UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, DC 20549

FORM 10-Q

(Mark One)

☒ **QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the quarterly period ended June 30, 2019

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from _____to _____

Commission File Number: 001-38829

ShockWave Medical, Inc.

(Exact Name of Registrant as Specified in its Charter)

Delaware	**27-0494101**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
5403 Betsy Ross Drive Santa Clara, California	**95054**
(Address of principal executive offices)	**(Zip Code)**

Registrant's telephone number, including area code: (510) 279-4262

Securities registered pursuant to Section 12(b) of the Act:

Title of each class of securities	Trading symbol(s)	Name of each national exchange and principal U.S. market for the securities
ShockWave Medical Inc., common stock, par value $0.001 per share	SWAV	The Nasdaq Stock Market LLC (Nasdaq Global Select Market)

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, 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 13(a) of the Exchange Act. ☒

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

Indicate by check mark whether the registrant has filed all documents and reports required to be filed by Sections 12, 13 or 15(d) of the Securities Exchange Act of 1934 subsequent to the distribution of securities under a plan confirmed by a court. Yes ☒ No ☐

As of August 1, 2019, the registrant had 28,026,863 shares of common stock, $0.001 par value per share, outstanding.

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PART I—FINANCIAL INFORMATION

Item 1. Financial Statements.

SHOCKWAVE MEDICAL, INC.
Condensed Consolidated Balance Sheets
(*Unaudited*)
(in thousands)

	June 30, 2019	December 31, 2018
		(1)
ASSETS		
CURRENT ASSETS:		
Cash and cash equivalents	$ 41,924	$ 39,643
Short-term investments	83,213	—
Accounts receivable, net	5,242	2,850
Inventory	8,291	5,131
Prepaid expenses and other current assets	1,953	1,112
Total current assets	140,623	48,736
Operating lease right-of-use assets	2,398	—
Property and equipment, net	3,244	2,619
Other assets	542	2,066
TOTAL ASSETS	$ 146,807	$ 53,421
LIABILITIES, CONVERTIBLE PREFERRED STOCK AND STOCKHOLDERS' EQUITY (DEFICIT)		
CURRENT LIABILITIES:		
Accounts payable	$ 2,216	$ 1,487
Term notes, current portion	5,000	1,667
Accrued liabilities	7,378	6,217
Lease liability, current portion	806	—
Total current liabilities	15,400	9,371
Lease liability, noncurrent portion	1,732	—
Term notes, noncurrent portion	10,262	13,383
Convertible preferred stock warrant liability	—	313
Other liabilities	—	136
TOTAL LIABILITIES	27,394	23,203
Commitments and contingencies (Note 6)		
Convertible preferred stock	—	152,806
STOCKHOLDERS' EQUITY (DEFICIT):		
Preferred stock	—	—
Common stock	28	2
Additional paid-in capital	269,582	4,275
Accumulated other comprehensive income	75	—
Accumulated deficit	(150,272)	(126,865)
TOTAL STOCKHOLDERS' EQUITY (DEFICIT)	119,413	(122,588)
TOTAL LIABILITIES, CONVERTIBLE PREFERRED STOCK AND STOCKHOLDERS' EQUITY (DEFICIT)	$ 146,807	$ 53,421

The accompanying notes are an integral part of these unaudited condensed consolidated financial statements.

(1) The consolidated balance sheet as of December 31, 2018 is derived from the audited consolidated financial statements as of that date.

SHOCKWAVE MEDICAL, INC.
Condensed Consolidated Statements of Operations and Comprehensive Loss
(Unaudited)
(in thousands, except share and per share data)

	Three Months Ended June 30,		Six Months Ended June 30,	
	2019	**2018**	**2019**	**2018**
Revenue:				
Product revenue	$ 10,012	$ 2,279	$ 17,282	$ 3,601
Operating expenses:				
Cost of product revenue	4,133	1,179	7,205	1,973
Research and development	6,926	5,530	14,410	11,046
Sales and marketing	6,961	4,372	12,831	7,810
General and administrative	3,245	1,392	6,247	2,768
Total operating expenses	21,265	12,473	40,693	23,597
Loss from operations	(11,253)	(10,194)	(23,411)	(19,996)
Interest expense	(250)	(40)	(495)	(58)
Change in fair value of warrant liability	—	10	(609)	51
Other income, net	913	138	1,133	323
Net loss before taxes	(10,590)	(10,086)	(23,382)	(19,680)
Income tax provision	18	21	25	21
Net loss	$ (10,608)	$ (10,107)	$ (23,407)	$ (19,701)
Unrealized gain on available-for-sale securities	75	—	75	1
Total comprehensive loss	$ (10,533)	$ (10,107)	$ (23,332)	$ (19,700)
Net loss per share, basic and diluted	$ (0.38)	$ (5.79)	$ (1.25)	$ (11.42)
Shares used in computing net loss per share, basic and diluted	28,002,887	1,745,499	18,735,307	1,725,414

The accompanying notes are an integral part of these unaudited condensed consolidated financial statements.

