method based on precedent transactions. The backsolve method for inferring the equity value implied by a recent financing transaction involves making assumptions for the expected time to liquidity, volatility and risk-free rate and then solving for the value of equity such that value for the most recent financing equals the amount paid. This method was selected as management concluded that the contemporaneous financing transaction was an arm's-length transaction. Furthermore, as of each of the valuation dates prior to December 31, 2017, we were at an early stage of development and future liquidity events were difficult to forecast.

Given the absence of a public trading market for our common stock, our board of directors exercised their judgment and considered a number of objective and subjective factors to determine the best estimate of the fair value of our common stock, including valuations performed by an independent third party, developments in our operations, sales of preferred stock, the prices, rights, preferences and privileges of our preferred stock relative to the common stock, actual operating results and financial performance and capital resources, the conditions in the medical device industry and the economy and capital markets in general, the stock price performance and volatility of comparable public companies, the likelihood of achieving a liquidity event for shares of our common stock underlying these stock options, such as an initial public offering or sale of our company, and the lack of liquidity of our common stock, among other factors. After the closing of this offering, our board of directors will determine the fair value of each share of underlying common stock based on the closing price of our common stock as reported on the date of the grant. Our board of directors intended all options granted to be exercisable at a price per share not less than the per share fair value of our common stock underlying those options on the grant date.

Emerging Growth Company Status

In April 2012, the JOBS Act was enacted. Section 107 of the JOBS Act provides that an "emerging growth company" may take advantage of the extended transition period provided in Section 7(a)(2)(B) of the Securities Act for complying with new or revised accounting standards. Therefore, an emerging growth company can delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We have irrevocably elected not to avail ourselves of this exemption from new or revised accounting standards, and, therefore, will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

Recent Accounting Pronouncements

See Note 2 to our consolidated financial statements included elsewhere in this prospectus for more information.

Quantitative and Qualitative Disclosures About Market Risk

Interest rate risk

We held cash, cash equivalents and short-term investments of $53.7 million as of December 31, 2017, consisting of bank deposits, money market funds and available-for-sale securities. Such interest-earning

instruments carry a degree of interest rate risk. The goals of our investment policy are liquidity and capital preservation; we do not enter into investments for trading or speculative purposes and have not used any derivative financial instruments to manage our interest rate exposure. We believe that we do not have any material exposure to changes in the fair value of these assets as a result of changes in interest rates due to the short-term nature of our cash and cash equivalents.

As of September 30, 2018, we had $10.0 million in variable rate debt outstanding. Our term loan is due in monthly installments from July 2018 through December 2021. The term loan accrues interest at a floating per annum rate equal to the greater of the Wall Street Journal prime rate minus 1.75% and 2.75% (3.50% as of September 30, 2018).

Foreign currency exchange risk

As we expand internationally, our results of operations and cash flows may become increasingly subject to fluctuations due to changes in foreign currency exchange rates. Our revenue is denominated primarily in U.S. dollars and Euros. For the year ended December 31, 2017, approximately 43% of our product revenue was denominated in Euros. Our expenses are generally denominated in the currencies in which our operations are located, which is primarily in the United States. As of December 31, 2017, the effect of a 10% adverse change in exchange rates on foreign denominated cash and cash equivalents, receivables and payables would not have been material for the period presented. As our operations in countries outside of the United States grow, our results of operations and cash flows may be subject to fluctuations due to changes in foreign currency exchange rates, which could harm our business in the future. To date, we have not entered into any material foreign currency hedging contracts, although we may do so in the future.

BUSINESS

Company Overview

We are a medical device company focused on developing and commercializing products intended to transform the way calcified cardiovascular disease is treated. We aim to establish a new standard of care for medical device treatment of atherosclerotic cardiovascular disease through our differentiated and proprietary local delivery of sonic pressure waves for the treatment of calcified plaque, which we refer to as intravascular lithotripsy ("IVL"). Our IVL system (our "IVL System"), which leverages our IVL technology (our "IVL Technology"), is a minimally invasive, easy-to-use and safe way to significantly improve patient outcomes. Our Shockwave M5 IVL catheter ("M5 catheter") was CE-Marked in April 2018 and cleared by the U.S. Food and Drug Administration ("FDA") in July 2018 for use in our IVL System for the treatment of peripheral artery disease ("PAD"). Our Shockwave C2 IVL catheter ("C2 catheter"), which we are currently marketing in Europe, was CE-Marked in June 2018 for use in our IVL System for the treatment of coronary artery disease ("CAD"). We have ongoing clinical programs across several products and indications which, if successful, will allow us to expand commercialization of our products into new geographies and indications. Importantly, we are undertaking ongoing clinical trials of our C2 catheter intended to support a pre-market application ("PMA") in the United States and a Shonin submission in Japan for the treatment of CAD. We anticipate having final data from these ongoing clinical trials intended to support a U.S. launch of our C2 catheter in the first half of 2021.

The Opportunity

Atherosclerosis is a common disease of aging in which arteries become narrowed ("stenotic") and the supply of oxygenated blood to the affected organ is reduced by the progressive growth of plaque. Atherosclerotic plaque is comprised of fibrous tissue, lipids (fat) and, when it progresses, calcium. This calcium is present both deep within the walls of the artery ("deep" or "medial" calcium) and close to the inner surface of the artery ("superficial" or "intimal" calcium).

The first two indications we are targeting with our IVL System are occlusive PAD, the narrowing or blockage of vessels that carry blood from the heart to the extremities, and CAD, the narrowing or blockage of the arteries that supply blood to the heart. In the future, we see significant opportunity in the potential treatment of Aortic Stenosis ("AS"), a condition in which the heart's aortic valve becomes increasingly calcified with age, causing it to narrow and obstruct blood flow from the heart.

The PAD population in the United States has been estimated to be at least eight million people, according to the National Institutes of Health. The global PAD device market size for treatment of occlusive disease is estimated at approximately $2.9 billion and is expected to grow approximately 3% annually due to the fundamental drivers of an aging population and increasing prevalence of diabetes. The "calcium" segment of the PAD market represents a significant percentage of the market, with 50% or more of the population having moderate-to-severe calcium in their vessels, according to our estimates. Current technologies are often not able to safely and effectively treat heavily calcified vessels. Accordingly, we believe our IVL System to treat PAD has a total addressable market opportunity of over $1.7 billion.

The global device market in coronary intervention for CAD is estimated to be nearly $10 billion, according to Decision Resources Group, Inc. ("DRG"). The most common treatment for patients is percutaneous coronary intervention ("PCI"). This involves a suite of devices to facilitate successful angioplasty and stenting, the most commonly used device being drug-eluting stents ("DES"). Moreover, there are nearly four million PCI procedures performed globally every year, and the number of PCI procedures is growing at a rate of more than 5% annually. A study published in the *American Journal of Cardiology* in 2014 demonstrated that more than 30% of patients undergoing PCI have calcified lesions and this percentage is growing. Minimizing complications is particularly important in the coronary vessels, but current plaque modification devices carry meaningful safety risks and are inherently challenging to use, which is why these devices are used very sparingly

for PCI procedures in patients with calcified coronary disease. Despite significant under-penetration of the market, these devices still represented a market of nearly $100 million in 2018 within the United States alone, according to DRG; we believe this market is significantly larger globally. Due to the increasing prevalence of calcified cardiovascular disease, the market growth for plaque modification devices exceeds that of PCI procedure growth. We believe the safety, ease of use and efficient impact on calcium of our IVL System will result in rapid adoption and market expansion in markets where our C2 catheter is introduced. We believe there is over a $2 billion total addressable market opportunity for our IVL System to treat CAD.

The global market for Aortic Valve Replacement ("AVR"), the main treatment for AS, is growing rapidly, and is dominated by the emergence of Transcatheter Aortic Valve Replacement ("TAVR") devices. TAVR has rapidly developed into a multibillion-dollar market globally. According to an article published in the *Journal of Thoracic Disease* in 2017, the global market for TAVR is over 125,000 procedures performed worldwide in 2018 and is expected to grow to nearly 300,000 by 2025. We are currently developing an IVL catheter which we believe can safely and effectively treat patients with AS. If successful, this represents a potential total addressable market of over $3 billion for our IVL System to treat AS.

Current Challenges

The primary approaches to treat vascular disease are angioplasty balloons ("balloons"), drug-coated balloons ("DCB"), bare metal stents and DES. These devices all work by using pressurized balloons to expand the diseased blood vessels. Calcified plaque creates challenges for these therapies in achieving optimal outcomes in treating PAD and CAD because the calcified vessels fail to expand under safe pressures. This, in turn, can lead to acute failure, damage to the blood vessel, which increases the rate of restenosis (re-occlusion of the vessel following endovascular treatment) or complications requiring adjunctive tools, future re-interventions or conversion to bypass surgery. These complications are significantly increased when treating calcified cardiovascular disease and include dissections, embolization, restenosis, vessel perforations and vessel recoil.

Plaque modification devices (including atherectomy and specialty balloons) have enhanced the treatment of some moderately calcified cardiovascular lesions by improving the ability of stent and balloon therapies to effectively expand in the vessel. Atherectomy devices are designed to break or remove superficial calcium by cutting or sanding the calcium in order to improve vessel expansion. Specialty balloon devices incorporate metallic elements like wires and cutting blades onto standard angioplasty balloons; these devices are intended to make discreet cuts in the plaque and surrounding tissue in order to improve vessel expansion. Despite improvements in plaque modification devices, significant limitations remain, including being difficult to use and creating complications and inconsistent efficacy. Further, because medial calcium is encased in the vessel wall, the existing plaque modification devices are unable to impact medial calcium without damaging the vessel. Combined, these limitations decrease the utilization of plaque modification devices for treating calcified cardiovascular disease, thereby reducing the clinical benefit of angioplasty and stent therapies compared to their use in non-calcified anatomies.

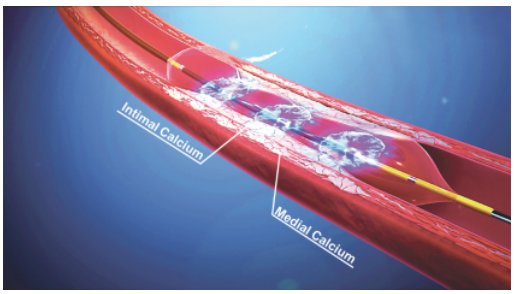
Our Solution

We have adapted the use of lithotripsy to the cardiovascular field with the aim of creating what we believe can become the safest, most effective means of addressing the growing challenge of cardiovascular calcification. Lithotripsy has been used to successfully treat kidney stones (deposits of hardened calcium) for over 30 years. By integrating lithotripsy into a device that resembles a standard balloon catheter, physicians can prepare, deliver and treat calcified lesions using a familiar form factor, without disruption to their standard procedural workflow. Our differentiated IVL System works by delivering shockwaves through the entire depth of the artery wall, modifying calcium in the medial layer of the artery, not just in the intimal layer. The shockwaves crack this calcium and enable the stenotic artery to expand at low pressures, thereby minimizing complications inherent to traditional balloon dilations, such as dissections or tears. Preparing the vessel with IVL facilitates optimal outcomes with other therapies, including stents and drug-eluting technologies. Using IVL also avoids

complications associated with atherectomy devices such as dissection, perforation and embolism. When followed by an anti-proliferative therapy such as a DCB or DES, the micro-fractures may enable better drug penetration into the arterial wall and improve drug uptake, thereby improving the effectiveness of the combination treatment.

Our IVL System includes a generator, connector cable and a variety of IVL catheters designed to treat PAD and CAD. Our IVL System employs our IVL Technology to crack calcium through short bursts of sonic pressure waves, which are generated within the IVL catheter, travel through the vessel and crack calcium with an effective pressure of up to 50 atmospheres ("atm") (a unit of pressure) without harming the soft tissue. Our IVL catheters utilize multiple lithotripsy emitters that are integrated into a standard, semi-compliant balloon-catheter platform. The IVL catheter is advanced to the target lesion and the integrated balloon is inflated with fluid at a low pressure to make contact with the arterial wall. IVL is then activated through the generator with the touch of a button, creating a small bubble within the catheter balloon which rapidly expands and collapses. The rapid expansion and collapse of the bubble creates sonic pressure waves that travel through the vessel and crack the calcium, allowing the blood vessel to expand under low static pressure.

We believe there is a significant opportunity to apply our IVL Technology as a platform to treat a wide array of indications throughout the cardiovascular system. Ultimately, our plan is to have a family of IVL catheters that can treat calcium-related diseases across a wide variety of vasculatures and structures.



Our IVL System *delivers lithotripsy directly to the calcified vessels using a standard interventional balloon catheter delivery system that is able to make contact with the vessel wall and transmit energy efficiently.*

In addition to the treatment of PAD and CAD, we believe our IVL Technology has the potential to improve the care of patients with AS. AVR is the standard of care for patients suffering from symptomatic severe AS, performed either by surgery ("surgical aortic valve replacement" or "SAVR") or through a less-invasive TAVR approach. Currently, our M5 catheters are used in our IVL System to enable transfemoral access in patients for whom severely stenotic and calcified ilio-femoral disease puts them at risk for cardiovascular complications associated with TAVR devices. We believe that increasing the number of patients who can have TAVR performed via transfemoral access, the preferred delivery pathway for TAVR, will help reduce complications associated with the procedure. We are also evaluating the use of our IVL Technology to directly treat patients with symptomatic severe AS in clinical feasibility trials as an alternative to AVR. Our transcatheter aortic valve lithotripsy system (our "TAVL System") is designed to safely crack calcium in the aortic valve leaflets, thereby improving leaflet mobility and reducing the severity of AS. The prospect of being able to offer an alternative that either delays or obviates the need for AVR in some patients represents a substantial opportunity to provide a meaningfully safer and less invasive approach to treating AS.

Since inception, we have focused on generating clinical data to demonstrate the safety and effectiveness of our IVL Technology. These initial studies have consistently delivered exceptionally low rates of complications

regardless of which vessel was being studied. In addition to gaining regulatory approvals or clearances, the data from our clinical studies strengthen our ability to drive adoption of IVL Technology across multiple therapies in existing and new market segments. Our past studies have demonstrated that our IVL Technology significantly reduces residual stenosis and vascular complications in infrapopliteal and femoropopliteal PAD, with outstanding durability and sustained improvement in functional outcome in 115 patients. Our past studies have also guided optimal IVL procedure technique and informed the design of our IVL System and future products in development. In the treatment of CAD, our past studies have demonstrated both safety and effectiveness of our IVL System in heavily calcified coronary lesions prior to stenting in 60 patients. Feasibility studies have shown the potential of our TAVL System to safely improve the aortic valve area and reduce transvalvular gradients in AS. We are currently enrolling patients in multiple studies to support applications for approvals and clearances in a variety of indications and geographies, as well as a randomized trial to assess the combination of IVL with DCB for treating PAD.

We market our IVL System to hospitals whose interventional cardiologists, vascular surgeons and interventional radiologists treat patients with PAD and CAD. We have dedicated meaningful resources to establish direct sales capability in the United States, Germany, Austria and Switzerland, and we have complemented those direct teams with distributors, including in Australia, the Baltics, Canada, France, Italy, New Zealand, the Nordic region, Spain and the United Kingdom. We are actively expanding our international field presence through new distributors, additional sales and clinical personnel, and are adding new U.S. sales territories.

We are a vertically integrated company headquartered in Santa Clara, California, and we have additional operations and facilities in Fremont, California. We currently manufacture our IVL catheters in Fremont, California. As of September 30, 2018, we had 153 full-time employees. Our revenue was $1.7 million and $ million for the years ended December 31, 2017 and 2018, respectively, and we incurred a net loss of $30.6 million and $ million for those same periods, respectively.

Why ShockWave? Safe – Simple – Effective

- **Treatment of both superficial and deep calcium.** Our IVL System employs our IVL Technology to create shockwaves that penetrate through the entire depth of the artery wall, modifying calcium in the medial layer of the artery, not just at the superficial, most intimal layer. We believe our IVL System is the only available cardiovascular therapy able to safely and effectively treat medial calcium, which is highly prevalent and for which other existing therapies have limited utility.
- **Improved safety through unique mechanism of action.** By relying on locally delivered sonic pressure, our IVL System safely modifies both intimal and medial calcium without causing perforations, distal embolization or damage to the vasculature and surrounding tissues. We believe that by reducing complications, physicians will also be able to reduce the number of additional devices required to successfully complete the treatment of the patient.
- **Improved efficacy for angioplasty, stents and drug-eluting therapies.** We believe our IVL System enables better interventions in complex calcified lesions by improving the likelihood of the procedure's success and facilitating optimal outcomes in conjunction with other therapies, including stents, drug-eluting technologies and structural heart interventions.
- **Seamless integration into interventional practice with exceptional ease-of-use.** Our IVL System is portable and easy to install and set-up. There are no special facility requirements, no external connections and no settings to adjust. Physicians prepare and deliver our IVL catheters just as they would a standard angioplasty catheter, and they maintain the ability to use guidewires and other interventional tools of their choice.
- **Expanded access to interventional techniques for patients.** The ability to treat complex calcium effectively and with low safety risk may enable endovascular therapy in multiple underserved patient

cohorts, including: common femoral artery stenosis cases currently avoided due to the risk of stenting; critical limb ischemia ("CLI") patients scheduled for bypass or amputation; transfemoral access instead of alternate access or surgical cut-down for TAVR, Endovascular Aneurysm Repair ("EVAR") and Thoracic Endovascular Aneurysm Repair ("TEVAR") procedures; and PCI in patients who may otherwise need a surgical coronary bypass procedure.

- **Cost-saving potential of our IVL System.** We believe that our IVL System will provide economic value to the healthcare system. Multiple value streams can result in cost saving benefits:
  - reduced time required by physicians to understand and adopt our IVL System relative to other therapies;
  - reduced expense to train and support physicians compared to the burdensome and expensive physician certification programs required by manufacturers of some atherectomy devices;
  - reduced cost to hospitals to treat complex calcified disease due to lower risk of complications, less lab time and lower equipment costs per case than other commercially available options; and
  - reduced need for complex, risky and expensive alternative procedures, such as surgery or surgical access for TAVR, EVAR and TEVAR.

Our Growth Strategy

Our mission is to provide safe, effective and easy-to-use treatments to optimize outcomes for calcified cardiovascular disease. We believe the following strategies will advance our mission and will contribute to our future success and growth.

- **Address unmet clinical needs in multiple large markets.** Calcified cardiovascular disease is a growing treatment challenge that is not safely and effectively treated by existing therapies. Treatment of this disease represents a large, growing total addressable market opportunity across multiple indications. Patients with calcified arteries are typically excluded from clinical trials and are often referred to highly specialized hospitals and physicians for treatment. This habitual avoidance of complex calcium cases is due to the difficulty in using, and high complication rates associated with, existing therapies. Our IVL System is safe, easy to use and effective for its approved indications. We are targeting PAD and CAD as our first two indications, which represent an existing combined global medical device market of nearly $13 billion as of 2018, according to DRG. Calcified vascular disease represents an immediate total addressable market opportunity of over $3.5 billion for our IVL Technology. We believe treating AS, our third target indication which is currently being developed, represents a potential $3 billion total addressable market opportunity.
- **Advance our IVL System as a common treatment for calcified PAD and CAD.** Our clinical studies demonstrate our IVL System's safety and effectiveness in treating calcified cardiovascular disease. In addition, our IVL System is as familiar and easy to use as a standard angioplasty catheter, making it an attractive option for physicians. Procedures using our IVL System are generally reimbursed by public and private insurers, and there is potential to improve the existing reimbursement profile in the future. To grow our business, we plan to continue to establish and strengthen our clinical evidence and commercial presence in our first two target indications, PAD and CAD.
- **Grow our specialized sales force across indications and geographies to foster deep relationships with physicians and drive revenue growth.** We sell our IVL System through our direct sales organization in the United States, Germany, Austria and Switzerland, and through distribution partners in other geographies. We have assembled a team with in-depth knowledge of the target markets in which we compete and seek to compete. We have also collaborated with many of the physician thought leaders in the interventional cardiology, interventional radiology and vascular surgery communities; they have helped us deliver new and improved products that meet their clinical needs and inform our product pipeline. We intend to grow our sales organization meaningfully as we launch new products, expand our indications and enter new geographies.

- **Execute on our clinical program to expand indications and build a robust body of clinical evidence.** Our clinical and regulatory strategies are designed to gain approval for new products in new indications and new geographies, including our Shockwave S4 IVL catheter ("S4 catheter") and our TAVL System, among others. They are also designed to demonstrate the benefits of our IVL Technology when combined with existing therapies. We are currently enrolling patients in Disrupt PAD III, a study designed to demonstrate the benefit of combining our IVL Technology with DCB as an alternative to standalone DCB in severely calcified femoropopliteal lesions. CAD III, a study designed to demonstrate the safety and efficacy of our IVL Technology when combined with DES in the treatment of severely calcified CAD, is expected to begin enrolling patients in early 2019. If successful, we expect the data from CAD III will support the approval of our C2 catheter to be used in our IVL System for the treatment of CAD in the United States and Japan in the first half of 2021.
- **Leverage our IVL Technology to develop new products that satisfy significant unmet clinical needs.** For its approved uses, our IVL System has been shown to be safe, effective and easy to use. We see a significant opportunity for the expansion of our IVL Technology beyond our current indications, and we have robust research and development capabilities and a growing intellectual property portfolio to support such expansion. We believe our ability to rapidly and cost-effectively develop innovative products is in large part attributable to our fully integrated product development process. Ultimately, our plan is to have a family of IVL catheters that can be used in our IVL System to treat calcium-related vascular disease throughout the body.
- **Drive profitability by scaling our business operations to achieve cost and production efficiencies.** We plan to drive profitability by expanding the scale and improve the efficiency of our manufacturing process with the goal of lowering our costs and having enough supply to meet demand as we grow our business. We intend to move our production to our new facility in Santa Clara, California in 2019, which we expect to provide us enough manufacturing space to support our business for the foreseeable future. In the future we intend to lower our cost of goods sold through productivity improvements, the implementation of lean manufacturing and fixed cost absorption as we grow volume.

The Market

Occlusive Calcified Cardiovascular Disease (Atherosclerosis)

Atherosclerosis is a common disease associated with aging in which arteries become narrowed and the supply of oxygenated blood to the affected organ is reduced by the progressive growth of plaque. Atherosclerotic plaque is comprised of fibrous tissue, lipids (fat) and, when it progresses, calcium. This calcium can be present in multiple layers of the artery. Primarily, it is found in the intimal layer and the medial layer. None of the commercially available technologies, other than our IVL System, are able to adequately target both the intimal and medial layers of calcium.

The first two indications which we have sought to develop our IVL Technology to treat atherosclerotic occlusive PAD and CAD. These diseases decrease the diameter of the blood vessel which impedes the heart's ability to pump oxygenated blood throughout the body and can lead to heart attacks, organ failure, claudication (severe leg pain), tissue loss (including amputation) and ultimately death. In the future, we see a significant opportunity for the use of our IVL Technology in the potential paradigm shifting treatment of AS, a disease characterized by calcification of the aortic valve, which can also lead to death if left untreated.

As of 2018, the global market opportunities for medical devices that treat occlusive PAD and CAD are approximately $2.9 billion and $10 billion, respectively, according to DRG. Within these segments, the presence of calcified disease is as high as 30% to 75% of procedures, representing a combined, immediately total addressable market opportunity of over $3.5 billion for our IVL System. Likewise, our TAVL System could potentially have a total addressable opportunity of over $3 billion if it is determined to be safe and effective for

treating the aortic valve and we are able to obtain relevant regulatory approvals or clearances. We expect these markets to grow significantly due to the following trends:

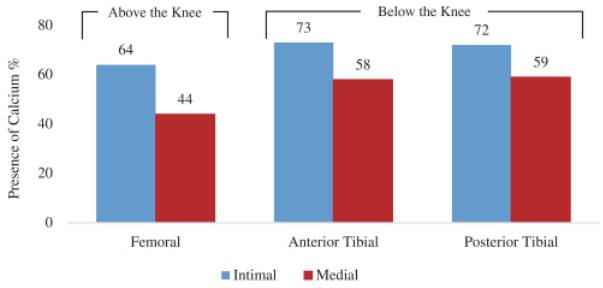
- global, aging population;
- meaningful increase in the number of diabetic patients;
- additional clinical evidence that supports endovascular treatment of cardiovascular disease;
- improvement of technologies to enable safer and more effective endovascular treatment;
- growing evidence of the complications and costs associated with surgical treatment of cardiovascular disease;
- continued support and education of the growing number of physicians who treat cardiovascular disease; and
- increasing patient awareness and physician adoption of less invasive endovascular treatment options.

Peripheral Artery Disease (PAD)

PAD is the narrowing or blockage of vessels that carry blood from the heart to the extremities, caused by the buildup of plaque within the walls of arteries. It is a common, under-diagnosed and under-treated disease whose global patient population, estimated at more than 200 million in 2010 by a paper published in *The Lancet*, is driven by an aging population and increased rates of diabetes, among other causes. The most common symptom of PAD in the lower extremities is claudication and painful muscle cramping in the hips, thighs or calves when walking, climbing stairs or exercising. The more advanced form of PAD, CLI, is characterized by resting pain and sores or wounds that heal slowly and, if not resolved, can lead to amputation of a limb. The PAD population in the United States is estimated to be at least eight million people. Calcium is a prevalent problem and the "calcium" segment of the PAD market is a relatively high percentage of the current commercial market.

Moderate-to-severe calcium can occur in different parts of the peripheral vasculature, including:

- **Femoropopliteal:** Over 325,000 estimated worldwide cases of heavily calcified procedures annually, representing a nearly $700 million total addressable market opportunity for our IVL System.
- **Common Femoral Artery, Iliac Artery:** Over 300,000 estimated worldwide cases of heavily calcified procedures annually, representing a $600 million total addressable market opportunity for our IVL System.
- **Infrapopliteal (Below the Knee ("BTK")):** Over 180,000 estimated worldwide cases of heavily calcified procedures annually, representing a nearly $400 million total addressable market opportunity for our IVL System.



***Medial Calcification Prevalence** is higher in PAD below the knee than above the knee, creating additional challenges for effective treatment and the potential for complications increasing the risk of amputation. Soor, et al, Pathology, June 2008; from ScienceDirect.*

There are expected to be nearly 750,000 PAD endovascular procedures performed in the United States and an additional 500,000 PAD endovascular procedures performed in other developed international markets to treat occlusive disease in 2018, according to DRG. A significant portion of these procedures involves moderate-to-severe calcium, which varies in intensity between vessels. In 2018, the total market for endovascular devices used to treat occlusive PAD was estimated to be approximately $2 billion and $950 million in the United States and international markets, respectively, as reported by DRG. Of this, the plaque modification market for PAD is estimated to be over $600 million annually, nearly all of which is in the United States.

Vessel(s)	Region	Endovascular Procedure Volume(1)	% Calcification(2)
Femoropopliteal (includes superficial femoral artery (“SFA”))	United States	339,000	50%
	International	337,000	
Iliac	United States	212,000	70%
	International	182,000	
Infrapopliteal (BTK)	United States	152,000	65%
	International	133,000	
TAVR Access	United States	55,000	15%
	International	70,000	
EVAR / TEVAR Access	United States	53,000	15%
	International	107,000	
Common Femoral (Surgical Endarterectomy (“CFE”) + Endovascular)	United States	50,000	75%

(1) Annual procedures in the United States and internationally (nine European countries and Japan), according to DRG, an article published in the Journal of Thoracic Disease *and Company estimates.*

(2) Proportion of annual procedures associated with calcified disease, according to Yost, M. L., Prevalence and Significance of Calcium, Vulnerable Plaque and Plaque Morphology in Peripheral Artery Disease (PAD). Beaufort, SC: THE SAGE GROUP; 2016 (for femoropopliteal, BTK, TAVR and common femoral) and Company estimates based on multiple occlusive disease studies (for iliac and EVAR / TEVAR).

Coronary Artery Disease (CAD)

CAD is the narrowing or blockage of the arteries that supply blood to the heart, caused by the buildup and rupture of plaque within the walls of arteries. As with PAD, its growing prevalence is driven by an aging population and increased rates of diabetes, among others. According to the American Heart Association, approximately 15.5 million people in the United States suffered from CAD in 2016. Patients are treated for CAD following either a heart attack or after presenting symptoms, such as angina, which is an acute pain in the chest. As is the case with PAD, the primary goal of treatment of CAD is to re-open the coronary artery in order to restore adequate blood flow to the heart muscle.

Plaque modification devices for treating CAD are under-penetrated in the market due to a number of reasons, including the difficulty to use available devices, their limited effectiveness in some cases and the potential for serious complications to the patient. Despite these significant limitations, they still represent a market of nearly $100 million in 2018 in the United States and Japan alone, according to DRG, an amount we believe is significantly larger globally. Moreover, due to increasing prevalence of calcified disease, we believe that our safe, simple and effective solution in approved indications can increase the utilization of IVL Technology beyond the existing market for plaque modification devices.

Aortic Stenosis (AS)

AS is a condition where the heart's aortic valve, which regulates oxygenated blood flow from the heart to the rest of the body, becomes increasingly calcified with age. As the calcium burden on the valve increases, the valve narrows and stiffens, reducing the ability to pump blood from the heart to the rest of the body. Patients who become symptomatic and/or are diagnosed with severe AS are treated by surgically replacing the aortic valve. Historically, this procedure, SAVR, was a highly invasive surgical procedure. Over the last decade, a new class of devices known as TAVR has enabled interventional cardiologists to replace the valve through a less invasive, catheter-based endovascular approach. According to an article published in the *Journal of Thoracic Disease* in 2017, the global market for TAVR is estimated to be over 125,000 procedures performed worldwide in 2018 and is expected to grow to nearly 300,000 by 2025.

***AS** results from calcification that inhibits the aortic valve from opening and closing effectively.*

Current Treatments & Limitations

Occlusive Calcified Cardiovascular Disease (Atherosclerosis)

The primary approaches to treat occlusive cardiovascular disease are balloons, DCB, stents and DES. The drug-eluting technologies were designed to reduce restenosis rates associated with balloons and bare metal stents. The application of medical therapy via balloons or stents targets the inflammatory response caused by the use of devices, to reduce the risk of restenosis. The delivery of drugs in conjunction with vessel dilation has been shown to improve long-term results in atherosclerotic disease. Treatment with balloons and stents is often suboptimal because calcified vessels fail to expand under pressure. This in turn can lead to acute failure, damage to the intimal layer leading to restenosis or acute complications requiring adjunctive tools or conversion to bypass surgery.

Plaque modification devices have also meaningfully contributed to the advancement in the treatment of cardiovascular disease. These devices are designed to improve the outcomes of angioplasty and stenting by modifying the calcium, thus improving the ability of the vessels to expand. Some of these devices are incremental, such as specialty angioplasty balloons, and others are more paradigm-shifting, such as atherectomy. The specialty balloon devices incorporate metallic elements like wires and cutting blades onto standard angioplasty balloons; these devices are intended to make discreet cuts in the plaque and surrounding tissue. The atherectomy devices vary in function with mechanisms, including carving, "sanding", high-pressure mechanical disruption, focused dissection and laser ablation of the plaque and surrounding tissue.

In patients with moderate and severe calcium, the complications associated with endovascular treatment are significantly increased. Particularly in cases where there is medial calcium, where existing plaque modification devices cannot effectively modify the calcium without damaging the surrounding tissue. These severe complications commonly include:

- **Dissections**: The abnormal, and usually abrupt, formation of a tear along the inside wall of an artery. If the tear is large enough, blood can accumulate behind the tear creating blood clots or the tear itself can block the flow of blood. Treatment options for managing a dissection include additional balloons, stenting or for PAD, implantation of a covered stent.

- **Embolization**: Particles that travel down the bloodstream and occlude the artery as it narrows. These particles can be blood clots, thrombus, vascular tissue or calcium. While embolization is inherently a risk with all procedures, the use of cutting or sanding tools increases the risk of creating these particles as part of the procedure to occlude blood flow.
- **Restenosis:** Re-occlusion of the vessel following endovascular treatment, leading to the need for one or more repeat treatments.
- **Vessel Perforations**: A hole or break in the vessel wall. Depending on where the perforations occur in the vasculature, this could be a life-threatening event. Treatment is usually implantation of a covered stent.
- **Vessel Recoil**: After expansion is created by ballooning or stenting, the vessel does not maintain its larger diameter and recoils to a smaller diameter which continues to inhibit blood flow. With balloons, this may mean insufficient lumen gain. With stenting, this may result in an under-expanded stent, which is a serious complication that may require surgery to repair.

Advances in technologies have addressed many of the challenges associated with non-calcified lesions. However, these advancements do not adequately address the challenges posed by calcified lesions. For example, DCB and DES have generally been studied in patients without severe calcification. In the limited PAD clinical trials where DCB have been evaluated in severely calcified arteries, their effectiveness was significantly lower than in non-calcified arteries and not noticeably different than other treatment modalities, according to a study published in *CardioVascular and Interventional Radiology* in May 2014.

Plaque modification devices were initially considered the advancement needed to effectively treat all lesion types, including calcified lesions. However, due to the nature of how these devices modify the vessel, their use can create additional complications, including severe dissection, perforation and distal embolism. Furthermore, because these devices can cause damage to the surrounding healthy artery, they may increase the risk of restenosis, which would put the patient at an increased risk of requiring a repeat procedure.

We believe that by successfully addressing cardiovascular calcification and by enabling safer and more effective treatment of the disease, the use of our IVL Technology delivered through our IVL System will lead to an increase in the number of patients who receive endovascular treatment for calcified cardiovascular disease rather than surgery in approved indications.

Peripheral Artery Disease (PAD)

Initial treatment for PAD is through medication and lifestyle adjustments. More advanced cases are treated using invasive CFE (surgical removal of the inside of the blood vessel), surgical bypass or minimally invasive interventional procedures. The primary goal of interventional therapy is to re-open the peripheral artery to restore adequate blood flow, thereby eliminating leg pain or supporting wound healing.

Percutaneous Balloon Angioplasty (“PTA”) is a catheter-based procedure that uses a balloon to open a blood vessel. It is the most common tool for PAD due to its simplicity and low cost. However, balloons often fail to open the vessel due to vessel recoil, which occurs when the diseased vessel fails to stay open immediately after the PTA procedure. PTA procedures also use high pressure which can cause vessel injury, and which is associated with poor long-term outcomes. When PTA fails, stent implantation can help improve acute outcomes and has better long-term outcomes than PTA. But in many cases, stent implantation is not preferred because it leaves metal in the peripheral arteries reducing future treatment options. Considerations for selecting a device to treat PAD include planning for the best acute outcome, choosing a therapy that may provide good long-term outcomes and the eventual likelihood of re-intervention or intervention in another part of the vasculature.

Moderate-to-severe calcium poses different challenges and an unmet need in various parts of the peripheral vasculature. The use of high-pressure balloons and stents can result in dissection, perforation and barotrauma,

which result in restenosis. The use of atherectomy devices damages the vessel and can cause embolization. Further, heavy calcium can prevent full stent expansion and can also cause vessel recoil after angioplasty due to the stiffness of the vessel.

- **Femoropopliteal:** Endovascular intervention is the most common treatment for occlusive disease in the femoropopliteal arteries, principally via atherectomy, PTA and stenting. While endovascular procedures are generally profitable for hospitals, treating complex lesions is much more resource intensive, and treatment of these types of patients can be unprofitable for hospitals.
- **Common Femoral Artery:** The common femoral artery is found at the junction between the SFA and the iliac arteries. Occlusive disease in this location is typically treated by CFE. Recent studies, however, have shown that CFE is not a benign procedure and not all patients are good candidates for this therapy. CFE can lead to complications such as infection and an increased length of hospital stay for the patient. Endovascular treatment has not been considered a primary treatment option previously due to calcium-related risks, such as embolization and dissection, which is subsequently treated with stenting and risks blocking blood flow.
- **Infrapopliteal (BTK):** BTK lesions are more commonly found in patients with the more advanced CLI. The most common clinical treatment approach is PTA. Failure of PTA, including balloon rupture, is more common in BTK lesions because medial calcification is most prevalent in these vessels and because the vessels are smaller and more tortuous. Reinterventions due to failed treatment are also more common, as they are required to ensure adequate blood flow for ongoing wound healing. Importantly, calcium has been shown to be an independent predictor of poor wound healing and increased amputation risk in patients with CLI. Further, distal emboli can be a severe complication in patients with CLI.
- **Iliac Artery:** Stenting is considered the standard of care for symptomatic iliac disease with good acute diameter gain and long-term outcomes. Though calcium is common in the iliac arteries, modifying calcium in these vessels has not previously been an option because of the large diameter and potentially catastrophic outcome if the iliac is ruptured during treatment. As a result, atherectomy devices are not approved for use in the iliac arteries.

Calcified iliac and femoral arteries can hinder the delivery of large endovascular devices for other catheter-based procedures, including those that treat aortic aneurysms (EVAR and TEVAR), severe aortic stenosis treated with TAVR and cardiac support devices for high-risk PCI (e.g. Abiomed's Impella). The standard practice for these procedures is to gain vascular access in the femoral artery and insert large diameter sheaths that facilitate the delivery of the treatment devices to the aorta or the heart. However, when significant calcium is present in these arteries, it can prevent delivery of the devices, and thus may require more invasive treatments, increase complications or prevent the device from being used altogether. For example, in up to 20% of patients, the transfemoral approach through the iliac and femoral arteries is not viable for TAVR delivery or creates risk due to the extent of vascular calcification, according to a 2018 study in the *Journal of the American College of Cardiology*.

With increasing frequency, our IVL System using our M5 catheters is being used to crack the ilio-femoral calcium prior to insertion of devices that are delivered via large-diameter catheters. Treating these arteries with our IVL System makes them more pliable and enables them to stretch and bend, thus accommodating the large-diameter catheters required for TAVR, EVAR, TEVAR and Impella. We have observed that many of the cardiologists using TAVR and Impella in Europe also perform PCI in the same interventional lab. Introducing physicians in the United States to our IVL System for large bore access can be beneficial in terms of building awareness and access to our IVL Technology in advance of the regulatory approval or clearance of our C2 catheters in the United States.

In December 2018, we entered into a collaboration with Abiomed, a leading global provider of medical devices that provide circulatory support. Pursuant to this collaboration, we will work with Abiomed to integrate our products into Abiomed's physician training and education programs. In connection with the collaboration, Abiomed purchased shares of our Series D convertible preferred stock.

There are multiple treatment options for PAD across the different vessel types throughout the vascular system. Each treatment type presents different limitations and safety issues, which restrict their use by physicians. The following table summarizes the treatment options for each vessel type, their frequency of use and the challenges calcium poses for each treatment option.

Vessels	Endovascular Treatment	Frequency of Use	Challenges Associated with Use in Calcified Lesions
Femoropopliteal & Common Femoral	PTA & DCB	Moderate	• Perforation, Dissection, Recoil • Limited Drug Uptake (DCB)
	Stents & DES	Moderate	• Crushed Stents • Perforation, Dissection, Recoil
	Plaque Modification	Moderate	• Lack of efficacy in medial calcium • Difficulty of use and procedure time
Iliac	PTA	Moderate	• Dissection • Perforation
	Stents/covered stents	High	• Recoil • Catastrophic perforation
	Plaque Modification	Low	• Large vessel size • Embolization
Infrapopliteal (BTK)	Angioplasty	High	• Perforation, Dissection, Recoil • High restenosis rates
	Stents	Low	• Increases complexity of reintervention • Embolization
	Plaque Modification	Moderate	• Lack of efficacy in medial calcium

Coronary Artery Disease (CAD)

The most common treatment for patients with CAD is PCI. This involves a suite of devices to facilitate successful angioplasty and stenting (most commonly DES) of the culprit artery or arteries. According to DRG, there are nearly 4 million PCI procedures performed globally every year, and the growth in PCI procedures is more than 5% annually. A study published in the *American Journal of Cardiology* in 2014 demonstrated that more than 30% of patients undergoing PCI have calcified lesions and that this percentage is growing. Calcium can impair the ability to deliver and expand coronary stents. The complication rates for patients undergoing PCI increase significantly with a greater calcium burden. Further, the long-term outcomes in patients who have increased calcium are worse, including increased risk of death and increased need for target lesion revascularization. Due to the demographic changes discussed earlier, the percentage of PCI cases that include moderate-to-severe calcium are increasing at a faster rate than the growth of non-calcified PCI cases. There is an unmet need for tools to safely and effectively treat calcified CAD, which is increasing.

As with PAD treatment, plaque modification devices are used to facilitate PCI in patients with moderate-to-severe calcium. This class includes atherectomy devices and specialty angioplasty balloons. The most common mechanism in coronary atherectomy is to "sand" the calcium with miniature, high-speed, drill-like catheters known as either "rotational" or "orbital" atherectomy. Physicians typically use these devices in conjunction with, and in preparation for, stents and balloons. When there is significant calcium present and plaque modification devices are not used successfully, however, it is difficult to fully expand the stent due to the

under-treated calcium, and when stents are under-expanded there is an increased risk of stent thrombosis, creating an increased risk that the patient suffers from chest pain or a future heart attack.

Due to the risk of complications and complexity of the anatomy, coronary atherectomy devices are difficult to use. They necessitate specialized training, physician certification and significant support from manufacturers. Use of these devices can cause severe complications and damage to healthy tissue due to the high-speed rotation of atherectomy and the high-pressure mechanical trauma of specialty balloons. These complications include severe dissection, perforation and distal embolism. When these complications occur during treatment of a coronary artery, the patient may experience major adverse events ("MAE"), including greater damage to the heart (myocardial infarction) and even death. Because these devices can damage the surrounding healthy artery, they may increase the risk of future restenosis, which puts the patient at risk of a heart attack or the need for a repeat procedure. Specialty balloon devices also incorporate metallic elements like wires and cutting blades onto standard angioplasty balloons. These devices are intended to make discreet cuts in the plaque and surrounding tissue.

For many interventional cardiologists and treatment centers, the burden of training and certification, the increased time and complexity in using plaque modification devices and the risk of serious procedural complications limit the use of such devices. This has led to a low penetration in cases with significant calcium burden.

Device Type	Device Utilization in Calcified Cases	Challenges
Atherectomy	**Low**	• Ease of Use • Dissections & Perforations • Distal Embolism • Bifurcated lesions • Large vessels (i.e., Left Main Artery) • Damage to healthy vessel • Tortuous vessels
Specialty Balloon	**Low**	• Efficacy in severe, diffuse calcium • Dissections & Perforations • Damage to healthy vessel

Aortic Stenosis (AS)

Patients who become symptomatic and/or are diagnosed with severe AS are treated by replacing the aortic valve. Historically, this procedure was a highly invasive surgical procedure. Over the last decade, however, TAVR has enabled interventional cardiologists to replace the valve through a less invasive, catheter-based endovascular approach. The introduction of TAVR has led to a paradigm shift in treating patients with severe AS and has enabled access to a life-saving therapy for severe AS patients who otherwise would generally have no safe and effective option. TAVR has also led to an increasing diagnosis of patients with symptomatic severe AS. TAVR, however, introduces the potential for certain significant complications, including risk of ischemic stroke and cardiovascular complications associated with the delivery of the catheter. In patients with severely stenotic and calcified iliofemoral disease, the large diameter catheters required to deliver TAVR devices can create severe cardiovascular complications or even necessitate the use of alternative access routes, such as the subclavian, direct aortic, transcaval and transapical approaches. Furthermore, TAVR outcomes can be compromised or can be prohibitive in patients with poor ventricular function or other co-morbidities that preclude safe administration of the pharmaceutical regimen required after the TAVR procedure. We believe there is significant potential for our IVL Technology to be used as a synergistic procedure to facilitate TAVR access and thus avoid a potentially more invasive procedure. Additionally, we are evaluating the use of our IVL Technology to directly treat patients with symptomatic severe AS in clinical feasibility trials as an alternative to aortic valve replacement. Our TAVL System is designed to safely crack calcium in the aortic valve leaflets, thereby improving leaflet mobility and reducing the severity of AS.

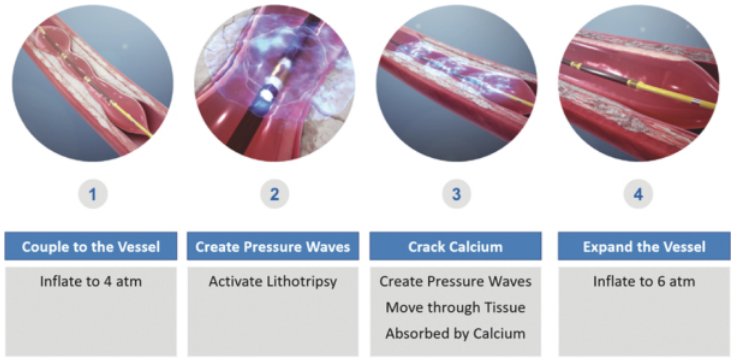
Our Approach

Our IVL System utilizes a generator, connector cable and IVL catheter to create short bursts of sonic pressure waves that travel through the diseased vessel. These pressure waves crack calcium with an effective pressure of up to 50 atm without harming the soft tissue of the vessel. The IVL catheter consists of a semi-compliant balloon catheter integrated with multiple lithotripsy emitters specific to each region of the body.

During the procedure, the IVL catheter is advanced to the target lesion, and the integrated balloon is inflated with fluid at a low pressure so the balloon is able to make contact with the artery wall and facilitate efficient energy transfer. IVL is then activated with the touch of a button on the connector cable, creating a small bubble that rapidly expands and collapses within the catheter balloon. The expansion and collapse of this bubble creates sonic pressure waves that pass through the artery and cracks both intimal and medial calcium, making the artery more compliant, enabling it to be dilated by the balloon at very low pressures. This minimizes injury inherent with traditional high-pressure balloon dilations or atherectomy devices typically used to treat calcified lesions.

After cracking the calcium with IVL, the physician may decide to perform additional endovascular treatments, depending on the location and type of lesion. IVL enables more effective delivery and expansion of stents or balloons at lower pressure. When followed by an anti-proliferative therapy such as DCB or DES, the micro-fractures may enable better drug penetration into the arterial wall and improved drug uptake, thereby improving the effectiveness of the combined treatment.

The IVL Procedure



We believe there is significant opportunity to apply our IVL Technology as a platform to treat a broad scope of vasculature, and therefore a broad scope of indications. The interchangeability of specific catheters enables delivery of IVL therapy across diseased vasculature throughout the body. Ultimately, our plan is to have a family of IVL catheters that can treat calcium-related vascular disease.

ShockWave IVL System Components

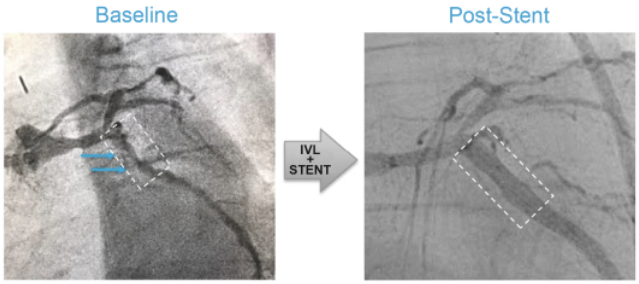
ShockWave IVL Catheters: Our IVL catheters are prepared in the interventional lab and delivered through the blood vessel, just like traditional balloon angioplasty devices. Our IVL catheters incorporate proximal and distal radiopaque markers for visibility under fluoroscopy. At the touch of a button, miniaturized lithotripsy emitters create high-pressure sonic waves through a conversion of electrical energy into mechanical energy. These pressure waves are created along the length of the balloon at a frequency of one per second and propagate spherically from the emitters to impact calcium in all directions.

IVL Connector Cable: Our IVL catheters attach to our IVL connector cable through a magnetic plug designed to provide a simple and secure connection. The physician activates the lithotripsy by pushing a button on the IVL connector cable.

IVL Generator: Our compact, battery-powered, rechargeable IVL Generator is linked to the balloon catheter via the IVL connector cable. By design, the IVL Generator recognizes which type of IVL catheter is connected and the generator software then determines how much power and how many pulses to deliver.

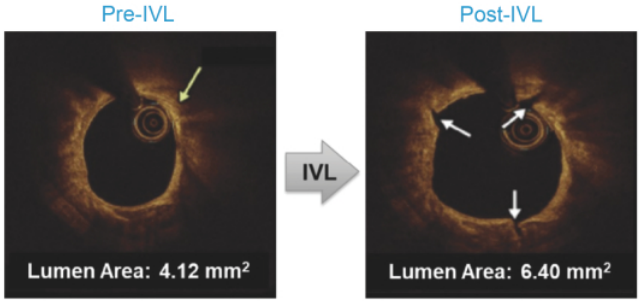
Angiographic Images of Calcified Coronary Lesion Prior to IVL, Post-IVL and Post-Stent

The angiogram images below show the treatment of a heavily calcified left anterior descending artery in the heart. Baseline imaging shows a calcified stenosis, to which IVL is delivered at a balloon pressure of only 4 atm. With subsequent pulses and without increasing the balloon pressure, the balloon expands, demonstrating IVL's efficacy in cracking calcium and making the artery more compliant. The final angiogram shows a widely patent vessel after stent implantation.



OCT Images of Calcified Coronary Lesion Prior to IVL and After IVL

Below, optical coherence tomography ("OCT") imaging shows on the left, stenotic vessel with circumferential calcium prior to treatment by IVL and on the right, cracks in the calcium and luminal diameter gain (from 4.1 mm^2 to 6.4 mm^2) following IVL.



Broad Anatomical Applications

Below is a summary of the vasculature in which IVL can be used and what we believe are its benefits:

Patient Segment		Expected IVL Advantages
PAD	Femoropopliteal (including SFA) Iliac Occlusive Disease Common Femoral Infrapopliteal (BTK)	• Improves ease of use • Reduces procedure time • Lowers complications • Helps with cost containment • Addresses medial calcium • Reduces risk of complications (e.g. dissection, rupture) • Enables stent delivery and full expansion • Avoids embolic debris in the profunda artery • Enables safe endovascular treatment options • Avoids risks associated with surgical endarterectomy • Improves outcomes • Provides option for treating the trifurcation • Lowers complications vs. atherectomy • Reduces recoil • Addresses medial calcium
EVAR & TEVAR	Access Stent-graft Deployment	• Reduces complications associated with large-diameter delivery systems • Enables transfemoral access and contains costs • Reduces complications associated with under-expanded iliac grafts
CAD	Stable Angina Acute Coronary Syndromes (unstable/emergency patients)	• Improves ease of use • Reduces procedure time • Lowers complications • Improves outcomes • Lowers complications vs. direct stenting • Improves outcomes vs. direct stenting • Reduces hospitalization time vs. staged procedures
AS	TAVR Access Primary Therapy	• Reduces complications • Enables transfemoral access • Reduces costs associated with alternate access • Stabilizes patients to improve future treatment options • Avoids the long-term risks associated with an implant

Our Products

Current Marketed Products

We are marketing our IVL System using M5 catheters (“medium” vessel, five-emitters) for treating PAD in the United States and internationally. We are marketing our IVL System using C2 catheters (coronary, two-emitters) for treating CAD in select international markets. We received an investigational device exemption (“IDE”) to conduct our pivotal global study for our IVL System using our C2 catheters, which is intended to support U.S. FDA and Japanese Shonin approval of the device. We expect to commence enrollment of the study in early 2019. Our IVL catheters resemble in form and function a standard balloon angioplasty catheter, the

device most commonly used by interventionalists. This familiarity makes our IVL System easy to learn, adopt and use on a day-to-day basis.

Our IVL catheters are single-use and are powered in our IVL System by our non-disposable IVL Generator and IVL connector cable.

Disposable Products	Specifications	Indications	Regulatory Status
	• 3.5 – 7.0 mm diameter • 60 mm length • 5 lithotripsy emitters • 6 & 7 Fr sheath compatible • 300 pulses (max)	Peripheral vascular use excluding carotid and cerebral vessels	FDA 510(k) clearance and CE Mark in 2018
	• 2.5 – 4.0 mm diameter • 12 mm length • 2 lithotripsy emitters • 6 Fr guide compatible • 80 pulses (max)	Calcified *de novo* coronary arteries in CAD	CE Mark in 2018 Ongoing global IDE study. Enrollment expected to begin in early 2019.

Reusable Products	Specifications	Indications	Regulatory Status
	• Compact & portable • Rechargeable power supply • 3 kV output at 1 Hz • Intuitive controls • Ergonomic handle • Reusable	For use with ShockWave Medical IVL catheters	FDA 510(k) in 2016 and CE Mark in 2014

Our Product Pipeline

We believe there is a significant opportunity to apply our IVL Technology to additional cardiovascular indications. Our strategy is to maintain a robust, efficient product development team that will continue to create lithotripsy-based products that meet our customers' unmet needs. In addition to our pipeline of new products, we will continue to focus on building clinical evidence through both company-sponsored and investigator-sponsored research.

Pipeline Product	Specifications	Indications	Regulatory Status
	• 2.5 – 4.0 mm diameter • 40 mm length • 4 lithotripsy emitters • 5 Fr sheath compatible • 160 pulses (max)	Peripheral vascular use excluding carotid and cerebral vessels	FDA 510(k) and CE Mark in 2018

The next product that we plan to broadly commercialize through our IVL System will be our S4 catheter ("small" vessel, four-emitters) for treating PAD BTK. We have 510(k) clearance and CE Mark for the use of our S4 catheters in our IVL System. Our experience to date suggests the S4 catheter may be effective at modifying the calcium below-the-knee (which includes significant medial calcium) without causing distal embolic clinical events. We are continuing to assess the performance of the product, including its deliverability and durability in long, calcified and stenotic lesions. The S4 catheter is powered by the same generator and connector cable that power the other IVL catheters.

In July 2018, we initiated and subsequently completed a voluntary recall of the S4 catheters based on an inability of the balloon to maintain inflation due to suboptimal balloon wall thickness in some of the sizes. We

are currently engaged in a limited market release of the product to test its performance in the heavily calcified and challenging BTK environment. There were no reports of adverse clinical events related to this issue.

Transcatheter Aortic Valve Lithotripsy (TAVL)

We are also exploring the ability of our IVL Technology to directly treat calcified aortic valves to safely reduce the symptoms of and potentially delay or negate valve replacement treatment for AS. Our IVL Technology can potentially be used to apply lithotripsy directly to the aortic valve leaflets, called transcatheter aortic valve lithotripsy ("TAVL"). This represents a potentially significant long-term opportunity and is currently in clinical feasibility trials. Our TAVL System is designed to safely crack calcium in the aortic valve leaflets, thereby improving leaflet mobility and reducing the severity of AS. If TAVL-mediated calcium fracture is successful, valve leaflets will be re-mobilized and the valve will open more effectively, allowing increased blood delivery from the heart to the rest of the body. The initial goal of this technology is to safely, and without the associated risks of a prosthetic valve implant, decrease the severity of AS and its associated symptoms. We believe our TAVL System could provide a valuable alternative treatment option for a significant population of patients with AS including those who are:

- absolutely contraindicated for SAVR or TAVR;
- at higher risk for complications from SAVR or TAVR;
- in need of treatment for other conditions prior to receiving TAVR, such as hip or knee replacement, cancer surgery, correction of metabolic or nutritional deficiency;
- younger, for whom delaying valve replacement may reduce the likelihood of needing a subsequent valve-in-valve procedure; and
- suffering from moderate AS (in whom treatment with our TAVL System could delay the onset of symptomatic severe AS).

Clinical Studies

Overview of Clinical Programs

We are committed to obtaining clinical evidence to support the safety and effectiveness of our products based on our IVL Technology. The data from our clinical studies strengthen our ability to drive the adoption of products based on our IVL Technology across multiple therapies in existing and new market segments. We expect our clinical evidence will support regulatory approvals, provide physicians with safety and efficacy data on the appropriate use of our IVL System and demonstrate the cost effectiveness of our IVL System. A recurring theme across the studies we have conducted is our ability to treat calcified lesions with a strong safety profile.

Investment in clinical evidence is a core strategy of our company. We involve physician advisors who are recognized for excellence in cardiovascular medicine to assist us with clinical study designs. We also seek to ensure rigorous, high-quality data collection and reporting using imaging core laboratories and clinical events committees ("CEC") for an independent assessment of safety and imaging-based effectiveness endpoints.

We have completed five clinical studies with a total of 179 patients, across 22 centers in multiple countries, for peripheral and coronary artery and cardiac valve diseases. We are currently conducting or planning five other studies, involving nearly 2,000 patients in up to 190 centers in the United States and internationally.

Below is a chart of our completed, ongoing and planned clinical programs:

	Name	Trial	Size	Sites	Product	Geography	Primary Endpoint(s)	Outcome / Conclusion	Enrolled
Peripheral	**Disrupt PAD I**	Pre-market, OUS, single arm	n=35	3	MV60	EU; NZ	Acute; 30d	CE Approval	2014
	Disrupt PAD II	Pre-market, OUS, single arm	n=60	8	MV60	EU; NZ	30d; 12m	510(k) Approval	2015
	Disrupt PAD III	Global, post-market RCT	n=400	60	M5	US; EU; NZ	Acute; 12m	Market adoption	—
	Disrupt PAD III Observational Study	Global, post-market registry	n=1,000	60	M5	US; EU	Acute	Market adoption	—
	BTK Registry	Post-market, OUS, single arm	n=20	3	MV60	EU; NZ	30d	Support CE Mark and 510(k) for S4	2016/2017
Coronary	**Disrupt CAD I**	Pre-market, OUS, single arm	n=60	7	C2	EU; AUS	30d	CE Approval	2015/2016
	Disrupt CAD II	Post-market, EU, single arm	n=120	15	C2	EU	30d	Post-Market Study	—
	Disrupt CAD III	Pre-market, Global, single arm	n=392	50	C2	US; EU	30d	US Coronary PMA Approval	—
	Disrupt CAD IV	Pre-market, JP, single arm	n=64	5	C2	JPN	30d	JP Coronary Shonin Approval	—
TAVL	**TAVL FIM Study**	First-in-man feasibility study	n=4	1	C2	Paraguay	30d	Feasibility	2016

Completed Clinical Studies

Clinical Studies to Support Use of our IVL System in the Treatment of PAD to Date

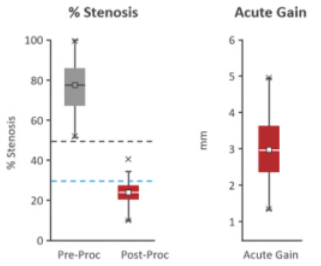
To date, all of our PAD studies were performed using our first generation IVL catheter called MV60. MV60 is identical to our recently introduced M5 catheters in all but two ways. The first difference is that each M5 catheter is able to deliver up to 300 pulses, whereas the MV60 catheter was only able to deliver 180 pulses. The second difference is that each pulse from an M5 catheter delivers approximately 40% more energy than a pulse from the MV60 catheter. These changes have improved the efficacy of our IVL System and helped reduce the overall procedure cost by requiring fewer devices to complete the treatment. In 2019, we expect that all of our M5 catheters will have replaced our MV60 catheters for commercial and clinical trial use.

The Disrupt PAD I study was a prospective, non-randomized, multicenter study to demonstrate the safety and performance of our IVL System using the MV60 catheter in heavily calcified femoropopliteal lesions. This study demonstrated the safety and effectiveness of our IVL System as a standalone treatment in calcified, femoropopliteal PAD up to six months. The study showed 100% procedural results, excellent safety and a low use of adjunctive therapies. The data from this study was supportive of the 510(k) clearance for the use of our M5 catheters in our IVL System.

Between January 2014 and September 2014, 35 patients were enrolled at three centers in Europe and New Zealand. All patients had heavily calcified, femoropopliteal lesions and were treated with standalone IVL System therapy. Key study endpoints included MAEs at 30 days and six months, procedural success, and vessel patency

and freedom from target lesion revascularization (“TLR”) at 30 days and six months. All results were adjudicated by an independent core lab and CEC.

The delivery of IVL catheters was successful in 100% of patients with minimal pre- or post-dilation (8.6% and 14.3% respectively) and no stent implants. There were no vascular complications or MAEs. The results showed a significant reduction in percent diameter stenosis, large acute diameter gain and along with excellent durability of results at 30 days and six months.



High Acute Gain, Low Residual Stenosis, and Minimal Complications

Complications or Adverse Events	Post-Procedure N=60
Dissections D†/E/F	1.7%
Perforations	0% (0)
Abrupt Closure	0% (0)
Slow/No Reflow	0% (0)
Thrombosis	0% (0)

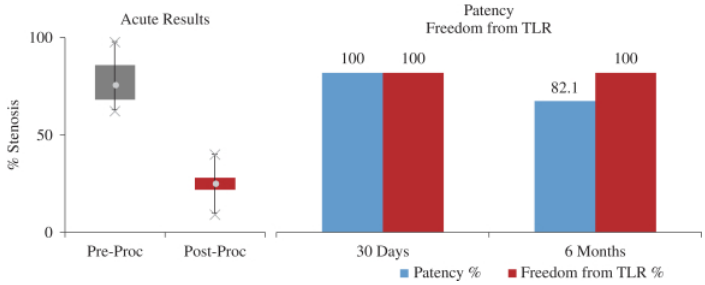
†Guidewire induced through recanalization of a CTO which was resolved with stent placement

(Left) Pre-procedural (Pre-Proc) stenosis (76.3 ±13.5%) measured at baseline, post-procedural (Post-Proc) (23.4 ±5.7%) measured post-index procedure.
(Right) Patency and freedom from TLR

The Disrupt PAD II study was a prospective, non-randomized, multicenter study to demonstrate the safety and performance of our IVL System using the MV60 catheter in heavily calcified femoropopliteal lesions. This study demonstrated the safety and effectiveness of our IVL System in calcified, femoropopliteal PAD up to 12 months. We believe it is the first and only core lab adjudicated study to exclusively enroll heavily calcified disease. The results demonstrated safety and long-term functional benefit from our IVL System in this challenging patient population.

Between June 2015 and December 2015, 60 patients were enrolled at eight centers in Europe and New Zealand. All patients had heavily calcified, femoropopliteal lesions and were treated with standalone IVL System therapy. Key study endpoints included MAEs at 30 days, six and 12 months, procedural success, in addition to vessel patency, freedom from TLR and improvement in functional outcomes at 30 days, six months and 12 months. All results were adjudicated by an independent core lab and CEC, and the study incorporated revised definitions of severe calcification and primary patency as published in the Peripheral Academic Research Consortium (“PARC”) paper.

The acute safety and performance results were positive, particularly for a severely calcified patient population. The original stenosis was 78.2% and the final residual stenosis after IVL System therapy was 24.2%, with an average acute gain of 3.0 mm. The 30-day MAE rate was very low at 1.7%, with only one grade D dissection that was resolved following stent placement. There were no instances of vessel perforation, distal embolization, thrombus, abrupt closure and slow flow or no-reflow events.



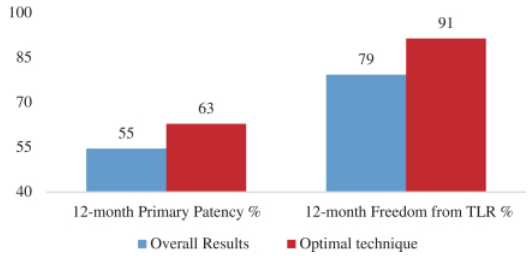
The long-term functional results demonstrated strong durability of our IVL System as a standalone therapy. The safety profile continued to be strong, with no additional MAEs beyond 30 days. Freedom from clinically-driven revascularization at 12 months was 79% and revascularizations were completed using simple, endovascular procedures. Functional outcomes, including patient symptoms measured by Rutherford Category and arterial pulse pressures measured by the ankle-brachial index ("ABI"), showed statistically significant and sustained improvements from baseline.

This study led to an increased understanding of how to teach physicians to optimize our IVL System procedure and obtain better outcomes. Through analysis of the study data, we learned that correct balloon sizing and appropriate therapeutic overlap resulted in improved 12-month primary patency and TLR outcomes. Patients treated with optimal technique had less than 9% TLR at 12 months. Balloon sizing and appropriate therapeutic overlap are simple, intuitive techniques that have been incorporated into physician training to achieve optimal results.

Optimal Technique Can Enhance IVL Energy Delivery and Improve Clinical Patency

Primary Patency: 55% for intent-to-treat versus 63% for those with optimal technique

Freedom from TLR: 79% for intent-to-treat versus 91% for those with optimal technique



Optimal IVL System Technique *was defined as the correct balloon sizing and the avoidance of therapeutic miss. In patients who received optimal technique, 12-month primary patency increased from 55% to 63% and 12-month clinically driven TLR decreased from 21% to 9%.*

The Disrupt BTK study was a prospective, non-randomized, multicenter study to demonstrate the safety and feasibility of our IVL System using the MV60 catheter in heavily calcified infrapopliteal lesions. We believe this study demonstrated the safety and feasibility of our IVL System in calcified, infrapopliteal lesions up to 30 days. Despite using a first generation MV60 catheter, it was successfully delivered in over 95% of this challenging patient population. We also believe that the safety of IVL System therapy for treatment of BTK was demonstrated in this study.

Between June 2016 and April 2017, 20 patients were enrolled at three centers in Europe and New Zealand. All patients had heavily calcified, infrapopliteal lesions, and were treated with standalone IVL System therapy. Key study endpoints included MAEs at 30 days, reduction in stenosis and procedural success. All results were adjudicated by an independent core lab.

The delivery of IVL catheters was successful in 95% of patients. There were no MAEs and no vascular complications, including flow-limiting dissections, perforation, distal embolization, abrupt closure and slow flow or no-reflow events. Two stents were placed per the physician discretion. The results showed a low residual stenosis and large acute gain, with minimal vascular complications that are consistent with IVL System results in femoropopliteal lesions. The Disrupt BTK experience informed the design of the S4 catheter in heavily calcified infrapopliteal lesions. These patients present with CLI, which has a risk of target limb major amputation and responds poorly to traditional balloon angioplasty.

Clinical Studies to Support IVL System Use in the Treatment of CAD to Date

The Disrupt CAD I study was a prospective, non-randomized, multicenter study to demonstrate the safety and performance of our first generation coronary IVL catheter in heavily calcified coronary lesions prior to stenting. This study was our first in CAD and we believe it demonstrated the safety and performance of our IVL System in heavily calcified coronary lesions prior to stenting. The results of this study supported CE Mark approval of the use of our C2 catheters in our IVL System.

Between December 2015 and September 2016, 60 patients were enrolled at seven centers in Europe and Australia. All patients had heavily calcified, coronary lesions and were treated with IVL System therapy followed by DES implantation. Key study endpoints included major adverse cardiac events (“MACE”) at 30 days, and procedural success was defined as residual stenosis < 50% after stenting and no in-hospital MACE. Additional endpoints include MACE at six months and angiographic success. All results were adjudicated by an independent core lab and CEC.

Angiographic Complications **Achieved <50% stenosis in all patients, despite >90% of patients having moderate-to-severe CAD**

Complications	Procedural	Post-Stent
Dissections		
D	3.3%	0%
E	0%	0%
F	0%	0%
Perforation	0.0%	0.0%
Abrupt Closure	0.0%	0.0%
Slow flow	0.0%	0.0%
No reflow	0.0%	0.0%

Safety	Results	Events
30 day MACE[1] Cardiac death, MI or TVR	5%	Death N = 0 QWMI[2] N = 0 NQWMI N = 3 TVR N = 0
6 month MACE[1] Cardiac death, MI or TVR	8.5%	Death N = 2 QWMI[2] N = 0 NQWMI N = 3 TVR N = 0

Effectiveness	Results
Clinical Success[3] Residual stenosis <50% post-PCI with no evidence of in-hospital MACE	95%
Device Success Successful device delivery and IVL treatment at target lesion	98.3%
Stent Delivery	100%

[1]CEC adjudicated
[2]NQWI defined as 3x upper limit CK-MB
[3]Core Lab adjudicated

Disrupt CAD I results showed safety and effectiveness at 30 days and six months

The results of Disrupt CAD I Study were positive and we believe demonstrated the safety and effectiveness of our IVL System in heavily calcified coronary lesions prior to stenting. There were no instances of perforation, abrupt closure or slow flow or reflow events. There were two procedural dissections that were treated as per the standard of care with a DES and did not require additional procedures or result in an event. The 30-day MAE rate was five percent. There were only three non-Q-wave myocardial infarctions, as determined by cardiac biomarkers and all three patients were discharged without additional events. The IVL catheter was delivered in 98% of patients, and all patients were treated with a DES and successfully facilitated stent delivery and expansion. We believe this trial showed excellent procedural results and safety at 30 days and six months.

The Disrupt CAD I OCT Sub-study was a pre-specified sub-study to demonstrate the mechanism of action and effectiveness of coronary IVL in heavily calcified coronary lesions prior to stenting. The study utilized intravascular OCT imaging to demonstrate the mechanistic effects of our IVL System on calcium. OCT imaging clearly showed cracks in the calcified lesions after being treated with IVL System therapy. These cracks are consistent with the intended effect that IVL has on calcium.

Thirty-one of the 60 enrolled CAD I patients underwent OCT imaging at three time points: prior to IVL; after IVL but prior to stenting; and at the end of procedure. The goal was to assess the impact of IVL System therapy on calcified coronary lesions using high resolution, OCT intravascular imaging. Key study endpoints included acute area gain, minimal stent area, stent expansion and vascular complications. An independent core lab analyzed all images, showing that IVL resulted in calcium fractures at multiple locations along the treated lesion, resulting in a significant gain in the vessel area and favorable stent expansion.

Other Clinical Studies to Date

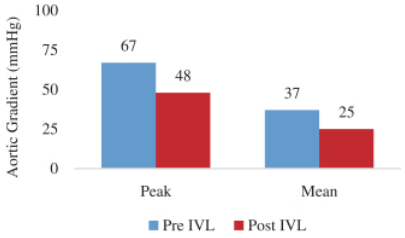
The Transcatheter Aortic Valve Lithotripsy Feasibility Study was a preliminary, first-in-man feasibility study to assess the early safety and feasibility of our TAVL System in calcified, stenotic aortic valves prior to a surgical valve replacement. In a small series, we believe we were able to demonstrate that our IVL Technology can be safely applied to calcified aortic valves and result in acutely increased valve areas and reduced gradients.

Aortic Regurgitation

Patient	Pre	Post
Patient 1	Trace	Trace
Patient 2	Trace	Trace
Patient 3	Trace	Trace
Patient 4	Mild Central	Mild Central

Aortic Regurgitation: *Data from the TAVL FIM study show that application of TAVL did not change the degree of aortic valve regurgitation.*

In December 2016, four patients at a single center with severe AS were treated with TAVL therapy immediately prior to surgical valve replacement. Distal embolic filters were placed in bilateral carotid arteries to confirm athero-embolic debris following TAVL treatment. Key study endpoints included MAEs at 30 days, successful delivery of IVL to the aortic valve and various success criteria, including reduction in the mean pressure gradient, improvement in leaflet mobility and successful AVR surgery. All results were adjudicated by an independent echocardiographic core lab.



Gradient Reduction: *Data from the TAVL FIM study show that both the peak and mean transvalvular gradients were reduced by TAVL.*

We believe this first-in-man study demonstrated that our IVL Technology could be safely delivered to calcified, stenotic aortic valves prior to AVR. All patients had improvement in aortic valve area and a reduction in peak and mean transvalvular gradients of 19 and 12 mmHg, respectively. IVL did not cause a change in aortic regurgitation, indicating that the native valve was not damaged. No embolic debris was identified in the filters following TAVL treatment.

Ongoing and Planned Clinical Studies

Further Clinical Studies to Support IVL System use in Peripheral Arterial Disease

The Disrupt PAD III Study is a prospective, randomized, multicenter, post-market study to demonstrate the safety and effectiveness of our IVL System using the MV60 and M5 catheters in combination with DCB compared to standalone DCB in heavily calcified femoropopliteal lesions. The study is designed to demonstrate the optimal therapy to dilate heavily calcified, femoropopliteal lesions and to demonstrate the benefit of our IVL System when combined with DCB vs. standalone DCB, in severely calcified femoropopliteal lesions up to 24 months. Disrupt PAD III is the largest randomized clinical trial to assess the ideal treatment strategy for this difficult to treat patient population.

The study is currently enrolling, with enrollment expected to be completed in the second half of 2019. It is expected to enroll up to 400 patients at 60 global centers in the United States, Europe and New Zealand. All patients will present with severely calcified, femoropopliteal lesions. Patients will be randomized in a one-to-one fashion with IVL System therapy combined with DCB in the treatment arm and standalone DCB in the control arm. Patients with sub-optimal acute results may be treated with a bailout stent in both arms. Key study endpoints include MAEs at 30 days, six, 12 and 24 months, procedural success, in addition to primary patency and freedom from TLR at 12 and 24 months and functional outcomes at 30 days, six, 12 and 24 months. All results will be adjudicated by an independent core lab and CEC.

The Disrupt PAD III Observational Study is a prospective, multicenter, observational study to assess the real-world, acute performance of our IVL System using the MV60 and M5 catheters in calcified, peripheral arteries. The study will assess the real-world, acute performance of our IVL System in heavily calcified

peripheral lesions. Lesions may include multi-level treatment of calcified iliac, common femoral, superficial femoral, popliteal and infrapopliteal lesions, in patients with claudication or CLI.

The study is currently enrolling patients, with enrollment expected to be completed in the second half of 2019. It is expected to enroll up to 1,000 patients presenting with heavily calcified, peripheral lesions. Patients may be treated with standalone IVL System therapy or adjunctive interventional therapies including DCB, atherectomy and bare metal or DES. Key study endpoints include procedural success and in-hospital adverse events.

Further Clinical Studies to Support IVL System use in Coronary Artery Disease

The Disrupt CAD II Study is a prospective, non-randomized, multicenter, post-market study to demonstrate the ongoing safety and performance of the coronary IVL catheter in heavily calcified coronary lesions up to 30 days prior to stenting. The study is a condition to support the CE Mark.

The study is currently enrolling patients, with enrollment expected to be completed in the first half of 2019. It will enroll up to 120 patients at 15 centers in Europe. All patients are expected to present with heavily calcified, stenotic coronary lesions, and will be treated with coronary IVL System therapy followed by DES implantation. Key study endpoints include in-hospital MACE, 30-day cardiac death and procedural success defined as residual stenosis <50% after stenting with no in-hospital MACE. All results will be adjudicated by an independent core lab and CEC. An OCT sub-study of approximately 60 patients will be included.

The Disrupt CAD III Study is a prospective, non-randomized, multicenter study to demonstrate the safety and effectiveness of our IVL System using the C^2 catheter in heavily calcified coronary lesions prior to stenting. The study is an IDE study that has been approved by the FDA. The goal of this study is to provide the clinical evidence needed to support a PMA for the use of our C^2 catheters in our IVL System in the United States.

This study is expected to enroll approximately 392 patients at 50 global centers in the United States and Europe, with the first patient expected to be enrolled in early 2019. All patients will present with heavily calcified, coronary lesions, and will be treated with our IVL System followed by DES implantation. Key study endpoints will include 30-day MACE and procedural success compared to objective performance goals. Additional endpoints include MACE at six, 12 and 24 months, and device delivery success. All results will be adjudicated by an independent core lab and CEC. An OCT sub-study of approximately 100 patients will be included.

The Disrupt CAD IV Study is a pre-market clinical trial notification (“CTN”) that is currently in the early planning phase with the Japanese PMDA. The goal of this confirmatory study is to show that the safety and effectiveness results of IVL System therapy prior to stenting are consistent in a Japanese patient population. A Shonin submission would then be completed for Japanese approval.

Research and Development

We invest in research and development efforts that advance our IVL Technology with the goal to expand and improve upon our existing product offerings. Our research and development expenses totaled $18.0 million and $ million for the years ended December 31, 2017, and December 31, 2018, respectively.

We believe our ability to rapidly develop innovative products is attributable to the dynamic product innovation process that we have implemented, the versatility and leveragability of our core technology and the management philosophy behind that process. We have recruited and retained engineers and scientists with significant experience in the development of medical devices. We have a pipeline of products in various stages of development that are expected to provide additional commercial opportunities. Our research and development efforts are based at our facility in Santa Clara, California.

Manufacturing

We produce substantially all of our IVL catheters in-house at our facilities in Fremont, California which, together with our research and development, controlled environment room and office space, currently totals 12,000 square feet. We stock inventory of raw materials, components and finished goods at our facilities in Fremont and with our direct sales representatives, who travel to our hospital customers' locations as part of their sales efforts. Our electronics (*i.e.*, our generators and connector cables) are produced by original equipment manufacturing ("OEM") partners using our design specifications. We plan to move our production of IVL catheters to our new 35,000 square foot facility in Santa Clara, California in 2019. We rely on a single or limited number of suppliers for certain raw materials and components, and we generally have no long-term supply arrangements with our suppliers, as we order on a purchase order basis. In the United States, we generally ship our IVL products from Fremont to our hospital customers in the United States on a consignment basis, but also may sell our IVL products directly to our hospital customers through our direct sales representatives, who deliver such products to hospital customers in the field. Internationally, we ship our IVL products from Fremont to either our third-party logistic provider located in the Netherlands who then ship directly to hospital customers and distributors pursuant to purchase orders or from Fremont directly to hospital customers and distributors pursuant to purchase orders. We also ship to some customers in Germany, Austria and Switzerland on a consignment basis from our third-party logistic provider located in the Netherlands. As of September 30, 2018, we had approximately 39 manufacturing employees.

Our rigorous quality control management programs have earned us a number of quality-related manufacturing designations. Our manufacturing facilities are EN ISO 13485 compliant with ISO 13485:2016 edition certification achieved in 2017. In 2014, we achieved compliance with MDD standards, allowing our products to be CE marked. We use annual internal audits, combined with external audits by regulatory agencies, to help ensure strong quality control practices. An internal, on-going staff training and education program contributes to our quality assurance program; training is documented and considered part of the employee evaluation process.

Sales & Marketing

We market our products to hospitals whose interventional cardiologists, vascular surgeons and interventional radiologists treat patients with PAD and CAD. We have dedicated meaningful resources to establish a direct sales capability in the United States, Germany, Austria and Switzerland, which we have complemented with distributors in Australia, the Baltics, Canada, France, Italy, New Zealand, the Nordic region, Spain and the United Kingdom. We are actively expanding our international field presence through new distributors, additional sales and clinical personnel, and are adding new U.S. sales territories. We have the CE Mark in Europe and the 510(k) clearance in the United States for our IVL System using our peripheral catheters (our M^5 catheters and S^4 catheters) and CE Mark in Europe for our IVL System using our C^2 catheter.

Our sales representatives and sales managers generally have substantial and applicable medical device experience, specifically in the vascular space and market our products directly to interventional cardiologists, vascular surgeons and interventional radiologists who treat patients with PAD and CAD. We are focused on developing strong relationships with our physician and hospital customers in order to educate them on the use and benefits of our products. Similarly, our marketing team has a significant amount of domain expertise and a strong track record of success. Our global sales and marketing team totals 46 professionals as of September 30, 2018.

In the United States, our IVL Generators and connector cables are typically provided, on loan, to our hospital customers at no charge, while our disposable IVL catheters are provided on a consignment basis whereby title to such catheters passes to the hospital once they are used in a clinical procedure. Following such use, we charge the hospital a predetermined set fee for each IVL catheter, which fee may be determined based on the hospital's overall use of our IVL catheters.

In addition to our direct sales organizations, we sell to distributors in certain geographies outside the United States where we have determined that selling through third party distributors is the best way to optimize our opportunities and resources. We select distribution partners who have deep experience in our markets, have strong customer relationships and have a demonstrated track record of launching innovative products.

Our IVL System is simple, intuitive, easy to install and easy to use. This provides value to our customers, but also makes our sales model a source of competitive advantage. Lower service burden means we can develop a cost-efficient sales model by optimizing a mix of clinical specialists and sales people. Moreover, our vascular IVL catheters have similar call points, meaning we can further leverage our field sales team.

Reimbursement

United States

In the United States, hospitals are the primary purchasers of our products. Hospitals bill various third-party payors, primarily Medicare in the case of PAD and CAD, for the total healthcare services required to treat the patient. Endovascular interventions to treat PAD and CAD are performed in two primary settings of care: hospital inpatient and hospital outpatient, each with different coding and payment schemes. For PAD, a minority of interventions are performed in a third setting of care known as physician office-based labs ("OBLs").

Setting	Payment System	Common Setting for IVL Application
Inpatient	Medicare Severity Diagnosis Related Groups ("MS-DRGs")	• CLI (more severe PAD) • Infrapopliteal (BTK) • EVAR & TEVAR Access • TAVR Access • PCI
Outpatient	Ambulatory Payment Classifications ("APCs")	• Claudicants (less severe PAD) • Femoropopliteal • Iliac occlusive • PCI

Our IVL System incorporates an integrated balloon that is used by the physicians to perform angioplasty during the relevant procedure. Angioplasty procedures have coding, coverage and payment in all settings of care. The IVL System therapy delivered by our vascular IVL catheters is novel and, as is typical of novel technologies, does not yet have its own specific reimbursement coding. We believe there is an opportunity in the future for increased reimbursement over current levels for procedures using our IVL System by generating additional clinical evidence, gaining advocacy in the respective physician societies and by working with the Centers for Medicare and Medicaid Services ("CMS") and payors.

Absent any incremental payment to hospitals for IVL System procedures to treat PAD, our initial commercial success suggests that our IVL System provides compelling economic value. We address the procedural complications that drive up supply costs for complex calcified lesions. As has been published in the *Journal of Vascular Surgery*, while the treatment of standard lesions can be profitable, a minority of severe lesions can cause a hospital to lose money because the significantly higher number of devices needed to complete treatment exceeds reimbursement levels.

Hospital Inpatient

Medicare reimbursement in the hospital inpatient department is determined according to the hospital inpatient prospective payment system ("IPPS"). Payment is determined by the applicable MS-DRGs, which groups patients by similar diagnoses and/or performed procedures and are used to determine the payment rate

that is used to reimburse hospitals for an inpatient stay. The IPPS payment covers the entire admission, including any secondary procedures. For endovascular interventions, the difference between whether a patient is classified as an inpatient or outpatient is a medical decision, but in general, sicker patients and/or those expected to need a longer length of stay are admitted as inpatients.

In the inpatient setting, endovascular treatment of PAD and CAD is assigned to one of two groups of surgical MS-DRGs, depending if atherectomy is also performed during the procedure or not. These MS-DRGs are independent of anatomical location. When IVL System therapy is performed as an adjunctive therapy during an EVAR, TEVAR or TAVR procedure, the applicable MS-DRG is based on those procedures, not the IVL System procedure.