SHOCKWAVE MEDICAL, INC.
Condensed Consolidated Statements of Convertible Preferred Stock and Stockholders' Equity (Deficit)
(Unaudited)
(in thousands, except share data)

	Convertible Preferred Stock		Common Stock		Additional Paid-In Capital	Accumulated Other Comprehensive Income	Accumulated Deficit	Total Stockholders' Equity (Deficit)
	Shares	Amount	Shares	Amount				
Balance — December 31, 2018	18,670,328	$ 152,806	1,824,852	$ 2	$ 4,275	$ —	$ (126,865)	$ (122,588)
Exercise of common stock warrants for cash	—	—	50,331	—	110	—	—	110
Issuance of common stock upon net exercise of warrants	—	—	101,744	—	133	—	—	133
Conversion of preferred stock to common stock upon initial public offering	(18,670,328)	(152,806)	18,670,328	18	152,788	—	—	152,806
Conversion of Series A-1 warrants to common stock warrants upon initial public offering	—	—	—	—	789	—	—	789
Issuance of common stock in connection with initial public offering, net of issuance costs of $11.3 million	—	—	6,555,000	7	100,132	—	—	100,139
Issuance of common stock in connection with private placement	—	—	588,235	1	9,999	—	—	10,000
Exercise of stock options	—	—	80,515	—	169	—	—	169
Vesting of early exercised options	—	—	—	—	18	—	—	18
Stock-based compensation	—	—	—	—	412	—	—	412
Adjustment for fractional shares resulting from reverse stock split	—	—	(114)	—	(3)	—	—	(3)
Net loss	—	—	—	—	—	—	(12,799)	(12,799)
Balance — March 31, 2019	—	—	27,870,891	28	268,822	—	(139,664)	129,186
Issuance of common stock upon net exercise of warrants	—	—	79,208	—	—	—	—	—
Exercise of stock options	—	—	73,608	—	148	—	—	148
Vesting of early exercised options	—	—	—	—	9	—	—	9
Stock-based compensation	—	—	—	—	818	—	—	818
Offering costs related to the initial public offering	—	—	—	—	(215)	—	—	(215)
Unrealized gain on available-for-sale securities	—	—	—	—	—	75	—	75
Net loss	—	—	—	—	—	—	(10,608)	(10,608)
Balance — June 30, 2019	—	$ —	28,023,707	$ 28	$ 269,582	$ 75	$ (150,272)	$ 119,413

	Convertible Preferred Stock		Common Stock		Additional Paid-In Capital	Accumulated Other Comprehensive Loss	Accumulated Deficit	Total Stockholders' Equity (Deficit)
	Shares	Amount	Shares	Amount				
Balance — December 31, 2017	17,510,045	$ 137,469	1,627,032	$ 2	$ 2,470	$ (1)	$ (85,763)	$ (83,292)
Exercise of Series A-1 warrants	52,169	312	—	—	—	—	—	—
Issuance of common stock warrants	—	—	—	—	104	—	—	104
Exercise of stock options	—	—	143,422	—	215	—	—	215
Unrealized gain on available-for-sale securities	—	—	—	—	—	1	—	1
Vesting of early exercised options	—	—	—	—	22	—	—	22
Stock-based compensation	—	—	—	—	273	—	—	273
Net loss	—	—	—	—	—	—	(9,594)	(9,594)
Balance — March 31, 2018	17,562,214	137,781	1,770,454	2	3,084	—	(95,357)	(92,271)
Exercise of Series A-1 warrants	17,506	105	—	—	—	—	—	—
Exercise of stock options	—	—	27,067	—	60	—	—	60
Vesting of early exercised options	—	—	—	—	20	—	—	20
Stock-based compensation	—	—	—	—	312	—	—	312
Net loss	—	—	—	—	—	—	(10,107)	(10,107)
Balance — June 30, 2018	17,579,720	$ 137,886	1,797,521	$ 2	$ 3,476	$ —	$ (105,464)	$ (101,986)

The accompanying notes are an integral part of these unaudited condensed consolidated financial statements.

SHOCKWAVE MEDICAL, INC.
Condensed Consolidated Statements of Cash Flows
(Unaudited)
(in thousands)