U.S. Hospital Inpatient Payments for PAD & CAD Interventions
(FY19 Unadjusted Medicare Payment)

IVL Performed in Conjunction with	DRG Codes*	FY19 National Average Hospital Payment**
PAD Intervention: PTA, Stent	DRG 254, 253, 252	$11,050.94 - $19,902.68
PAD Intervention: Atherectomy	DRG 272, 271, 270	$15,984.78 - $30,904.16
CAD Intervention: DES with or without Atherectomy	DRG 247, 246	$12,681.71 - $19,774.46
EVAR (AAA)	DRG 269,268	$25,343.28 - $40,929.37
TAVR	DRG 267, 266	$35,705.52 - $43,907.63

** DRG coding groups listed are assigned depending if complications and comorbidities present.*

***Medicare rates for the same or similar procedures vary due to geographic location, nature of facility in which the procedure is performed (i.e., teaching or community hospital) and other factors.*

Hospital Outpatient

Reimbursement is determined by Medicare's comprehensive APC, which is a smaller bundle than a DRG more specifically related to a single procedure. Hospitals receive a Medicare outpatient payment based on the APC group assigned to the physician service or procedure performed, which are described by Current Procedure Terminology ("CPT") codes. CPT codes are specific to the approach, the technique used and the specific anatomy in which the procedure is performed. For PAD and CAD interventions, the main drivers of APC assignment are anatomical location and which devices are used during the procedure.

U.S. Hospital Outpatient Payments for PAD & CAD Interventions
(FY19 National Payment Rates)

Vessel Anatomy	Treatment Strategy			
	IVL + PTA	IVL + Stent	IVL + Atherectomy + PTA	IVL+ Atherectomy + Stent
Iliac	$4,755.58 (APC 5192)	$9,765.28 (APC 5193)	*Atherectomy not indicated for use in iliac arteries*	*Atherectomy not indicated for use in iliac arteries*
Femoropopliteal			$9,765.28 (APC 5193)	$15,503.79 (APC 5194)
Tibial-Peroneal	$9,765.28 (APC 5193)		$15,503.79 (APC 5194)	
Coronary	*IVL will be indicated for use prior to stenting*	$9,765.28 (APC 5193)	*IVL will be indicated for use prior to stenting*	$15,503.79 (APC 5194)

Office-Based Procedures

A minority of U.S. PAD interventions are performed in non-hospital, freestanding facilities that may be treated by payors like physician offices. Medicare pays for procedures in the physician office setting based on submission of a claim using one or more eligible CPT or HCPCS codes. Procedures are reimbursed based on Medicare under the Medicare physician fee schedule, which reimburses for supplies, equipment, professional fees and overhead to perform the procedure. These non-hospital, freestanding facilities are a highly financially sensitive segment of the U.S. PAD market and as such are not an initial target of our sales and marketing efforts.

Commercial Third-Party Payors

No uniform policy for coverage and reimbursement for medical procedures exists in the United States. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own reimbursement rates, but also have their own methods and approval process apart from Medicare determinations. Therefore, coverage and reimbursement can differ significantly from payor to payor.

International

Outside the United States, market acceptance of medical devices depends partly upon the availability of reimbursement within the prevailing healthcare payment system. Reimbursement levels vary significantly by country and, within some countries, by region. Reimbursement is obtained from a variety of sources, including government-sponsored and private health insurance plans, and combinations of both. PCI is a standard of care in developed international markets and procedure reimbursement exists. However, specific reimbursement for plaque modification devices is not common in most developed international markets. For PAD, the standard of care varies widely by country and so does reimbursement. Our plan is to broadly access international markets for coronary IVL System therapies and we plan to selectively approach markets and opportunities for peripheral IVL System therapies where it makes economic sense and where we believe the clinical benefit is large enough that the overall value to the system outweighs the cost of the device.

In Germany, in contrast to the other major European markets, there is an established path to secure reimbursement, making incremental payments viable in that market. We have obtained codes for peripheral and coronary IVL System therapies to track procedure costs, and we expect that the data will support incremental payment in the near- to mid-term.

Japan also provides incremental payment for atherectomy devices used during PCI procedures. We intend to work with Japanese regulators to secure payment for IVL System therapy that is similar to atherectomy.

Competition

The medical device industry is intensely competitive, subject to rapid change and significantly affected by new product introductions and other market activities of industry participants. We compete or plan to compete with manufacturers and distributors of cardiovascular medical devices. Our most notable competitors in the highly competitive cardiovascular field include Boston Scientific Corporation, Cardiovascular Systems, Inc., Medtronic plc and Philips N.V. Many of these competitors are large, well-capitalized companies with significantly greater market share and resources than we have. As a consequence, they are able to spend more on product development, marketing, sales and other product initiatives than we can. We also compete with smaller medical device companies that have single products or a limited range of products. Some of our competitors have:

- significantly greater name recognition;
- broader or deeper relations with healthcare professionals, customers and third-party payors;
- more established distribution networks;
- additional lines of products and the ability to offer rebates or bundle products to offer greater discounts or other incentives to gain a competitive advantage;
- greater experience in conducting research and development, manufacturing, clinical trials, marketing and obtaining regulatory clearance or approval for products; and
- greater financial and human resources for product development, sales and marketing and patent prosecution.

We believe that our proprietary IVL Technology, our focus on calcified cardiovascular disease and our organizational culture and strategy, will be important factors in our future success. We compete primarily on the basis that our products are designed to treat patients with calcified cardiovascular disease safely, easily and effectively, with improved outcomes and procedural cost savings. Our continued success depends on our ability to:

- develop innovative, proprietary products that can cost-effectively address significant clinical needs in a manner that is safe and effective for patients and easy to use for physicians;
- continue to innovate and develop scientifically advanced technology;
- obtain and maintain regulatory clearances or approvals;
- demonstrate efficacy in our sponsored and third-party clinical trials and studies;
- obtaining and maintaining adequate reimbursement for procedures using our products;
- apply technology across product lines and markets;
- attract and retain skilled research and development and sales personnel; and
- cost-effectively manufacture and successfully market and sell products.

Intellectual Property

Our success depends in part on our ability to obtain, maintain, protect and enforce our proprietary technology and intellectual property rights, in particular, our patent rights, preserve the confidentiality of our trade secrets, and operate without infringing the valid and enforceable patents and other proprietary rights of third parties. We rely on a combination of patent, trademark, trade secret, copyright and other intellectual

property rights and measures to protect the intellectual property rights that we consider important to our business. We also rely on know-how and continuing technological innovation to develop and maintain our competitive position.

We seek to protect our proprietary rights through a variety of methods, including confidentiality agreements and proprietary information agreements with suppliers, employees, consultants and others who may have access to our proprietary information. However, trade secrets and proprietary information can be difficult to protect. While we have confidence in the measures we take to protect and preserve our trade secrets and proprietary information, such measures can be breached, and we may not have adequate remedies for any such breach. In addition, our trade secrets and proprietary information may otherwise become known or be independently discovered by competitors.

As of November 28, 2018, we own 29 issued U.S. patents and 38 issued foreign patents, 20 pending U.S. patent applications and 21 pending foreign patent applications (including six Patent Cooperation Treaty ("PCT") applications). This portfolio includes 15 issued U.S. patents, 23 issued foreign patents, five pending U.S. patent applications and 11 pending foreign patent applications (including one PCT application) relating to our current IVL Technology. These issued patents, and any patents granted from such applications, are expected to expire between 2029 and 2037, without taking potential patent term extensions or adjustments into account.

The term of individual patents depends upon the legal term for patents in the countries in which they are granted. In most countries, including the United States, the patent term is 20 years from the earliest claimed filing date of a non-provisional patent application in the applicable country. In the United States, a patent's term may, in certain cases, be lengthened by patent term adjustment, which compensates a patentee for administrative delays by the United States Patent and Trademark Office in examining and granting a patent, or may be shortened if a patent is terminally disclaimed over a commonly owned patent or a patent naming a common inventor and having an earlier expiration date. We cannot be sure that our pending patent applications that we have filed or may file in the future will result in issued patents, and we can give no assurance that any patents that have issued or might issue in the future will protect our current or future products, will provide us with any competitive advantage, and will not be challenged, invalidated, or circumvented.

For more information regarding the risks related to our intellectual property, please see section titled "Risk Factors— Risks Related to Our Intellectual Property."

Government Regulation

United States

Our products are medical devices subject to extensive and ongoing regulation by the FDA under the Federal Food, Drug, and Cosmetic Act ("FD&C Act") and its implementing regulations, as well as other federal and state regulatory bodies in the United States and comparable authorities in other countries under other statutes and regulations. The laws and regulations govern, among other things, product design and development, preclinical and clinical testing, manufacturing, packaging, labeling, storage, recordkeeping and reporting, clearance or approval, marketing, distribution, promotion, import and export and post-marketing surveillance. Failure to comply with applicable requirements may subject a device and/or its manufacturer to a variety of administrative sanctions, such as issuance of warning letters, import detentions, civil monetary penalties and/or judicial sanctions, such as product seizures, injunctions and criminal prosecution.

FDA's Pre-market Clearance and Approval Requirements

Each medical device we seek to commercially distribute in the United States will require either a prior 510(k) clearance, unless it is exempt, or a pre-market approval from the FDA. Generally, if a new device has a

predicate that is already on the market under a 510(k) clearance, the FDA will allow that new device to be marketed under a 510(k) clearance; otherwise, a PMA is required. Medical devices are classified into one of three classes—Class I, Class II or Class III—depending on the degree of risk associated with each medical device and the extent of control needed to provide reasonable assurance of safety and effectiveness. Class I devices are deemed to be low risk and are subject to the general controls of the FD&C Act, such as provisions that relate to: adulteration; misbranding; registration and listing; notification, including repair, replacement, or refund; records and reports; and good manufacturing practices. Most Class I devices are classified as exempt from pre-market notification under section 510(k) of the FD&C Act, and therefore may be commercially distributed without obtaining 510(k) clearance from the FDA. Class II devices are subject to both general controls and special controls to provide reasonable assurance of safety and effectiveness. Special controls include performance standards, post market surveillance, patient registries and guidance documents. A manufacturer may be required to submit to the FDA a pre-market notification requesting permission to commercially distribute some Class II devices. Devices deemed by the FDA to pose the greatest risk, such as life-sustaining, life-supporting or implantable devices, or devices deemed not substantially equivalent to a previously cleared 510(k) device, are placed in Class III. A Class III device cannot be marketed in the United States unless the FDA approves the device after submission of a PMA. However, there are some Class III devices for which FDA has not yet called for a PMA. For these devices, the manufacturer must submit a pre-market notification and obtain 510(k) clearance in orders to commercially distribute these devices. The FDA can also impose sales, marketing or other restrictions on devices in order to assure that they are used in a safe and effective manner.

510(k) Clearance Pathway

When a 510(k) clearance is required, we must submit a pre-market notification to the FDA demonstrating that our proposed device is substantially equivalent to a predicate device, which is a previously cleared and legally marketed 510(k) device or a device that was in commercial distribution before May 28, 1976. By regulation, a pre-market notification must be submitted to the FDA at least 90 days before we intend to distribute a device. As a practical matter, clearance often takes significantly longer. To demonstrate substantial equivalence, the manufacturer must show that the proposed device has the same intended use as the predicate device, and it either has the same technological characteristics, or different technological characteristics and the information in the pre-market notification demonstrates that the device is equally safe and effective and does not raise different questions of safety and effectiveness. The FDA may require further information, including clinical data, to make a determination regarding substantial equivalence. If the FDA determines that the device, or its intended use, is not substantially equivalent to a previously cleared device or use, the FDA will place the device into Class III.

There are three types of 510(k)s: traditional; special; and abbreviated. Special 510(k)s are for devices that are modified and the modification needs a new 510(k) but does not affect the intended use or alter the fundamental scientific technology of the device. Abbreviated 510(k)s are for devices that conform to a recognized standard. The special and abbreviated 510(k)s are intended to streamline review, and the FDA intends to process special 510(k)s within 30 days of receipt.

Pre-market Approval Pathway

A pre-market approval application must be submitted to the FDA for Class III devices for which the FDA has required a PMA. The pre-market approval application process is much more demanding than the 510(k) pre-market notification process. A pre-market approval application must be supported by extensive data, including but not limited to technical, preclinical, clinical trials, manufacturing and labeling to demonstrate to the FDA's satisfaction reasonable evidence of safety and effectiveness of the device.

After a pre-market approval application is submitted, the FDA has 45 days to determine whether the application is sufficiently complete to permit a substantive review and thus whether the FDA will file the application for review. The FDA has 180 days to review a filed pre-market approval application, although the

review of an application generally occurs over a significantly longer period of time and can take up to several years. During this review period, the FDA may request additional information or clarification of the information already provided. Also, an advisory panel of experts from outside the FDA may be convened to review and evaluate the application and provide recommendations to the FDA as to the approvability of the device.

Although the FDA is not bound by the advisory panel decision, the panel's recommendations are important to the FDA's overall decision making process. In addition, the FDA may conduct a preapproval inspection of the manufacturing facility to ensure compliance with the Quality System Regulation ("QSR"). The agency also may inspect one or more clinical sites to assure compliance with FDA's regulations.

Upon completion of the PMA review, the FDA may: (i) approve the PMA which authorizes commercial marketing with specific prescribing information for one or more indications, which can be more limited than those originally sought; (ii) issue an approvable letter which indicates the FDA's belief that the PMA is approvable and states what additional information the FDA requires, or the post-approval commitments that must be agreed to prior to approval; (iii) issue a not approvable letter which outlines steps required for approval, but which are typically more onerous than those in an approvable letter, and may require additional clinical trials that are often expensive and time consuming and can delay approval for months or even years; or (iv) deny the application. If the FDA issues an approvable or not approvable letter, the applicant has 180 days to respond, after which the FDA's review clock is reset.

Clinical Trials

Clinical trials are almost always required to support pre-market approval and are sometimes required for 510(k) clearance. In the United States, for significant risk devices, these trials require submission of an application for an IDE to the FDA. The IDE application must be supported by appropriate data, such as animal and laboratory testing results, showing it is safe to test the device in humans and that the testing protocol is scientifically sound. The IDE must be approved in advance by the FDA for a specific number of patients at specified study sites. During the trial, the sponsor must comply with the FDA's IDE requirements for investigator selection, trial monitoring, reporting and recordkeeping. The investigators must obtain patient informed consent, rigorously follow the investigational plan and study protocol, control the disposition of investigational devices and comply with all reporting and recordkeeping requirements. Clinical trials for significant risk devices may not begin until the IDE application is approved by the FDA and the appropriate institutional review boards ("IRBs") at the clinical trial sites. An IRB is an appropriately constituted group that has been formally designated to review and monitor medical research involving subjects and which has the authority to approve, require modifications in, or disapprove research to protect the rights, safety and welfare of human research subjects. A nonsignificant risk device does not require FDA approval of an IDE; however, the clinical trial must still be conducted in compliance with various requirements of FDA's IDE regulations and be approved by an IRB at the clinical trials sites. The FDA or the IRB at each site at which a clinical trial is being performed may withdraw approval of a clinical trial at any time for various reasons, including a belief that the risks to study subjects outweigh the benefits or a failure to comply with FDA or IRB requirements. Even if a trial is completed, the results of clinical testing may not demonstrate the safety and effectiveness of the device, may be equivocal or may otherwise not be sufficient to obtain approval or clearance of the product.

Sponsors of clinical trials of devices are required to register with clinicaltrials.gov, a public database of clinical trial information. Information related to the device, patient population, phase of investigation, study sites and investigators and other aspects of the clinical trial is made public as part of the registration.

Ongoing Regulation by the FDA

Even after a device receives clearance or approval and is placed on the market, numerous regulatory requirements apply. These include:

- establishment registration and device listing;

- the QSR, which requires manufacturers, including third-party manufacturers, to follow stringent design, testing, control, documentation and other quality assurance procedures during all aspects of the manufacturing process;
- labeling regulations and the FDA prohibitions against the promotion of products for uncleared, unapproved or "off-label" uses and other requirements related to promotional activities;
- medical device reporting regulations, which require that manufactures report to the FDA if their device may have caused or contributed to a death or serious injury, or if their device malfunctioned and the device or a similar device marketed by the manufacturer would be likely to cause or contribute to a death or serious injury if the malfunction were to recur;
- corrections and removal reporting regulations, which require that manufactures report to the FDA field corrections or removals if undertaken to reduce a risk to health posed by a device or to remedy a violation of the FD&C Act that may present a risk to health; and
- post market surveillance regulations, which apply to certain Class II or III devices when necessary to protect the public health or to provide additional safety and effectiveness data for the device.

After a device receives 510(k) clearance, any modification that could significantly affect its safety or effectiveness, or that would constitute a major change in its intended use, will require a new clearance or possibly a pre-market approval. The FDA requires each manufacturer to make this determination initially, but the FDA can review any such decision and can disagree with a manufacturer's determination. If the FDA disagrees with our determination not to seek a new 510(k) clearance, the FDA may retroactively require us to seek 510(k) clearance or possibly a pre-market approval. The FDA could also require us to cease marketing and distribution and/or recall the modified device until 510(k) clearance or pre-market approval is obtained. Also, in these circumstances, we may be subject to significant regulatory fines and penalties.

Some changes to an approved PMA device, including changes in indications, labeling or manufacturing processes or facilities, require submission and FDA approval of a new PMA or PMA supplement, as appropriate, before the change can be implemented. Supplements to a PMA often require the submission of the same type of information required for an original PMA, except that the supplement is generally limited to that information needed to support the proposed change from the device covered by the original PMA. The FDA uses the same procedures and actions in reviewing PMA supplements as it does in reviewing original PMAs.

FDA regulations require us to register as a medical device manufacturer with the FDA. Additionally, the California Department of Health Services ("CDHS"), requires us to register as a medical device manufacturer within the state. Because of this, the FDA and the CDHS inspect us on a routine basis for compliance with the QSR. These regulations require that we manufacture our products and maintain related documentation in a prescribed manner with respect to manufacturing, testing and control activities. We have undergone and expect to continue to undergo regular QSR inspections in connection with the manufacture of our products at our facilities. Further, the FDA requires us to comply with various FDA regulations regarding labeling. Failure by us or by our suppliers to comply with applicable regulatory requirements can result in enforcement action by the FDA or state authorities, which may include any of the following sanctions:

- warning or untitled letters, fines, injunctions, consent decrees and civil penalties;
- customer notifications, voluntary or mandatory recall or seizure of our products;
- operating restrictions, partial suspension or total shutdown of production;
- delay in processing submissions or applications for new products or modifications to existing products;
- withdrawing approvals that have already been granted; and
- criminal prosecution.

The Medical Device Reporting laws and regulations require us to provide information to the FDA when we receive or otherwise become aware of information that reasonably suggests our device may have caused or contributed to a death or serious injury as well as a device malfunction that likely would cause or contribute to death or serious injury if the malfunction were to recur. In addition, the FDA prohibits an approved device from being marketed for off-label use. The FDA and other agencies actively enforce the laws and regulations prohibiting the promotion of off-label uses, and a company that is found to have improperly promoted off-label uses may be subject to significant liability, including substantial monetary penalties and criminal prosecution.

Newly discovered or developed safety or effectiveness data may require changes to a product's labeling, including the addition of new warnings and contraindications, and also may require the implementation of other risk management measures. Also, new government requirements, including those resulting from new legislation, may be established, or the FDA's policies may change, which could delay or prevent regulatory clearance or approval of our products under development.

We are also subject to other federal, state and local laws and regulations relating to safe working conditions, laboratory and manufacturing practices.

European Union

Our products are regulated in the European Union as medical devices per the European Union Directive (93/42/EEC), also known as the Medical Device Directive. An authorized third party, Notified Body, must approve products for CE marking. The CE Mark is contingent upon continued compliance to the applicable regulations and the quality system requirements of the ISO 13485 standard.

Other Regions

Most major markets have different levels of regulatory requirements for medical devices. Modifications to the cleared or approved products may require a new regulatory submission in all major markets. The regulatory requirements, and the review time, vary significantly from country to country. Products can also be marketed in other countries that have minimal requirements for medical devices.

Fraud and Abuse and Other Healthcare Regulations

Federal and state governmental agencies and equivalent foreign authorities subject the healthcare industry to intense regulatory scrutiny, including heightened civil and criminal enforcement efforts. These laws constrain the sales, marketing and other promotional activities of medical device manufacturers by limiting the kinds of financial arrangements we may have with hospitals, physicians and other potential purchases of our products. Federal healthcare fraud and abuse laws apply to our business when a customer submits a claim for an item or service that is reimbursed under Medicare, Medicaid or other federally-funded healthcare programs. Patient privacy statutes and regulations by foreign, federal and state governments may also apply in the locations in which we do business. Descriptions of some of the U.S. laws and regulations that may affect our ability to operate follows.

Federal Healthcare Anti-Kickback Statute

The federal healthcare Anti-Kickback Statute ("Anti-Kickback Statute") prohibits, among other things, persons or entities from knowingly and willfully soliciting, offering, receiving or paying any remuneration, directly or indirectly, overtly or covertly, in cash or in kind, to induce or reward either the referral of an individual for, or the purchasing, leasing, ordering, or arranging for or recommending the purchase, lease, or order of any good or service for which payment may be made, in whole or in part, by federal healthcare programs, such as the Medicare and Medicaid programs. The term "remuneration" has been broadly interpreted to include anything of value, and the government can establish a violation of the Anti-Kickback Statute without

proving that a person or entity had actual knowledge of the law or a specific intent to violate it. In addition, the government may assert that a claim, including items or services resulting from a violation of the Anti-Kickback Statute, constitutes a false or fraudulent claim for purposes of the federal civil False Claims Act. The Anti-Kickback Statute is subject to evolving interpretations and has been applied by government enforcement officials to a number of common business arrangements in the medical device industry. There are a number of statutory exceptions and regulatory safe harbors protecting certain business arrangements from prosecution under the Anti-Kickback Statute; however, those exceptions and safe harbors are drawn narrowly, and there is no exception or safe harbor for many common business activities, such as reimbursement support programs, educational and research grants or charitable donations. The failure of a transaction or arrangement to fit precisely within one or more applicable statutory exceptions or regulatory safe harbors does not necessarily mean that it is illegal or that prosecution will be pursued. However, conduct and business arrangements that do not fully satisfy all requirements of an applicable safe harbor may result in increased scrutiny by government enforcement authorities and will be evaluated on a case-by-case basis based on a cumulative review of all facts and circumstances.

Federal Civil False Claims Act

The federal civil False Claims Act prohibits, among other things, persons or entities from knowingly presenting, or causing to be presented, a false or fraudulent claim for payment of government funds, or knowingly making, using or causing to be made or used a false record or statement material to a false or fraudulent claim to avoid, decrease or conceal an obligation to pay money to the federal government. A claim including items or services resulting from a violation of the Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the federal civil False Claims Act. Actions under the federal civil False Claims Act may be brought by the government or as a qui tam action by a private individual in the name of the government. These individuals, sometimes known as "relators" or, more commonly, as "whistleblowers," may share in any amounts paid by the entity to the government in fines or settlement. The number of filings of qui tam actions has increased significantly in recent years. Qui tam actions are filed under seal and impose a mandatory duty on the U.S. Department of Justice to investigate such allegations. Most private citizen actions are declined by the Department of Justice or dismissed by federal courts. However, the investigation costs for a company can be significant and material even if the allegations are without merit. Various states have adopted laws similar to the federal civil False Claims Act, and many of these state laws are broader in scope and apply to all payors, and therefore, are not limited to only those claims submitted to the federal government. Medical device manufacturers and other healthcare companies also are subject to other federal false claims laws, including, among others, federal criminal healthcare fraud and false statement statutes that extend to non-government health benefit programs.

Healthcare Fraud Statute

The federal Health Insurance Portability and Accountability Act ("HIPAA") and its implementing regulations created federal criminal statutes that prohibit, among other things, knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program, including private third-party payors knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false, fictitious or fraudulent statement or representation, or making or using any false writing or document knowing the same to contain any materially false, fictitious or fraudulent statement or entry, in connection with the delivery of or payment for healthcare benefits, items or services.

Sunshine Act

The federal Physician Payments Sunshine Act requires certain manufacturers of drugs, devices, biologics and medical supplies for which payment is available under Medicare, Medicaid or the Children's Health Insurance Program to report annually with certain exceptions to CMS information related to payments or other transfers of value made to a physician or teaching hospital, or to a third party at the request of a physician or

teaching hospital, and requires applicable manufacturers and group purchasing organizations to report annually to CMS ownership and investment interests held by physicians and their immediate family members. Beginning in 2022, applicable manufacturers also will be required to report information regarding payments and transfers of value provided to physician assistants, nurse practitioners, clinical nurse specialists, certified nurse anesthetists and certified nurse-midwives.

Patient Data Privacy

HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act ("HITECH Act"), and their implementing regulations impose obligations on covered entities, such as health plans, healthcare clearinghouses and certain healthcare providers, as well as business associates that provide services involving the use or disclosure of personal health information to or on behalf of covered entities. These obligations, such as mandatory contractual terms, relate to safeguarding the privacy and security of protected health information. Many states also have laws governing the privacy and security of health information in certain circumstances, many of which differ from each other in significant ways and often are not preempted by HIPAA.

Other State Laws

Certain states also mandate implementation of commercial compliance programs, impose restrictions on device manufacturer marketing practices and/or require tracking and reporting of gifts, compensation and other remuneration to healthcare professionals and entities.

State and federal regulatory and enforcement agencies continue to actively investigate violations of healthcare laws and regulations, and the U.S. Congress continues to strengthen the arsenal of enforcement tools. Most recently, the Bipartisan Budget Act of 2018 ("BBA") increased the criminal and civil penalties that can be imposed for violating certain federal healthcare laws, including the Anti-Kickback Statute. Enforcement agencies also continue to pursue novel theories of liability under these laws. In particular, government agencies recently have increased regulatory scrutiny and enforcement activity with respect to manufacturer reimbursement support activities and other patient support programs, including bringing criminal charges or civil enforcement actions under the Anti-Kickback Statute, federal civil False Claims Act and violations of healthcare fraud and HIPAA privacy provisions.

Compliance with these federal and state laws and regulations requires substantial resources. If our operations are found to be in violation of any of the laws described above or any other governmental regulations that apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, fines, imprisonment, disgorgement, exclusion from participation in government healthcare programs such as the Medicare and Medicaid programs, reputational harm, administrative burdens, diminished profits and future earnings, and the curtailment or restructuring of our operations. Companies settling federal civil False Claims Act, Anti-Kickback Statute and other fraud and abuse cases also may be required to enter into a Corporate Integrity Agreement with the U.S. Department of Health and Human Services Office of Inspector General in order to avoid exclusion from participation (i.e., loss of coverage for their products) in federal healthcare programs such as Medicare and Medicaid. Corporate Integrity Agreements typically impose substantial costs on companies to ensure compliance.

For additional information regarding obligations under federal healthcare statues and regulations, please refer to the risk factor titled "*If we fail to comply with U.S. federal and state fraud and abuse laws and regulations, including those relating to kickbacks and false claims for reimbursement, we could face substantial penalties and our business operations and financial condition could be adversely affected.*"

United States Healthcare Reform

There have been and continue to be proposals by the federal government, state governments, regulators and third-party payors to control or manage the increased costs of healthcare and, more generally, to reform the U.S. healthcare system.

For example, in the United States, in March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education and Reconciliation Act (collectively, the "ACA"), was enacted. The ACA contains a number of significant provisions, including those governing enrollment in federal healthcare programs, reimbursement changes and fraud and abuse measures, all of which will impact existing government healthcare programs and will result in the development of new programs. The ACA, among other things, imposes an excise tax of 2.3% on the sale of most medical devices.

There have been judicial and Congressional challenges to certain aspects of the ACA, as well as recent efforts by the Trump administration to repeal or replace certain aspects of the ACA. For example, since January 2017, President Trump has signed two Executive Orders and other directives designed to delay the implementation of certain provisions of the ACA or otherwise circumvent some of the requirements for health insurance mandated by the ACA. Concurrently, Congress has considered legislation that would repeal or repeal and replace all or part of the ACA. While Congress has not passed comprehensive repeal legislation, two bills affecting the implementation of certain taxes under the ACA have been signed into law. The Tax Cuts and Jobs Act of 2017 includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the ACA on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate." Additionally, on January 22, 2018, President Trump signed a continuing resolution on appropriations for fiscal year 2018 that delayed the implementation of certain ACA-mandated fees, including the 2.3% excise tax imposed on manufacturers and importers for certain sales of medical devices through December 31, 2019. Further, the BBA, among other things, amends the ACA, effective January 1, 2019, to close the coverage gap in most Medicare drug plans, commonly referred to as the "donut hole." More recently, in July 2018, CMS published a final rule permitting further collections and payments to and from certain ACA qualified health plans and health insurance issuers under the ACA risk adjustment program in response to the outcome of federal district court litigation regarding the method CMS uses to determine this risk adjustment.

In addition, other legislative changes have been proposed and adopted since the ACA was enacted. On August 2, 2011, the Budget Control Act of 2011 was signed into law, which, among other things, includes reductions to Medicare payments to providers of 2% per fiscal year, which went into effect on April 1, 2013 and, due to subsequent legislative amendments to the statute, including the BBA, will remain in effect through 2027 unless additional Congressional action is taken. On January 2, 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, reduced Medicare payments to several providers, including hospitals, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.

Further, recently there has been heightened governmental scrutiny over the manner in which manufacturers set prices for their marketed products, which has resulted in several U.S. Congressional inquiries and proposed, and enacted federal and state legislation designed to bring transparency to product pricing and reduce the cost of products and services under government healthcare programs. Congress and the Trump administration have each indicated that it will continue to seek new legislative and/or administrative measures to control product costs. Additionally, regional healthcare authorities and individual hospitals are increasingly using bidding procedures to determine what products to purchase and which suppliers will be included in their healthcare programs.

Employees

As of September 30, 2018, we had approximately 153 employees worldwide. None of our employees are represented by a collective bargaining agreement and we have never experienced a work stoppage. We believe our employee relations are good.

Facilities

We produce substantially all of our IVL catheters in-house at our facilities in Fremont, California which, together with our research and development, controlled environment room and office space, currently totals 12,000 square feet. We plan to move our production of IVL catheters to our new 35,000 square foot facility in Santa Clara, California in 2019.

We believe that our Santa Clara facility meets our current and future anticipated needs.

Legal Proceedings

We are not currently party to any material legal proceedings. In the future we may at times be involved in litigation and other legal claims in the ordinary course of business.

We may be subject to other legal proceedings and claims in the ordinary course of business. We have received, and may from time to time receive, letters from third parties alleging patent infringement, violation of employment practices or trademark infringement, and we may in the future participate in litigation to defend ourselves. We cannot predict the results of any such disputes, and despite the potential outcomes, the existence thereof may have an adverse material impact on us due to diversion of management time and attention as well as the financial costs related to resolving such disputes.

MANAGEMENT

Executive Officers and Directors

The following table sets forth information regarding our executive officers and directors as of September 30, 2018:

Name	Age	Position
Douglas Godshall	54	President, Chief Executive Officer & Director
Dan Puckett	55	Chief Financial Officer & Secretary
Isaac Zacharias	44	Chief Commercial Officer
F.T. “Jay” Watkins	66	Chairman
Antoine Papiernik	52	Director
Colin Cahill	43	Director
Frederic Moll, M.D.	67	Director
Todd Brinton, M.D.	49	Director
Marc-Andre Marcotte	44	Director

(1) Member of the audit committee.
(2) Member of the compensation committee.
(3) Member of the nominating and corporate governance committee.

Executive Officers

Douglas Godshall. Mr. Godshall has served as our President and Chief Executive Officer and as a member of our board of directors since May 2017. Previously, Mr. Godshall served as the Chief Executive Officer of HeartWare International, Inc. (“HeartWare”), a Nasdaq-listed company, from September 2006 until August 2016 and as director from October 2006 until its acquisition by Medtronic plc in August 2016. Prior to joining HeartWare, Mr. Godshall served in various executive, managerial and leadership positions at Boston Scientific Corporation (“Boston Scientific”), where he had been employed since 1990. Mr. Godshall also serves on the board of directors of Eyepoint Pharmaceuticals, Inc. Mr. Godshall has a B.A. in Business from Lafayette College and M.B.A from Northeastern University. Mr. Godshall’s experience in the clinical development, business execution, and regulatory strategy for medical devices and pharmaceuticals provides him with the qualifications and skills to serve on our board of directors.

Dan Puckett. Mr. Puckett has served as our Chief Financial Officer since April 2016 and has served as our Secretary since November 2018. Prior to joining ShockWave Medical, from June 2015 to April 2016, Mr. Puckett served as Chief Financial Officer for Counsyl, a venture backed DNA testing and genetic counseling company. From 2011 to June 2015, Mr. Puckett served as Chief Financial Officer for Ariosa Diagnostics, Inc. (“Ariosa”), a molecular diagnostics company, until its acquisition by Roche in January 2015. Mr. Puckett came to Ariosa from Forest Laboratories, Inc. in September 2011, where he served as Executive Director, Operations of Cerexa, Inc., a Forest Laboratories, Inc. subsidiary. Prior to Cerexa, Inc., Mr. Puckett held senior finance and operations positions at Affymetrix, Inc. and AOL. Mr. Puckett holds an M.B.A. from the University of San Francisco and a B.A. in Accounting from Washington State University.

Isaac Zacharias. Mr. Zacharias has served as our Chief Commercial Officer since November 2018. Previously, Mr. Zacharias served as our General Manager of Structural Heart and Vice President of International Sales from March 2018 to November 2018. Prior to joining Shockwave Medical, Mr. Zacharias served as the Vice President, General Manager for the PCI Guidance business at Boston Scientific from July 2011 to March 2018. Prior to that, Mr. Zacharias also served as the Vice President, New Business Development for Boston

Scientific where he negotiated investments and acquisitions for the Cardiology, Rhythm Management and Vascular business units. Mr. Zacharias began his career as an R&D engineer and has held a variety of clinical and marketing roles. Mr. Zacharias holds B.S. and M.S. degrees in Mechanical Engineering from the University of California, Davis.

Nonemployee Directors

F.T. "Jay" Watkins. Mr. Watkins has served as a member of our board of directors since 2013. He became the Chairman of our board in May 2017. Mr. Watkins has been a Managing Director at De Novo Ventures ("De Novo") since 2002. Prior to joining De Novo in 2002 Mr. Watkins was a co-founder and founding Chief Executive Officer of Origin Medsystems, Inc. ("Origin"), a venture funded medical technology start-up, until its acquisition by Eli Lilly & Company ("Eli Lilly") in 1995. When Eli Lilly spun out its medical device businesses as Guidant Corporation ("Guidant"), Mr. Watkins became a member of Guidant's Management Committee and served as president of several divisions including the Minimally Invasive Surgery Group, the Cardiac and Vascular Surgery Group and Heart Rhythm Technologies. Mr. Watkins also co-founded Gynecare, Inc., a woman's health care company, which was spun out, taken public and subsequently acquired by Johnson & Johnson. Mr. Watkins was also the founding president of Compass, Guidant's corporate business development and new ventures group. where he was involved in the acquisition of two public companies and led venture investments in 14 companies. Prior to joining Origin, Mr. Watkins also held management positions in several start-ups, including Microgenics (acquired by Boehringer Manngheim) and was a consultant with McKinsey & Company. Mr. Watkins received his M.B.A. from Harvard Business School and his B.A. from Stanford University. Mr. Watkin's experience in the healthcare industry provides him with the qualifications and skills to serve on our board of directors.

Antoine Papiernik. Mr. Papiernik has served as a member of our board of directors since July 2013. Mr. Papiernik has been Managing Partner of Sofinnova Partners since 1997. Mr. Papiernik has been an initial investor and a board member in public companies, including ProQr Therapeutics N.V. and Mainstay Medical International plc. Mr. Papiernik is also a board member of private companies MedDay Pharmaceuticals, MD Start, Reflexion Medical, Gecko Biomedical, SafeHeal, Highlife and Rgenix. Mr. Papiernik served on the boards of EOS (Ethical Oncology Science S.p.A., CoAxia, Lectus Therapeutics Ltd, Entourage Medical Technologies, Inc., Corwave SA, Auris Medical Holding and Impatients. Mr. Papiernik previously was an initial investor and a board member of the following companies, Actelion Pharmaceuticals Ltd. ("Actelion"), NovusPharma S.p.A. (sold to Cell Therapeutics, Inc.), Movetis NV (sold to Shire Plc), Pixium Vision SA and Stentys S, which went public respectively on the Zürich stock exchange, Nasdaq, the Stockholm stock exchange, the Milan Nuovo Mercato, the Belgium Stock Exchange and the EuroNext Paris. He was also a board member for Cotherix Inc. (initially Nasdaq listed, then sold to Actelion), CoreValve (sold to Medtronic plc), Fovea Pharmaceuticals (sold to Sanofi-Aventis S.A.) and ReCor Medical, Inc. (sold to Otsuka Pharmaceutical Co., Ltd.). Mr. Papiernik received his M.B.A. from the Wharton School of Business, University of Pennsylvania and his B.S. from Institut Etudes Economiques Commerciales. Mr. Papiernik's experience in the healthcare industry provides him with the qualifications and skills to serve on our board of directors.

Colin Cahill. Mr. Cahill has served as a member of our board of directors since May 2015. Mr. Cahill has been Vice-President of Venrock since 2012 and focuses on Venrock's public and cross-over biotech fund. Prior to joining Venrock, Mr. Cahill was a co-founder and Chief Development Officer at Simpirica Spine, Inc. ("Simpirica"), a Bay Area medical device company focused on the development and commercialization of devices for spinal stabilization. Mr. Cahill also served as Simpirica's Chief Executive Officer from 2006 until 2009. Prior to graduate school, Mr. Cahill worked at the Boston Consulting Group as a strategy consultant. Mr. Cahill received a M.B.A. from the Stanford Graduate School of Business and his M.S. in biological sciences from Stanford University. Mr. Cahill received his B.A. and B.S. in biological sciences and economics, respectively, from Stanford University. Mr. Cahill's experience in life science operations and investment provides him with the qualifications and skills to serve on our board of directors.

Frederic Moll, M.D. Dr. Moll has served as a member of our board of directors since 2011. Dr. Moll has been a member and served as Chairman of the board of Restoration Robotics, Inc. since November 2002. Dr. Moll is also a co-founder, and, since September 2012, has been the Chairman and Chief Executive Officer of Auris Health, Inc. Dr. Moll has served in a leadership capacity of Circuit Therapeutics since 2011. From 2002 to 2010, Dr. Moll served as the Chief Executive Officer of Hansen Medical, which he also co-founded. Previously, Dr. Moll co-founded Intuitive Surgical, Inc. and from 1995 to 2002 served as its first Chief Executive Officer. Dr. Moll also co-founded Endo-Therapeutics, Inc. and Origin, which later became an operating company within Guidant Corporation following its acquisition by Eli Lilly & Company. Dr. Moll serves on the boards of directors of IntersectENT, Inc. Dr. Moll received a B.A. in economics from the University of California at Berkeley, an M.S. in management from Stanford University and an M.D. from the University of Washington. Dr. Moll's experience in the healthcare sector and his medical background and experience provide him with the qualifications and skills to serve on our board of directors.

Todd Brinton, M.D. Dr. Brinton is our co-founder and has served as a member of our board of directors since 2010. Dr. Brinton is a Clinical Associate Professor of Medicine (Cardiology) and Adjunct Professor of Bioengineering at Stanford University. Dr. Brinton is an attending general and interventional cardiologist at both Stanford University Medical Center and the Palo Alto VA Medical Center. Dr. Brinton has served as the fellowship director for the Stanford Program in Biodesign since 2005 and also co-directs both the executive education program in innovation management and the Stanford graduate course series in biodesign innovation. Dr. Brinton completed his medicine, cardiology and interventional training at Stanford University. Dr. Brinton was a director for Infogard Laboratories, Inc. until its acquisition by UL LLC (formerly Underwriter Laboratories) in 2015 and was responsible for the early feasibility and clinical development programs for both Kona Medical, Inc. and Qool Therapeutics, Inc. Additionally, Dr. Brinton serves on the advisory board of a number of early-stage medical device companies where he focuses on clinical development and strategy. Prior to medical school, Dr. Brinton was the Clinical Research Director for Pulse Metric, Inc. Dr. Brinton holds an M.D. from the Chicago Medical School of Rosalind Franklin University and a B.S. in bioengineering from the University of California, San Diego. Dr. Brinton's experience in the healthcare industry and as our co-founder provide him with the qualifications and skills to serve on our board of directors.

Marc-Andre Marcotte, CFA. Mr. Marcotte has served as a member of our board of directors since August 2018. He serves as Partner at Sectoral Asset Management Inc., which he joined in 2006. There, Mr. Marcotte has been Chief Operating Officer since April 2018. Prior to his current position, Mr. Marcotte was a Managing Director of Sectoral Asset Management from December 2013 to April 2018. Prior to Sectoral Asset Management Inc., Mr. Marcotte served at CryoCath Technologies, Inc. as the Director of Quality. Prior to that, Mr. Marcotte worked at Arterial Vascular Engineering in Vancouver as an engineer on angioplasty catheters and stents. Mr. Marcotte has been a C.F.A. charterholder since 2010. Mr. Marcotte graduated from Sherbrooke University in 1997 with a B.E. and completed a M.B.A. at HEC Montreal in 2003. Mr. Marcotte's perspective as a partner of a healthcare investment firm, along with his experience in the healthcare industry, provides him with the qualifications and skills to serve on our board of directors.

Family Relationships

There are no family relationships among any of our directors or executive officers.

Board Structure and Compensation of Directors

Upon completion of this offering, our board of directors will consist of members. In accordance with our amended and restated certificate of incorporation and our amended and restated bylaws, immediately after the completion of this offering, our directors will be divided into three classes serving staggered three-year terms. At each annual meeting of stockholders, our directors will be elected to succeed the class of directors whose terms have expired. Our current directors will be divided among the three classes as follows:

- the Class I directors will consist of , and , and their terms will expire at the annual meeting of stockholders to be held in 2019;

- the Class II directors will consist of , and , and their terms will expire at the annual meeting of stockholders to be held in 2020; and
- the Class III directors will consist of , and , and their terms will expire at the annual meeting of stockholders to be held in 2021.

This classification of our board of directors could have the effect of increasing the length of time necessary to change the composition of a majority of the board of directors. In general, at least two annual meetings of stockholders will be necessary for stockholders to effect a change in a majority of the members of the board of directors.

Director Independence

Our board of directors has undertaken a review of the independence of each director. Based on information provided by each director concerning his background, employment and affiliations, our board of directors has determined that each of , and do not have a relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a director and is independent under applicable rules. In making these determinations, our board of directors considered the current and prior relationships that each non-employee director has with our company and all other facts and circumstances our board of directors deemed relevant in determining their independence, including the beneficial ownership of our capital stock by each non-employee director, and the transactions involving them described in the section titled "Certain Relationships and Related Party Transactions."

Compensation of Directors

Directors who are also full-time officers or employees of our company will receive no additional compensation for serving as directors. All other directors will receive an annual retainer of $. Each non-employee director also will receive a fee of $ for each board meeting and each committee meeting attended. In addition, the chairman of the audit committee will receive an annual fee of $ and the chairman of the nominating, governance and compensation committee will receive an annual fee of $. Each non-employee director also will receive an annual grant of restricted stock under our 2019 Equity Incentive Plan having a fair market value (as defined in the plan) of $.

Board Committees

Audit Committee

The members of our audit committee are , and . is the chairman of our audit committee. The composition of our audit committee meets the requirements for independence under the current listing standards and SEC rules and regulations. Each member of our audit committee is financially literate. In addition, our board of directors has determined that is an "audit committee financial expert" as defined in Item 407(d)(5)(ii) of Regulation S-K promulgated under the Securities Act of 1933, as amended (the "Securities Act"). This designation does not impose on either any duties, obligations or liabilities that are greater than are generally imposed on members of our audit committee and our board of directors. Our audit committee is directly responsible for, among other things:

- selecting a firm to serve as the independent registered public accounting firm to audit our financial statements;
- ensuring the independence of the independent registered public accounting firm;
- discussing the scope and results of the audit with the independent registered public accounting firm and reviewing, with management and that firm, our interim and year-end operating results;

- establishing procedures for employees to anonymously submit concerns about questionable accounting or audit matters;
- considering the adequacy of our internal controls and internal audit function;
- reviewing material related party transactions or those that require disclosure; and
- approving or, as permitted, pre-approving all audit and non-audit services to be performed by the independent registered public accounting firm.

Our audit committee will operate under a written charter, to be effective prior to the completion of this offering, that satisfies the applicable rules of the SEC and the listing standards of the .

Compensation Committee

The members of our compensation committee are , and . is the chairman of our compensation committee. Each member of this committee is a non-employee director, as defined by Rule 16b-3 promulgated under the Exchange Act, and an outside director, as defined pursuant to Section 162(m) of the Internal Revenue Code of 1989, as amended, (the "Code"), and meets the requirements for independence under the current listing standards and SEC rules and regulations. Our compensation committee is responsible for, among other things:

- reviewing and approving, or recommending that our board of directors approve, the compensation of our executive officers;
- reviewing and recommending to our board of directors the compensation of our directors;
- administering our stock and equity incentive plans;
- reviewing and approving, or making recommendations to our board of directors with respect to, incentive compensation and equity plans; and
- reviewing our overall compensation philosophy.

Our compensation committee will operate under a written charter, to be effective prior to the completion of this offering, that satisfies the applicable rules of the SEC and the listing standards of the .

Nominating and Governance Committee

The members of our nominating and governance committee are , and . is the chairman of our nominating and governance committee. , and all meet the requirements for independence under the current listing standards. Our nominating and governance committee is responsible for, among other things:

- identifying and recommending candidates for membership on our board of directors;
- reviewing and recommending our corporate governance guidelines and policies;
- reviewing proposed waivers of the code of conduct for directors and executive officers;
- overseeing the process of evaluating the performance of our board of directors; and
- assisting our board of directors on corporate governance matters.

Our nominating and governance committee will operate under a written charter, to be effective prior to the completion of this offering, that satisfies the applicable rules of the SEC and the listing standards of the .

Code of Ethics

In connection with this offering, our board of directors will adopt a code of ethics that applies to all of our employees, officers and directors, including our Chief Executive Officer, Chief Financial Officer and other executive and senior financial officers. Upon completion of this offering, the full text of our code of business conduct and ethics will be posted on the investor relations section of our website. We intend to disclose future amendments to our code of business conduct and ethics, or any waivers of such code, on our website or in public filings.

Limitation of Liability and Indemnification

Our amended and restated certificate of incorporation, which will be in effect upon the completion of this offering, contains provisions that limit the liability of our directors for monetary damages to the fullest extent permitted by Delaware law. Consequently, our directors will not be personally liable to us or our stockholders for monetary damages for any breach of fiduciary duties as directors, except liability for:

- any breach of the director's duty of loyalty to us or our stockholders;
- any act or omission not in good faith or that involves intentional misconduct or a knowing violation of law;
- unlawful payments of dividends or unlawful stock repurchases or redemptions as provided in Section 174 of the Delaware General Corporation Law; or
- any transaction from which the director derived an improper personal benefit.

Our amended and restated certificate of incorporation to be in effect upon the completion of this offering will provide that we may indemnify our directors and officers, in each case to the fullest extent permitted by Delaware law. Our amended and restated bylaws to be in effect upon the completion of this offering will also provide that we are obligated to indemnify our directors and officers to the fullest extent permitted by Delaware law and advance expenses incurred by a director or officer in advance of the final disposition of any action or proceeding and permit us to secure insurance on behalf of any officer, director, employee or other agent for any liability arising out of his or her actions in that capacity regardless of whether we would otherwise be permitted to indemnify him or her under the provisions of Delaware law. We have entered into agreements to indemnify our directors, executive officers and other employees as determined by our board of directors. With specified exceptions, these agreements will provide for indemnification for related expenses including, among other things, attorneys' fees, judgments, fines and settlement amounts incurred by any of these individuals in any action or proceeding. We believe these limitations of liability provisions and indemnification agreements are necessary to attract and retain qualified persons as directors and officers. We also maintain directors' and officers' liability insurance.

The limitation of liability and indemnification provisions in our amended and restated certificate of incorporation, amended and restated bylaws and indemnification agreements may discourage stockholders from bringing a lawsuit against our directors and officers for breach of their fiduciary duty. Our amended and restated certificate of incorporation will provide that any such lawsuit must be brought in the Court of Chancery of the State of Delaware. The foregoing provisions may also reduce the likelihood of derivative litigation against our directors and officers, even though an action, if successful, might benefit us and other stockholders. Further, a stockholder's investment may be adversely affected to the extent that we pay the costs of settlement and damage awards against directors and officers as required by these indemnification provisions. Insofar as indemnification for liabilities arising under the Securities Act may be permitted to our directors, officers and controlling persons pursuant to the foregoing provisions, or otherwise, we have been advised that, in the opinion of the SEC, such indemnification is against public policy as expressed in the Securities Act, and is, therefore, unenforceable. At present, there is no pending litigation or proceeding involving any of our directors, officers or employees for which indemnification is sought, and we are not aware of any threatened litigation that may result in claims for indemnification.

Compensation Committee Interlocks and Insider Participation

Prior to this offering, our compensation committee consisted of F.T. "Jay" Watkins, our Chairman, Antoine Papiernik and Frederic Moll. As a result, Mr. Watkins, Mr. Papiernik and Dr. Moll determined the compensation of our executive officers. None of our executive officers has served as a member of a compensation committee (or if no committee performs that function, the board of directors) of any other entity that has an executive officer serving as a member of our board of directors.

EXECUTIVE COMPENSATION

Summary Compensation Table

The following table sets forth information concerning the compensation paid to our principal executive officer, and our two other most highly compensated executive officers during our fiscal year ended December 31, 2018.

2018 SUMMARY COMPENSATION TABLE

Name and Principal Position	Year	Salary ($)	Bonus ($)	Stock Awards ($)	Option Awards ($)	Non-Equity Incentive Plan Compensation ($)	All Other Compensation ($)	Total ($)
Douglas Godshall, Chief Executive Officer	2018							
Dan Puckett, Chief Financial Officer & Secretary	2018							
Isaac Zacharias, Chief Commercial Officer	2018							

Executive Officer Employment Arrangements

We have entered into employment agreements with each of our named executive officers, the key terms of which are described below. In addition, as a condition of employment each of our named executive officers has also entered into our standard, at-will employment, confidential information, invention assignment and arbitration agreement. Under these agreements, each officer has made a covenant not to solicit our employees, both during the officer's employment and for the 12-month period following termination of employment for any reason.

Douglas Godshall

We are party to an offer letter with Mr. Godshall dated April 28, 2017, under which Mr. Godshall has agreed to serve as our President and Chief Executive Officer, and as a member of our board of directors.

This offer letter provides that Mr. Godshall will receive an initial compensation package including (i) an annual base salary of $375,000, (ii) an annual bonus with a target opportunity of 40% of annual base salary, subject to Mr. Godshall and our achievement of milestones to be established by our board of directors, and (iii) an option award to purchase 6% of the fully diluted shares of our common stock as of the date of grant, with an exercise price equal to the fair market value of the common stock on the date of grant, to vest as to 25% of the award on the first anniversary of the date of grant, with the remainder of the award to vest in equal amounts over the next 36 months (with any then unvested shares vesting upon the closing of a change of control, if Mr. Godshall is employed through the date we sign a definitive agreement with respect to that change of control and subject to Mr. Godshall's release of claims).

Under his offer letter, Mr. Godshall's employment is for no specified period and constitutes at-will employment. In the event that Mr. Godshall's employment is terminated by us without cause (as defined in the offer letter and described below) or by Mr. Godshall for good reason (as defined in the offer letter and described below) then, subject to Mr. Godshall's release of claims in a form acceptable to us, Mr. Godshall will receive a continuation of benefits and base salary for twelve months following termination. Unless we have conducted an initial public offering and experienced a subsequent change of control prior to Mr. Godshall's termination or resignation, this severance arrangement will terminate early if Mr. Godshall commences new employment fewer than twelve months after such termination or resignation.

For purposes of Mr. Godshall's offer letter, "cause" is defined as Mr. Godshall's (i) failure to substantially perform material duties and obligations, which failure is not cured to the reasonable satisfaction of our board of directors within ten business days after written notice; (ii) act of personal dishonesty, moral turpitude, fraud, embezzlement, misrepresentation or other unlawful act that results in harm to us or our affiliates; (iii) violation of law or regulation applicable to our business; (iv) conviction of, or plea of nolo contendere or guilty to, a felony; or (v) material breach of the terms of any agreement with us or one of our affiliates.

For purposes of Mr. Godshall's offer letter, "good reason" is defined as the occurrence, without Mr. Godshall's prior written consent, of: (i) a material diminution of Mr. Godshall's base salary (unless part of a generalized reduction affecting senior level employees); (ii) a material diminution of authority, duties or responsibilities (unless in connection with a change of control if Mr. Godshall has reasonably comparable authority, duties and responsibilities after the change of control, regardless of any change in title or whether he subsequently provides services to a subsidiary, affiliate, business unit, division or otherwise); (iii) our requirement that Mr. Godshall relocate his principal residence to the state in which we conduct our principal business; or (iv) our material breach of the agreement under which Mr. Godshall provides services to us, which is not cured to Mr. Godshall's reasonable satisfaction within ten business days after notice.

For purposes of Mr. Godshall's offer letter, "change of control" is defined as: (1) our acquisition by another entity by means of any transaction (including a series of related transactions, but excluding our sale of securities for the purpose of raising additional funds) unless our stockholders of record immediately prior to such transaction hold, immediately after such transactions, at least 50% of the voting power of the surviving or acquiring entity; or (2) a sale of all or substantially all of our assets.

Dan Puckett

We are party to an offer letter with Mr. Puckett dated March 21, 2016, under which Mr. Puckett has agreed to serve as our Chief Financial Officer.

This offer letter provides that Mr. Puckett will receive an initial compensation package, including (i) an annual base salary of $290,000 and (ii) an option award to purchase 1.01% of the fully diluted shares of our common stock as of the date of grant, with an exercise price equal to the fair market value of the common stock on the date of grant, to vest as to 25% of the award on the first anniversary of the date of grant, with the remainder of the award to vest in equal amounts over the next 36 months subject to his continued employment with the company (with any then unvested shares vesting on a "double trigger" basis in the event of a change of control). Mr. Puckett's employment with the company is on an at-will basis. We are free to conclude his employment at any time, with or without cause and with or without notice.

Isaac Zacharias

We are party to a letter agreement with Mr. Zacharias dated November 26, 2018, under which Mr. Zacharias has agreed to serve as our Chief Commercial Officer. This letter agreement, which is cast as an offer letter, sets forth the terms and conditions of Mr. Zacharias' continued employment with us in his new role.

This letter agreement provides that Mr. Zacharias will receive a compensation package including (i) an annual base salary of $310,000, (ii) an annual bonus of up to 25% of annual base salary and (iii) an option award to purchase 1,000,000 shares of our common stock with an exercise price equal to the fair market value of the common stock on the date of grant, to vest in equal amounts over the next 48 months subject to his continued employment with the company. Mr. Zacharias' employment with the company is on an at-will basis. We are free to conclude his employment at any time, with or without cause and with or without notice.

Outstanding Equity Awards at Fiscal Year End

The following table sets forth information concerning unexercised options, stock that has not vested and equity incentive plan awards for the executive officers named in the Summary Compensation Table as of the end of our fiscal year ended December 31, 2018.

OUTSTANDING EQUITY AWARDS AT 2018 FISCAL YEAR END

	Option Awards					Stock Awards			
Name	Numbers of Securities Underlying Unexercised Options Exercisable (#)	Numbers of Securities Underlying Unexercised Options Unexercisable (#)	Equity Incentive Plan Awards: Number of Securities Underlying Unexercised Unearned Options (#)	Option Exercise Price ($)	Option Expiration Date	Number of Shares or Units of Stock That Have Not Vested (#)	Market Value of Shares or Units of Stock That Have Not Vested ($)	Equity Incentive Plan Awards: Number of Unearned Shares, Units or Other Rights That Have Not Vested (#)	Equity Incentive Plan Awards: Market or Payout Value of Unearned Shares, Units or Other Rights That Have Not Vested ($)
Douglas Godshall									
Dan Puckett									
Isaac Zacharias									

Employee Benefit Plans

Our officers are entitled to participate in our equity incentive plans. All officers are eligible to participate in the company's 401(k) plan on the same terms as all other employees.

Annual Bonus Program

We maintain an annual bonus program that rewards each of our named executive officers for our performance against business goals, and for the officer's performance against his or her individual goals. Our board of directors establishes performance goals for this program each year and then evaluates performance to these established goals to determine the amount of each award. This program is based on performance over a calendar year and pays out on or before March 15 of the following year, subject to the executive's continued service through the payment date. All awards under this program are subject to management discretion.

2019 Equity Incentive Plan

Our board of directors and our stockholders approved our 2019 Equity Incentive Plan (the "2019 Plan"), which will become effective upon the effectiveness of the registration statement, of which this prospectus forms a part. Our 2019 Plan replaces our 2009 Equity Incentive Plan (the "2009 Plan"). Following the effectiveness of the 2019 Plan, no further equity awards may be granted under our 2009 Plan.

Stock awards. The 2019 Plan provides for the grant of incentive stock options ("ISOs"), nonstatutory stock options ("NSOs"), stock appreciation rights, restricted stock awards and restricted stock unit awards (collectively, "stock awards"). ISOs may be granted only to employees. All other awards may be granted to employees, directors and consultants.

Share reserve. The aggregate number of shares of our common stock initially reserved for issuance pursuant to stock awards under the 2019 Plan is , plus (i) the shares reserved for issuance under 2009 Plan which were not issued or subject to awards granted under that plan and (ii) any shares subject to stock options or other stock awards granted under our 2009 Plan that expire or terminate for any reason, are forfeited or repurchased by us or are reacquired, withheld or not issued to satisfy a tax withholding obligation, up to a maximum of shares added through clauses (i) or (ii). The maximum number of shares that may be issued upon the exercise of incentive stock options will equal this aggregate maximum number of shares plus other shares that become available upon lapsed awards or certain other conditions, to the extent allowed by Section 422 of the Code and the regulations promulgated thereunder.

If a stock award granted under the 2019 Plan is forfeited back to us because of the failure to meet a contingency or condition required to vest, such shares will become available for subsequent issuance under the 2019 Plan. In addition, shares withheld to satisfy income or employment withholding taxes and shares used to pay the exercise price of a stock option will become available for the grant of new stock awards under the 2019 Plan.

Administration. Our board of directors, or one or more duly authorized committees thereof, have the authority to administer the 2019 Plan. Subject to the terms of the 2019 Plan, our board of directors or the authorized committee, referred to herein as the plan administrator, determines recipients, dates of grant, the numbers and types of stock awards to be granted and the terms and conditions of the stock awards, including the period of their exercisability and vesting schedule applicable to a stock award. Subject to the limitations set forth below, the plan administrator will also determine the exercise price, strike price or purchase price of awards granted and the types of consideration to be paid for the award. The plan administrator has the authority to modify outstanding awards made under the 2019 Plan, but is not authorized to reduce the exercise price of stock options or stock appreciation rights without stockholder consent.

The plan administrator has the authority to modify outstanding awards under our 2019 Plan. Subject to the terms of our 2019 Plan, the plan administrator has the authority to extend the post-termination exercisability period of awards and to extend the maximum term of an option.

Stock Options. Incentive and nonstatutory stock options are granted pursuant to stock option agreements adopted by the plan administrator. The plan administrator determines the exercise price for a stock option, within the terms and conditions of the 2019 Plan, provided that the exercise price of a stock option cannot be less than 100% of the fair market value of our common stock on the date of grant. In the case of an ISO granted to an employee who owns stock representing more than 10% of the voting power of all classes of our stock or any parent or subsidiary of us, the exercise price will be no less 110% of the fair market value on the date of the grant. Options vest at the rate specified by the plan administrator. At the time an option is granted, the plan administrator will fix the period within which the option may be exercised and will determine any conditions that must be satisfied before the option may be exercised.

The plan administrator determines the term of stock options granted under the 2019 Plan, up to a maximum of 10 years. In the case of an incentive stock option granted to an employee who owns stock representing more than 10% of the voting power of all classes of our stock or the stock of any of our parents or subsidiaries, the maximum term will be five years. Unless the terms of an optionholder's stock option agreement provide otherwise, if an optionholder's service relationship with us ceases for any reason other than disability or death, the optionholder may generally exercise any vested options for a period of 30 days following the cessation of service. If an optionholder's service relationship with us ceases due to disability or death, the optionholder or a beneficiary may generally exercise any vested options for a period of six months, or within such longer period of time as is specified in the award agreement. In no event may an option be exercised beyond the expiration of its term.

Acceptable consideration for the purchase of common stock issued upon the exercise of a stock option will be determined by the plan administrator and may include (1) cash, (2) check, (3) promissory note, (4) other shares, (5) a broker-assisted cashless exercise, (6) by net exercise or (7) combination of the foregoing methods of payment.

Unless the plan administrator provides otherwise, options generally are not transferable except by will or by the laws of descent and distribution. An optionholder may designate a beneficiary, however, who may exercise the option following the optionholder's death.

Stock Appreciation Rights. The 2019 Plan permits the grant of stock appreciation rights. Stock appreciation rights give recipients the right to acquire a specified number of shares of stock at a predetermined price. The

terms of the stock appreciation rights granted under the 2019 Plan are determined by the plan administrator in the award agreement evidencing the award, including the number of shares, exercise price, expiration date and other terms.

Restricted Stock and Restricted Stock Units. The 2019 Plan permits the grant of restricted stock and/or restricted stock units. Restricted stock awards are grants of shares of our common stock. Restricted stock units represent the right to receive shares of our common stock (or a cash amount equal to the value of our common stock) on future specified dates. The terms of the restricted stock and/or restricted stock units granted under the 2019 Plan are determined by the plan administrator in the award agreement evidencing the award, including the number of shares, period of restriction or vesting schedule and other terms.

Tax Limitations on Incentive Stock Options. The aggregate fair market value, determined at the time of grant, of our common stock with respect to ISOs that are exercisable for the first time by an optionholder during any calendar year under all of our stock plans may not exceed $100,000. Options or portions thereof that exceed such limit will generally be treated as NSOs. No ISO may be granted to any person who, at the time of the grant, owns or is deemed to own stock possessing more than 10% of our total combined voting power or that of any of our affiliates unless (1) the option exercise price is at least 110% of the fair market value of the stock subject to the option on the date of grant and (2) the option is not exercisable after the expiration of five years from the date of grant.

Adjustments; Corporate Transactions. In the event of certain changes in our corporate structure, including any dividend or other distribution, recapitalization, stock split, reverse stock split, reorganization, merger, consolidation, split-up, spin-off, combination, repurchase or exchange of shares of the company, the plan administrator will make appropriate adjustments to outstanding awards to prevent diminution or enlargement of the benefits or potential benefits available under the 2019 Plan.

Merger or Change of Control. In the event of certain corporate transactions specified in the 2019 Plan, including a merger or change of control, as defined in the 2019 Plan, each outstanding award will be treated as the plan administrator determines, without a participant's consent, including that (i) awards will be assumed or substituted by the succeeding corporation; (ii) the awards will terminate; (iii) outstanding awards will vest and become exercisable; (iv) the awards will terminate in exchange for an amount of cash and/or property, if any, equal to the amount that would have been attained upon the exercise of the award or realization of the rights under the award as of the date of the transaction; (v) the replacement of any award with rights or property selected by the plan administrator; or (vi) any combination of the above. In the event that the successor corporation does not assume or substitute the award, the participant will fully vest in and have the right to exercise all of his or her outstanding options and stock appreciation rights, and all restrictions on restricted stock and restricted stock units will lapse and performance goals will be deemed achieved at 100% of the target levels. Our plan administrator is not obligated to treat all stock awards, even those that are of the same type, in the same manner. Under the 2019 Plan, a change of control is generally: (i) the acquisition by a person or entity of more than 50% of our combined voting power other than by private financing that is approved by our board of directors; (ii) if we are public, the date on which a majority of our board of directors has been replaced during any 12-month period by directors whose appointment or election is not endorsed by a majority of the members of our board of directors prior to the date of appointment or election; or (iii) change in ownership of a substantial portion of our assets.

Amendment and Termination. The 2019 Plan will terminate in 2029. However, our board of directors has the authority to amend, alter, or terminate our 2019 Plan, provided that such action does not materially impair the existing rights of any participant without such participant's written consent.

2009 Equity Incentive Plan

Our board of directors approved our 2009 Plan in June 2009, and it became effective in January 2010. The 2009 Plan provides for grants of stock options, stock appreciation rights, restricted stock awards and restricted stock unit awards (collectively, stock awards) to employees, directors or consultants.

Stock Options. Each of our named executive officers has received one or more grants of stock options under the 2009 Plan. Each of these awards has been designated as an ISO, and will be treated as such to the extent that the award complies with the Code requirements for ISOs, including the requirement that not more than $100,000 in ISOs shall become exercisable for any given employee in any given year. Any portion of the options granted to our named executive officers that do not comply as ISOs will be treated as NSOs.

Each stock option granted to any of our named executive officers under our 2009 Plan has an exercise price equal to the fair market value of the common stock on the date of grant, as determined by our board of directors. The first such stock option award granted to each of our named executive officers is scheduled to vest as to 25% of the award on the first anniversary of the date of grant, with the remainder of the award to vest in equal monthly amounts over the next 36 months. Each stock option award granted to a named executive officer after the officer's initial award, is scheduled to vest in equal monthly amounts over the next 48 months.

As described above, the offer letter for Mr. Godshall provides for single-trigger vesting on a change of control for his initial option grant, and Mr. Puckett's offer letter provides for double-trigger vesting on a termination in connection with a change of control for his initial option grant. Other option awards to our named executive officers under the 2009 Plan will vest upon a change of control to the extent provided in the 2009 Plan.

In the event of certain corporate transactions specified in the 2009 Plan, including a merger or change of control, as defined in the 2009 Plan, each outstanding award will be treated as the plan administrator determines, without a participant's consent, including that: (i) awards will be assumed or substituted by the succeeding corporation; (ii) the awards will terminate; (iii) outstanding awards will vest and become exercisable; (iv) the awards will terminate in exchange for an amount of cash and/or property, if any, equal to the amount that would have been attained upon the exercise of the award or realization of the rights under the award as of the date of the transaction; (v) the replacement of any award with rights or property selected by the plan administrator; or (vi) any combination of the above. In the event that the successor corporation does not assume or substitute the award, the participant will fully vest in and have the right to exercise all of his or her outstanding options and stock appreciation rights, and all restrictions on restricted stock and restricted stock units will lapse and performance goals will be deemed achieved at 100% of the target levels. Our plan administrator is not obligated to treat all stock awards, even those that are of the same type, in the same manner. Under the 2009 Plan, a change of control is generally: (i) the acquisition by a person or entity of more than 50% of our combined voting power other than by private financing that is approved by our board of directors; (ii) if we are public, the date on which a majority of the board has been replaced during any 12-month period by directors whose appointment or election is not endorsed by a majority of the members of our board of directors prior to the date of appointment or election; or (iii) change in ownership of a substantial portion of our assets.

Each of these stock options will become exercisable upon vesting, and will remain exercisable until its termination date on the tenth anniversary of the award, or, if earlier, until the day that is twelve months after the recipient ceases to be a service provider due to death or disability, or the day that is three months after the recipient ceases to be a service provider for any other reason.

Each of these options includes an agreement by the applicable named executive officer to comply with the trading restrictions under any lock-up period following a public offering of our securities.

Pension and Retirement Benefits

We currently maintain a 401(k) retirement savings plan (the "401(k) plan") for our employees, including our named executive officers, who satisfy certain eligibility requirements. The 401(k) plan is intended to qualify as a

tax-qualified plan under Section 401(k) of the Code. Our named executive officers are eligible to participate in the 401(k) plan on the same basis as our other employees. The Code allows eligible employees to defer a portion of their compensation, within prescribed limits, on a pre-tax basis through contributions to the 401(k) plan. We reserve the right to make discretionary matching contributions or non-elective contributions under the 401(k) plan. In 2018, we did not provide a matching contribution or a non-elective contribution under the 401(k) plan.

We do not maintain any defined benefit pension plans.

Nonqualified Deferred Compensation

We do not maintain any nonqualified deferred compensation plans.

DIRECTOR COMPENSATION

We did not provide any compensation to non-employee members of our board of directors for service on our board and none of our non-employee directors received any cash or equity compensation during the year ended December 31, 2018. In connection with this offering, we expect to implement a compensation policy for our independent directors. Mr. Godshall, our Chief Executive Officer and President, did not receive additional compensation for his services as a director. For more information on Mr. Godshall's compensation as an officer, see the section titled "Executive Compensation."

Benefit Plans for Directors

Our directors are entitled to participate in our equity incentive plans, described above, and, following this offering, we may include equity awards in our compensation policy for independent directors.

CERTAIN RELATIONSHIPS AND RELATED PARTY TRANSACTIONS

We describe below transactions and series of similar transactions, during our last three fiscal years or currently proposed, to which we were a party or will be a party, in which:

- the amounts involved exceeds $120,000; and
- any of our directors, executive officers or beneficial holders of more than 5% of any class of our capital stock had or will have a direct or indirect material interest.

Other than as described below, there have not been, nor are there any currently proposed, transactions or series of similar transactions meeting this criteria to which we have been or will be a party other than compensation arrangements, which are described where required under the sections titled "Management—Board Structure and Compensation of Directors" and "Executive Compensation."

Convertible Preferred Stock Financings

Series A-1 Preferred Stock Financing. In January 2015, in a subsequent preferred stock financing, we issued an aggregate of 13,790,374 shares of our Series A-1 preferred stock at $0.2538 per share, for an aggregate consideration of approximately $3.5 million. All shares of our Series A-1 convertible preferred stock will convert into shares of our common stock immediately prior to the closing of this offering in accordance with our current certificate of incorporation.

Series B Preferred Stock Financing. In May 2015, we issued an aggregate of 64,777,331 shares of our Series B preferred stock at $0.6175 per share, for an aggregate consideration of approximately $40.0 million. All shares of our Series B convertible preferred stock will convert into shares of our common stock immediately prior to the closing of this offering in accordance with our current certificate of incorporation. In connection with the Series B preferred stock financing, we issued non-compensatory warrants to purchase shares of common stock, totaling 1,729,699 shares of common stock in the aggregate, in consideration for the transfer of the intellectual property rights of DJT, LLC ("DJT"), a dissolved entity formerly affiliated with our founders, including one of our directors, Todd Brinton, to the company. The warrants have an exercise price of $0.18 per share.

Series C Preferred Stock Financing. In November 2016 and September 2017, we issued an aggregate of 79,209,457 shares of our Series C preferred stock at $1.00998 per share, for an aggregate consideration of approximately $80.0 million. All shares of our Series C convertible preferred stock will convert into shares of our common stock immediately prior to the closing of this offering in accordance with our current certificate of incorporation.

The following table sets forth the aggregate number of shares of our capital stock acquired by our directors, officers and beneficial owners of more than 5% of our capital stock in the financing transactions described above.

Participant(1)	Series A-1 Preferred Stock	Series B Preferred Stock	Series C Preferred Stock	Warrants for Common Stock	Cash Purchase Price
Greater than 5% Stockholders:					
Sofinnova Capital VII FCPR	10,004,235	13,527,954	7,227,865	—	$ 18,192,585.55
Entities affiliated with Venrock Funds	—	13,487,467	12,401,235	—	$ 20,853,510.25
Entities managed by Fidelity Management & Research Company or its affiliates	—	—	24,752,965	—	$ 24,999,999.62
Certain funds and accounts advised by T. Rowe Price Associates, Inc.	—	—	13,366,601	—	$ 13,499,999.72
Entities affiliated with Sectoral Asset Management	—	3,238,866	14,059,659	—	$ 16,199,974.17
Directors:					
Jay Watkins	137,903	175,480	—	—	$ 143,358.69
Frederic Moll, M.D.	275,807	350,960	297,035	—	$ 586,717.03
Todd Brinton, M.D.(2)	—	—	—	501,613	$ 90,290.34

(1) Additional details regarding these participants and their equity holdings are provided in "Principal Stockholders."
(2) Represents Dr. Brinton's beneficial ownership in warrants initially issued to DJT. Such warrants, which have an exercise price of $0.18 per share, were transferred to Dr. Brinton upon DJT's dissolution.

Investor Rights Agreement

We are party to an Amended and Restated Investor Rights Agreement (the "IRA") with the holders of our preferred stock, including certain of our directors and entities to which certain of our directors are related. The agreement provides these holders the right, subject to the terms of the lock-up agreements entered into in connection with this offering, to demand that we file a registration statement or request that their shares be covered by a registration statement that we are otherwise filing. See the section titled "Description of Capital Stock—Registration Rights" for additional information. The agreement also provides these holders pro rata participation rights and information rights, which will terminate upon completion of this offering.

Director and Officer Indemnification

We have entered into an indemnification agreement with each of our directors and executive officers. These indemnification agreements and our amended and restated certificate of incorporation and amended and restated bylaws indemnify each of our directors and officers to the fullest extent permitted by the Delaware General Corporation Law. For information regarding these indemnification arrangements, please refer to the section titled "Management—Limitations on Liability and Indemnification of Directors and Officers."

Equity Grants to Executive Officers and Directors

We have granted options to our named executive officers and certain of our non-employee directors as more fully described in the sections titled "Director Compensation" and "Executive Compensation."

Policies and Procedures for Related Party Transactions

Our board of directors will adopt a written related party transaction policy, to be effective upon the completion of this offering, setting forth the policies and procedures for the review and approval or ratification of

related-party transactions. This policy will cover any transaction, arrangement or relationship or any series of similar transactions, arrangements or relationships, in which we were or are to be a participant and a related party had or will have a direct or indirect material interest, as determined by the audit committee of our board of directors, including, without limitation, purchases of goods or services by or from the related party or entities in which the related party has a material interest, and indebtedness, guarantees of indebtedness or employment by us of a related party.

All related party transactions described in this section occurred prior to adoption of this policy and as such, these transactions were not subject to the approval and review procedures set forth in the policy. However, these transactions were reviewed and approved by our board of directors.

PRINCIPAL STOCKHOLDERS

The following table sets forth information regarding beneficial ownership of our common stock as of September 30, 2018, by:

- each person whom we know to own beneficially more than 5% of our common stock;
- each of our directors and named executive officers individually; and
- all of our directors and executive officers as a group.

In accordance with the rules of the SEC, beneficial ownership includes voting or investment power with respect to securities and includes the shares issuable pursuant to stock options that are exercisable within 60 days of September 30, 2018. Shares issuable pursuant to stock options are deemed outstanding for computing the percentage of the person holding such options but are not outstanding for computing the percentage of any other person. The number of shares of common stock outstanding after this offering includes shares of common stock being offered for sale by us in this offering. The percentage ownership of our common stock in the "Shares Beneficially Owned Before the Offering" column in the table is based on 236,560,731 shares of our common stock issued and outstanding as of September 30, 2018, assuming (i) the automatic conversion of all outstanding shares of our convertible preferred stock into shares of our common stock immediately prior to the completion of this offering and (ii) the net exercise of our outstanding warrants to purchase 1,729,699 shares of our common stock immediately prior to the completion of this offering. The percentage ownership of our common stock in the "Shares Beneficially Owned After the Offering" column in the table is based on shares of our common stock issued and outstanding as of September 30, 2018, assuming the automatic conversion and net exercise described above, and which gives further effect to the issuance of shares of our common stock in this offering and assumes no exercise of the underwriters' option to purchase additional shares.

Unless otherwise indicated, the address for each listed stockholder is: c/o ShockWave Medical, Inc., 5403 Betsy Ross Drive, Santa Clara, California 95054. To our knowledge, except as indicated in the footnotes to this table and pursuant to applicable community property laws, the persons named in the table have sole voting and investment power with respect to all shares of common stock.

	Shares Beneficially Owned Before the Offering		Shares Beneficially Owned After the Offering	
Name and Address of Beneficial Owner	Number	Percent	Number	Percent
Greater than 5% Stockholders:				
Sofinnova Capital VII FCPR(1)	49,339,348	20.9%		
Entities affiliated with Venrock Funds(2)	25,888,702	10.9%		
Entities managed by Fidelity Management & Research Company or its affiliates(3)	24,752,965	10.5%		
Certain funds and accounts advised by T. Rowe Price Associates, Inc.(4)	14,556,820	6.2%		
Entities affiliated with Sectoral Asset Management(5)	12,797,985	5.4%		
Directors and Named Executive Officers:				
Douglas Godshall(6)	5,420,456	2.2%		
Dan Puckett(7)	1,241,666	*		
Isaac Zacharias	—	*		
F.T. “Jay” Watkins(8)	2,190,432	*		
Antoine Papiernik(1)	49,339,348	20.9%		
Colin Cahill	—	*		
Frederic Moll, M.D.(9)	4,873,745	2.1%		
Todd Brinton, M.D.(10)	5,788,863	2.4%		
Marc-Andre Marcotte(5)	12,797,985	5.4%		
Directors and Officers as a Group (9 persons)(11)	81,652,495	33.2%		

* Represents beneficial ownership of less than one percent (1%) of the outstanding common stock.

(1) Sofinnova Partners SAS, a French corporation and the management company of Sofinnova Capital VII FCPR, may be deemed to have sole voting and dispositive power over the shares held by Sofinnova Capital VII FCPR. The managing partners of Sofinnova Partners SAS, Denis Lucquin, Antoine Papiernik (a member of our board of directors) and Monique Saulnier, may be deemed to have shared voting and dispositive power with respect to such shares. The address of Sofinnova Capital VII FCPR is Sofinnova Partners, Immeuble le Centorial, 16-18 Rue du Quatre-Septembre, 75002 Paris, France.

(2) Consists of (a) 13,754,006 shares held by Venrock Associates VII, L.P. (“VA VII”), (b) 7,823,195 shares held by Venrock Healthcare Capital Partners II, L.P. (“VHCP II”), (c) 3,172,160 shares held by VHCP Co-Investment Holdings II, LLC (“Co-Invest II”) and (d) 1,139,341 shares held by Venrock Partners VII, L.P. (“VP VII”). VHCP Management II, LLC (“VHCP Management II”) is the general partner of VHCP II and the manager of Co-Invest II and may be deemed to beneficially own the shares held by VHCP II and Co-Invest II (the “VHCP II Shares”). Drs. Bong Koh and Nimish Shah are the managing members of VHCP Management II and may be deemed to beneficially own the VHCP II Shares. Drs. Koh and Shah and VHCP Management II expressly disclaim beneficial ownership over the VHCP II Shares except to the extent of their indirect pecuniary interests therein. Venrock Management VII, LLC is the general partner of VA VII and VP VII and may be deemed to beneficially own the shares held by VA VII and VP VII (the “VII Shares”). Venrock Management VII, LLC expressly disclaims beneficial ownership over the VII Shares except to the extent of its indirect pecuniary interests therein. The address for VHCP II, Co-Invest II, and Drs. Koh and Shah is 7 Bryant Park, 23rd Floor, New York, NY 10018. The address for VA VII and VP VII is 3340 Hillview Avenue, Palo Alto, CA 94304.

(3) Consists of (a) 7,425,890 shares held by Fidelity Select Portfolios: Health Care Portfolio (“Fidelity Health”), (b) 7,425,890 shares held by Fidelity Select Portfolios: Medical Equipment and Systems Portfolio (“Fidelity Medical Equipment”), (c) 5,413,080 shares held by Fidelity Mt. Vernon Street Trust: Fidelity Growth Company Fund (“Fidelity Growth”), (d) 3,472,799 shares held by Fidelity Growth Company Commingled Pool (“Fidelity Growth Commingled Pool”) and (e) 1,015,306 shares held by Fidelity Mt. Vernon Street Trust: Fidelity Series Growth Company Fund (“Fidelity Series Growth”). Fidelity Health, Fidelity Medical Equipment, Fidelity Growth, Fidelity Growth Commingled Pool and Fidelity Series Growth are managed by Fidelity Management & Research Company (FMR Co.) or another direct or indirect subsidiary of FMR LLC. Abigail P. Johnson is a Director, the Chairman, the Chief Executive Officer and the President of FMR LLC. Members of the Johnson family, including Abigail P. Johnson, are the predominant owners, directly or through trusts, of Series B voting common shares of FMR LLC, representing 49% of the voting power of FMR LLC. The Johnson family group and all other Series B shareholders have entered into a shareholders’ voting agreement under which all Series B voting common shares will be voted in accordance with the majority vote of Series B voting common shares. Accordingly, through their ownership of voting common shares and the execution of the shareholders’ voting agreement, members of the Johnson family may be deemed, under the

Investment Company Act of 1940, to form a controlling group with respect to FMR LLC. Neither FMR LLC nor Abigail P. Johnson has the sole power to vote or direct the voting of the shares owned directly by the various investment companies registered under the Investment Company Act ("Fidelity Funds") advised by FMR Co., a wholly owned subsidiary of FMR LLC, which power resides with the Fidelity Funds' Boards of Trustees. FMR Co. carries out the voting of the shares under written guidelines established by the Fidelity Funds' Boards of Trustees. The address for FMR LLC is 200 Seaport Blvd. V12G, Boston, Massachusetts 02210.

(4) Consists of (a) 12,389,184 shares held by T. Rowe Price Health Sciences Fund, Inc., (b) 805,177 shares held by VALIC Company I—Health Sciences Fund, (c) 704,718 shares held by T. Rowe Price Health Sciences Portfolio and (d) 657,741 shares held by TD Mutual Funds—TD Health Sciences Fund. T. Rowe Price Associates, Inc. is the investment adviser or subadviser, as applicable, for each of T. Rowe Price Health Sciences Fund, Inc., VALIC Company I—Health Sciences Fund, T. Rowe Price Health Sciences Portfolio and TD Mutual Funds—TD Health Sciences Fund. T. Rowe Price Associates, Inc. ("TRPA") serves as investment adviser or subadviser, as applicable, with power to direct investments and/or sole power to vote the securities owned by these funds and accounts (with the exception of VALIC Company I—Health Sciences Fund that retains voting authority). The T. Rowe Price Proxy Committee (the "Proxy Committee") develops the firm's positions on all major proxy voting issues, creates guidelines and oversees the voting process. Once the Proxy Committee establishes its recommendations, they are distributed to the firm's portfolio managers as voting guidelines. Ultimately, the portfolio managers for each account decide how to vote on the proxy proposals of companies in their portfolios. More information on the T. Rowe Price proxy voting guidelines is available on its website at troweprice.com. The T. Rowe Price portfolio manager of the funds and accounts that hold the securities is Ziad Bakri. For purposes of reporting requirements of the Securities Exchange Act of 1934, TRPA may be deemed to be the beneficial owner of all the shares listed above; however, TRPA expressly disclaims that it is, in fact, the beneficial owner of such securities. T. Rowe Price Associates, Inc. is the wholly owned subsidiary of T. Rowe Price Group, Inc., which is a publicly traded financial services holding company. The address for T. Rowe Price Associates, Inc. is 100 East Pratt Street, Baltimore, Maryland 21202. T. Rowe Price Investment Services, Inc. ("TRPIS"), a registered broker-dealer, is a subsidiary of T. Rowe Price Associates, Inc. TRPIS was formed primarily for the limited purpose of acting as the principal underwriter and distributor of shares of the funds in the T. Rowe Price fund family and complements the other services provided to shareholders of the T. Rowe Price funds. TRPIS does not engage in underwriting or market-making activities involving individual securities.

(5) Consists of (a) 5,219,103 shares held by New Emerging Medical Opportunities Fund II Limited Partnership, (b) 5,148,617 shares held by New Emerging Medical Opportunities Fund III Limited Partnership and (c) 2,430,265 shares held by Sectoral Asset Management Holding Ltd. Marc-Andre Marcotte (a member of our board of directors), is Partner & COO for Sectoral Asset Management, Inc., which manages these funds, and may be deemed to have voting and dispositive power over the shares held by these funds. The address of each of these funds is 1010 Sherbrooke St. West, Suite 1610, Montreal, Quebec H3A 2R7, Canada.

(6) Consists of 5,420,456 shares issuable pursuant to options that are exercisable within 60 days of September 30, 2018 (of which all would be vested).

(7) Consists of 1,241,666 shares issuable pursuant to options that are exercisable within 60 days of September 30, 2018 (of which all would be vested).

(8) Consists of (a) 1,369,490 shares and (b) 820,942 shares issuable pursuant to options that are exercisable within 60 days of September 30, 2018 (of which all would be vested).

(9) Consists of (a) 3,548,745 shares and (b) 1,325,000 shares issuable pursuant to options that are exercisable within 60 days of September 30, 2018 (of which all would be vested).

(10) Consists of (a) 5,156,000 shares (of which 195,000 were issued pursuant to options that were early exercised and are subject to repurchase), (b) 501,613 warrants to purchase common stock that are currently exercisable and (c) 131,250 shares issuable pursuant to options that are exercisable within 60 days of September 30, 2018 (of which all would be vested).

(11) Consists of (a) 81,652,495 shares held by all current executive officers and directors as a group (of which 195,000 were issued pursuant to options that were early exercised and are subject to repurchase), which includes 501,613 shares issuable pursuant to warrants that are currently exercisable and 8,939,314 shares issuable pursuant to options that are exercisable within 60 days of September 30, 2018 (of which all would be vested).

DESCRIPTION OF CAPITAL STOCK

The following descriptions are summaries of the material terms of our amended and restated certificate of incorporation, amended and restated bylaws, the amended and restated investor rights agreement to which we and certain of our stockholders are parties and of the Delaware General Corporation Law. Because the following is only a summary, it does not contain all of the information that may be important to you. For a complete description, you should refer to our amended and restated certificate of incorporation, amended and restated bylaws and amended and restated investor rights agreement, copies of which have been filed as exhibits to the registration statement of which this prospectus is part.

General

Following this offering, our authorized capital stock will consist of shares of common stock, par value $0.001 per share, and shares of preferred stock, par value $0.001 per share.

Based on shares of common stock outstanding as of December 31, 2018, and after giving effect to the automatic conversion of all of our outstanding convertible preferred stock into an aggregate of shares of common stock upon the completion of this offering and the issuance of shares of common stock in this offering, there will be shares of common stock outstanding upon the closing of this offering. As of December 31, 2018, we had stockholders of record. As of December 31, 2018, there were shares of common stock subject to outstanding options. As of December 31, 2018, there were shares of common stock subject to outstanding warrants, with a weighted-average exercise price of $ per share. As of December 31, 2018, we had outstanding warrants to purchase up to an aggregate of shares of our Series A-1 preferred stock with an exercise price of $.

Common Stock

Common stock outstanding. As of December 31, 2018 there were shares of common stock outstanding which were held of record by stockholders. There will be shares of common stock outstanding, assuming no exercise of the underwriters' over-allotment option and no exercise of outstanding options, after giving effect to the sale of the shares of common stock offered hereby. All outstanding shares of common stock are fully paid and non-assessable, and the shares of common stock to be issued upon completion of this offering will be fully paid and non-assessable.

Voting rights. The holders of common stock are entitled to one vote per share on all matters to be voted upon by the stockholders.

Dividend rights. Subject to preferences that may be applicable to any outstanding preferred stock, the holders of common stock are entitled to receive ratably such dividends, if any, as may be declared from time to time by our board of directors, out of funds legally available therefor. See the section titled "Dividend Policy."

Rights upon liquidation. In the event of liquidation, dissolution or winding up of the company, the holders of common stock are entitled to share ratably in all assets remaining after payment of liabilities, subject to prior distribution rights of preferred stock, if any, then outstanding.

Other rights. The holders of our common stock have no preemptive or conversion rights or other subscription rights. There are no redemption or sinking fund provisions applicable to the common stock.

Preferred Stock

Effective immediately upon closing of this offering, there will be no shares of preferred stock outstanding because all our outstanding shares of preferred stock will have been automatically converted into an aggregate of

shares of common stock at such time. Our board of directors has the authority to issue the preferred stock in one or more series and to fix the rights, preferences, privileges and restrictions thereof, including dividend rights, dividend rates, conversion rights, voting rights, terms of redemption, redemption prices, liquidation preferences and the number of shares constituting any series or the designation of such series, without further vote or action by the stockholders.

The issuance of preferred stock may have the effect of delaying, deferring or preventing a change in control of the company without further action by the stockholders and may adversely affect the voting and other rights of the holders of common stock. At present, we have no plans to issue any of the preferred stock following consummation of this offering.

Common Stock Warrants

As of December 31, 2018, we had common stock warrants exercisable for an aggregate of 2,149,873 shares of our common stock, with a weighted-average exercise price of $0.21 per share. The warrants are exercisable into 2,149,873 shares of our common stock. Warrants to purchase 1,729,699 shares of our common stock, with an exercise price of $0.18 per share, expire in May 2025, but would also expire earlier upon (i) certain transactions involving the merger of our company with or into another organization or the sale or disposition of all or substantially all of our assets and (ii) the closing of a firm commitment underwritten initial public offering pursuant to an effective registration statement filed under the Securities Act covering the offering and sale of the company's common stock. Warrants to purchase 420,174 shares of our common stock, with an exercise price of $0.33 per share, expire in February 2028, but would also expire earlier upon certain transactions involving the merger of our company with or into another organization or the sale or disposition of all or substantially all of our assets. The warrants contain provisions for adjustment of the exercise price and number of shares issuable upon the exercise of the warrants in the event of reclassification of shares, certain stock dividends, subdivisions and stock splits or combinations. The warrants have a net exercise provision under which its holder may, in lieu of payment of the exercise price in cash, surrender the warrant and receive a net amount of shares based on the fair market value of our stock at the time of exercise of the warrant after deduction of the aggregate exercise price.

Preferred Stock Warrants

As of December 31, 2018, we had outstanding a convertible preferred stock warrant to purchase up to an aggregate of 669,817 shares of our Series A-1 preferred stock, with an exercise price of $0.2538 per share. Upon the closing of this offering, the warrants will automatically convert into warrants to purchase 669,817 shares of our common stock with an exercise price of $ 0.2538 per share, and, unless exercised earlier, will expire in June 2024.

The warrants contain provisions for the adjustment of the exercise price and the number of shares issuable upon the exercise of the applicable warrant in the event of certain stock dividends, stock splits, reorganizations, reclassifications and consolidations.

Common Stock Options

As of December 31, 2018, we had outstanding options to purchase an aggregate of shares of our common stock, with a weighted-average exercise price of $ per share, under our 2009 Plan. After December 31, 2018, we issued options to purchase an aggregate of shares of our common stock, with a weighted-average exercise price of $ per share, under our 2009 Plan.

Registration Rights

After the closing of this offering, certain holders of our common stock will be entitled to rights with respect to the registration of their shares under the Securities Act pursuant to the IRA as described in additional detail

below. In an underwritten offering, the managing underwriter, if any, has the right, subject to specified conditions, to limit the number of shares such holders may include. In connection with this offering, each stockholder that has registration rights agreed not to sell or otherwise dispose of any securities without the prior written consent of the underwriters for a period of 180 days after the date of this prospectus, subject to certain terms and conditions. For more information regarding such restrictions, see the section captioned "Underwriting."

Demand Registration Rights

Beginning the earlier of either 180 days following the completion of this offering or the third anniversary of the date of the initial sale of shares of our Series C Preferred Stock, the holders of approximately shares of our common stock will be entitled to certain demand registration rights. The holders of at least 40% of the registrable securities have the right to require us, on not more than two occasions, to file a registration statement under the Securities Act in order to register the resale of their shares of common stock, *provided* that such registration of shares would result in aggregate proceeds (after deducting the estimated underwriting discounts and commissions) of at least $10.0 million. We may, in certain circumstances, defer such registrations and the underwriters have the right, subject to certain limitations, to limit the number of shares included in such registrations.

Piggyback Registration Rights

After the closing of this offering, if we propose to register the offer and sale of any of our securities under the Securities Act, in connection with the public offering of such securities the holders of approximately shares of our common stock will be entitled to certain "piggyback" registration rights, allowing the holders to include their shares in such registration, subject to certain limitations. If our proposed registration involves an underwriting, the managing underwriter of such offering will have the right to limit the number of shares to be underwritten for reasons related to the marketing of the shares.

S-3 Registration Rights

After the closing of this offering, we are required to use commercially reasonable efforts to qualify for registration on Form S-3. After we are qualified for registration on Form S-3, the holders of registrable securities may make a written request that we register the offer and sale of their shares on Form S-3, *provided* that such registration of shares would result in an aggregate price to the public of not less than $2,000,000 and we have not effected two such registrations in the last 12 months. We may, in certain circumstances, defer such registrations and the underwriters have the right, subject to certain limitations, to limit the number of shares included in such registrations.

Expenses

Subject to specified conditions and limitations, we are required to pay all expenses, other than underwriting discounts and commissions and stock transfer taxes, incurred in connection with any exercise of these registration rights.

Indemnification

The IRA contains customary cross-indemnification provisions, pursuant to which we are obligated to indemnify the selling holders of registrable securities in the event of either material misstatements or omissions in the applicable registration statement attributable to us or our violation of the Securities Act, and the selling stockholders are obligated to indemnify us for material misstatements or omissions in the registration statement attributable to them, subject to certain limitations.

Termination

The registration rights terminate upon the earliest of: (i) such date after the completion of this offering on which all shares of registrable securities may be sold during any 90 day period pursuant to Rule 144 of the Securities Act, (ii) the fifth anniversary of the completion of this offering, (iii) the occurrence of a deemed liquidation event or (iv) the date that no registrable securities remain outstanding that have not previously been sold to the public pursuant to a registration or in reliance on Rule 144 of the Securities Act.

Northgate Right of Participation

As part of the Exclusive License Agreement by and between Northgate Technologies, Inc. (together with its affiliates, "Northgate") and the company, dated as of June 23, 2011, Northgate has the right to participate in future financings by the company in a proportion equal to its percentage ownership of the company as of immediately prior to each such financing on a fully diluted basis, subject to various exclusions, including exclusions for the issuance of shares of common stock to employees and consultants or in a firmly underwritten public offering (including this offering) and for specified strategic transaction purposes.

Anti-Takeover Effects of our Certificate of Incorporation and our Bylaws

Election and Removal of Directors

Immediately prior to the completion of this offering, our board of directors will consist of between and directors. The exact number of directors will be fixed from time to time by resolution of the board. No director may be removed except for cause, and directors may be removed for cause by an affirmative vote of shares representing a majority of the shares then entitled to vote at an election of directors. Any vacancy occurring on the board of directors and any newly created directorship may be filled only by a majority of the remaining directors in office.

Staggered Board

Upon the closing of this offering, our board of directors will be will be divided into three classes serving staggered three-year terms. Class I, Class II and Class III directors will serve until our annual meetings of stockholders in 2019, 2020 and 2021, respectively. At each annual meeting of stockholders, directors will be elected to succeed the class of directors whose terms have expired. This classification of our board of directors could have the effect of increasing the length of time necessary to change the composition of a majority of the board of directors. In general, at least two annual meetings of stockholders will be necessary for stockholders to effect a change in a majority of the members of the board of directors.

Limits on Written Consents

Our amended and restated certificate of incorporation and our amended and restated bylaws provide that holders of our common stock will not be able to act by written consent without a meeting, unless such consent is unanimous.

Stockholder Meetings

Our amended and restated certificate of incorporation and our amended and restated bylaws provide that special meetings of our stockholders may be called only by the chairman of our board of directors or a majority of the directors. Our amended and restated certificate of incorporation and bylaws will specifically deny any power of any other person to call a special meeting.

Amendment of Certificate of Incorporation

The provisions of our amended and restated certificate of incorporation described under "Election and Removal of Directors," "Stockholder Meetings" and "Limits on Written Consents" may be amended only by the

affirmative vote of holders of at least 75% of the voting power of our outstanding shares of voting stock, voting together as a single class. The affirmative vote of holders of at least a majority of the voting power of our outstanding shares of stock will generally be required to amend other provisions of our amended and restated certificate of incorporation.

Amendment of Bylaws

Our amended and restated bylaws may generally be altered, amended or repealed, and new bylaws may be adopted, with:

- the affirmative vote of a majority of directors present at any regular or special meeting of the board of directors called for that purpose, provided that any alteration, amendment or repeal of, or adoption of any bylaw inconsistent with, specified provisions of the bylaws, including those related to special and annual meetings of stockholders, action of stockholders by written consent, classification of the board of directors, nomination of directors, special meetings of directors, removal of directors, committees of the board of directors and indemnification of directors and officers, requires the affirmative vote of at least 75% of all directors in office at a meeting called for that purpose; or
- the affirmative vote of holders of 75% of the voting power of our outstanding shares of voting stock, voting together as a single class.

Other Limitations on Stockholder Actions

Our amended and restated bylaws will also impose some procedural requirements on stockholders who wish to:

- make nominations in the election of directors;
- propose that a director be removed;
- propose any repeal or change in our bylaws; or
- propose any other business to be brought before an annual or special meeting of stockholders.

Under these procedural requirements, in order to bring a proposal before a meeting of stockholders, a stockholder must deliver timely notice of a proposal pertaining to a proper subject for presentation at the meeting to our corporate secretary along with the following:

- a description of the business or nomination to be brought before the meeting and the reasons for conducting such business at the meeting;
- the stockholder's name and address;
- any material interest of the stockholder in the proposal;
- the number of shares beneficially owned by the stockholder and evidence of such ownership; and
- the names and addresses of all persons with whom the stockholder is acting in concert and a description of all arrangements and understandings with those persons, and the number of shares such persons beneficially own.

To be timely, a stockholder must generally deliver notice:

- in connection with an annual meeting of stockholders, not less than 120 nor more than 180 days prior to the date on which the annual meeting of stockholders was held in the immediately preceding year, but in the event that the date of the annual meeting is more than 30 days before or more than 60 days after the anniversary date of the preceding annual meeting of stockholders, a stockholder notice will be timely if received by us not later than the close of business on the later of (1) the 120th day prior to the annual meeting and (2) the 10th day following the day on which we first publicly announce the date of the annual meeting; or

- in connection with the election of a director at a special meeting of stockholders, not less than 40 nor more than 60 days prior to the date of the special meeting, but in the event that less than 55 days' notice or prior public disclosure of the date of the special meeting of the stockholders is given or made to the stockholders, a stockholder notice will be timely if received by us not later than the close of business on the 10th day following the day on which a notice of the date of the special meeting was mailed to the stockholders or the public disclosure of that date was made.

In order to submit a nomination for our board of directors, a stockholder must also submit any information with respect to the nominee that we would be required to include in a proxy statement, as well as some other information. If a stockholder fails to follow the required procedures, the stockholder's proposal or nominee will be ineligible and will not be voted on by our stockholders.

Limitation of Liability of Directors and Officers

Our amended and restated certificate of incorporation to be in effect upon the completion of this offering will provide that we may indemnify our directors and officers, in each case to the fullest extent permitted by Delaware law. For information regarding the limitation of liability of our directors and officers, please refer to the section titled "Management—Limitations on Liability and Indemnification of Directors and Officers."

Forum Selection

The Court of Chancery of the State of Delaware will be the sole and exclusive forum for (i) any derivative action or proceeding brought on behalf of the company, (ii) any action asserting a claim of breach of fiduciary duty owed by any director, officer or other employee of the company to the company or the company's stockholders, (iii) any action asserting a claim arising pursuant to any provision of the Delaware General Corporation Law or (iv) any action asserting a claim governed by the internal affairs doctrine. Any person or entity purchasing or otherwise acquiring any interest in shares of capital stock of the company shall be deemed to have notice of and consented to the foregoing forum selection provisions. The provision would not apply to suits brought to enforce a duty or liability created by the Exchange Act. In addition, our amended and restated bylaws will also provide that unless we consent in writing to the selection of an alternative forum, the federal district courts of the United States shall be the exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act.

Delaware Business Combination Statute

We will elect to be subject to Section 203 of the Delaware General Corporation Law, which regulates corporate acquisitions. Section 203 prevents an "interested stockholder," which is defined generally as a person owning 15% or more of a corporation's voting stock, or any affiliate or associate of that person, from engaging in a broad range of "business combinations" with the corporation for three years after becoming an interested stockholder unless:

- the board of directors of the corporation had previously approved either the business combination or the transaction that resulted in the stockholder's becoming an interested stockholder;
- upon completion of the transaction that resulted in the stockholder's becoming an interested stockholder, that person owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, other than statutorily excluded shares; or
- following the transaction in which that person became an interested stockholder, the business combination is approved by the board of directors of the corporation and holders of at least two-thirds of the outstanding voting stock not owned by the interested stockholder.

Under Section 203, the restrictions described above also do not apply to specific business combinations proposed by an interested stockholder following the announcement or notification of designated extraordinary

transactions involving the corporation and a person who had not been an interested stockholder during the previous three years or who became an interested stockholder with the approval of a majority of the corporation's directors, if such extraordinary transaction is approved or not opposed by a majority of the directors who were directors prior to any person becoming an interested stockholder during the previous three years or were recommended for election or elected to succeed such directors by a majority of such directors.

Section 203 may make it more difficult for a person who would be an interested stockholder to effect various business combinations with a corporation for a three-year period. Section 203 also may have the effect of preventing changes in our management and could make it more difficult to accomplish transactions that our stockholders may otherwise deem to be in their best interests.

Anti-Takeover Effects of Some Provisions

Some provisions of our amended and restated certificate of incorporation and bylaws could make the following more difficult:

- acquisition of control of us by means of a proxy contest or otherwise, or
- removal of our incumbent officers and directors.

These provisions, as well as our ability to issue preferred stock, are designed to discourage coercive takeover practices and inadequate takeover bids. These provisions are also designed to encourage persons seeking to acquire control of us to first negotiate with our board of directors. We believe that the benefits of increased protection give us the potential ability to negotiate with the proponent of an unfriendly or unsolicited proposal to acquire or restructure us, and that the benefits of this increased protection outweigh the disadvantages of discouraging those proposals, because negotiation of those proposals could result in an improvement of their terms.

Listing

We intend to apply to list our common stock on the under the symbol "SWAV."

Transfer Agent and Registrar

The transfer agent and registrar for the common stock is . The transfer agent and registrar's address is .

MATERIAL U.S. FEDERAL INCOME AND ESTATE TAX CONSEQUENCES FOR NON-U.S. HOLDERS OF COMMON STOCK

The following are the material U.S. federal income and estate tax consequences of the ownership and disposition of our common stock acquired in this offering by a "Non-U.S. Holder" that does not own, and has not owned, actually or constructively, more than 5% of our common stock. You are a Non-U.S. Holder if for U.S. federal income tax purposes you are a beneficial owner of our common stock that is:

- a nonresident alien individual;
- a foreign corporation; or
- a foreign estate or trust.

You are not a Non-U.S. Holder if you are a nonresident alien individual present in the United States for 183 days or more in the taxable year of disposition, or if you are a former citizen or former resident of the United States for U.S. federal income tax purposes. If you are such a person, you should consult your tax adviser regarding the U.S. federal income tax consequences of the ownership and disposition of our common stock.

If you are a partnership for U.S. federal income tax purposes, the U.S. federal income tax treatment of a partner will generally depend on the status of the partner and your activities.

This discussion is based on the Internal Revenue Code of 1986, as amended to the date hereof (the "Code"), administrative pronouncements, judicial decisions and final, temporary and proposed Treasury regulations, changes to any of which subsequent to the date of this prospectus may affect the tax consequences described herein, possibly with retroactive effect. This discussion does not describe all of the tax consequences that may be relevant to you in light of your particular circumstances, including alternative minimum tax and Medicare contribution tax consequences and does not address any aspect of state, local or non-U.S. taxation, or any taxes other than income and estate taxes. You should consult your tax adviser with regard to the application of the U.S. federal tax laws to your particular situation, as well as any tax consequences arising under the laws of any state, local or non-U.S. taxing jurisdiction.

Dividends

As discussed under "Dividend Policy" above, we do not currently expect to make distributions on our common stock. In the event that we do make distributions of cash or other property, those distributions will constitute dividends for U.S. federal income tax purposes to the extent paid from our current or accumulated earnings and profits, as determined under U.S. federal income tax principles. To the extent those distributions exceed our current and accumulated earnings and profits, they will constitute a return of capital, which will first reduce your basis in our common stock, but not below zero, and then will be treated as gain from the sale of our common stock, as described below under "—Gain on Disposition of Our Common Stock."

Dividends paid to you generally will be subject to withholding tax at a 30% rate or a reduced rate specified by an applicable income tax treaty. In order to obtain a reduced rate of withholding (subject to the discussion below under "—FATCA"), you will be required to provide a properly executed applicable Internal Revenue Service ("IRS") Form W-8 certifying your entitlement to benefits under a treaty.

If dividends paid to you are effectively connected with your conduct of a trade or business in the United States (and, if required by an applicable income tax treaty, are attributable to a permanent establishment or fixed base maintained by you in the United States), you will generally be taxed on the dividends in the same manner as a U.S. person. In this case, you will be exempt from the withholding tax discussed in the preceding paragraph, although you will be required to provide a properly executed IRS Form W-8ECI in order to claim an exemption from withholding. You should consult your tax adviser with respect to other U.S. tax consequences of the ownership and disposition of our common stock, including the possible imposition of a branch profits tax at a rate of 30% (or a lower treaty rate) if you are a corporation.

Gain on Disposition of Our Common Stock

Subject to the discussions below under "—Information Reporting and Backup Withholding" and "—FATCA," you generally will not be subject to U.S. federal income or withholding tax on gain realized on a sale or other taxable disposition of our common stock unless:

- the gain is effectively connected with your conduct of a trade or business in the United States (and, if required by an applicable income tax treaty, is attributable to a permanent establishment or fixed base maintained by you in the United States), or
- we are or have been a "United States real property holding corporation," as defined in the Code, at any time within the five-year period preceding the disposition or your holding period, whichever period is shorter, and our common stock has ceased to be regularly traded on an established securities market prior to the beginning of the calendar year in which the sale or disposition occurs.

We believe that we are not, and do not anticipate becoming, a United States real property holding corporation.

If you recognize gain on a sale or other disposition of our common stock that is effectively connected with your conduct of a trade or business in the United States (and if required by an applicable income tax treaty, is attributable to a permanent establishment or fixed base maintained by you in the United States), you will generally be taxed on such gain in the same manner as a U.S. person. You should consult your tax adviser with respect to other U.S. tax consequences of the ownership and disposition of our common stock, including the possible imposition of a branch profits tax at a rate of 30% (or a lower treaty rate) if you are a corporation.

Information Reporting and Backup Withholding

Information returns are required to be filed with the IRS in connection with payments of dividends on our common stock. Unless you comply with certification procedures to establish that you are not a U.S. person, information returns may also be filed with the IRS in connection with the proceeds from a sale or other disposition of our common stock. You may be subject to backup withholding on payments on our common stock or on the proceeds from a sale or other disposition of our common stock unless you comply with certification procedures to establish that you are not a U.S. person or otherwise establish an exemption. Your provision of a properly executed applicable IRS Form W-8 certifying your non-U.S. status will permit you to avoid backup withholding. Amounts withheld under the backup withholding rules are not additional taxes and may be refunded or credited against your U.S. federal income tax liability, provided the required information is timely furnished to the IRS.

FATCA

Provisions of the Code commonly referred to as "FATCA" require withholding of 30% on payments of dividends on our common stock, as well as of gross proceeds of dispositions occurring after December 31, 2018 of our common stock, to "foreign financial institutions" (which is broadly defined for this purpose and in general includes investment vehicles) and certain other non-U.S. entities unless various U.S. information reporting and due diligence requirements (generally relating to ownership by U.S. persons of interests in or accounts with those entities) have been satisfied, or an exemption applies. An intergovernmental agreement between the United States and an applicable foreign country may modify these requirements. If FATCA withholding is imposed, a beneficial owner that is not a foreign financial institution generally may obtain a refund of any amounts withheld by filing a U.S. federal income tax return (which may entail significant administrative burden). You should consult your tax adviser regarding the effects of FATCA on your investment in our common stock.

Federal Estate Tax

Individual Non-U.S. Holders and entities the property of which is potentially includible in such an individual's gross estate for U.S. federal estate tax purposes (for example, a trust funded by such an individual and with respect to which the individual has retained certain interests or powers), should note that, absent an applicable treaty exemption, our common stock will be treated as U.S.-situs property subject to U.S. federal estate tax.

SHARES ELIGIBLE FOR FUTURE SALE

Prior to this offering, there has been no market for our common stock. Future sales of substantial amounts of our common stock in the public market could adversely affect market prices prevailing from time to time. Furthermore, because only a limited number of shares will be available for sale shortly after this offering due to existing contractual and legal restrictions on resale as described below, there may be sales of substantial amounts of our common stock in the public market after the restrictions lapse. This may adversely affect the prevailing market price and our ability to raise equity capital in the future.

Upon completion of this offering, we will have shares of common stock outstanding assuming the exercise of the underwriters' over-allotment option, the conversion of all outstanding shares of preferred stock and no exercise of any options and warrants outstanding as of December 31, 2018 (other than the assumed net exercise of certain of our common stock warrants into shares of our common stock that would otherwise expire upon completion of this offering) . Of these shares, the shares, or shares if the underwriters exercise their option in full, sold in this offering will be freely transferable without restriction or registration under the Securities Act, except for any shares purchased by one of our existing "affiliates," as that term is defined in Rule 144 under the Securities Act. The remaining shares of common stock existing are "restricted shares" as defined in Rule 144. Restricted shares may be sold in the public market only if registered or if they qualify for an exemption from registration under Rules 144 or 701 of the Securities Act. As a result of the contractual 180-day lock-up period described below and the provisions of Rules 144 and 701, these shares will be available for sale in the public market as follows:

Number of Shares	Date
	On the date of this prospectus.
	After 90 days from the date of this prospectus.
	After 180 days from the date of this prospectus (subject, in some cases, to volume limitations).
	At various times after 180 days from the date of this prospectus (subject, in some cases, to volume limitations).

Rule 144

In general, a person who has beneficially owned restricted shares of our common stock for at least six months would be entitled to sell such securities, provided that (i) such person is not deemed to have been one of our affiliates at the time of, or at any time during the 90 days preceding, a sale and (ii) we are subject to the Exchange Act periodic reporting requirements for at least 90 days before the sale. Persons who have beneficially owned restricted shares of our common stock for at least six months but who are our affiliates at the time of, or any time during the 90 days preceding, a sale, would be subject to additional restrictions, by which such person would be entitled to sell within any three month period only a number of securities that does not exceed the greater of either of the following:

- 1% of the number of shares of our common stock then outstanding, which will equal approximately—shares immediately after this offering, assuming no exercise of the underwriters' over-allotment option; or
- the average weekly trading volume of our common stock on the during the four calendar weeks preceding the filing of a notice on Form 144 with respect to the sale;

provided, in each case, that we are subject to the Exchange Act periodic reporting requirements for at least 90 days before the sale. Such sales both by affiliates and by non-affiliates must also comply with the manner of sale, current public information and notice provisions of Rule 144 to the extent applicable.

Rule 701

In general, under Rule 701, any of our employees, directors, officers, consultants or advisors who purchases shares from us in connection with a compensatory stock or option plan or other written agreement before the effective date of this offering is entitled to resell such shares 90 days after the effective date of this offering in reliance on Rule 144, without having to comply with the holding period requirements or other restrictions contained in Rule 701.

The SEC has indicated that Rule 701 will apply to typical stock options granted by an issuer before it becomes subject to the reporting requirements of the Exchange Act, along with the shares acquired upon exercise of such options, including exercises after the date of this prospectus. Securities issued in reliance on Rule 701 are restricted securities and, subject to the contractual restrictions described above, beginning 90 days after the date of this prospectus, may be sold by persons other than "affiliates," as defined in Rule 144, subject only to the manner of sale provisions of Rule 144 and by "affiliates" under Rule 144 without compliance with its one-year minimum holding period requirement.

Registration Rights

Upon completion of this offering, the holders of shares of common stock will be entitled to various rights with respect to the registration of these shares under the Securities Act. Registration of these shares under the Securities Act would result in these shares becoming freely tradable without restriction under the Securities Act immediately upon the effectiveness of the registration, except for shares purchased by affiliates.

Warrants

Upon completion of this offering, warrants to purchase an aggregate of shares of our common stock with an exercise price of $ per share will remain outstanding. See the section of this prospectus titled "Description of Capital Stock—Warrants" for additional information. Such shares issued upon exercise of the warrants may be able to be sold after the expiration of the lock-up period described above subject to the requirements of Rule 144 described above.

Stock Options

As of December 31, 2018, options to purchase a total of shares of common stock were outstanding. All of the shares subject to options are subject to lock-up agreements. All of the shares subject to options are subject to lock-up agreements. An additional shares of common stock were available for future grants under our stock plans.

Upon completion of this offering, we intend to file a registration statement under the Securities Act covering all shares of common stock subject to outstanding options or issuable pursuant to our 2019 Plan. Subject to Rule 144 volume limitations applicable to affiliates, shares registered under any registration statements will be available for sale in the open market, beginning 90 days after the date of the prospectus, except to the extent that the shares are subject to vesting restrictions with us or the contractual restrictions described below.

Lock-up Agreements

All of our directors, executive officers and substantially all of the other holders of our equity securities have agreed, subject to certain exceptions, not to offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, or otherwise transfer or dispose of, directly or indirectly, or enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of any shares of common stock or any securities convertible into or exercisable or exchangeable for shares of common stock for a period of 180 days after the date of this prospectus, without the prior written consent of the representatives of the underwriters. See the section titled "Underwriting" for more information.

UNDERWRITING

Under the terms and subject to the conditions in an underwriting agreement dated the date of this prospectus, the underwriters named below, for whom Morgan Stanley & Co. LLC and Merrill Lynch, Pierce, Fenner & Smith Incorporated are acting as representatives, have severally agreed to purchase, and we have agreed to sell to them, severally, the number of shares indicated below:

Name	Number of Shares
Morgan Stanley & Co. LLC	
Merrill Lynch, Pierce, Fenner & Smith Incorporated	
Wells Fargo Securities, LLC	
Canaccord Genuity LLC	
Total:	

The underwriters and the representatives are collectively referred to as the "underwriters" and the "representatives," respectively. The underwriters are offering the shares of common stock subject to their acceptance of the shares from us and subject to prior sale. The underwriting agreement provides that the obligations of the several underwriters to pay for and accept delivery of the shares of common stock offered by this prospectus are subject to the approval of certain legal matters by their counsel and to certain other conditions. The underwriters are obligated to take and pay for all of the shares of common stock offered by this prospectus if any such shares are taken. However, the underwriters are not required to take or pay for the shares covered by the underwriters' over-allotment option described below. The offering of the shares of common stock by the underwriters is subject to receipt and acceptance and subject to the underwriters' right to reject any order in whole or in part.

The underwriters initially propose to offer part of the shares of common stock directly to the public at the offering price listed on the cover page of this prospectus and part to certain dealers. After the initial offering of the shares of common stock, the offering price and other selling terms may from time to time be varied by the representatives.

We have granted to the underwriters an option, exercisable for 30 days from the date of this prospectus, to purchase up to additional shares of common stock at the public offering price listed on the cover page of this prospectus, less underwriting discounts and commissions. The underwriters may exercise this option solely for the purpose of covering over-allotments, if any, made in connection with the offering of the shares of common stock offered by this prospectus. To the extent the option is exercised, each underwriter will become obligated, subject to certain conditions, to purchase about the same percentage of the additional shares of common stock as the number listed next to the underwriter's name in the preceding table bears to the total number of shares of common stock listed next to the names of all underwriters in the preceding table.

The following table shows the per share and total public offering price, underwriting discounts and commissions, and proceeds before expenses to us. These amounts are shown assuming both no exercise and full exercise of the underwriters' over-allotment option.

		Total	
	Per Share	No Exercise	Full Exercise
Public offering price	$	$	$
Underwriting discounts and commissions to be paid by us	$	$	$
Proceeds, before expenses, to us	$	$	$

Perella Weinberg Partners LP ("Perella Weinberg"), a Financial Industry Regulatory Association, Inc. ("FINRA") member, is acting as our financial advisor in connection with the offering. We expect to pay Perella

Weinberg, upon the successful completion of this offering, a fee of $ for its services. The services provided to us by Perella Weinberg include, among other things, an independent financial valuation analysis; assisting in drafting our positioning and investment thesis; assisting us in our interactions with the underwriters; and assisting us in crafting an appropriate aftermarket trading and investor relations strategy. Apart from Perella Weinberg's role as financial advisor in connection with this offering, Perella Weinberg has had no other relationships with the company. Perella Weinberg will not sell or offer to sell any securities in this offering and will not identify, solicit or engage directly with potential investors in this offering. In addition, Perella Weinberg will not purchase any of the offered shares of common stock.

The estimated offering expenses payable by us, including the fees of Perella Weinberg but exclusive of the underwriting discounts and commissions, are approximately $. We have also agreed to reimburse the underwriters for expense relating to clearance of this offering with FINRA up to $.

The underwriters have informed us that they do not intend sales to discretionary accounts to exceed 5% of the total number of shares of common stock offered by them.

We intend to apply to list our common stock on the under the symbol "SWAV."

We and all of our directors and officers and the holders of all of our outstanding securities have agreed that, without the prior written consent of Morgan Stanley & Co. LLC and Merrill Lynch, Pierce, Fenner & Smith Incorporated on behalf of the underwriters, we and they will not, during the period ending 180 days after the date of this prospectus (the "restricted period"):

- offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, lend or otherwise transfer or dispose of, directly or indirectly, any shares of common stock or any securities convertible into or exercisable or exchangeable for shares of common stock;
- file any registration statement with the SEC relating to the offering of any shares of common stock or any securities convertible into or exercisable or exchangeable for common stock; or
- enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of the common stock;

whether any such transaction described above is to be settled by delivery of common stock or such other securities, in cash or otherwise. In addition, we and each such person have agreed that, without the prior written consent of Morgan Stanley & Co. LLC and Merrill Lynch, Pierce, Fenner & Smith Incorporated on behalf of the underwriters, we or such other person will not, during the restricted period, make any demand for, or exercise any right with respect to, the registration of any shares of common stock or any security convertible into or exercisable or exchangeable for common stock.

The restrictions described in the immediately preceding paragraph do not apply to our directors, officers and securityholders with respect to, among other things:

(a) transactions relating to shares of common stock or other securities acquired in open market transactions after the completion of this offering, provided that no filing under Section 16(a) of the Exchange Act or other public announcement shall be required or shall be voluntarily made in connection with subsequent sales of common stock or other securities acquired in such open market transactions during the restricted period;

(b) transfers of securities to us in connection with the conversion of our outstanding preferred stock or warrants into shares of common stock or warrants to acquire shares of common stock in connection with the consummation of this offering, which conversion is described in this prospectus, it being understood that any such shares of common stock or warrants received by the securityholder upon such conversion shall be subject to the restrictions on transfer set forth in the lock-up agreement;

(c) transfers of shares of common stock or any security convertible into common stock (i) as a bona fide gift, (ii) to an immediate family member or a trust for the direct or indirect benefit of the securityholder or such immediate family member of the securityholder, (iii) if the securityholder is a trust, to a trustor or beneficiary of the trust or to the estate of a beneficiary of such trust, (iv) if the secuirtyholder is a corporation, partnership, limited liability company, investment fund or other entity, distributions of shares of common stock or any security convertible into shares of common stock to stockholders, limited partners, members or affiliates or to any other entity that is controlled or managed by, or under common control or management with, the securityholder or (v) by will, other testamentary document or intestate succession to the legal representative, heir, beneficiary or a member of the immediate family of the securityholder; provided that in the case of any transfer or distribution pursuant to this clause, (i) each donee or distributee shall sign and deliver a lock-up agreement, (ii) no filing under Section 16(a) of the Exchange Act or other public announcement, reporting a reduction in beneficial ownership of shares of common stock, shall be required or shall be voluntarily made during the restricted period and (iii) such transfer shall not involve a disposition for value;

(d) transfers of shares of common stock or any securities convertible into or exercisable or exchangeable for common stock that occur by operation of law pursuant to a qualified domestic order or in connection with a divorce settlement, provided that (i) each transferee shall sign and deliver a lock-up agreement, (ii) any public report or filing required to be made under Section 16(a) of the Exchange Act shall clearly indicate in the footnotes thereto that such transfer is pursuant to a qualified domestic order or in connection with a divorce settlement and (iii) such transfer shall not involve a disposition for value, and provided, further that no other public announcement shall be required or shall be made voluntarily in connection with such transfer;

(e) transfers of shares of common stock or any securities convertible into or exercisable or exchangeable for common stock to us pursuant to agreements entered into pursuant to a stock incentive plan disclosed in this prospectus and in effect on the date of this prospectus under which we have the option to repurchase such shares or securities upon termination of service of the securityholder, provided that no public report or filing required to be made under Section 16(a) of the Exchange Act or other public filing, report or announcement shall be required or shall be voluntarily made during the period beginning on the date hereof and continuing to and including the date that is 30 days after the date of this prospectus (the "30 Day Period"), and after such 30th day, if the securityholder is required to file a report under Section 16(a) of the Exchange Act during the restricted period, the securityholder shall clearly indicate in the footnotes thereto that such transfer is pursuant to the circumstances described in this clause, and provided, further that no other public announcement shall be made voluntarily in connection with such transfer;

(f) the exercise of outstanding warrants by the securityholder described in this prospectus or any stock option by the securityholder that was granted under a stock incentive plan or stock purchase plan described in this prospectus, provided that the shares received upon exercise shall continue to be subject to the restrictions on transfer set forth in the lock-up agreement and provided, further that no public report or filing required to be made under Section 16(a) of the Exchange Act or other public filing, report or announcement shall be required or shall be voluntarily made during the 30 Day Period, and after the 30 Day Period, if the securityholder is required to file a report under Section 16(a) of the Exchange Act during the restricted period, the securityholder shall clearly indicate in the footnotes thereto that the filing relates to the exercise of a stock option or warrant, that no shares were sold by the reporting person and that the shares received upon exercise of the stock option or warrant are subject to a lock-up agreement, and provided, further that no other public announcement shall be made voluntarily in connection with such exercise;

(g) the transfer of shares of common stock or any security convertible into common stock to us upon the exercise of options or warrants to purchase our securities outstanding or pursuant to a stock incentive plan or stock purchase plan described in this prospectus, on a "cashless" or "net exercise" basis, provided that the shares received upon exercise shall continue to be subject to the restrictions on

transfer set forth in the lock-up agreement and provided, further that no public report or filing required to be made under Section 16(a) of the Exchange Act or other public filing, report or announcement shall be required or shall be voluntarily made during the period beginning on the date of the lock-up agreement and continuing to and including the 30 Day Period, and after the 30 Day Period, if the securityholder is required to file a report under Section 16(a) of the Exchange Act during the restricted period, the securityholder shall clearly indicate in the footnotes thereto that the filing relates to the "cashless" or "net" exercise of a stock option or warrant, that no shares were sold by the reporting person and that the shares received upon exercise of the stock option or warrant are subject to a lock-up agreement, and provided, further that no other public announcement shall be made voluntarily in connection with such transfer;

(h) the transfer of shares of common stock or any security convertible into common stock to us, or the withholding of shares of common stock by us, in connection with a vesting event of our securities granted pursuant to a stock incentive plan or stock purchase plan described in this prospectus, to cover tax withholding obligations or the payment of taxes due in connection with the vesting event, provided that no public report or filing required to be made under Section 16(a) of the Exchange Act or other public filing, report or announcement shall be required or shall be voluntarily made during the period beginning on the date of the lock-up agreement and continuing to and including the 30 Day Period, and after the 30 Day Period, if the securityholder is required to file a report under Section 16(a) of the Exchange Act during the restricted period, the securityholder shall clearly indicate in the footnotes thereto that the purpose of such transfer is to cover such tax withholding obligations or the payment of taxes due in connection with the vesting event, and provided, further that no other public announcement shall be made voluntarily in connection with such transfer;

(i) a merger, consolidation or other similar transaction involving a change of control of our company after the closing of this offering and approved by our board of directors, provided that in the event that such change of control is not completed, the securityholder's shares shall remain subject to the restrictions contained in the lock-up agreement and title to the securityholder's shares shall remain with the securityholder; and

(j) the establishment of a trading plan pursuant to Rule 10b5-1 under the Exchange Act for the transfer of shares of common stock, provided that (i) such plan does not provide for the transfer of common stock during the restricted period and (ii) to the extent a public announcement or filing under the Exchange Act, if any, is required of or voluntarily made by or on behalf of the securityholder or us regarding the establishment of such plan, such announcement or filing shall include a statement to the effect that no transfer of Common Stock may be made under such plan during the restricted period.

In our case, such restrictions shall not apply to:

(a) the shares of our common stock to be sold in this offering;

(b) any shares of our common stock issued upon the exercise of options or warrants or the conversion of a security outstanding on the date of the underwriting agreement of which Morgan Stanley & Co. LLC and Merrill Lynch, Pierce, Fenner & Smith Incorporated have been advised in writing;

(c) the grant of options or the issuance of shares of common stock by us to our employees, officers, directors, advisors or consultants pursuant to employee benefit plans in effect on the date of the underwriting agreement and as described herein;

(d) the filing by us of a registration statement with the SEC on Form S-8 in respect of any shares issued under or the grant of any award pursuant to an employee benefit plan described herein; or

(e) the sale or issuance of or entry into an agreement to sell or issue shares of our common stock or securities convertible into or exercisable or exchangeable for our common stock in connection with any (1) mergers, (2) acquisition of securities, businesses, property or other assets, (3) joint ventures, (4) strategic alliances, (5) partnerships with experts or other talent to develop or provide content,

(6) equipment leasing arrangements or (7) debt financing, provided that the aggregate number of shares of our common stock or securities convertible into or exercisable for common stock (on an as-converted or as-exercised basis, as the case may be) that we may sell or issue or agree to sell or issue as described in this bullet point shall not exceed 5% of the total number of shares of our common stock issued and outstanding immediately following the completion of this offering, and provided, further, that each recipient of shares of our common stock or securities convertible into or exercisable for our common stock pursuant to this bullet point shall execute and deliver to Morgan Stanley & Co. LLC and Merrill Lynch, Pierce, Fenner & Smith Incorporated a lock-up agreement.

Morgan Stanley & Co. LLC and Merrill Lynch, Pierce, Fenner & Smith Incorporated, in their sole discretion, may release the common stock and other securities subject to the lock-up agreements described above in whole or in part at any time.

In order to facilitate the offering of the common stock, the underwriters may engage in transactions that stabilize, maintain or otherwise affect the price of the common stock. Specifically, the underwriters may sell more shares than they are obligated to purchase under the underwriting agreement, creating a short position. A short sale is covered if the short position is no greater than the number of shares available for purchase by the underwriters under the over-allotment option. The underwriters can close out a covered short sale by exercising the over-allotment option or purchasing shares in the open market. In determining the source of shares to close out a covered short sale, the underwriters will consider, among other things, the open market price of shares compared to the price available under the over-allotment option. The underwriters may also sell shares in excess of the over-allotment option, creating a naked short position. The underwriters must close out any naked short position by purchasing shares in the open market. A naked short position is more likely to be created if the underwriters are concerned that there may be downward pressure on the price of the common stock in the open market after pricing that could adversely affect investors who purchase in this offering. As an additional means of facilitating this offering, the underwriters may bid for, and purchase, shares of common stock in the open market to stabilize the price of the common stock. These activities may raise or maintain the market price of the common stock above independent market levels or prevent or retard a decline in the market price of the common stock. The underwriters are not required to engage in these activities and may end any of these activities at any time.

We and the underwriters have agreed to indemnify each other against certain liabilities, including liabilities under the Securities Act.

A prospectus in electronic format may be made available on websites maintained by one or more underwriters, or selling group members, if any, participating in this offering. The representatives may agree to allocate a number of shares of common stock to underwriters for sale to their online brokerage account holders. Internet distributions will be allocated by the representatives to underwriters that may make Internet distributions on the same basis as other allocations.

Other Relationships

The underwriters and their respective affiliates are full service financial institutions engaged in various activities, which may include securities trading, commercial and investment banking, financial advisory, investment management, investment research, principal investment, hedging. financing and brokerage activities. Certain of the underwriters and their respective affiliates may in the future perform, various financial advisory and investment banking services for us, for which they will receive customary fees and expenses.

In addition, in the ordinary course of their various business activities, the underwriters and their respective affiliates may make or hold a broad array of investments and actively trade debt and equity securities (or related derivative securities) and financial instruments (including bank loans) for their own account and for the accounts of their customers and may at any time hold long and short positions in such securities and instruments. Such

investment and securities activities may involve our securities and instruments. The underwriters and their respective affiliates may also make investment recommendations or publish or express independent research views in respect of such securities or instruments and may at any time hold, or recommend to clients that they acquire, long or short positions in such securities and instruments.

Pricing of the Offering

Prior to this offering, there has been no public market for our common stock. The initial public offering price was determined by negotiations between us and the representatives. Among the factors considered in determining the initial public offering price were our future prospects and those of our industry in general, our sales, earnings and certain other financial and operating information in recent periods, and the price-earnings ratios, price-sales ratios, market prices of securities, and certain financial and operating information of companies engaged in activities similar to ours.

Selling Restrictions

European Economic Area

In relation to each Member State of the European Economic Area which has implemented the Prospectus Directive (each, a "Relevant Member State") an offer to the public of any shares of our common stock may not be made in that Relevant Member State, except that an offer to the public in that Relevant Member State of any shares of our common stock may be made at any time under the following exemptions under the Prospectus Directive:

(a) to any legal entity which is a qualified investor as defined in the Prospectus Directive;

(b) to fewer than 150 natural or legal persons (other than qualified investors as defined in the Prospectus Directive), subject to obtaining the prior consent of Morgan Stanley & Co. LLC and Merrill Lynch, Pierce, Fenner & Smith Incorporated for any such offer; or

(c) in any other circumstances falling within Article 3(2) of the Prospectus Directive, provided that no such offer of shares of our common stock shall result in a requirement for the publication by us or any underwriter of a prospectus pursuant to Article 3 of the Prospectus Directive.

For the purposes of this provision, the expression an "offer to the public" in relation to any shares of our common stock in any Relevant Member State means the communication in any form and by any means of sufficient information on the terms of the offer and any shares of our common stock to be offered so as to enable an investor to decide to purchase any shares of our common stock, as the same may be varied in that Member State by any measure implementing the Prospectus Directive in that Member State, the expression "Prospectus Directive" means Directive 2003/71/EC (as amended), including by Directive 2010/73/EU, and includes any relevant implementing measure in the Relevant Member State.

This European Economic Area selling restriction is in addition to any other selling restrictions set out below.

United Kingdom

Each underwriter has represented and agreed that:

(a) it has only communicated or caused to be communicated and will only communicate or cause to be communicated an invitation or inducement to engage in investment activity (within the meaning of Section 21 of the Financial Services and Markets Act 2000 or the "FSMA") received by it in connection with the issue or sale of the shares of our common stock in circumstances in which Section 21(1) of the FSMA does not apply to us; and

(b) it has complied and will comply with all applicable provisions of the FSMA with respect to anything done by it in relation to the shares of our common stock in, from or otherwise involving the United Kingdom.

Canada

The shares may be sold only to purchasers purchasing, or deemed to be purchasing, as principal that are accredited investors, as defined in National Instrument 45-106 Prospectus Exemptions or subsection 73.3(1) of the Securities Act (Ontario), and are permitted clients, as defined in National Instrument 31-103 Registration Requirements, Exemptions and Ongoing Registrant Obligations. Any resale of the shares must be made in accordance with an exemption from, or in a transaction not subject to, the prospectus requirements of applicable securities laws.

Securities legislation in certain provinces or territories of Canada may provide a purchaser with remedies for rescission or damages if this prospectus supplement or the accompanying prospectus (including any amendment thereto) contains a misrepresentation, provided that the remedies for rescission or damages are exercised by the purchaser within the time limit prescribed by the securities legislation of the purchaser's province or territory. The purchaser should refer to any applicable provisions of the securities legislation of the purchaser's province or territory for particulars of these rights or consult with a legal advisor.

Pursuant to section 3A.3 (or, in the case of securities issued or guaranteed by the government of a non-Canadian jurisdiction, section 3A.4) of National Instrument 33-105 Underwriting Conflicts (NI 33-105), the underwriters are not required to comply with the disclosure requirements of NI 33-105 regarding underwriter conflicts of interest in connection with this offering.

Russia

Under Russian law, shares of common stock may be considered securities of a foreign issuer. Neither we, nor this prospectus, nor shares of our common stock have been, or are intended to be, registered with the Central Bank of the Russian Federation under the Federal Law No. 39-FZ "On Securities Market" dated April 22, 1996 (as amended, the "Russian Securities Law"), and none of the shares of our common stock are intended to be, or may be offered, sold or delivered, directly or indirectly, or offered or sold to any person for reoffering or re-sale, directly or indirectly, in the territory of the Russian Federation or to any resident of the Russian Federation, except pursuant to the applicable laws and regulations of the Russian Federation.

The information provided in this prospectus does not constitute any representation with respect to the eligibility of any recipients of this prospectus to acquire shares of our common stock under the laws of the Russian Federation, including, without limitation, the Russian Securities Law and other applicable legislation.

This prospectus is not to be distributed or reproduced (in whole or in part) in the Russian Federation by the recipients of this prospectus. Recipients of this prospectus undertake not to offer, sell or deliver, directly or indirectly, or offer or sell to any person for reoffering or re-sale, directly or indirectly, shares of our common stock in the territory of the Russian Federation or to any resident of the Russian Federation, except pursuant to the applicable laws and regulations of the Russian Federation.

Recipients of this prospectus understand that respective receipt/acquisition of shares of our common stock is subject to restrictions and regulations applicable from the Russian law perspective.

Switzerland

The shares of common stock may not be publicly offered in Switzerland and will not be listed on the SIX Swiss Exchange, or SIX, or on any other stock exchange or regulated trading facility in Switzerland. This

document has been prepared without regard to the disclosure standards for issuance prospectuses under art. 652a or art. 1156 of the Swiss Code of Obligations or the disclosure standards for listing prospectuses under art. 27 ff. of the SIX Listing Rules or the listing rules of any other stock exchange or regulated trading facility in Switzerland. Neither this document nor any other offering or marketing material relating to the shares or the offering may be publicly distributed or otherwise made publicly available in Switzerland. Neither this document nor any other offering or marketing material relating to the offering, us, or the shares have been or will be filed with or approved by any Swiss regulatory authority. In particular, this document will not be filed with, and the offer of shares will not be supervised by, the Swiss Financial Market Supervisory Authority FINMA, or FINMA, and the offer of shares has not been and will not be authorized under the Swiss Federal Act on Collective Investment Schemes, or CISA. The investor protection afforded to acquirers of interests in collective investment schemes under the CISA does not extend to acquirers of shares.

Dubai International Financial Centre

This prospectus relates to an Exempt Offer in accordance with the Offered Securities Rules of the Dubai Financial Services Authority, or DFSA. This prospectus is intended for distribution only to persons of a type specified in the Offered Securities Rules of the DFSA. It must not be delivered to, or relied on by, any other person. The DFSA has no responsibility for reviewing or verifying any documents in connection with Exempt Offers. The DFSA has not approved this prospectus nor taken steps to verify the information set forth herein and has no responsibility for the prospectus. The shares to which this prospectus relates may be illiquid and/or subject to restrictions on their resale. Prospective purchasers of the shares offered should conduct their own due diligence on the shares. If you do not understand the contents of this prospectus you should consult an authorized financial advisor.

Australia

No placement document, prospectus, product disclosure statement or other disclosure document has been lodged with the Australian Securities and Investments Commission, or ASIC, in relation to the offering. This prospectus does not constitute a prospectus, product disclosure statement or other disclosure document under the Corporations Act 2001, or the Corporations Act, and does not purport to include the information required for a prospectus, product disclosure statement or other disclosure document under the Corporations Act.

Any offer in Australia of the shares may only be made to persons, or the Exempt Investors, who are “sophisticated investors” (within the meaning of section 708(8) of the Corporations Act), “professional investors” (within the meaning of section 708(11) of the Corporations Act) or otherwise pursuant to one or more exemptions contained in section 708 of the Corporations Act so that it is lawful to offer the shares without disclosure to investors under Chapter 6D of the Corporations Act.

The shares applied for by Exempt Investors in Australia must not be offered for sale in Australia in the period of 12 months after the date of allotment under the offering, except in circumstances where disclosure to investors under Chapter 6D of the Corporations Act would not be required pursuant to an exemption under section 708 of the Corporations Act or otherwise or where the offer is pursuant to a disclosure document which complies with Chapter 6D of the Corporations Act. Any person acquiring shares must observe such Australian on-sale restrictions.

This prospectus contains general information only and does not take into account the investment objectives, financial situation or particular needs of any particular person. It does not contain any securities recommendations or financial product advice. Before making an investment decision, investors need to consider whether the information in this prospectus is appropriate for their needs, objectives and circumstances, and, if necessary, seek expert advice on those matters.

New Zealand

The shares of common stock offered hereby have not been offered or sold, and will not be offered or sold, directly or indirectly in New Zealand and no offering materials or advertisements have been or will be distributed in relation to any offer of shares in New Zealand, in each case other than:

(a) to persons whose principal business is the investment of money or who, in the course of and for the purposes of their business, habitually invest money; or

(b) to persons who in all the circumstances can properly be regarded as having been selected otherwise than as members of the public; or

(c) to persons who are each required to pay a minimum subscription price of at least NZ$500,000 for the shares before the allotment of those shares (disregarding any amounts payable, or paid, out of money lent by the issuer or any associated person of the issuer); or

(d) in other circumstances where there is no contravention of the Securities Act 1978 of New Zealand (or any statutory modification or re-enactment of, or statutory substitution for, the Securities Act 1978 of New Zealand).

Hong Kong

The shares of common stock have not been offered or sold and will not be offered or sold in Hong Kong, by means of any document, other than (i) to "professional investors" as defined in the Securities and Futures Ordinance (Cap. 571) of Hong Kong and any rules made under that Ordinance; or (ii) in other circumstances which do not result in the document being a "prospectus" as defined in the Companies (Winding Up and Miscellaneous Provisions) Ordinance (Cap. 32) of Hong Kong or which do not constitute an offer to the public within the meaning of that Ordinance. No advertisement, invitation or document relating to the shares of common stock has been or may be issued or has been or may be in the possession of any person for the purposes of issuance, whether in Hong Kong or elsewhere, which is directed at, or the contents of which are likely to be accessed or read by, the public of Hong Kong (except if permitted to do so under the securities laws of Hong Kong) other than with respect to shares of common stock which are or are intended to be disposed of only to persons outside Hong Kong or only to "professional investors" as defined in the Securities and Futures Ordinance and any rules made under that Ordinance.

Japan

No registration pursuant to Article 4, paragraph 1 of the Financial Instruments and Exchange Law of Japan (Law No. 25 of 1948, as amended), or the FIEL, has been made or will be made with respect to the solicitation of the application for the acquisition of the shares of common stock.

Accordingly, the shares of common stock have not been, directly or indirectly, offered or sold and will not be, directly or indirectly, offered or sold in Japan or to, or for the benefit of, any resident of Japan (which term as used herein means any person resident in Japan, including any corporation or other entity organized under the laws of Japan) or to others for re-offering or re-sale, directly or indirectly, in Japan or to, or for the benefit of, any resident of Japan except pursuant to an exemption from the registration requirements, and otherwise in compliance with, the FIEL and the other applicable laws and regulations of Japan.

For Qualified Institutional Investors, or QII

Please note that the solicitation for newly-issued or secondary securities (each as described in Paragraph 2, Article 4 of the FIEL) in relation to the shares of common stock constitutes either a "QII only private placement" or a "QII only secondary distribution" (each as described in Paragraph 1, Article 23-13 of the FIEL). Disclosure regarding any such solicitation, as is otherwise prescribed in Paragraph 1, Article 4 of the FIEL, has not been made in relation to the shares of common stock. The shares of common stock may only be transferred to QIIs.

For Non-QII Investors

Please note that the solicitation for newly-issued or secondary securities (each as described in Paragraph 2, Article 4 of the FIEL) in relation to the shares of common stock constitutes either a "small number private placement" or a "small number private secondary distribution" (each as is described in Paragraph 4, Article 23-13 of the FIEL). Disclosure regarding any such solicitation, as is otherwise prescribed in Paragraph 1, Article 4 of the FIEL, has not been made in relation to the shares of common stock. The shares of common stock may only be transferred en bloc without subdivision to a single investor.

Singapore

This prospectus has not been registered as a prospectus with the Monetary Authority of Singapore. Accordingly, this prospectus and any other document or material in connection with the offer or sale, or invitation for subscription or purchase, of the shares of common stock may not be circulated or distributed, nor may the shares of common stock be offered or sold, or be made the subject of an invitation for subscription or purchase, whether directly or indirectly, to persons in Singapore other than (i) to an institutional investor under Section 274 of the Securities and Futures Act, Chapter 289 of Singapore, or the SFA, (ii) to a relevant person pursuant to Section 275(1), or any person pursuant to Section 275(1A), and in accordance with the conditions specified in Section 275, of the SFA, or (iii) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA.

Where the shares of common stock are subscribed or purchased under Section 275 of the SFA by a relevant person which is:

(a) a corporation (which is not an accredited investor (as defined in Section 4A of the SFA)) the sole business of which is to hold investments and the entire share capital of which is owned by one or more individuals, each of whom is an accredited investor; or

(b) a trust (where the trustee is not an accredited investor) the sole purpose of which is to hold investments and each beneficiary of the trust is an individual who is an accredited investor,

securities (as defined in Section 239(1) of the SFA) of that corporation or the beneficiaries' rights and interest (howsoever described) in that trust shall not be transferred within six months after that corporation or that trust has acquired the shares of common stock pursuant to an offer made under Section 275 of the SFA except:

(a) to an institutional investor or to a relevant person defined in Section 275(2) of the SFA, or to any person arising from an offer referred to in Section 275(1A) or Section 276(4)(i)(B) of the SFA;

(b) where no consideration is or will be given for the transfer;

(c) where the transfer is by operation of law;

(d) as specified in Section 276(7) of the SFA; or

(e) as specified in Regulation 32 of the Securities and Futures (Offers of Investments) (Shares and Debentures) Regulations 2005 of Singapore.

Solely for the purposes of its obligations pursuant to Section 309B of the SFA, we have determined, and hereby notify all relevant persons (as defined in the CMP Regulations 2018), that the shares are "prescribed capital markets products" (as defined in the CMP Regulations 2018) and Excluded Investment Products (as defined in MAS Notice SFA 04-N12: Notice on the Sale of Investment Products and MAS Notice FAA-N16: Notice on Recommendations on Investment Products).

LEGAL MATTERS

The validity of the issuance of the shares of common stock offered hereby will be passed upon for us by Davis Polk & Wardwell LLP, Menlo Park, California. Cooley LLP, San Diego, California, is representing the underwriters.

EXPERTS

The consolidated financial statements of ShockWave Medical, Inc. (the "Company") as of December 31, 2017, and for the year then ended, included in this Prospectus and Registration Statement have been audited by Ernst & Young LLP, independent registered public accounting firm, as set forth in their report thereon (which contains an explanatory paragraph describing conditions that raise substantial doubt about the Company's ability to continue as a going concern as described in Note 1 to the consolidated financial statements) appearing elsewhere herein, and are included in reliance upon such report given on the authority of such firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We have filed with the SEC a registration statement on Form S-1 under the Securities Act with respect to the common stock offered hereby. This prospectus does not contain all of the information set forth in the registration statement and the exhibits and schedules thereto. For further information with respect to the company and its common stock, reference is made to the registration statement and the exhibits and any schedules filed therewith. Statements contained in this prospectus as to the contents of any contract or other document referred to are not necessarily complete and in each instance, if such contract or document is filed as an exhibit, reference is made to the copy of such contract or other document filed as an exhibit to the registration statement, each statement being qualified in all respects by such reference. A copy of the registration statement, including the exhibits and schedules thereto, may be read and copied at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. Information on the operation of the Public Reference Room may be obtained by calling the SEC at 1-800-SEC-0330. In addition, the SEC maintains an Internet site at www.sec.gov, from which interested persons can electronically access the registration statement, including the exhibits and any schedules thereto.

As a result of the offering, we will be required to file periodic reports and other information with the SEC. We also maintain an Internet site at www.Shockwavemedical.com. Our website and the information contained therein or accessible therefrom shall not be deemed to be incorporated into this prospectus or the registration statement of which it forms a part.

SHOCKWAVE MEDICAL, INC.
INDEX TO CONSOLIDATED FINANCIAL STATEMENTS
Year Ended December 31, 2017

Report of Independent Registered Public Accounting Firm

To the Stockholders and the Board of Directors of ShockWave Medical, Inc.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheet of ShockWave Medical, Inc. (the "Company") as of December 31, 2017, the related consolidated statement of operations and comprehensive loss, stockholders' deficit and cash flows for the year then ended, and the related notes (collectively referred to as the "consolidated financial statements"). In our opinion, the consolidated financial statements present fairly, in all material respects, the financial position of the Company at December 31, 2017, and the results of its operations and its cash flows for the year then ended, in conformity with U.S. generally accepted accounting principles.

The Company's Ability to Continue as a Going Concern

The accompanying consolidated financial statements have been prepared assuming that the Company will continue as a going concern. As discussed in Note 1 to the consolidated financial statements, the Company has incurred significant losses and has negative cash flows from operations, and has stated that substantial doubt exists about the Company's ability to continue as a going concern. Management's evaluation of the events and conditions and management's plans regarding these matters are also described in Note 1. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Basis for Opinion

These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's consolidated financial statements based on our audit. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) ("PCAOB") and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB and in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud. Our audit included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audit also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. We believe that our audit provides a reasonable basis for our opinion.

/s/ Ernst & Young LLP

We have served as the Company's auditor since 2016.

San Jose, California
December 6, 2018

SHOCKWAVE MEDICAL, INC.
Consolidated Balance Sheet
(in thousands, except share and per share data)

	December 31, 2017	Pro Forma December 31, 2017 (unaudited)
ASSETS		
CURRENT ASSETS:		
Cash and cash equivalents	$ 51,923	
Short-term investments	1,806	
Accounts receivable	639	
Inventory	2,523	
Prepaid expenses and other current assets	968	
Total current assets	57,859	
Property and equipment, net	1,372	
Other assets	73	
TOTAL ASSETS	$ 59,304	
LIABILITIES, CONVERTIBLE PREFERRED STOCK AND STOCKHOLDERS' EQUITY (DEFICIT)		
CURRENT LIABILITIES:		
Accounts payable	$ 1,148	
Accrued liabilities	3,393	
Total current liabilities	4,541	
Convertible preferred stock warrant liability	577	—
Other liabilities	9	
TOTAL LIABILITIES	5,127	
Commitments and contingencies (Note 6)		
Convertible preferred stock, $0.001 par value; 216,079,811 shares authorized; 213,622,561 shares issued and outstanding, actual; aggregate liquidation preference of $137.2 million; no shares issued and outstanding, pro forma (unaudited)	137,469	—
STOCKHOLDERS' EQUITY (DEFICIT):		
Common stock, $0.001 par value; 325,000,000 shares authorized; 19,849,791 shares issued and outstanding; shares issued and outstanding pro forma (unaudited)	20	
Additional paid-in capital	2,452	
Accumulated deficit	(85,763)	
Accumulated other comprehensive loss	(1)	
TOTAL STOCKHOLDERS' EQUITY (DEFICIT)	(83,292)	
TOTAL LIABILITIES, CONVERTIBLE PREFERRED STOCK AND STOCKHOLDERS' EQUITY (DEFICIT)	$ 59,304	

The accompanying notes are an integral part of these consolidated financial statements.

SHOCKWAVE MEDICAL, INC.
Consolidated Statement of Operations and Comprehensive Loss
(in thousands, except share and per share data)

	Year Ended December 31, 2017
Revenue:	
Product revenue	$ 1,719
Operating expenses:	
Cost of product revenue	2,836
Research and development	17,963
Sales and marketing	6,363
General and administrative	5,422
Total operating expenses	32,584
Loss from operations	(30,865)
Interest expense	(58)
Change in fair value of warrant liability	(32)
Other income, net	366
Net loss before taxes	(30,589)
Income tax provision	26
Net loss	$ (30,615)
Unrealized loss on available-for-sale securities	(1)
Total comprehensive loss	$ (30,616)
Net loss per share, basic and diluted	$ (1.62)
Shares used in computing net loss per share, basic and diluted	18,951,047
Pro forma net loss per share, basic and diluted (unaudited)	$
Shares used in computing pro forma net loss per share, basic and diluted (unaudited)	

The accompanying notes are an integral part of these consolidated financial statements.

SHOCKWAVE MEDICAL, INC.
Consolidated Statement of Convertible Preferred Stock and Stockholders' Deficit
(in thousands, except share data)

	Convertible Preferred Stock		Common Stock		Additional Paid-In Capital	Accumulated Deficit	Accumulated Other Comprehensive Loss	Total Stockholders' Deficit
	Shares	Amount	Shares	Amount				
Balance—December 31, 2016	178,188,194	$ 102,180	18,977,211	$ 18	$ 1,299	$ (55,148)	$ —	$ (53,831)
Issuance of Series C convertible preferred stock, net of issuance costs of $93	34,654,151	34,907	—	—	—	—	—	—
Exercise of Series A-1 warrants	780,216	382	—	—	—	—	—	—
Exercise of stock options	—	—	872,580	2	137	—	—	139
Unrealized loss on available-for-sale securities	—	—	—	—	—	—	(1)	(1)
Vesting of restricted stock	—	—	—	—	51	—	—	51
Stock-based compensation	—	—	—	—	965	—	—	965
Net loss	—	—	—	—	—	(30,615)	—	(30,615)
Balance—December 31, 2017	213,622,561	$ 137,469	19,849,791	$ 20	$ 2,452	$ (85,763)	$ (1)	$ (83,292)

The accompanying notes are an integral part of these consolidated financial statements.

SHOCKWAVE MEDICAL, INC.
Consolidated Statement of Cash Flows
(in thousands)

	Year Ended December 31, 2017
CASH FLOWS FROM OPERATING ACTIVITIES:	
Net loss	$ (30,615)
Adjustments to reconcile net loss to net cash used in operating activities:	
Depreciation and amortization	468
Stock-based compensation	965
Loss on write down of obsolete inventory	403
Loss on write down of fixed assets	38
Change in fair value of warrant liability	32
Amortization of debt issuance costs	18
Changes in operating assets and liabilities:	
Accounts receivable	(594)
Inventory	(2,266)
Prepaid expenses and other current assets	(373)
Accounts payable	249
Accrued and other current liabilities	1,328
Net cash used in operating activities	(30,347)
CASH FLOWS FROM INVESTING ACTIVITIES:	
Purchase of available-for-sale securities	(17,707)
Proceeds from maturities of available-for-sale securities	15,900
Purchase of property and equipment	(425)
Net cash used in investing activities	(2,232)
CASH FLOWS FROM FINANCING ACTIVITIES:	
Proceeds from issuance of convertible preferred stock, net of issuance costs	34,907
Proceeds from stock option exercises	139
Proceeds from warrant exercises	198
Principal payment of term loan	(1,557)
Net cash provided by financing activities	33,687
Net increase in cash	1,108
Cash and cash equivalents at beginning of period	50,815
Cash and cash equivalents at end of period	$ 51,923
SUPPLEMENTAL DISCLOSURES OF CASH FLOW INFORMATION:	
Interest paid	$ 40
NON-CASH FINANCING ACTIVITIES:	
Property and equipment purchases included in accounts payable	$ 51

The accompanying notes are an integral part of these consolidated financial statements.

ShockWave Medical, Inc.
Notes to Consolidated Financial Statements

1. Organization and Basis of Presentation

ShockWave Medical, Inc. (the "Company") was incorporated on June 17, 2009. The Company is primarily engaged in the development of Intravascular Lithotripsy ("IVL") Technology for the treatment of calcified plaque in patients with peripheral vascular, coronary vascular and heart valve disease. Built on a balloon catheter platform, the IVL technology uses lithotripsy to disrupt both superficial and deep vascular calcium, while minimizing soft tissue injury, and an integrated angioplasty balloon to dilate blockages at low pressures, restoring blood flow.

In 2016, the Company began commercial and manufacturing operations, and began selling catheters based on the IVL Technology. The Company's headquarters are in Santa Clara, California. The Company is located and operates primarily in the United States.

Going Concern

The Company has incurred significant losses and has negative cash flows from operations. As of December 31, 2017, the Company had an accumulated deficit of $85.8 million. Management expects to continue to incur additional substantial losses in the foreseeable future.

As of December 31, 2017, the Company had cash, cash equivalents and short-term investments of $53.7 million, which are available to fund future operations. The Company will need to raise additional capital to support the commercialization of its products and research and development activities. The Company's activities are subject to significant risks and uncertainties, including the market acceptance of the Company's products and the timing and extent of spending on research and development.

The Company closed an equity financing and obtained $15.0 million in gross proceeds from the sale of its Series D convertible preferred stock in December 2018 (see Note 14). The Company believes that its cash, cash equivalents, and short-term investments as of December 31, 2017, plus the proceeds from the Series D convertible preferred stock financing (the "Series D Financing"), will not be sufficient for the Company to continue as a going concern for at least one year from the issuance date of its consolidated financial statements. The Company believes that this raises substantial doubt about its ability to continue as a going concern. As a result, the Company will be required to raise additional capital from the sale of convertible preferred stock or common stock or the issuance of debt. However, no assurance can be given as to whether additional needed financing will be available on terms acceptable to the Company, if at all. If sufficient funds on acceptable terms are not available when needed, the Company may be required to significantly reduce its operating expenses. Failure to manage discretionary spending or raise additional financing, as needed, may adversely impact the Company's ability to achieve its intended business objectives.

The accompanying consolidated financial statements have been prepared assuming that the Company will continue as a going concern, which contemplates the realization of assets and the settlement of liabilities and commitments in the normal course of business. The accompanying consolidated financial statements do not reflect any adjustments relating to the recoverability and reclassifications of assets and liabilities that might be necessary if the Company is unable to continue as a going concern.

2. Summary of Significant Accounting Policies

Principles of Consolidation

The accompanying consolidated financial statements include the accounts of the Company and its wholly owned subsidiary. All significant intercompany balances and transactions have been eliminated in consolidation.

ShockWave Medical, Inc.
Notes to Consolidated Financial Statements

Use of Estimates

The preparation of consolidated financial statements in conformity with accounting principles generally accepted in the United States of America ("U.S. GAAP") requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of expense during the reporting period. Significant estimates and assumptions made in the accompanying consolidated financial statements include, but are not limited to the valuation of inventory, the fair value of common stock, the fair value of preferred stock warrant liabilities, the fair value of stock options, recoverability of the Company's net deferred tax assets, and related valuation allowance and certain accruals. The Company evaluates its estimates and assumptions on an ongoing basis using historical experience and other factors and adjusts those estimates and assumptions when facts and circumstances dictate. Actual results could materially differ from those estimates.

Unaudited Pro Forma Financial Information

The unaudited pro forma consolidated balance sheet information as of December 31, 2017 reflects: (i) the automatic conversion of all outstanding shares of the Company's convertible preferred stock into an aggregate of shares of common stock immediately prior to the completion of the Company's planned initial public offering ("IPO"); (ii) the net exercise of outstanding preferred stock warrants into shares of common stock, based on an assumed IPO price of $ per share, and the related reclassification of the convertible preferred stock warrant liability to additional paid-in capital; (iii) the reclassification of the remaining convertible preferred stock warrant liability to additional paid-in capital due to the warrants converting to warrants to purchase common stock; and (iv) the net exercise of outstanding common stock warrants that would otherwise expire upon completion of an IPO into shares of common stock, based on an assumed IPO price of $ per share. The shares of common stock issuable and the proceeds expected to be received in the IPO are excluded from such pro forma financial information.

Pro forma basic and diluted net loss per share has been computed to give effect to the conversion of all outstanding convertible preferred stock into shares of common stock and the net exercise of certain convertible preferred stock warrants and common stock warrants. Also, the numerator in the pro forma basic and diluted net loss per share calculation has been adjusted to remove gains or losses resulting from the remeasurement of the convertible preferred stock warrant liability. The unaudited pro forma net loss per share does not include the shares expected to be sold and related proceeds to be received from the IPO. The unaudited pro forma net loss per share for the year ended December 31, 2017 was computed using the weighted-average number of shares of common stock outstanding, including the pro forma effect of the conversion of all outstanding shares of convertible preferred stock into shares of common stock and the net exercise of certain convertible preferred stock warrants and common stock warrants, as if such conversion or net exercise had occurred at the beginning of the period, or their issuance dates if later.

Cash and Cash Equivalents

The Company considers all highly liquid investments purchased with original maturities of three months or less from the purchase date to be cash equivalents. Cash equivalents consist primarily of amounts invested in money market accounts.

Short-Term Investments

Short-term investments have been classified as available-for-sale and are carried at estimated fair value as determined based upon quoted market prices or pricing models for similar securities. The Company determines

the appropriate classification of its investments in debt securities at the time of purchase. Available-for-sale securities with original maturities beyond three months at the date of purchase are classified as current based on their availability for use in current operations.

Unrealized gains and losses are excluded from earnings and are reported as a component of comprehensive loss. The Company periodically evaluates whether declines in fair values of its marketable securities below their book value are other-than-temporary. This evaluation consists of several qualitative and quantitative factors regarding the severity and duration of the unrealized loss as well as the Company's ability and intent to hold the marketable security until a forecasted recovery occurs. Additionally, the Company assesses whether it has plans to sell the security or it is more likely than not it will be required to sell any marketable securities before recovery of its amortized cost basis. Realized gains and losses and declines in fair value judged to be other than temporary, if any, on marketable securities are included in other income, net. The cost of investments sold is based on the specific-identification method. Interest on marketable securities is included in other income, net.

Concentration of Credit Risk

Financial instruments that potentially subject the Company to significant concentrations of credit risk consist primarily of cash, cash equivalents, investments and trade receivables. Risks associated with cash and cash equivalents are mitigated by banking with creditworthy institutions and the Company's investments have investment grade ratings when purchased. The Company performs ongoing evaluations of its customers and generally does not require collateral.

Concentration of Customers

For the year ended December 31, 2017, one customer accounted for 19% of the Company's revenue. As of December 31, 2017, there were no customers which accounted for more than 10% of the Company's accounts receivable.

Fair Value of Financial Instruments

The Company's cash and cash equivalents, short-term investments, accounts receivable, accounts payable and accrued liabilities approximate their fair value at December 31, 2017 due to their short maturities.

The Company utilizes valuation techniques that maximize the use of observable inputs and minimize the use of unobservable inputs to the extent possible. The Company determines the fair value of its financial instruments based on assumptions that market participants would use in pricing an asset or liability in the principal or most advantageous market. When considering market participant assumptions in fair value measurements, the following fair value hierarchy distinguishes between observable and unobservable inputs, which are categorized in one of the following levels:

Level 1 – Inputs are unadjusted, quoted prices in active markets for identical assets or liabilities at the measurement date;

Level 2 – Inputs are observable, unadjusted quoted prices in active markets for similar assets or liabilities, unadjusted quoted prices for identical or similar assets or liabilities in markets that are not active or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the related assets or liabilities; and

Level 3 – Unobservable inputs that are significant to the measurement of the fair value of the assets or liabilities that are supported by little or no market data.

ShockWave Medical, Inc.
Notes to Consolidated Financial Statements

Accounts Receivable

Accounts receivable are recorded at invoice value, net of any allowance for doubtful accounts. Allowances on accounts receivable are recorded when circumstances indicate collection is doubtful for a particular accounts receivable. Receivables are written off if reasonable collection efforts prove unsuccessful. The Company provides for allowances on a specific account basis. As of December 31, 2017, the Company did not have an allowance for doubtful accounts.

Inventory

Inventory is stated at the lower of standard cost (which approximates actual cost on a first-in, first-out basis) and net realizable value. Inventory costs include direct materials, direct labor and normal manufacturing overhead. Prior to achieving normal capacity, excess capacity costs are expensed in cost of product revenue as period costs. Finished goods that are used for research and development are expensed as consumed. Provisions for slow-moving, excess or obsolete inventories are recorded when required to reduce inventory values to their estimated net realizable values based on product life cycle, development plans, product expiration or quality issues.

Property and Equipment

Property and equipment are stated at cost, net of accumulated depreciation and amortization. Depreciation and amortization is computed using the straight-line method over the estimated useful lives of the respective assets, generally three to five years. Leasehold improvements are amortized over the lesser of their useful life or the remaining life of the lease. When assets are retired or otherwise disposed of, the cost and related accumulated depreciation and amortization are removed from the balance sheet and the resulting gain or loss is reflected in operations in the period realized. Maintenance and repairs are charged to operations as incurred.

Impairment of Long-Lived Assets

The Company reviews long-lived assets for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. Recoverability is measured by comparing the carrying amount to the future net undiscounted cash flows which the assets are expected to generate. If such assets are considered to be impaired, the impairment to be recognized is measured by the amount by which the carrying amount of the assets exceeds the projected discounted future net cash flows arising from the asset. The Company has not identified any such impairment losses to date.

Convertible Preferred Stock Warrant Liability

The Company has accounted for its freestanding warrants to purchase shares of the Company's convertible preferred stock as liabilities at fair value upon issuance primarily because the shares underlying the warrants contain contingent redemption features outside the control of the Company. The warrants are subject to re-measurement at each balance sheet date and any change in fair value is recognized as the change in fair value of warrant liability. We will continue to adjust the carrying value of the warrants until such time as these instruments are exercised, expire or convert into warrants to purchase shares of our common stock. At that time, the liabilities will be reclassified to additional paid-in capital, a component of stockholders' equity (deficit). The consummation of this offering will result in this reclassification.

Revenue Recognition

The Company sells its products to hospitals, primarily through direct sales representatives, as well as through distributors in select international markets. Additionally, a significant portion of the Company's revenue

is generated when the Company's catheter products are removed from consignment inventory maintained at hospitals and used in a clinical procedure.

The Company recognizes revenue when persuasive evidence of an arrangement exists, delivery has occurred or services have been rendered, the price to the customer is fixed or determinable, and collectability is reasonably assured. For products sold through direct sales representatives, revenue is recognized upon delivery to customers. For consignment inventory, revenue is recognized at the time the product has been used in a clinical procedure. For products sold to distributors, revenue is recognized upon transfer of title and risk of loss to the distributor.

Research and Development Costs

Research and development costs, including new product development, regulatory compliance, and clinical research are expensed as incurred.

Accrued Research and Development Costs

The Company accrues liabilities for estimated costs of research and development activities conducted by its third-party service providers, which include the conduct of preclinical and clinical studies. The estimated costs of research and development activities are recorded based upon the estimated amount of services provided but not yet invoiced, and these costs are included in accrued liabilities on the consolidated balance sheet and within research and development expense on the consolidated statement of operations and comprehensive loss.

These costs are accrued for based on factors such as estimates of the work completed and budget provided and in accordance with agreements established with third-party service providers. Significant judgments and estimates are made in determining the accrued liabilities balance in each reporting period. Accrued liabilities are adjusted as actual costs become known. There have not been any material differences between accrued costs and actual costs incurred since the Company's inception.

Stock-Based Compensation

The Company accounts for share-based payments at fair value. The fair value of stock options is measured using the Black-Scholes option-pricing model. For share-based awards that vest subject to the satisfaction of a service requirement, the fair value measurement date for employee stock-based compensation awards is the date of grant and the expense is recognized on a straight-line basis, over the vesting period. The Company accounts for forfeitures as they occur.

Stock-based compensation arrangements with nonemployees are recognized at the grant date and remeasured to fair value at each reporting period until the award is vested. The expense is recognized over the vesting period which is generally the service period.

Pension Benefits

The Company has a defined contribution retirement savings plan under Section 401(k) of the Internal Revenue Code. This plan allows eligible employees to defer a portion of their annual compensation on a pre-tax basis. The Company is authorized to, but has not made matching contributions for the year ended December 31, 2017.

Comprehensive Loss

Comprehensive loss is comprised of net loss and changes in unrealized gains and losses on the Company's available-for-sale investments.

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Foreign Currency

The functional currency of the Company's foreign subsidiary is the U.S. Dollar. Accordingly, all monetary assets and liabilities of the subsidiary are remeasured at the current exchange rate at the end of the period, nonmonetary assets and liabilities are remeasured at historical rates, and revenue and expenses are remeasured at average exchange rates during the period. Foreign currency transaction gains were $36,000 for the year ended December 31, 2017.

Net Loss Per Share

Basic net loss per share is calculated by dividing net loss by the weighted-average number of shares of common stock outstanding for the period, without consideration for potential dilutive shares of common stock. The unvested portion of early exercised stock options are excluded from the computation of weighted-average shares as the continuing vesting of such shares is contingent on the holders' continued service to the Company. Since the Company was in a loss position for the period presented, basic net loss per share is the same as diluted net loss per share since the effects of potentially dilutive securities are antidilutive.

Income Taxes

The Company uses the asset and liability method of accounting for income taxes. Under this method, deferred tax assets and liabilities are determined based on the differences between the financial reporting and the tax bases of assets and liabilities and are measured using the enacted tax rates and laws that will be in effect when the differences are expected to reverse. Management makes an assessment of the likelihood that the resulting deferred tax assets will be realized. A valuation allowance is provided when it is more likely than not that some portion or all of a deferred tax asset will not be realized. Due to the Company's historical operating performance and the recorded cumulative net losses in prior fiscal periods, the net deferred tax assets have been fully offset by a valuation allowance.

The Company recognizes uncertain income tax positions at the largest amount that is more likely than not to be sustained upon audit by the relevant taxing authority. An uncertain income tax position will not be recognized if it has less than a 50% likelihood of being sustained. Changes in recognition or measurement are reflected in the period in which judgment occurs. The Company's policy is to recognize interest and penalties related to the underpayment of income taxes as a component of provision for income taxes.

Segment Reporting

Operating segments are defined as components of an entity for which separate financial information is available and that is regularly reviewed by the Chief Operating Decision Maker ("CODM") in deciding how to allocate resources to an individual segment and in assessing performance. The Company's CODM is its Chief Executive Officer. The Company has determined it operates in one segment.

Recent Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2014-09, *Revenue from Contracts with Customers*. This new standard will replace most of the existing revenue recognition guidance in U.S. GAAP when it becomes effective and permits the use of either modified retrospective or full retrospective transition method. While the Company has not completed its evaluation, the Company currently plans to adopt this accounting standard as of January 1, 2018 using the modified retrospective method. The Company is currently in the process of evaluating the impact of the adoption of this new standard on the Company's consolidated financial statements.

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In February 2016, the FASB issued ASU No. 2016-02, *Leases*. This new standard requires lessees to apply a dual approach, classifying leases as either finance or operating leases based on the principle of whether or not the lease is effectively a financed purchase by the lessee. This classification will determine whether lease expense is recognized based on an effective interest method or on a straight-line basis over the term of the lease. A lessee is also required to record a right-of-use asset and a lease liability for all leases with a term of greater than 12 months regardless of their classification. Leases with a term of 12 months or less will be accounted for similar to existing guidance for operating leases. The Company plans to adopt this accounting standard as of January 1, 2019 using the adoption method defined in ASU No. 2018-11 in which the new leases standard is not applied in comparative periods presented in the year of adoption. The Company is currently in the process of evaluating the impact of the adoption of this new standard on the Company's consolidated financial statements.

In June 2018, the FASB issued ASU No. 2018-07, *Improvements to Nonemployee Share-Based Payment Accounting*. ASU 2018-07 simplifies the accounting for share-based payments to nonemployees by aligning it with the accounting for share-based payments to employees, with certain exceptions. Some of the areas of simplification apply only to nonpublic entities. The Company plans to early adopt this guidance as of January 1, 2018. The Company does not believe adoption of this guidance will have a material impact on the Company's consolidated financial statements.

3. Financial Instruments and Fair Value Measurements

The following tables summarize the Company's financial assets and liabilities measured at fair value on a recurring basis by level within the fair value hierarchy:

	December 31, 2017			
	Level 1	Level 2	Level 3	Total
	(in thousands)			
Assets:				
Money market funds	$26,379	$ —	$ —	$26,379
U.S. treasury	1,806	—	—	1,806
Total assets	$28,185	$ —	$ —	$28,185
Liabilities:				
Convertible preferred stock warrant liability	$ —	$ —	$ 577	$ 577
Total liabilities	$ —	$ —	$ 577	$ 577

The change in the value of the warrant liability is summarized below:

	Year Ended December 31, 2017
	(in thousands)
Beginning balance	$ 729
Exercise of warrants	(184)
Change in fair value	32
Ending balance	$ 577

The valuation of the Company's convertible preferred stock warrant liability contains unobservable inputs that reflect the Company's own assumptions for which there is little, if any, market activity for at the measurement date. Accordingly, the Company's convertible preferred stock warrant liability is measured at fair

value on a recurring basis using unobservable inputs and are classified as Level 3 inputs, and any change in fair value is recognized as change in fair value of warrant liability in the consolidated statement of operations and comprehensive loss. Refer to Note 9 for the valuation technique and assumptions used in estimating the fair value of the warrants.

There were no transfers between Levels 1, 2 or 3 for the period presented.

4. Cash Equivalents and Short-Term Investments

The following is a summary of the Company's cash equivalents and short-term investments:

	December 31, 2017			
	Amortized Cost Basis	Unrealized Gains	Unrealized Losses	Fair Value
	(in thousands)			
Money market funds	$ 26,379	$ —	$ —	$ 26,379
U.S. treasury note	1,807	—	(1)	1,806
Total	$ 28,186	$ —	$ (1)	$ 28,185
Reported as:				
Cash equivalents				$ 26,379
Short-term investments				1,806
Total				$ 28,185

The contractual maturities of the Company's investments were all due within one year as of December 31, 2017. For the year ended December 31, 2017, the Company recognized no material realized gains or losses on cash equivalents and short-term investments.

5. Balance Sheet Components

Inventory

Inventory consists of the following:

	December 31, 2017
	(in thousands)
Raw material	$ 478
Work in progress	198
Finished goods	1,041
Consigned inventory	806
Total inventory	$ 2,523

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Property and Equipment, Net

Property and equipment, net consists of the following:

	December 31, 2017 (in thousands)
Equipment	$ 1,561
Office furniture	68
Software	76
Leasehold improvements	366
Construction in progress	258
Property and equipment, gross	2,329
Less accumulated depreciation and amortization	(957)
Total property and equipment, net	$ 1,372

Depreciation and amortization expense was $0.5 million for the year ended December 31, 2017.

Accrued Liabilities

Accrued liabilities consist of the following:

	December 31, 2017 (in thousands)
Accrued employee compensation	$ 2,072
Accrued research and development costs	507
Accrued professional services	348
Other	466
Total accrued liabilities	$ 3,393

6. Commitments and Contingencies

Operating Leases

In August 2012, the Company entered into a lease for office space located in Fremont, California. In September 2016, the Company extended the term of the lease to March 31, 2019. The Company is using the facility for office, manufacturing and research and development purposes. There were no tenant improvement allowances granted nor early termination rights for this lease.

In May 2018, the Company entered into a new lease agreement that will end on August 31, 2022 (see Note 14).

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The following are minimum future rental payments owed under these agreements, including the new lease agreement entered into as a subsequent event (see Note 14):

Year Ending December 31:	(in thousands)
2018	$ 577
2019	918
2020	830
2021	855
Thereafter	582
Total	$ 3,762

Rent expense for the year ended December 31, 2017 was $0.4 million.

7. Term Notes

Loan and Security Agreement

In June 2014, the Company entered into a Loan and Security Agreement with Silicon Valley Bank, under which a total of $4.0 million was borrowed. The Company made monthly payments of principal and interest through the maturity date of October 1, 2017, and a one-time payment of $0.2 million on the maturity date of the loan. All the borrowings under the Loan and Security Agreement were fully repaid as of December 31, 2017.

In connection with the Loan and Security Agreement, the Company issued warrants to purchase shares of the Company's Series A-1 convertible preferred stock. Upon issuance, the fair value of the warrants was recorded as a debt discount. The debt discount was amortized to interest expense, net over the repayment period of the loan. During the year ended December 31, 2017, amortization of debt discount was $0.1 million.

8. Convertible Preferred Stock

In September 2017, the Company issued 34,654,151 shares of its Series C convertible preferred stock at a price per share of $1.0099 for net proceeds of $34.9 million.

Convertible preferred stock consists of the following:

	December 31, 2017			
	Shares Authorized	Shares Issued and Outstanding	Net Carrying Value	Aggregate Liquidation Preference
	(in thousands, except share amounts)			
Series A	19,280,722	19,280,722	$ 4,226	$ 4,473
Series A-1	52,589,632	50,355,051	13,637	12,780
Series B	65,000,000	64,777,331	39,877	40,000
Series C	79,209,457	79,209,457	79,729	79,994
	216,079,811	213,622,561	$ 137,469	$ 137,247

The Company recorded its convertible preferred stock at fair value on the dates of issuance, net of issuance costs. As of December 31, 2017, the Company classified its Series A, Series A-1, Series B and Series C convertible preferred stock outside of stockholders' deficit in temporary equity because, in the event of certain "liquidation events" that are not solely within the control of the Company (including liquidation, sale or transfer

of control of the Company), the shares would become redeemable at the option of the holders. As of December 31, 2017, the Company did not adjust the carrying values of the Series A, Series A-1, Series B and Series C convertible stock to the deemed liquidation values of such shares since a liquidation event was not probable at the balance sheet date. Subsequent adjustments to increase or decrease the carrying values to the ultimate liquidation values will be made if and when it becomes probable that such a liquidation event will occur.

The holders of the Convertible Preferred Stock have the following rights, privileges and preferences:

Optional Conversion Rights

Each share of Series A, Series A-1, Series B and Series C convertible preferred stock is convertible at the option of the holder into the number of shares of common stock determined by dividing the original issue price by the applicable conversion price. The original issue price per share and initial conversion price per share is $0.232 for Series A, $0.2538 for Series A-1, $0.6175 for Series B and $1.00998 for Series C convertible preferred stock. As of December 31, 2017, at the current conversion ratios, each share of Series A, Series A-1, Series B and Series C convertible preferred stock will convert on a one-for-one basis into common stock. The conversion price per share for the convertible preferred stock shall be adjusted for certain recapitalizations, splits, combinations, common stock dividends or as set forth in the Company's Amended and Restated Articles of Incorporation. At December 31, 2017, none of the Series A, Series A-1, Series B and Series C convertible preferred stock has been converted to common stock.

Automatic Conversion Rights

Each share of convertible preferred stock shall automatically be converted into shares of common stock at the then effective conversion rate for such share (i) immediately prior to the closing of a firm commitment underwritten initial public offering pursuant to an effective registration statement filed under the Securities Act of 1933, as amended (the "Securities Act"), covering the offer and sale of the Company's common stock, provided that the offering price per share is not less than $1.235 (as adjusted for recapitalizations) and the aggregate gross proceeds to the Company are not less than $30.0 million, or (ii) upon the receipt by the Company of a written request for such conversion from the preferred requisite majority, or, if later, the effective date for conversion specified in such requests. The conversion prices and rates for each series of convertible preferred stock are the same in the event of an automatic conversion as they would be in the event of an optional conversion.

Voting Rights

Each share of convertible preferred stock has a number of votes equal to the number of shares of common stock into which it is convertible. The holders of the Series A, Series A-1, Series B and Series C convertible preferred stock, voting as separate classes, each have the right to elect one director to the Company's board of directors (the "Board"). The holders of the common stock, voting as a separate class, have the right to elect two members to the Board. Any other members of the Company's Board shall be elected by both (i) the holders of convertible preferred stock, voting as a separate class and on an as-converted basis, and (ii) the holders of common stock, voting as a separate class.

Liquidation Rights

In the event of any liquidation, dissolution or winding-up of the corporation, the holders of the Series A, Series A-1, Series B and Series C convertible preferred stock are entitled to liquidation preferences in the amount of $0.232 per share for the Series A, $0.2538 per share for the Series A-1, $0.6175 per share for the Series B

and $1.0099 per share for the Series C convertible preferred stock (each subject to adjustment for recapitalizations), plus all declared but unpaid dividends. After the payment or setting aside for payment to the holders of the Series A, Series A-1, Series B and Series C convertible preferred stock of their full liquidation preference amounts, the entire remaining assets of the Company legally available for distribution shall be distributed pro rata to the holders of common stock in proportion to the number of shares of common stock held by them.

A Liquidation Event is defined as including (i) the acquisition of the corporation by another entity by means of any transaction or series of related transactions to which the corporation is party other than a transaction or series of transactions in which the holders of the voting securing of the corporation outstanding immediately prior to such transaction retain, immediately after such transaction or series of transactions, as a result of shares in the corporation held by such holders prior to such transaction, at least a majority of the total voting power represented by the outstanding voting securities of the corporation or such other surviving or resulting entity; (ii) a sale, lease or other disposition (excluding by exclusive license) of all or substantially all of the assets of the corporation; or (iii) any liquidation, dissolution or winding up of the corporation whether voluntary or involuntary.

Dividend Rights

The convertible preferred stockholders are entitled to receive dividends at an annual rate of $0.01856 per share of Series A, $0.02030 per share of Series A-1, $0.0494 per share of Series B and $0.0808 per share of Series C (each adjusted to reflect recapitalizations). Such dividends are payable out of funds legally available, are payable only when and if declared by the board of directors and are noncumulative. No dividends may be paid on the common stock during any fiscal year until the Series A, Series A-1, Series B and Series C convertible preferred stockholders have received their dividend preference for that fiscal year. After the payment of these dividends, any dividends declared by our board of directors out of funds legally available shall be shared equally among all outstanding shares on an as-converted basis. No dividends have been declared to date.

Redemption Rights

There are no redemption rights afforded to the holders of convertible preferred stock. Upon certain change in control events that are outside of the Company's control, including liquidation, sale or transfer of control of the Company, holders of the convertible preferred stock can cause its redemption.

9. Warrant Liability

The key terms of the outstanding convertible preferred stock warrants are summarized in the following table:

	Warrants Outstanding		
	Warrants Outstanding December 31, 2017	Exercise Price	Expiration
Series A-1 convertible preferred stock warrants	1,564,764	$ 0.2538	Various dates in 2018
Series A-1 convertible preferred stock warrants	669,817	$ 0.2538	June 2024
Total convertible preferred stock warrants	2,234,581		

The fair value of the warrants was determined using the Black-Scholes option pricing model and the following assumptions:

	December 31, 2017
Expected term (in years)	0-6.5
Expected volatility	19.8%-42.3%
Risk-free interest rate	1.1%-1.8%
Expected dividend yield	0%

10. Stock-Based Compensation

Total stock-based compensation was as follows:

	Year Ended December 31, 2017 (in thousands)
Cost of product revenue	$ 46
Research and development	185
Selling and marketing	130
General and administrative	604
Total stock-based compensation	$ 965

Stock-based compensation related to non-employee awards, which is included in the table above, was insignificant for the year ended December 31, 2017.

Determination of Fair Value

The estimated grant-date fair value of all the Company's stock-based awards was calculated using the Black-Scholes option pricing model, based on the following assumptions:

	December 31, 2017
Expected term (in years)	6.08
Expected volatility	45.6%
Risk-free interest rate	1.9-2.2%
Expected dividend yield	0%

The fair value of each stock option grant was determined by the Company using the methods and assumptions discussed below. Each of these inputs is subjective and generally requires significant judgment and estimation by management.

Expected Term—The expected term represents the period that stock-based awards are expected to be outstanding. The Company's historical share option exercise information is limited due to a lack of sufficient data points, and did not provide a reasonable basis upon which to estimate an expected term. The expected term for option grants is therefore determined using the simplified method. The simplified method deems the expected term to be the midpoint between the vesting date and the contractual life of the stock-based awards. The expected term for options issued to nonemployees is the contractual term.

Expected Volatility—The expected volatility was derived from the historical stock volatilities of comparable peer public companies within the Company's industry that are considered to be comparable to the

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Company's business over a period equivalent to the expected term of the stock-based awards since there has been no trading history of the Company's common stock.

Risk-Free Interest Rate—The risk-free interest rate is based on the U.S. Treasury yield curve in effect at the date of grant for zero-coupon U.S. Treasury notes with maturities approximately equal to the stock-based awards' expected term.

Expected Dividend Yield—The expected dividend yield is zero as the Company has not paid nor does it anticipate paying any dividends on its common stock in the foreseeable future.

The Company has elected to recognize forfeitures of share-based payment awards as they occur.

Equity Incentive Plan

On June 17, 2009, the Company adopted the 2009 Equity Incentive Plan (the "Plan") under which the Board may issue stock options to employees, directors and consultants. The Board has the authority to determine to whom options will be granted, the number of shares, the term and the exercise price. If an individual owns stock representing 10% or more of the outstanding shares, the price of each share shall be at least 110% of the fair market value, as determined by the Board. Options granted under the Plan have a term of up to 10 years and generally vest over a 4 year period with a straight-line vesting and a 25% one year cliff. As of December 31, 2017, the Company had reserved 53,268,142 shares of common stock for issuance under the Plan.

Activity under the 2009 Plan is set forth below:

	Shares Available for Grant	Number of Shares	Weighted-Average Exercise Price Per Share	Weighted-Average Remaining Term (in years)	Aggregate Intrinsic Value (in thousands)
Balance, December 31, 2016	10,832,197	16,664,405	$ 0.16		$ 2,011
Awards authorized	16,502,662	—			
Options granted	(24,089,989)	24,089,989	0.28		
Options exercised	—	(872,580)	0.16		
Options cancelled	1,956,844	(1,956,844)	0.20		
Balance, December 31, 2017	5,201,714	37,924,970	$ 0.23	8.03	$ 3,647
Vested and exercisable, December 31, 2017		10,291,257	$ 0.16	5.76	$ 1,785
Vested and expected to vest, December 31, 2017		37,924,970	$ 0.23	8.03	$ 3,647

The weighted-average grant date fair value of options granted during the year ended December 31, 2017 was $0.13 per share. The total grant date fair value of options vested was $0.9 million for the year ended December 31, 2017.

The aggregate intrinsic values of options outstanding, vested and exercisable, and vested and expected to vest were calculated as the difference between the exercise price of the options and the estimated fair value of the Company's common stock, as determined by the Board, as of December 31, 2017. The aggregate intrinsic value of options exercised was $0.1 million for the year ended December 31, 2017.

As of December 31, 2017, total unrecognized stock-based compensation related to unvested stock options was $2.7 million, which the Company expects to recognize over a remaining weighted-average period of 3.0 years.

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Restricted Stock

A summary of restricted stock activity is presented below:

	Number of Shares	Weighted-Average Exercise Price
Outstanding and unvested at December 31, 2016	1,154,251	$ 0.05
Vested	(1,012,689)	0.05
Outstanding and unvested at December 31, 2017	141,562	$ 0.05

Terms of the Plan permit optionholders to exercise options before their options are vested, subject to certain limitations. Upon early exercise, the awards become subject to a restricted stock agreement. The shares of restricted stock granted upon early exercise of the options are subject to the same vesting provisions in the original stock option awards. Common stock outstanding in these consolidated financial statements includes restricted stock subject to repurchase. Shares issued as a result of early exercise that have not vested are subject to repurchase by the Company upon termination of the purchaser's employment, at the price paid by the purchaser, and are not deemed to be issued for accounting purposes until those related shares vest. The liability is reclassified into common stock and additional paid-in capital as the shares vest and the repurchase right lapses. Accordingly, the Company has recorded the unvested portion of the exercise proceeds of $7,000 as a liability as of December 31, 2017 from the early exercise in the accompanying consolidated balance sheet.

Stock-Based Awards Granted Outside of Equity Incentive Plans

Related Party Common Stock Warrants

In May 2015, the Company issued warrants to purchase shares of its common stock to the three founders of the Company. The key terms of the outstanding common stock warrants are summarized in the following table:

	Warrants Outstanding		
	Warrants Outstanding December 31, 2017	Exercise Price	Expiration
Common stock warrants	1,729,699	$ 0.18	May 2025
Total common stock warrants	1,729,699		

11. Income Taxes

Income tax provision consists of the following:

	December 31, 2017 (in thousands)
Domestic	$ 1
Foreign	25
Total income tax provision	$ 26

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The components of the deferred tax assets are as follows:

	December 31, 2017 (in thousands)
Deferred tax assets:	
Net operating loss carryovers	$ 19,251
Fixed and intangible assets	664
Accruals and reserves	465
Stock-based compensation	31
Research and development credits	1,858
Contributions	13
Total deferred tax assets	22,282
Less valuation allowance	(22,282)
Total net deferred tax assets	$ —

Reconciliation of the statutory federal income tax to the Company's effective tax is as follows:

	December 31, 2017 (in thousands)
Income tax benefit at federal statutory rate	$ (10,404)
State and local income taxes net of federal tax benefit	1
Foreign tax rate differential	(3)
Change in valuation allowance	(522)
Stock-based compensation	309
R&D tax credits	(222)
Other	109
Federal rate change (pursuant to the Tax Cuts and Jobs Act of 2017)	10,758
Total income tax provision	$ 26

The effective tax rate for the year ended December 31, 2017 differs from the federal statutory rate primarily due to the change in the federal rate during 2017 and the valuation allowance against deferred tax assets. Due to the uncertainties surrounding the realization of deferred assets through future taxable income, the Company has provided a full valuation allowance and, therefore, no benefit has been recognized for the net operating loss and other deferred tax assets. The valuation allowance increased by approximately $0.6 million during the year ended December 31, 2017.

As of December 31, 2017, the Company had net operating loss carryforwards available to reduce future federal and California income of $80.8 million and $32.6 million, respectively. All net operating loss carryforwards begin expiring in 2030. The net operating loss related deferred tax assets do not include excess tax benefits from employee stock option exercises.

For the year ended December 31, 2017, the Company had research and development credit carryforwards of $1.0 million for federal income tax purposes and $1.1 million for California state income tax purposes available to reduce future taxable income, if any. The federal Research and Development credit carryforwards expire beginning 2032 and California credits can be carried forward indefinitely.

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Utilization of the net operating loss carryforward may be subject to an annual limitation due to the ownership percentage change limitations provided by the Internal Revenue Code of 1986, as amended, and similar state provisions. The annual limitation may result in the expiration of the net operating loss before utilization.

The Tax Cuts and Job Act (the "Tax Act") was enacted on December 22, 2017. The Tax Act reduces the top U.S. federal corporate tax rate from 35% to 21%, requires companies to pay a one-time transition tax on earnings of certain foreign subsidiaries that were previously tax deferred, changes the rules related to uses and limitations of net operating loss carryforwards created in tax years beginning after December 31, 2017, allows for immediate expensing of fixed asset additions beginning after September 27, 2017, and creates new taxes on certain foreign sourced earnings. In 2017, the Company was not subject to a one-time transition tax as no foreign accumulated earnings and profits existed.

As a result of the signing of the Tax Act, the Company recorded a $10.1 million reduction due to remeasurement of its deferred tax assets along with a corresponding reduction of our valuation allowance. Subsequent to the enactment of the Tax Act, the SEC staff issued Staff Accounting Bulletin No. 118 ("SAB 118"), which allows companies to record provisional amounts related to the effects of the Tax Act during a measurement period not to extend beyond one year of the enactment date. The Tax Act could be amended or subject to technical correction, which could change the financial impacts that were recorded at December 31, 2017 or are expected to be recorded in future periods. As further guidance may be forthcoming from the FASB, as well as regulations, interpretations and rulings from federal and state tax agencies, which could result in additional impacts, we have not yet completed our analysis of the income tax effects of the Tax Act. As a result, the Company has disclosed amounts on a provisional basis. The Company will finalize and record any adjustments related to the Tax Act within the one-year measurement period provided under SAB 118.

Uncertain Tax Positions

The activity related to the gross amount of unrecognized tax benefits is as follows:

	December 31, 2017
	(in thousands)
Beginning balance	$ 688
Additions based on tax positions related to current year	205
Balance at end of year	$ 893

If recognized, gross unrecognized tax benefits would not have an impact on the Company's effective tax rate due to the Company's full valuation allowance position. While it is often difficult to predict the final outcome of any particular uncertain tax position, the Company does not believe that the amount of gross unrecognized tax benefits will change significantly in the next twelve months. The Company is subject to taxation in the United States, including the State of California, and in Germany. The Company files federal and California income tax returns. The Company is not currently under examination by any income tax authorities. The federal and California statute of limitations remains open for three and four years, respectively, from the date of utilization of any net operating loss or credits.

It is the Company's policy to include penalties and interest expense related to income taxes as a component of the income tax provision as necessary. The Company determined that no accrual for interest and penalties was required as of December 31, 2017.

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12. Net Loss Per Share

The following outstanding potentially dilutive common stock equivalents have been excluded from the calculation of diluted net loss per share for the period presented due to their anti-dilutive effect:

	Year Ended December 31, 2017
Convertible preferred stock	213,622,561
Common stock options issued and outstanding	37,924,970
Restricted stock subject to future vesting	141,562
Convertible preferred stock warrants	2,234,581
Common stock warrants	1,729,699
Total	255,653,373

Unaudited Pro Forma Net Loss Per Share

The following table sets forth the computation of unaudited pro forma basic and diluted net loss per share:

	Year Ended December 31, 2017 (unaudited) (in thousands, except share and per share data)
Numerator:	
Net loss	$ (30,615)
Change in fair value of warrant liability	32
Pro forma net loss, basic and diluted	$ (30,583)
Denominator:	
Shares of common stock used in computing net loss per share, basic and diluted	
Pro forma adjustment to reflect assumed conversion of convertible preferred stock	
Pro forma adjustment to reflect assumed exercise of certain convertible preferred stock warrants and common stock warrants	
Pro forma shares of common stock, basic and diluted	
Pro forma net loss per share, basic and diluted	$

13. Geographic Information

The following table represents the Company's revenue based on the location to which the product is shipped:

	Year Ended December 31, 2017 (in thousands)
United States	$ 969
Germany	597
All other countries	153
Product revenue	$ 1,719

As of December 31, 2017, the Company's long-lived assets are all held in the United States.

14. Subsequent Events

Subsequent events have been evaluated through December 6, 2018, which is the date that the consolidated financial statements were available to be issued.

Loan and Security Agreement

In February 2018, the Company entered into a Loan and Security Agreement with Silicon Valley Bank. The terms of the Loan and Security Agreement includes a term loan of $15.0 million and a revolving line of credit of $2.0 million. The term loan is available in two tranches. The first tranche of $10.0 million is available to draw commencing in February 2018 through June 2018. The second tranche of $5.0 million is available to draw upon achievement of certain milestones through March 31, 2019. The first tranche of $10.0 million was funded in June 2018. In connection with the execution of the Loan and Security Agreement, the Company issued warrants to purchase 420,174 shares of the Company's common stock.

The term loan is due in monthly installments from July 2018 through its repayment in December 2021, with interest-only monthly payments until March 2019. The interest-only period will extend through September 2019 if the Company draws the second tranche and December 2019 if certain financing milestones are met. The term loan accrues interest at a floating per annum rate equal to the greater of the Wall Street Journal prime rate minus 1.75% and 2.75%. There is a final payment equal to 6.75% of the original aggregate principal amount of the term loan advances. The line of credit accrues interest at the Wall Street Journal prime rate.

The term loan is secured by all of the Company's assets, excluding intellectual property and certain other assets. The loan contains customary affirmative and restrictive covenants, including with respect to the Company's ability to enter into fundamental transactions, incur additional indebtedness, grant liens, pay any dividend or make any distributions to its holders, make investments, merge or consolidate with any other person or engage in transactions with our affiliates, but does not include any financial covenants.

Operating Lease Agreement

As discussed in Note 6, in May 2018, the Company entered into a lease agreement for new office and laboratory space which consists of approximately 35,000 square feet located in Santa Clara, California. The lease term commences in September 2018 and ends in August 2022 and provides no early termination rights. In connection with the lease, the Company will maintain a letter of credit for the benefit of the landlord in the amount of $0.5 million.

Series D Convertible Preferred Stock Financing

In December 2018, the Company issued 13,305,422 shares of its Series D convertible preferred stock at a price per share of $1.12736 for gross proceeds of $15.0 million. The Series D investor has the option to purchase up to $10.0 million in common stock at a price per share equal to the price per share of the common stock to the public in an initial public offering.

Shares

Common Stock

Prospectus

Morgan Stanley **BofA Merrill Lynch**

Wells Fargo Securities **Canaccord Genuity**

PART II

INFORMATION NOT REQUIRED IN PROSPECTUS

Item 13. Other Expenses of Issuance and Distribution

The following table sets forth all expenses to be paid by us, other than underwriting discounts and commissions, upon completion of this offering. All amounts shown are estimates except for the SEC registration fee, the FINRA filing fee and the , or , listing fee.

	Amount to Be Paid
SEC registration fee	$ *
FINRA filing fee	*
Listing fee	*
Advisory fees payable to Perella Weinberg Partners LP	*
Transfer agent and registrar's fees	*
Printing and engraving expenses	*
Legal fees and expenses	*
Accounting fees and expenses	*
Blue Sky fees and expenses	*
Miscellaneous expenses	*
Total	$ *

* To be completed by amendment.

Item 14. Indemnification of Directors and Officers

Section 145 of the Delaware General Corporation Law provides that a corporation may indemnify directors and officers as well as other employees and individuals against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by such person in connection with any threatened, pending or completed actions, suits or proceedings in which such person is made a party by reason of such person being or having been a director, officer, employee or agent to the registrant. The Delaware General Corporation Law provides that Section 145 is not exclusive of other rights to which those seeking indemnification may be entitled under any bylaw, agreement, vote of stockholders or disinterested directors or otherwise. The registrant's Bylaws provides for indemnification by the registrant of its directors, officers and employees to the fullest extent permitted by the Delaware General Corporation Law. The registrant has entered into indemnification agreements with each of its current directors and executive officers to provide these directors and executive officers additional contractual assurances regarding the scope of the indemnification set forth in the registrant's amended and restated certificate of incorporation and amended and restated bylaws and to provide additional procedural protections. There is no pending litigation or proceeding involving a director or executive officer of the registrant for which indemnification is sought.

Section 102(b)(7) of the Delaware General Corporation Law permits a corporation to provide in its certificate of incorporation that a director of the corporation shall not be personally liable to the corporation or its stockholders for monetary damages for breach of fiduciary duty as a director, except for liability (i) for any breach of the director's duty of loyalty to the corporation or its stockholders, (ii) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (iii) for unlawful payments of dividends or unlawful stock repurchases, redemptions or other distributions, or (iv) for any transaction from which the director derived an improper personal benefit. The registrant's amended and restated certificate of incorporation provides for such limitation of liability.

The registrant maintains standard policies of insurance under which coverage is provided (a) to its directors and officers against loss rising from claims made by reason of breach of duty or other wrongful act, and (b) to the registrant with respect to payments which may be made by the registrant to such officers and directors pursuant to the above indemnification provision or otherwise as a matter of law.

The proposed form of underwriting agreement filed as Exhibit 1.1 to this registration statement provides for indemnification of directors and officers of the registrant by the underwriters against certain liabilities.

Item 15. Recent Sales of Unregistered Securities

Since January 1, 2015, the registrant has sold the following securities without registration under the Securities Act of 1933:

1. In January 2015, in a subsequent preferred stock financing, the registrant issued an aggregate of 13,790,374 shares of its Series A-1 preferred stock at $0.2538 per share, for an aggregate consideration of approximately $3.5 million. All shares of our Series A-1 convertible preferred stock will convert into shares of our common stock immediately prior to the closing of this offering in accordance with our certificate of incorporation.

2. In May 2015, the registrant issued an aggregate of 64,777,331 shares of its Series B preferred stock at $0.6175 per share for an aggregate consideration of approximately $40.0 million, pursuant to Section 4(a)(2) of the Securities Act as a transaction not involving a public offering. All shares of our Series B convertible preferred stock will convert into shares of our common stock immediately prior to the closing of this offering in accordance with our certificate of incorporation. In connection with the Series B preferred stock financing, the registrant issued non-compensatory warrants to purchase shares of common stock, totaling 1,729,699 shares of common stock in the aggregate, in consideration for the transfer of the intellectual property rights of DJT, LLC ("DJT") a dissolved entity formerly affiliated with our founders, including one of its directors, Todd Brinton, to the Company. The warrants have an exercise price of $0.18 per share.

3. In November 2016 and September 2017, the registrant issued an aggregate of 79,209,457 shares of its Series C preferred stock at $1.00998 per share, for an aggregate consideration of approximately $80.0 million. All shares of our Series C convertible preferred stock will convert into shares of our common stock immediately prior to the closing of this offering in accordance with our certificate of incorporation. In February 2018, the registrant issued a ten-year common stock warrant to purchase up to 420,174 shares of common stock with an exercise price of $0.33 per share.

5. In December 2018, the registrant issued an aggregate of 13,305,422 shares of its Series D preferred stock at $1.12736 per share, for an aggregate consideration of approximately $15.0 million. All shares of our Series D convertible preferred stock will convert into shares of our common stock immediately prior to the closing of this offering in accordance with our certificate of incorporation.

6. Since January 1, 2015, we have granted stock options to purchase an aggregate of 50,784,439 shares of our common stock at a weighted-average exercise price of $0.29 per share, to certain of our employees, consultants and directors in connection with services provided to us by such persons.

7. Since January 1, 2015, we have issued an aggregate of 4,255,201 shares of common stock to our employees, consultants and directors upon their exercise of stock options, for aggregate cash consideration of approximately $0.6 million.

The issuances of stock options and the shares of common stock issuable upon the exercise of the options described in paragraphs 6 and 7 above were issued pursuant to written compensatory plans or arrangements with our employees, directors and consultants, in reliance on the exemption provided by Rule 701 promulgated under the Securities Act, or pursuant to Section 4(a)(2) under the Securities Act, relative to transactions by an issuer not involving any public offering, to the extent an exemption from such registration was required.

All of the foregoing securities are deemed restricted securities for purposes of the Securities Act. All certificates representing the issued shares of capital stock described in this Item 15 included appropriate legends setting forth that the securities have not been registered and the applicable restrictions on transfer.

Item 16. Exhibits and Financial Statement Schedules

(a) The following exhibits are filed as part of this registration statement:

Exhibit Number	Description
1.1*	Form of Underwriting Agreement
3.1*	Amended and Restated Certificate of Incorporation, as currently in effect
3.2*	Form of Amended and Restated Certificate of Incorporation, to become effective immediately prior to the completion of this offering
3.3	Amended and Restated Bylaws, as currently in effect
3.4*	Form of Amended and Restated Bylaws, to become effective immediately prior to the completion of this offering
4.1*	Form of Common Stock Certificate
4.2*	Amended and Restated Investors' Rights Agreement, between the Registrant and the investors listed on Exhibit A thereto
4.3	Common Stock Warrant
4.4	Series A-1 Convertible Preferred Stock Warrant
5.1*	Opinion of Davis Polk & Wardwell LLP
10.1	Sublease Agreement by and between the Registrant and Benvenue Medical, Inc. for facilities at 5403 Betsy Ross Drive, Santa Clara, California, dated May 7, 2018
10.2*	Lease by and between the Registrant and Hines VAF No Cal Properties, L.P. for facilities at 48531 Warm Springs Boulevard, Fremont, California, dated August 10, 2012 and amended on August 30, 2013, October 3, 2014, July 29, 2015, September 30, 2016 and October 18, 2018
10.3†	2009 Equity Incentive Plan, and forms of Stock Option Agreement and Early Exercise Stock Option Agreement
10.4*†	2019 Equity Incentive Plan, and forms of Restricted Stock Agreement, Stock Option Agreement and Early Exercise Stock Option Agreement
10.5*†	Non-Employee Director Compensation Policy
10.6*†	Form of Indemnification Agreement by and between the Registrant and each of its directors and executive officers
10.7†	Offer Letter with Douglas Godshall
10.8†	Offer Letter with Dan Puckett
10.9†	Offer Letter with Isaac Zacharias
10.10	Loan and Security Agreement by and between the Registrant and Silicon Valley Bank, dated February 26, 2018
21.1	Subsidiaries of the Registrant
23.1*	Consent of Independent Registered Public Accounting Firm

Exhibit Number	Description
23.2*	Consent of Davis Polk & Wardwell LLP (included in Exhibit 5.1)
24.1*	Power of Attorney (included on signature pages of this registration statement)

* To be filed by amendment.

† Indicates management contract or compensatory plan

Item 17. Undertakings

The undersigned registrant hereby undertakes:

(a) The undersigned registrant hereby undertakes to provide to the underwriter at the closing specified in the underwriting agreement certificates in such denominations and registered in such names as required by the underwriter to permit prompt delivery to each purchaser.

(b) Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons of the registrant pursuant to the provisions referenced in Item 14 of this registration statement, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer, or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered hereunder, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question of whether such indemnification by it is against public policy as expressed in the Act and will be governed by the final adjudication of such issue.

(c) The undersigned registrant hereby undertakes that:

(1) For purposes of determining any liability under the Securities Act of 1933, the information omitted from the form of prospectus filed as part of this registration statement in reliance upon Rule 430A and contained in a form of prospectus filed by the registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act shall be deemed to be part of this registration statement as of the time it was declared effective.

(2) For the purpose of determining any liability under the Securities Act of 1933, each post-effective amendment that contains a form of prospectus shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Santa Clara, State of California, on the day of , 2019.

SHOCKWAVE MEDICAL, INC.

By: _____
Name: Douglas Godshall
Title: President, Chief Executive Officer & Director

POWER OF ATTORNEY AND SIGNATURES

KNOW ALL MEN BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Douglas Godshall and Dan Puckett, and each of them, his or her true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for him or her and in his or her name, place and stead, in any and all capacities, to sign any and all amendments (including post-effective amendments) to this registration statement and any and all additional registration statements pursuant to Rule 462(b) of the Securities Act of 1933, and to file the same, with all exhibits thereto, and all other documents in connection therewith, with the Securities and Exchange Commission, granting unto each said attorney-in-fact and agents full power and authority to do and perform each and every act in person, hereby ratifying and confirming all that said attorneys-in-fact and agents or either of them or their or his or her substitute or substitutes may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, this registration statement has been signed by the following persons in the capacities and on the dates indicated.

Signature	Title	Date
_____ Douglas Godshall	President, Chief Executive Officer & Director (principal executive officer)	, 2019
_____ Dan Puckett	Chief Financial Officer & Secretary (principal financial and accounting officer)	, 2019
_____ F.T. “Jay” Watkins	Director	, 2019
_____ Antoine Papiernik	Director	, 2019
_____ Colin Cahill	Director	, 2019
_____ Frederic Moll, M.D.	Director	, 2019
_____ Todd Brinton, M.D.	Director	, 2019
_____ Marc-Andre Marcotte	Director	, 2019

Exhibit 3.3

BYLAWS OF

SHOCKWAVE MEDICAL, INC.

Adopted June 17, 2009

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BYLAWS

ARTICLE I — MEETINGS OF STOCKHOLDERS

1.1 ***Place of Meetings***. Meetings of stockholders of ShockWave Medical, Inc. (the "**Company**") shall be held at any place, within or outside the State of Delaware, determined by the Company's board of directors (the **"Board").** The Board may, in its sole discretion, determine that a meeting of stockholders shall not be held at any place, but may instead be held solely by means of remote communication as authorized by Section 211(a)(2) of the Delaware General Corporation Law (the "**DGCL**"). In the absence of any such designation or determination, stockholders' meetings shall be held at the Company's principal executive office.

1.2 ***Annual Meeting***. An annual meeting of stockholders shall be held for the election of directors at such date and time as may be designated by resolution of the Board from time to time. Any other proper business may be transacted at the annual meeting. The Company shall not be required to hold an annual meeting of stockholders, *provided* that (i) the stockholders are permitted to act by written consent under the Company's certificate of incorporation and these bylaws, (ii) the stockholders take action by written consent to elect directors and (iii) the stockholders unanimously consent to such action or, if such consent is less than unanimous, all of the directorships to which directors could be elected at an annual meeting held at the effective time of such action are vacant and are filled by such action.

1.3 ***Special Meeting***. A special meeting of the stockholders may be called at any time by the Board, Chairperson of the Board, Chief Executive Officer or President (in the absence of a Chief Executive Officer) or by one or more stockholders holding shares in the aggregate entitled to cast not less than 10% of the votes at that meeting.

If any person(s) other than the Board calls a special meeting, the request shall:

(i) be in writing;

(ii) specify the time of such meeting and the general nature of the business proposed to be transacted; and

(iii) be delivered personally or sent by registered mail or by facsimile transmission to the Chairperson of the Board, the Chief Executive Officer, the President (in the absence of a Chief Executive Officer) or the Secretary of the Company.

The officer(s) receiving the request shall cause notice to be promptly given to the stockholders entitled to vote at such meeting, in accordance with these bylaws, that a meeting will be held at the time requested by the person or persons calling the meeting. No business may be transacted at such special meeting other than the business specified in such notice to stockholders. Nothing contained in this paragraph of this **section 1.3** shall be construed as limiting, fixing, or affecting the time when a meeting of stockholders called by action of the Board may be held.

1.4 ***Notice of Stockholders' Meetings***. Whenever stockholders are required or permitted to take any action at a meeting, a written notice of the meeting shall be given which shall state the place, if any, date and hour of the meeting, the means of remote communication, if any, by which stockholders and proxy

holders may be deemed to be present in person and vote at such meeting, and, in the case of a special meeting, the purpose or purposes for which the meeting is called. Except as otherwise provided in the DGCL, the certificate of incorporation or these bylaws, the written notice of any meeting of stockholders shall be given not less than 10 nor more than 60 days before the date of the meeting to each stockholder entitled to vote at such meeting.

1.5 ***Quorum***. Except as otherwise provided by law, the certificate of incorporation or these bylaws, at each meeting of stockholders the presence in person or by proxy of the holders of shares of stock having a majority of the votes which could be cast by the holders of all outstanding shares of stock entitled to vote at the meeting shall be necessary and sufficient to constitute a quorum. Where a separate vote by a class or series or classes or series is required, a majority of the outstanding shares of such class or series or classes or series, present in person or represented by proxy, shall constitute a quorum entitled to take action with respect to that vote on that matter, except as otherwise provided by law, the certificate of incorporation or these bylaws.

If, however, such quorum is not present or represented at any meeting of the stockholders, then either (i) the chairperson of the meeting, or (ii) the stockholders entitled to vote at the meeting, present in person or represented by proxy, shall have the power to adjourn the meeting from time to time, in the manner provided in **section 1.6,** until a quorum is present or represented.

1.6 ***Adjourned Meeting; Notice***. Any meeting of stockholders, annual or special, may adjourn from time to time to reconvene at the same or some other place, and notice need not be given of the adjourned meeting if the time, place, if any, thereof, and the means of remote communications, if any, by which stockholders and proxy holders may be deemed to be present in person and vote at such adjourned meeting are announced at the meeting at which the adjournment is taken. At the adjourned meeting, the Company may transact any business which might have been transacted at the original meeting. If the adjournment is for more than 30 days, or if after the adjournment a new record date is fixed for the adjourned meeting, a notice of the adjourned meeting shall be given to each stockholder of record entitled to vote at the meeting.

1.7 ***Conduct of Business***. Meetings of stockholders shall be presided over by the Chairperson of the Board, if any, or in his or her absence by the Vice Chairperson of the Board, if any, or in the absence of the foregoing persons by the Chief Executive Officer, or in the absence of the foregoing persons by the President, or in the absence of the foregoing persons by a Vice President, or in the absence of the foregoing persons by a chairperson designated by the Board, or in the absence of such designation by a chairperson chosen at the meeting. The Secretary shall act as secretary of the meeting, but in his or her absence the chairperson of the meeting may appoint any person to act as secretary of the meeting. The chairperson of any meeting of stockholders shall determine the order of business and the procedure at the meeting, including such regulation of the manner of voting and the conduct of business.

1.8 ***Voting***. The stockholders entitled to vote at any meeting of stockholders shall be determined in accordance with the provisions of **section 1.10** of these bylaws, subject to Section 217 (relating to voting rights of fiduciaries, pledgors and joint owners of stock) and Section 218 (relating to voting trusts and other voting agreements) of the DGCL.

Except as may be otherwise provided in the certificate of incorporation, each stockholder entitled to vote at any meeting of stockholders shall be entitled to one vote for each share of capital stock held by such stockholder which has voting power upon the matter in question. Voting at meetings of stockholders need not be by written ballot and, unless otherwise required by law, need not be conducted by inspectors of election unless so determined by the holders of shares of stock having a majority of the votes which could be cast by

the holders of all outstanding shares of stock entitled to vote thereon which are present in person or by proxy at such meeting. If authorized by the Board, such requirement of a written ballot shall be satisfied by a ballot submitted by electronic transmission (as defined in **section 7.2** of these bylaws), *provided* that any such electronic transmission must either set forth or be submitted with information from which it can be determined that the electronic transmission was authorized by the stockholder or proxy holder.

Except as otherwise required by law, the certificate of incorporation or these bylaws, in all matters other than the election of directors, the affirmative vote of a majority of the voting power of the shares present in person or represented by proxy at the meeting and entitled to vote on the subject matter shall be the act of the stockholders. Except as otherwise required by law, the certificate of incorporation or these bylaws, directors shall be elected by a plurality of the voting power of the shares present in person or represented by proxy at the meeting and entitled to vote on the election of directors. Where a separate vote by a class or series or classes or series is required, in all matters other than the election of directors, the affirmative vote of the majority of shares of such class or series or classes or series present in person or represented by proxy at the meeting shall be the act of such class or series or classes or series, except as otherwise provided by law, the certificate of incorporation or these bylaws.

1.9 ***Stockholder Action by Written Consent Without a Meeting***. Unless otherwise provided in the certificate of incorporation, any action required by the DGCL to be taken at any annual or special meeting of stockholders of a corporation, or any action which may be taken at any annual or special meeting of such stockholders, may be taken without a meeting, without prior notice, and without a vote, if a consent or consents in writing, setting forth the action so taken, shall be signed by the holders of outstanding stock having not less than the minimum number of votes that would be necessary to authorize or take such action at a meeting at which all shares entitled to vote thereon were present and voted.

An electronic transmission (as defined in **section 7.2**) consenting to an action to be taken and transmitted by a stockholder or proxy holder, or by a person or persons authorized to act for a stockholder or proxy holder, shall be deemed to be written, signed and dated for purposes of this section, provided that any such electronic transmission sets forth or is delivered with information from which the Company can determine (i) that the electronic transmission was transmitted by the stockholder or proxy holder or by a person or persons authorized to act for the stockholder or proxy holder and (ii) the date on which such stockholder or proxy holder or authorized person or persons transmitted such electronic transmission.

In the event that the Board shall have instructed the officers of the Company to solicit the vote or written consent of the stockholders of the Company, an electronic transmission of a stockholder written consent given pursuant to such solicitation may be delivered to the Secretary or the President of the Company or to a person designated by the Secretary or the President. The Secretary or the President of the Company or a designee of the Secretary or the President shall cause any such written consent by electronic transmission to be reproduced in paper form and inserted into the corporate records.

Prompt notice of the taking of the corporate action without a meeting by less than unanimous written consent shall be given to those stockholders who have not consented in writing and who, if the action had been taken at a meeting, would have been entitled to notice of the meeting if the record date for such meeting had been the date that written consents signed by a sufficient number of holders to take the action were delivered to the Company as provided in Section 228 of the DGCL. In the event that the action which is consented to is such as would have required the filing of a certificate under any provision of the DGCL, if such action had been voted on by stockholders at a meeting thereof, the certificate filed under such provision shall state, in lieu of any statement required by such provision concerning any vote of stockholders, that written consent has been given in accordance with Section 228 of the DGCL.

1.10 ***Record Date for Stockholder Notice; Voting; Giving Consents****. In* order that the Company may determine the stockholders entitled to notice of or to vote at any meeting of stockholders or any adjournment thereof, or entitled to express consent to corporate action in writing without a meeting, or entitled to receive payment of any dividend or other distribution or allotment of any rights, or entitled to exercise any rights in respect of any change, conversion or exchange of stock or for the purpose of any other lawful action, the Board may fix a record date, which record date shall not precede the date upon which the resolution fixing the record date is adopted by the Board and which record date:

(i) in the case of determination of stockholders entitled to notice of or to vote at any meeting of stockholders or adjournment thereof, shall, unless otherwise required by law, not be more than sixty nor less than ten days before the date of such meeting;

(ii) in the case of determination of stockholders entitled to express consent to corporate action in writing without a meeting, shall not be more than ten days after the date upon which the resolution fixing the record date is adopted by the Board; and

(iii) in the case of determination of stockholders for any other action, shall not be more than 60 days prior to such other action.

If no record date is fixed by the Board:

(i) the record date for determining stockholders entitled to notice of or to vote at a meeting of stockholders shall be at the close of business on the day next preceding the day on which notice is given, or, if notice is waived, at the close of business on the day next preceding the day on which the meeting is held;

(ii) the record date for determining stockholders entitled to express consent to corporate action in writing without a meeting when no prior action of the Board is required by law, shall be the first date on which a signed written consent setting forth the action taken or proposed to be taken is delivered to the Company in accordance with applicable law, or, if prior action by the Board is required by law, shall be at the close of business on the day on which the Board adopts the resolution taking such prior action; and

(iii) the record date for determining stockholders for any other purpose shall be at the close of business on the day on which the Board adopts the resolution relating thereto.

A determination of stockholders of record entitled to notice of or to vote at a meeting of stockholders shall apply to any adjournment of the meeting, *provided* that the Board may fix a new record date for the adjourned meeting.

1.11 ***Proxies****.* Each stockholder entitled to vote at a meeting of stockholders or to express consent or dissent to corporate action in writing without a meeting may authorize another person or persons to act for such stockholder by proxy authorized by an instrument in writing or by a transmission permitted by law filed in accordance with the procedure established for the meeting, but no such proxy shall be voted or acted upon after three years from its date, unless the proxy provides for a longer period. The revocability of a proxy that states on its face that it is irrevocable shall be governed by the provisions of Section 212 of the DGCL.

1.12 ***List of Stockholders Entitled to Vote.*** The officer who has charge of the stock ledger of the Company shall prepare and make, at least ten days before every meeting of stockholders, a complete list of the stockholders entitled to vote at the meeting, arranged in alphabetical order, and showing the address of

each stockholder and the number of shares registered in the name of each stockholder. The Company shall not be required to include electronic mail addresses or other electronic contact information on such list. Such list shall be open to the examination of any stockholder, for any purpose germane to the meeting for a period of at least ten days prior to the meeting: (i) on a reasonably accessible electronic network, *provided* that the information required to gain access to such list is provided with the notice of the meeting, or (ii) during ordinary business hours, at the Company's principal place of business. In the event that the Company determines to make the list available on an electronic network, the Company may take reasonable steps to ensure that such information is available only to stockholders of the Company. If the meeting is to be held at a place, then the list shall be produced and kept at the time and place of the meeting during the whole time thereof, and may be examined by any stockholder who is present. If the meeting is to be held solely by means of remote communication, then the list shall also be open to the examination of any stockholder during the whole time of the meeting on a reasonably accessible electronic network, and the information required to access such list shall be provided with the notice of the meeting.

ARTICLE H — DIRECTORS

2.1 ***Powers***. The business and affairs of the Company shall be managed by or under the direction of the Board, except as may be otherwise provided in the DGCL or the certificate of incorporation.

2.2 ***Number of Directors***. The Board shall consist of one or more members, each of whom shall be a natural person. Unless the certificate of incorporation fixes the number of directors, the number of directors shall be determined from time to time by resolution of the Board. No reduction of the authorized number of directors shall have the effect of removing any director before that director's term of office expires.

2.3 ***Election, Qualification and Term of Office of Directors***. Except as provided in **section 2.4** of these bylaws, and subject to sections **1.2** and **1.9** of these bylaws, directors shall be elected at each annual meeting of stockholders. Directors need not be stockholders unless so required by the certificate of incorporation or these bylaws. The certificate of incorporation or these bylaws may prescribe other qualifications for directors. Each director shall hold office until such director's successor is elected and qualified or until such director's earlier death, resignation or removal.

2.4 ***Resignation and Vacancies***. Any director may resign at any time upon notice given in writing or by electronic transmission to the Company. A resignation is effective when the resignation is delivered unless the resignation specifies a later effective date or an effective date determined upon the happening of an event or events. A resignation which is conditioned upon the director failing to receive a specified vote for reelection as a director may provide that it is irrevocable. Unless otherwise provided in the certificate of incorporation or these bylaws, when one or more directors resign from the Board, effective at a future date, a majority of the directors then in office, including those who have so resigned, shall have power to fill such vacancy or vacancies, the vote thereon to take effect when such resignation or resignations shall become effective.

Unless otherwise provided in the certificate of incorporation or these bylaws:

(i) Vacancies and newly created directorships resulting from any increase' in the authorized number of directors elected by all of the stockholders having the right to vote as a single class may be filled by a majority of the directors then in office, although less than a quorum, or by a sole remaining director.

(ii) Whenever the holders of any class or classes of stock or series thereof are entitled to elect one or more directors by the provisions of the certificate of incorporation, vacancies and newly created directorships of such class or classes or series may be filled by a majority of the directors elected by such class or classes or series thereof then in office, or by a sole remaining director so elected.

If at any time, by reason of death or resignation or other cause, the Company should have no directors in office, then any officer or any stockholder or an executor, administrator, trustee or guardian of a stockholder, or other fiduciary entrusted with like responsibility for the person or estate of a stockholder, may call a special meeting of stockholders in accordance with the provisions of the certificate of incorporation or these bylaws, or may apply to the Court of Chancery for a decree summarily ordering an election as provided in Section 211 of the DGCL.

If, at the time of filling any vacancy or any newly created directorship, the directors then in office constitute less than a majority of the whole Board (as constituted immediately prior to any such increase), the Court of Chancery may, upon application of any stockholder or stockholders holding at least 10% of the voting stock at the time outstanding having the right to vote for such directors, summarily order an election to be held to fill any such vacancies or newly created directorships, or to replace the directors chosen by the directors then in office as aforesaid, which election shall be governed by the provisions of Section 211 of the DGCL as far as applicable.

A director elected to fill a vacancy shall be elected for the unexpired term of his or her predecessor in office and until such director's successor is elected and qualified, or until such director's earlier death, resignation or removal.

2.5 ***Place of Meetings; Meetings by Telephone***. The Board may hold meetings, both regular and special, either within or outside the State of Delaware.

Unless otherwise restricted by the certificate of incorporation or these bylaws, members of the Board, or any committee designated by the Board, may participate in a meeting of the Board, or any committee, by means of conference telephone or other communications equipment by means of which all persons participating in the meeting can hear each other, and such participation in a meeting shall constitute presence in person at the meeting.

2.6 ***Conduct of Business***. Meetings of the Board shall be presided over by the Chairperson of the Board, if any, or in his or her absence by the Vice Chairperson of the Board, if any, or in the absence of the foregoing persons by a chairperson designated by the Board, or in the absence of such designation by a chairperson chosen at the meeting. The Secretary shall act as secretary of the meeting, but in his or her absence the chairperson of the meeting may appoint any person to act as secretary of the meeting.

2.7 ***Regular Meetings***. Regular meetings of the Board may be held without notice at such time and at such place as shall from time to time be determined by the Board.

2.8 ***Special Meetings; Notice***. Special meetings of the Board for any purpose or purposes may be called at any time by the Chairperson of the Board, the Chief Executive Officer, the President, the Secretary or any two directors.

Notice of the time and place of special meetings shall be:

(i) delivered personally by hand, by courier or by telephone;

(ii) sent by United States first-class mail, postage prepaid;

(iii) sent by facsimile; or

(iv) sent by electronic mail,

directed to each director at that director's address, telephone number, facsimile number or electronic mail address, as the case may be, as shown on the Company's records.

If the notice is (i) delivered personally by hand, by courier or by telephone, (ii) sent by facsimile or (iii) sent by electronic mail, it shall be delivered or sent at least 24 hours before the time of the holding of the meeting. If the notice is sent by United States mail, it shall be deposited in the United States mail at least four days before the time of the holding of the meeting. Any oral notice may be communicated to the director. The notice need not specify the place of the meeting (if the meeting is to be held at the Company's principal executive office) nor the purpose of the meeting.

2.9 ***Quorum; Voting***. At all meetings of the Board, a majority of the total authorized number of directors shall constitute a quorum for the transaction of business. If a quorum is not present at any meeting of the Board, then the directors present thereat may adjourn the meeting from time to time, without notice other than announcement at the meeting, until a quorum is present. A meeting at which a quorum is initially, present may continue to transact business notwithstanding the withdrawal of directors, if any action taken is approved by at least a majority of the required quorum for that meeting.

The vote of a majority of the directors present at any meeting at which a quorum is present shall be the act of the Board, except as may be otherwise specifically provided by statute, the certificate of incorporation or these bylaws.

If the certificate of incorporation provides that one or more directors shall have more or less than one vote per director on any matter, every reference in these bylaws to a majority or other proportion of the directors shall refer to a majority or other proportion of the votes of the directors.

2.10 ***Board Action by Written Consent Without a Meeting***. Unless otherwise restricted by the certificate of incorporation or these bylaws, any action required or permitted to be taken at any meeting of the Board, or of any committee thereof, may be taken without a meeting if all members of the Board or committee, as the case may be, consent thereto in writing or by electronic transmission and the writing or writings or electronic transmission or transmissions are filed with the minutes of proceedings of the Board or committee. Such filing shall be in paper form if the minutes are maintained in paper form and shall be in electronic form if the minutes are maintained in electronic form.

2.11 ***Fees and Compensation of Directors***. Unless otherwise restricted by the certificate of incorporation or these bylaws, the Board shall have the authority to fix the compensation of directors.

2.12 ***Removal of Directors***. Unless otherwise restricted by statute, the certificate of incorporation or these bylaws, any director or the entire Board may be removed, with or without cause, by the holders of a majority of the shares then entitled to vote at an election of directors.

No reduction of the authorized number of directors shall have the effect of removing any director prior to the expiration of such director's term of office.

ARTICLE III — COMMITTEES

3.1 ***Committees of Directors***. The Board may designate one or more committees, each committee to consist of one or more of the directors of the Company. The Board may designate one or more directors as alternate members of any committee, who may replace any absent or disqualified member at any meeting of the committee. In the absence or disqualification of a member of a committee, the member or members thereof present at any meeting and not disqualified from voting, whether or not such member or members constitute a quorum, may unanimously appoint another member of the Board to act at the meeting in the place of any such absent or disqualified member. Any such committee, to the extent provided in the resolution of the Board or in these bylaws, shall have and may exercise all the powers and authority of the Board in the management of the business and affairs of the Company, and may authorize the seal of the Company to be affixed to all papers that may require it; but no such committee shall have the power or authority to (i) approve or adopt, or recommend to the stockholders, any action or matter (other than the election or removal of directors) expressly required by the DGCL to be submitted to stockholders for approval, or (ii) adopt, amend or repeal any bylaw of the Company.

3.2 ***Committee Minutes***. Each committee shall keep regular minutes of its meetings and report the same to the Board when required.

3.3 ***Meetings and Actions of Committees***. Meetings and actions of committees shall be governed by, and held and taken in accordance with, the provisions of:

(i) **section 2.5** (Place of Meetings; Meetings by Telephone);

(ii) **section 2.7** (Regular Meetings);

(iii) **section 2.8** (Special Meetings; Notice);

(iv) **section 2.9** (Quorum; Voting);

(v) **section 2.10** (Board Action by Written Consent Without a Meeting); and

(vi) **section 7.5** (Waiver of Notice)

with such changes in the context of those bylaws as are necessary to substitute the committee and its members for the Board and its members. *However:*

(i) the time of regular meetings of committees may be determined either by resolution of the Board or by resolution of the committee;

(ii) special meetings of committees may also be called by resolution of the Board; and

(iii) notice of special meetings of committees shall also be given to all alternate members, who shall have the right to attend all meetings of the committee. The Board may adopt rules for the government of any committee not inconsistent with the provisions of these bylaws.

Any provision in the certificate of incorporation providing that one or more directors shall have more or less than one vote per director on any matter shall apply to voting in any committee or subcommittee, unless otherwise provided in the certificate of incorporation or these bylaws.

3.4 ***Subcommittees***. Unless otherwise provided in the certificate of incorporation, these bylaws or the resolutions of the Board designating the committee, a committee may create one or more subcommittees, each subcommittee to consist of one or more members of the committee, and delegate to a subcommittee any or all of the powers and authority of the committee.

ARTICLE IV — OFFICERS

4.1 ***Officers***. The officers of the Company shall be a President and a Secretary. The Company may also have, at the discretion of the Board, a Chairperson of the Board, a Vice Chairperson of the Board, a Chief Executive Officer, one or more Vice Presidents, a Chief Financial Officer, a Treasurer, one or more Assistant Treasurers, one or more Assistant Secretaries, and any such other officers as may be appointed in accordance with the provisions of these bylaws. Any number of offices may be held by the same person.

4.2 ***Appointment of Officers***. The Board shall appoint the officers of the Company, except such officers as may be appointed in accordance with the provisions of **section 4.3** of these bylaws.

4.3 ***Subordinate Officers***. The Board may appoint, or empower the Chief Executive Officer or, in the absence of a Chief Executive Officer, the President, to appoint, such other officers and agents as the business of the Company may require. Each of such officers and agents shall hold office for such period, have such authority, and perform such duties as are provided in these bylaws or as the Board may from time to time determine.

4.4 ***Removal and Resignation of Officers***. Any officer may be removed, either with or without cause, by an affirmative vote of the majority of the Board at any regular or special meeting of the Board or, except in the case of an officer chosen by the Board, by any officer upon whom such power of removal may be conferred by the Board.

Any officer may resign at any time by giving written notice to the Company. Any resignation shall take effect at the date of the receipt of that notice or at any later time specified in that notice. Unless otherwise specified in the notice of resignation, the acceptance of the resignation shall not be necessary to make it effective. Any resignation is without prejudice to the rights, if any, of the Company under any contract to which the officer is a party.

4.5 ***Vacancies in Offices***. Any vacancy occurring in any office of the Company shall be filled by the Board or as provided in **section 4.3.**

4.6 ***Representation of Shares of Other Corporations***. Unless otherwise directed by the Board, the President or any other person authorized by the Board or the President is authorized to vote, represent and exercise on behalf of the Company all rights incident to any and all shares of any other corporation or corporations standing in the name of the Company. The authority granted herein may be exercised either by such person directly or by any other person authorized to do so by proxy or power of attorney duly executed by such person having the authority.

4.7 ***Authority and Duties of Officers***. Except as otherwise provided in these bylaws, the officers of the Company shall have such powers and duties in the management of the Company as may be designated from time to time by the Board and, to the extent not so provided, as generally pertain to their respective offices, subject to the control of the Board.

ARTICLE V — INDEMNIFICATION

5.1 ***Indemnification of Directors and Officers in Third Party Proceedings***. Subject to the other provisions of this **Article V,** the Company shall indemnify, to the fullest extent permitted by the DGCL, as now or hereinafter in effect, any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (a **"Proceeding")** (other than an action by or in the right of the Company) by reason of the fact that such person is or was a director or officer of the Company, or is or was a director or officer of the Company serving at the request of the Company as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by such person in connection with such Proceeding if such person acted in good faith and in a manner such person reasonably believed to be in or not opposed to the best interests of the Company, and, with respect to any criminal action or proceeding, had no reasonable cause to believe such person's conduct was unlawful. The termination of any Proceeding by judgment, order, settlement, conviction, or upon a plea of *nolo contendere* or its equivalent, shall not, of itself, create a presumption that the person did not act in good faith and in a manner which such person reasonably believed to be in or not opposed to the best interests of the Company, and, with respect to any criminal action or proceeding, had reasonable cause to believe that such person's conduct was unlawful.

5.2 ***Indemnification of Directors and Officers in Actions by or in the Right of the Company***. Subject to the other provisions of this **Article V,** the Company shall indemnify, to the fullest extent permitted by the DGCL, as now or hereinafter in effect, any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action or suit by or in the right of the Company to procure a judgment in its favor by reason of the fact that such person is or was a director or officer of the Company, or is or was a director or officer of the Company serving at the request of the Company as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise against expenses (including attorneys' fees) actually and reasonably incurred by such person in connection with the defense or settlement of such action or suit if such person acted in good faith and in a manner such person reasonably believed to be in or not opposed to the best interests of the Company; except that no indemnification shall be made in respect of any claim, issue or matter as to which such person shall have been adjudged to be liable to the Company unless and only to the extent that the Court of Chancery or the court in which such action or suit was brought shall determine upon application that, despite the adjudication of liability but in view of all the circumstances of the case, such person is fairly and reasonably entitled to indemnity for such expenses which the Court of Chancery or such other court shall deem proper.

5.3 ***Successful Defense***. To the extent that a present or former director or officer of the Company has been successful on the merits or otherwise in defense of any action, suit or proceeding described in **section 5.1** or **section 5.2,** or in defense of any claim, issue or matter therein, such person shall be indemnified against expenses (including attorneys' fees) actually and reasonably incurred by such person in connection therewith.

5.4 ***Indemnification of Others***. Subject to the other provisions of this **Article V,** the Company shall have power to indemnify its employees and agents to the extent not prohibited by the DGCL or other applicable law. The Board shall have the power to delegate to such person or persons the determination of whether employees or agents shall be indemnified.

5.5 ***Advanced Payment of Expenses***. Expenses (including attorneys' fees) incurred by an officer or director of the Company in defending any Proceeding shall be paid by the Company in advance of the final disposition of such Proceeding upon receipt of a written request therefor (together with documentation reasonably evidencing such expenses) and an undertaking by or on behalf of the person to repay such amounts if it shall ultimately be determined that the person is not entitled to be indemnified under this **Article V** or the DGCL. Such expenses (including attorneys' fees) incurred by former directors and officers or other employees and agents may be so paid upon such terms and conditions, if any, as the Company deems appropriate. The right to advancement of expenses shall not apply to any Proceeding for which indemnity is excluded pursuant to these bylaws, but shall apply to any Proceeding referenced in **section 5.6(ii)** or **5.6(iii)** prior to a determination that the person is not entitled to be indemnified by the Company.

5.6 ***Limitation on Indemnification***. Subject to the requirements in **section 5.3** and the DGCL, the Company shall not be obligated to indemnify any person pursuant to this **Article V** in connection with any Proceeding (or any part of any Proceeding):

(i) for which payment has actually been made to or on behalf of such person under any statute, insurance policy, indemnity provision, vote or otherwise, except with respect to any excess beyond the amount paid;

(ii) for an accounting or disgorgement of profits pursuant to Section 16(b) of the Securities Exchange Act of 1934, as amended, or similar provisions of federal, state or local statutory law or common law, if such person is held liable therefor (including pursuant to any settlement arrangements);

(iii) for any reimbursement of the Company by such person of any bonus or other incentive-based or equity-based compensation or of any profits realized by such person from the sale of securities of the Company, as required in each case under the Securities Exchange Act of 1934, as amended (including any such reimbursements that arise from an accounting restatement of the Company pursuant to Section 304 of the Sarbanes-Oxley Act of 2002 (the **"Sarbanes-Oxley Act"),** or the payment to the Company of profits arising from the purchase and sale by such person of securities in violation of Section 306 of the Sarbanes-Oxley Act), if such person is held liable therefor (including pursuant to any settlement arrangements);

(iv) initiated by such person, including any Proceeding (or any part of any Proceeding) initiated by such person against the Company or its directors, officers, employees, agents or other indemnitees, unless (a) the Board authorized the Proceeding (or the relevant part of the Proceeding) prior to its initiation, (b) the Company provides the indemnification, in its sole discretion, pursuant to the powers vested in the Company under applicable law, (c) otherwise required to be made under **section 5.7** or (d) otherwise required by applicable law; or

(v) if prohibited by applicable law.

5.7 ***Determination; Claim***. If a claim for indemnification or advancement of expenses under this **Article V** is not paid by the Company or on its behalf within 90 days after receipt by the Company of a written request therefor, the claimant shall be entitled to an adjudication by a court of competent jurisdiction of his or her entitlement to such indemnification or advancement of expenses. To the extent not prohibited by law, the Company shall indemnify such person against all expenses actually and reasonably incurred by such person in connection with any action for indemnification or advancement of expenses from the Company under this **Article V,** to the extent such person is successful in such action. In any such suit, the Company shall, to the fullest extent not prohibited by law, have the burden of proving that the claimant is not entitled to the requested indemnification or advancement of expenses.

5.8 ***Non-Exclusivity of Rights***. The indemnification and advancement of expenses provided by, or granted pursuant to, this **Article V** shall not be deemed exclusive of any other rights to which those seeking indemnification or advancement of expenses may be entitled under the certificate of incorporation or any statute, bylaw, agreement, vote of stockholders or disinterested directors or otherwise, both as to action in such person's official capacity and as to action in another capacity while holding such office. The Company is specifically authorized to enter into individual contracts with any or all of its directors, officers, employees or agents respecting indemnification and advancement of expenses, to the fullest extent not prohibited by the DGCL or other applicable law.

5.9 ***Insurance***. The Company may purchase and maintain insurance on behalf of any person who is or was a director, officer, employee or agent of the Company, or is or was serving at the request of the Company as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise against any liability asserted against such person and incurred by such person in any such capacity, or arising out of such person's status as such, whether or not the Company would have the power to indemnify such person against such liability under the provisions of the DGCL.

5.10 ***Survival***. The rights to indemnification and advancement of expenses conferred by this **Article V** shall continue as to a person who has ceased to be a director, officer, employee or agent and shall inure to the benefit of the heirs, executors and administrators of such a person.

5.11 ***Effect of Repeal or Modification***. Any amendment, alteration or repeal of this **Article V** shall not adversely affect any right or protection hereunder of any person in respect of any act or omission occurring prior to such amendment, alteration or repeal.

5.12 ***Certain Definitions***. For purposes of this **Article V,** references to the **"Company"** shall include, in addition to the resulting corporation, any constituent corporation (including any constituent of a constituent) absorbed in a consolidation or merger which, if its separate existence had continued, would have had power and authority to indemnify its directors, officers, employees or agents, so that any person who is or was a director, officer, employee or agent of such constituent corporation, or is or was serving at the request of such constituent corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, shall stand in the same position under the provisions of this **Article V** with respect to the resulting or surviving corporation as such person would have with respect to such constituent corporation if its separate existence had continued. For purposes of this **Article V,** references to **"other enterprises"** shall include employee benefit plans; references to **"fines"** shall include any excise taxes assessed on a person with respect to an employee benefit plan; and references to **"serving at the request of the Company"** shall include any service as a director, officer, employee or agent of the Company which imposes duties on, or involves services by, such director, officer, employee or agent with respect to an employee benefit plan, its participants or beneficiaries; and a person who acted in good faith and in a manner such person reasonably believed to be in the interest of the participants and beneficiaries of an employee benefit plan shall be deemed to have acted in a manner **"not opposed to the best interests of the Company"** as referred to in this **Article V.**

ARTICLE VI — STOCK

6.1 ***Stock Certificates; Partly Paid Shares***. The shares of the Company shall be represented by certificates, *provided* that the Board may provide by resolution or resolutions that some or all of any or all classes or series of its stock shall be uncertificated shares. Any such resolution shall not apply to shares represented by a certificate until such certificate is surrendered to the Company. Every holder of stock

represented by certificates shall be entitled to have a certificate signed by, or in the name of the Company by the Chairperson of the Board or Vice-Chairperson of the Board, or the President or a Vice-President, and by the Treasurer or an Assistant Treasurer, or the Secretary or an Assistant Secretary of the Company representing the number of shares registered in certificate form. Any or all of the signatures on the certificate may be a facsimile. In case any officer, transfer agent or registrar who has signed or whose facsimile signature has been placed upon a certificate has ceased to be such officer, transfer agent or registrar before such certificate is issued, it may be issued by the Company with the same effect as if such person were such officer, transfer agent or registrar at the date of issue. The Company shall not have power to issue a certificate in bearer form.

The Company may issue the whole or any part of its shares as partly paid and subject to call for the remainder of the consideration to be paid therefor. Upon the face or back of each stock certificate issued to represent any such partly paid shares, or upon the books and records of the Company in the case of uncertificated partly paid shares, the total amount of the consideration to be paid therefor and the amount paid thereon shall be stated. Upon the declaration of any dividend on fully paid shares, the Company shall declare a dividend upon partly paid shares of the same class, but only upon the basis of the percentage of the consideration actually paid thereon.

6.2 ***Special Designation on Certificates***. If the Company is authorized to issue more than one class of stock or more than one series of any class, then the powers, the designations, the preferences, and the relative, participating, optional or other special rights of each class of stock or series thereof and the qualifications, limitations or restrictions of such preferences and/or rights shall be set forth in full or summarized on the face or back of the certificate that the Company shall issue to represent such class or series of stock; *provided* that, except as otherwise provided in Section 202 of the DGCL, in lieu of the foregoing requirements there may be set forth on the face or back of the certificate that the Company shall issue to represent such class or series of stock, a statement that the Company will furnish without charge to each stockholder who so requests the powers, designations, preferences and relative, participating, optional or other special rights of each class of stock or series thereof and the qualifications, limitations or restrictions of such preferences and/or rights. Within a reasonable time after the issuance or transfer of uncertificated stock, the Company shall send to the registered owner thereof a written notice containing the information required to be set forth or stated on certificates pursuant to this section 6.2 or Sections 156, 202(a) or 218(a) of the DGCL or with respect to this section 6.2 a statement that the Company will furnish without charge to each stockholder who so requests the powers, designations, preferences and relative, participating, optional or other special rights of each class of stock or series thereof and the qualifications, limitations or restrictions of such preferences and/or rights. Except as otherwise expressly provided by law, the rights and obligations of the holders of uncertificated stock and the rights and obligations of the holders of certificates representing stock of the same class and series shall be identical.

6.3 ***Lost Certificates***. Except as provided in this section 6.3, no new certificates for shares shall be issued to replace a previously issued certificate unless the latter is surrendered to the Company and cancelled at the same time. The Company may issue a new certificate of stock or uncertificated shares in the place of any certificate theretofore issued by it, alleged to have been lost, stolen or destroyed, and the Company may require the owner of the lost, stolen or destroyed certificate, or such owner's legal representative, to give the Company a bond sufficient to indemnify it against any claim that may be made against it on account of the alleged loss, theft or destruction of any such certificate or the issuance of such new certificate or uncertificated shares.

6.4 ***Dividends***. The Board, subject to any restrictions contained in the certificate of incorporation or applicable law, may declare and pay dividends upon the shares of the Company's capital stock. Dividends may be paid in cash, in property, or in shares of the Company's capital stock, subject to the provisions of the certificate of incorporation.

The Board may set apart out of any of the funds of the Company available for dividends a reserve or reserves for any proper purpose and may abolish any such reserve.

6.5 ***Stock Transfer Agreements.*** The Company shall have power to enter into and perform any agreement with any number of stockholders of any one or more classes of stock of the Company to restrict the transfer of shares of stock of the Company of any one or more classes owned by such stockholders in any manner not prohibited by the DGCL.

6.6 ***Registered Stockholders***. The Company:

(i) shall be entitled to recognize the exclusive right of a person registered on its books as the owner of shares to receive dividends and to vote as such owner;

(ii) shall be entitled to hold liable for calls and assessments the person registered on its books as the owner of shares; and

(iii) shall not be bound to recognize any equitable or other claim to or interest in such share or shares on the part of another person, whether or not it shall have express or other notice thereof, except as otherwise provided by the laws of Delaware.

6.7 ***Transfers***. Transfers of record of shares of stock of the Company shall be made only upon its books by the holders thereof, in person or by an attorney duly authorized, and, if such stock is certificated, upon the surrender of a certificate or certificates for a like number of shares, properly endorsed or accompanied by proper evidence of succession, assignation or authority to transfer.

ARTICLE VII — MANNER OF GIVING NOTICE AND WAIVER

7.1 ***Notice of Stockholder Meetings***. Notice of any meeting of stockholders, if mailed, is given when deposited in the United States mail, postage prepaid, directed to the stockholder at such stockholder's address as it appears on the Company's records. An affidavit of the Secretary or an Assistant Secretary of the Company or of the transfer agent or other agent of the Company that the notice has been given shall, in the absence of fraud, be *prima facie* evidence of the facts stated therein.

7.2 ***Notice by Electronic Transmission***. *Without* limiting the manner by which notice otherwise may be given effectively to stockholders pursuant to the DGCL, the certificate of incorporation or these bylaws, any notice to stockholders given by the Company under any provision of the DGCL, the certificate of incorporation or these bylaws shall be effective if given by a form of electronic transmission consented to by the stockholder to whom the notice is given. Any such consent shall be revocable by the stockholder by written notice to the Company. Any such consent shall be deemed revoked if:

(i) the Company is unable to deliver by electronic transmission two consecutive notices given by the Company in accordance with such consent; and

(ii) such inability becomes known to the Secretary or an Assistant Secretary of the Company or to the transfer agent, or other person responsible for the giving of notice.

However, the inadvertent failure to treat such inability as a revocation shall not invalidate any meeting or other action.

Any notice given pursuant to the preceding paragraph shall be deemed given:

(i) if by facsimile telecommunication, when directed to a number at which the stockholder has consented to receive notice;

(ii) if by electronic mail, when directed to an electronic mail address at which the stockholder has consented to receive notice;

(iii) if by a posting on an electronic network together with separate notice to the stockholder of such specific posting, upon the later of (A) such posting and (B) the giving of such separate notice; and

(iv) if by any other form of electronic transmission, when directed to the stockholder.

An affidavit of the Secretary or an Assistant Secretary or of the transfer agent or other agent of the Company that the notice has been given by a form of electronic transmission shall, in the absence of fraud, be *prima facie* evidence of the facts stated therein.

An **"electronic transmission"** means any form of communication, not directly involving the physical transmission of paper, that creates a record that may be retained, retrieved, and reviewed by a recipient thereof, and that may be directly reproduced in paper form by such a recipient through an automated process.

Notice by a form of electronic transmission shall not apply to Sections 164, 296, 311, 312 or 324 of the DGCL.

7.3 ***Notice to Stockholders Sharing an Address***. Except as otherwise prohibited under the DGCL, without limiting the manner by which notice otherwise may be given effectively to stockholders, any notice to stockholders given by the Company under the provisions of the DGCL, the certificate of incorporation or these bylaws shall be effective if given by a single written notice to stockholders who share an address if consented to by the stockholders at that address to whom such notice is given. Any such consent shall be revocable by the stockholder by written notice to the Company. Any stockholder who fails to object in writing to the Company, within 60 days of having been given written notice by the Company of its intention to send the single notice, shall be deemed to have consented to receiving such single written notice.

7.4 ***Notice to Person with Whom Communication is Unlawful***. Whenever notice is required to be given, under the DGCL, the certificate of incorporation or these bylaws, to any person with whom communication is unlawful, the giving of such notice to such person shall not be required and there shall be no duty to apply to any governmental authority or agency for a license or permit to give such notice to such person. Any action or meeting which shall be taken or held without notice to any such person with whom communication is unlawful shall have the same force and effect as if such notice had been duly given. In the event that the action taken by the Company is such as to require the filing of a certificate under the DGCL, the certificate shall state, if such is the fact and if notice is required, that notice was given to all persons entitled to receive notice except such persons with whom communication is unlawful.

7.5 ***Waiver of Notice***. Whenever notice is required to be given under any provision of the DGCL, the certificate of incorporation or these bylaws, a written waiver, signed by the person entitled to notice, or a waiver by electronic transmission by the person entitled to notice, whether before or after the time of the event for which notice is to be given, shall be deemed equivalent to notice. Attendance of a person at a meeting shall constitute a waiver of notice of such meeting, except when the person attends a meeting for the express purpose of objecting at the beginning of the meeting, to the transaction of any business because the meeting is not lawfully called or convened. Neither the business to be transacted at, nor the purpose of, any regular or special meeting of the stockholders need be specified in any written waiver of notice or any waiver by electronic transmission unless so required by the certificate of incorporation or these bylaws.

ARTICLE VIII — GENERAL MATTERS

8.1 ***Fiscal Year***. The fiscal year of the Company shall be fixed by resolution of the Board and may be changed by the Board.

8.2 ***Seal***. The Company may adopt a corporate seal, which shall be in such form as may be approved from time to time by the Board. The Company may use the corporate seal by causing it or a facsimile thereof to be impressed or affixed or in any other manner reproduced.

8.3 ***Annual Report***. The Company shall cause an annual report to be sent to the stockholders of the Company to the extent required by applicable law. If and so long as there are fewer than 100 holders of record of the Company's shares, the requirement of sending an annual report to the stockholders of the Company is expressly waived (to the extent permitted under applicable law).

8.4 ***Construction; Definitions***. Unless the context requires otherwise, the general provisions, rules of construction, and definitions in the DGCL shall govern the construction of these bylaws. Without limiting the generality of this provision, the singular number includes the plural, the plural number includes the singular, and the term "person" includes both a corporation and a natural person.

ARTICLE IX — AMENDMENTS

These bylaws may be adopted, amended or repealed by the stockholders entitled to vote. However, the Company may, in its certificate of incorporation, confer the power to adopt, amend or repeal bylaws upon the directors. The fact that such power has been so conferred upon the directors shall not divest the stockholders of the power, nor limit their power to adopt, amend or repeal bylaws.

A bylaw amendment adopted by stockholders which specifies the votes that shall be necessary for the election of directors shall not be further amended or repealed by the Board.

CERTIFICATE OF ADOPTION OF BYLAWS
OF
SHOCKWAVE MEDICAL, INC.

The undersigned certifies that he or she is the duly elected, qualified and acting Secretary of ShockWave Medical, Inc., a Delaware corporation (the *"**Company**"*), and that the foregoing bylaws, comprising sixteen (16) pages, were adopted as the bylaws of the Company on June 17, 2009 by the sole incorporator of the Company.

The undersigned has executed this certificate as of June 17, 2009.

/s/ J. Casey McGlynn
J. Casey McGlynn, Secretary

THIS WARRANT AND THE SHARES ISSUABLE HEREUNDER HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "**ACT**"), OR THE SECURITIES LAWS OF ANY STATE AND, EXCEPT AS SET FORTH IN SECTIONS 5.3 AND 5.4 BELOW, MAY NOT BE OFFERED, SOLD, PLEDGED OR OTHERWISE TRANSFERRED UNLESS AND UNTIL REGISTERED UNDER SAID ACT AND LAWS OR IN FORM AND SUBSTANCE SATISFACTORY TO THE COMPANY, SUCH OFFER, SALE, PLEDGE OR OTHER TRANSFER IS EXEMPT FROM SUCH REGISTRATION.

WARRANT TO PURCHASE COMMON STOCK

Company:	SHOCKWAVE MEDICAL, INC., a Delaware corporation
Number of Shares of Common Stock:	420,174 which is equal to 0.15% of the total fully diluted shares of the Company as of the Issue Date
Warrant Price:	$0.33 per share which is equal to the fair market value of a share of Common Stock set forth in the most recent 409A Valuation Report completed prior to the Issue Date (the "**409A Valuation Report**")
Issue Date:	**February 26, 2018**
Expiration Date:	**February 26, 2028 See also Section 5.1(b).**
Credit Facility:	This Warrant to Purchase Common Stock (as the same may be amended, modified, supplemented or restated from time to time, the "**Warrant**") is issued in connection with that certain Loan and Security Agreement of even date herewith between Silicon Valley Bank and the Company (as the same may be amended, modified, supplemented or restated from time to time, the "**Loan Agreement**").

THIS WARRANT CERTIFIES THAT, for good and valuable consideration, SILICON VALLEY BANK (together with any successor or permitted assignee or transferee of this Warrant or of any shares issued upon exercise hereof, "**Holder**") is entitled to purchase up to the number of fully paid and non-assessable shares (the "**Shares**") of the above-stated common stock (the "**Common Stock**") of the above-named company (the "**Company**") at the above- stated Warrant Price, all as set forth above and as adjusted pursuant to Section 2 of this Warrant, subject to the provisions and upon the terms and conditions set forth in this Warrant. Reference is made to Section 5.4 of this Warrant whereby Silicon Valley Bank shall transfer this Warrant to its parent company, SVB Financial Group.

SECTION 1. EXERCISE.

1.1 Method of Exercise. Holder may at any time and from time to time exercise this Warrant, in whole or in part, by delivering to the Company the original of this Warrant together with a duly executed Notice of Exercise in substantially the form attached hereto as Appendix 1 and, unless Holder is exercising this Warrant pursuant to a cashless exercise as set forth in Section 1.2, a check, wire transfer of same-day funds (to an account designated by theCompany), or other form of payment acceptable to the Company for the aggregate Warrant Price for the Shares being purchased.

1.2 Cashless Exercise. On any exercise of this Warrant, in lieu of payment of the aggregate Warrant Price in the manner as specified in Section 1.1 above, but otherwise in accordance with the requirements of Section 1.1, Holder may elect to receive Shares equal to the value of this Warrant, or portion hereof as to which this Warrant is being exercised. Thereupon, the Company shall issue to Holder such number of fully paid and non-assessable Shares as are computed using the following formula:

$$X = Y(A-B)/A$$

where:

X = the number of Shares to be issued to Holder;

Y = the number of Shares with respect to which this Warrant is being exercised (inclusive of the Shares surrendered to the Company in payment of the aggregate Warrant Price);

A = the Fair Market Value (as determined pursuant to Section 1.3 below) of one Share; and

B = the Warrant Price.

1.3 Fair Market Value. If the Common Stock is then traded or quoted on a nationally recognized securities exchange, inter-dealer quotation system or over-the-counter market (a "**Trading Market**"), the fair market value of a Share shall be the closing price or last sale price of a share of Common Stock reported for the Business Day immediately before the date on which Holder delivers this Warrant together with its Notice of Exercise to the Company (or if this Warrant is exercised immediately prior to the effectiveness of the IPO (as defined below), the "price to public" per share price as specified in the final prospectus relating to such offering). If the Common Stock is not traded in a Trading Market, the Board of Directors of the Company shall determine the fair market value of a Share in its reasonable good faith judgment. If the Warrant is exercised in connection with the IPO (as defined below), the fair market value of a Share shall be the per share offering price to the public of the IPO.

1.4 Delivery of Certificate and New Warrant. Within a reasonable time after Holder exercises this Warrant in the manner set forth in Section 1.1 or 1.2 above, the Company shall deliver to Holder a certificate representing the Shares issued to Holder upon such exercise and, if this Warrant has not been fully exercised and has not expired, a new warrant of like tenor representing the Shares not so acquired.

1.5 Replacement of Warrant. On receipt of evidence reasonably satisfactory to the Company of the loss, theft, destruction or mutilation of this Warrant and, in the case of loss, theft or destruction, on delivery of an indemnity agreement reasonably satisfactory in form, substance and amount to the Company or, in the case of mutilation, on surrender of this Warrant to theCompany for cancellation, the Company shall, within a reasonable time, execute and deliver to Holder, in lieu of this Warrant, a new warrant of like tenor and amount.

1.6 Treatment of Warrant Upon Acquisition of Company.

(a) Acquisition. For the purpose of this Warrant, "**Acquisition**" means any transaction or series of related transactions involving: (i) the sale, lease, exclusive license, or other disposition of all or substantially all of the assets of the Company (ii) any merger or consolidation of the Company into or with another person or entity (other than a merger or consolidation effected exclusively to change the Company's domicile), or any other corporate reorganization, in which the stockholders of the Company in their capacity as such immediately prior to such merger, consolidation or reorganization, own less than a majority of the Company's (or the surviving or successor entity's) outstanding voting power immediately after such merger, consolidation or reorganization; or (iii) any sale or other transfer by the stockholders of the Company of shares representing at least a majority of the Company's then-total outstanding combined voting power (other than a sale of equity primarily for capital raising purposes).

(b) Treatment of Warrant at Acquisition. In the event of an Acquisition in which the consideration to be received by the Company's stockholders consists solely of cash, solely of Marketable Securities or a combination of cash and Marketable Securities (a "**Cash/Public Acquisition**"), and the fair market value of one Share as determined in accordance with Section 1.3 above would be greater than the Warrant Price in effect on such date immediately prior to such Cash/Public Acquisition, and Holder has not exercised this Warrant pursuant to Section 1.1 above as to all Shares, then this Warrant shall automatically be deemed to be Cashless Exercised pursuant to Section 1.2 above as to all Shares effective immediately prior to and contingent upon the consummation of a Cash/Public Acquisition. In connection with such Cashless Exercise, Holder shall be deemed to have restated each of the representations and warranties in Section 4 of this Warrant as the date thereof and the Company shall promptly notify Holder of the number of Shares (or such other securities) issued upon exercise. In the event of a Cash/Public Acquisition in which the fair market value of one Share as determined in accordance with Section 1.3 above would be less than the Warrant Price in effect immediately prior to such Cash/Public Acquisition, then this Warrant will expire immediately prior to the consummation of such Cash/Public Acquisition.

(c) Upon the closing of any Acquisition other than a Cash/Public Acquisition defined above, the acquiring, surviving or successor entity shall assume the obligations of this Warrant, and this Warrant shall thereafter be exercisable for the same securities and/or other property as would have been paid for the Shares issuable upon exercise of the unexercised portion of this Warrant as if such Shares were outstanding on and as of the closing of such Acquisition, subject to further adjustment from time to time in accordance with the provisions of this Warrant.

(d) As used in this Warrant, "**Marketable Securities**" means securities meeting all of the following requirements: (i) the issuer thereof is then subject to the reporting requirements of Section 13 or Section 15(d) of the Securities Exchange Act of 1934, as amended (the "**Exchange Act**"), and is then current in its filing of all required reports and other information under the Act and the Exchange Act; (ii) the class and series of shares or other security of the issuer that would be received by Holder in connection with the Acquisition were Holder to exercise this Warrant on

or prior to the closing thereof is then traded in Trading Market, and (iii) following the closing of such Acquisition, Holder would not be restricted from publicly re-selling all of the issuer's shares and/or other securities that would be received by Holder in such Acquisition were Holder to exercise or convert this Warrant in full on or prior to the closing of such Acquisition, except to the extent that any such restriction (x) arises solely under federal or state securities laws, rules or regulations, and (y) does not extend beyond six (6) months from the closing of such Acquisition.

SECTION 2. ADJUSTMENTS TO THE SHARES AND WARRANT PRICE.

2.1 Stock Dividends, Splits, Etc. If the Company declares or pays a dividend or distribution on the outstanding shares of the Common Stock payable in securities or property (other than cash), then upon exercise of this Warrant, for each Share acquired, Holder shall receive, without additional cost to Holder, the total number and kind of securities and property which Holder would have received had Holder owned the Shares of record as of the date the dividend or distribution occurred. If the Company subdivides the outstanding shares of the Common Stock by reclassification or otherwise into a greater number of shares, the number of Shares purchasable hereunder shall be proportionately increased and the Warrant Price shall be proportionately decreased. If the outstanding shares of the Common Stock are combined or consolidated, by reclassification or otherwise, into a lesser number of shares, the Warrant Price shall be proportionately increased and the number of Shares shall be proportionately decreased.

2.2 Reclassification, Exchange, Combinations or Substitution. Upon any event whereby all of the outstanding shares of the Common Stock are reclassified, exchanged, combined, substituted, or replaced for, into, with or by Company securities of a different class and/or series, then from and after the consummation of such event, this Warrant will be exercisable for the number, class and series of Company securities that Holder would have received had the Shares been outstanding on and as of the consummation of such event, and subject to further adjustment thereafter from time to time in accordance with the provisions of this Warrant. The provisions of this Section 2.2 shall similarly apply to successive reclassifications, exchanges, combinations substitutions, replacements or other similar events.

2.3 Intentionally Omitted.

2.4 Intentionally Omitted.

2.5 No Fractional Share. No fractional Share shall be issuable upon exercise of this Warrant and the number of Shares to be issued shall be rounded down to the nearest whole Share. If a fractional Share interest arises upon any exercise of this Warrant, the Company shall eliminate such fractional Share interest by paying Holder in cash the amount computed by multiplying the fractional interest by (i) the fair market value (as determined in accordance with Section 1.3 above) of a full Share, less (ii) the then-effective Warrant Price.

2.6 Notice/Certificate as to Adjustments. Upon each adjustment of the Warrant Price, Common Stock and/or number of Shares, the Company, at the Company's expense, shall notify Holder in writing within a reasonable time setting forth the adjustments to the Warrant Price,class and/or number of Shares and facts upon which such adjustment is based. The Company shall, upon written request from Holder, furnish Holder with a certificate of its Chief Financial Officer or other duly authorized officer, including computations of such adjustment and the Warrant Price, class and number of Shares in effect upon the date of such adjustment.

SECTION 3. REPRESENTATIONS AND COVENANTS OF THE COMPANY.

3.1 Representations and Warranties. The Company represents and warrants to, and agrees with, the Holder as follows:

(a) The initial Warrant Price referenced on the first page of this Warrant is not greater than the fair market value of a share of Company Common Stock as set forth in the 409A Valuation Report.

(b) All Shares which may be issued upon the exercise of this Warrant shall, upon issuance, be duly authorized, validly issued, fully paid and non-assessable, and free of any liens and encumbrances except for restrictions on transfer provided for herein or under applicable federal and state securities laws. The Company covenants that it shall at all times cause to be reserved and kept available out of its authorized and unissued capital stock such number of securities as will be sufficient to permit the exercise in full of this Warrant.

(c) The Company's summary capitalization table attached hereto as Schedule 1 is true and complete, in all material respects, as of the Issue Date.

3.2 Notice of Certain Events. If the Company proposes at any time to:

(a) declare any dividend or distribution upon the outstanding shares of the Company's stock, whether in cash, property, stock, or other securities and whether or not a regular cash dividend;

(b) offer for subscription or sale pro rata to the holders of the outstanding shares any additional shares of any class or series of the Company's stock (other than pursuant to contractual pre-emptive rights);

(c) effect any reclassification, exchange, combination, substitution, reorganization or recapitalization of the outstanding shares of the Common Stock;

(d) effect an Acquisition or to liquidate, dissolve or wind up; or

(e) effect an initial, underwritten offering and sale of its securities to the public pursuant to an effective registration statement under the Act (the "**IPO**");

then, in connection with each such event, the Company shall give Holder:

(1) in the case of the matters referred to in (a) and (b) above, at least seven (7) Business Days prior written notice of the earlier to occur of the effective date thereof or the date on which a record will be taken for such dividend, distribution, or subscription rights (and specifying the date on which the holders of outstanding shares of the Common Stock will be entitled thereto) or for determining rights to vote, if any;

(2) in the case of the matters referred to in (c) and (d) above at least seven (7) Business Days prior written notice of the date when the same will take place (and specifying the date on which the holders of outstanding shares of the Common Stock will be entitled to exchange their shares for the securities or other property deliverable upon the occurrence of such event and such reasonable information as Holder may reasonably require regarding the treatment of this Warrant in connection with such event giving rise to the notice); and

(3) with respect to the IPO, at least seven (7) Business Days prior written notice of the date on which the Company proposes to file its registration statement in connection therewith.

Company will also provide information requested by Holder that is reasonably necessary to enable Holder to comply with Holder's accounting or reporting requirements. Holder agrees that any information provided to Holder by the Company pursuant to this Warrant may be confidential and Holder agrees that with respect to any such confidential information received by Holder pursuant to this Warrant that Holder will be bound by the confidentiality provisions of Section 12.9 of the Loan Agreement, which provision is incorporated herein by this reference. For the avoidance of any doubt, Holder hereby acknowledges and agrees that no future termination of such Section 12.9 contained in the Loan Agreement (including the termination of the Loan Agreement itself) shall in any way affect the foregoing obligation contained in the previous sentence as such obligation exists as of the date hereof.

SECTION 4. REPRESENTATIONS, WARRANTIES OF THE HOLDER.

The Holder represents and warrants to the Company as follows:

4.1 Purchase for Own Account. This Warrant and the Shares to be acquired upon exercise of this Warrant by Holder are being acquired for investment for Holder's account, not as a nominee or agent, and not with a view to the public resale or distribution within the meaning of the Act. Holder also represents that it has not been formed for the specific purpose of acquiring this Warrant or the Shares.

4.2 Disclosure of Information. Holder is aware of the Company's business affairs and financial condition and has received or has had full access to all the information it considers necessary or appropriate to make an informed investment decision with respect to the acquisition of this Warrant and its underlying securities. Holder further has had an opportunity to ask questions and receive answers from the Company regarding the terms and conditions of the offering of this Warrant and its underlying securities and to obtain additional information (to the extent the Company possessed such information or could acquire it without unreasonable effort or expense) necessary to verify any information furnished to Holder or to which Holder has access.

4.3 No Public Market. Holder understands and acknowledges that no public market now exists for any of the securities issued by the Company and that the Company has made no assurances that a public market will ever exist for the Company's securities.

4.4 Investment Experience. Holder understands that the purchase of this Warrant and its underlying securities involves substantial risk. Holder has experience as an investor in securities of companies in the development stage and acknowledges that Holder can bear the economic risk of such Holder's investment in this Warrant and its underlying securities and has such knowledge and experience in financial or business matters that Holder is capable of evaluating the merits and risks of its investment in this Warrant and its underlying securities and/or has a preexisting personal or business relationship with the Company and certain of its officers, directors or controlling persons of a nature and duration that enables Holder to be aware of the character, business acumen and financial circumstances of such persons.

4.5 Accredited Investor Status. Holder is an "accredited investor" within the meaning of Regulation D promulgated under the Act.

4.6 The Act. Holder understands that this Warrant and the Shares issuable upon exercise hereof have not been registered under the Act in reliance upon a specific exemption therefrom, which exemption depends upon, among other things, the bona fide nature of the Holder's investment intent as expressed herein. Holder understands that this Warrant and the Shares issued upon any exercise hereof must be held indefinitely unless subsequently registered under the Act and qualified under applicable state securities laws, or unless exemption from such registration and qualification are otherwise available. Holder is aware of the provisions of Rule 144 promulgated under the Act.

4.7 Market Stand-off Agreement. The Holder agrees that the Shares shall be subject to the Market Standoff provisions in Section 2.10 of the Company's Amended and Restated Investor Rights Agreement dated as of November 10, 2016 by and among the Company and the persons and entities listed on the exhibits attached thereto, as may be amended, modified, supplemented or restated and in effect from time to time. The Holder agrees to execute a market stand-off agreement with the underwriters in connection with the IPO in customary form consistent with the provisions of this Section 4.7.

4.8 No Voting Rights. Holder, as a Holder of this Warrant, will not have any voting rights until the exercise of this Warrant.

4.9 Legal and Tax Advisors. Holder has had the opportunity to review this Warrant, the exhibits and schedules attached hereto and the transactions contemplated by this Warrant with its own legal counsel. Holder is not relying on any statements or representations of the Company or its agents for legal advice with respect to this investment or the transactions contemplated by this Warrant. Holder has also reviewed with its own tax advisors the U.S. federal, state and local and non-U.S. tax consequences of this investment and the transactions contemplated by this Warrant. With respect to such matters, Holder relies solely on any such advisors and not on any statements or representations of the Company or any of its agents written or oral. Holder understands that it (and not the Company) shall be responsible for its own tax liability that may arise as a result of this investment and the transactions contemplated by this Warrant.

4.10 No "Bad Actor" Disqualification. As of the Issue Date, neither (i) Holder, nor (ii) any beneficial owner of any of the Company's voting equity securities (in accordance with Rule 506(d) of the Act) held by Holder is subject to any of the "bad actor" disqualifications described in Rule 506(d)(1)(i) through (viii) under the Act, except as set forth in Rule 506(d)(2)(ii) or (d)(3) under the Act and disclosed, reasonably in advance of the acceptance of this Warrant, in writing in reasonable detail to the Company.

SECTION 5. MISCELLANEOUS.

5.1 Term and Automatic Conversion Upon Expiration.

(a) Term. Subject to the provisions of Section 1.6 above, this Warrant is exercisable in whole or in part at any time and from time to time on or before 6:00 PM, Pacific time, on the Expiration Date and shall be void thereafter.

(b) Automatic Cashless Exercise upon Expiration. In the event that, upon the Expiration Date, the fair market value of one Share (or other security issuable upon the exercise hereof) as determined in accordance with Section 1.3 above is greater than the Warrant Price in effect on such date, then this Warrant shall automatically be deemed on and as of such date to be exercised pursuant to Section 1.2 above as to all Shares (or such other securities) for which it shall not previously have been exercised, and the Company shall, within a reasonable time, deliver a certificate representing the Shares (or such other securities) issued upon such exercise to Holder.

5.2 Legends. The Shares (and the securities issuable, directly or indirectly, upon conversion of the Shares, if any) shall be imprinted with a legend in substantially the following form:

> THE SHARES EVIDENCED BY THIS CERTIFICATE HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "**ACT**"), OR THE SECURITIES LAWS OF ANY STATE AND, EXCEPT AS SET FORTH IN THAT CERTAIN WARRANT TO PURCHASE COMMON STOCK ISSUED BY THE ISSUER TO SILICON VALLEY BANK DATED FEBRUARY 26, 2018, MAY NOT BE OFFERED, SOLD, PLEDGED OR OTHERWISE TRANSFERRED UNLESS AND UNTIL REGISTERED UNDER SAID ACT AND LAWS OR IN FORM AND SUBSTANCE SATISFACTORY TO THE ISSUER, SUCH OFFER, SALE, PLEDGE OR OTHER TRANSFER IS EXEMPT FROM SUCH REGISTRATION. THE ISSUER OF THESE SECURITIES MAY REQUIRE AN OPINION OF COUNSEL IN FORM AND SUBSTANCE SATISFACTORY TO THE ISSUER THAT SUCH OFFER, SALE, PLEDGE OR OTHER TRANSFER COMPLIES WITH THE ACT AND ANY APPLICABLE STATE SECURITIES LAWS.

THE SHARES EVIDENCED BY THIS CERTIFICATE ARE SUBJECT TO RESTRICTIONS ON TRANSFERABILITY AND RESALE, INCLUDING A LOCK-UP PERIOD OF UP TO 180 DAYS IN THE EVENT OF A PUBLIC OFFERING, AS SET FORTH IN THE WARRANT PURSUANT TO WHICH THESE SHARES WERE ISSUED, A COPY OF WHICH MAY BE OBTAINED AT THE PRINCIPAL OFFICE OF THE COMPANY.

5.3 Compliance with Securities Laws on Transfer. This Warrant and the Shares issuable upon exercise of this Warrant (and the securities issuable, directly or indirectly, upon conversion of the Shares, if any) may not be transferred or assigned in whole or in part except in compliance with applicable federal and state securities laws by the transferor and the transferee (including, without limitation, the delivery of investment representation letters and legal opinions reasonably satisfactory to the Company, as reasonably requested by the Company). The Company shall not require Holder to provide an opinion of counsel if the transfer is to SVB Financial Group (Silicon Valley Bank's parent company) or any other affiliate of Holder, provided that any such transferee is an "accredited investor" as defined in Regulation D promulgated under the Act. Additionally, the Company shall also not require an opinion of counsel if there is no material question as to the availability of Rule 144 promulgated under the Act.

5.4 Transfer Procedure. After receipt by Silicon Valley Bank of the executed Warrant, Silicon Valley Bank will transfer all of this Warrant to its parent company, SVB Financial Group. By its acceptance of this Warrant, SVB Financial Group hereby makes to the Company each of the representations and warranties set forth in Section 4 hereof and agrees to be bound by all of the terms and conditions of this Warrant as if the original Holder hereof. Subject to the provisions of Section 5.3 and upon providing the Company with written notice, SVB Financial Group and any subsequent Holder may transfer all or part of this Warrant or the Shares issuable upon exercise of this Warrant (or the securities issuable directly or indirectly, upon conversion of the Shares, if any) to any transferee, provided, however, in connection with any such transfer, SVB Financial Group or any subsequent Holder will give the Company notice of the portion of the Warrant being transferred with the name, address and taxpayer identification number of the transferee and Holder will surrender this Warrant to the Company for reissuance to the transferee(s) (and Holder if applicable); and provided further, that any subsequent transferee other than SVB Financial Group shall agree in writing with the Company to be bound by all of the terms and conditions of this Warrant. Notwithstanding any contrary provision herein, at all times prior to the IPO, Holder may not, without the Company's prior written consent, transfer this Warrant or any portion hereof, or any Shares issued upon any exercise hereof, or any shares or other securities issued upon any conversion of any Shares issued upon any exercise hereof, to any person or entity who directly competes with the Company, except in connection with an Acquisition of the Company by such a direct competitor.

5.5 Notices. All notices and other communications hereunder from the Company to the Holder, or vice versa, shall be deemed delivered and effective (i) when given personally, (ii) on the third (3rd) Business Day after being mailed by first-class registered or certified mail, postage prepaid, (iii) upon actual receipt if given by facsimile or electronic mail and such receipt is confirmed in writing by the recipient, or (iv) on the first Business Day following delivery to a reliable overnight courier service, courier fee prepaid, in any case at such address as may have been furnished to the Company or Holder, as the case may be, in writing by the Company or such Holder from time to time in accordance with the provisions of this Section 5.5. All notices to Holder shall be addressed as follows until the Company receives notice of a change of address in connection with a transfer or otherwise:

SVB Financial Group
Attn: Treasury Department
3003 Tasman Drive, HC 215
Santa Clara, California 95054

Notice to the Company shall be addressed as follows until Holder receives notice of a change in address:

Shockwave Medical, Inc
Attn: Dan Puckett, CFO
48501 Warm Springs Blvd., Suite 108
Fremont, California 94539

5.6 Waiver. This Warrant and any term hereof may be changed, waived, discharged or terminated (either generally or in a particular instance and either retroactively or prospectively) only by an instrument in writing signed by the party against which enforcement of such change, waiver, discharge or termination is sought.

5.7 Attorneys' Fees. In the event of any dispute between the parties concerning the terms and provisions of this Warrant, the party prevailing in such dispute shall be entitled to collect from the other party all costs incurred in such dispute, including reasonable attorneys' fees.

5.8 Counterparts; Facsimile/Electronic Signatures. This Warrant may be executed in counterparts, all of which together shall constitute one and the same agreement. Company, Holder and any other party hereto may execute this Warrant by electronic means and each party hereto recognizes and accepts the use of electronic signatures and records by any other party hereto in connection with the execution and storage hereof. To the extent that this Warrant or any agreement subject to the terms hereof or any amendment hereto is executed, recorded or delivered electronically, it shall be binding to the same extent as though it had been executed on paper with an original ink signature. The fact that this Warrant is executed, signed, stored or delivered electronically shall not prevent the transfer by any Holder of this Warrant pursuant to Section 5.4 or the enforcement of the terms hereof.

5.9 Governing Law. This Warrant shall be governed by and construed in accordance with the laws of the State of California, without giving effect to its principles regarding conflicts of law.

5.10 Headings. The headings in this Warrant are for purposes of reference only and shall not limit or otherwise affect the meaning of any provision of this Warrant.

5.11 Business Days. "**Business Day**" is any day that is not a Saturday, Sunday or a day on which Silicon Valley Bank is closed.

[Remainder of page left blank intentionally]
[Signature page follows]

IN WITNESS WHEREOF, the parties have caused this Warrant to Purchase Common Stock to be executed by their duly authorized representatives effective as of the Issue Date written above.

"COMPANY"

SHOCKWAVE MEDICAL, INC.

By: /s/ Dan Puckett
Name: Dan Puckett
Title: CFO

"HOLDER"

SILICON VALLEY BANK

By: /s/ Michelle Lai
Name: Michelle Lai
Title: Vice President

APPENDIX 1

NOTICE OF EXERCISE

1. The undersigned Holder hereby exercises its right purchase shares of the Common Stock of SHOCKWAVE MEDICAL, INC., a Delaware corporation (the "**Company**") in accordance with the attached Warrant To Purchase Common Stock, and tenders payment of the aggregate Warrant Price for such shares as follows:

[ ] check in the amount of $ payable to order of the Company enclosed herewith

[ ] Wire transfer of immediately available funds to the Company's account

[ ] Cashless Exercise pursuant to Section 1.2 of the Warrant

[ ] Other [Describe]

2. Please issue a certificate or certificates representing the Shares in the name specified below:

Holder's Name

(Address)

3. By its execution below and for the benefit of the Company, Holder hereby restates each of the representations and warranties in Section 4 of the Warrant to Purchase Common Stock as of the date hereof.

HOLDER:

By:

Name:

Title:

(Date):

THIS WARRANT AND THE SHARES ISSUABLE HEREUNDER HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "**ACT**"), OR THE SECURITIES LAWS OF ANY STATE AND, EXCEPT AS SET FORTH IN SECTIONS 5.3 AND 5.4 BELOW, MAY NOT BE OFFERED, SOLD, PLEDGED OR OTHERWISE TRANSFERRED UNLESS AND UNTIL REGISTERED UNDER SAID ACT AND LAWS OR IN FORM AND SUBSTANCE SATISFACTORY TO THE COMPANY, SUCH OFFER, SALE, PLEDGE OR OTHER TRANSFER IS EXEMPT FROM SUCH REGISTRATION.

WARRANT TO PURCHASE STOCK

Company: SHOCKWAVE MEDICAL, INC., a Delaware corporation
Number of Shares: as set forth below
Type/Series of Stock: as set forth below
Warrant Price as set forth below
Issue Date: June 17, 2014

Expiration Date: June 17, 2024 See also Section 5.1(b).

Credit Facility: This Warrant to Purchase Stock ("**Warrant**") is issued in connection with that certain Loan and Security Agreement of even date herewith between Silicon Valley Bank and the Company (the "**Loan Agreement**").

THIS WARRANT CERTIFIES THAT, for good and valuable consideration, SILICON VALLEY BANK (together with any successor or permitted assignee or transferee of this Warrant or of any shares issued upon exercise hereof, "**Holder**") is entitled to purchase the number of fully paid and non-assessable shares (the "**Shares**") of the above-stated Type/Series of Stock (the "**Class**") of the above-named company (the "**Company**") at the above-stated Warrant Price, all as set forth above and as adjusted pursuant to Section 2 of this Warrant, subject to the provisions and upon the terms and conditions set forth in this Warrant. Reference is made to Section 5.4 of this Warrant whereby Silicon Valley Bank shall transfer this Warrant to its parent company, SVB Financial Group.

As used herein:

"Class of Stock" means at Bank's option: (i) the Company's Series A-1 Preferred Stock, or (ii) Next Round Stock; provided that until the Next Round occurs, the Class of Stock shall be the Company's Series A-1 Preferred Stock.

"Next Round" means the Company's sale of its next series of convertible preferred stock (other than Series A Preferred Stock or Series A-1 Preferred Stock) to purchasers which include at least one venture capital investor.

"Next Round Price" means the lowest effective price per share (on a common stock equivalent basis and taking into account any securities issued together with the Next Round Stock) at which shares of the Next Round Stock are sold to investors in respect of cash consideration in the Next Round.

"Next Round Stock" means the Company's convertible preferred stock sold in the Next Round.

"Number of Shares" means the number of Shares equal to: (i) four and one-half percent (4.50%) of the aggregate original principal amount of all Term Loans advanced under the First Tranche and the Second Tranche, divided by the Warrant Price, rounded down to the nearest whole share, *plus* (ii) three and one-half percent (3.50%) of the aggregate original principal amount of all Term Loans advanced under the Third Tranche, divided by the Warrant Price, rounded down to the nearest whole share. "First Tranche" "Second Tranche" "Term Loans" and "Third Tranche" shall have the meanings given those capitalized terms in the Loan Agreement.

"Series A-1 Price" means $0.2538 per share (as adjusted for any stock dividend, stock split, combination of shares, reorganization, recapitalization, reclassification or similar event).

"Warrant Price" means: (i) if the Class of Stock is the Company's Series A-1 Preferred Stock, the Series A-1 Price, or (ii) if the Class of Stock is Next Round Stock, the Next Round.

SECTION 1. EXERCISE.

1.1 Method of Exercise. Holder may at any time and from time to time exercise this Warrant, in whole or in part, by delivering to the Company the original of this Warrant together with a duly executed Notice of Exercise in substantially the form attached hereto as Appendix 1 and, unless Holder is exercising this Warrant pursuant to a cashless exercise set forth in Section 1.2, a check, wire transfer of same-day funds (to an account designated by the Company), or other form of payment acceptable to the Company for the aggregate Warrant Price for the Shares being purchased.

1.2 Cashless Exercise. On any exercise of this Warrant, in lieu of payment of the aggregate Warrant Price in the manner as specified in Section 1.1 above, but otherwise in accordance with the requirements of Section 1.1, Holder may elect to receive Shares equal to the value of this Warrant, or portion hereof as to which this Warrant is being exercised. Thereupon, the Company shall issue to the Holder such number of fully paid and non-assessable Shares as are computed using the following formula:

$$X = Y(A-B)/A$$

where:

X = the number of Shares to be issued to the Holder;

Y = the number of Shares with respect to which this Warrant is being exercised (inclusive of the Shares surrendered to the Company in payment of the aggregate Warrant Price);

A = The Fair Market Value (as determined pursuant to Section 1.3 below) of one Share; and

B = the Warrant Price.

1.3 Fair Market Value. If the Company's common stock is then traded or quoted on a nationally recognized securities exchange, inter-dealer quotation system or over-the-counter market (a "**Trading Market**") and the Class is common stock, the fair market value of a Share shall be the closing price or last sale price of a share of common stock reported for the Business Day immediately before the date on which Holder delivers this Warrant together with its Notice of Exercise to the Company. If the Company's common stock is then traded in a Trading Market and the Class is a series of the Company's convertible preferred stock, the fair market value of a Share shall be the closing price or last sale price of a share of the Company's common stock reported for the Business Day immediately before the date on which Holder delivers this Warrant together with its Notice of Exercise to the Company multiplied by the number of shares of the Company's common stock into which a Share is then convertible. If the Company's common stock is not traded in a Trading Market, the Board of Directors of the Company shall determine the fair market value of a Share in its reasonable good faith judgment.

1.4 Delivery of Certificate and New Warrant. Within a reasonable time after Holder exercises this Warrant in the manner set forth in Section 1.1 or 1.2 above, the Company shall deliver to Holder a certificate representing the Shares issued to Holder upon such exercise and, if this Warrant has not been fully exercised and has not expired, a new warrant of like tenor representing the Shares not so acquired.

1.5 Replacement of Warrant. On receipt of evidence reasonably satisfactory to the Company of the loss, theft, destruction or mutilation of this Warrant and, in the case of loss, theft or destruction, on delivery of an indemnity agreement reasonably satisfactory in form, substance and amount to the Company or, in the case of mutilation, on surrender of this Warrant to the Company for cancellation, the Company shall, within a reasonable time, execute and deliver to Holder, in lieu of this Warrant, a new warrant of like tenor and amount.

1.6 Treatment of Warrant Upon Acquisition of Company.

(a) Acquisition. For the purpose of this Warrant, "**Acquisition**" means any transaction or series of related transactions involving: (i) the sale, lease, exclusive license, or other disposition of all or substantially all of the assets of the Company (ii) any merger or consolidation of the Company into or with another person or entity (other than a merger or consolidation effected exclusively to change the Company's domicile), or any other corporate reorganization, in which the stockholders of the Company in their capacity as such immediately prior to such merger, consolidation or reorganization, own less than a majority of the Company's (or the surviving or successor entity's) outstanding voting power immediately after such merger, consolidation or reorganization; or (iii) any sale or other transfer by the stockholders of the Company of shares representing at least a majority of the Company's then-total outstanding combined voting power.

(b) Treatment of Warrant at Acquisition. In the event of an Acquisition in which the consideration to be received by the Company's stockholders consists solely of cash, solely of Marketable Securities or a combination of cash and Marketable Securities (a "**Cash/Public Acquisition**"), and the fair market value of one Share as determined in accordance with Section 1.3 above would be greater than the Warrant Price in effect on such date immediately prior to such Cash/Public Acquisition, and Holder has not exercised this Warrant pursuant to Section 1.1 above as to all Shares, then this Warrant shall automatically be deemed to be Cashless Exercised pursuant to Section 1.2 above as to all Shares effective immediately prior to and contingent upon the consummation of a Cash/Public Acquisition. In connection with such Cashless Exercise, Holder shall be deemed to have restated each of the representations and warranties in Section 4 of the Warrant as the date thereof and the Company shall promptly notify the Holder of the number of Shares (or such other securities) issued upon exercise. In the event of a Cash/Public Acquisition where the fair market value of one Share as determined in accordance with Section 1.3 above would be less than the Warrant Price in effect immediately prior to such Cash/Public Acquisition, then this Warrant will expire immediately prior to the consummation of such Cash/Public Acquisition.

(c) Upon the closing of any Acquisition other than a Cash/Public Acquisition defined above, the acquiring, surviving or successor entity shall assume the obligations of this Warrant, and this Warrant shall thereafter be exercisable for the same securities and/or other property as would have been paid for the Shares issuable upon exercise of the unexercised portion of this Warrant as if such Shares were outstanding on and as of the closing of such Acquisition, subject to further adjustment from time to time in accordance with the provisions of this Warrant.

(d) As used in this Warrant, "**Marketable Securities**" means securities meeting all of the following requirements: (i) the issuer thereof is then subject to the reporting requirements of Section 13 or Section 15(d) of the Securities Exchange Act of 1934, as amended (the "**Exchange Act**"), and is then current in its filing of all required reports and other information under the Act and the Exchange Act; (ii) the class and series of shares or other security of the issuer that would be received by Holder in connection with the Acquisition were Holder to exercise this Warrant on or prior to the closing thereof is then traded in Trading Market, and (iii) following the closing of such Acquisition, Holder would not be restricted from publicly re-selling all of the issuer's shares and/or other securities that would be received by Holder in such Acquisition were Holder to exercise or convert this Warrant in full on or prior to the closing of such Acquisition, except to the extent that any such restriction (x) arises solely under federal or state securities laws, rules or regulations, and (y) does not extend beyond six (6) months from the closing of such Acquisition.

SECTION 2. ADJUSTMENTS TO THE SHARES AND WARRANT PRICE.

2.1 Stock Dividends, Splits, Etc. If the Company declares or pays a dividend or distribution on the outstanding shares of the Class payable in common stock or other securities or property (other than cash), then upon exercise of this Warrant, for each Share acquired, Holder shall receive, without additional cost to Holder, the total number and kind of securities and property which Holder would have received had Holder owned the Shares of record as of the date the dividend or distribution occurred. If the Company subdivides the outstanding shares of the Class by reclassification or otherwise into a greater number of shares, the number of Shares purchasable hereunder shall be proportionately increased and the Warrant Price shall be proportionately decreased. If the outstanding shares of the Class are combined or consolidated, by reclassification or otherwise, into a lesser number of shares, the Warrant Price shall be proportionately increased and the number of Shares shall be proportionately decreased.

2.2 Reclassification, Exchange, Combinations or Substitution. Upon any event whereby all of the outstanding shares of the Class are reclassified, exchanged, combined, substituted, or replaced for, into, with or by Company securities of a different class and/or series, then from and after the consummation of such event, this Warrant will be exercisable for the number, class and series of Company securities that Holder would have received had the Shares been outstanding on and as of the consummation of such event, and subject to further adjustment thereafter from time to time in accordance with the provisions of this Warrant. The provisions of this Section 2.2 shall similarly apply to successive reclassifications, exchanges, combinations substitutions, replacements or other similar events.

2.3 Conversion of Preferred Stock. If the Class is a class and series of the Company's convertible preferred stock, in the event that all outstanding shares of the Class are converted, automatically or by action of the holders thereof, into common stock pursuant to the provisions of the Company's Certificate of Incorporation, including, without limitation, in connection with the Company's initial, underwritten public offering and sale of its common stock pursuant to an effective registration statement under the Act (the "**IPO**"), then from and after the date on which all outstanding shares of the Class have been so converted, this Warrant shall be exercisable for such number of shares of common stock into which the Shares would have been converted had the Shares been outstanding on the date of such conversion, and the Warrant Price shall equal the Warrant Price in effect as of immediately prior to such conversion divided by the number of shares of common stock into which one Share would have been converted, all subject to further adjustment thereafter from time to time in accordance with the provisions of this Warrant.

2.4 Adjustments for Diluting Issuances. Without duplication of any adjustment otherwise provided for in this Section 2, the number of shares of common stock issuable upon conversion of the Shares shall be subject to anti-dilution adjustment from time to time in the manner set forth in the Company's Articles or Certificate of Incorporation as if the Shares were issued and outstanding on and as of the date of any such required adjustment.

2.5 No Fractional Share. No fractional Share shall be issuable upon exercise of this Warrant and the number of Shares to be issued shall be rounded down to the nearest whole Share. If a fractional Share interest arises upon any exercise of the Warrant, the Company shall eliminate such fractional Share interest by paying Holder in cash the amount computed by multiplying the fractional interest by (i) the fair market value (as determined in accordance with Section 1.3 above) of a full Share, less (ii) the then-effective Warrant Price.

2.6 Notice/Certificate as to Adjustments. Upon each adjustment of the Warrant Price, Class and/or number of Shares, the Company, at the Company's expense, shall notify Holder in writing within a reasonable time setting forth the adjustments to the Warrant Price, Class and/or number of Shares and facts upon which such adjustment is based. The Company shall, upon written request from Holder, furnish Holder with a certificate of its Chief Financial Officer, including computations of such adjustment and the Warrant Price, Class and number of Shares in effect upon the date of such adjustment.

SECTION 3. REPRESENTATIONS AND COVENANTS OF THE COMPANY.

3.1 Representations and Warranties. The Company represents and warrants to, and agrees with, the Holder as follows:

(a) The initial Warrant Price referenced on the first page of this Warrant is not greater than the price per share at which shares of the Class were last sold and issued prior to the Issue Date hereof in an arms-length transaction in which at least $500,000 of such shares were sold.

(b) All Shares which may be issued upon the exercise of this Warrant, and all securities, if any, issuable upon conversion of the Shares, shall, upon issuance, be duly authorized, validly issued, fully paid and non-assessable, and free of any liens and encumbrances except for restrictions on transfer provided for herein or under applicable federal and state securities laws. The Company covenants that it shall at all times cause to be reserved and kept available out of its authorized and unissued capital stock such number of shares of the Class, common stock and other securities as will be sufficient to permit the exercise in full of this Warrant and the conversion of the Shares into common stock or such other securities.

(c) The Company's capitalization table attached hereto as Schedule 1 is true and complete, in all material respects, as of the Issue Date.

3.2 Notice of Certain Events. If the Company proposes at any time to:

(a) declare any dividend or distribution upon the outstanding shares of the Class or common stock, whether in cash, property, stock, or other securities and whether or not a regular cash dividend;

(b) offer for subscription or sale pro rata to the holders of the outstanding shares of the Class any additional shares of any class or series of the Company's stock (other than pursuant to contractual pre-emptive rights);

(c) effect any reclassification, exchange, combination, substitution, reorganization or recapitalization of the outstanding shares of the Class;

(d) effect an Acquisition or to liquidate, dissolve or wind up; or

(e) effect an IPO;

then, in connection with each such event, the Company shall give Holder:

(1) at least seven (7) Business Days prior written notice of the date on which a record will be taken for such dividend, distribution, or subscription rights (and specifying the date on which the holders of outstanding shares of the Class will be entitled thereto) or for determining rights to vote, if any, in respect of the matters referred to in (a) and (b) above;

(2) in the case of the matters referred to in (c) and (d) above at least seven (7) Business Days prior written notice of the date when the same will take place (and specifying the date on which the holders of outstanding shares of the Class will be entitled to exchange their shares for the securities or other property deliverable upon the occurrence of such event and such reasonable information as Holder may reasonably require regarding the treatment of this Warrant in connection with such event giving rise to the notice); and

(3) with respect to the IPO, at least seven (7) Business Days prior written notice of the date on which the Company proposes to file its registration statement in connection therewith.

Company will also provide information requested by Holder that is reasonably necessary to enable Holder to comply with Holder's accounting or reporting requirements.

SECTION 4. REPRESENTATIONS, WARRANTIES OF THE HOLDER.

The Holder represents and warrants to the Company as follows:

4.1 Purchase for Own Account. This Warrant and the securities to be acquired upon exercise of this Warrant by Holder are being acquired for investment for Holder's account, not as a nominee or agent, and not with a view to the public resale or distribution within the meaning of the Act. Holder also represents that it has not been formed for the specific purpose of acquiring this Warrant or the Shares.

4.2 Disclosure of Information. Holder is aware of the Company's business affairs and financial condition and has received or has had full access to all the information it considers necessary or appropriate to make an informed investment decision with respect to the acquisition of this Warrant and its underlying securities. Holder further has had an opportunity to ask questions and receive answers from the Company regarding the terms and conditions of the offering of this Warrant and its underlying securities and to obtain additional information (to the extent the Company possessed such information or could acquire it without unreasonable effort or expense) necessary to verify any information furnished to Holder or to which Holder has access.

4.3 Investment Experience. Holder understands that the purchase of this Warrant and its underlying securities involves substantial risk. Holder has experience as an investor in securities of companies in the development stage and acknowledges that Holder can bear the economic risk of such Holder's investment in this Warrant and its underlying securities and has such knowledge and experience in financial or business matters that Holder is capable of evaluating the merits and risks of its investment in this Warrant and its underlying securities and/or has a preexisting personal or business relationship with the Company and certain of its officers, directors or controlling persons of a nature and duration that enables Holder to be aware of the character, business acumen and financial circumstances of such persons.

4.4 Accredited Investor Status. Holder is an "accredited investor" within the meaning of Regulation D promulgated under the Act.

4.5 The Act. Holder understands that this Warrant and the Shares issuable upon exercise hereof have not been registered under the Act in reliance upon a specific exemption therefrom, which exemption depends upon, among other things, the bona fide nature of the Holder's investment intent as expressed herein. Holder understands that this Warrant and the Shares issued upon any exercise hereof must be held indefinitely unless subsequently registered under the Act and qualified under applicable state securities laws, or unless exemption from such registration and qualification are otherwise available. Holder is aware of the provisions of Rule 144 promulgated under the Act.

4.6 Market Stand-off Agreement. The Holder agrees that the Shares shall be subject to the Market Standoff provisions in Section 2.10 of that certain Investor Rights Agreement dated as of July 1, 2013 by and among the Company and the persons and entities listed on Exhibit A thereto.

4.7 No Voting Rights. Holder, as a Holder of this Warrant, will not have any voting rights until the exercise of this Warrant.

SECTION 5. MISCELLANEOUS.

5.1 Term and Automatic Conversion Upon Expiration.

(a) Term. Subject to the provisions of Section 1.6 above, this Warrant is exercisable in whole or in part at any time and from time to time on or before 6:00 PM, Pacific time, on the Expiration Date and shall be void thereafter.

(b) Automatic Cashless Exercise upon Expiration. In the event that, upon the Expiration Date, the fair market value of one Share (or other security issuable upon the exercise hereof) as determined in accordance with Section 1.3 above is greater than the Warrant Price in effect on such date, then this Warrant shall automatically be deemed on and as of such date to be exercised pursuant to Section 1.2 above as to all Shares (or such other securities) for which it shall not previously have been exercised, and the Company shall, within a reasonable time, deliver a certificate representing the Shares (or such other securities) issued upon such exercise to Holder.

5.2 Legends. The Shares (and the securities issuable, directly or indirectly, upon conversion of the Shares, if any) shall be imprinted with a legend in substantially the following form:

> THE SHARES EVIDENCED BY THIS CERTIFICATE HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "**ACT**"), OR THE SECURITIES LAWS OF ANY STATE AND, EXCEPT AS SET FORTH IN THAT CERTAIN WARRANT TO PURCHASE STOCK ISSUED BY THE ISSUER TO SILICON VALLEY BANK DATED , MAY NOT BE OFFERED, SOLD, PLEDGED OR OTHERWISE TRANSFERRED UNLESS AND UNTIL REGISTERED UNDER SAID ACT AND LAWS OR IN FORM AND SUBSTANCE SATISFACTORY TO THE ISSUER, SUCH OFFER, SALE, PLEDGE OR OTHER TRANSFER IS EXEMPT FROM SUCH REGISTRATION.

5.3 Compliance with Securities Laws on Transfer. This Warrant and the Shares issuable upon exercise of this Warrant (and the securities issuable, directly or indirectly, upon conversion of the Shares, if any) may not be transferred or assigned in whole or in part except in compliance with applicable federal and state securities laws by the transferor and the transferee (including, without limitation, the delivery of investment representation letters and legal opinions reasonably satisfactory to the Company, as reasonably requested by the Company). The Company shall not require Holder to provide an opinion of counsel if the transfer is to SVB Financial Group (Silicon Valley Bank's parent company) or any other affiliate of Holder, provided that any such transferee is an "accredited investor" as defined in Regulation D promulgated under the Act. Additionally, the Company shall also not require an opinion of counsel if there is no material question as to the availability of Rule 144 promulgated under the Act.

5.4 Transfer Procedure. After receipt by Silicon Valley Bank of the executed Warrant, Silicon Valley Bank will transfer all of this Warrant to its parent company, SVB Financial Group. By its acceptance of this Warrant, SVB Financial Group hereby makes to the Company each of the representations and warranties set forth in Section 4 hereof and agrees to be bound by all of the terms and conditions of this Warrant as if the original Holder hereof. Subject to the provisions of Section 5.3 and upon providing the Company with written notice, SVB Financial Group and any subsequent Holder may transfer all or part of this Warrant or the Shares issuable upon exercise of this Warrant (or the securities issuable directly or indirectly, upon conversion of the Shares, if any) to any transferee, provided, however, in connection with any such transfer, SVB Financial Group or any subsequent Holder will give the Company notice of the portion of the Warrant being transferred with the name, address and taxpayer identification number of the transferee and Holder will surrender this Warrant to the Company for reissuance to the transferee(s) (and Holder if applicable); and provided further, that any subsequent transferee other than SVB Financial Group shall agree in writing with the Company to be bound by all of the terms and conditions of this Warrant. Notwithstanding any contrary provision herein, at all times prior to the IPO, Holder may not, without the Company's prior written consent, transfer this Warrant or any portion hereof, or any Shares issued upon any exercise hereof, or any shares or other securities issued upon any conversion of any Shares issued upon any exercise hereof, to any person or entity who directly competes with the Company, except in connection with an Acquisition of the Company by such a direct competitor.

5.5 Notices. All notices and other communications hereunder from the Company to the Holder, or vice versa, shall be deemed delivered and effective (i) when given personally, (ii) on the third (3rd) Business Day after being mailed by first-class registered or certified mail, postage prepaid, (iii) upon actual receipt if given by facsimile or electronic mail and such receipt is confirmed in writing by the recipient, or (iv) on the first Business Day following delivery to a reliable overnight courier service, courier fee prepaid, in any case at such address as may have been furnished to the Company or Holder, as the case may be, in writing by the Company or such Holder from time to time in accordance with the provisions of this Section 5.5. All notices to Holder shall be addressed as follows until the Company receives notice of a change of address in connection with a transfer or otherwise:

SVB Financial Group
Attn: Treasury Department
3003 Tasman Drive, HC 215
Santa Clara, CA 95054

Notice to the Company shall be addressed as follows until Holder receives notice of a change in address:

Shockwave Medical, Inc.
Attn: Daniel Hawkins
48501 Warm Springs Blvd., Suite 108
Fremont, CA 94539

With a copy (which shall not constitute notice) to:

Wilson Sonsini Goodrich & Rosati
Attn: J. Casey McGlynn
650 Page Mill Road
Palo Alto, CA 94304

5.6 Waiver. This Warrant and any term hereof may be changed, waived, discharged or terminated (either generally or in a particular instance and either retroactively or prospectively) only by an instrument in writing signed by the party against which enforcement of such change, waiver, discharge or termination is sought.

5.7 Attorney's Fees. In the event of any dispute between the parties concerning the terms and provisions of this Warrant, the party prevailing in such dispute shall be entitled to collect from the other party all costs incurred in such dispute, including reasonable attorneys' fees.

5.8 Counterparts; Facsimile/Electronic Signatures. This Warrant may be executed in counterparts, all of which together shall constitute one and the same agreement. Any signature page delivered electronically or by facsimile shall be binding to the same extent as an original signature page with regards to any agreement subject to the terms hereof or any amendment thereto.

5.9 Governing Law. This Warrant shall be governed by and construed in accordance with the laws of the State of California, without giving effect to its principles regarding conflicts of law.

5.10 Headings. The headings in this Warrant are for purposes of reference only and shall not limit or otherwise affect the meaning of any provision of this Warrant.

5.11 Business Days. "**Business Day**" is any day that is not a Saturday, Sunday or a day on which Silicon Valley Bank is closed.

[Remainder of page left blank intentionally]
[Signature page follows]

IN WITNESS WHEREOF, the parties have caused this Warrant to Purchase Stock to be executed by their duly authorized representatives effective as of the Issue Date written above.

"COMPANY"

SHOCKWAVE MEDICAL, INC.

By: /s/ Daniel Hawkins
Name: Daniel Hawkins
(Print)
Title: CEO

"HOLDER"

SILICON VALLEY BANK

By: /s/ Justin Pirzadeh
Name: Justin Pirzadeh
(Print)
Title: Vice President

APPENDIX 1

NOTICE OF EXERCISE

1. The undersigned Holder hereby exercises its right purchase shares of the Common/Series Preferred [circle one] Stock of Shockwave Medical, Inc. (the "**Company**") in accordance with the attached Warrant To Purchase Stock, and tenders payment of the aggregate Warrant Price for such shares as follows:

[ ] check in the amount of $ payable to order of the Company enclosed herewith

[ ] Wire transfer of immediately available funds to the Company's account

[ ] Cashless Exercise pursuant to Section 1.2 of the Warrant

[ ] Other [Describe]

2. Please issue a certificate or certificates representing the Shares in the name specified below:

_____

Holder's Name

_____

_____

(Address)

3. By its execution below and for the benefit of the Company, Holder hereby restates each of the representations and warranties in Section 4 of the Warrant to Purchase Stock as of the date hereof.

HOLDER:

_____

By: _____

Name: _____

Title: _____

(Date): _____

SUBLEASE AGREEMENT

THIS SUBLEASE AGREEMENT ("Sublease") is dated for reference purposes only as of May 7, 2018, and is made by and between Benvenue Medical, Inc., a Delaware corporation ("Sublandlord"), and Shockwave Medical, Inc., a Delaware corporation ("Subtenant").

RECITALS

A. SVF Betsy Ross Santa Clara Corporation, a Delaware Corporation ("SVF"), and Sublandlord entered into that certain Office Lease (Net) dated March 17, 2016 ("Lease Agreement"), pursuant to which Sublandlord leased from SVF the 35,000 rentable square feet of space located at 5403 Betsy Ross Drive, Santa Clara, California ("Building").

B. On or about December 20, 2017, SVF sold the Building, including its interest in the Lease Agreement, to Betsy Ross Property LLC, a Delaware limited liability company ("Landlord").

C. On or about April 18, 2018, Landlord and Sublandlord entered into that certain First Amendment to Lease ("Lease Amendment"), pursuant to which Landlord and Sublandlord modified certain provisions of the Lease Agreement. Together, the Lease Agreement and the Lease Amendment are referred to herein as the Master Lease, a true and correct copy of which is attached hereto as Exhibit A.

D. Subject to and in accordance with the terms and conditions hereinafter set forth, Sublandlord desires to sublease to Subtenant, and Subtenant wishes to sublease from Sublandlord, the entire Building.

AGREEMENT

Now, THEREFORE, for good and valuable consideration, the receipt and adequacy of which are acknowledged, Sublandlord and Subtenant (each a "Party," and collectively, the "Parties") hereby agree as follows:

1. Sublease. On the terms and conditions set forth herein, Sublandlord subleases to Subtenant, and Subtenant subleases from Sublandlord, the Building, together with the non-exclusive right (unless otherwise provided in the Master Lease), in common with Landlord and other tenants and subtenants of the Property and their invitees, to use the Common Areas.

2. Landlord Consent. Notwithstanding any language to the contrary in this Sublease—

2.1. This Sublease is subject to, and its effectiveness is expressly conditioned on, the written consent of Landlord to the subletting of the Building to Subtenant pursuant to the provisions of this Sublease in a form reasonably acceptable to Sublandlord and Subtenant ("Consent"). At its sole cost and expense, Sublandlord agrees, upon execution of the Sublease by both Parties, promptly to request such Consent from Landlord.

2.2. In the event that Sublandlord does not receive such Consent of Landlord by a date which is thirty (30) days after the date first set forth above, then, upon written notice to the other, Sublandlord or Subtenant may cancel this Sublease, and upon the giving of such notice, this Sublease shall be deemed canceled and of no further force or effect and Sublandlord shall immediately return to Subtenant all prepaid Base Rent and Additional Rent and the Letter of Credit.

3. Master Lease.

3.1. This Sublease is made subject to and subordinate to all of the terms and conditions of the Master Lease. All provisions of the Master Lease, except as expressly set forth below, are hereby deemed incorporated into, and made a part of, this Sublease by this reference, notwithstanding that such provisions are not restated herein; provided however, that—

3.1.1. Wherever the word "Landlord" appears in the provisions incorporated pursuant to Section 3.1, it shall be deemed to mean the Sublandlord herein (except as otherwise provided below);

3.1.2. Wherever the word "Tenant" appears in the provisions incorporated pursuant to Section 3.1, it shall be deemed to mean the Subtenant herein;

3.1.3. Where the word "Lease" appears in the provisions incorporated pursuant to Section 3.1, it shall be deemed to mean the Sublease, as defined herein;

3.1.4. Where the word "Term" appears in the provisions incorporated pursuant to Section 3.1, it shall be deemed to mean the Sublease Term, as defined herein; and

3.1.5. As between Sublandlord and Subtenant, in the event of any inconsistency between the terms of the Master Lease (including without limitation provisions incorporated herein under Section 3.1) and this Sublease, the terms of this Sublease shall govern.

3.2. Notwithstanding any language to the contrary in this Sublease, Sublandlord and Subtenant agree that-

3.2.1. Sublandlord is not assuming, and shall not be responsible or liable for Landlord's obligation to perform any agreement or obligation on the part of the Landlord under the Master Lease to the extent that Landlord exercises its right to so perform (such as, by way of example and not limitation, restoring the Building following a fire or other casualty or making any of the repairs required by this Sublease). In the event Landlord fails to perform any such agreement or obligation, then, promptly following Subtenant's request, Sublandlord shall use diligent, good faith efforts, as permitted by law or by the terms of the Master Lease, to enforce such agreements and obligations of Landlord;

3.2.1.1. Sublandlord shall use diligent, good faith efforts to cause Landlord to satisfy its obligations under the Master Lease, including to provide to and for the benefit of the Building each and all of the services which Landlord is required to provide to and for the benefit of the Building pursuant to the terms and provisions of the Master Lease. With respect

to all such obligations of Landlord under the Master Lease, if the Landlord fails to provide any such services or to perform any of the terms and conditions of the Master Lease on the Landlord's part to be performed ("Landlord's Obligations"), Sublandlord shall use diligent good faith efforts to cause Landlord to perform such obligations for the benefit of Subtenant. Subtenant shall be entitled to participate with Sublandlord in the enforcement of Sublandlord's rights against the Landlord. Such diligent good faith efforts shall include, without limitation, upon Subtenant's written request, immediately notifying Landlord of its nonperformance under the Master Lease, and requesting that Landlord perform its obligations under the Master Lease. If the Landlord fails to fulfill the Landlord's Obligations, Subtenant may, notwithstanding the provisions of the prior sentence, at Subtenant's sole cost and expense, institute any appropriate action or proceeding against the Landlord for the enforcement of the Landlord's Obligations. Sublandlord agrees that it will cooperate with Subtenant to enable Subtenant to enforce the Landlord's Obligations; provided, however, that notwithstanding any language to the contrary in this Sublease, Sublandlord shall have no obligation to institute any action or legal proceeding against Landlord.

3.2.1.2. During the Sublease Term (defined below), Subtenant shall have the right to receive and enjoy the benefit of the services required to be provided by Landlord under the Master Lease;

3.2.2. Sublandlord represents to Subtenant that the Master Lease is in full force and effect and that no default exists on the part of any party to the Master Lease, and there exists no state of facts and no event has occurred which, with the passage of time or the giving of notice, or both, would constitute a default by either Landlord or Sublandlord under the Master Lease, and that the copy of the Master Lease attached hereto as Exhibit A is a true, correct and complete copy of the Master Lease;

3.2.3. Sublandlord agrees to maintain the Master Lease during the entire term of this Sublease; provided, however, that Sublandlord's obligation to do so shall cease in the event of any earlier termination of the Master Lease that arises through no fault of Sublandlord;

3.2.4. Subtenant shall comply with all terms and conditions of this Sublease, and perform all its obligations as set forth herein; and

3.2.5. With respect to any approval required to be obtained from the Landlord under the Master Lease, such consent must be obtained from both the Landlord and Sublandlord. Sublandlord's consent, in each instance, shall not be unreasonably withheld, conditioned or delayed.

3.3. Notwithstanding any language to the contrary in this Sublease, the following provisions of the Lease Agreement are hereby excluded from this Sublease:

3.3.1. The Lease Summary, except for Sections 7, 8, 11, 14, 15 and 17; provided, however, that Addendum #1 and Exhibits A, D, E and E-1 are deleted.

3.3.2. The first paragraph of the Lease Agreement.

3.3.3. Article 1.

3.3.4. Sections 2-4, 2.10, 2.15 and 2.40 of Article 2.

3.3.5. Article 3.

3.3.6. Sections 4.1 and 4.5 of Article 4.

3.3.7. Article 9.

3.3.8. Section 17.3 of Article 17.

3.3.9. In Section 19.1 of Article 19, the paragraph beginning, “Additionally...Default under this Lease.”

3.3.10. In Section 19.2 of Article 19, the paragraph beginning, “In addition...if applicable.”

3.3.11. Article 25.

3.3.12. Addendum #1, Appendix 1, Exhibit D, Exhibit E, Exhibit E-1,

3.4. References to “Landlord” in the following incorporated provisions of the Master Lease shall mean Landlord only (and not Sublandlord), provided, that, all payment shall be made to Sublandlord in such provisions (except as otherwise expressly permitted by this Sublease):

3.4.1. Sections 2.11, 2.18, 2.24, 2.31, 2.34, 2.39, 4.2, 4.3, 4.4, the second paragraph of 6.2, 6.5, 8.6, 8.7, 10.1, 12 (but not 12.4), 13, 15, 16, 18.1, 29, 30.17, Exhibit F, Exhibit G, and Exhibit H;

3.4.1.1. Notwithstanding any language to the contrary in this Sublease, Sublandlord and Subtenant acknowledge that-

3.4.1.1.1. Sublandlord shall not be responsible for any risks Subtenant assumes under Lease Agreement Section 8.6;

3.4.1.1.2. The intention of the repair and maintenance obligations described in Lease Agreement Section 10.1 is for the Master Lease to be a net lease and the Sublease to be a net sublease;

3.4.1.1.3. Sublandlord shall not be responsible for any violation of rules and regulations, as described in Lease Agreement Section 13, by any other tenants or occupants of the Project;

3.4.1.1.4. Subtenant’s obligations concerning provision of estoppel certificates under Lease Agreement Section 29.2 shall apply to both Landlord and Sublandlord;

3.4.1.1.5. With respect to Lease Agreement Section 30.17, Subtenant does not rely on the fact, nor does Sublandlord represent, that any specific tenant or type or number of tenants shall, during the Term, occupy any space in the Project;

3.4.1.1.6. Sublandlord shall not be responsible for, nor shall Subtenant be entitled to (except to the extent actually received by Sublandlord with respect to the Subleased Premises and attributable to the Sublease Term) any abatement in Subtenant's Rent for, any damages or liability to Subtenant or Subtenant-related parties arising from (a) the provision or non-provision of building services described in Lease Agreement Exhibit F; Landlord's enforcement or non-enforcement of the rules and regulations described in Lease Agreement Exhibit G; or (c) the parking agreement arrangements described in Lease Agreement Exhibit H.

3.5. Notwithstanding any language to the contrary in this Sublease, the following provisions of the Lease Amendment are hereby excluded from this Sublease:

3.5.1. The first paragraph and all recitals in the Lease Amendment.

3.5.2. Sections 1 through 9 and 12 through 14.

3.6. Notwithstanding anything to the contrary herein, if Subtenant receives a written demand from Landlord requiring Subtenant to pay rent due under this Sublease directly to Landlord, then, so long as Subtenant first confirms in writing that Sublandlord has received a copy of Landlord's demand, Subtenant shall have the right to comply with such demand and pay such rent to Landlord. Sublandlord agrees that, upon providing to Sublandlord written evidence that Subtenant has paid such a rental sum to Landlord pursuant to such written demand, that sum paid by Subtenant to Landlord shall be deemed applied against any sums owed by Subtenant under this Sublease.

4. Basic Terms.

4.1. Term; Occupancy. The Sublease term shall commence on the later of (i) September 1, 2018, (ii) the date that Sublandlord obtains the Consent and (iii) the date that Sublandlord delivers possession of the Building to Subtenant in good, vacant, broom clean condition ("Commencement Date"), and shall end on August 31, 2022 ("Sublease Term"). Notwithstanding any language herein to the contrary, if for any reason Sublandlord cannot deliver possession of the Building to Subtenant on September 1, 2018, then this Sublease shall not be void or voidable, but Subtenant shall not be obligated to pay Rent or perform any other Subtenant obligation hereunder with respect to the undelivered Building, until the Sublandlord delivers to Subtenant possession of the Building and the Commencement Date occurs; provided, however, that—

4.1.1. If Sublandlord delivers possession of the Building but Subtenant does not occupy the Building, Sublandlord shall nonetheless be deemed to have delivered possession of the Building; and

4.1.2. If Sublandlord does not deliver possession of the Building and cause the Commencement Date to occur by October 31, 2018, then Subtenant may, by notifying Sublandlord in writing, terminate this Sublease, in which event Subtenant shall be discharged from all obligations hereunder.

4.1.3. Subtenant waives all rights under California Civil Code §1932(1).

4.2. Acceptance of Building.

4.2.1. Except as otherwise provided herein, Subtenant accepts the Building in "as is" condition. From the date that Landlord consents to the Sublease, until the Commencement Date, Sublandlord shall permit Subtenant to enter the Building during normal business hours with 24-hour notice to Sublandlord for the purpose of having its contractors and architects survey the Building and not for the purpose of conducting business therein or making improvements therein, provided such access does not interfere with Sublandlord's use of the Building. Such access shall be subject to all of the provisions of this Sublease, except for the obligation to pay Rent and shall not advance the expiration date of this Sublease.

4.2.2. Sublandlord warrants that, as of the commencement date of the Sublease Term, the Building, including without limitation the mechanical (including the Building management system), electrical, plumbing, HVAC, lighting and roofing systems, is in good working order. Subtenant's acceptance of the Building shall not be deemed a waiver of Subtenant's right to have defects in the delivery condition of the Building described in this Sublease repaired at no cost to Subtenant, which right shall be limited to the first sixty (60) days after the Commencement Date ("Delivery Condition Repair Period"). Subtenant shall give notice to Sublandlord whenever any such defect becomes reasonably apparent during the Delivery Condition Repair Period, and Sublandlord shall repair such defect as soon as practicable. Repair of any such defect that becomes apparent after the expiration of the Delivery Condition Repair Period shall be performed and paid for in accordance with this Sublease and the Master Lease.

4.2.3. Sublandlord makes no representation or warranty as to the compliance of the Building, Common Area or Property with applicable codes, including without limitation all statutes, ordinances and regulations related to parking and ADA requirements.

4.2.3.1. As between Sublandlord and Subtenant, Subtenant shall be responsible for any compliance with Law obligations of the "Tenant" under Lease Agreement Section 6.2 during the Sublease Term. Sublandlord represents that it has received no notices of violations of any ADA requirements or related statutes, ordinances or regulations. Subtenant agrees to indemnify and hold Sublandlord harmless from any and all costs, expenses, claims and liability, including without limitation attorney fees, arising from Subtenant's failure to perform such compliance with Law obligations. This indemnity shall survive the expiration or sooner termination of this Sublease. Sublandlord shall have no responsibility for any costs and expenses of Landlord described in the second paragraph of Lease Agreement Section 6.2.

4.2.4. Subtenant acknowledges that (a) it has been advised to satisfy itself with respect to the condition of the Building (including but not limited to the electrical, HVAC and fire sprinkler systems, security, environmental aspects, and compliance with all applicable requirements) and their suitability for Subtenant's intended use; (b) Subtenant has made such investigation as it deems necessary with reference to all such matters; and (c) neither Sublandlord nor Sublandlord's agents have made any oral or written representations or warranties with respect to said matters other than as set forth in this Sublease.

4.2.5. Except to the extent to be performed by Subtenant pursuant to the terms and conditions of this Sublease, the covenants, agreements and obligations of "Tenant" under the Master Lease shall be timely performed by Sublandlord, including without limitation the payment of all rent and additional rent payable to Landlord under the Master Lease. Sublandlord agrees that, subject to the provisions of Section 2 hereof, it will not (i) amend or modify the Master Lease in any way that impacts Subtenant's tenancy at the Building during the Sublease Term without the prior written consent of Subtenant, which consent shall not be unreasonably withheld, conditioned or delayed so long as the amendment or modification does not diminish the rights and privileges of Subtenant under this Sublease (including without limitation those provisions of this Sublease which are incorporated by reference from the Master Lease) or impose greater duties and obligations on Subtenant under this Sublease, or (ii) terminate or agree to a termination of the Master Lease unless, in connection therewith, Landlord accepts this Sublease as a direct lease between Landlord and Subtenant. Subtenant acknowledges that Subtenant has no option to extend the Sublease Term beyond August 31, 2022.

4.2.6. Prior to Subtenant's occupancy of the Building, Sublandlord shall vacate and decommission all lab areas in the Building in compliance with all applicable statutes, ordinances and regulations and provide Subtenant with written evidence of such decommissioning.

4.2.7. Prior to Subtenant's occupancy of the Building, Sublandlord shall remove all furniture and other personal items from the Building other than the Transferred FF&E (defined below); provided, however, that Sublandlord shall have no obligation to repaint, recarpet or otherwise repair the Building in the wake of removing its furniture and other personal items from the Building, except that Sublandlord shall repair any damage caused by such removal.

4.2.8. The Parties and Landlord acknowledge that, notwithstanding the provisions of Lease Agreement Article 11, (i) Subtenant, with its own project team, may perform work in the Building to make the Building suitable for Subtenant's use and purposes ("Subtenant Work"); and (ii) Subtenant shall not owe Sublandlord a construction supervisory fee for any Subtenant Work; provided, that Subtenant shall pay any construction supervisory fee imposed by Landlord for any Subtenant Work.

4.3. Surrender of Building.

4.3.1. On expiration or sooner termination of the Sublease Term, Subtenant shall surrender to Sublandlord the Building and all Subtenant's improvements and alterations, including the Subtenant Work, in the condition received (except for ordinary wear and tear, loss by fire or other casualty, and loss by condemnation); provided, that, all of Subtenant's trade fixtures, furniture, equipment and other personal property installed in the Premises ("Subtenant's Property") shall at all times be and remain Subtenant's property and Subtenant may remove Subtenant's Property from the Building, provided that Subtenant repairs all damage caused by such removal (and Subtenant shall remove Subtenant's Property from the Building at the expiration or earlier termination of this Sublease).

4.3.2. Notwithstanding language to the contrary in the Master Lease, including without limitation the provisions of Lease Agreement Articles 11 and 24, but subject to the provisions of Section 4.3.2.1 below, Subtenant shall have no restoration requirements for any Subtenant Work or other improvements within the Building, except that, upon the expiration or sooner termination of the Sublease Term, Subtenant shall vacate and decommission all lab areas in the Building in accordance with all applicable statutes, ordinances and regulations, and provide Sublandlord with written evidence of such decommissioning.

4.3.2.1. Notwithstanding language to the contrary in Section 4.3.2, Subtenant shall comply with any restoration requirements Landlord imposes upon Subtenant with respect to any Subtenant Work.

4.3.3. If Subtenant fails to surrender the Building to Sublandlord on expiration or sooner termination of the Sublease Term as required by this Section, then Subtenant shall hold Sublandlord harmless from all damages resulting from Subtenant's failure to surrender the Building, including, without limitation, claims made by a succeeding tenant or subtenant resulting from Subtenant's failure to surrender the Building.

5. Rent.

5.1. Subtenant shall pay to Sublandlord during the Sublease Term as base rental for the Building the following monthly amounts, which monthly amounts shall be paid in advance on the first day of each calendar month ("Base Rent"):

Months 1-4: $33,250.00 NNN per month
Months 4-12: $66,500.00 NNN per month
Months 13-24: $68,495.00 NNN per month
Months 25-36: $70,549.85 NNN per month
Months 37-48: $72,666.35 NNN per month

5.2. If the Sublease Term commences on a date other than the first day of a calendar month, then Subtenant shall pay Base Rent for the fractional month on a per diem basis (calculated on the basis of a thirty (30) day month) until the first day of the month, and thereafter the Base Rent shall be paid in equal monthly installments on the first day of each and every month in advance. All sums to be paid by Subtenant to Sublandlord, including without limitation Base Rent, shall be paid in lawful money of the United States of America, shall be paid without deduction or offset, prior notice or demand, and shall be paid to Sublandlord via wire transfer pursuant to written instructions that Sublandlord shall deliver to Subtenant. No measurement of the Building after the execution of this Sublease shall alter any amount payable hereunder by Subtenant, including the Base Rent.

5.3. Subtenant acknowledges and agrees that this is an absolute triple net lease to Sublandlord, and that Subtenant shall pay Additional Rent to Sublandlord during the Sublease Term, in addition to the Base Rent. Additional Rent shall include without limitation—

5.3.1. All sums (excluding Base Rent) payable by Sublandlord to Landlord pursuant to the Master Lease with respect to the Building during the Sublease Term, including without limitation Lease Agreement Sections 4.2 and 4.4, but excluding (i) any such sums imposed by Landlord under the Master Lease to the extent due to any breach of the Master Lease committed or caused by Sublandlord and not caused by a breach of Subtenant's obligations under this Sublease and (ii) any amounts payable under the Lease Amendment; and

5.3.2. All charges, costs and expenses that Subtenant is required to pay hereunder, together with all late charges, interest, costs and expenses including attorney fees that may accrue thereto in the event of Subtenant's failure to pay such amounts, and all damages, reasonable costs and expenses which Sublandlord may incur by reason of Subtenant's default or breach of this Sublease.

5.4. Subtenant acknowledges that amounts due as Additional Rent may be billed to and payable by Subtenant in accordance with the provisions of Lease Agreement Section 4.2.

5.5. In the event of Subtenant's non-payment of Base Rent or Additional Rent, Sublandlord shall have all rights and remedies allowed by law.

5.6. First Month's Rent and Estimated Additional Rent; Letter of Credit. Upon execution of this Sublease, Subtenant shall, contemporaneously with such execution-

5.6.1. Pay to Sublandlord Thirty-three Thousand Two Hundred Fifty Dollars ($33,250.00) as Base Rent for the first month of the Sublease Term;

5.6.2. Pay to Sublandlord Five Thousand Eight Hundred Eighty Dollars ($5,880.00), as estimated Additional Rent for the first month of the Sublease Term; and

5.6.3. Provide Sublandlord with an irrevocable letter of credit in the amount of Four Hundred Fifty Thousand Dollars ($450,000), substantially similar to that set forth in Addendum #1.

5.7. Subtenant waives all rights under California Civil Code §1950.7.

6. Use.

6.1. Subtenant acknowledges that neither Sublandlord nor its agents have made any oral or written representations or warranties with respect to Subtenant's proposed use of the Building, or the compliance of that proposed use with any federal, state or local law, statute, ordinance or regulation.

6.2. Subtenant shall comply with the provisions of Lease Agreement Section 7.2, whose references to Exhibits J and J-1 are hereby deemed by Subtenant and Sublandlord to refer to Exhibits C and C-1, which are attached hereto and hereby incorporated herein.

7. Alterations.

7.1. Subtenant shall deliver to Sublandlord all notices deliverable to Landlord pursuant to Lease Agreement Article 11.

7.2. Subtenant shall indemnify and hold Sublandlord harmless against loss, damage, attorney fees and all other expenses arising from (a) mechanics' liens; and (b) any other liability related to any Alteration performed by Subtenant, including without limitation loss, damage, attorney fees and all other expenses arising from claims of lien of laborers or materialmen or others for work performed or materials or supplies furnished at the Building and/or for Subtenant or persons claiming under it.

7.3. Any Alteration shall be performed only by a licensed contractor, who shall submit to Sublandlord and Landlord prior to work commencement proof of liability insurance naming Sublandlord and Landlord as an additional insured along with proof of worker compensation insurance.

7.4. Subtenant shall pay all costs for construction done by or for Subtenant on the Building as permitted by this Sublease.

7.5. Upon completion of any work hereunder, Subtenant shall record in the office of the Santa Clara County Recorder a notice of completion or any other notice required or permitted by applicable mechanic's lien law to commence the running of, or terminate, any period for the filing of liens or claims, and shall deliver to Sublandlord any certificate of occupancy or other equivalent evidence of completion of such work in accordance with the requirements of applicable law.

8. Limitation of Sublandlord Liability. No Sublandlord Related Party (other than Sublandlord) shall have any personal liability with respect to any of the provisions of the Sublease, or the Premises. No real, personal or mixed property of any Sublandlord Related Parties (other than Sublandlord), wherever situated, shall be subject to levy to satisfy any Subtenant remedy or judgment.

9. Subtenant Insurance.

9.1. Subtenant shall comply with all provisions of Lease Agreement Article 18, naming both Sublandlord and Landlord as additional insureds as applicable. Subtenant shall obtain all policies required thereunder at its sole cost and expense.

9.2. Subtenant's policy of property insurance required hereunder shall be for an amount equal to the full replacement value of the Subtenant's improvements, trade fixtures, inventory, and other personal property; plus the full replacement value of the tenant improvements existing in the Building as of the Commencement Date.

10. Entry. The purposes for which Sublandlord may exercise its right of entry under Lease Agreement Section 12.4 shall include without limitation entering the Building to post notices of non-responsibility.

11. Notice. Each Party shall provide to the other copies of all notices received by each from Landlord. All notices between the Parties shall be delivered pursuant to the provisions of Article 26, at the following addresses:

If to Sublandlord:	Prior to the Commencement Date at the Building
	After the Commencement Date: to be provided
If to Subtenant:	Prior to the Commencement Date Shockwave Medical, Inc. 48501 Warm Springs Blvd., Ste 108 Fremont, California 94539 Attn: Chief Financial Officer
	After the Commencement Date: Shockwave Medical, Inc. at the Building Attn: Chief Financial Officer

12. Miscellaneous.

12.1. Interpretation. This Sublease has been fully negotiated at arms length between the Parties, after advice by counsel, and the Parties are fully informed with respect to its provisions. No Party shall be deemed the scrivener of this Sublease, and the Sublease provisions shall be construed as a whole, according to their common meaning, and not strictly for or against any Party. When required by the context of this Sublease, the singular shall include the plural. All capitalized terms not defined herein shall have the meaning assigned to them in the Master Lease.

12.2. Brokers. Sublandlord represents and warrants that it has been represented by Kidder Matthews (“KM”) and Subtenant represents and warrants that it has been represented by Cushman & Wakefield (“Cushman”). Sublandlord indemnifies and holds harmless Subtenant and the Landlord against any claims arising from its dealings with any broker or agent other than KM and Cushman, and Subtenant indemnifies and holds harmless Sublandlord and the Landlord against any claims arising from its dealings with any broker or agent other than KM and Cushman. Sublandlord shall pay a commission to KM and to Cushman pursuant to separate written agreement.

13. Mediation. Notwithstanding any provision to the contrary in the Sublease, the Parties agree to non-binding mediation of any dispute between some or all of them arising out of this Sublease, prior to any court action or arbitration. The mediator’s fees shall be split between the disputing Parties. A Party who refuses mediation shall not be entitled to recover prevailing party attorney fees in accordance with the provisions of this Sublease.

14. Survival. The indemnity obligations that shall survive the expiration or sooner termination of this Sublease shall include without limitation the indemnity obligations set forth in Sublease Section 4 and Section 7, and Lease Agreement Article 17 and Article 23.

15. Security Systems. Sublandlord will use its best efforts to transfer the existing Bay Alarm security system, Tyco fire alarm system and the related contracts to Subtenant; provided, however, that Sublandlord shall have no obligation to subsidize such contracts for Subtenant or to provide to Subtenant equipment that is not owned by Sublandlord.

16. Parking. Subtenant shall be granted the right to use all parking on-site at the Project, at no cost to Subtenant, subject to the terms of the Master Lease (which specifies 140 parking spaces).

17. FF&E. Effective as of the Commencement Date, Sublandlord shall convey to Subtenant all of the furniture, fixtures and equipment identified as the "Personal Property" on and pursuant to the Bill of Sale attached hereto as Exhibit D (the "Transferred FF&E"). Sublandlord shall cause all such Transferred FF&E to be located in the Building on the Commencement Date.

(signatures on following page)

IN WITNESS WHEREOF, the Parties have duly executed this Sublease on the date set forth below.

SUBTENANT:	SUBLANDLORD:
Shockwave Medical, Inc.,	**Benvenue Medical, Inc.,**
a Delaware corporation	a Delaware corporation
/s/ Dan Puckett	/s/ Rob Weigle
By:	By:
Dan Puckett	Rob Weigle
Its:	Its:
CFO	CEO
Date	Date
5/7/18	5.9.18

SHOCKWAVE MEDICAL, INC.

2009 EQUITY INCENTIVE PLAN

1. Purposes of the Plan. The purposes of this Plan are:

- to attract and retain the best available personnel for positions of substantial responsibility,
- to provide additional incentive to Employees, Directors and Consultants, and
- to promote the success of the Company's business.

The Plan permits the grant of Incentive Stock Options, Nonstatutory Stock Options, Stock Appreciation Rights, Restricted Stock and Restricted Stock Units.

2. Definitions. As used herein, the following definitions will apply:

(a) "Administrator" means the Board or any of its Committees as will be administering the Plan, in accordance with Section 4 of the Plan.

(b) "Applicable Laws" means the requirements relating to the administration of equity-based awards under U.S. state corporate laws, U.S. federal and state securities laws, the Code, any stock exchange or quotation system on which the Common Stock is listed or quoted and the applicable laws of any foreign country or jurisdiction where Awards are, or will be, granted under the Plan.

(c) "Award" means, individually or collectively, a grant under the Plan of Options, Stock Appreciation Rights, Restricted Stock, or Restricted Stock Units.

(d) "Award Agreement" means the written or electronic agreement setting forth the terms and provisions applicable to each Award granted under the Plan. The Award Agreement is subject to the terms and conditions of the Plan.

(e) "Board" means the Board of Directors of the Company.

(f) "Change in Control" means the occurrence of any of the following events:

(i) Change in Ownership of the Company. A change in the ownership of the Company which occurs on the date that any one person, or more than one person acting as a group ("Person"), acquires ownership of the stock of the Company that, together with the stock held by such Person, constitutes more than 50% of the total voting power of the stock of the Company, except that any change in the ownership of the stock of the Company as a result of a private financing of the Company that is approved by the Board will not be considered a Change in Control; or

(ii) Change in Effective Control of the Company. If the Company has a class of securities registered pursuant to Section 12 of the Exchange Act, a change in the effective control of the Company which occurs on the date that a majority of members of the Board is replaced during any twelve (12) month period by Directors whose appointment or election is not endorsed by a majority of the members of the Board prior to the date of the appointment or election. For purposes of this clause (ii), if any Person is considered to be in effective control of the Company, the acquisition of additional control of the Company by the same Person will not be considered a Change in Control; or

(iii) Change in Ownership of a Substantial Portion of the Company's Assets. A change in the ownership of a substantial portion of the Company's assets which occurs on the date that any Person acquires (or has acquired during the twelve (12) month period ending on the date of the most recent acquisition by such person or persons) assets from the Company that have a total gross fair market value equal to or more than 50% of the total gross fair market value of all of the assets of the Company immediately prior to such acquisition or acquisitions. For purposes of this subsection (iii), gross fair market value means the value of the assets of the Company, or the value of the assets being disposed of, determined without regard to any liabilities associated with such assets.

For purposes of this Section 2(f), persons will be considered to be acting as a group if they are owners of a corporation that enters into a merger, consolidation, purchase or acquisition of stock, or similar business transaction with the Company.

Notwithstanding the foregoing, a transaction will not be deemed a Change in Control unless the transaction qualifies as a change in control event within the meaning of Code Section 409A, as it has been and may be amended from time to time, and any proposed or final Treasury Regulations and Internal Revenue Service guidance that has been promulgated or may be promulgated thereunder from time to time.

Further and for the avoidance of doubt, a transaction will not constitute a Change in Control if: (i) its sole purpose is to change the state of the Company's incorporation, or

(ii) its sole purpose is to create a holding company that will be owned in substantially the same proportions by the persons who held the Company's securities immediately before such transaction.

(g) "Code" means the Internal Revenue Code of 1986, as amended. Any reference to a section of the Code herein will be a reference to any successor or amended section of the Code.

(h) "Committee" means a committee of Directors or of other individuals satisfying Applicable Laws appointed by the Board, or by the compensation committee of the Board, in accordance with Section 4 hereof.

(i) "Common Stock" means the common stock of the Company.

(j) "Company" means ShockWave Medical, Inc., a Delaware corporation, or any successor thereto.

(k) "Consultant" means any person, including an advisor, engaged by the Company or a Parent or Subsidiary to render services to such entity.

(l) "Director" means a member of the Board.

(m) "Disability" means total and permanent disability as defined in Code Section 22(e)(3), provided that in the case of Awards other than Incentive Stock Options, the Administrator in its discretion may determine whether a permanent and total disability exists in accordance with uniform and non-discriminatory standards adopted by the Administrator from time to time.

(n) "Employee" means any person, including officers and Directors, employed by the Company or any Parent or Subsidiary of the Company. Neither service as a Director nor payment of a director's fee by the Company will be sufficient to constitute "employment" by the Company.

(o) "Exchange Act" means the Securities Exchange Act of 1934, as amended.

(p) "Exchange Program" means a program under which (i) outstanding Awards are surrendered or cancelled in exchange for Awards of the same type (which may have higher or lower exercise prices and different terms), Awards of a different type, and/or cash, (ii) Participants would have the opportunity to transfer any outstanding Awards to a financial institution or other person or entity selected by the Administrator, and/or (iii) the exercise price of an outstanding Award is reduced or increased. The Administrator will determine the terms and conditions of any Exchange Program in its sole discretion.

(q) "Fair Market Value" means, as of any date, the value of Common Stock determined as follows:

(i) If the Common Stock is listed on any established stock exchange or a national market system, including without limitation the Nasdaq Global Select Market, the Nasdaq Global Market or the Nasdaq Capital Market of The Nasdaq Stock Market, its Fair Market Value will be the closing sales price for such stock (or the closing bid, if no sales were reported) as quoted on such exchange or system on the day of determination, as reported in *The Wall Street Journal* or such other source as the Administrator deems reliable;

(ii) If the Common Stock is regularly quoted by a recognized securities dealer but selling prices are not reported, the Fair Market Value of a Share will be the mean between the high bid and low asked prices for the Common Stock on the day of determination (or, if no bids and asks were reported on that date, as applicable, on the last trading date such bids and asks were reported), as reported in *The Wall Street Journal* or such other source as the Administrator deems reliable; or

(iii) In the absence of an established market for the Common Stock, the Fair Market Value will be determined in good faith by the Administrator.

(r) "Incentive Stock Option" means an Option that by its terms qualifies and is otherwise intended to qualify as an incentive stock option within the meaning of Code Section 422 and the regulations promulgated thereunder.

(s) "Nonstatutory Stock Option" means an Option that by its terms does not qualify or is not intended to qualify as an Incentive Stock Option.

(t) "Option" means a stock option granted pursuant to the Plan.

(u) "Parent" means a "parent corporation," whether now or hereafter existing, as defined in Code Section 424(e).

(v) "Participant" means the holder of an outstanding Award.

(w) "Period of Restriction" means the period during which the transfer of Shares of Restricted Stock are subject to restrictions and therefore, the Shares are subject to a substantial risk of forfeiture. Such restrictions may be based on the passage of time, the achievement of target levels of performance, or the occurrence of other events as determined by the Administrator.

(x) "Plan" means this 2009 Equity Incentive Plan.

(y) "Restricted Stock" means Shares issued pursuant to an Award of Restricted Stock under Section 8 of the Plan, or issued pursuant to the early exercise of an Option.

(z) "Restricted Stock Unit" means a bookkeeping entry representing an amount equal to the Fair Market Value of one Share, granted pursuant to Section 9. Each Restricted Stock Unit represents an unfunded and unsecured obligation of the Company.

(aa) "Service Provider" means an Employee, Director or Consultant.

(bb) "Share" means a share of the Common Stock, as adjusted in accordance with Section 13 of the Plan.

(cc) "Stock Appreciation Right" means an Award, granted alone or in connection with an Option, that pursuant to Section 7 is designated as a Stock Appreciation Right.

(dd) "Subsidiary" means a "subsidiary corporation," whether now or hereafter existing, as defined in Code Section 424(f).

3. Stock Subject to the Plan.

(a) Stock Subject to the Plan. Subject to the provisions of Section 13 of the Plan, the maximum aggregate number of Shares that may be subject to Awards and sold under the Plan is **61,704,485** Shares. The Shares may be authorized but unissued, or reacquired Common Stock.

(b) Lapsed Awards. If an Award expires or becomes unexercisable without having been exercised in full, is surrendered pursuant to an Exchange Program, or, with respect to Restricted Stock or Restricted Stock Units, is forfeited to or repurchased by the Company due to the failure to vest, the unpurchased Shares (or for Awards other than Options or Stock Appreciation Rights the forfeited or repurchased Shares) which were subject thereto will become available for future grant or sale under the Plan (unless the Plan has terminated). With respect to Stock Appreciation Rights, only Shares actually issued pursuant to a Stock Appreciation Right will cease to be available under the Plan; all remaining Shares under Stock Appreciation Rights will remain available for future grant or sale under the Plan (unless the Plan has terminated). Shares that have actually been issued under the Plan under any Award will not be returned to the Plan and will not become available for future distribution under the Plan; provided, however, that if Shares issued pursuant to Awards of Restricted Stock or Restricted Stock Units are repurchased by the Company or are forfeited to the Company due to the failure to vest, such Shares will become available for future grant under the Plan. Shares used to pay the exercise price of an Award or to satisfy the tax withholding obligations related to an Award will become available for future grant or sale under the Plan. To the extent an Award under the Plan is paid out in cash rather than Shares, such cash payment will not result in reducing the number of Shares available for issuance under the Plan. Notwithstanding the foregoing and, subject to adjustment as provided in Section 13, the maximum number of Shares that may be issued upon the exercise of Incentive Stock Options will equal the aggregate Share number stated in Section 3(a), plus, to the extent allowable under Code Section 422 and the Treasury Regulations promulgated thereunder, any Shares that become available for issuance under the Plan pursuant to Section 3(b).

(c) Share Reserve. The Company, during the term of this Plan, will at all times reserve and keep available such number of Shares as will be sufficient to satisfy the requirements of the Plan.

4. Administration of the Plan.

(a) Procedure.

(i) Multiple Administrative Bodies. Different Committees with respect to different groups of Service Providers may administer the Plan.

(ii) Other Administration. Other than as provided above, the Plan will be administered by (A) the Board or (B) a Committee, which Committee will be constituted to satisfy Applicable Laws.

(b) Powers of the Administrator. Subject to the provisions of the Plan, and in the case of a Committee, subject to the specific duties delegated by the Board to such Committee, the Administrator will have the authority, in its discretion:

(i) to determine the Fair Market Value;

(ii) to select the Service Providers to whom Awards may be granted hereunder;

(iii) to determine the number of Shares to be covered by each Award granted hereunder;

(iv) to approve forms of Award Agreements for use under the Plan;

(v) to determine the terms and conditions, not inconsistent with the terms of the Plan, of any Award granted hereunder. Such terms and conditions include, but are not limited to, the exercise price, the time or times when Awards may be exercised (which may be based on performance criteria), any vesting acceleration or waiver of forfeiture restrictions, and any restriction or limitation regarding any Award or the Shares relating thereto, based in each case on such factors as the Administrator will determine;

(vi) to institute and determine the terms and conditions of an Exchange Program;

(vii) to construe and interpret the terms of the Plan and Awards granted pursuant to the Plan;

(viii) to prescribe, amend and rescind rules and regulations relating to the Plan, including rules and regulations relating to sub-plans established for the purpose of satisfying applicable foreign laws or for qualifying for favorable tax treatment under applicable foreign laws;

(ix) to modify or amend each Award (subject to Section 18(c) of the Plan), including but not limited to the discretionary authority to extend the post-termination exercisability period of Awards and to extend the maximum term of an Option (subject to Section 6(d));

(x) to allow Participants to satisfy withholding tax obligations in a manner prescribed in Section 14;

(xi) to authorize any person to execute on behalf of the Company any instrument required to effect the grant of an Award previously granted by the Administrator;

(xii) to allow a Participant to defer the receipt of the payment of cash or the delivery of Shares that otherwise would be due to such Participant under an Award; and

(xiii) to make all other determinations deemed necessary or advisable for administering the Plan.

(c) Effect of Administrator's Decision. The Administrator's decisions, determinations and interpretations will be final and binding on all Participants and any other holders of Awards.

5. Eligibility. Nonstatutory Stock Options, Stock Appreciation Rights, Restricted Stock, and Restricted Stock Units may be granted to Service Providers. Incentive Stock Options may be granted only to Employees.

6. Stock Options.

(a) Grant of Options. Subject to the terms and provisions of the Plan, the Administrator, at any time and from time to time, may grant Options in such amounts as the Administrator, in its sole discretion, will determine.

(b) Option Agreement. Each Award of an Option will be evidenced by an Award Agreement that will specify the exercise price, the term of the Option, the number of Shares subject to the Option, the exercise restrictions, if any, applicable to the Option, and such other terms and conditions as the Administrator, in its sole discretion, will determine.

(c) Limitations. Each Option will be designated in the Award Agreement as either an Incentive Stock Option or a Nonstatutory Stock Option. Notwithstanding such designation, however, to the extent that the aggregate Fair Market Value of the Shares with respect to which Incentive Stock Options are exercisable for the first time by the Participant during any calendar year (under all plans of the Company and any Parent or Subsidiary) exceeds one hundred thousand dollars ($100,000), such Options will be treated as Nonstatutory Stock Options. For purposes of this Section 6(c), Incentive Stock Options will be taken into account in the order in which they were granted, the Fair Market Value of the Shares will be determined as of the time the Option with respect to such Shares is granted, and calculation will be performed in accordance with Code Section 422 and Treasury Regulations promulgated thereunder.

(d) Term of Option. The term of each Option will be stated in the Award Agreement; provided, however, that the term will be no more than ten (10) years from the date of grant thereof. In the case of an Incentive Stock Option granted to a Participant who, at the time the Incentive Stock Option is granted, owns stock representing more than ten percent (10%) of the total combined voting power of all classes of stock of the Company or any Parent or Subsidiary, the term of the Incentive Stock Option will be five (5) years from the date of grant or such shorter term as may be provided in the Award Agreement.

(e) Option Exercise Price and Consideration.

(i) Exercise Price. The per Share exercise price for the Shares to be issued pursuant to the exercise of an Option will be determined by the Administrator, but will be no less than one hundred percent (100%) of the Fair Market Value per Share on the date of grant. In addition, in the case of an Incentive Stock Option granted to an Employee who owns stock representing more than ten percent (10%) of the voting power of all classes of stock of the Company or any Parent or Subsidiary, the per Share exercise price will be no less than one hundred ten percent (110%) of the Fair Market Value per Share on the date of grant. Notwithstanding the foregoing provisions of this Section 6(e)(i), Options may be granted with a per Share exercise price of less than one hundred percent (100%) of the Fair Market Value per Share on the date of grant pursuant to a transaction described in, and in a manner consistent with, Code Section 424(a).

(ii) Waiting Period and Exercise Dates. At the time an Option is granted, the Administrator will fix the period within which the Option may be exercised and will determine any conditions that must be satisfied before the Option may be exercised.

(iii) Form of Consideration. The Administrator will determine the acceptable form of consideration for exercising an Option, including the method of payment. In the case of an Incentive Stock Option, the Administrator will determine the acceptable form of consideration at the time of grant. Such consideration may consist entirely of: (1) cash; (2) check; (3) promissory note, to the extent permitted by Applicable Laws, (4) other Shares, provided that such Shares have a Fair Market Value on the date of surrender equal to the aggregate exercise price of the Shares as to which such Option will be exercised and provided further that accepting such Shares will not result in any adverse accounting consequences to the Company, as the Administrator determines in its sole discretion; (5) consideration received by the Company under cashless exercise program (whether through a broker or otherwise) implemented by the Company in connection with the Plan; (6) by net exercise, (7) such other consideration and method of payment for the issuance of Shares to the extent permitted by Applicable Laws, or (8) any combination of the foregoing methods of payment. In making its determination as to the type of consideration to accept, the Administrator will consider if acceptance of such consideration may be reasonably expected to benefit the Company.

(f) Exercise of Option.

(i) Procedure for Exercise; Rights as a Stockholder. Any Option granted hereunder will be exercisable according to the terms of the Plan and at such times and under such conditions as determined by the Administrator and set forth in the Award Agreement. An Option may not be exercised for a fraction of a Share.

An Option will be deemed exercised when the Company receives: (i) notice of exercise (in such form as the Administrator may specify from time to time) from the person entitled to exercise the Option, and (ii) full payment for the Shares with respect to which the Option is exercised (together with applicable tax withholding). Full payment may consist of any consideration and method of payment authorized by the Administrator and permitted by the Award Agreement and the Plan. Shares issued upon exercise of an Option will be issued in the name of the Participant or, if requested by the Participant, in the name of the Participant and his or her spouse. Until the Shares are issued (as evidenced by the appropriate entry on the books of the Company or of a duly authorized transfer agent of the Company), no right to vote or receive dividends or any other rights as a stockholder will exist with respect to the Shares subject to an Option, notwithstanding the exercise of the Option. The Company will issue (or cause to be issued) such Shares promptly after the Option is exercised. No adjustment will be made for a dividend or other right for which the record date is prior to the date the Shares are issued, except as provided in Section 13 of the Plan.

Exercising an Option in any manner will decrease the number of Shares thereafter available, both for purposes of the Plan and for sale under the Option, by the number of Shares as to which the Option is exercised.

(ii) Termination of Relationship as a Service Provider. If a Participant ceases to be a Service Provider, other than upon the Participant's termination as the result of the Participant's death or Disability, the Participant may exercise his or her Option within thirty (30) days of termination, or such longer period of time as is specified in the Award Agreement (but in no event later than the expiration of the term of such Option as set forth in the Award Agreement) to the extent that the Option is vested on the date of termination. Unless otherwise provided by the

Administrator, if on the date of termination the Participant is not vested as to his or her entire Option, the Shares covered by the unvested portion of the Option will revert to the Plan. If after termination the Participant does not exercise his or her Option within the time specified by the Administrator, the Option will terminate, and the Shares covered by such Option will revert to the Plan.

(iii) Disability of Participant. If a Participant ceases to be a Service Provider as a result of the Participant's Disability, the Participant may exercise his or her Option within six (6) months of termination, or such longer period of time as is specified in the Award Agreement (but in no event later than the expiration of the term of such Option as set forth in the Award Agreement) to the extent the Option is vested on the date of termination. Unless otherwise provided by the Administrator, if on the date of termination the Participant is not vested as to his or her entire Option, the Shares covered by the unvested portion of the Option will revert to the Plan. If after termination the Participant does not exercise his or her Option within the time specified herein, the Option will terminate, and the Shares covered by such Option will revert to the Plan.

(iv) Death of Participant. If a Participant dies while a Service Provider, the Option may be exercised within six (6) months following the Participant's death, or within such longer period of time as is specified in the Award Agreement (but in no event later than the expiration of the term of such Option as set forth in the Award Agreement) to the extent that the Option is vested on the date of death, by the Participant's designated beneficiary, provided such beneficiary has been designated prior to the Participant's death in a form acceptable to the Administrator. If no such beneficiary has been designated by the Participant, then such Option may be exercised by the personal representative of the Participant's estate or by the person(s) to whom the Option is transferred pursuant to the Participant's will or in accordance with the laws of descent and distribution. Unless otherwise provided by the Administrator, if at the time of death Participant is not vested as to his or her entire Option, the Shares covered by the unvested portion of the Option will immediately revert to the Plan. If the Option is not so exercised within the time specified herein, the Option will terminate, and the Shares covered by such Option will revert to the Plan.

7. Stock Appreciation Rights.

(a) Grant of Stock Appreciation Rights. Subject to the terms and conditions of the Plan, a Stock Appreciation Right may be granted to Service Providers at any time and from time to time as will be determined by the Administrator, in its sole discretion.

(b) Number of Shares. The Administrator will have complete discretion to determine the number of Shares subject to any Award of Stock Appreciation Rights.

(c) Exercise Price and Other Terms. The per Share exercise price for the Shares that will determine the amount of the payment to be received upon exercise of a Stock Appreciation Right as set forth in Section 7(f) will be determined by the Administrator and will be no less than one hundred percent (100%) of the Fair Market Value per Share on the date of grant. Otherwise, the Administrator, subject to the provisions of the Plan, will have complete discretion to determine the terms and conditions of Stock Appreciation Rights granted under the Plan.

(d) Stock Appreciation Right Agreement. Each Stock Appreciation Right grant will be evidenced by an Award Agreement that will specify the exercise price, the term of the Stock Appreciation Right, the conditions of exercise, and such other terms and conditions as the Administrator, in its sole discretion, will determine.

(e) Expiration of Stock Appreciation Rights. A Stock Appreciation Right granted under the Plan will expire upon the date determined by the Administrator, in its sole discretion, and set forth in the Award Agreement. Notwithstanding the foregoing, the rules of Section 6(d) relating to the maximum term and Section 6(f) relating to exercise also will apply to Stock Appreciation Rights.

(f) Payment of Stock Appreciation Right Amount. Upon exercise of a Stock Appreciation Right, a Participant will be entitled to receive payment from the Company in an amount determined by multiplying:

(i) The difference between the Fair Market Value of a Share on the date of exercise over the exercise price; times

(ii) The number of Shares with respect to which the Stock Appreciation Right is exercised.

At the discretion of the Administrator, the payment upon Stock Appreciation Right exercise may be in cash, in Shares of equivalent value, or in some combination thereof.

8. Restricted Stock.

(a) Grant of Restricted Stock. Subject to the terms and provisions of the Plan, the Administrator, at any time and from time to time, may grant Shares of Restricted Stock to Service Providers in such amounts as the Administrator, in its sole discretion, will determine.

(b) Restricted Stock Agreement. Each Award of Restricted Stock will be evidenced by an Award Agreement that will specify the Period of Restriction, the number of Shares granted, and such other terms and conditions as the Administrator, in its sole discretion, will determine. Unless the Administrator determines otherwise, the Company as escrow agent will hold Shares of Restricted Stock until the restrictions on such Shares have lapsed.

(c) Transferability. Except as provided in this Section 8 or as the Administrator determines, Shares of Restricted Stock may not be sold, transferred, pledged, assigned, or otherwise alienated or hypothecated until the end of the applicable Period of Restriction.

(d) Other Restrictions. The Administrator, in its sole discretion, may impose such other restrictions on Shares of Restricted Stock as it may deem advisable or appropriate.

(e) Removal of Restrictions. Except as otherwise provided in this Section 8, Shares of Restricted Stock covered by each Restricted Stock grant made under the Plan will be released from escrow as soon as practicable after the last day of the Period of Restriction or at such other time as the Administrator may determine. The Administrator, in its discretion, may accelerate the time at which any restrictions will lapse or be removed.

(f) Voting Rights. During the Period of Restriction, Service Providers holding Shares of Restricted Stock granted hereunder may exercise full voting rights with respect to those Shares, unless the Administrator determines otherwise.

(g) Dividends and Other Distributions. During the Period of Restriction, Service Providers holding Shares of Restricted Stock will be entitled to receive all dividends and other distributions paid with respect to such Shares, unless the Administrator provides otherwise. If any such dividends or distributions are paid in Shares, the Shares will be subject to the same restrictions on transferability and forfeitability as the Shares of Restricted Stock with respect to which they were paid.

(h) Return of Restricted Stock to Company. On the date set forth in the Award Agreement, the Restricted Stock for which restrictions have not lapsed will revert to the Company and again will become available for grant under the Plan.

9. Restricted Stock Units.

(a) Grant. Restricted Stock Units may be granted at any time and from time to time as determined by the Administrator. After the Administrator determines that it will grant Restricted Stock Units, it will advise the Participant in an Award Agreement of the terms, conditions, and restrictions related to the grant, including the number of Restricted Stock Units.

(b) Vesting Criteria and Other Terms. The Administrator will set vesting criteria in its discretion, which, depending on the extent to which the criteria are met, will determine the number of Restricted Stock Units that will be paid out to the Participant. The Administrator may set vesting criteria based upon the achievement of Company-wide, business unit, or individual goals (including, but not limited to, continued employment or service), or any other basis determined by the Administrator in its discretion.

(c) Earning Restricted Stock Units. Upon meeting the applicable vesting criteria, the Participant will be entitled to receive a payout as determined by the Administrator. Notwithstanding the foregoing, at any time after the grant of Restricted Stock Units, the Administrator, in its sole discretion, may reduce or waive any vesting criteria that must be met to receive a payout.

(d) Form and Timing of Payment. Payment of earned Restricted Stock Units will be made as soon as practicable after the date(s) determined by the Administrator and set forth in the Award Agreement. The Administrator, in its sole discretion, may settle earned Restricted Stock Units in cash, Shares, or a combination of both.

(e) Cancellation. On the date set forth in the Award Agreement, all unearned Restricted Stock Units will be forfeited to the Company.

10. Compliance With Code Section 409A. Awards will be designed and operated in such a manner that they are either exempt from the application of, or comply with, the requirements of Code Section 409A, except as otherwise determined in the sole discretion of the Administrator. The Plan and each Award Agreement under the Plan is intended to meet the requirements of Code Section 409A and will be construed and interpreted in accordance with such intent, except as

otherwise determined in the sole discretion of the Administrator. To the extent that an Award or payment, or the settlement or deferral thereof, is subject to Code Section 409A the Award will be granted, paid, settled or deferred in a manner that will meet the requirements of Code Section 409A, such that the grant, payment, settlement or deferral will not be subject to the additional tax or interest applicable under Code Section 409A.

11. Leaves of Absence/Transfer Between Locations. Unless the Administrator provides otherwise, vesting of Awards granted hereunder will be suspended during any unpaid leave of absence. A Participant will not cease to be an Employee in the case of (i) any leave of absence approved by the Company or (ii) transfers between locations of the Company or between the Company, its Parent, or any Subsidiary. For purposes of Incentive Stock Options, no such leave may exceed three (3) months, unless reemployment upon expiration of such leave is guaranteed by statute or contract. If reemployment upon expiration of a leave of absence approved by the Company is not so guaranteed, then six (6) months following the first (1st) day of such leave, any Incentive Stock Option held by the Participant will cease to be treated as an Incentive Stock Option and will be treated for tax purposes as a Nonstatutory Stock Option.

12. Limited Transferability of Awards.

(a) Unless determined otherwise by the Administrator, Awards may not be sold, pledged, assigned, hypothecated, or otherwise transferred in any manner other than by will or by the laws of descent and distribution, and may be exercised, during the lifetime of the Participant, only by the Participant. If the Administrator makes an Award transferable, such Award may only be transferred (i) by will, (ii) by the laws of descent and distribution, or (iii) as permitted by Rule 701 of the Securities Act of 1933, as amended (the "Securities Act").

(b) Further, until the Company becomes subject to the reporting requirements of Section 13 or 15(d) of the Exchange Act, or after the Administrator determines that it is, will, or may no longer be relying upon the exemption from registration under the Exchange Act as set forth in Rule 12h-1(f) promulgated under the Exchange Act, an Option, or prior to exercise, the Shares subject to the Option, may not be pledged, hypothecated or otherwise transferred or disposed of, in any manner, including by entering into any short position, any "put equivalent position" or any "call equivalent position" (as defined in Rule 16a-1(h) and Rule 16a-1(b) of the Exchange Act, respectively), other than to (i) persons who are "family members" (as defined in Rule 701(c)(3) of the Securities Act) through gifts or domestic relations orders, or (ii) to an executor or guardian of the Participant upon the death or disability of the Participant. Notwithstanding the foregoing sentence, the Administrator, in its sole discretion, may determine to permit transfers to the Company or in connection with a Change in Control or other acquisition transactions involving the Company to the extent permitted by Rule 12h-1(f).

13. Adjustments; Dissolution or Liquidation; Merger or Change in Control.

(a) Adjustments. In the event that any dividend or other distribution (whether in the form of cash, Shares, other securities, or other property), recapitalization, stock split, reverse stock split, reorganization, merger, consolidation, split-up, spin-off, combination, repurchase, or exchange of Shares or other securities of the Company, or other change in the corporate structure of the Company affecting the Shares occurs, the Administrator, in order to prevent diminution or

enlargement of the benefits or potential benefits intended to be made available under the Plan, will adjust the number and class of Shares that may be delivered under the Plan and/or the number, class, and price of Shares covered by each outstanding Award; provided, however, that the Administrator will make such adjustments to an Award required by Section 25102(o) of the California Corporations Code to the extent the Company is relying upon the exemption afforded thereby with respect to the Award.

(b) Dissolution or Liquidation. In the event of the proposed dissolution or liquidation of the Company, the Administrator will notify each Participant as soon as practicable prior to the effective date of such proposed transaction. To the extent it has not been previously exercised, an Award will terminate immediately prior to the consummation of such proposed action.

(c) Merger or Change in Control. In the event of a merger or Change in Control, each outstanding Award will be treated as the Administrator determines without a Participant's consent, including, without limitation, that (i) Awards will be assumed, or substantially equivalent Awards will be substituted, by the acquiring or succeeding corporation (or an affiliate thereof) with appropriate adjustments as to the number and kind of shares and prices; (ii) upon written notice to a Participant, that the Participant's Awards will terminate upon or immediately prior to the consummation of such merger or Change in Control (subject to the provisions of the proceeding paragraph); (iii) outstanding Awards will vest and become exercisable, realizable, or payable, or restrictions applicable to an Award will lapse, in whole or in part prior to or upon consummation of such merger or Change in Control, and, to the extent the Administrator determines, terminate upon or immediately prior to the effectiveness of such merger of Change in Control; (iv) (A) the termination of an Award in exchange for an amount of cash and/or property, if any, equal to the amount that would have been attained upon the exercise of such Award or realization of the Participant's rights as of the date of the occurrence of the transaction (and, for the avoidance of doubt, if as of the date of the occurrence of the transaction the Administrator determines in good faith that no amount would have been attained upon the exercise of such Award or realization of the Participant's rights, then such Award may be terminated by the Company without payment), or (B) the replacement of such Award with other rights or property selected by the Administrator in its sole discretion; or (v) any combination of the foregoing. In taking any of the actions permitted under this subsection 13(c), the Administrator will not be obligated to treat all Awards, all Awards held by a Participant, or all Awards of the same type, similarly.

In the event that the successor corporation does not assume or substitute for the Award (or portion thereof), the Participant will fully vest in and have the right to exercise all of his or her outstanding Options and Stock Appreciation Rights, including Shares as to which such Awards would not otherwise be vested or exercisable, all restrictions on Restricted Stock and Restricted Stock Units will lapse, and, with respect to Awards with performance-based vesting, all performance goals or other vesting criteria will be deemed achieved at one hundred percent (100%) of target levels and all other terms and conditions met. In addition, if an Option or Stock Appreciation Right is not assumed or substituted in the event of a merger or Change in Control, the Administrator will notify the Participant in writing or electronically that the Option or Stock Appreciation Right will be exercisable for a period of time determined by the Administrator in its sole discretion, and the Option or Stock Appreciation Right will terminate upon the expiration of such period.

For the purposes of this subsection 13(c), an Award will be considered assumed if, following the merger or Change in Control, the Award confers the right to purchase or receive, for each Share subject to the Award immediately prior to the merger or Change in Control, the consideration (whether stock, cash, or other securities or property) received in the merger or Change in Control by holders of Common Stock for each Share held on the effective date of the transaction (and if holders were offered a choice of consideration, the type of consideration chosen by the holders of a majority of the outstanding Shares); provided, however, that if such consideration received in the merger or Change in Control is not solely common stock of the successor corporation or its Parent, the Administrator may, with the consent of the successor corporation, provide for the consideration to be received upon the exercise of an Option or Stock Appreciation Right or upon the payout of a Restricted Stock Unit, for each Share subject to such Award, to be solely common stock of the successor corporation or its Parent equal in fair market value to the per share consideration received by holders of Common Stock in the merger or Change in Control.

Notwithstanding anything in this Section 13(c) to the contrary, an Award that vests, is earned or paid-out upon the satisfaction of one or more performance goals will not be considered assumed if the Company or its successor modifies any of such performance goals without the Participant's consent; provided, however, a modification to such performance goals only to reflect the successor corporation's post-Change in Control corporate structure will not be deemed to invalidate an otherwise valid Award assumption.

Notwithstanding anything in this Section 13(c) to the contrary, if a payment under an Award Agreement is subject to Code Section 409A and if the change in control definition contained in the Award Agreement does not comply with the definition of "change of control" for purposes of a distribution under Code Section 409A, then any payment of an amount that is otherwise accelerated under this Section will be delayed until the earliest time that such payment would be permissible under Code Section 409A without triggering any penalties applicable under Code Section 409A.

14. Tax Withholding.

(a) Withholding Requirements. Prior to the delivery of any Shares or cash pursuant to an Award (or exercise thereof), the Company will have the power and the right to deduct or withhold, or require a Participant to remit to the Company, an amount sufficient to satisfy federal, state, local, foreign or other taxes (including the Participant's FICA obligation) required to be withheld with respect to such Award (or exercise thereof).

(b) Withholding Arrangements. The Administrator, in its sole discretion and pursuant to such procedures as it may specify from time to time, may permit a Participant to satisfy such tax withholding obligation, in whole or in part by (without limitation) (i) paying cash, (ii) electing to have the Company withhold otherwise deliverable Shares having a Fair Market Value equal to the minimum statutory amount required to be withheld, (iii) delivering to the Company already-owned Shares having a Fair Market Value equal to the statutory amount required to be withheld, provided the delivery of such Shares will not result in any adverse accounting consequences, as the Administrator determines in its sole discretion, or (iv) selling a sufficient number of Shares otherwise deliverable to the Participant through such means as the Administrator may determine in its sole discretion (whether through a broker or otherwise) equal to the amount

required to be withheld. The amount of the withholding requirement will be deemed to include any amount which the Administrator agrees may be withheld at the time the election is made, not to exceed the amount determined by using the maximum federal, state or local marginal income tax rates applicable to the Participant with respect to the Award on the date that the amount of tax to be withheld is to be determined. The Fair Market Value of the Shares to be withheld or delivered will be determined as of the date that the taxes are required to be withheld.

15. No Effect on Employment or Service. Neither the Plan nor any Award will confer upon a Participant any right with respect to continuing the Participant's relationship as a Service Provider with the Company, nor will they interfere in any way with the Participant's right or the Company's right to terminate such relationship at any time, with or without cause, to the extent permitted by Applicable Laws.

16. Date of Grant. The date of grant of an Award will be, for all purposes, the date on which the Administrator makes the determination granting such Award, or such other later date as is determined by the Administrator. Notice of the determination will be provided to each Participant within a reasonable time after the date of such grant.

17. Term of Plan. Subject to Section 21 of the Plan, the Plan will become effective upon its adoption by the Board. Unless sooner terminated under Section 18, it will continue in effect for a term of ten (10) years from the later of (a) the effective date of the Plan, or (b) the earlier of the most recent Board or stockholder approval of an increase in the number of Shares reserved for issuance under the Plan.

18. Amendment and Termination of the Plan.

(a) Amendment and Termination. The Board may at any time amend, alter, suspend or terminate the Plan.

(b) Stockholder Approval. The Company will obtain stockholder approval of any Plan amendment to the extent necessary and desirable to comply with Applicable Laws.

(c) Effect of Amendment or Termination. No amendment, alteration, suspension or termination of the Plan will impair the rights of any Participant, unless mutually agreed otherwise between the Participant and the Administrator, which agreement must be in writing and signed by the Participant and the Company. Termination of the Plan will not affect the Administrator's ability to exercise the powers granted to it hereunder with respect to Awards granted under the Plan prior to the date of such termination.

19. Conditions Upon Issuance of Shares.

(a) Legal Compliance. Shares will not be issued pursuant to the exercise of an Award unless the exercise of such Award and the issuance and delivery of such Shares will comply with Applicable Laws and will be further subject to the approval of counsel for the Company with respect to such compliance.

(b) Investment Representations. As a condition to the exercise of an Award, the Company may require the person exercising such Award to represent and warrant at the time of any such exercise that the Shares are being purchased only for investment and without any present intention to sell or distribute such Shares if, in the opinion of counsel for the Company, such a representation is required.

20. Inability to Obtain Authority. The inability of the Company to obtain authority from any regulatory body having jurisdiction, which authority is deemed by the Company's counsel to be necessary to the lawful issuance and sale of any Shares hereunder, will relieve the Company of any liability in respect of the failure to issue or sell such Shares as to which such requisite authority will not have been obtained.

21. Stockholder Approval. The Plan will be subject to approval by the stockholders of the Company within twelve (12) months after the date the Plan is adopted by the Board. Such stockholder approval will be obtained in the manner and to the degree required under Applicable Laws.

22. Information to Participants. Beginning on the earlier of (i) the date that the aggregate number of Participants under this Plan is five hundred (500) or more and the Company is relying on the exemption provided by Rule 12h-1(f)(1) under the Exchange Act and (ii) the date that the Company is required to deliver information to Participants pursuant to Rule 701 under the Securities Act, and until such time as the Company becomes subject to the reporting requirements of Section 13 or 15(d) of the Exchange Act, is no longer relying on the exemption provided by Rule 12h-1(f)(1) under the Exchange Act or is no longer required to deliver information to Participants pursuant to Rule 701 under the Securities Act, the Company shall provide to each Participant the information described in paragraphs (e)(3), (4), and (5) of Rule 701 under the Securities Act not less frequently than every six (6) months with the financial statements being not more than 180 days old and with such information provided either by physical or electronic delivery to the Participants or by written notice to the Participants of the availability of the information on an Internet site that may be password-protected and of any password needed to access the information. The Company may request that Participants agree to keep the information to be provided pursuant to this section confidential. If a Participant does not agree to keep the information to be provided pursuant to this section confidential, then the Company will not be required to provide the information unless otherwise required pursuant to Rule 12h-1(f)(1) under the Exchange Act or Rule 701 of the Securities Act.

SHOCKWAVE MEDICAL, INC.

2009 EQUITY INCENTIVE PLAN

STOCK OPTION AGREEMENT

Unless otherwise defined herein, the terms defined in the 2009 Equity Incentive Plan (the "Plan") shall have the same defined meanings in this Stock Option Agreement (the "Option Agreement").

I. NOTICE OF STOCK OPTION GRANT

Name:

The undersigned Participant has been granted an Option to purchase Common Stock of the Company, subject to the terms and conditions of the Plan and this Option Agreement, as follows:

Date of Grant:	
Vesting Commencement Date:	
Exercise Price per Share:	
Total Number of Shares Granted:	
Total Exercise Price :	
Type of Option:	
Term/Expiration Date:	

Vesting Schedule:

This Option shall be exercisable, in whole or in part, according to the following vesting schedule:

Termination Period:

This Option shall be exercisable for three (3) months after Participant ceases to be a Service Provider, unless such termination is due to Participant's death or Disability, in which case this Option shall be exercisable for twelve (12) months after Participant ceases to be a Service Provider. Notwithstanding the foregoing sentence, in no event may this Option be exercised after the Term/Expiration Date as provided above and this Option may be subject to earlier termination as provided in Section 13(c) of the Plan.

II. AGREEMENT

1. Grant of Option. The Administrator of the Company hereby grants to the Participant named in the Notice of Stock Option Grant in Part I of this Agreement ("Participant"), an option (the "Option") to purchase the number of Shares set forth in the Notice of Stock Option Grant, at the exercise price per Share set forth in the Notice of Stock Option Grant (the "Exercise Price"), and subject to the terms and conditions of the Plan, which is incorporated herein by reference. Subject to Section 18(c) of the Plan, in the event of a conflict between the terms and conditions of the Plan and this Option Agreement, the terms and conditions of the Plan shall prevail.

If designated in the Notice of Stock Option Grant as an Incentive Stock Option ("ISO"), this Option is intended to qualify as an Incentive Stock Option as defined in Section 422 of the Code. Nevertheless, to the extent that it exceeds the $100,000 rule of Code Section 422(d), this Option shall be treated as a Nonstatutory Stock Option ("NSO"). Further, if for any reason this Option (or portion thereof) shall not qualify as an ISO, then, to the extent of such nonqualification, such Option (or portion thereof) shall be regarded as a NSO granted under the Plan. In no event shall the Administrator, the Company or any Parent or Subsidiary or any of their respective employees or directors have any liability to Participant (or any other person) due to the failure of the Option to qualify for any reason as an ISO.

2. Exercise of Option.

(a) Right to Exercise. This Option shall be exercisable during its term in accordance with the Vesting Schedule set out in the Notice of Stock Option Grant and with the applicable provisions of the Plan and this Option Agreement.

(b) Method of Exercise. This Option shall be exercisable by delivery of an exercise notice in the form attached as Exhibit A (the "Exercise Notice") or in a manner and pursuant to such procedures as the Administrator may determine, which shall state the election to exercise the Option, the number of Shares with respect to which the Option is being exercised, and such other representations and agreements as may be required by the Company. The Exercise Notice shall be accompanied by payment of the aggregate Exercise Price as to all Exercised Shares, together with any applicable tax withholding. This Option shall be deemed to be exercised upon receipt by the Company of such fully executed Exercise Notice accompanied by the aggregate Exercise Price, together with any applicable tax withholding.

No Shares shall be issued pursuant to the exercise of an Option unless such issuance and such exercise comply with Applicable Laws. Assuming such compliance, for income tax purposes the Shares shall be considered transferred to Participant on the date on which the Option is exercised with respect to such Shares.

3. Participant's Representations. In the event the Shares have not been registered under the Securities Act of 1933, as amended, at the time this Option is exercised, Participant shall, if required by the Company, concurrently with the exercise of all or any portion of this Option, deliver to the Company his or her Investment Representation Statement in the form attached hereto as Exhibit B.

4. Lock-Up Period. Participant hereby agrees that Participant shall not offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, lend, or otherwise transfer or dispose of, directly or indirectly, any Common Stock (or other securities) of the Company or enter into any swap, hedging or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of any Common Stock (or other securities) of the Company held by Participant (other than those included in the registration) for a period specified by the representative of the underwriters of Common Stock (or other securities) of the Company not to exceed one hundred and eighty (180) days following the effective date of any registration statement of the Company filed under the Securities Act (or such other period as may be requested by the Company or the underwriters to accommodate regulatory restrictions on (i) the publication or other distribution of research reports and (ii) analyst recommendations and opinions, including, but not limited to, the restrictions contained in NASD Rule 2711(f)(4) or NYSE Rule 472(f)(4), or any successor provisions or amendments thereto).

Participant agrees to execute and deliver such other agreements as may be reasonably requested by the Company or the underwriter which are consistent with the foregoing or which are necessary to give further effect thereto. In addition, if requested by the Company or the representative of the underwriters of Common Stock (or other securities) of the Company, Participant shall provide, within ten (10) days of such request, such information as may be required by the Company or such representative in connection with the completion of any public offering of the Company's securities pursuant to a registration statement filed under the Securities Act. The obligations described in this Section 4 shall not apply to a registration relating solely to employee benefit plans on Form S-1 or Form S-8 or similar forms that may be promulgated in the future, or a registration relating solely to a Commission Rule 145 transaction on Form S-4 or similar forms that may be promulgated in the future. The Company may impose stop-transfer instructions with respect to the shares of Common Stock (or other securities) subject to the foregoing restriction until the end of said one hundred and eighty (180) day (or other) period. Participant agrees that any transferee of the Option or shares acquired pursuant to the Option shall be bound by this Section 4.

5. Method of Payment. Payment of the aggregate Exercise Price shall be by any of the following, or a combination thereof, at the election of the Participant:

(a) cash;

(b) check;

(c) consideration received by the Company under a formal cashless exercise program adopted by the Company in connection with the Plan; or

(d) surrender of other Shares which (i) shall be valued at its Fair Market Value on the date of exercise, and (ii) must be owned free and clear of any liens, claims, encumbrances or security interests, if accepting such Shares, in the sole discretion of the Administrator, shall not result in any adverse accounting consequences to the Company.

6. Restrictions on Exercise. This Option may not be exercised until such time as the Plan has been approved by the stockholders of the Company, or if the issuance of such Shares upon such exercise or the method of payment of consideration for such shares would constitute a violation of any Applicable Law.

7. Non-Transferability of Option.

(a) This Option may not be transferred in any manner otherwise than by will or by the laws of descent or distribution and may be exercised during the lifetime of Participant only by Participant. The terms of the Plan and this Option Agreement shall be binding upon the executors, administrators, heirs, successors and assigns of Participant.

(b) Further, until the Company becomes subject to the reporting requirements of Section 13 or 15(d) of the Exchange Act, or after the Administrator determines that it is, will, or may no longer be relying upon the exemption from registration of Options under the Exchange Act as set forth in Rule 12h-1(f) promulgated under the Exchange Act (the "Reliance End Date"), Participant shall not transfer this Option or, prior to exercise, the Shares subject to this Option, in any manner other than (i) to persons who are "family members" (as defined in Rule 701(c)(3) of the Securities Act of 1933, as amended) through gifts or domestic relations orders, or (ii) to an executor or guardian of Participant upon the death or disability of Participant. Until the Reliance End Date, the Options and, prior to exercise, the Shares subject to this Option, may not be pledged, hypothecated or otherwise transferred or disposed of, including by entering into any short position, any "put equivalent position" or any "call equivalent position" (as defined in Rule 16a-1(h) and Rule 16a-1(b) of the Exchange Act, respectively), other than as permitted in clauses (i) and (ii) of this paragraph.

8. Term of Option. This Option may be exercised only within the term set out in the Notice of Stock Option Grant, and may be exercised during such term only in accordance with the Plan and the terms of this Option.

9. Tax Obligations.

(a) Tax Withholding. Participant agrees to make appropriate arrangements with the Company (or the Parent or Subsidiary employing or retaining Participant) for the satisfaction of all Federal, state, local and foreign income and employment tax withholding requirements applicable to the Option exercise. Participant acknowledges and agrees that the Company may refuse to honor the exercise and refuse to deliver the Shares if such withholding amounts are not delivered at the time of exercise.

(b) Notice of Disqualifying Disposition of ISO Shares. If the Option granted to Participant herein is an ISO, and if Participant sells or otherwise disposes of any of the Shares acquired pursuant to the ISO on or before the later of (i) the date two (2) years after the Date of Grant, or (ii) the date one (1) year after the date of exercise, Participant shall immediately notify the Company in writing of such disposition. Participant agrees that Participant may be subject to income tax withholding by the Company on the compensation income recognized by Participant.

(c) Code Section 409A. Under Code Section 409A, an Option that vests after December 31, 2004 (or that vested on or prior to such date but which was materially modified after October 3, 2004) that was granted with a per Share exercise price that is determined by the Internal Revenue Service (the "IRS") to be less than the Fair Market Value of a Share on the date of grant (a "discount option") may be considered "deferred compensation." An Option that is a "discount option" may result in (i) income recognition by Participant prior to the exercise of the Option, (ii) an additional twenty percent (20%) federal income tax, and (iii) potential penalty and interest charges.

The “discount option” may also result in additional state income, penalty and interest tax to the Participant. Participant acknowledges that the Company cannot and has not guaranteed that the IRS will agree that the per Share exercise price of this Option equals or exceeds the Fair Market Value of a Share on the date of grant in a later examination. Participant agrees that if the IRS determines that the Option was granted with a per Share exercise price that was less than the Fair Market Value of a Share on the date of grant, Participant shall be solely responsible for Participant’s costs related to such a determination.

10. Entire Agreement; Governing Law. The Plan is incorporated herein by reference. The Plan and this Option Agreement constitute the entire agreement of the parties with respect to the subject matter hereof and supersede in their entirety all prior undertakings and agreements of the Company and Participant with respect to the subject matter hereof, and may not be modified adversely to the Participant’s interest except by means of a writing signed by the Company and Participant. This Agreement is governed by the internal substantive laws but not the choice of law rules of California.

11. No Guarantee of Continued Service. PARTICIPANT ACKNOWLEDGES AND AGREES THAT THE VESTING OF SHARES PURSUANT TO THE VESTING SCHEDULE HEREOF IS EARNED ONLY BY CONTINUING AS A SERVICE PROVIDER AT THE WILL OF THE COMPANY (OR THE PARENT OR SUBSIDIARY EMPLOYING OR RETAINING PARTICIPANT) AND NOT THROUGH THE ACT OF BEING HIRED, BEING GRANTED THIS OPTION OR ACQUIRING SHARES HEREUNDER. PARTICIPANT FURTHER ACKNOWLEDGES AND AGREES THAT THIS AGREEMENT, THE TRANSACTIONS CONTEMPLATED HEREUNDER AND THE VESTING SCHEDULE SET FORTH HEREIN DO NOT CONSTITUTE AN EXPRESS OR IMPLIED PROMISE OF CONTINUED ENGAGEMENT AS A SERVICE PROVIDER FOR THE VESTING PERIOD, FOR ANY PERIOD, OR AT ALL, AND SHALL NOT INTERFERE IN ANY WAY WITH PARTICIPANT’S RIGHT OR THE RIGHT OF THE COMPANY (OR THE PARENT OR SUBSIDIARY EMPLOYING OR RETAINING PARTICIPANT) TO TERMINATE PARTICIPANT’S RELATIONSHIP AS A SERVICE PROVIDER AT ANY TIME, WITH OR WITHOUT CAUSE.

Participant acknowledges receipt of a copy of the Plan and represents that he or she is familiar with the terms and provisions thereof, and hereby accepts this Option subject to all of the terms and provisions thereof. Participant has reviewed the Plan and this Option in their entirety, has had an opportunity to obtain the advice of counsel prior to executing this Option and fully understands all provisions of the Option. Participant hereby agrees to accept as binding, conclusive and final all decisions or interpretations of the Administrator upon any questions arising under the Plan or this Option. Participant further agrees to notify the Company upon any change in the residence address indicated below.

PARTICIPANT	SHOCKWAVE MEDICAL, INC.
Signature	By
Print Name	Print Name
	Title
Residence Address	
Email Address	

EXHIBIT A

2009 EQUITY INCENTIVE PLAN

EXERCISE NOTICE

ShockWave Medical, Inc.
48501 Warm Springs Blvd., Ste. 108
Fremont, CA 94539
Attention: Corporate Secretary

1. Exercise of Option. Effective as of today, , , the undersigned ("Participant") hereby elects to exercise Participant's option (the "Option") to purchase shares of the Common Stock (the "Shares") of ShockWave Medical, Inc. (the "Company") under and pursuant to the 2009 Equity Incentive Plan (the "Plan") and the Stock Option Agreement dated [] (the "Option Agreement").

2. Delivery of Payment. Participant herewith delivers to the Company the full purchase price of the Shares, as set forth in the Option Agreement, and any and all withholding taxes due in connection with the exercise of the Option.

3. Representations of Participant. Participant acknowledges that Participant has received, read and understood the Plan and the Option Agreement and agrees to abide by and be bound by their terms and conditions.

4. Rights as Stockholder. Until the issuance of the Shares (as evidenced by the appropriate entry on the books of the Company or of a duly authorized transfer agent of the Company), no right to vote or receive dividends or any other rights as a stockholder shall exist with respect to the Common Stock subject to an Award, notwithstanding the exercise of the Option. The Shares shall be issued to Participant as soon as practicable after the Option is exercised in accordance with the Option Agreement. No adjustment shall be made for a dividend or other right for which the record date is prior to the date of issuance except as provided in Section 13 of the Plan.

5. Company's Right of First Refusal. Before any Shares held by Participant or any transferee (either being sometimes referred to herein as the "Holder") may be sold or otherwise transferred (including transfer by gift or operation of law), the Company or its assignee(s) shall have a right of first refusal to purchase the Shares on the terms and conditions set forth in this Section 5 (the "Right of First Refusal").

Notice of Proposed Transfer. The Holder of the Shares shall deliver to the Company a written notice (the "Notice") stating: (i) the Holder's bona fide intention to sell or otherwise transfer such Shares; (ii) the name of each proposed purchaser or other transferee ("Proposed Transferee"); (iii) the number of Shares to be transferred to each Proposed Transferee; and (iv) the bona fide cash price or other consideration for which the Holder proposes to transfer the Shares (the "Offered Price"), and the Holder shall offer the Shares at the Offered Price to the Company or its assignee(s).

Exercise of Right of First Refusal. At any time within thirty (30) days after receipt of the Notice, the Company and/or its assignee(s) may, by giving written notice to the Holder, elect to purchase all, but not less than all, of the Shares proposed to be transferred to any one or more of the Proposed Transferees, at the purchase price determined in accordance with subsection (c) below.

Purchase Price. The purchase price ("Purchase Price") for the Shares purchased by the Company or its assignee(s) under this Section 5 shall be the Offered Price. If the Offered Price includes consideration other than cash, the cash equivalent value of the non-cash consideration shall be determined by the Board of Directors of the Company in good faith.

Payment. Payment of the Purchase Price shall be made, at the option of the Company or its assignee(s), in cash (by check), by cancellation of all or a portion of any outstanding indebtedness of the Holder to the Company (or, in the case of repurchase by an assignee, to the assignee), or by any combination thereof within thirty (30) days after receipt of the Notice or in the manner and at the times set forth in the Notice.

Holder's Right to Transfer. If all of the Shares proposed in the Notice to be transferred to a given Proposed Transferee are not purchased by the Company and/or its assignee(s) as provided in this Section 5, then the Holder may sell or otherwise transfer such Shares to that Proposed Transferee at the Offered Price or at a higher price, *provided* that such sale or other transfer is consummated within one hundred and twenty (120) days after the date of the Notice, that any such sale or other transfer is effected in accordance with any applicable securities laws and that the Proposed Transferee agrees in writing that the provisions of this Section 5 shall continue to apply to the Shares in the hands of such Proposed Transferee. If the Shares described in the Notice are not transferred to the Proposed Transferee within such period, a new Notice shall be given to the Company, and the Company and/or its assignees shall again be offered the Right of First Refusal before any Shares held by the Holder may be sold or otherwise transferred.

Exception for Certain Family Transfers. Anything to the contrary contained in this Section 5 notwithstanding, the transfer of any or all of the Shares during the Participant's lifetime or on the Participant's death by will or intestacy to the Participant's immediate family or a trust for the benefit of the Participant's immediate family shall be exempt from the provisions of this Section 5. "Immediate Family" as used herein shall mean spouse, lineal descendant or antecedent, father, mother, brother or sister. In such case, the transferee or other recipient shall receive and hold the Shares so transferred subject to the provisions of this Section 5, and there shall be no further transfer of such Shares except in accordance with the terms of this Section 5.

Termination of Right of First Refusal. The Right of First Refusal shall terminate as to any Shares upon the earlier of (i) the first sale of Common Stock of the Company to the general public, or (ii) a Change in Control in which the successor corporation has equity securities that are publicly traded.

6. Tax Consultation. Participant understands that Participant may suffer adverse tax consequences as a result of Participant's purchase or disposition of the Shares. Participant represents that Participant has consulted with any tax consultants Participant deems advisable in connection with the purchase or disposition of the Shares and that Participant is not relying on the Company for any tax advice.

7. Restrictive Legends and Stop-Transfer Orders.

Legends. Participant understands and agrees that the Company shall cause the legends set forth below or legends substantially equivalent thereto, to be placed upon any certificate(s) evidencing ownership of the Shares together with any other legends that may be required by the Company or by state or federal securities laws:

THE SECURITIES REPRESENTED HEREBY HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933 (THE "ACT") AND MAY NOT BE OFFERED, SOLD OR OTHERWISE TRANSFERRED, PLEDGED OR HYPOTHECATED UNLESS AND UNTIL REGISTERED UNDER THE ACT OR, IN THE OPINION OF COUNSEL SATISFACTORY TO THE ISSUER OF THESE SECURITIES, SUCH OFFER, SALE OR TRANSFER, PLEDGE OR HYPOTHECATION IS IN COMPLIANCE THEREWITH.

THE SHARES REPRESENTED BY THIS CERTIFICATE ARE SUBJECT TO CERTAIN RESTRICTIONS ON TRANSFER AND A RIGHT OF FIRST REFUSAL HELD BY THE ISSUER OR ITS ASSIGNEE(S) AS SET FORTH IN THE EXERCISE NOTICE BETWEEN THE ISSUER AND THE ORIGINAL HOLDER OF THESE SHARES, A COPY OF WHICH MAY BE OBTAINED AT THE PRINCIPAL OFFICE OF THE ISSUER. SUCH TRANSFER RESTRICTIONS AND RIGHT OF FIRST REFUSAL ARE BINDING ON TRANSFEREES OF THESE SHARES.

THE SHARES REPRESENTED BY THIS CERTIFICATE ARE SUBJECT TO RESTRICTIONS ON TRANSFER FOR A PERIOD OF TIME FOLLOWING THE EFFECTIVE DATE OF THE UNDERWRITTEN PUBLIC OFFERING OF THE COMPANY'S SECURITIES SET FORTH IN AN AGREEMENT BETWEEN THE ISSUER AND THE ORIGINAL HOLDER OF THESE SHARES AND MAY NOT BE SOLD OR OTHERWISE DISPOSED OF BY THE HOLDER PRIOR TO THE EXPIRATION OF SUCH PERIOD WITHOUT THE CONSENT OF THE COMPANY OR THE MANAGING UNDERWRITER.

Stop-Transfer Notices. Participant agrees that, in order to ensure compliance with the restrictions referred to herein, the Company may issue appropriate "stop transfer" instructions to its transfer agent, if any, and that, if the Company transfers its own securities, it may make appropriate notations to the same effect in its own records.

Refusal to Transfer. The Company shall not be required (i) to transfer on its books any Shares that have been sold or otherwise transferred in violation of any of the provisions of this Exercise Notice or (ii) to treat as owner of such Shares or to accord the right to vote or pay dividends to any purchaser or other transferee to whom such Shares shall have been so transferred.

8. Successors and Assigns. The Company may assign any of its rights under this Exercise Notice to single or multiple assignees, and this Exercise Notice shall inure to the benefit of the successors and assigns of the Company. Subject to the restrictions on transfer herein set forth, this Exercise Notice shall be binding upon Participant and his or her heirs, executors, administrators, successors and assigns.

9. Interpretation. Any dispute regarding the interpretation of this Exercise Notice shall be submitted by Participant or by the Company forthwith to the Administrator, which shall review such dispute at its next regular meeting. The resolution of such a dispute by the Administrator shall be final and binding on all parties.

10. Governing Law; Severability. This Exercise Notice is governed by the internal substantive laws, but not the choice of law rules, of California. In the event that any provision hereof becomes or is declared by a court of competent jurisdiction to be illegal, unenforceable or void, this Exercise Notice shall continue in full force and effect.

11. Entire Agreement. The Plan and Option Agreement are incorporated herein by reference. This Exercise Notice, the Plan, the Option Agreement and the Investment Representation Statement constitute the entire agreement of the parties with respect to the subject matter hereof and supersede in their entirety all prior undertakings and agreements of the Company and Participant with respect to the subject matter hereof, and may not be modified adversely to the Participant's interest except by means of a writing signed by the Company and Participant.

Submitted by: PARTICIPANT	Accepted by: SHOCKWAVE MEDICAL, INC.
_____	_____
Signature	By
_____	_____
Print Name	Print Name
	_____
	Title
Address:	Address:
_____	_____
_____	_____
	_____
	Date Received

EXHIBIT B

INVESTMENT REPRESENTATION STATEMENT

PARTICIPANT	:	
COMPANY	:	SHOCKWAVE MEDICAL, INC.
SECURITY	:	COMMON STOCK
AMOUNT	:	
DATE	:	

In connection with the purchase of the above-listed Securities, the undersigned Participant represents to the Company the following:

(a) Participant is aware of the Company's business affairs and financial condition and has acquired sufficient information about the Company to reach an informed and knowledgeable decision to acquire the Securities. Participant is acquiring these Securities for investment for Participant's own account only and not with a view to, or for resale in connection with, any "distribution" thereof within the meaning of the Securities Act of 1933, as amended (the "Securities Act").

(b) Participant acknowledges and understands that the Securities constitute "restricted securities" under the Securities Act and have not been registered under the Securities Act in reliance upon a specific exemption therefrom, which exemption depends upon, among other things, the bona fide nature of Participant's investment intent as expressed herein. In this connection, Participant understands that, in the view of the Securities and Exchange Commission, the statutory basis for such exemption may be unavailable if Participant's representation was predicated solely upon a present intention to hold these Securities for the minimum capital gains period specified under tax statutes, for a deferred sale, for or until an increase or decrease in the market price of the Securities, or for a period of one (1) year or any other fixed period in the future. Participant further understands that the Securities must be held indefinitely unless they are subsequently registered under the Securities Act or an exemption from such registration is available. Participant further acknowledges and understands that the Company is under no obligation to register the Securities. Participant understands that the certificate evidencing the Securities shall be imprinted with any legend required under applicable state securities laws.

(c) Participant is familiar with the provisions of Rule 701 and Rule 144, each promulgated under the Securities Act, which, in substance, permit limited public resale of "restricted securities" acquired, directly or indirectly from the issuer thereof, in a non-public offering subject to the satisfaction of certain conditions. Rule 701 provides that if the issuer qualifies under Rule 701 at the time of the grant of the Option to Participant, the exercise shall be exempt from registration under the Securities Act. In the event the Company becomes subject to the reporting requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, ninety (90) days thereafter (or such longer period as any market stand-off agreement may require) the Securities exempt under Rule 701 may be resold,

subject to the satisfaction of the applicable conditions specified by Rule 144, including in the case of affiliates (1) the availability of certain public information about the Company, (2) the amount of Securities being sold during any three (3) month period not exceeding specified limitations, (3) the resale being made in an unsolicited "broker's transaction", transactions directly with a "market maker" or "riskless principal transactions" (as those terms are defined under the Securities Exchange Act of 1934) and (4) the timely filing of a Form 144, if applicable.

In the event that the Company does not qualify under Rule 701 at the time of grant of the Option, then the Securities may be resold in certain limited circumstances subject to the provisions of Rule 144, which may require (i) the availability of current public information about the Company; (ii) the resale to occur more than a specified period after the purchase and full payment (within the meaning of Rule 144) for the Securities; and (iii) in the case of the sale of Securities by an affiliate, the satisfaction of the conditions set forth in sections (2), (3) and (4) of the paragraph immediately above.

(d) Participant further understands that in the event all of the applicable requirements of Rule 701 or 144 are not satisfied, registration under the Securities Act, compliance with Regulation A, or some other registration exemption shall be required; and that, notwithstanding the fact that Rules 144 and 701 are not exclusive, the Staff of the Securities and Exchange Commission has expressed its opinion that persons proposing to sell private placement securities other than in a registered offering and otherwise than pursuant to Rules 144 or 701 shall have a substantial burden of proof in establishing that an exemption from registration is available for such offers or sales, and that such persons and their respective brokers who participate in such transactions do so at their own risk. Participant understands that no assurances can be given that any such other registration exemption shall be available in such event.

PARTICIPANT

Signature

Print Name

Date

SHOCKWAVE MEDICAL, INC.

2009 EQUITY INCENTIVE PLAN

STOCK OPTION AGREEMENT — EARLY EXERCISE

Unless otherwise defined herein, the terms defined in the 2009 Equity Incentive Plan (the "Plan") shall have the same defined meanings in this Stock Option Agreement – Early Exercise (the "Option Agreement").

I. NOTICE OF STOCK OPTION GRANT

Name:

Address:

The undersigned Participant has been granted an Option to purchase Common Stock of the Company, subject to the terms and conditions of the Plan and this Option Agreement, as follows:

Date of Grant:	
Vesting Commencement Date:	
Exercise Price per Share:	
Total Number of Shares Granted:	
Total Exercise Price:	
Type of Option:	
Term/Expiration Date:	

Vesting Schedule:

This Option shall be exercisable, in whole or in part, according to the following vesting schedule:

Termination Period:

This Option shall be exercisable for three (3) months after Participant ceases to be a Service Provider, unless such termination is due to Participant's death or Disability, in which case this Option shall be exercisable for twelve (12) months after Participant ceases to be a Service Provider. Notwithstanding the foregoing sentence, in no event may this Option be exercised after the Term/Expiration Date as provided above and this Option may be subject to earlier termination as provided in Section 13(c) of the Plan.

II. AGREEMENT

III. Grant of Option. The Administrator of the Company hereby grants to the Participant named in the Notice of Stock Option Grant in Part I of this Agreement ("Participant"), an option (the "Option") to purchase the number of Shares set forth in the Notice of Stock Option Grant, at the exercise price per Share set forth in the Notice of Stock Option Grant (the "Exercise Price"), and subject to the terms and conditions of the Plan, which is incorporated herein by reference. Subject to Section 18(c) of the Plan, in the event of a conflict between the terms and conditions of the Plan and this Option Agreement, the terms and conditions of the Plan shall prevail.

If designated in the Notice of Stock Option Grant as an Incentive Stock Option ("ISO"), this Option is intended to qualify as an Incentive Stock Option as defined in Section 422 of the Code. Nevertheless, to the extent that it exceeds the $100,000 rule of Code Section 422(d), this Option shall be treated as a Nonstatutory Stock Option ("NSO"). Further, if for any reason this Option (or portion thereof) shall not qualify as an ISO, then, to the extent of such nonqualification, such Option (or portion thereof) shall be regarded as a NSO granted under the Plan. In no event shall the Administrator, the Company or any Parent or Subsidiary or any of their respective employees or directors have any liability to Participant (or any other person) due to the failure of the Option to qualify for any reason as an ISO.

IV. Exercise of Option. This Option shall be exercisable during its term in accordance with the provisions of Section 6 of the Plan as follows:

1. Right to Exercise.

(a) Subject to subsections 2(a)(ii) and 2(a)(iii) below, this Option shall be exercisable cumulatively according to the vesting schedule set forth in the Notice of Stock Option Grant. Alternatively, at the election of Participant, this Option may be exercised in whole or in part at any time as to Shares that have not yet vested. Vested Shares shall not be subject to the Company's repurchase right (as set forth in the Restricted Stock Purchase Agreement, attached hereto as Exhibit C-1).

(b) As a condition to exercising this Option for unvested Shares, Participant shall execute the Restricted Stock Purchase Agreement.

(c) This Option may not be exercised for a fraction of a Share.

2. Method of Exercise. This Option shall be exercisable by delivery of an exercise notice in the form attached as Exhibit A (the "Exercise Notice") or in a manner and pursuant to such procedures as the Administrator may determine, which shall state the election to exercise the Option, the number of Shares with respect to which the Option is being exercised, and such other representations and agreements as may be required by the Company. The Exercise Notice shall be accompanied by payment of the aggregate Exercise Price as to all Exercised Shares, together with any applicable tax withholding. This Option shall be deemed to be exercised upon receipt by the Company of such fully executed Exercise Notice accompanied by the aggregate Exercise Price, together with any applicable tax withholding.

No Shares shall be issued pursuant to the exercise of an Option unless such issuance and such exercise comply with Applicable Laws. Assuming such compliance, for income tax purposes the Shares shall be considered transferred to Participant on the date on which the Option is exercised with respect to such Shares.

V. Participant's Representations. In the event the Shares have not been registered under the Securities Act of 1933, as amended, at the time this Option is exercised, Participant shall, if required by the Company, concurrently with the exercise of all or any portion of this Option, deliver to the Company his or her Investment Representation Statement in the form attached hereto as Exhibit B.

VI. Lock-Up Period. Participant hereby agrees that Participant shall not offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, lend, or otherwise transfer or dispose of, directly or indirectly, any Common Stock (or other securities) of the Company or enter into any swap, hedging or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of any Common Stock (or other securities) of the Company held by Participant (other than those included in the registration) for a period specified by the representative of the underwriters of Common Stock (or other securities) of the Company not to exceed one hundred and eighty (180) days following the effective date of any registration statement of the Company filed under the Securities Act (or such other period as may be requested by the Company or the

underwriters to accommodate regulatory restrictions on (i) the publication or other distribution of research reports and (ii) analyst recommendations and opinions, including, but not limited to, the restrictions contained in NASD Rule 2711(f)(4) or NYSE Rule 472(f)(4), or any successor provisions or amendments thereto).

Participant agrees to execute and deliver such other agreements as may be reasonably requested by the Company or the underwriter which are consistent with the foregoing or which are necessary to give further effect thereto. In addition, if requested by the Company or the representative of the underwriters of Common Stock (or other securities) of the Company, Participant shall provide, within ten (10) days of such request, such information as may be required by the Company or such representative in connection with the completion of any public offering of the Company's securities pursuant to a registration statement filed under the Securities Act. The obligations described in this Section 4 shall not apply to a registration relating solely to employee benefit plans on Form S-1 or Form S-8 or similar forms that may be promulgated in the future, or a registration relating solely to a Commission Rule 145 transaction on Form S-4 or similar forms that may be promulgated in the future. The Company may impose stop-transfer instructions with respect to the shares of Common Stock (or other securities) subject to the foregoing restriction until the end of said one hundred and eighty (180) day (or other) period. Participant agrees that any transferee of the Option or shares acquired pursuant to the Option shall be bound by this Section 4.

VII. Method of Payment. Payment of the aggregate Exercise Price shall be by any of the following, or a combination thereof, at the election of the Participant:

1. cash;

2. check;

3. consideration received by the Company under a formal cashless exercise program adopted by the Company in connection with the Plan; or

4. surrender of other Shares which (i) shall be valued at its Fair Market Value on the date of exercise, and (ii) must be owned free and clear of any liens, claims, encumbrances or security interests, if accepting such Shares, in the sole discretion of the Administrator, shall not result in any adverse accounting consequences to the Company.

VIII. Restrictions on Exercise. This Option may not be exercised until such time as the Plan has been approved by the stockholders of the Company, or if the issuance of such Shares upon such exercise or the method of payment of consideration for such shares would constitute a violation of any Applicable Law.

IX. Non-Transferability of Option.

1. This Option may not be transferred in any manner otherwise than by will or by the laws of descent or distribution and may be exercised during the lifetime of Participant only by Participant. The terms of the Plan and this Option Agreement shall be binding upon the executors, administrators, heirs, successors and assigns of Participant.

2. Further, until the Company becomes subject to the reporting requirements of Section 13 or 15(d) of the Exchange Act, or after the Administrator determines that it is, will, or may no longer be relying upon the exemption from registration of Options under the Exchange Act as set forth in Rule 12h-1(f) promulgated under the Exchange Act (the "Reliance End Date"), Participant shall not transfer this Option or, prior to exercise, the Shares subject to this Option, in any manner other than (i) to persons who are "family members" (as defined in Rule 701(c)(3) of the Securities Act of 1933, as amended) through gifts or domestic relations orders, or (ii) to an executor or guardian of Participant upon the death or disability of Participant. Until the Reliance End Date, the Options and, prior to exercise, the Shares subject to this Option, may not be pledged, hypothecated or otherwise transferred or disposed of, including by entering into any short position, any "put equivalent position" or any "call equivalent position" (as defined in Rule 16a-1(h) and Rule 16a-1(b) of the Exchange Act, respectively), other than as permitted in clauses (i) and (ii) of this paragraph.

X. Term of Option. This Option may be exercised only within the term set out in the Notice of Stock Option Grant, and may be exercised during such term only in accordance with the Plan and the terms of this Option.

XI. Tax Obligations.

1. Tax Withholding. Participant agrees to make appropriate arrangements with the Company (or the Parent or Subsidiary employing or retaining Participant) for the satisfaction of all Federal, state, local and foreign income and employment tax withholding requirements applicable to the Option exercise. Participant acknowledges and agrees that the Company may refuse to honor the exercise and refuse to deliver the Shares if such withholding amounts are not delivered at the time of exercise.

2. Notice of Disqualifying Disposition of ISO Shares. If the Option granted to Participant herein is an ISO, and if Participant sells or otherwise disposes of any of the Shares acquired pursuant to the ISO on or before the later of (i) the date two (2) years after the Date of Grant, or (ii) the date one (1) year after the date of exercise, Participant shall immediately notify the Company in writing of such disposition. Participant agrees that Participant may be subject to income tax withholding by the Company on the compensation income recognized by Participant.

3. Code Section 409 A. Under Code Section 409A, an Option that vests after December 31, 2004 (or that vested on or prior to such date but which was materially modified after October 3, 2004) that was granted with a per Share exercise price that is determined by the Internal Revenue Service (the "IRS") to be less than the Fair Market Value of a Share on the date of grant (a "discount option") may be considered "deferred compensation." An Option that is a "discount option" may result in (i) income recognition by Participant prior to the exercise of the Option, (ii) an additional twenty percent (20%) federal income tax, and (iii) potential penalty and interest charges. The "discount option" may also result in additional state income, penalty and interest tax to the Participant. Participant acknowledges that the Company cannot and has not guaranteed that the IRS will agree that the per Share exercise price of this Option equals or exceeds the Fair Market Value of a Share on the date of grant in a later examination. Participant agrees that if the IRS determines that the Option was granted with a per Share exercise price that was less than the Fair Market Value of a Share on the date of grant, Participant shall be solely responsible for Participant's costs related to such a determination.

XII. Entire Agreement; Governing Law. The Plan is incorporated herein by reference. The Plan and this Option Agreement constitute the entire agreement of the parties with respect to the subject matter hereof and supersede in their entirety all prior undertakings and agreements of the Company and Participant with respect to the subject matter hereof, and may not be modified adversely to the Participant's interest except by means of a writing signed by the Company and Participant. This Agreement is governed by the internal substantive laws but not the choice of law rules of California.

XIII. No Guarantee of Continued Service. PARTICIPANT ACKNOWLEDGES AND AGREES THAT THE VESTING OF SHARES PURSUANT TO THE VESTING SCHEDULE HEREOF IS EARNED ONLY BY CONTINUING AS A SERVICE PROVIDER AT THE WILL OF THE COMPANY (OR THE PARENT OR SUBSIDIARY EMPLOYING OR RETAINING PARTICIPANT) AND NOT THROUGH THE ACT OF BEING HIRED, BEING GRANTED THIS OPTION OR ACQUIRING SHARES HEREUNDER. PARTICIPANT FURTHER ACKNOWLEDGES AND AGREES THAT THIS AGREEMENT, THE TRANSACTIONS CONTEMPLATED HEREUNDER AND THE VESTING SCHEDULE SET FORTH HEREIN DO NOT CONSTITUTE AN EXPRESS OR IMPLIED PROMISE OF CONTINUED ENGAGEMENT AS A SERVICE PROVIDER FOR THE VESTING PERIOD, FOR ANY PERIOD, OR AT ALL, AND SHALL NOT INTERFERE IN ANY WAY WITH PARTICIPANT'S RIGHT OR THE RIGHT OF THE COMPANY (OR THE PARENT OR SUBSIDIARY EMPLOYING OR RETAINING PARTICIPANT) TO TERMINATE PARTICIPANT'S RELATIONSHIP AS A SERVICE PROVIDER AT ANY TIME, WITH OR WITHOUT CAUSE.

Participant acknowledges receipt of a copy of the Plan and represents that he or she is familiar with the terms and provisions thereof, and hereby accepts this Option subject to all of the terms and provisions thereof. Participant has reviewed the Plan and this Option in their entirety, has had an opportunity to obtain the advice of counsel prior to executing this Option and fully understands all provisions of the Option. Participant hereby agrees to accept as binding, conclusive and final all decisions or interpretations of the Administrator upon any questions arising under the Plan or this Option. Participant further agrees to notify the Company upon any change in the residence address indicated below.

PARTICIPANT	SHOCKWAVE MEDICAL, INC.
Signature	By
Print Name	Print Name
	Title
Residence Address	
Email Address	

EXHIBIT A

2009 EQUITY INCENTIVE PLAN

EXERCISE NOTICE

Shockwave Medical, Inc.
48531 Warm Springs Blvd, Suite 416
Fremont, CA 94539

Attention: Corporate Secretary

1. Exercise of Option. Effective as of today, , , the undersigned ("Participant") hereby elects to exercise Participant's option (the "Option") to purchase shares of the Common Stock (the "Shares") of Shockwave Medical, Inc. (the "Company") under and pursuant to the 2009 Equity Incentive Plan (the "Plan") and the Stock Option Agreement dated [ ] (the "Option Agreement").

2. Delivery of Payment. Participant herewith delivers to the Company the full purchase price of the Shares, as set forth in the Option Agreement, and any and all withholding taxes due in connection with the exercise of the Option.

3. Representations of Participant. Participant acknowledges that Participant has received, read and understood the Plan and the Option Agreement and agrees to abide by and be bound by their terms and conditions.

4. Rights as Stockholder. Until the issuance of the Shares (as evidenced by the appropriate entry on the books of the Company or of a duly authorized transfer agent of the Company), no right to vote or receive dividends or any other rights as a stockholder shall exist with respect to the Common Stock subject to an Award, notwithstanding the exercise of the Option. The Shares shall be issued to Participant as soon as practicable after the Option is exercised in accordance with the Option Agreement. No adjustment shall be made for a dividend or other right for which the record date is prior to the date of issuance except as provided in Section 13 of the Plan.

5. Company's Right of First Refusal. Before any Shares held by Participant or any transferee (either being sometimes referred to herein as the "Holder") may be sold or otherwise transferred (including transfer by gift or operation of law), the Company or its assignee(s) shall have a right of first refusal to purchase the Shares on the terms and conditions set forth in this Section 5 (the "Right of First Refusal").

(a) Notice of Proposed Transfer. The Holder of the Shares shall deliver to the Company a written notice (the "Notice") stating: (i) the Holder's bona fide intention to sell or otherwise transfer such Shares; (ii) the name of each proposed purchaser or other transferee ("Proposed Transferee"); (iii) the number of Shares to be transferred to each Proposed Transferee; and (iv) the bona fide cash price or other consideration for which the Holder proposes to transfer the Shares (the "Offered Price"), and the Holder shall offer the Shares at the Offered Price to the Company or its assignee(s).

(b) Exercise of Right of First Refusal. At any time within thirty (30) days after receipt of the Notice, the Company and/or its assignee(s) may, by giving written notice to the Holder, elect to purchase all, but not less than all, of the Shares proposed to be transferred to any one or more of the Proposed Transferees, at the purchase price determined in accordance with subsection (c) below.

(c) Purchase Price. The purchase price ("Purchase Price") for the Shares purchased by the Company or its assignee(s) under this Section 5 shall be the Offered Price. If the Offered Price includes consideration other than cash, the cash equivalent value of the non-cash consideration shall be determined by the Board of Directors of the Company in good faith.

(d) Payment. Payment of the Purchase Price shall be made, at the option of the Company or its assignee(s), in cash (by check), by cancellation of all or a portion of any outstanding indebtedness of the Holder to the Company (or, in the case of repurchase by an assignee, to the assignee), or by any combination thereof within thirty (30) days after receipt of the Notice or in the manner and at the times set forth in the Notice.

(e) Holder's Right to Transfer. If all of the Shares proposed in the Notice to be transferred to a given Proposed Transferee are not purchased by the Company and/or its assignee(s) as provided in this Section 5, then the Holder may sell or otherwise transfer such Shares to that Proposed Transferee at the Offered Price or at a higher price, provided that such sale or other transfer is consummated within one hundred and twenty (120) days after the date of the Notice, that any such sale or other transfer is effected in accordance with any applicable securities laws and that the Proposed Transferee agrees in writing that the provisions of this Section 5 shall continue to apply to the Shares in the hands of such Proposed Transferee. If the Shares described in the Notice are not transferred to the Proposed Transferee within such period, a new Notice shall be given to the Company, and the Company and/or its assignees shall again be offered the Right of First Refusal before any Shares held by the Holder may be sold or otherwise transferred.

(f) Exception for Certain Family Transfers. Anything to the contrary contained in this Section 5 notwithstanding, the transfer of any or all of the Shares during the Participant's lifetime or on the Participant's death by will or intestacy to the Participant's immediate family or a trust for the benefit of the Participant's immediate family shall be exempt from the provisions of this Section 5. "Immediate Family" as used herein shall mean spouse, lineal descendant or antecedent, father, mother, brother or sister. In such case, the transferee or other recipient shall receive and hold the Shares so transferred subject to the provisions of this Section 5, and there shall be no further transfer of such Shares except in accordance with the terms of this Section 5.

(g) Termination of Right of First Refusal. The Right of First Refusal shall terminate as to any Shares upon the earlier of (i) the first sale of Common Stock of the Company to the general public, or (ii) a Change in Control in which the successor corporation has equity securities that are publicly traded.

6. Tax Consultation. Participant understands that Participant may suffer adverse tax consequences as a result of Participant's purchase or disposition of the Shares. Participant represents that Participant has consulted with any tax consultants Participant deems advisable in connection with the purchase or disposition of the Shares and that Participant is not relying on the Company for any tax advice.

7. Restrictive Legends and Stop-Transfer Orders.

(a) Legends. Participant understands and agrees that the Company shall cause the legends set forth below or legends substantially equivalent thereto, to be placed upon any certificate(s) evidencing ownership of the Shares together with any other legends that may be required by the Company or by state or federal securities laws:

> THE SECURITIES REPRESENTED HEREBY HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933 (THE "ACT") AND MAY NOT BE OFFERED, SOLD OR OTHERWISE TRANSFERRED, PLEDGED OR HYPOTHECATED UNLESS AND UNTIL REGISTERED UNDER THE ACT OR, IN THE OPINION OF COUNSEL SATISFACTORY TO THE ISSUER OF THESE SECURITIES, SUCH OFFER, SALE OR TRANSFER, PLEDGE OR HYPOTHECATION IS IN COMPLIANCE THEREWITH.
>
> THE SHARES REPRESENTED BY THIS CERTIFICATE ARE SUBJECT TO CERTAIN RESTRICTIONS ON TRANSFER AND A RIGHT OF FIRST REFUSAL HELD BY THE ISSUER OR ITS ASSIGNEE(S) AS SET FORTH IN THE EXERCISE NOTICE BETWEEN THE ISSUER AND THE ORIGINAL HOLDER OF THESE SHARES, A COPY OF WHICH MAY BE OBTAINED AT THE PRINCIPAL OFFICE OF THE ISSUER. SUCH TRANSFER RESTRICTIONS AND RIGHT OF FIRST REFUSAL ARE BINDING ON TRANSFEREES OF THESE SHARES.
>
> THE SHARES REPRESENTED BY THIS CERTIFICATE ARE SUBJECT TO RESTRICTIONS ON TRANSFER FOR A PERIOD OF TIME FOLLOWING THE EFFECTIVE DATE OF THE UNDERWRITTEN PUBLIC OFFERING OF THE COMPANY'S SECURITIES SET FORTH IN AN AGREEMENT BETWEEN THE ISSUER AND THE ORIGINAL HOLDER OF THESE SHARES AND MAY NOT BE SOLD OR OTHERWISE DISPOSED OF BY THE HOLDER PRIOR TO THE EXPIRATION OF SUCH PERIOD WITHOUT THE CONSENT OF THE COMPANY OR THE MANAGING UNDERWRITER.

(b) Stop-Transfer Notices. Participant agrees that, in order to ensure compliance with the restrictions referred to herein, the Company may issue appropriate "stop transfer" instructions to its transfer agent, if any, and that, if the Company transfers its own securities, it may make appropriate notations to the same effect in its own records.

(c) Refusal to Transfer. The Company shall not be required (i) to transfer on its books any Shares that have been sold or otherwise transferred in violation of any of the provisions of this Exercise Notice or (ii) to treat as owner of such Shares or to accord the right to vote or pay dividends to any purchaser or other transferee to whom such Shares shall have been so transferred.

8. Successors and Assigns. The Company may assign any of its rights under this Exercise Notice to single or multiple assignees, and this Exercise Notice shall inure to the benefit of the successors and assigns of the Company. Subject to the restrictions on transfer herein set forth, this Exercise Notice shall be binding upon Participant and his or her heirs, executors, administrators, successors and assigns.

9. Interpretation. Any dispute regarding the interpretation of this Exercise Notice shall be submitted by Participant or by the Company forthwith to the Administrator, which shall review such dispute at its next regular meeting. The resolution of such a dispute by the Administrator shall be final and binding on all parties.

10. Governing Law; Severability. This Exercise Notice is governed by the internal substantive laws, but not the choice of law rules, of California. In the event that any provision hereof becomes or is declared by a court of competent jurisdiction to be illegal, unenforceable or void, this Exercise Notice shall continue in full force and effect.

11. Entire Agreement. The Plan and Option Agreement are incorporated herein by reference. This Exercise Notice, the Plan, the Restricted Stock Purchase Agreement, the Option Agreement and the Investment Representation Statement constitute the entire agreement of the parties with respect to the subject matter hereof and supersede in their entirety all prior undertakings and agreements of the Company and Participant with respect to the subject matter hereof, and may not be modified adversely to the Participant's interest except by means of a writing signed by the Company and Participant.

Submitted by: PARTICIPANT	Accepted by: SHOCKWAVE MEDICAL, INC.
_____	_____
Signature	By
_____	_____
Print Name	Print Name
	_____
	Title
Address:	Address:
_____	_____
_____	_____
_____	_____
Email Address	Date Received

EXHIBIT B

INVESTMENT REPRESENTATION STATEMENT

PARTICIPANT	:	
COMPANY	:	SHOCKWAVE MEDICAL, INC.
SECURITY	:	COMMON STOCK
AMOUNT	:	
DATE	:	

In connection with the purchase of the above-listed Securities, the undersigned Participant represents to the Company the following:

(a) Participant is aware of the Company's business affairs and financial condition and has acquired sufficient information about the Company to reach an informed and knowledgeable decision to acquire the Securities. Participant is acquiring these Securities for investment for Participant's own account only and not with a view to, or for resale in connection with, any "distribution" thereof within the meaning of the Securities Act of 1933, as amended (the "Securities Act").

(b) Participant acknowledges and understands that the Securities constitute "restricted securities" under the Securities Act and have not been registered under the Securities Act in reliance upon a specific exemption therefrom, which exemption depends upon, among other things, the bona fide nature of Participant's investment intent as expressed herein. In this connection, Participant understands that, in the view of the Securities and Exchange Commission, the statutory basis for such exemption may be unavailable if Participant's representation was predicated solely upon a present intention to hold these Securities for the minimum capital gains period specified under tax statutes, for a deferred sale, for or until an increase or decrease in the market price of the Securities, or for a period of one (1) year or any other fixed period in the future. Participant further understands that the Securities must be held indefinitely unless they are subsequently registered under the Securities Act or an exemption from such registration is available. Participant further acknowledges and understands that the Company is under no obligation to register the Securities. Participant understands that the certificate evidencing the Securities shall be imprinted with any legend required under applicable state securities laws.

(c) Participant is familiar with the provisions of Rule 701 and Rule 144, each promulgated under the Securities Act, which, in substance, permit limited public resale of "restricted securities" acquired, directly or indirectly from the issuer thereof, in a non-public offering subject to the satisfaction of certain conditions. Rule 701 provides that if the issuer qualifies under Rule 701 at the time of the grant of the Option to Participant, the exercise shall be exempt from registration under the Securities Act. In the event the Company becomes subject to the reporting requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, ninety (90) days thereafter (or such longer period as any market stand-off agreement may require) the Securities exempt under Rule 701 may be resold, subject to the satisfaction of the applicable conditions specified by Rule 144, including in the case of affiliates (1) the availability of certain public information about the Company, (2) the amount of Securities being sold during any three (3) month period not exceeding specified limitations, (3) the resale being made in an unsolicited "broker's transaction", transactions directly with a "market maker" or "riskless principal transactions" (as those terms are defined under the Securities Exchange Act of 1934) and (4) the timely filing of a Form 144, if applicable.

In the event that the Company does not qualify under Rule 701 at the time of grant of the Option, then the Securities may be resold in certain limited circumstances subject to the provisions of Rule 144, which may require (i) the availability of current public information about the Company; (ii) the resale to occur more than a specified period after the purchase and full payment (within the meaning of Rule 144) for the Securities; and (iii) in the case of the sale of Securities by an affiliate, the satisfaction of the conditions set forth in sections (2), (3) and (4) of the paragraph immediately above.

(d) Participant further understands that in the event all of the applicable requirements of Rule 701 or 144 are not satisfied, registration under the Securities Act, compliance with Regulation A, or some other registration exemption shall be required; and that, notwithstanding the fact that Rules 144 and 701 are not exclusive, the Staff of the Securities and Exchange Commission has expressed its opinion that persons proposing to sell private placement securities other than in a registered offering and otherwise than pursuant to Rules 144 or 701 shall have a substantial burden of proof in establishing that an exemption from registration is available for such offers or sales, and that such persons and their respective brokers who participate in such transactions do so at their own risk. Participant understands that no assurances can be given that any such other registration exemption shall be available in such event.

PARTICIPANT

Signature

Print Name

Date

EXHIBIT C-1

SHOCKWAVE MEDICAL, INC.

2009 EQUITY INCENTIVE PLAN

RESTRICTED STOCK PURCHASE AGREEMENT

THIS RESTRICTED STOCK PURCHASE AGREEMENT (the "Agreement") is made between _____ (the "Purchaser") and Shockwave Medical, Inc. (the "Company") or its assignees of rights hereunder as of _____, ____.

Unless otherwise defined herein, the terms defined in the 2009 Equity Incentive Plan shall have the same defined meanings in this Agreement.

i. RECITALS

A. Pursuant to the exercise of the option granted to Purchaser under the Plan and pursuant to the Stock Option Agreement (the "Option Agreement") dated by and between the Company and Purchaser with respect to such grant (the "Option"), which Plan and Option Agreement are hereby incorporated by reference, Purchaser has elected to purchase _____ of those shares of Common Stock which have not become vested under the vesting schedule set forth in the Option Agreement ("Unvested Shares"). The Unvested Shares and the shares subject to the Option Agreement, which have become vested are sometimes collectively referred to herein as the "Shares."

B. As required by the Option Agreement, as a condition to Purchaser's election to exercise the option, Purchaser must execute this Agreement, which sets forth the rights and obligations of the parties with respect to Shares acquired upon exercise of the Option.

1. Repurchase Option.

(a) If Purchaser's status as a Service Provider is terminated for any reason, including for death and Disability, the Company shall have the right and option for ninety (90) days from such date to purchase from Purchaser, or Purchaser's personal representative, as the case may be, all of the Purchaser's Unvested Shares as of the date of such termination at the price paid by the Purchaser for such Shares (the "Repurchase Option").

(b) Upon the occurrence of such termination, the Company may exercise its Repurchase Option by delivering personally or by registered mail, to Purchaser (or his or her transferee or legal representative, as the case may be) with a copy to the escrow agent described in Section 2 below, a notice in writing indicating the Company's intention to exercise the Repurchase Option AND, at the Company's option, (i) by delivering to the Purchaser (or the Purchaser's transferee or legal representative) a check in the amount of the aggregate repurchase price, or (ii) by the Company canceling an amount of the Purchaser's indebtedness to the Company equal to the aggregate repurchase price, or (iii) by a combination of (i) and (ii) so that the combined payment and cancellation of indebtedness equals such aggregate repurchase price. Upon delivery of such notice and payment of the aggregate repurchase price in any of the ways described above, the Company shall become the legal and beneficial owner of the Unvested Shares being repurchased and the rights and interests therein or relating thereto, and the Company shall have the right to retain and transfer to its own name the number of Unvested Shares being repurchased by the Company.

(c) Whenever the Company shall have the right to repurchase Unvested Shares hereunder, the Company may designate and assign one or more employees, officers, directors or stockholders of the Company or other persons or organizations to exercise all or a part of the Company's Repurchase Option under this Agreement and purchase all or a part of such Unvested Shares.

(d) If the Company does not elect to exercise the Repurchase Option conferred above by giving the requisite notice within ninety (90) days following the termination, the Repurchase Option shall terminate.

(e) The Repurchase Option shall terminate in accordance with the vesting schedule contained in Purchaser's Option Agreement.

2. Transferability of the Shares; Escrow.

(a) Purchaser hereby authorizes and directs the Secretary of the Company, or such other person designated by the Company, to transfer the Unvested Shares as to which the Repurchase Option has been exercised from Purchaser to the Company.

(b) To insure the availability for delivery of Purchaser's Unvested Shares upon repurchase by the Company pursuant to the Repurchase Option under Section 1, Purchaser hereby appoints the Secretary, or any other person designated by the Company as escrow agent (the "Escrow Agent"), as its attorney-in-fact to sell, assign and transfer unto the Company, such Unvested Shares, if any, repurchased by the Company pursuant to the Repurchase Option and shall, upon execution of this Agreement, deliver and deposit with the Escrow Agent, the share certificates representing the Unvested Shares, together with the stock assignment duly endorsed in blank, attached hereto as Exhibit C-2. The Unvested Shares and stock assignment shall be held by the Escrow Agent in escrow, pursuant to the Joint Escrow Instructions of the Company and Purchaser attached as Exhibit C-3 hereto, until the Company exercises its Repurchase Option, until such Unvested Shares are vested, or until such time as this Agreement no longer is in effect. Upon vesting of the Unvested Shares, the Escrow Agent shall promptly deliver to the Purchaser the certificate or certificates representing such Shares in the Escrow Agent's possession belonging to the Purchaser, and the Escrow Agent shall be discharged of all further obligations hereunder; provided, however, that the Escrow Agent shall nevertheless retain such certificate or certificates as Escrow Agent if so required pursuant to other restrictions imposed pursuant to this Agreement.

(c) Neither the Company nor the Escrow Agent shall be liable for any act it may do or omit to do with respect to holding the Shares in escrow and while acting in good faith and in the exercise of its judgment.

(d) Transfer or sale of the Shares is subject to restrictions on transfer imposed by any applicable state and federal securities laws. Any transferee shall hold such Shares subject to all the provisions hereof and the Exercise Notice executed by the Purchaser with respect to any Unvested Shares purchased by Purchaser and shall acknowledge the same by signing a copy of this Agreement.

3. Ownership, Voting Rights, Duties. This Agreement shall not affect in any way the ownership, voting rights or other rights or duties of Purchaser, except as specifically provided herein.

4. Legends. The share certificate evidencing the Shares issued hereunder shall be endorsed with the following legend (in addition to any legend required under applicable federal and state securities laws):

> THE SHARES REPRESENTED BY THIS CERTIFICATE ARE SUBJECT TO CERTAIN RESTRICTIONS UPON TRANSFER AND RIGHTS OF REPURCHASE AS SET FORTH IN AN AGREEMENT BETWEEN THE COMPANY AND THE STOCKHOLDER, A COPY OF WHICH IS ON FILE WITH THE SECRETARY OF THE COMPANY.

5. Adjustment for Stock Split. All references to the number of Shares and the purchase price of the Shares in this Agreement shall be appropriately adjusted to reflect any stock split, stock dividend or other change in the Shares, which may be made by the Company pursuant to Section 13 of the Plan after the date of this Agreement.

6. Notices. Notices required hereunder shall be given in person or by registered mail to the address of Purchaser shown on the records of the Company, and to the Company at their respective principal executive offices.

7. Survival of Terms. This Agreement shall apply to and bind Purchaser and the Company and their respective permitted assignees and transferees, heirs, legatees, executors, administrators and legal successors.

8. Section 83(b) Election. Purchaser hereby acknowledges that he or she has been informed that, with respect to the exercise of an Option for Unvested Shares, an election (the "Election") may be filed by the Purchaser with the Internal Revenue Service, within thirty (30) days of the purchase of the exercised Shares, electing pursuant to Section 83(b) of the Code to be taxed currently on any difference between the purchase price of the exercised Shares and their Fair Market Value on the date of purchase. In the case of a Nonstatutory Stock Option, this will result in the recognition of taxable income to the Purchaser on the date of exercise, measured by the excess, if any, of the Fair Market Value of the exercised Shares, at the time the Option is exercised over the purchase price for the exercised Shares. Absent such an Election, taxable income will be measured and recognized by Purchaser at the time or times on which the Company's Repurchase Option lapses. In the case of an Incentive Stock Option, such an Election will result in a recognition of income to the Purchaser for alternative minimum tax purposes on the date of exercise, measured by the excess, if any, of the Fair Market Value of the exercised Shares, at the time the option is exercised, over the purchase price for the exercised Shares. Absent such an Election, alternative minimum taxable income will be measured and recognized by Purchaser at the time or times on which the Company's Repurchase Option lapses.

This discussion is intended only as a summary of the general United States income tax laws that apply to exercising Options as to Shares that have not yet vested and is accurate only as of the date this form Agreement was approved by the Board. The federal, state and local tax consequences to any particular taxpayer will depend upon his or her individual circumstances. Purchaser is strongly encouraged to seek the advice of his or her own tax consultants in connection with the purchase of the Shares and the advisability of filing of the Election under Section 83(b) of the Code. A form of Election under Section 83(b) is attached hereto as Exhibit C-4 for reference.

PURCHASER ACKNOWLEDGES THAT IT IS PURCHASER'S SOLE RESPONSIBILITY AND NOT THE COMPANY'S TO FILE TIMELY THE ELECTION UNDER SECTION 83(b) OF THE CODE, EVEN IF PURCHASER REQUESTS THE COMPANY OR ITS REPRESENTATIVE TO MAKE THIS FILING ON PURCHASER'S BEHALF.

9. Representations. Purchaser has reviewed with his or her own tax advisors the federal, state, local and foreign tax consequences of this investment and the transactions contemplated by this Agreement. Purchaser is relying solely on such advisors and not on any statements or representations of the Company or any of its agents. Purchaser understands that he or she (and not the Company) shall be responsible for his or her own tax liability that may arise as a result of this investment or the transactions contemplated by this Agreement.

10. Entire Agreement; Governing Law. The Plan and Option Agreement are incorporated herein by reference. The Plan, the Option Agreement, the Exercise Notice, this Agreement, and the Investment Representation Statement constitute the entire agreement of the parties with respect to the subject matter hereof and supersede in their entirety all prior undertakings and agreements of the Company and Purchaser with respect to the subject matter hereof, and may not be modified adversely to the Purchaser's interest except by means of a writing signed by the Company and Purchaser. This Agreement is governed by the internal substantive laws but not the choice of law rules of California.

Purchaser represents that he or she has read this Agreement and is familiar with its terms and provisions. Purchaser hereby agrees to accept as binding, conclusive and final all decisions or interpretations of the Board upon any questions arising under this Agreement.

IN WITNESS WHEREOF, this Agreement is deemed made as of the date first set forth above.

PARTICIPANT	SHOCKWAVE MEDICAL, INC.
Signature	By
Print Name	Print Name
	Title
Residence Address	

Dated: _____, _____

[Signature Page to Exhibit C-1]

EXHIBIT C-2

ASSIGNMENT SEPARATE FROM CERTIFICATE

FOR VALUE RECEIVED I,_____, hereby sell, assign and transfer unto Shockwave Medical, Inc. _____ shares of the Common Stock of Shockwave Medical, Inc. standing in my name of the books of said corporation represented by Certificate No. ____ herewith and do hereby irrevocably constitute and appoint _____ to transfer the said stock on the books of the within named corporation with full power of substitution in the premises.

This Stock Assignment may be used only in accordance with the Restricted Stock Purchase Agreement between Shockwave Medical, Inc. and the undersigned dated _____, ____ (the "Agreement").

Dated: _____, ____ Signature: _____

INSTRUCTIONS: Please do not fill in any blanks other than the signature line. The purpose of this assignment is to enable the Company to exercise its "repurchase option," as set forth in the Agreement, without requiring additional signatures on the part of the Purchaser.

EXHIBIT C-3

JOINT ESCROW INSTRUCTIONS

_____, ____

Shockwave Medical, Inc.
1750 112th Avenue NE, Suite C-102
Bellevue, WA 98004

Dear Corporate Secretary:

As Escrow Agent for both Shockwave Medical, Inc. (the "Company"), and the undersigned purchaser of stock of the Company (the "Purchaser"), you are hereby authorized and directed to hold the documents delivered to you pursuant to the terms of that certain Restricted Stock Purchase Agreement (the "Agreement") between the Company and the undersigned, in accordance with the following instructions:

12. In the event the Company and/or any assignee of the Company (referred to collectively for convenience herein as the "Company") exercises the Company's repurchase option set forth in the Agreement, the Company shall give to Purchaser and you a written notice specifying the number of shares of stock to be purchased, the purchase price, and the time for a closing hereunder at the principal office of the Company. Purchaser and the Company hereby irrevocably authorize and direct you to close the transaction contemplated by such notice in accordance with the terms of said notice.

13. At the closing, you are directed (a) to date the stock assignments necessary for the transfer in question, (b) to fill in the number of shares being transferred, and (c) to deliver the stock assignments, together with the certificate evidencing the shares of stock to be transferred, to the Company or its assignee, against the simultaneous delivery to you of the purchase price (by cash, a check, or some combination thereof) for the number of shares of stock being purchased pursuant to the exercise of the Company's repurchase option.

14. Purchaser irrevocably authorizes the Company to deposit with you any certificates evidencing shares of stock to be held by you hereunder and any additions and substitutions to said shares as defined in the Agreement. Purchaser does hereby irrevocably constitute and appoint you as Purchaser's attorney-in-fact and agent for the term of this escrow to execute with respect to such securities all documents necessary or appropriate to make such securities negotiable and to complete any transaction herein contemplated, including but not limited to the filing with any applicable state blue sky authority of any required applications for consent to, or notice of transfer of, the securities. Subject to the provisions of this paragraph 3, Purchaser shall exercise all rights and privileges of a stockholder of the Company while the stock is held by you.

15. Upon written request of the Purchaser, but no more than once per calendar year, unless the Company's repurchase option has been exercised, you shall deliver to Purchaser a certificate or certificates representing so many shares of stock as are not then subject to the Company's repurchase option. Within one hundred and twenty (120) days after cessation of Purchaser's continuous employment by or services to the Company, or any parent or subsidiary of the Company, you shall deliver to Purchaser a certificate or certificates representing the aggregate number of shares held or issued pursuant to the Agreement and not purchased by the Company or its assignees pursuant to exercise of the Company's repurchase option.

16. If at the time of termination of this escrow you should have in your possession any documents, securities, or other property belonging to Purchaser, you shall deliver all of the same to Purchaser and shall be discharged of all further obligations hereunder.

17. Your duties hereunder may be altered, amended, modified or revoked only by a writing signed by all of the parties hereto.

18. You shall be obligated only for the performance of such duties as are specifically set forth herein and may rely and shall be protected in relying or refraining from acting on any instrument reasonably believed by you to be genuine and to have been signed or presented by the proper party or parties. You shall not be personally liable for any act you may do or omit to do hereunder as Escrow Agent or as attorney-in-fact for Purchaser while acting in good faith, and any act done or omitted by you pursuant to the advice of your own attorneys shall be conclusive evidence of such good faith.

19. You are hereby expressly authorized to disregard any and all warnings given by any of the parties hereto or by any other person or corporation, excepting only orders or process of courts of law and are hereby expressly authorized to comply with and obey orders, judgments or decrees of any court. In case you obey or comply with any such order, judgment or decree, you shall not be liable to any of the parties hereto or to any other person, firm or corporation by reason of such compliance, notwithstanding any such order, judgment or decree being subsequently reversed, modified, annulled, set aside, vacated or found to have been entered without jurisdiction.

20. You shall not be liable in any respect on account of the identity, authorities or rights of the parties executing or delivering or purporting to execute or deliver the Agreement or any documents or papers deposited or called for hereunder.

21. You shall not be liable for the outlawing of any rights under the Statute of Limitations with respect to these Joint Escrow Instructions or any documents deposited with you.

22. You shall be entitled to employ such legal counsel and other experts as you may deem necessary properly to advise you in connection with your obligations hereunder, may rely upon the advice of such counsel, and may pay such counsel reasonable compensation therefor.

23. Your responsibilities as Escrow Agent hereunder shall terminate if you shall cease to be an officer or agent of the Company or if you shall resign by written notice to each party. In the event of any such termination, the Company shall appoint a successor Escrow Agent.

24. If you reasonably require other or further instruments in connection with these Joint Escrow Instructions or obligations in respect hereto, the necessary parties hereto shall join in furnishing such instruments.

25. It is understood and agreed that should any dispute arise with respect to the delivery and/or ownership or right of possession of the securities held by you hereunder, you are authorized and directed to retain in your possession without liability to anyone all or any part of said securities

until such disputes shall have been settled either by mutual written agreement of the parties concerned or by a final order, decree or judgment of a court of competent jurisdiction after the time for appeal has expired and no appeal has been perfected, but you shall be under no duty whatsoever to institute or defend any such proceedings.

26. Any notice required or permitted hereunder shall be given in writing and shall be deemed effectively given upon personal delivery or upon deposit in the United States Post Office, by registered or certified mail with postage and fees prepaid, addressed to each of the other parties thereunto entitled at the following addresses or at such other addresses as a party may designate by ten (10) days' advance written notice to each of the other parties hereto.

27. By signing these Joint Escrow Instructions, you become a party hereto only for the purpose of said Joint Escrow Instructions; you do not become a party to the Agreement.

28. This instrument shall be binding upon and inure to the benefit of the parties hereto, and their respective successors and permitted assigns.

29. These Joint Escrow Instructions shall be governed by the internal substantive laws, but not the choice of law rules, of California.

PURCHASER

_____
Signature

_____
Print Name

_____

_____
Residence Address

ESCROW AGENT

_____
Corporate Secretary
Dated: _____

SHOCKWAVE MEDICAL, INC.

_____
By

_____
Print Name

_____
Title

EXHIBIT C-4

ELECTION UNDER SECTION 83(b)
OF THE INTERNAL REVENUE CODE OF 1986

The undersigned taxpayer hereby elects, pursuant to Sections 55 and 83(b) of the Internal Revenue Code of 1986, as amended, to include in taxpayer's gross income or alternative minimum taxable income, as the case may be, for the current taxable year the amount of any compensation taxable to taxpayer in connection with taxpayer's receipt of the property described below.

1. The name, address, taxpayer identification number and taxable year of the undersigned are as follows:

	TAXPAYER	SPOUSE
NAME:		
ADDRESS:		
TAX ID NO.:		
TAXABLE YEAR:		

2. The property with respect to which the election is made is described as follows: _____ shares (the "Shares") of the Common Stock of Shockwave Medical, Inc. (the "Company").

3. The date on which the property was transferred is: _____ , ____.

4. The property is subject to the following restrictions:

The Shares may not be transferred and are subject to forfeiture under the terms of an agreement between the taxpayer and the Company. These restrictions lapse upon the satisfaction of certain conditions contained in such agreement.

5. The Fair Market Value at the time of transfer, determined without regard to any restriction other than a restriction which by its terms shall never lapse, of such property is: $_____.

6. The amount (if any) paid for such property is: $_____.

The undersigned has submitted a copy of this statement to the person for whom the services were performed in connection with the undersigned's receipt of the above-described property. The transferee of such property is the person performing the services in connection with the transfer of said property.

The undersigned understands that the foregoing election may not be revoked except with the consent of the Commissioner.

Dated: _____, _____

_____
Taxpayer

The undersigned spouse of taxpayer joins in this election.

Dated: _____, _____

_____
Spouse of Taxpayer

April 28, 2017
Doug Godshall
[Private address]

Dear Doug,

I am pleased to offer you a position with Shockwave Medical (the "Company"), as its President and Chief Executive Officer and a member of the Company's board of directors (the "Board"). If you decide to join us, you will receive a base annual salary of $375,000, less applicable withholdings, which will be paid semi-monthly in accordance with the Company's normal payroll procedures. In addition, you will be eligible to receive an annual bonus in an amount equal to forty percent (40%) of your then existing annual base salary subject to your and the Company's achievement of milestones to be established by the Board.

You are eligible for reimbursement for appropriate business expenses, such as mileage, phone, and travel expenses in accordance with Company's T&E policy. As an employee, you will also be eligible to receive certain employee benefits, including health, dental and vision care coverage, paid vacation, and paid Company holidays. You will also be entitled to paid sick leave if you are employed in a jurisdiction that requires it.

In addition, if you decide to join the Company, it will be recommended at the first meeting of the Board following your start date that the Company grant you an option to purchase [six percent (6%) of the fully diluted shares of the Company's Common Stock as of the date of grant], at a price per share equal to the fair market value per share of the Common Stock on the date of grant, as determined by the Board. Twenty-five percent (25%) of the shares subject to the option shall vest 12 months after the date your vesting begins, subject to your continuing employment with the Company, and no shares shall vest before such date. The remaining shares shall vest monthly over the next 36 months in equal monthly amounts, subject to your continuing employment with the Company. This option grant shall be subject to the terms and conditions of the Company's Equity Incentive Plan and a stock option agreement. No right to any stock is earned or accrued until such time that vesting occurs, nor does the grant confer any right to continue vesting or employment. Upon the closing of a Change of Control, 100% of the total number of unvested shares subject to the option shall vest, conditioned upon your employment with the Company on the date the Company signs a definitive agreement with respect to such Change of Control and you executing and not revoking a release of claims in a reasonable and customary form provided by and acceptable to the Company.

The Company is excited about your joining and looks forward to a beneficial and productive relationship. Nevertheless, you should be aware that your employment with the Company is for no specified period and constitutes at-will employment. As a result, you are free to resign at any time, for any reason or for no reason. Similarly, the Company is free to conclude its employment relationship with you at any time, with or without Cause, and with or without notice. We request that, in the event of resignation, you give the Company at least two weeks' notice.

If (i) your employment is terminated by the Company without Cause or if you voluntarily resign from your employment for Good Reason and (ii) you sign a release of claims in a reasonable and customary form provided by and acceptable to the Company, then, following that release becoming effective and irrevocable, you will receive a continuation of your then-current benefits and base salary, less applicable withholdings, for a period ending upon the earlier of (x) twelve (12) months following the date of such termination or resignation and (y) the date upon which you commence new employment; *provided*, that if a Change of Control occurs following the Company's initial public offering during your employment with the Company, any severance to be paid pursuant to the foregoing provision following such Change of Control shall be paid for twelve (12) months following the date of any such termination or resignation, regardless of when you commence new employment.

"Cause" is defined as: (1) your failure to substantially perform your material duties and obligations, which failure is not cured to the sole and reasonable satisfaction of the Board within ten (10) business days after you receive a written demand for performance from the Company; (2) any act of personal dishonesty, moral turpitude, fraud, embezzlement, misrepresentation, or other unlawful act committed by you that results in harm to the Company or its affiliates; (3) your violation of a federal or state law or regulation applicable to the business of the Company or its affiliates; (4) your being convicted of, or entering a plea of *nolo contendere* or guilty to, a felony under the laws of the United States or its equivalent in the jurisdiction in which the act that constituted the felony occurred; or (5) your material breach of the terms of this Agreement or any other agreement between you and the Company (or any affiliate of the Company).

"Good Reason" is defined as the occurrence, without your prior written consent, of either of the following events: (1) a material diminution of your base salary, unless such diminution is part of a generalized salary reduction affecting senior level (VP or higher) employees; (2) a material diminution of your authority, duties or responsibilities as an employee relative to such authority, duties or responsibilities in effect immediately prior to such diminution; *provided* that your authority, duties and responsibilities will not be deemed to be materially reduced if you have reasonably comparable authority, duties and responsibilities as an employee with respect to the Company's business following a Change of Control, regardless of any change in title or whether you subsequently provide services to a subsidiary, affiliate, business unit, division or otherwise; (3) a requirement that you relocate your principal residence to the state in which the Company's principal business is conducted; or (4) a material breach by the Company of the agreement under which you provides services to the Company, which failure is not cured to your sole and reasonable satisfaction within ten (10) business days after the Company receives a written demand for performance from you.

"Change of Control" is defined as: (1) the acquisition of the Company by another entity by means of any transaction or series of related transactions (including, without limitation, any reorganization, merger or consolidation or stock transfer, but excluding any such transaction effected primarily for the purpose of changing the domicile of the Company), unless the Company's stockholders of record immediately prior to such transaction or series of related transactions hold, immediately after such transaction or series of related transactions, at least 50% of the voting power of the surviving or acquiring entity (provided that the sale by the Company of its securities for the purposes of raising additional funds shall not constitute a Change of Control hereunder); or (2) a sale of all or substantially all of the assets of the Company.

The Company reserves the right to conduct background investigations and/or reference checks on all of its potential employees. Your job offer, therefore, is contingent upon a clearance of such a background investigation and/or reference check, if any. For purposes of federal immigration law, you will be required to provide to the Company documentary evidence of your identity and eligibility for employment in the United States. Such documentation must be provided to us within three (3) business days of your date of hire, or our employment relationship with you may be terminated.

We also ask that, if you have not already done so, you disclose to the Company any and all agreements relating to your prior employment that may affect your eligibility to be employed by the Company or limit the manner in which you may be employed, including but not limited to any non-compete agreements you may have entered into with former or current employers. It is the Company's understanding that any such agreements will not prevent you from performing the duties of your position and you represent that such is the case. Moreover, you agree that, during the term of your employment with the Company, you will not engage in any other employment, occupation, consulting or other business activity directly related to the business in which the Company is now involved or becomes involved during the term of your employment, nor will you engage in any other activities that conflict with your obligations to the Company. Similarly, you agree not to bring any third party confidential information to the Company, including that of your former employer, and that in performing your duties for the Company you will not in any way utilize any such information.

As a Company employee, you will be expected to abide by the Company's rules and standards. Specifically, you will be required to sign an acknowledgment that you have read and that you understand the Company's rules of conduct which are included in the Company Handbook.

As a condition of your employment, you are also required to sign and comply with an At-Will Employment, Confidential Information, Invention Assignment, and Arbitration Agreement (the "Confidentiality Agreement") which requires, among other provisions, the assignment of patent rights to any invention made during your employment at the Company, and non-disclosure of Company proprietary information, and which contains a non-compete provision. In the event of any dispute or claim relating to or arising out of our employment relationship, you and the Company agree that (i) any and all disputes between you and the Company shall be fully and finally resolved by binding arbitration, (ii) you are waiving any and all rights to a jury trial but all court remedies will be available in arbitration, (iii) all disputes shall be resolved by a neutral

arbitrator who shall issue a written opinion, (iv) the arbitration shall provide for adequate discovery, and (v) the Company shall pay all the arbitration fees, except an amount equal to the filing fees you would have paid had you filed a complaint in a court of law. Please note that we must receive your signed Confidentiality Agreement before your first day of employment.

To accept the Company's offer, please sign and date this letter in the space provided below. If you accept our offer, your first day of employment will be May 9, 2017. This letter, along with any agreements relating to proprietary rights between you and the Company, sets forth the terms of your employment with the Company and supersede any prior representations or agreements including, but not limited to, any representations made during your recruitment, interviews or pre-employment negotiations, whether written or oral. This letter, including, but not limited to, its at-will employment provision, may not be modified or amended except by a written agreement signed by the Executive Chairman of the Board and you. This offer of employment will terminate if it is not accepted, signed and returned by the close of business on April 28, 2017.

We look forward to your favorable reply and to working with you at the Company.

Sincerely,

/s/ Jay Watkins
Jay Watkins
Executive Chairman of the Board

Agreed to and accepted:

Signature: /s/ Douglas E. Godshall
Printed Name: Douglas E. Godshall
Date: April 28, 2017

March 21, 2016

Daniel K Puckett
Menlo Park, CA

VIA EMAIL

Dear Dan:

I am pleased to offer you a position with Shockwave Medical (the "**Company**"), as its Chief Financial Officer. If you decide to join us, you will receive an annual salary of $290,000 which will be paid semi-monthly in accordance with the Company's normal payroll procedures. As an employee, you will also be eligible to receive certain employee benefits including health, dental and vision care coverage, paid vacation and paid company holidays.

In addition, if you decide to join the Company, it will be recommended at the first meeting of the Company's Board of Directors following your start date that the Company grant you an option to purchase 1,800,000 shares of the Company's Common Stock, which equates to 1.01% of the current fully diluted shares of the Company, at a price per share equal to the fair market value per share of the Common Stock on the date of grant, as determined by the Company's Board of Directors. 25% of the shares subject to the option shall vest 12 months after the date your vesting begins subject to your continuing employment with the Company, and no shares shall vest before such date. The remaining shares shall vest monthly over the next 36 months in equal monthly amounts subject to your continuing employment with the Company. This option grant shall be subject to the terms and conditions of the Company's Equity Incentive Plan and Stock Option Agreement, including vesting requirements. If, during the course of continued employment as defined by the Company's Equity Incentive Plan and Stock Option Agreement, a Change Of Control of the company according to the terms of the Stock Option Agreement should occur, all unvested options in the above mentioned grant shall be subject to "double trigger" accelerated vesting as defined in the Stock Option Agreement. No right to any stock is earned or accrued until such time that vesting occurs, nor does the grant confer any right to continue vesting or employment.

The Company is excited about your joining and looks forward to a beneficial and productive relationship. Nevertheless, you should be aware that your employment with the Company is for no specified period and constitutes at-will employment. As a result, you are free to resign at any time, for any reason or for no reason. Similarly, the Company is free to conclude its employment relationship with you at any time, with or without cause, and with or without notice. We request that, in the event of resignation, you give the Company at least three weeks notice.

The Company reserves the right to conduct background investigations and/or reference checks on all of its potential employees. Your job offer, therefore, is contingent upon a clearance of such a background investigation and/or reference check, if any.

For purposes of federal immigration law, you will be required to provide to the Company documentary evidence of your identity and eligibility for employment in the United States. Such documentation must be provided to us within three (3) business days of your date of hire, or our employment relationship with you may be terminated.

We also ask that, if you have not already done so, you disclose to the Company any and all agreements relating to your prior employment that may affect your eligibility to be employed by the Company or limit the manner in which you may be employed. It is the Company's understanding that any such agreements will not prevent you from performing the duties of your position and you represent that such is the case. Moreover, you agree that, during the term of your employment with the Company, you will not engage in any other employment, occupation, consulting or other business activity directly related to the business in which the Company is now involved or becomes involved during the term of your employment, nor will you engage in any other activities that conflict with your obligations to the Company. Similarly, you agree not to bring any third party confidential information to the Company, including that of your former employer, and that in performing your duties for the Company you will not in any way utilize any such information.

As a Company employee, you will be expected to abide by the Company's rules and standards. Specifically, you will be required to sign an acknowledgment that you have read and that you understand the Company's rules of conduct which are included in the Company Handbook, which the Company will soon complete and distribute.

As a condition of your employment, you are also required to sign and comply with an At-Will Employment, Confidential Information, Invention Assignment and Arbitration Agreement which requires, among other provisions, the assignment of patent rights to any invention made during your employment at the Company, and non-disclosure of Company proprietary information. In the event of any dispute or claim relating to or arising out of our employment relationship, you and the Company agree that (i) any and all disputes between you and the Company shall be fully and finally resolved by binding arbitration, (ii) you are waiving any and all rights to a jury trial but all court remedies will be available in arbitration, (iii) all disputes shall be resolved by a neutral arbitrator who shall issue a written opinion, (iv) the arbitration shall provide for adequate discovery, and (v) the Company shall pay all the arbitration fees, except an amount equal to the filing fees you would have paid had you filed a complaint in a court of law. Please note that we must receive your signed Agreement before your first day of employment.

To accept the Company's offer, please sign and date this letter in the space provided below. If you accept our offer, your first day of employment will be on or before April 15, 2016.

This letter, along with any agreements relating to proprietary rights between you and the Company, set forth the terms of your employment with the Company and supersede any prior representations or agreements including, but not limited to, any representations made during your recruitment, interviews or pre-employment negotiations, whether written or oral. This letter, including, but not limited to, its at-will employment provision, may not be modified or amended except by a written agreement signed by the CEO of the Company and you. This offer of employment will terminate if it is not accepted, signed and returned by March 24, 2016.

We look forward to your favorable reply and to working with you at Shockwave Medical.

Sincerely,

/s/ Daniel Hawkins
Daniel Hawkins
Founder, CEO

Agreed to and accepted:

Signature: /s/ Dan K. Puckett
Printed Name: Dan K. Puckett
Date: 3/23/16

November 26, 2018

Isaac Zacharias

Dear Isaac,

I am pleased to offer you a promotion to the position of Chief Commercial Officer beginning on December 3, 2018. In this role, you will receive an annual base salary of $310,000 less applicable withholdings, which will be paid semi-monthly in accordance with the Company's normal payroll procedures. As in your prior position, you will continue to be eligible to receive certain employee benefits including health, dental and vision care coverage, paid vacation, paid company holidays and participate in the company annual bonus incentive plan. If the bonus plan is approved by the Board of Directors, you will be eligible to participate in it, as the bonus plan is currently drafted, you will be entitled to receive an annual bonus of up to 25% of your annual salary. Bonus payout will be prorated.

The company's Board of Directors has approved an option for you to purchase 1,000,000 shares of the Company's Common Stock at a price per share equal to the fair market value per share of the Common Stock on the date of grant (November 14, 2018), as determined by the Company's Board of Directors. The shares subject to the option shall vest over the next 48 months in equal monthly amounts subject to your continuing employment with the Company. This option grant shall be subject to the terms and conditions of the Company's Equity Incentive Plan and Stock Option Agreement, including vesting requirements. No right to any stock is earned or accrued until such time that vesting occurs, nor does the grant confer any right to continue vesting or employment.

The Company is excited about the broader impact you will be able to have on the business and looks forward to a beneficial and productive relationship. Nevertheless, you should be aware that your employment with the Company is for no specified period and constitutes at-will employment. As a result, you are free to resign at any time, for any reason or for no reason. Similarly, the Company is free to conclude its employment relationship with you at any time, with or without cause, and with or without notice. We request that, in the event of resignation, you give the Company at least four weeks' notice.

To accept the Company's offer, please sign and date this letter in the space provided below. This letter, along with any agreements relating to proprietary rights between you and the Company, set forth the terms of your employment with the Company and supersede any prior

representations or agreements including, but not limited to, any representations made during your recruitment, interviews or pre-employment negotiations, whether written or oral. This letter, including, but not limited to, its at-will employment provision, may not be modified or amended except by a written agreement signed by the CEO of the Company and you.

We look forward to your favorable reply and to working with you at Shockwave Medical.

Sincerely,

/s/ Doug Godshall
Doug Godshall, CEO

Agreed to and accepted:

Signature: /s/ Isaac Zacharias

Printed Name: Isaac Zacharias

Date: 11/29/2018

LOAN AND SECURITY AGREEMENT

THIS LOAN AND SECURITY AGREEMENT (this "**Agreement**") dated as of February 26, 2018 (the "**Effective Date**") between **SILICON VALLEY BANK**, a California corporation ("**Bank**"), and **SHOCKWAVE MEDICAL, INC.**, a Delaware corporation ("**Borrower**"), provides the terms on which Bank shall lend to Borrower and Borrower shall repay Bank. The parties agree as follows:

1. ACCOUNTING AND OTHER TERMS

Accounting terms not defined in this Agreement shall be construed following GAAP, except with respect to unaudited financial statements (i) for non-compliance with FAS 123R and (ii) for the absence of footnotes and subject to year-end audit adjustments; *provided* that if at any time any change in GAAP would affect the computation of any covenant or requirement set forth in any Loan Document, and either Borrower or Bank shall so request, Borrower and Bank shall negotiate in good faith to amend such covenant or requirement to preserve the original intent thereof in light of such change in GAAP; *provided*, *further*, that, until so amended (a) such covenant or requirement shall continue to be computed in accordance with GAAP prior to such change therein and (b) Borrower shall provide Bank financial statements and other documents required under this Agreement or as reasonably requested hereunder setting forth a reconciliation between calculations of such ratio or requirement made before and after giving effect to such change in GAAP, provided, further, that any obligations of a Person under a lease (whether existing now or entered into in the future) that is not (or would not be) a capital lease obligation under GAAP as in effect of the Effective Date shall not be treated as a capital lease obligation solely as a result of the adopting of changes in GAAP. Calculations and determinations must be made following GAAP. Capitalized terms not otherwise defined in this Agreement shall have the meanings set forth in Section 13. All other terms contained in this Agreement, unless otherwise indicated, shall have the meaning provided by the Code to the extent such terms are defined therein.

2. LOAN AND TERMS OF PAYMENT

2.1 Promise to Pay. Borrower hereby unconditionally promises to pay Bank the outstanding principal amount of all Credit Extensions and accrued and unpaid interest thereon as and when due in accordance with this Agreement.

2.2 Revolving Line.

(a) Availability. Subject to the terms and conditions of this Agreement and to deduction of Reserves, Bank shall make Advances not exceeding the Availability Amount. Amounts borrowed under the Revolving Line may be repaid and, prior to the Revolving Line Maturity Date, reborrowed, subject to the applicable terms and conditions precedent herein.

(b) Termination; Repayment. The Revolving Line terminates on the Revolving Line Maturity Date, when the principal amount of all Advances, the unpaid interest thereon, and all other Obligations relating to the Revolving Line shall be immediately due and payable.

2.3 Term Loan.

(a) Availability. Subject to the terms and conditions of this Agreement, upon Borrower's request, Bank shall make term loan advances available, pursuant to the terms set forward below, to Borrower in an aggregate original principal amount not to exceed Fifteen Million Dollars ($15,000,000) (each such advance is referred to herein as a "**Term Loan Advance**" and, collectively, as the "**Term Loan Advances**"). The Term Loan Advances shall be available in two (2) tranches (respectively the "**First Tranche**" and the "**Second Tranche**") as follows: (a) the First Tranche is available to Borrower during the First Tranche Draw Period in an aggregate principal amount of up to Ten Million Dollars ($10,000,000), and (b) provided that Borrower has achieved the Second Tranche Milestone, the Second Tranche is available during the Second Tranche Draw Period in an aggregate principal amount of up to Five Million Dollars ($5,000,000). After repayment, no Term Loan Advance (or any portion thereof) may be reborrowed.

(b) Interest Payments. With respect to each Term Loan Advance, commencing on the first Date following the Funding Date of such Term Loan Advance and continuing on the Payment Date of each month thereafter, Borrower shall make monthly payments of interest, in arrears, on the principal amount of such Term Loan Advance at the rate set forth in Section 2.5(a).

(c) Repayment. Commencing on the Term Loan Amortization Date and continuing on each Payment Date thereafter, Borrower shall repay each Term Loan Advance in (i) the Applicable Number of equal monthly installments of principal, which interest shall be calculated at the rate set forth in Section 2.5(a)(ii), plus (ii) monthly payments of accrued interest at the rate set forth in Section 2.5(a)(ii). All outstanding principal and accrued and unpaid interest under each Term Loan Advance, and all other outstanding Obligations with respect to such Term Loan Advance, are due and payable in full on the Term Loan Maturity Date.

(d) Permitted Prepayment. Borrower shall have the option to prepay all, but not less than all, of the Term Loan Advances, provided Borrower (i) delivers written notice to Bank of its election to prepay the Term Loan Advances at least ten (10) days prior to such prepayment, and (ii) pays, on the date of such prepayment (A) the outstanding principal plus accrued and unpaid interest with respect to the Term Loan Advances, (B) the Prepayment Fee, (C) the Final Payment, and (D) all other sums, if any, that shall have become due and payable with respect to the Term Loan Advances, including interest at the Default Rate with respect to any past due amounts.

(e) Mandatory Prepayment Upon an Acceleration. If the Term Loan Advances are accelerated by Bank following the occurrence and during the continuance of an Event of Default, Borrower shall immediately pay to Bank an amount equal to the sum of (i) all outstanding principal plus accrued and unpaid interest with respect to the Term Loan Advances, (ii) the Prepayment Fee, (iii) the Final Payment, and (iv) all other sums, if any, that shall have become due and payable with respect to the Term Loan Advances, including interest at the Default Rate with respect to any past due amounts.

2.4 Overadvances. If, at any time, the outstanding principal amount of any Advances exceeds the lesser of either the Revolving Line or the Borrowing Base, Borrower shall immediately pay to Bank in cash the amount of such excess (such excess, the "**Overadvance**"). Without limiting Borrower's obligation to repay Bank any Overadvance, Borrower agrees to pay Bank interest on the outstanding amount of any Overadvance, on demand, at a per annum rate equal to the rate that is otherwise applicable to Advances plus five percent (5.0%).

2.5 Payment of Interest on the Credit Extensions.

(a) Interest Rate.

(i) Advances. Subject to Section 2.5(b), the principal amount outstanding under the Revolving Line shall accrue interest at a floating per annum rate equal to the Prime Rate, which interest shall be payable monthly in accordance with Section 2.5(b) below.

(ii) Term Loan Advances. Subject to Section 2.5(b), the principal amount outstanding under each Term Loan Advance shall accrue interest at a floating per annum rate equal to the greater of (A) the Prime Rate minus one and three quarters of one percent (1.75%) and (B) two and three quarters of one percent (2.75%), which interest shall be payable monthly in accordance with Section 2.5(b)below.

(b) Default Rate. Immediately upon the occurrence and during the continuance of an Event of Default, Obligations shall bear interest at a rate per annum which is five percent (5.0%) above the rate that is otherwise applicable thereto (the "**Default Rate**"). Fees and expenses which are required to be paid by Borrower pursuant to the Loan Documents (including, without limitation, Bank Expenses) but are not paid when due shall bear interest until paid at a rate equal to the highest rate applicable to the Obligations. Payment or acceptance of the increased interest rate provided in this Section 2.5(b) is not a permitted alternative to timely payment and shall not constitute a waiver of any Event of Default or otherwise prejudice or limit any rights or remedies of Bank.

(c) Adjustment to Interest Rate. Changes to the interest rate of any Credit Extension based on changes to the Prime Rate shall be effective on the effective date of any change to the Prime Rate and to the extent of any such change.

(d) Payment; Interest Computation. Interest is payable monthly on the Payment Date of each month and shall be computed on the basis of a 360-day year for the actual number of days elapsed. In computing interest, (i) all payments received after 12:00 p.m. Pacific time on any day shall be deemed received at the opening of business on the next Business Day, and (ii) the date of the making of any Credit Extension shall be included and the date of payment shall be excluded; provided, however, that if any Credit Extension is repaid on the same day on which it is made, such day shall be included in computing interest on such Credit Extension.

2.6 Fees. Borrower shall pay to Bank:

(a) Good Faith Deposit. A deposit of Twenty Thousand Dollars ($20,000) (the "**Good Faith Deposit**") was previously delivered to Bank to initiate Bank's due diligence review process. If Bank fails to obtain initial credit approval for the transaction hereunder by April 17, 2018, then the Good Faith Deposit shall be refunded to Borrower if Borrower elects not to continue with the transaction. If such credit approval is so obtained and Borrower fails to execute the Loan Documents or deliver to Bank any of the information required therein by April 17, 2018, Bank shall retain the Good Faith Deposit, which Bank shall retain as an additional fee. To the extent Borrower and Bank close the transaction hereunder, Bank will refund the Good Faith Deposit to Borrower;

(b) First Anniversary Fee. A fully earned, non-refundable anniversary fee of Twenty Thousand Dollars ($20,000) (the "**First Anniversary Fee**") is earned and is due and payable on the one (1) year anniversary of the Effective Date;

(c) Second Anniversary Fee. A fully earned, non-refundable anniversary fee of Twenty Thousand Dollars ($20,000) (the "**Second Anniversary Fee**", and together with the First Anniversary Fee, collectively, the "**Anniversary Fees**") is earned and is due and payable on the two (2) year anniversary of the Effective Date;

(d) Termination Fee. Upon termination of this Agreement or the termination of the Revolving Line for any reason prior to the Revolving Line Maturity Date, in addition to the payment of any other amounts thenowing, a termination fee in an amount equal to Twenty Thousand Dollars ($20,000) provided that no termination fee shall be charged if the credit facility hereunder is replaced with a new facility from Bank;

(e) Prepayment Fee. The Prepayment Fee, when due hereunder;

(f) Final Payment. The Final Payment, when due hereunder;

(g) Bank Expenses. All Bank Expenses (including reasonable attorneys' fees and expenses for documentation and negotiation of this Agreement) incurred after the Effective Date, when due (or, if no stated due date, upon demand by Bank).

(h) Fees Fully Earned. Unless otherwise provided in this Agreement or in a separate writing by Bank, Borrower shall not be entitled to any credit, rebate, or repayment of any fees earned by Bank pursuant to this Agreement notwithstanding any termination of this Agreement or the suspension or termination of Bank's obligation to make loans and advances hereunder. Bank may deduct amounts owing by Borrower under the clauses of this Section 2.6 pursuant to the terms of Section 2.7(c). Bank shall provide Borrower written notice of deductions made from the Designated Deposit Account pursuant to the terms of the clauses of this Section 2.6.

2.7 Payments; Application of Payments; Debit of Accounts.

(a) All payments to be made by Borrower under any Loan Document shall be made in immediately available funds in Dollars, without setoff or counterclaim, before 12:00 p.m. Pacific time on the date when due. Payments of principal and/or interest received after 12:00 p.m. Pacific time are considered received at the opening of business on the next Business Day. When a payment is due on a day that is not a Business Day, the payment shall be due the next Business Day, and additional fees or interest, as applicable, shall continue to accrue until paid.

(b) Bank has the exclusive right to determine the order and manner in which all payments with respect to the Obligations may be applied. Borrower shall have no right to specify the order or the accounts to which Bank shall allocate or apply any payments required to be made by Borrower to Bank or otherwise received by Bank under this Agreement when any such allocation or application is not specified elsewhere in this Agreement.

(c) Bank may debit any of Borrower's deposit accounts, including the Designated Deposit Account, for principal and interest payments or any other amounts Borrower owes Bank when due. These debits shall not constitute a set-off.

2.8 Withholding. Payments received by Bank from Borrower under this Agreement will be made free and clear of and without deduction for any and all present or future taxes, levies, imposts, duties, deductions, withholdings, assessments, fees or other charges imposed by any Governmental Authority (including any interest, additions to tax or penalties applicable thereto). Specifically, however, if at any time any Governmental Authority, applicable law, regulation or international agreement requires Borrower to make any withholding or deduction from any such payment or other sum payable hereunder to Bank, Borrower hereby covenants and agrees that the amount due from Borrower with respect to such payment or other sum payable hereunder will be increased to the extent necessary to ensure that, after the making of such required withholding or deduction, Bank receives a net sum equal to the sum which it would have received had no withholding or deduction been required, and Borrower shall pay the full amount withheld or deducted to the relevant Governmental Authority. Borrower will, upon request, furnish Bank with proof reasonably satisfactory to Bank indicating that Borrower has made such withholding payment; provided, however, that Borrower need not make any withholding payment if the amount or validity of such withholding payment is contested in good faith by appropriate and timely proceedings and as to which payment in full is bonded or reserved against by Borrower. The agreements and obligations of Borrower contained in this Section 2.8 shall survive the termination of this Agreement.

3. CONDITIONS OF LOANS

3.1 Conditions Precedent to Initial Credit Extension. Bank's obligation to make the initial Credit Extension is subject to the condition precedent that Bank shall have received, in form and substance satisfactory to Bank, such documents, and completion of such other matters, as Bank may reasonably deem necessary or appropriate, including, without limitation:

(a) signatures to the Loan Documents;

(b) signatures to the Warrant, together with a capitalization table and copies of Borrower's equity documents;

(c) the Operating Documents and long-form good standing certificates of Borrower certified by the Secretary of State (or equivalent agency) of Delaware and each jurisdiction in which Borrower is qualified to conduct business, each as of a date no earlier than thirty (30) days prior to the Effective Date;

(d) a secretary's certificate of Borrower with respect to such Borrower's Operating Documents, incumbency, specimen signatures and resolutions authorizing the execution and delivery of this Agreement and the other Loan Documents to which it is a party;

(e) signatures to the completed Borrowing Resolutions for Borrower;

(f) certified copies, dated as of a recent date, of financing statement searches, as Bank may request, accompanied by written evidence (including any UCC termination statements) that the Liens indicated in any such financing statements either constitute Permitted Liens or have been or, in connection with the initial Credit Extension, will be terminated or released;

(g) the Perfection Certificate of Borrower, together with the signature thereto;

(h) [reserved];

(i) [reserved]; and

(j) with respect to the initial Advance, a completed Borrowing Base Statement (and any schedules related thereto and including any other information requested by Bank with respect to Borrower's Accounts).

3.2 Conditions Precedent to all Credit Extensions. Bank's obligations to make each Credit Extension, including the initial Credit Extension, is subject to the following conditions precedent:

(a) timely receipt of (i) the Credit Extension request and any materials and documents required by Section 3.4 and (ii) with respect to the request for Term Loan Advances, an executed Payment/Advance Form and any materials and documents required by Section 3.4;

(b) the representations and warranties in this Agreement shall be true, accurate, and complete in all material respects on the date of the proposed Credit Extension and/or of the Payment/Advance Form, as applicable, and on the Funding Date of each Credit Extension; provided, however, that such materiality qualifier shall not be applicable to any representations and warranties that already are qualified or modified by materiality in the text thereof; and provided, further that those representations and warranties expressly referring to a specific date shall be true, accurate and complete in all material respects as of such date, and no Event of Default shall have occurred and be continuing or result from the Credit Extension. Each Credit Extension is Borrower's representation and warranty on that date that the representations and warranties in this Agreement remain true, accurate, and complete in all material respects; provided, however, that such materiality qualifier shall not be applicable to any representations and warranties that already are qualified or modified by materiality in the text thereof; and provided, further that those representations and warranties expressly referring to a specific date shall be true, accurate and complete in all material respects as of such date;

(c) with respect to the initial Advance only, the completion of the Initial Audit; and

(d) Bank determines to its satisfaction that there has not been any Material Adverse Change.

3.3 Covenant to Deliver.

(a) Borrower agrees to deliver to Bank each item required to be delivered to Bank under this Agreement as a condition precedent to any Credit Extension. Borrower expressly agrees that a Credit Extension made prior to the receipt by Bank of any such item shall not constitute a waiver by Bank of Borrower's obligation to deliver such item, and the making of any Credit Extension in the absence of a required item shall be in Bank's sole discretion.

(b) Borrower further agrees to deliver to Bank the insurance policies and/or endorsements required pursuant to Section 6.7 hereof within 30 days after the Effective Date.

3.4 Procedures for Borrowing.

(a) Advances. Subject to the prior satisfaction of all other applicable conditions to the making of an Advance set forth in this Agreement, to obtain an Advance, Borrower (via an individual duly authorized by an Administrator) shall notify Bank (which notice shall be irrevocable) by electronic mail by 12:00 p.m. Pacific time on the Funding Date of the Advance. Such notice shall be made by Borrower through Bank's online banking program, provided, however, if Borrower is not utilizing Bank's online banking program, then such notice shall be in a written format acceptable to Bank that is executed by an Authorized Signer. Bank shall have received satisfactory evidence that the Board has approved that such Authorized Signer may provide such notices and request Advances. In connection with any such notification, Borrower must promptly deliver to Bank by electronic mail or through Bank's online banking program such reports and information, including without limitation, sales journals, cash receipts journals, accounts receivable aging reports, as Bank may request in its sole discretion. Bank shall credit proceeds of an Advance to the Designated Deposit Account. Bank may make Advances under this Agreement based on instructions from an Authorized Signer or without instructions if the Advances are necessary to meet Obligations which have become due.

(b) Term Loan Advances. Subject to the prior satisfaction of all other applicable conditions to the making of a Term Loan Advance set forth in this Agreement, to obtain a Term Loan Advance, Borrower (via an individual duly authorized by an Administrator) shall notify Bank (which notice shall be irrevocable) by electronic mail by 12:00 noon Pacific time on the Funding Date of the Term Loan Advance. Such notice shall be made by Borrower through Bank's online banking program, provided, however, if Borrower is not utilizing Bank's online banking program, then such notice shall be in a written format acceptable to Bank that is executed by an Authorized Signer. Bank shall have received satisfactory evidence that the Board has approved that such Authorized Signer may provide such notices and request Term Loan Advances. In connection with such notification, Borrower must promptly deliver to Bank by electronic mail or through Bank's online banking program a completed Payment/Advance Form executed by an Authorized Signer together with such other reports and information, as Bank may request in its sole discretion. Bank shall credit proceeds of any Term Loan Advance to the Designated Deposit Account. Bank may make Term Loan Advances under this Agreement based on instructions from an Authorized Signer or without instructions if the Term Loan Advances are necessary to meet Obligations which have become due.

4. CREATION OF SECURITY INTEREST

4.1 Grant of Security Interest. Borrower hereby grants Bank, to secure the payment and performance in full of all of the Obligations, a continuing security interest in, and pledges to Bank, the Collateral, wherever located, whether now owned or hereafter acquired or arising, and all proceeds and products thereof.

Borrower acknowledges that it previously has entered, and/or may in the future enter, into Bank Services Agreements with Bank. Regardless of the terms of any Bank Services Agreement, Borrower agrees that any amounts Borrower owes Bank thereunder shall be deemed to be Obligations hereunder and that it is the intent of Borrower and Bank to have all such Obligations secured by the first priority perfected security interest in the Collateral granted herein (subject only to Permitted Liens).

Subject to the terms contained herein, Bank agrees that the security interests granted to it hereunder in Third Party Equipment shall be subordinate (or released upon request of the applicable equipment lender or lessor) to the security interests in Third Party Equipment of future lenders and lessors engaged in the business of providing equipment financing and leasing for Third Party Equipment; provided that such liens are (i) permitted under clause (c) of the definition of Permitted Liens, and (ii) with respect to purchase money security interests, properly perfected as a valid "purchase money security interest" under applicable law. "**Third Party Equipment**" means the equipment (and additions, accessions, parts, replacements, fixtures, improvements and attachments thereto and the proceeds thereof) financed or acquired pursuant to clause (c) of the definition of Permitted Liens. So long as no Event of Default has occurred and is continuing, Bank agrees to execute and deliver, at Borrower's expense, such agreements and documents as may be reasonably requested in writing by Borrower and such equipment lender or equipment lessor from time to time which set forth the lien subordination (or, if applicable, lien release) described in this Section and are reasonably acceptable to Bank. Bank shall have no obligation to execute any agreement or document which would impose obligations, restrictions, or lien priority on Bank which are less favorable to Bank than those described in this Section. For purposes of clarity, such subordinations shall be of the priority of Bank's security interest with respect to and not in right in payment in connection with such Third Party Equipment and shall not otherwise limit Bank's rights or remedies with respect to such Third Party Equipment.

If this Agreement is terminated, Bank's Lien in the Collateral shall continue until the Obligations (other than inchoate indemnity obligations and Bank Services, so long as Borrower complies with the cash collateral requirements of this Section 4.1) are repaid in full in cash. Upon payment in full in cash of the Obligations (other than inchoate indemnity obligations) and at such time as Bank's obligation to make Credit Extensions has terminated, Bank shall, at the sole cost and expense of Borrower, release its Liens in the Collateral and all rights therein shall revert to Borrower. In the event (x) all Obligations (other than inchoate indemnity obligations), except for Bank Services, are satisfied in full, and (y) this Agreement is terminated, Bank shall terminate the security interest granted herein upon Borrower providing cash collateral acceptable to Bank in its good faith business judgment for Bank Services, if any. In the event such Bank Services consist of outstanding Letters of Credit, Borrower shall provide to Bank cash collateral in an amount equal to (x) if such Letters of Credit are denominated in Dollars, then at least one hundred five percent (105.0%); and (y) if such Letters of Credit are denominated in a Foreign Currency, then at least one hundred ten percent (110.0%), of the Dollar Equivalent of the face amount of all such Letters of Credit plus all interest, fees, and costs due or to become due in connection therewith (as estimated by Bank in its business judgment), to secure all of the Obligations relating to such Letters of Credit.

4.2 Priority of Security Interest. Borrower represents, warrants, and covenants that the security interest granted herein is and shall at all times continue to be a first priority perfected security interest in the Collateral (subject only to Permitted Liens). If Borrower shall acquire a commercial tort claim, Borrower shall promptly notify Bank in a writing signed by Borrower of the general details thereof and grant to Bank in such writing a security interest therein and in the proceeds thereof, all upon the terms of this Agreement, with such writing to be in form and substance reasonably satisfactory to Bank.

4.3 Authorization to File Financing Statements. Borrower hereby authorizes Bank to file financing statements, without notice to Borrower, with all appropriate jurisdictions to perfect or protect Bank's interest or rights hereunder, including a notice that any disposition of the Collateral, by either Borrower or any other Person, shall be deemed to violate the rights of Bank under the Code. Such financing statements may indicate the Collateral as "all assets of the Debtor" or words of similar effect, or as being of an equal or lesser scope, or with greater detail, all in Bank's discretion.

5. REPRESENTATIONS AND WARRANTIES

Borrower represents and warrants as follows:

5.1 Due Organization, Authorization; Power and Authority. Borrower is duly existing and in good standing as a Registered Organization in its jurisdiction of formation and is qualified and licensed to do business and is in good standing in any jurisdiction in which the conduct of its business or its ownership of property requires that it be qualified except where the failure to do so could not reasonably be expected to have a material adverse effect on Borrower's business. In connection with this Agreement, Borrower has delivered to Bank a completed certificate signed by Borrower, entitled "Perfection Certificate" (the "**Perfection Certificate**"). Borrower represents and warrants to Bank, except as may have been updated by notification to Bank pursuant to Section 7.2, that (a) Borrower's exact legal name is that indicated on the Perfection Certificate and on the signature page hereof; (b) Borrower is an organization of the type and is organized in the jurisdiction set forth in the Perfection Certificate; (c) the Perfection Certificate accurately sets forth Borrower's organizational identification number or accurately states that Borrower has none; (d) the Perfection Certificate accurately sets forth Borrower's place of business, or, if more than one, its chief executive office as well as Borrower's mailing address (if different than its chief executive office); (e) except as set forth on the Perfection Certificate, Borrower (and each of its predecessors) has not, in the past five (5) years, changed its jurisdiction of formation, organizational structure or type, or any organizational number assigned by its jurisdiction; and (f) all other information set forth on the Perfection Certificate pertaining to Borrower and each of its Subsidiaries is accurate and complete in all material respects (it being understood and agreed that Borrower may from time to time update certain information in the Perfection Certificate after the Effective Date to the extent permitted by one or more specific provisions in this Agreement).

The execution, delivery and performance by Borrower of the Loan Documents to which it is a party have been duly authorized, and do not (i) conflict with any of Borrower's organizational documents, (ii) contravene, conflict with, constitute a default under or violate any material Requirement of Law, (iii) contravene, conflict or violate any applicable order, writ, judgment, injunction, decree, determination or award of any Governmental Authority by which Borrower or any of its Subsidiaries or any of their property or assets may be bound or affected, (iv) require any action by, filing, registration, or qualification with, or Governmental Approval from, any Governmental Authority (except (i) such Governmental Approvals which have already been obtained and are in full force and effect, and (ii) the filing of a UCC-1 financing statement with the Delaware Secretary of State covering the Collateral in connection with the security interests granted herein), or (v) conflict with, contravene, constitute a default or breach under, or result in or permit the termination or acceleration of, any material agreement by which Borrower is bound. Borrower is not in default under any agreement to which it is a party or by which it is bound in which the default could reasonably be expected to have a material adverse effect on Borrower's business.

5.2 Collateral. Borrower has good title to, rights in, and the power to transfer each item of the Collateral upon which it purports to grant a Lien hereunder, free and clear of any and all Liens except Permitted Liens. Borrower has no Collateral Accounts at or with any bank or financial institution other than Bank or Bank's Affiliates except for the Collateral Accounts described in the Perfection Certificate delivered to Bank in connection herewith and which Borrower has taken such actions as are necessary to give Bank a perfected security interest therein, pursuant to the terms of Section 6.8(b). The Accounts are bona fide, existing obligations of the Account Debtors.

The Collateral is not in the possession of any third party bailee (such as a warehouse) except as otherwise provided in the Perfection Certificate or as permitted pursuant to Section 7.2. None of the components of the Collateral shall be maintained at locations other than as provided in the Perfection Certificate or as permitted pursuant to Section 7.2.

All Inventory is in all material respects of good and marketable quality, free from material defects.

Borrower is the sole owner of the Intellectual Property which it owns or purports to own except for (a) nonexclusive licenses granted to its customers in the ordinary course of business and other licenses permitted under Section 7.1(f), (b) over-the-counter software that is commercially available to the public, and (c) material Intellectual Property licensed to Borrower and noted on the Perfection Certificate. To Borrower's knowledge, each Patent which it owns or purports to own and which is material to Borrower's business is valid and enforceable, and no part of the Intellectual Property which Borrower owns or purports to own and which is material to Borrower's business has been judged invalid or unenforceable, in whole or in part. To Borrower's knowledge, no claim has been made in writing that any part of the Intellectual Property violates the rights of any third party except to the extent such claim would not reasonably be expected to have a material adverse effect on Borrower's business.

Except as noted on the Perfection Certificate, Borrower is not a party to, nor is it bound by, any Restricted License.

5.3 Accounts Receivable.

(a) For each Account with respect to which Advances are requested, on the date each Advance is requested and made, such Account shall be an Eligible Account.

(b) All statements made and all unpaid balances appearing in all invoices, instruments and other documents evidencing the Eligible Accounts are and shall be true and correct and all such invoices, instruments and other documents, and all of Borrower's Books are genuine and in all respects what they purport to be. All sales and other transactions underlying or giving rise to each Eligible Account shall comply in all material respects with all applicable laws and governmental rules and regulations. Borrower has no knowledge of any actual or imminent Insolvency Proceeding of any Account Debtor whose accounts are Eligible Accounts in any Borrowing Base Statement. To the best of Borrower's knowledge, all signatures and endorsements on all documents, instruments, and agreements relating to all Eligible Accounts are genuine, and all such documents, instruments and agreements are legally enforceable in accordance with their terms.

5.4 Litigation. Except as disclosed to Bank in writing, including any reports provided pursuant to Section 6.2(i), there are no actions or proceedings pending or, to the knowledge of any Responsible Officer, threatened in writing by or against Borrower or any of its Subsidiaries that could reasonably be expected to result in damages more than, individually or in the aggregate, Five Hundred Fifty Thousand Dollars ($500,000).

5.5 Financial Statements; Financial Condition. All consolidated financial statements for Borrower and any of its Subsidiaries delivered to Bank by submission to the Financial Statement Repository or otherwise submitted to Bank fairly present in all material respects Borrower's consolidated financial condition as of the dates thereof and Borrower's consolidated results of operations as of the dates and for the periods presented (except with respect to unaudited financial statements, subject to year-end adjustments and for the absence of footnotes). There has not been any material deterioration in Borrower's consolidated financial condition since the date of the most recent financial statements submitted to the Financial Statement Repository or otherwise submitted to Bank.

5.6 Solvency. The fair salable value of Borrower's consolidated assets (including goodwill minus disposition costs) exceeds the fair value of Borrower's liabilities; Borrower is not left with unreasonably small capital after the transactions in this Agreement; and Borrower is able to pay its debts (including trade debts) as they mature.

5.7 Regulatory Compliance. Borrower is not an "investment company" or a company "controlled" by an "investment company" under the Investment Company Act of 1940, as amended. Borrower is not engaged as one of its important activities in extending credit for margin stock (under Regulations X, T and U of the Federal Reserve Board of Governors). Borrower (a) has complied in all material respects with all Requirements of Law, and

(b) has not violated any Requirements of Law the violation of which could reasonably be expected to have a material adverse effect on its business. None of Borrower's or any of its Subsidiaries' properties or assets has been used by Borrower or any Subsidiary or, to the best of Borrower's knowledge, by previous Persons, in disposing, producing, storing, treating, or transporting any hazardous substance other than legally. Borrower and each of its Subsidiaries have obtained all consents, approvals and authorizations of, made all declarations or filings with, and given all notices to, all Governmental Authorities that are necessary to continue their respective businesses as currently conducted, except to the extent that failure to do so could not reasonably be expected to have a material adverse effect on its business or impair Borrower's performance of the Obligations.

5.8 Subsidiaries; Investments. Borrower does not own any stock, partnership, or other ownership interest or other equity securities except for Permitted Investments.

5.9 Tax Returns and Payments; Pension Contributions. Borrower has timely filed all required tax returns and reports, and Borrower has timely paid all foreign, federal, state and local taxes, assessments, deposits and contributions owed by Borrower except (a) to the extent such taxes are being contested in good faith by appropriate proceedings promptly instituted and diligently conducted, so long as such reserve or other appropriate provision, if any, as shall be required in conformity with GAAP shall have been made therefor, or (b) if such taxes, assessments, deposits and contributions do not, individually or in the aggregate, exceed Fifty Thousand Dollars ($50,000).

To the extent Borrower defers payment of any contested taxes, Borrower shall (i) notify Bank in writing of the commencement of, and any material development in, the proceedings, and (ii) post bonds or take any other steps required to prevent the Governmental Authority levying such contested taxes from obtaining a Lien upon any of the Collateral that is other than a "Permitted Lien." Borrower is unaware of any claims or adjustments proposed for any of Borrower's prior tax years which could result in additional taxes becoming due and payable by Borrower. Borrower has paid all amounts necessary to fund all present pension, profit sharing and deferred compensation plans in accordance with their terms, and Borrower has not withdrawn from participation in, and has not permitted partial or complete termination of, or permitted the occurrence of any other event with respect to, any such plan which could reasonably be expected to result in any liability of Borrower, including any liability to the Pension Benefit Guaranty Corporation or its successors or any other governmental agency.

5.10 Use of Proceeds. Borrower shall use the proceeds of the Credit Extensions solely as working capital and to fund its general business requirements and not for personal, family, household or agricultural purposes.

5.11 Full Disclosure. No written representation, warranty or other statement of Borrower in any report, certificate, or written statement submitted to the Financial Statement Repository or otherwise submitted to Bank, as of the date such representation, warranty, or other statement was made, taken together with all such written reports, written certificates, and written statements submitted to the Financial Statement Repository or otherwise submitted to Bank, contains any untrue statement of a material fact or omits to state a material fact necessary to make the statements contained in the reports, certificates, or written statements not misleading (it being recognized by Bank that the projections and forecasts provided by Borrower in good faith and based upon reasonable assumptions are not viewed as facts and that actual results during the period or periods covered by such projections and forecasts may differ from the projected or forecasted results).

5.12 Definition of "**Knowledge.**" For purposes of the Loan Documents, whenever a representation or warranty is made to Borrower's knowledge or awareness, to the "best of" Borrower's knowledge, or with a similar qualification, knowledge or awareness means the actual knowledge, after reasonable investigation, of any Responsible Officer.

6. AFFIRMATIVE COVENANTS

Borrower shall do all of the following:

6.1 Government Compliance.

(a) Except as permitted by Section 7.3, maintain its and all its Subsidiaries' legal existence and good standing in their respective jurisdictions of formation and maintain qualification in each jurisdiction in which the failure to so qualify would reasonably be expected to have a material adverse effect on Borrower's business or operations. Borrower shall comply, and have each Subsidiary comply, in all material respects, with all laws, ordinances and regulations to which it is subject.

(b) Obtain all of the Governmental Approvals necessary for the performance by Borrower of its obligations under the Loan Documents to which it is a party and the grant of a security interest to Bank in all of its property. Borrower shall promptly provide copies of any such obtained Governmental Approvals to Bank.

6.2 Financial Statements, Reports. Provide Bank with the following by submitting to the Financial Statement Repository or otherwise submitting to Bank:

(a) a Borrowing Base Statement (and any schedules related thereto and including any other information requested by Bank with respect to Borrower's Accounts) (i) no later than Friday of each week when a Streamline Period is not in effect and (ii) within thirty (30) days after the end of each month when a Streamline Period is in effect;

(b) within thirty (30) days after the end of each month, (A) monthly accounts receivable agings, aged by invoice date, (B) monthly accounts payable agings, aged by invoice date, and (C) a detailed accounts receivable ledger report, and (D) reconciliations of accounts receivable agings (aged by invoice date), transaction reports, and general ledger;

(c) as soon as available, but no later than thirty (30) days after the last day of each month, a company prepared consolidated balance sheet and income statement covering Borrower's consolidated operations for such month in a form acceptable to Bank (the "Monthly Financial Statements");

(d) within thirty (30) days after the last day of each month and together with the Monthly Financial Statements, a duly completed Compliance Statement, substantially in the form of Exhibit B;

(e) contemporaneously with any updates or amendments thereto, within thirty (30) days of the later of Board approval or the end of each fiscal year of Borrower, (A) annual operating budgets (including income statements, balance sheets and cash flow statements, by month) for the upcoming fiscal year of Borrower, and (B) annual financial projections for the following fiscal year (on a quarterly basis), in each case as approved by the Board, together with any related business forecasts used in the preparation of such annual financial projections;

(f) as soon as available and in any event within one hundred eighty (180) days following the end of Borrower's fiscal year, audited consolidated financial statements prepared under GAAP, consistently applied, together with an unqualified opinion (provided that such opinion may contain a going concern qualification typical for venture backed companies similar to Borrower) on the financial statements from an independent certified public accounting firm reasonably acceptable to Bank; provided, however, for any fiscal year for which the Board does not require Borrower to prepare audited financial statements, Borrower shall instead deliver to Bank, as soon as available, but no later than sixty (60) days after the last day of Borrower's fiscal year, a company-prepared consolidated balance sheet and income statement covering Borrower's consolidated operations during such fiscal year in a form acceptable to Bank;

(g) in the event that Borrower becomes subject to the reporting requirements under the Exchange Act within five (5) days of filing, copies of all periodic and other reports, proxy statements and other materials filed by Borrower and/or any Guarantor with the SEC, any Governmental Authority succeeding to any or all of the functions of the SEC or with any national securities exchange, or distributed to its shareholders, as the case may be. Documents required to be delivered pursuant to the terms hereof (to the extent any such documents are included in materials otherwise filed with the SEC) may be delivered electronically and if so delivered, shall be deemed to have been delivered on the date on which Borrower posts such documents, or provides a link thereto, on Borrower's website on the internet at Borrower's website address; provided, however, Borrower shall promptly notify Bank in writing (which may be by electronic mail) of the posting of any such documents;

(h) within five (5) days of delivery, copies of all statements, reports and notices made available to Borrower's security holders or to any holders of Subordinated Debt;

(i) a prompt report of any legal actions pending or threatened in writing against Borrower or any of its Subsidiaries that could reasonably be expected to result in damages or costs to Borrower or any of its Subsidiaries of, individually or in the aggregate, Five Hundred Thousand Dollars ($500,000) or more; and

(j) promptly, from time to time, such other information regarding Borrower or compliance with the terms of any Loan Documents as reasonably requested by Bank.

Any submission by Borrower of a Compliance Statement, a Borrowing Base Statement or any other financial statement submitted to the Financial Statement Repository pursuant to this Section 6.2 or otherwise submitted to Bank shall be deemed to be a representation by Borrower that (i) as of the date of such Compliance Statement, Borrowing Base Statement or other financial statement, the information and calculations set forth therein are true, accurate and correct, (ii) as of the end of the compliance period set forth in such submission, Borrower is in complete compliance with all required covenants except as noted in such Compliance Statement, Borrowing Base Statement or other financial statement, as applicable, (iii) as of the date of such submission, no Events of Default have occurred or are continuing, (iv) all representations and warranties other than any representations or warranties that are made as of a specific date in Section 5 remain true and correct in all material respects as of the date of such submission except as noted in such Compliance Statement, Borrowing Base Statement or other financial statement, as applicable, (v) as of the date of such submission, Borrower and each of its Subsidiaries has timely filed all required tax returns and reports, and Borrower has timely paid all foreign, federal, state and local taxes, assessments, deposits and contributions owed by Borrower except as otherwise permitted pursuant to the terms of Section 5.9, and (vi) as of the date of such submission, no Liens have been levied or claims made against Borrower or any of its Subsidiaries relating to unpaid employee payroll or benefits of which Borrower has not previously provided written notification to Bank.

6.3 Accounts Receivable.

(a) Schedules and Documents Relating to Accounts. Borrower shall deliver to Bank transaction reports and schedules of collections, as provided in Section 6.2, on Bank's standard forms; provided, however, that Borrower's failure to execute and deliver the same shall not affect or limit Bank's Lien and other rights in all of Borrower's Accounts, nor shall Bank's failure to advance or lend against a specific Account affect or limit Bank's Lien and other rights therein. If requested by Bank, Borrower shall furnish Bank with copies (or, at Bank's request, originals) of all contracts, orders, invoices, and other similar documents, and all shipping instructions, delivery receipts, bills of lading, and other evidence of delivery, for any goods the sale or disposition of which gave rise to such Accounts. In addition, Borrower shall deliver to Bank, on its request, the originals of all instruments, chattel paper, security agreements, guarantees and other documents and property evidencing or securing any Accounts, in the same form as received, with all necessary indorsements, and copies of all credit memos.

(b) Disputes. Borrower shall promptly notify Bank of all disputes or claims relating to Accounts involving more than Fifty Thousand Dollars ($50,000) in the aggregate. Borrower may forgive (completely or partially), compromise, or settle any Account for less than payment in full, or agree to do any of the foregoing so long as (i) Borrower does so in good faith, in a commercially reasonable manner, in the ordinary course of business, in arm's-length transactions, and reports the same to Bank in the regular reports provided to Bank; (ii) no Event of Default has occurred and is continuing; and (iii) after taking into account all such discounts, settlements and forgiveness, the total outstanding Advances will not exceed the lesser of the Revolving Line or the Borrowing Base.

(c) Collection of Accounts. Borrower shall direct Account Debtors to deliver or transmit all proceeds of Accounts into a lockbox account, or "blocked account" as specified by Bank (either such account, the "**Cash Collateral Account**"). Whether or not an Event of Default has occurred and is continuing, Borrower shall immediately deliver all payments on and proceeds of Accounts to the Cash Collateral Account. Subject to Bank's right to maintain a reserve pursuant to Section 6.3(d), all amounts received in the Cash Collateral Account shall be (i) when a Streamline Period is not in effect, applied to immediately reduce the Obligations under the Revolving Line (unless Bank, in its sole discretion, at times when an Event of Default exists, elects not to so apply such

amounts), or (ii) when a Streamline Period is in effect, transferred on a daily basis to Borrower's operating account with Bank. Borrower hereby authorizes Bank to transfer to the Cash Collateral Account any amounts that Bank reasonably determines are proceeds of the Accounts (provided that Bank is under no obligation to do so and this allowance shall in no event relieve Borrower of its obligations hereunder).

(d) Reserves. Notwithstanding any terms in this Agreement to the contrary, at times when an Event of Default exists, Bank may hold any proceeds of the Accounts and any amounts in the Cash Collateral Account that are not applied to the Obligations pursuant to Section 6.3(c) above (including amounts otherwise required to be transferred to Borrower's operating account with Bank when a Streamline Period is in effect) as a reserve to be applied to any Obligations regardless of whether such Obligations are then due and payable.

(e) Returns. Provided no Event of Default has occurred and is continuing, if any Account Debtor returns any Inventory to Borrower, Borrower shall promptly (i) determine the reason for such return, (ii) issue a credit memorandum to the Account Debtor in the appropriate amount, and (iii) provide a copy of such credit memorandum to Bank, upon request from Bank. In the event any attempted return occurs after the occurrence and during the continuance of any Event of Default, Borrower shall hold the returned Inventory in trust for Bank, and immediately notify Bank of the return of the Inventory.

(f) Verifications; Confirmations; Credit Quality; Notifications. Bank may, from time to time, (i) verify and confirm directly with the respective Account Debtors the validity, amount and other matters relating to the Accounts, either in the name of Borrower or Bank or such other name as Bank may choose, and notify any Account Debtor of Bank's security interest in such Account and/or (ii) conduct a credit check of any Account Debtor to approve any such Account Debtor's credit.

(g) No Liability. Bank shall not be responsible or liable for any shortage or discrepancy in, damage to, or loss or destruction of, any goods, the sale or other disposition of which gives rise to an Account, or for any error, act, omission, or delay of any kind occurring in the settlement, failure to settle, collection or failure to collect any Account, or for settling any Account in good faith for less than the full amount thereof, nor shall Bank be deemed to be responsible for any of Borrower's obligations under any contract or agreement giving rise to an Account. Nothing herein shall, however, relieve Bank from liability for its own gross negligence or willful misconduct.

6.4 Remittance of Proceeds. Except as otherwise provided in Section 6.3(c), deliver, in kind, all cash proceeds arising from the disposition of any Collateral to Bank in the original form in which received by Borrower not later than the following Business Day after receipt by Borrower, to be applied to the Obligations (a) prior to an Event of Default, pursuant to the terms of Section 6.3(c) hereof, and (b) after the occurrence and during the continuance of an Event of Default, pursuant to the terms of Section 9.4 hereof; provided that, if no Event of Default has occurred and is continuing, Borrower shall not be obligated to remit to Bank the proceeds of the sale of worn out or obsolete Equipment disposed of by Borrower in good faith in an arm's length transaction for an aggregate purchase price of One Hundred Thousand Dollars ($100,000) or less (for all such transactions in any fiscal year). Borrower agrees that it will not commingle proceeds of Collateral with any of Borrower's other funds or property, but will hold such proceeds separate and apart from such other funds and property and in an express trust for Bank. Nothing in this Section 6.4 limits the restrictions on disposition of Collateral set forth elsewhere in this Agreement.

6.5 Taxes; Pensions. Timely file, and require each of its Subsidiaries to timely file, all required tax returns and reports and timely pay, and require each of its Subsidiaries to timely pay, all foreign, federal, state and local taxes, assessments, deposits and contributions owed by Borrower and each of its Subsidiaries, except for deferred payment of any taxes contested pursuant to the terms of Section 5.9 hereof, and shall deliver to Bank, on demand, appropriate certificates attesting to such payments, and pay all amounts necessary to fund all present pension, profit sharing and deferred compensation plans in accordance with their terms.

6.6 Access to Collateral; Books and Records. At reasonable times, on three (3) Business Days' notice (provided no notice is required if an Event of Default has occurred and is continuing), Bank, or its agents, shall have the right to inspect the Collateral and the right to audit and copy Borrower's Books. The foregoing inspections and audits shall be conducted no more often than once every twelve (12) months (or more frequently as Bank in its sole discretion determines that conditions warrant) unless an Event of Default has occurred and is continuing in which case such inspections and audits shall occur as often as Bank shall determine is necessary. The

foregoing inspections and audits shall be conducted at Borrower's expense and the charge therefor shall be One Thousand Dollars ($1,000) per person per day (or such higher amount as shall represent Bank's then-current standard charge for the same), plus reasonable out-of-pocket expenses. In the event Borrower and Bank schedule an audit more than ten (10) days in advance, and Borrower cancels or seeks to or reschedules the audit with less than ten (10) days written notice to Bank, then (without limiting any of Bank's rights or remedies) Borrower shall pay Bank a fee of One Thousand Dollars ($1,000) plus any out-of-pocket expenses incurred by Bank to compensate Bank for the anticipated costs and expenses of the cancellation or rescheduling. The Initial Audit shall be conducted within the earlier to occur of (i) the funding of the initial Advance hereunder, or (ii) sixty (60) days after the Effective Date.

6.7 Insurance.

(a) Keep its business and the Collateral insured for risks and in amounts standard for companies in Borrower's industry and location and as Bank may reasonably request. Insurance policies shall be in a form, with financially sound and reputable insurance companies that are not Affiliates of Borrower, and in amounts that are satisfactory to Bank. All property policies shall have a lender's loss payable endorsement showing Bank as the lender loss payee. All liability policies shall show, or have endorsements showing, Bank as an additional insured. Bank shall be named as lender loss payee and/or additional insured with respect to any such insurance providing coverage in respect of any Collateral.

(b) Ensure that proceeds payable under any property policy are, at Bank's option, payable to Bank on account of the Obligations. Notwithstanding the foregoing, (a) so long as no Event of Default has occurred and is continuing, Borrower shall have the option of applying the proceeds of any casualty policy with respect to any loss, but not exceeding Five Hundred Thousand Dollars ($500,000) in the aggregate for all losses under all casualty policies in any one year toward the replacement or repair of destroyed or damaged property; provided that any such replaced or repaired Collateral (i) shall be of equal or like value as the replaced or repaired Collateral and (ii) shall be deemed Collateral in which Bank has been granted a first priority security interest (subject only to Permitted Liens), and (b) after the occurrence and during the continuance of an Event of Default, all proceeds payable under such policy shall, at the option of Bank, be payable to Bank on account of the Obligations.

(c) At Bank's request, Borrower shall deliver certified copies of insurance policies and evidence of all premium payments. Each provider of any such insurance required under this Section 6.7 shall agree, by endorsement upon the policy or policies issued by it or by independent instruments furnished to Bank, that it will give Bank thirty (30) days prior written notice before any such policy or policies shall be canceled and ten (10) days prior written notice for any nonpayment of premium. If Borrower fails to obtain insurance as required under this Section 6.7 or to pay any amount or furnish any required proof of payment to third persons and Bank, Bank may make all or part of such payment or obtain such insurance policies required in this Section 6.7, and take any action under the policies Bank deems prudent.

6.8 Accounts.

(a) (i) Maintain with Bank the Cash Collateral Account and (ii) conduct with Bank and Bank's Affiliates, Borrower's and all of its Subsidiaries' primary banking including operating and other deposit accounts, securities/investment accounts, cash management, asset management, letters of credit and business credit cards; provided, however that Borrower and its Subsidiaries shall be permitted to maintain Collateral Accounts outside the United States with an aggregate balance not to exceed Five Hundred Thousand Dollars ($500,000). Any Guarantor shall maintain all depository, operating and securities/investment accounts with Bank and Bank's Affiliates.

(b) In addition to and without limiting the restrictions in (a), Borrower shall provide Bank five (5) days prior written notice before establishing any Collateral Account at or with any bank or financial institution other than Bank or Bank's Affiliates. For each Collateral Account that Borrower at any time maintains, Borrower shall cause the applicable bank or financial institution (other than Bank) at or with which any Collateral Account is maintained to execute and deliver a Control Agreement or other appropriate instrument with respect to such Collateral Account to perfect Bank's Lien in such Collateral Account in accordance with the terms hereunder which Control Agreement may not be terminated without the prior written consent of Bank. The provisions of the previous sentence shall not apply to deposit accounts exclusively used for payroll, payroll taxes, and other employee wage and benefit payments to or for the benefit of Borrower's employees and identified to Bank by Borrower as such.

6.9 [Reserved].

6.10 Protection of Intellectual Property Rights

(a) (i) Protect, defend and maintain the validity and enforceability of its Intellectual Property material to Borrower; (ii) promptly advise Bank in writing of material infringements or any other event that could reasonably be expected to materially and adversely affect the value of its Intellectual Property; and (iii) not allow any Intellectual Property material to Borrower's business to be abandoned, forfeited or dedicated to the public without Bank's written consent.

(b) Provide written notice to Bank within ten (10) days of entering or becoming bound by any Restricted License (other than over-the-counter software that is commercially available to the public). Borrower shall take such steps as Bank requests to obtain the consent of, or waiver by, any person whose consent or waiver is necessary for (i) any Restricted License to be deemed "Collateral" and for Bank to have a security interest in it that might otherwise be restricted or prohibited by law or by the terms of any such Restricted License, whether now existing or entered into in the future, and (ii) Bank to have the ability in the event of a liquidation of any Collateral to dispose of such Collateral in accordance with Bank's rights and remedies under this Agreement and the other Loan Documents.

6.11 Litigation Cooperation. From the date hereof and continuing through the termination of this Agreement, make available to Bank, without expense to Bank, Borrower and its officers, employees and agents and Borrower's books and records, to the extent that Bank may deem them reasonably necessary to prosecute or defend any third-party suit or proceeding instituted by or against Bank with respect to any Collateral or relating to Borrower.

6.12 Online Banking.

(a) Utilize Bank's online banking platform for all matters requested by Bank which shall include, without limitation (and without request by Bank for the following matters), uploading information pertaining to Accounts and Account Debtors, requesting approval for exceptions, requesting Credit Extensions, and uploading financial statements and other reports required to be delivered by this Agreement (including, without limitation, those described in Section 6.2 of this Agreement).

(b) Comply with the terms of the "Banking Terms and Conditions" and ensure that all persons utilizing the online banking platform are duly authorized to do so by an Administrator. Bank shall be entitled to assume the authenticity, accuracy and completeness on any information, instruction or request for a Credit Extension submitted via the online banking platform and to further assume that any submissions or requests made via the online banking platform have been duly authorized by an Administrator.

6.13 Formation or Acquisition of Subsidiaries. Notwithstanding and without limiting the negative covenants contained in Sections 7.3 and 7.7 hereof, at the time that Borrower forms any direct or indirect Subsidiary or acquires any direct or indirect Subsidiary after the Effective Date, if Bank requests in its sole discretion, Borrower shall (a) cause any such new Domestic Subsidiary to provide to Bank a joinder to this Agreement to become a coborrower hereunder, together with such appropriate financing statements and/or Control Agreements, all in form and substance satisfactory to Bank (including being sufficient to grant Bank a first priority Lien (subject to Permitted Liens) in and to the assets of such newly formed or acquired Domestic Subsidiary), (b) provide to Bank appropriate certificates and powers and financing statements, pledging all of the direct or beneficial ownership interest in such new Domestic Subsidiary, in form and substance satisfactory to Bank; (c) pledge sixty-five percent (65%) of the direct or beneficial ownership interest of any new Foreign Subsidiary, and (d) provide to Bank all other documentation in form and substance satisfactory to Bank. Any document, agreement, or instrument executed or issued pursuant to this Section 6.13 shall be a Loan Document.

6.14 Further Assurances. Execute any further instruments and take further action as Bank reasonably requests to perfect or continue Bank's Lien in the Collateral or to effect the purposes of this Agreement. Deliver to Bank, within five (5) days after the same are sent or received, copies of all correspondence, reports, documents and other filings with any Governmental Authority regarding compliance with or maintenance of Governmental Approvals or Requirements of Law or that could reasonably be expected to have a material effect on any of the Governmental Approvals or otherwise on the operations of Borrower or any of its Subsidiaries.

7. NEGATIVE COVENANTS

Borrower shall not do any of the following without Bank's prior written consent:

7.1 Dispositions. Convey, sell, lease, transfer, assign, or otherwise dispose of (collectively, "**Transfer**"), or permit any of its Subsidiaries to Transfer, all or any part of its business or property, except for Transfers (a) of Inventory in the ordinary course of business; (b) of worn-out, un-needed, or obsolete Equipment that is, in the reasonable judgment of Borrower, no longer economically practicable to maintain or useful in the ordinary course of business of Borrower; (c) consisting of Permitted Liens and Permitted Investments; (d) consisting of the sale or issuance of any stock of Borrower permitted under Section 7.2 of this Agreement; (e) consisting of Borrower's use or transfer of money or Cash Equivalents in the ordinary course of its business for the payment of ordinary course business expenses in a manner that is not prohibited by the terms of this Agreement or the other Loan Documents; (f) of (A) non-exclusive licenses for the use of the Intellectual Property of Borrower or its Subsidiaries in the ordinary course of business and (B) exclusive licenses for the use of the Intellectual Property of Borrower or its Subsidiaries in the ordinary course of business; and (g) other Transfers not to exceed One Hundred Thousand Dollars ($100,000) in the aggregate in any fiscal year.

7.2 Changes in Business, Management, Control, or Business Locations. (a) Engage in or permit any of its Subsidiaries to engage in any business other than the businesses currently engaged in by Borrower and such Subsidiary, as applicable, or reasonably related thereto; (b) liquidate or dissolve; (c) the Key Person departs from or ceases to be employed by Borrower without providing prompt notice to Bank after such departure or cessation and Borrower fails to appoint a new chief executive officer within ninety (90) days of such departure or cessation; or (d) permit or suffer any Change in Control.

Borrower shall not, without at least five (5) days prior written notice to Bank: (1) add any new offices or business locations, including warehouses (unless such new offices or business locations contain less than Five Hundred Thousand Dollars ($500,000) in Borrower's assets or property) or deliver any portion of the Collateral valued, individually or in the aggregate, in excess of Five Hundred Thousand Dollars ($500,000) to a bailee at a location other than to a bailee and at a location already disclosed in the Perfection Certificate, (2) change its jurisdiction of organization, (3) change its organizational structure or type, (4) change its legal name, or (5) change any organizational number (if any) assigned by its jurisdiction of organization. If Borrower intends to deliver any portion of the Collateral valued, individually or in the aggregate, in excess of Five Hundred Thousand Dollars ($500,000) to a bailee, and Bank and such bailee are not already parties to a bailee agreement governing both the Collateral and the location to which Borrower intends to deliver the Collateral, then Borrower shall use commercially reasonable efforts to cause such bailee to execute and deliver a bailee agreement in form and substance satisfactory to Bank.

7.3 Mergers or Acquisitions. Merge or consolidate, or permit any of its Subsidiaries to merge or consolidate, with any other Person, or acquire, or permit any of its Subsidiaries to acquire, all or substantially all of the capital stock or property of another Person (including, without limitation, by the formation of any Subsidiary). A Subsidiary may merge or consolidate into another Subsidiary or into Borrower.

7.4 Indebtedness. Create, incur, assume, or be liable for any Indebtedness, or permit any Subsidiary to do so, other than Permitted Indebtedness.

7.5 Encumbrance. Create, incur, allow, or suffer any Lien on any of its property, or assign or convey any right to receive income, including the sale of any Accounts, or permit any of its Subsidiaries to do so, except for Permitted Liens, permit any Collateral not to be subject to the first priority security interest granted herein, or enter into any agreement, document, instrument or other arrangement (except with or in favor of Bank) with any Person which directly or indirectly prohibits or has the effect of prohibiting Borrower or any Subsidiary from assigning, mortgaging, pledging, granting a security interest in or upon, or encumbering any of Borrower's or any Subsidiary's Intellectual Property in favor of Bank, except (i) as is otherwise permitted in Section 7.1 hereof and the definition of

"Permitted Liens" herein, (ii) customary restrictions in license agreements on the licensed property where Borrower or a Subsidiary is the licensee and not the licensor, and (iii) covenants with such restrictions in contracts of sale or merger or acquisition agreements, provided that (1) such covenants do not prohibit or restrict Borrower from granting a security interest in Borrower's or any Subsidiary's Intellectual Property in favor of Bank, and (2) the counter-parties to such covenants are not permitted to receive a security interest in Borrower's Intellectual Property or any Collateral (it being understood, for the avoidance of doubt, that on or prior to the consummation of such sale, acquisition or merger Borrower shall either be required to prepay the Obligations and terminate Bank's commitment to make Credit Extensions to Borrower in accordance with the prepayment provisions hereunder or Borrower shall have obtained Bank's written consent to such transaction hereunder (which consent shall be at Bank's sole discretion)).

7.6 Maintenance of Collateral Accounts. Maintain any Collateral Account except pursuant to the terms of Section 6.8(b) hereof.

7.7 Distributions; Investments. (a) Pay any dividends or make any distribution or payment or redeem, retire or purchase any capital stock provided that Borrower may (i) convert any of its convertible securities into other securities pursuant to the terms of such convertible securities or otherwise in exchange thereof, (ii) pay dividends solely in common stock; and (iii) repurchase the stock of former employees or consultants pursuant to stock repurchase agreements so long as an Event of Default does not exist at the time of any such repurchase and would not exist after giving effect to any such repurchase, provided that the aggregate amount of all such repurchases does not exceed One Hundred Thousand Dollars ($100,000) per fiscal year; or (b) directly or indirectly make any Investment (including, without limitation, by the formation of any Subsidiary) other than Permitted Investments, or permit any of its Subsidiaries to do so.

7.8 Transactions with Affiliates. Directly or indirectly enter into or permit to exist any material transaction with any Affiliate of Borrower, except for (i) transactions that are in the ordinary course of Borrower's business, upon fair and reasonable terms that are no less favorable to Borrower than would be obtained in an arm's length transaction with a non-affiliated Person, (ii) transactions permitted pursuant to the terms of Section 7.7 of this Agreement, (iii) transactions under clauses (a), (g) or (h) of the definition of Permitted Investments, and (iv) equity financings and bridge financings with Borrower's existing investors so long as any such Indebtedness is unsecured Subordinated Debt.

7.9 Subordinated Debt. (a) Make or permit any payment on any Subordinated Debt, except under the terms of the subordination, intercreditor, or other similar agreement to which such Subordinated Debt is subject, or (b) amend any provision in any document relating to the Subordinated Debt which would increase the amount thereof provide for earlier or greater principal, interest, or other payments thereon, or adversely affect the subordination thereof to Obligations owed to Bank.

7.10 Compliance. Become an "investment company" or a company controlled by an "investment company", under the Investment Company Act of 1940, as amended, or undertake as one of its important activities extending credit to purchase or carry margin stock (as defined in Regulation U of the Board of Governors of the Federal Reserve System), or use the proceeds of any Credit Extension for that purpose; fail to meet the minimum funding requirements of ERISA, permit a Reportable Event or Prohibited Transaction, as defined in ERISA, to occur; fail to comply with the Federal Fair Labor Standards Act or violate any other law or regulation, if the violation could reasonably be expected to have a material adverse effect on Borrower's business, or permit any of its Subsidiaries to do so; withdraw or permit any Subsidiary to withdraw from participation in, permit partial or complete termination of, or permit the occurrence of any other event with respect to, any present pension, profit sharing and deferred compensation plan which could reasonably be expected to result in any liability of Borrower, including any liability to the Pension Benefit Guaranty Corporation or its successors or any other governmental agency.

8. EVENTS OF DEFAULT

Any one of the following shall constitute an event of default (an "**Event of Default**") under this Agreement:

8.1 Payment Default. Borrower fails to (a) make any payment of principal or interest on any Credit Extension when due, or (b) pay any other Obligations within three (3) Business Days after such Obligations are due and payable (which three (3) Business Day cure period shall not apply to payments due on the Revolving Line Maturity Date or the Term Loan Maturity Date). During the cure period, the failure to make or pay any payment specified under clause (b) hereunder is not an Event of Default (but no Credit Extension will be made during the cure period);

8.2 Covenant Default.

(a) Borrower fails or neglects to perform any obligation in Sections 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9 (if applicable), 6.10, 6.12, 6.13, or 6.14or violates any covenant in Section 7; or

(b) Borrower fails or neglects to perform, keep, or observe any other term, provision, condition, covenant or agreement contained in this Agreement or any Loan Documents, and as to any default (other than those specified in this Section 8) under such other term, provision, condition, covenant or agreement that can be cured, has failed to cure the default within ten (10) days after the occurrence thereof; provided, however, that if the default cannot by its nature be cured within the ten (10) day period or cannot after diligent attempts by Borrower be cured within such ten (10) day period, and such default is likely to be cured within a reasonable time, then Borrower shall have an additional period (which shall not in any case exceed thirty (30) days) to attempt to cure such default, and within such reasonable time period the failure to cure the default shall not be deemed an Event of Default (but no Credit Extensions shall be made during such cure period). Cure periods provided under this section shall not apply, among other things, to financial covenants or any other covenants set forth in clause (a) above;

8.3 Investor Abandonment. Bank determines that there is a lack of Investor Support, or Investor Support ceases to be provided to Borrower for any reason;

8.4 Attachment; Levy; Restraint on Business.

(a) (i) The service of process seeking to attach, by trustee or similar process, any funds of Borrower or of any entity under the control of Borrower (including a Subsidiary), or (ii) a notice of lien or levy is filed against any of Borrower's assets by any Governmental Authority, and the same under subclauses (i) and (ii) hereof are not, within ten (10) days after the occurrence thereof, discharged or stayed (whether through the posting of a bond or otherwise); provided, however, no Credit Extensions shall be made during any ten (10) day cure period; or

(b) (i) any material portion of Borrower's assets is attached, seized, levied on, or comes into possession of a trustee or receiver, or (ii) any court order enjoins, restrains, or prevents Borrower from conducting all or any material part of its business;

8.5 Insolvency. (a) Borrower is unable to pay its debts (including trade debts) as they become due or otherwise becomes insolvent (as determined pursuant to Section 5.6); (b) Borrower begins an Insolvency Proceeding; or (c) an Insolvency Proceeding is begun against Borrower and is not dismissed or stayed within thirty (30) days (but no Credit Extensions shall be made while any of the conditions described in clause (a) exist and/or until any Insolvency Proceeding is dismissed);

8.6 Other Agreements. There is, under any agreement to which Borrower or any Guarantor is a party with a third party or parties, any default resulting in a right by such third party or parties, whether or not exercised, to accelerate the maturity of any Indebtedness in an amount individually or in the aggregate in excess of Two Hundred Fifty Thousand Dollars ($250,000);

8.7 Judgments; Penalties. One or more fines, penalties or final judgments, orders or decrees for the payment of money in an amount, individually or in the aggregate, of at least Two Hundred Fifty Thousand Dollars ($250,000) (not covered by independent third-party insurance as to which liability has been accepted by such insurance carrier) shall be rendered against Borrower by any Governmental Authority, and the same are not, within ten (10) days after the entry, assessment or issuance thereof, discharged, satisfied, or paid, or after execution thereof, stayed or bonded pending appeal, or such judgments are not discharged prior to the expiration of any such stay (provided that no Credit Extensions will be made prior to the satisfaction, payment, discharge, stay, or bonding of such fine, penalty, judgment, order or decree);

8.8 Misrepresentations. Borrower or any Person acting for Borrower makes any representation, warranty, or other statement now or later in this Agreement, any Loan Document or in any writing delivered to Bank or to induce Bank to enter this Agreement or any Loan Document, and such representation, warranty, or other statement is incorrect in any material respect when made;

8.9 Subordinated Debt. Any document, instrument, or agreement evidencing any Subordinated Debt shall for any reason be revoked or invalidated or otherwise cease to be in full force and effect, any Person shall be in breach thereof or contest in any manner the validity or enforceability thereof or deny that it has any further liability or obligation thereunder, or the Obligations shall for any reason be subordinated or shall not have the priority contemplated by this Agreement or any applicable subordination or intercreditor agreement, except, in each case, as may be permitted pursuant to the terms of such subordination agreement between such Person;

8.10 Guaranty. (a) Any guaranty of any Obligations terminates or ceases for any reason to be in full force and effect; (b) any Guarantor does not perform any obligation or covenant under any guaranty of the Obligations; (c) any circumstance described in Sections 8.3, 8.4, 8.5, 8.6, 8.7, or 8.8 of this Agreement occurs with respect to any Guarantor, (d) the death, liquidation, winding up, or termination of existence of any Guarantor; or (e) a material impairment in the perfection or priority of Bank's Lien in the collateral provided by Guarantor or in the value of such collateral; or

8.11 Governmental Approvals. (a) Any Governmental Approval shall have been revoked, rescinded, suspended, modified in an adverse manner or not renewed in the ordinary course for a full term or (b) a Governmental Authority that renders a decision in a hearing with respect to any applications for renewal of any of such Governmental Approval that could result in the Governmental Authority taking any of the actions described in clause (a) above, and such decision or such revocation, rescission, suspension, modification or non-renewal (i) causes, or could reasonably be expected to cause, a Material Adverse Change, or (ii) adversely affects the legal qualifications of Borrower or any of its Subsidiaries to hold such Governmental Approval in any applicable jurisdiction and such revocation, rescission, suspension, modification or non-renewal could reasonably be expected to affect the status of or legal qualifications of Borrower or any of its Subsidiaries to hold any Governmental Approval in any other jurisdiction.

8.12 Lien Priority. There is a material impairment in the priority of Bank's security interest in the Collateral.

9. BANK'S RIGHTS AND REMEDIES

9.1 Rights and Remedies. Upon the occurrence and during the continuance of an Event of Default, Bank may, without notice or demand, do any or all of the following:

(a) declare all Obligations immediately due and payable (but if an Event of Default described in Section 8.5 occurs all Obligations are immediately due and payable without any action by Bank);

(b) stop advancing money or extending credit for Borrower's benefit under this Agreement or under any other agreement between Borrower and Bank;

(c) demand that Borrower (i) deposit cash with Bank in an amount equal to at least (A) one hundred five percent (105.0%) of the Dollar Equivalent of the aggregate face amount of all Letters of Credit denominated in Dollars remaining undrawn, and (B) one hundred ten percent (110.0%) of the Dollar Equivalent of the aggregate face amount of all Letters of Credit denominated in a Foreign Currency remaining undrawn (plus, in each case, all interest, fees, and costs due or to become due in connection therewith (as estimated by Bank in its good faith business judgment)), to secure all of the Obligations relating to such Letters of Credit, as collateral security for the repayment of any future drawings under such Letters of Credit, and Borrower shall forthwith deposit and pay such amounts, and (ii) pay in advance all letter of credit fees scheduled to be paid or payable over the remaining term of any Letters of Credit;

(d) terminate any FX Contracts;

(e) verify the amount of, demand payment of and performance under, and collect any Accounts and General Intangibles, settle or adjust disputes and claims directly with Account Debtors for amounts on terms and in any order that Bank considers advisable, and notify any Person owing Borrower money of Bank's security interest in such funds. Borrower shall collect all payments in trust for Bank and, if requested by Bank, immediately deliver the payments to Bank in the form received from the Account Debtor, with proper endorsements for deposit;

(f) make any payments and do any acts it considers necessary or reasonable to protect the Collateral and/or its security interest in the Collateral. Borrower shall assemble the Collateral if Bank requests and make it available as Bank designates. Bank may enter premises where the Collateral is located, take and maintain possession of any part of the Collateral, and pay, purchase, contest, or compromise any Lien which appears to be prior or superior to its security interest and pay all expenses incurred. Borrower grants Bank a license to enter and occupy any of its premises, without charge, to exercise any of Bank's rights or remedies;

(g) apply to the Obligations any (i) balances and deposits of Borrower it holds, or (ii) amount held by Bank owing to or for the credit or the account of Borrower;

(h) ship, reclaim, recover, store, finish, maintain, repair, prepare for sale, advertise for sale, and sell the Collateral. Bank is hereby granted a non-exclusive, royalty-free license or other right to use, without charge, Borrower's labels, Patents, Copyrights, mask works, rights of use of any name, trade secrets, trade names, Trademarks, and advertising matter, or any similar property as it pertains to the Collateral, in completing production of, advertising for sale, and selling any Collateral and, in connection with Bank's exercise of its rights under this Section 9.1, Borrower's rights under all licenses and all franchise agreements inure to Bank's benefit;

(i) place a "hold" on any account maintained with Bank and/or deliver a notice of exclusive control, any entitlement order, or other directions or instructions pursuant to any Control Agreement or similar agreements providing control of any Collateral;

(j) demand and receive possession of Borrower's Books; and

(k) exercise all rights and remedies available to Bank under the Loan Documents or at law or equity, including all remedies provided under the Code (including disposal of the Collateral pursuant to the terms thereof).

9.2 Power of Attorney. Borrower hereby irrevocably appoints Bank as its lawful attorney-in-fact, exercisable following the occurrence and continuance of an Event of Default, to: (a) endorse Borrower's name on any checks, payment instruments, or other forms of payment or security; (b) sign Borrower's name on any invoice or bill of lading for any Account or drafts against Account Debtors; (c) demand, collect, sue, and give releases to any Account Debtor for monies due, settle and adjust disputes and claims about the Accounts directly with Account Debtors, and compromise, prosecute, or defend any action, claim, case, or proceeding about any Collateral (including filing a claim or voting a claim in any bankruptcy case in Bank's or Borrower's name, as Bank chooses); (d) make, settle, and adjust all claims under Borrower's insurance policies; (e) pay, contest or settle any Lien, charge, encumbrance, security interest, or other claim in or to the Collateral, or any judgment based thereon, or otherwise take any action to terminate or discharge the same; and (f) transfer the Collateral into the name of Bank or a third party as the Code permits. Borrower hereby appoints Bank as its lawful attorney-in-fact to sign Borrower's name on any documents necessary to perfect or continue the perfection of Bank's security interest in the Collateral regardless of whether an Event of Default has occurred until all Obligations have been satisfied in full and the Loan Documents have been terminated. Bank's foregoing appointment as Borrower's attorney in fact, and all of Bank's rights and powers, coupled with an interest, are irrevocable until all Obligations have been fully repaid and performed and the Loan Documents have been terminated.

9.3 Protective Payments. If Borrower fails to obtain the insurance called for by Section 6.7 or fails to pay any premium thereon or fails to pay any other amount which Borrower is obligated to pay under this Agreement or any other Loan Document or which may be required to preserve the Collateral, Bank may obtain such insurance or make such payment, and all amounts so paid by Bank are Bank Expenses and immediately due and payable,

bearing interest at the then highest rate applicable to the Obligations, and secured by the Collateral. Bank will make reasonable efforts to provide Borrower with notice of Bank obtaining such insurance at the time it is obtained or within a reasonable time thereafter. No payments by Bank are deemed an agreement to make similar payments in the future or Bank's waiver of any Event of Default.

9.4 Application of Payments and Proceeds. Bank shall have the right to apply in any order any funds in its possession, whether from Borrower account balances, payments, proceeds realized as the result of any collection of Accounts or other disposition of the Collateral, or otherwise, to the Obligations. Bank shall pay any surplus to Borrower by credit to the Designated Deposit Account or to other Persons legally entitled thereto; Borrower shall remain liable to Bank for any deficiency. If Bank, directly or indirectly, enters into a deferred payment or other credit transaction with any purchaser at any sale of Collateral, Bank shall have the option, exercisable at any time, of either reducing the Obligations by the principal amount of the purchase price or deferring the reduction of the Obligations until the actual receipt by Bank of cash therefor.

9.5 Bank's Liability for Collateral. So long as Bank complies with reasonable banking practices regarding the safekeeping of the Collateral in the possession or under the control of Bank, Bank shall not be liable or responsible for: (a) the safekeeping of the Collateral; (b) any loss or damage to the Collateral; (c) any diminution in the value of the Collateral; or (d) any act or default of any carrier, warehouseman, bailee, or other Person. Borrower bears all risk of loss, damage or destruction of the Collateral.

9.6 No Waiver; Remedies Cumulative. Bank's failure, at any time or times, to require strict performance by Borrower of any provision of this Agreement or any other Loan Document shall not waive, affect, or diminish any right of Bank thereafter to demand strict performance and compliance herewith or therewith. No waiver hereunder shall be effective unless signed by the party granting the waiver and then is only effective for the specific instance and purpose for which it is given. Bank's rights and remedies under this Agreement and the other Loan Documents are cumulative. Bank has all rights and remedies provided under the Code, by law, or in equity. Bank's exercise of one right or remedy is not an election and shall not preclude Bank from exercising any other remedy under this Agreement or other remedy available at law or in equity, and Bank's waiver of any Event of Default is not a continuing waiver. Bank's delay in exercising any remedy is not a waiver, election, or acquiescence.

9.7 Demand Waiver. Borrower waives demand, notice of default or dishonor, notice of payment and nonpayment, notice of any default, nonpayment at maturity, release, compromise, settlement, extension, or renewal of accounts, documents, instruments, chattel paper, and guarantees held by Bank on which Borrower is liable.

9.8 Borrower Liability. Any Borrower may, acting singly, request Credit Extensions hereunder. Each Borrower hereby appoints each other as agent for the other for all purposes hereunder, including with respect to requesting Credit Extensions hereunder. Each Borrower hereunder shall be jointly and severally obligated to repay all Credit Extensions made hereunder, regardless of which Borrower actually receives said Credit Extension, as if each Borrower hereunder directly received all Credit Extensions. Each Borrower waives (a) any suretyship defenses available to it under the Code or any other applicable law, including, without limitation, the benefit of California Civil Code Section 2815 permitting revocation as to future transactions and the benefit of California Civil Code Sections 1432, 2809, 2810, 2819, 2839, 2845, 2847, 2848, 2849, 2850, and 2899 and 3433, and (b) any right to require Bank to: (i) proceed against any Borrower or any other person; (ii) proceed against or exhaust any security; or (iii) pursue any other remedy. Bank may exercise or not exercise any right or remedy it has against any Borrower or any security it holds (including the right to foreclose by judicial or non-judicial sale) without affecting any Borrower's liability. Notwithstanding any other provision of this Agreement or other related document, each Borrower irrevocably waives all rights that it may have at law or in equity (including, without limitation, any law subrogating Borrower to the rights of Bank under this Agreement) to seek contribution, indemnification or any other form of reimbursement from any other Borrower, or any other Person now or hereafter primarily or secondarily liable for any of the Obligations, for any payment made by Borrower with respect to the Obligations in connection with this Agreement or otherwise and all rights that it might have to benefit from, or to participate in, any security for the Obligations as a result of any payment made by Borrower with respect to the Obligations in connection with this Agreement or otherwise. Any agreement providing for indemnification, reimbursement or any other arrangement prohibited under this Section 9.8 shall be null and void. If any payment is made to a Borrower in contravention of this Section 9.8, such Borrower shall hold such payment in trust for Bank and such payment shall be promptly delivered to Bank for application to the Obligations, whether matured or unmatured.

10. NOTICES

All notices, consents, requests, approvals, demands, or other communication by any party to this Agreement or any other Loan Document must be in writing and shall be deemed to have been validly served, given, or delivered: (a) upon the earlier of actual receipt and three (3) Business Days after deposit in the U.S. mail, first class, registered or certified mail return receipt requested, with proper postage prepaid; (b) upon transmission, when sent by electronic mail or facsimile transmission; (c) one (1) Business Day after deposit with a reputable overnight courier with all charges prepaid; or (d) when delivered, if hand-delivered by messenger, all of which shall be addressed to the party to be notified and sent to the address, facsimile number, or email address indicated below. Bank or Borrower may change its mailing or electronic mail address or facsimile number by giving the other party written notice thereof in accordance with the terms of this Section 10

If to Borrower:	Shockwave Medical, Inc. 48501 Warm Springs Blvd., Suite 108 Fremont, California 94539 Attn: Dan Puckett, CFO Fax: _____
If to Bank:	Silicon Valley Bank. 2400 Hanover St. Palo Alto, California 94304 Attn: Michelle Lai, Vice President

11. CHOICE OF LAW, VENUE, JURY TRIAL WAIVER AND JUDICIAL REFERENCE

Except as otherwise expressly provided in any of the Loan Documents, California law governs the Loan Documents without regard to principles of conflicts of law. Borrower and Bank each submit to the exclusive jurisdiction of the State and Federal courts in Santa Clara, California; provided, however, that nothing in this Agreement shall be deemed to operate to preclude Bank from bringing suit or taking other legal action in any other jurisdiction to realize on the Collateral or any other security for the Obligations, or to enforce a judgment or other court order in favor of Bank. Borrower expressly submits and consents in advance to such jurisdiction in any action or suit commenced in any such court, and Borrower hereby waives any objection that it may have based upon lack of personal jurisdiction, improper venue, or forum non conveniens and hereby consents to the granting of such legal or equitable relief as is deemed appropriate by such court. Borrower hereby waives personal service of the summons, complaints, and other process issued in such action or suit and agrees that service of such summons, complaints, and other process may be made by registered or certified mail addressed to Borrower at the address set forth in, or subsequently provided by Borrower in accordance with, Section 10 of this Agreement and that service so made shall be deemed completed upon the earlier to occur of Borrower's actual receipt thereof or three (3) days after deposit in the U.S. mails, proper postage prepaid.

TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, BORROWER AND BANK EACH WAIVE THEIR RIGHT TO A JURY TRIAL OF ANY CLAIM OR CAUSE OF ACTION ARISING OUT OF OR BASED UPON THIS AGREEMENT, THE LOAN DOCUMENTS OR ANY CONTEMPLATED TRANSACTION, INCLUDING CONTRACT, TORT, BREACH OF DUTY AND ALL OTHER CLAIMS. THIS WAIVER IS A MATERIAL INDUCEMENT FOR BOTH PARTIES TO ENTER INTO THIS AGREEMENT. EACH PARTY HAS REVIEWED THIS WAIVER WITH ITS COUNSEL.

WITHOUT INTENDING IN ANY WAY TO LIMIT THE PARTIES' AGREEMENT TO WAIVE THEIR RESPECTIVE RIGHT TO A TRIAL BY JURY, if the above waiver of the right to a trial by jury is not enforceable, the parties hereto agree that any and all disputes or controversies of any nature between them arising at any time shall be decided by a reference to a private judge, mutually selected by the parties (or, if they cannot agree, by the Presiding Judge of the Santa Clara County, California Superior Court) appointed in accordance with California Code of Civil Procedure Section 638 (or pursuant to comparable provisions of federal law if the dispute falls within the exclusive jurisdiction of the federal courts), sitting without a jury, in Santa Clara County, California; and the parties hereby submit to the jurisdiction of such court. The reference proceedings shall be conducted pursuant to and in

accordance with the provisions of California Code of Civil Procedure Sections 638 through 645.1, inclusive. The private judge shall have the power, among others, to grant provisional relief, including without limitation, entering temporary restraining orders, issuing preliminary and permanent injunctions and appointing receivers. All such proceedings shall be closed to the public and confidential and all records relating thereto shall be permanently sealed. If during the course of any dispute, a party desires to seek provisional relief, but a judge has not been appointed at that point pursuant to the judicial reference procedures, then such party may apply to the Santa Clara County, California Superior Court for such relief. The proceeding before the private judge shall be conducted in the same manner as it would be before a court under the rules of evidence applicable to judicial proceedings. The parties shall be entitled to discovery which shall be conducted in the same manner as it would be before a court under the rules of discovery applicable to judicial proceedings. The private judge shall oversee discovery and may enforce all discovery rules and orders applicable to judicial proceedings in the same manner as a trial court judge. The parties agree that the selected or appointed private judge shall have the power to decide all issues in the action or proceeding, whether of fact or of law, and shall report a statement of decision thereon pursuant to California Code of Civil Procedure Section 644(a). Nothing in this paragraph shall limit the right of any party at any time to exercise self-help remedies, foreclose against collateral, or obtain provisional remedies. The private judge shall also determine all issues relating to the applicability, interpretation, and enforceability of this paragraph.

This Section 11 shall survive the termination of this Agreement.

12. GENERAL PROVISIONS

12.1 Termination Prior to Maturity Date; Survival. All covenants, representations and warranties made in this Agreement shall continue in full force until this Agreement has terminated pursuant to its terms and all Obligations have been satisfied. So long as Borrower has satisfied the Obligations (other than inchoate indemnity obligations, and any other obligations which, by their terms, are to survive the termination of this Agreement, and any Obligations under Bank Services Agreements that are cash collateralized in accordance with Section 4.1 of this Agreement), this Agreement may be terminated prior to the Revolving Line Maturity Date and the Term Loan Maturity Date by Borrower, effective three (3) Business Days after written notice of termination is given to Bank. Those obligations that are expressly specified in this Agreement as surviving this Agreement's termination shall continue to survive notwithstanding this Agreement's termination.

12.2 Successors and Assigns. This Agreement binds and is for the benefit of the successors and permitted assigns of each party. Borrower may not assign this Agreement or any rights or obligations under it without Bank's prior written consent (which may be granted or withheld in Bank's discretion). Bank has the right, without the consent of or notice to Borrower, to sell, transfer, assign, negotiate, or grant participation in all or any part of, or any interest in, Bank's obligations, rights, and benefits under this Agreement and the other Loan Documents (other than the Warrant, as to which assignment, transfer and other such actions are governed by the terms thereof).

12.3 Indemnification. General Indemnification. Borrower agrees to indemnify, defend and hold Bank and its directors, officers, employees, agents, attorneys, or any other Person affiliated with or representing Bank (each, an "**Indemnified Person**") harmless against: (i) all obligations, demands, claims, and liabilities (collectively, "**Claims**") claimed or asserted by any other party in connection with the transactions contemplated by the Loan Documents except for Claims caused by Bank's gross negligence or willful misconduct; and (ii) all losses or expenses (including Bank Expenses) in any way suffered, incurred, or paid by such Indemnified Person as a result of, following from, consequential to, or arising from transactions between Bank and Borrower contemplated by the Loan Documents (including reasonable attorneys' fees and expenses), except for Claims and/or losses directly caused by such Indemnified Person's gross negligence or willful misconduct. This Section 12.3 shall survive until all statutes of limitation with respect to the Claims, losses, and expenses for which indemnity is given shall have run.

12.4 Time of Essence. Time is of the essence for the performance of all Obligations in this Agreement.

12.5 Severability of Provisions. Each provision of this Agreement is severable from every other provision in determining the enforceability of any provision.

12.6 Correction of Loan Documents. Bank may correct patent errors and fill in any blanks in the Loan Documents consistent with the agreement of the parties.

12.7 Amendments in Writing; Waiver; Integration. No purported amendment or modification of any Loan Document, or waiver, discharge or termination of any obligation under any Loan Document, shall be enforceable or admissible unless, and only to the extent, expressly set forth in a writing signed by the party against which enforcement or admission is sought. Without limiting the generality of the foregoing, no oral promise or statement, nor any action, inaction, delay, failure to require performance or course of conduct shall operate as, or evidence, an amendment, supplement or waiver or have any other effect on any Loan Document. Any waiver granted shall be limited to the specific circumstance expressly described in it, and shall not apply to any subsequent or other circumstance, whether similar or dissimilar, or give rise to, or evidence, any obligation or commitment to grant any further waiver. The Loan Documents represent the entire agreement about this subject matter and supersede prior negotiations or agreements. All prior agreements, understandings, representations, warranties, and negotiations between the parties about the subject matter of the Loan Documents merge into the Loan Documents.

12.8 Counterparts. This Agreement may be executed in any number of counterparts and by different parties on separate counterparts, each of which, when executed and delivered, is an original, and all taken together, constitute one Agreement.

12.9 Confidentiality. In handling any confidential information, Bank shall exercise the same degree of care that it exercises for its own proprietary information, but disclosure of information may be made: (a) to Bank's Subsidiaries or Affiliates (such Subsidiaries and Affiliates, together with Bank, collectively, "**Bank Entities**"), provided that such Bank Entities are required to exercise the same degree of care as Bank; (b) to prospective transferees or purchasers of any interest in the Credit Extensions (provided, however, Bank shall use its best efforts to obtain any prospective transferee's or purchaser's agreement to the terms of this provision); (c) as required by law, regulation, subpoena, or other order; (d) to Bank's regulators or as otherwise required in connection with Bank's examination or audit; (e) as Bank considers appropriate in exercising remedies under the Loan Documents; and (f) to third-party service providers of Bank so long as such service providers have executed a confidentiality agreement with Bank with terms no less restrictive than those contained herein. Confidential information does not include information that is either: (i) in the public domain or in Bank's possession when disclosed to Bank, or becomes part of the public domain (other than as a result of its disclosure by Bank in violation of this Agreement) after disclosure to Bank; or (ii) disclosed to Bank by a third party, if Bank does not know that the third party is prohibited from disclosing the information.

Bank Entities may use anonymous forms of confidential information for aggregate datasets, for analyses or reporting, and for any other uses not expressly prohibited in writing by Borrower. The provisions of the immediately preceding sentence shall survive the termination of this Agreement.

12.10 Attorneys' Fees, Costs and Expenses. In any action or proceeding between Borrower and Bank arising out of or relating to the Loan Documents, the prevailing party shall be entitled to recover its reasonable attorneys' fees and other costs and expenses incurred, in addition to any other relief to which it may be entitled.

12.11 Electronic Execution of Documents. The words "execution," "signed," "signature" and words of like import in any Loan Document shall be deemed to include electronic signatures or the keeping of records in electronic form, each of which shall be of the same legal effect, validity and enforceability as a manually executed signature or the use of a paper-based recordkeeping systems, as the case may be, to the extent and as provided for in any applicable law, including, without limitation, any state law based on the Uniform Electronic Transactions Act.

12.12 Right of Setoff. Borrower hereby grants to Bank a Lien and a right of setoff as security for all Obligations to Bank, whether now existing or hereafter arising upon and against all deposits, credits, collateral and property, now or hereafter in the possession, custody, safekeeping or control of Bank or any entity under the control of Bank (including a subsidiary of Bank) or in transit to any of them. At any time after the occurrence and during the continuance of an Event of Default, without demand or notice, Bank may setoff the same or any part thereof and apply the same to any liability or Obligation of Borrower even though unmatured and regardless of the adequacy of any other collateral securing the Obligations. ANY AND ALL RIGHTS TO REQUIRE BANK TO EXERCISE ITS RIGHTS OR REMEDIES WITH RESPECT TO ANY OTHER COLLATERAL WHICH SECURES THE OBLIGATIONS, PRIOR TO EXERCISING ITS RIGHT OF SETOFF WITH RESPECT TO SUCH DEPOSITS, CREDITS OR OTHER PROPERTY OF BORROWER, ARE HEREBY KNOWINGLY, VOLUNTARILY AND IRREVOCABLY WAIVED.

12.13 Captions. The headings used in this Agreement are for convenience only and shall not affect the interpretation of this Agreement.

12.14 Construction of Agreement. The parties mutually acknowledge that they and their attorneys have participated in the preparation and negotiation of this Agreement. In cases of uncertainty this Agreement shall be construed without regard to which of the parties caused the uncertainty to exist.

12.15 Relationship. The relationship of the parties to this Agreement is determined solely by the provisions of this Agreement. The parties do not intend to create any agency, partnership, joint venture, trust, fiduciary or other relationship with duties or incidents different from those of parties to an arm's-length contract.

12.16 Third Parties. Nothing in this Agreement, whether express or implied, is intended to: (a) confer any benefits, rights or remedies under or by reason of this Agreement on any persons other than the express parties to it and their respective permitted successors and assigns; (b) relieve or discharge the obligation or liability of any person not an express party to this Agreement; or (c) give any person not an express party to this Agreement any right of subrogation or action against any party to this Agreement.

13. DEFINITIONS

13.1 Definitions. As used in the Loan Documents, the word "shall" is mandatory, the word "may" is permissive, the word "or" is not exclusive, the words "includes" and "including" are not limiting, the singular includes the plural, and numbers denoting amounts that are set off in brackets are negative. As used in this Agreement, the following capitalized terms have the following meanings:

"**Account**" is, as to any Person, any "**account**" of such Person as "account" is defined in the Code with such additions to such term as may hereafter be made, and includes, without limitation, all accounts receivable and other sums owing to such Person.

"**Account Debtor**" is any "**account debtor**" as defined in the Code with such additions to such term as may hereafter be made.

"**Administrator**" is an individual that is named:

(a) as an "Administrator" in the "SVB Online Services" form completed by Borrower with the authority to determine who will be authorized to use SVB Online Services (as defined in the "Banking Terms and Conditions") on behalf of Borrower; and

(b) as an Authorized Signer of Borrower in an approval by the Board.

"**Advance**" or "**Advances**" means a revolving credit loan (or revolving credit loans) under the Revolving Line.

"**Affiliate**" is, with respect to any Person, each other Person that owns or controls directly or indirectly the Person, any Person that controls or is controlled by or is under common control with the Person, and each of that Person's senior executive officers, directors, partners and, for any Person that is a limited liability company, that Person's managers and members. For purposes of the definition of Eligible Accounts, Affiliate shall include a Specified Affiliate.

"**Agreement**" is defined in the preamble hereof.

"**Anniversary Fees**" is defined in Section 2.6(c).

"**Applicable Number**" means (a) thirty-three (33) if Borrower does not draw any Term Loan Advance under the Second Tranche, (b) twenty-seven (27) if Borrower if Borrower does draw any Term Loan Advance under the Second Tranche, and (c) twenty-four (24) if the Equity Infusion Milestone is satisfied.

"**Authorized Signer**" is any individual listed in Borrower's Borrowing Resolution who is authorized to execute the Loan Documents, including making (and executing if applicable) any Credit Extension request, on behalf of Borrower.

"**Availability Amount**" is (a) the lesser of (i) the Revolving Line or (ii) the amount available under the Borrowing Base minus (b) the outstanding principal balance of any Advances.

"**Bank**" is defined in the preamble hereof.

"**Bank Entities**" is defined in Section 12.9.

"**Bank Expenses**" are all audit fees and expenses, costs, and expenses (including reasonable attorneys' fees and expenses) for preparing, amending, negotiating, administering, defending and enforcing the Loan Documents (including, without limitation, those incurred in connection with appeals or Insolvency Proceedings) or otherwise incurred with respect to Borrower or any Guarantor.

"**Bank Services**" are any products, credit services, and/or financial accommodations previously, now, or hereafter provided to Borrower or any of its Subsidiaries by Bank or any Bank Affiliate, including, without limitation, any letters of credit, cash management services (including, without limitation, merchant services, direct deposit of payroll, business credit cards, and check cashing services), interest rate swap arrangements, and foreign exchange services as any such products or services may be identified in Bank's various agreements related thereto (each, a "**Bank Services Agreement**").

"**Bank Services Agreement**" is defined in the definition of Bank Services.

"**Board**" is Borrower's board of directors.

"**Borrower**" is defined in the preamble hereof.

"**Borrower's Books**" are all Borrower's books and records including ledgers, federal and state tax returns, records regarding Borrower's assets or liabilities, the Collateral, business operations or financial condition, and all computer programs or storage or any equipment containing such information.

"**Borrowing Base**" is eighty percent (80%) of Eligible Accounts, as determined by Bank from Borrower's most recent Borrowing Base Statement (and as may subsequently be updated by Bank based upon information received by Bank including, without limitation, Accounts that are paid and/or billed following the date of the Borrowing Base Statement); provided, however, that Bank has the right to decrease the foregoing percentages in its good faith business judgment to mitigate the impact of events, conditions, contingencies, or risks which may adversely affect the Collateral or its value.

"**Borrowing Base Statement**" is that certain report of the value of certain Collateral in the form specified by Bank to Borrower from time to time.

"**Borrowing Resolutions**" are, with respect to any Person, those resolutions adopted by such Person's board of directors (and, if required under the terms of such Person's Operating Documents, stockholders) and delivered by such Person to Bank approving the Loan Documents to which such Person is a party and the transactions contemplated thereby, together with a certificate executed by its secretary on behalf of such Person certifying (a) such Person has the authority to execute, deliver, and perform its obligations under each of the Loan Documents to which it is a party, (b) that set forth as a part of or attached as an exhibit to such certificate is a true, correct, and complete copy of the resolutions then in full force and effect authorizing and ratifying the execution, delivery, and performance by such Person of the Loan Documents to which it is a party, (c) the name(s) of the Person(s) authorized to execute the Loan Documents, including making (and executing if applicable) any Credit Extension request, on behalf of such Person, together with a sample of the true signature(s) of such Person(s), and (d) that Bank may conclusively rely on such certificate unless and until such Person shall have delivered to Bank a further certificate canceling or amending such prior certificate.

"**Business Day**" is any day that is not a Saturday, Sunday or a day on which Bank is closed.

"**Cash Collateral Account**" is defined in Section 6.3(c).

"**Cash Equivalents**" means (a) marketable direct obligations issued or unconditionally guaranteed by the United States or any agency or any State thereof having maturities of not more than one (1) year from the date of acquisition; (b) commercial paper maturing no more than one (1) year after its creation and having the highest rating from either Standard & Poor's Ratings Group or Moody's Investors Service, Inc.; (c) Bank's certificates of deposit issued maturing no more than one (1) year after issue; and (d) money market funds at least ninety-five percent (95%) of the assets of which constitute Cash Equivalents of the kinds described in clauses (a) through (c) of this definition.

"**Change in Control**" means (a) at any time, any "person" or "group" (as such terms are used in Sections 13(d) and 14(d) of the Exchange Act), (other than Borrower) shall become, or obtain rights (whether by means of warrants, options or otherwise) to become, the "beneficial owner" (as defined in Rules 13(d)-3 and 13(d)-5 under the Exchange Act), directly or indirectly, of 49% or more of the ordinary voting power for the election of directors of Borrower (determined on a fully diluted basis) other than by the sale of Borrower's equity securities in a public offering or to venture capital or private equity investors so long as Borrower identifies to Bank the venture capital or private equity investors at least seven (7) Business Days prior to the closing of the transaction and provides to Bank a description of the material terms of the transaction; (b) during any period of twelve (12) consecutive months, a majority of the members of the board of directors or other equivalent governing body of Borrower cease to be composed of individuals (i) who were members of that board or equivalent governing body on the first day of such period, (ii) whose election or nomination to that board or equivalent governing body was approved by individuals referred to in clause (i) above constituting at the time of such election or nomination at least a majority of that board or equivalent governing body or (iii) whose election or nomination to that board or other equivalent governing body was approved by individuals referred to in clauses (i) and (ii) above constituting at the time of such election or nomination at least a majority of that board or equivalent governing body; (c) at any time, Borrower shall cease to own and control, of record and beneficially, directly or indirectly, one hundred percent (100.0%) of each class of outstanding capital stock of each subsidiary of Borrower free and clear of all Liens (except Liens created by this Agreement and except for directors' qualifying shares or other similar shares as required by applicable law).

"**Claims**" is defined in Section 12.3.

"**Code**" is the Uniform Commercial Code, as the same may, from time to time, be enacted and in effect in the State of California; provided, that, to the extent that the Code is used to define any term herein or in any Loan Document and such term is defined differently in different Articles or Divisions of the Code, the definition of such term contained in Article or Division 9 shall govern; provided further, that in the event that, by reason of mandatory provisions of law, any or all of the attachment, perfection, or priority of, or remedies with respect to, Bank's Lien on any Collateral is governed by the Uniform Commercial Code in effect in a jurisdiction other than the California, the term "Code" shall mean the Uniform Commercial Code as enacted and in effect in such other jurisdiction solely for purposes of the provisions thereof relating to such attachment, perfection, priority, or remedies and for purposes of definitions relating to such provisions.

"**Collateral**" is any and all properties, rights and assets of Borrower described on Exhibit A.

"**Collateral Account**" is any Deposit Account, Securities Account, or Commodity Account.

"**Commodity Account**" is any "commodity account" as defined in the Code with such additions to such term as may hereafter be made.

"**Compliance Statement**" is that certain certificate in the form attached hereto as Exhibit B.

"**Contingent Obligation**" is, for any Person, any direct or indirect liability, contingent or not, of that Person for (a) any indebtedness, lease, dividend, letter of credit or other obligation of another such as an obligation, in each case, directly or indirectly guaranteed, endorsed, co made, discounted or sold with recourse by that Person, or for which that Person is directly or indirectly liable; (b) any obligations for undrawn letters of credit for the account of that Person; and (c) all obligations from any interest rate, currency or commodity swap agreement, interest rate cap or collar agreement, or other agreement or arrangement designated to protect a Person against fluctuation in interest rates, currency exchange rates or commodity prices; but "Contingent Obligation" does not include endorsements in the ordinary course of business. The amount of a Contingent Obligation is the stated or determined amount of the primary obligation for which the Contingent Obligation is made or, if not determinable, the maximum reasonably anticipated liability for it determined by the Person in good faith; but the amount may not exceed the maximum of the obligations under any guarantee or other support arrangement.

"**Control Agreement**" is any control agreement entered into among the depository institution at which Borrower maintains a Deposit Account or the securities intermediary or commodity intermediary at which Borrower maintains a Securities Account or a Commodity Account, Borrower, and Bank pursuant to which Bank obtains control (within the meaning of the Code) over such Deposit Account, Securities Account, or Commodity Account.

"**Copyrights**" are any and all copyright rights, copyright applications, copyright registrations and like protections in each work of authorship and derivative work thereof, whether published or unpublished and whether or not the same also constitutes a trade secret.

"**Credit Extension**" is any Advance, any Overadvance, Term Loan Advance, or any other extension of credit by Bank for Borrower's benefit.

"**Currency**" is coined money and such other banknotes or other paper money as are authorized by law and circulate as a medium of exchange.

"**Default Rate**" is defined in Section 2.5(b).

"**Deferred Revenue**" is all amounts received or invoiced in advance of performance under contracts and not yet recognized as revenue.

"**Deposit Account**" is any "**deposit account**" as defined in the Code with such additions to such term as may hereafter be made.

"**Designated Deposit Account**" is the account number ending 516 (last three digits) maintained by Borrower with Bank (provided, however, if no such account number is included, then the Designated Deposit Account shall be any deposit account of Borrower maintained with Bank as chosen by Bank).

"**Dollars**," "**dollars**" or use of the sign "$" means only lawful money of the United States and not any other currency, regardless of whether that currency uses the "$" sign to denote its currency or may be readily converted into lawful money of the United States.

"**Dollar Equivalent**" is, at any time, (a) with respect to any amount denominated in Dollars, such amount, and (b) with respect to any amount denominated in a Foreign Currency, the equivalent amount therefor in Dollars as determined by Bank at such time on the basis of the then-prevailing rate of exchange in San Francisco, California, for sales of the Foreign Currency for transfer to the country issuing such Foreign Currency.

"**Domestic Subsidiary**" means a Subsidiary organized under the laws of the United States or any state or territory thereof or the District of Columbia.

"**Effective Date**" is defined in the preamble hereof.

"**Eligible Accounts**" means Accounts owing to Borrower which arise in the ordinary course of Borrower's business that meet all Borrower's representations and warranties in Section 5.3, that have been, at the option of Bank, confirmed in accordance with Section 6.3(f) of this Agreement, and are due and owing from Account Debtors deemed creditworthy by Bank in its good faith business judgment. Bank reserves the right at any time after the Effective Date to adjust any of the criteria set forth below and to establish new criteria in its good faith business judgment. Unless Bank otherwise agrees in writing, Eligible Accounts shall not include:

(a) Accounts (i) for which the Account Debtor is Borrower's Affiliate, officer, employee, investor, or agent, or (ii) that are intercompany Accounts;

(b) Accounts that the Account Debtor has not paid within ninety (90) days of invoice date regardless of invoice payment period terms;

(c) Accounts with credit balances over ninety (90) days from invoice date;

(d) Accounts owing from an Account Debtor if fifty percent (50%) or more of the Accounts owing from such Account Debtor have not been paid within ninety (90) days of invoice date;

(e) Accounts owing from an Account Debtor (i) which does not have its principal place of business in the United States or (ii) whose billing address (as set forth in the applicable invoice for such Account) is not in the United States, unless in the case of both (i) and (ii) such Accounts are otherwise approved by Bank in writing;

(f) Accounts billed from and/or payable to Borrower outside of the United States (sometimes called foreign invoiced accounts) unless such Accounts are otherwise approved by Bank in writing;

(g) Accounts in which Bank does not have a first priority, perfected security interest under all applicable laws;

(h) Accounts billed and/or payable in a Currency other than Dollars;

(i) Accounts owing from an Account Debtor to the extent that Borrower is indebted or obligated in any manner to the Account Debtor (as creditor, lessor, supplier or otherwise—sometimes called "contra" accounts, accounts payable, customer deposits or credit accounts);

(j) Accounts with or in respect of accruals for marketing allowances, incentive rebates, price protection, cooperative advertising and other similar marketing credits, unless otherwise approved by Bank in writing;

(k) Accounts owing from an Account Debtor which is a United States government entity or any department, agency, or instrumentality thereof unless Borrower has assigned its payment rights to Bank and the assignment has been acknowledged under the Federal Assignment of Claims Act of 1940, as amended;

(l) Accounts with customer deposits and/or with respect to which Borrower has received an upfront payment, to the extent of such customer deposit and/or upfront payment;

(m) Accounts for demonstration or promotional equipment, or in which goods are consigned, or sold on a "sale guaranteed", "sale or return", "sale on approval", or other terms if Account Debtor's payment may be conditional;

(n) Accounts owing from an Account Debtor where goods or services have not yet been rendered to the Account Debtor (sometimes called memo billings or pre-billings);

(o) Accounts subject to contractual arrangements between Borrower and an Account Debtor where payments shall be scheduled or due according to completion or fulfillment requirements (sometimes called contracts accounts receivable, progress billings, milestone billings, or fulfillment contracts);

(p) Accounts owing from an Account Debtor the amount of which may be subject to withholding based on the Account Debtor's satisfaction of Borrower's complete performance (but only to the extent of the amount withheld; sometimes called retainage billings);

(q) Accounts subject to trust provisions, subrogation rights of a bonding company, or a statutory trust;

(r) Accounts owing from an Account Debtor that has been invoiced for goods that have not been shipped to the Account Debtor unless Bank, Borrower, and the Account Debtor have entered into an agreement acceptable to Bank wherein the Account Debtor acknowledges that (i) it has title to and has ownership of the goods wherever located, (ii) a bona fide sale of the goods has occurred, and (iii) it owes payment for such goods in accordance with invoices from Borrower (sometimes called "bill and hold" accounts);

(s) Accounts for which the Account Debtor has not been invoiced;

(t) Accounts that represent non-trade receivables or that are derived by means other than in the ordinary course of Borrower's business;

(u) Accounts for which Borrower has permitted Account Debtor's payment to extend beyond ninety (90) days (including Accounts with a due date that is more than ninety (90) days from invoice date);

(v) Accounts arising from chargebacks, debit memos or other payment deductions taken by an Account Debtor;

(w) Accounts arising from product returns and/or exchanges (sometimes called "warranty" or "RMA" accounts);

(x) Accounts in which the Account Debtor disputes liability or makes any claim (but only up to the disputed or claimed amount), or if the Account Debtor is subject to an Insolvency Proceeding (whether voluntary or involuntary), or becomes insolvent, or goes out of business;

(y) Accounts owing from an Account Debtor with respect to which Borrower has received Deferred Revenue (but only to the extent of such Deferred Revenue);

(z) Accounts owing from an Account Debtor, whose total obligations to Borrower exceed twenty-five percent (25.0%) of all Accounts for the amounts that exceed that percentage, unless Bank approves in writing; and

(aa) Accounts for which Bank in its good faith business judgment determines collection to be doubtful, including, without limitation, accounts represented by "refreshed" or "recycled" invoices.

"**Equipment**" is all "**equipment**" as defined in the Code with such additions to such term as may hereafter be made, and includes without limitation all machinery, fixtures, goods, vehicles (including motor vehicles and trailers), and any interest in any of the foregoing.

"**ERISA**" is the Employee Retirement Income Security Act of 1974, and its regulations.

"**Equity Infusion Milestone**" means Bank's receipt of evidence satisfactory to Bank that Borrower has received proceeds of Forty Million Dollars ($40,000,000) from a bona fide round of equity financing of Borrower or Subordinated Debt, each on terms and with investors satisfactory to Bank.

"**Event of Default**" is defined in Section 8.

"**Exchange Act**" is the Securities Exchange Act of 1934, as amended.

"**FDA**" means the Food and Drug Administration of the United States.

"**Final Payment**" is a payment (in addition to and not a substitution for the regular monthly payments of principal plus accrued interest) due on the earliest to occur of (a) the Term Loan Maturity Date, or (b) the acceleration of the Term Loan Advances, or (c) the prepayment of the Term Loan Advances in full pursuant to Section 2.3(d) or 2.3(e), equal to the original aggregate principal amount of the Term Loan Advances multiplied by the Final Payment Percentage.

"**Final Payment Percentage**" is six and three quarters of one percent (6.75%).

"**Financial Statement Repository**" is each of (a) L43f1c@svb.com or such other means of collecting information approved and designated by Bank after providing notice thereof to Borrower from time to time and (b) Bank's online banking platform as described in Section 6.12.

"**First Tranche**" is defined in Section 2.3(a)

"**First Tranche Draw Period**" is the period of time commencing on the Effective Date through June 30, 2018.

"**Foreign Currency**" means lawful money of a country other than the United States.

"**Foreign Subsidiary**" means any Subsidiary which is not a Domestic Subsidiary.

"**Funding Date**" is any date on which a Credit Extension is made to or for the account of Borrower which shall be a Business Day.

"**FX Contract**" is any foreign exchange contract by and between Borrower and Bank under which Borrower commits to purchase from or sell to Bank a specific amount of Foreign Currency on a specified date.

"**GAAP**" is generally accepted accounting principles set forth in the opinions and pronouncements of the Accounting Principles Board of the American Institute of Certified Public Accountants and statements and pronouncements of the Financial Accounting Standards Board or in such other statements by such other Person as may be approved by a significant segment of the accounting profession, which are applicable to the circumstances as of the date of determination.

"**General Intangibles**" is all "general intangibles" as defined in the Code in effect on the date hereof with such additions to such term as may hereafter be made, and includes without limitation, all Intellectual Property, claims, income and other tax refunds, security and other deposits, payment intangibles, contract rights, options to purchase or sell real or personal property, rights in all litigation presently or hereafter pending (whether in contract, tort or otherwise), insurance policies (including without limitation key man, property damage, and business interruption insurance), payments of insurance and rights to payment of any kind.

"**Governmental Approval**" is any consent, authorization, approval, order, license, franchise, permit, certificate, accreditation, registration, filing or notice, of, issued by, from or to, or other act by or in respect of, any Governmental Authority.

"**Governmental Authority**" is any nation or government, any state or other political subdivision thereof, any agency, authority, instrumentality, regulatory body, court, central bank or other entity exercising executive, legislative, judicial, taxing, regulatory or administrative functions of or pertaining to government, any securities exchange and any self-regulatory organization.

"**Guarantor**" is any Person providing a Guaranty in favor of Bank.

"**Guaranty**" is any guarantee of all or any part of the Obligations, as the same may from time to time be amended, restated, modified or otherwise supplemented.

"**Indebtedness**" is (a) indebtedness for borrowed money or the deferred price of property or services, such as reimbursement and other obligations for surety bonds and letters of credit, (b) obligations evidenced by notes, bonds, debentures or similar instruments, (c) capital lease obligations, and (d) Contingent Obligations.

"**Indemnified Person**" is defined in Section 12.3.

"**Initial Audit**" is Bank's inspection of Borrower's Accounts, the Collateral, and Borrower's Books, with results satisfactory to Bank in its sole and absolute discretion.

"**Insolvency Proceeding**" is any proceeding by or against any Person under the United States Bankruptcy Code, or any other bankruptcy or insolvency law, including assignments for the benefit of creditors, compositions, extensions generally with its creditors, or proceedings seeking reorganization, arrangement, or other relief.

"**Intellectual Property**" means, with respect to any Person, all of such Person's right, title, and interest in and to the following:

(a) its Copyrights, Trademarks and Patents;

(b) any and all trade secrets and trade secret rights, including, without limitation, any rights to unpatented inventions, know-how and operating manuals;

(c) all internet domain names (including any right related to the registration thereof), trade names, brand names, d/b/a's, logos, symbols, trade dress and all goodwill associated therewith and symbolized thereby;

(d) any and all source code, object code and software;

(e) any and all design rights which may be available to such Person;

(f) any and all claims for damages by way of past, present and future infringement of any of the foregoing, with the right, but not the obligation, to sue for and collect such damages for said use or infringement of the Intellectual Property rights identified above; and

(g) all amendments, renewals and extensions of any of the Copyrights, Trademarks or Patents.

"**Interest-Only Period**" means, for each Term Loan Advance, the period beginning on the date of such Term Loan Advance and ending on (i) March 31, 2019 if Borrower does not draw any Term Loan Advance under the Second Tranche, (ii) September 30, 2019 if Borrower does draw any Term Loan Advance under the Second Tranche, and (iii) December 31, 2019 if Borrower achieves the Equity Infusion Milestone.

"**Inventory**" is all "**inventory**" as defined in the Code in effect on the date hereof with such additions to such term as may hereafter be made, and includes without limitation all merchandise, raw materials, parts, supplies, packing and shipping materials, work in process and finished products, including without limitation such inventory as is temporarily out of Borrower's custody or possession or in transit and including any returned goods and any documents of title representing any of the above.

"**Investment**" is any beneficial ownership interest in any Person (including stock, partnership interest or other securities), and any loan, advance or capital contribution to any Person.

"**Investor Support**" means it is the clear intention of Borrower's investors to continue to fund Borrower in the amounts and timeframe necessary to enable Borrower to satisfy the Obligations as they become due and payable.

"**Key Person**" is Borrower's Chief Executive Officer, who is Doug Godshall as of the Effective Date.

"**Lien**" is a claim, mortgage, deed of trust, levy, charge, pledge, security interest or other encumbrance of any kind, whether voluntarily incurred or arising by operation of law or otherwise against any property.

"**Loan Documents**" are, collectively, this Agreement and any schedules, exhibits, certificates, notices, and any other documents related to this Agreement, the Warrant, any Bank Services Agreement, any subordination agreement, any note, or notes or guaranties executed by Borrower or any Guarantor, and any other present or future agreement by Borrower and/or any Guarantor with or for the benefit of Bank, all as amended, restated, or otherwise modified.

"**Material Adverse Change**" is (a) a material impairment in the perfection or priority of Bank's Lien in the Collateral or in the value of such Collateral; (b) a material adverse change in the business, operations, or condition (financial or otherwise) of Borrower; or (c) a material impairment of the prospect of repayment of any portion of the Obligations.

"**Monthly Financial Statements**" is defined in Section 6.2(c).

"**Net Cash**" is, at any time, an amount equal to (a) Unrestricted Cash, less (b) the outstanding principal balance of all Advances.

"**Obligations**" are Borrower's obligations to pay when due any debts, principal, interest, fees, Bank Expenses, the Termination Fee, the Prepayment Fee, the Anniversary Fees, the Final Payment, and other amounts Borrower owes Bank now or later, whether under this Agreement, the other Loan Documents (other than the Warrant), or otherwise, including, without limitation, all obligations relating to Bank Services and interest accruing after Insolvency Proceedings begin and debts, liabilities, or obligations of Borrower assigned to Bank, and to perform Borrower's duties under the Loan Documents (other than the Warrant or any other warrant to purchase issued to Bank by Borrower).

"**Operating Documents**" are, for any Person, such Person's formation documents, as certified by the Secretary of State (or equivalent agency) of such Person's jurisdiction of organization on a date that is no earlier than thirty (30) days prior to the Effective Date, and, (a) if such Person is a corporation, its bylaws in current form, (b) if such Person is a limited liability company, its limited liability company agreement (or similar agreement), and (c) if such Person is a partnership, its partnership agreement (or similar agreement), each of the foregoing with all current amendments or modifications thereto.

"**Overadvance**" is defined in Section 2.4.

"**Patents**" means all patents, patent applications and like protections including without limitation improvements, divisions, continuations, renewals, reissues, extensions and continuations-in-part of the same.

"**Payment/Advance Form**" is that certain form in the form attached hereto as Exhibit C.

"**Payment Date**" is (a) with respect to Term Loan Advances, the first (1st) calendar day of each month and (b) with respect to Advances, the last calendar day of each month.

"**Perfection Certificate**" is defined in Section 5.1. "**Permitted Indebtedness**" is:

(a) Borrower's Indebtedness to Bank under this Agreement and the other Loan Documents;

(b) Indebtedness existing on the Effective Date which is shown on the Perfection Certificate;

(c) Subordinated Debt;

(d) unsecured Indebtedness to trade creditors incurred in the ordinary course of business;

(e) Indebtedness incurred as a result of endorsing negotiable instruments received in the ordinary course of business;

(f) Indebtedness secured by Liens permitted under clauses (a) and (c) of the definition of "Permitted Liens" hereunder;

(g) intercompany Indebtedness that otherwise constitutes an Investment allowed under clauses (a) and (g) of the definition of Permitted Investments;

(h) unsecured guaranties of the real estate leases of Subsidiaries;

(i) Indebtedness in an aggregate amount not to exceed One Hundred Thousand Dollars ($100,000) with respect to surety bonds and similar obligations arising in the ordinary course of business;

(j) other unsecured Indebtedness not otherwise permitted exceeding Two Hundred Fifty Thousand Dollars ($250,000) in the aggregate amount outstanding at any time; and

(k) extensions, refinancings, modifications, amendments and restatements of any items of Permitted Indebtedness (a) through (j) above, provided that the principal amount thereof is not increased or the terms thereof are not modified to impose more burdensome terms upon Borrower or its Subsidiary, as the case may be.

"**Permitted Investments**" are:

(a) Investments (including, without limitation, Subsidiaries) existing on the Effective Date which are shown on the Perfection Certificate;

(b) (i) Investments consisting of Cash Equivalents, and (ii) any Investments permitted by Borrower's investment policy, as amended from time to time, provided that such investment policy (and any such amendment thereto) has been approved in writing by Bank;

(c) Investments consisting of the endorsement of negotiable instruments for deposit or collection or similar transactions in the ordinary course of Borrower;

(d) Investments consisting of deposit accounts (but only to the extent that Borrower is permitted to maintain such accounts pursuant to Section 6.8 of this Agreement) in which Bank has a first priority perfected security interest;

(e) Investments accepted in connection with Transfers permitted by Section 7.1;

(f) Investments consisting of the creation of a Subsidiary for the purpose of consummating a merger transaction permitted by Section 7.3 of this Agreement, which is otherwise a Permitted Investment;

(g) Investments (i) by Borrower in Subsidiaries not to exceed Five Hundred Thousand Dollars ($500,000) outstanding at any time and (ii) by Subsidiaries in other Subsidiaries or in Borrower;

(h) Investments consisting of (i) travel advances and employee relocation loans and other employee loans and advances in the ordinary course of business, and (ii) loans to employees, officers or directors relating to the purchase of equity securities of Borrower or its Subsidiaries pursuant to employee stock purchase plans or agreements approved by the Board;

(i) Investments (including debt obligations) received in connection with the bankruptcy or reorganization of customers or suppliers and in settlement of delinquent obligations of, and other disputes with, customers or suppliers arising in the ordinary course of business;

(j) Investments consisting of notes receivable of, or prepaid royalties and other credit extensions, to customers and suppliers who are not Affiliates, in the ordinary course of business; provided that this paragraph (j) shall not apply to Investments of Borrower in any Subsidiary; and

(k) other Investments not to exceed One Hundred Thousand Dollars ($100,000) in the aggregate.

"**Permitted Liens**" are:

(a) Liens existing on the Effective Date which are shown on the Perfection Certificate or arising under this Agreement or the other Loan Documents;

(b) Liens for taxes, fees, assessments or other government charges or levies, either (i) not due and payable or (ii) being contested in good faith and for which Borrower maintains adequate reserves on Borrower's Books, provided that no notice of any such Lien has been filed or recorded under the Internal Revenue Code of 1986, as amended, and the Treasury Regulations adopted thereunder;

(c) purchase money Liens or Liens in connection with capital leases (i) on Equipment acquired or held by Borrower incurred for financing the acquisition of the Equipment securing no more than Two Hundred Fifty Thousand Dollars ($250,000) in the aggregate amount outstanding, or (ii) existing on Equipment when acquired, if the Lien is confined to the property and improvements and the proceeds of the Equipment;

(d) Liens of carriers, warehousemen, suppliers, or other Persons that are possessory in nature arising in the ordinary course of business so long as such Liens attach only to Inventory, securing liabilities in the aggregate amount not to exceed Fifty Thousand Dollars ($50,000) and which are not delinquent or remain payable without penalty or which are being contested in good faith and by appropriate proceedings which proceedings have the effect of preventing the forfeiture or sale of the property subject thereto;

(e) Liens to secure payment of workers' compensation, employment insurance, old-age pensions, social security and other like obligations incurred in the ordinary course of business (other than Liens imposed by ERISA);

(f) Liens incurred in the extension, renewal or refinancing of the Indebtedness secured by Liens described in (a) through (c), but any extension, renewal or replacement Lien must be limited to the property encumbered by the existing Lien and the principal amount of the indebtedness may not increase;

(g) leases or subleases of real property granted in the ordinary course of Borrower's business (or, if referring to another Person, in the ordinary course of such Person's business), and leases, subleases, non- exclusive licenses or sublicenses of personal property (other than Intellectual Property) granted in the ordinary course of Borrower's business (or, if referring to another Person, in the ordinary course of such Person's business), if the leases, subleases, licenses and sublicenses do not prohibit granting Bank a security interest therein;

(h) non-exclusive licenses of Intellectual Property granted to third parties in the ordinary course of business, and licenses of Intellectual Property that could not result in a legal transfer of title of the licensed property that may be exclusive in respects other than territory and that may be exclusive as to territory only as to discreet geographical areas outside of the United States;

(i) Liens arising from attachments or judgments, orders, or decrees in circumstances not constituting an Event of Default under Sections 8.4 and 8.7; and

(j) Liens in favor of other financial institutions arising in connection with Borrower's deposit and/or securities accounts held at such institutions, provided that (i) Bank has a first priority perfected security interest in the amounts held in such deposit and/or securities accounts and (ii) such accounts are permitted to be maintained pursuant to Section 6.8 of this Agreement

(k) deposits in the aggregate outstanding amount not to exceed One Hundred Thousand Dollars ($100,000) to secure the performance of bids, trade contracts, statutory obligations, surety bonds and similar obligations arising in the ordinary course of business described in clause (i) of the definition of Permitted Indebtedness;

(l) Liens in an aggregate outstanding amount not to exceed Twenty-Five Thousand Dollars ($25,000) in favor of customs and revenue authorities arising as a matter of law to secure payments of custom duties in connection with the importation of goods;

(m) Liens on insurance proceeds securing the payment of financed insurance premiums; and

(n) deposits in connection with real estate leases in an aggregate outstanding amount not to exceed One Hundred Thousand Dollars ($100,000).

"**Person**" is any individual, sole proprietorship, partnership, limited liability company, joint venture, company, trust, unincorporated organization, association, corporation, institution, public benefit corporation, firm, joint stock company, estate, entity or government agency.

"**Prepayment Fee**" shall be an additional fee, payable to Bank, with respect to each Term Loan Advance, in an amount equal to (a) two percent (2%) of the outstanding principal balance of the applicable Term Loan Advance if the prepayment is made on or before the date that is twelve (12) months after the Funding Date of such Term Loan Advance and (b) Zero Dollars ($0) if the prepayment is made after the date that is twelve (12) months after the Funding Date of such Term Loan Advance.

"**Prime Rate**" is the rate of interest per annum from time to time published in the money rates section of The Wall Street Journal or any successor publication thereto as the "prime rate" then in effect; provided that, in the event such rate of interest is less than zero, such rate shall be deemed to be zero for purposes of this Agreement; and provided further that if such rate of interest, as set forth from time to time in the money rates section of The Wall Street Journal, becomes unavailable for any reason as determined by Bank, the "Prime Rate" shall mean the rate of interest per annum announced by Bank as its prime rate in effect at its principal office in the State of California (such Bank announced Prime Rate not being intended to be the lowest rate of interest charged by Bank in connection with extensions of credit to debtors); provided that, in the event such rate of interest is less than zero, such rate shall be deemed to be zero for purposes of this Agreement.

"**Registered Organization**" is any "registered organization" as defined in the Code with such additions to such term as may hereafter be made.

"**Requirement of Law**" is as to any Person, the organizational or governing documents of such Person, and any law (statutory or common), treaty, rule or regulation or determination of an arbitrator or a court or other Governmental Authority, in each case applicable to or binding upon such Person or any of its property or to which such Person or any of its property is subject.

"**Reserves**" means, as of any date of determination, such amounts as Bank may from time to time establish and revise in its good faith business judgment, reducing the amount of Advances and other financial accommodations which would otherwise be available to Borrower (a) to reflect events, conditions, contingencies or risks which, as determined by Bank in its good faith business judgment, do or may adversely affect (i) the Collateral or any other property which is security for the Obligations or its value (including without limitation any increase in delinquencies of Accounts), (ii) the assets, business or prospects of Borrower or any Guarantor, or (iii) the security interests and other rights of Bank in the Collateral (including the enforceability, perfection and priority thereof); or (b) to reflect Bank's reasonable belief that any collateral report or financial information furnished by or on behalf of Borrower or any Guarantor to Bank is or may have been incomplete, inaccurate or misleading in any material respect; or (c) in respect of any state of facts which Bank determines constitutes an Event of Default or may, with notice or passage of time or both, constitute an Event of Default.

"**Responsible Officer**" is any of the Chief Executive Officer, President, Chief Financial Officer and Controller of Borrower.

"**Restricted License**" is any material license or other agreement with respect to which Borrower is the licensee (a) that prohibits or otherwise restricts Borrower from granting a security interest in Borrower's interest in such license or agreement or any other property, or (b) for which a default under or termination of could interfere with Bank's right to sell any Collateral.

"**Revolving Line**" is an aggregate principal amount equal to Two Million Dollars ($2,000,000).

"**Revolving Line Maturity Date**" is February 26, 2021.

"**SEC**" shall mean the Securities and Exchange Commission, any successor thereto, and any analogous Governmental Authority.

"**Second Tranche**" is defined in Section 2.3(a).

"**Second Tranche Draw Period**" is the period of time commencing on date on which the Second Tranche Milestone is satisfied through March 31, 2019.

"**Second Tranche Milestone**" means Bank's receipt of evidence satisfactory to Bank that Borrower has achieved either (a) Trailing Three-Month Net Revenue of Four Million Dollars ($4,000,000) or (b) FDA Investigational Device Exception conditional approval for Borrower's Coronary Premarket Approval.

"**Securities Account**" is any "**securities account**" as defined in the Code with such additions to such term as may hereafter be made.

"**Streamline Balance**" is defined in the definition of Streamline Period.

"**Streamline Period**" is, on and after the Effective Date, provided no Event of Default has occurred and is continuing, the period (a) commencing on the first day of the month following the day that Borrower provides to Bank a written report that Borrower has, for each consecutive day in the immediately preceding month Net Cash, as determined by Bank in its discretion, in an amount at all times greater than or equal to Two Million Dollars ($2,000,000) (the "**Streamline Balance**"); and (b) terminating on the earlier to occur of (i) the occurrence of an Event of Default, and (ii) the first day thereafter in which Borrower fails to maintain the Streamline Balance, as determined by Bank in its discretion. Upon the termination of a Streamline Period, Borrower must maintain the Streamline Balance each consecutive day for thirty (30) days, as determined by Bank in its discretion, prior to entering into a subsequent Streamline Period. Borrower shall give Bank prior written notice of Borrower's election

to enter into any such Streamline Period by providing Bank with (a) a current Borrowing Base Statement reflecting Borrower's maintenance of the Streamline Balance and (b) the information described in Section 6.2(b), and each such Streamline Period shall commence on the first day of the monthly period following the date Bank determines, in its reasonable discretion, that the Streamline Balance has been achieved. Notwithstanding the foregoing and regardless of Borrower's maintenance of the Streamline Balance, a Streamline Period shall also occur while there are no outstanding Advances unless an Event of Default is continuing.

"**Subordinated Debt**" is indebtedness incurred by Borrower subordinated to all of Borrower's now or hereafter indebtedness to Bank (pursuant to a subordination, intercreditor, or other similar agreement in form and substance satisfactory to Bank entered into between Bank and the other creditor), on terms acceptable to Bank.

"**Subsidiary**" is, as to any Person, a corporation, partnership, limited liability company or other entity of which shares of stock or other ownership interests having ordinary voting power (other than stock or such other ownership interests having such power only by reason of the happening of a contingency) to elect a majority of the board of directors or other managers of such corporation, partnership or other entity are at the time owned, or the management of which is otherwise controlled, directly or indirectly through one or more intermediaries, or both, by such Person. Unless the context otherwise requires, each reference to a Subsidiary herein shall be a reference to a Subsidiary of Borrower.

"**Term Loan Advance**" and "**Term Loan Advances**" are each defined in Section 2.3 of this Agreement.

"**Term Loan Amortization Date**" is, for each Term Loan Advance, the first (1st) calendar day of the first (1st) month following the end of the Interest-Only Period.

"**Term Loan Maturity Date**" is, for each Term Loan Advance, December 1, 2021.

"**Third Party Equipment**" is defined in Section 4.1.

"**Trademarks**" means any trademark and servicemark rights, whether registered or not, applications to register and registrations of the same and like protections, and the entire goodwill of the business of Borrower connected with and symbolized by such trademarks.

"**Trailing Three-Month Net Revenue**" means, as of any date, the net revenue of Borrower for the three (3) months preceding such date.

"**Transfer**" is defined in Section 7.1.

"**Unrestricted Cash**" is, at any time, the aggregate amount of Borrower's unrestricted and unencumbered cash and Cash Equivalents maintained with Bank (other than any security interests in favor of Bank, except to the extent such security interests secure cash collateral for Bank Services).

"**Valve Business**" is defined in Section 7.1.

"**Warrant**" is that certain Warrant to Purchase Common Stock dated as of the Effective Date between Borrower and Bank, as amended, modified, supplemented and/or restated from time to time.

[Signature page follows.]

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed as of the Effective Date.

BORROWER:

SHOCKWAVE MEDICAL, INC.

By /s/ Dan Puckett
Name: Dan Puckett
Title: CFO

BANK:

SILICON VALLEY BANK

By /s/ Michelle Lai
Name: Michelle Lai
Title: Vice President

EXHIBIT A - COLLATERAL DESCRIPTION

The Collateral consists of all of Borrower's right, title and interest in and to the following personal property:

All goods, Accounts (including health-care receivables), Equipment, Inventory, contract rights or rights to payment of money, leases, license agreements, franchise agreements, General Intangibles (except as provided below), commercial tort claims, documents, instruments (including any promissory notes), chattel paper (whether tangible or electronic), cash, deposit accounts, certificates of deposit, fixtures, letters of credit rights (whether or not the letter of credit is evidenced by a writing), securities, and all other investment property, supporting obligations, and financial assets, whether now owned or hereafter acquired, wherever located; and

All Borrower's Books relating to the foregoing, and any and all claims, rights and interests in any of the above and all substitutions for, additions, attachments, accessories, accessions and improvements to and replacements, products, proceeds and insurance proceeds of any or all of the foregoing.

Notwithstanding the foregoing, the Collateral does not include any: (i) more than 65% of the presently existing and hereafter arising issued and outstanding shares of capital stock owned by Borrower of any Foreign Subsidiary which shares entitle the holder thereof to vote for directors or any other matter, or (ii) Intellectual Property; provided, however, the Collateral shall include all Accounts and all proceeds of Intellectual Property. If a judicial authority (including a U.S. Bankruptcy Court) would hold that a security interest in the underlying Intellectual Property is necessary to have a security interest in such Accounts and such property that are proceeds of Intellectual Property, then the Collateral shall automatically, and effective as of the Effective Date, include the Intellectual Property to the extent necessary to permit perfection of Bank's security interest in such Accounts and such other property of Borrower that are proceeds of the Intellectual Property.

Pursuant to the terms of a certain negative pledge arrangement with Bank, Borrower has agreed not to encumber any of its Intellectual Property without Bank's prior written consent.

EXHIBIT B
COMPLIANCE STATEMENT

TO: SILICON VALLEY BANK Date:_____
FROM: SHOCKWAVE MEDICAL, INC.

Under the terms and conditions of the Loan and Security Agreement between Borrower and Bank (the "**Agreement**"), Borrower is in complete compliance for the period ending , with all required covenants except as noted below. Attached are the required documents evidencing such compliance, setting forth calculations prepared in accordance with GAAP consistently applied from one period to the next except (i) as explained in an accompanying letter or footnotes and (ii) with respect to unaudited financial statements, for the absence of footnotes and subject to year-end adjustments. Capitalized terms used but not otherwise defined herein shall have the meanings given them in the Agreement.

Please indicate compliance status by circling Yes/No under "Complies" column.

Reporting Covenants	Required	Complies	
Monthly financial statements with Compliance Statement	Monthly within 30 days	Yes	No
Annual audited financial statements	(a) if audited is required by the Board, FYE within 180 days (CPA Audited) and (b) if audited is not required by the Board, FYE within 60 days (company- prepared)	Annual audited financial statements	
10-Q, 10-K and 8-K	Within 5 days after filing with SEC	Yes	No
A/R & A/P Agings	Monthly within 30 days	Yes	No
Borrowing Base Statement (including detailed AR ledger report)	(a) When a Streamline Period is not in effect, weekly within 5 days; and (b) When a Streamline Period is in effect, monthly within 30 days	Yes	No
Annual financial projections	Within 30 days of later of Board Approval or FYE, and as amended/updated	Yes	No

Streamline Conditions			
Net Cash	Streamline Period	Applies	
Net Cash > $2,000,000 OR No Outstanding Advances	Yes	Yes	No
Net Cash < $2,000,000	No	Yes	No

The following financial covenant information set forth in Schedule 1 attached hereto are true and accurate as of the date of this Compliance Statement.

The following are the exceptions with respect to the statements above: (If no exceptions exist, state "**No exceptions to note.**")

EXHIBIT C

LOAN PAYMENT/ADVANCE REQUEST FORM

DEADLINE FOR SAME DAY PROCESSING IS NOON PACIFIC TIME

Fax To: Date: _____

LOAN PAYMENT:

SHOCKWAVE MEDICAL, INC.

From Account # _____ To Account # _____
(Deposit Account #) (Loan Account #)

Principal $ _____ and/or Interest $_____

Authorized Signature:_____ Phone Number:_____

Print Name/Title:_____

LOAN ADVANCE:

Complete *Outgoing Wire Request* section below if all or a portion of the funds from this loan advance are for an outgoing wire.

From Account #_____ To Account #_____
(Loan Account #) (Deposit Account #)

Amount of Term Loan Advance $_____

All Borrower's representations and warranties in the Loan and Security Agreement are true, correct and complete in all material respects on the date of the request for an advance; provided, however, that such materiality qualifier shall not be applicable to any representations and warranties that already are qualified or modified by materiality in the text thereof; and provided, further that those representations and warranties expressly referring to a specific date shall be true, accurate and complete in all material respects as of such date:

Authorized Signature:_____ Phone Number:_____

Print Name/Title:_____

OUTGOING WIRE REQUEST:

Complete only if all or a portion of funds from the loan advance above is to be wired.

Deadline for same day processing is noon, Pacific Time

Beneficiary Name:_____ Amount of Wire: $_____

Beneficiary Bank: _____ Account Number: _____

City and State: _____

Beneficiary Bank Transit (ABA) #: _____ Beneficiary Bank Code (Swift, Sort, Chip, etc.): _____
(For International Wire Only)

Intermediary Bank: Transit (ABA) #:

For Further Credit to:_____

Special Instruction: _____

By signing below, I (we) acknowledge and agree that my (our) funds transfer request shall be processed in accordance with and subject to the terms and conditions set forth in the agreements(s) covering funds transfer service(s), which agreements(s) were previously received and executed by me (us).

Authorized Signature:_____ 2nd Signature (if required):_____

Print Name/Title: _____ Print Name/Title: _____

Telephone #: _____ Telephone #: _____

Exhibit 21.1

SUBSIDIARIES OF SHOCKWAVE MEDICAL, INC.

Name of Subsidiary	Jurisdiction of Organization
ShockWave Medical GmbH	Germany