	Six Months Ended June 30,	
	2019	**2018**
CASH FLOWS FROM OPERATING ACTIVITIES:		
Net loss	$ (23,407)	$ (19,701)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	516	283
Stock-based compensation	1,230	585
Amortization of right-of-use assets	496	—
Accretion of discount on available-for-sale securities	(354)	—
Loss on write down of fixed assets	88	25
Change in fair value of warrant liability	609	(51)
Amortization of debt issuance costs	212	17
Changes in operating assets and liabilities:		
Accounts receivable	(2,392)	(1,064)
Inventory	(3,160)	(2,092)
Prepaid expenses and other current assets	(841)	(81)
Other assets	5	(60)
Accounts payable	713	338
Accrued and other current liabilities	1,848	44
Lease liabilities	(496)	—
Other liabilities	—	(9)
Net cash used in operating activities	(24,933)	(21,766)
CASH FLOWS FROM INVESTING ACTIVITIES:		
Purchase of available-for-sale securities	(82,784)	—
Proceeds from maturities of available-for-sale securities	—	1,807
Purchase of property and equipment	(1,191)	(821)
Net cash (used in) provided by investing activities	(83,975)	986
CASH FLOWS FROM FINANCING ACTIVITIES:		
Proceeds from issuance of common stock upon initial public offering, net of issuance costs paid	100,762	—
Proceeds from issuance of common stock in private placement	10,000	—
Proceeds from term loans	—	9,988
Proceeds from stock option exercises	317	375
Proceeds from warrant exercises	110	101
Net cash provided by financing activities	111,189	10,464
Net increase (decrease) in cash, cash equivalents and restricted cash	2,281	(10,316)
Cash, cash equivalents and restricted cash at beginning of period	40,093	51,923
Cash, cash equivalents and restricted cash equivalents at end of period	$ 42,374	$ 41,607
SUPPLEMENTAL DISCLOSURES OF CASH FLOW INFORMATION:		
Interest paid	$ 276	$ 18
Income tax paid	$ 8	$ 4
NON-CASH INVESTING AND FINANCING ACTIVITIES:		
Common stock issued on conversion of convertible preferred stock	$ 152,806	$ —
Issuance of Series A-1 convertible preferred stock on net exercise of warrants	$ —	$ 316
Common stock issued upon net exercise of warrants	$ 133	$ —
Common stock warrants issued on conversion of preferred stock warrants and the reclassification of the warrant liability	$ 789	$ —
Offering costs included in accrued liabilities	$ 215	$ —
Right-of-use asset obtained in exchange for lease liability	$ 73	$ —
Property and equipment purchases included in accounts payable and accrued liabilities	$ 93	$ 6
Issuance of common stock warrants in connection with debt financing	$ —	$ 104

The accompanying notes are an integral part of these unaudited condensed 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 and has a subsidiary in Germany.

Initial Public Offering

On March 11, 2019, the Company completed an initial public offering ("IPO") of its common stock. As part of the IPO, the Company issued and sold 6,555,000 shares of its common stock, which included 855,000 shares sold pursuant to the exercise of the underwriters' over-allotment option, at a public offering price of $17.00 per share. The Company received net proceeds of approximately $99.9 million from the IPO, after deducting underwriters' discounts and commissions of $7.1 million and offering costs of $4.4 million, of which $1.5 million was incurred as of December 31, 2018. Prior to the completion of the IPO, all shares of Series A, A-1, B, C and D convertible preferred stock then outstanding were converted into 18,670,259 shares of common stock on a one-to-one basis.

In addition, on the completion of the IPO, all the Company's outstanding preferred stock warrants were converted into 54,903 common stock warrants, which resulted in the reclassification of the convertible preferred stock warrant liability to additional paid-in capital. Furthermore, 101,744 shares of common stock were issued upon net exercise of warrants at the time of the IPO.

Concurrent with the IPO, the Company issued 588,235 shares of its common stock in a private placement for net proceeds of $10.0 million.

Reverse Stock Split

In February 2019, the Company's board of directors approved an amended and restated certificate of incorporation to effect a reverse split of shares of the Company's common stock and convertible preferred stock on a 12.2-for-one basis (the "Reverse Stock Split"). The par values of the common stock and convertible preferred stock were not adjusted as a result of the Reverse Stock Split. All references to common stock, convertible preferred stock, warrants to purchase common stock, warrants to purchase convertible preferred stock, options to purchase common stock, early exercised options, share data, per share data and related information contained in the financial statements have been retrospectively adjusted to reflect the effect of the Reverse Stock Split for all periods presented. The number of shares of the Company's common stock contained in the financial statements includes fractional shares resulting from the Reverse Stock Split, aggregating to 45 whole shares of common stock and 69 whole shares of preferred stock as of December 31, 2018, which fractional shares were settled in cash in fiscal 2019.

Need for Additional Capital

The Company has incurred significant losses and has negative cash flows from operations. As of June 30, 2019, the Company had an accumulated deficit of $150.3 million. Management expects to continue to incur additional substantial losses for the foreseeable future.

As of June 30, 2019, the Company had cash, cash equivalents and short-term investments of $125.1 million, which are available to fund future operations. The Company believes that its cash, cash equivalents and short-term investments as of June 30, 2019, together with available borrowings under a revolving line of credit, will be sufficient for the Company to continue as a going concern for at least 12 months from the date the unaudited condensed consolidated financial statements are filed with the Securities and Exchange Commission ("SEC"). The Company's future capital requirements will depend on many factors, including its growth rate, the timing and extent of its spending to support research and development activities and the timing and cost of establishing additional sales and marketing capabilities.

2. Summary of Significant Accounting Policies

Basis of Presentation

The accompanying unaudited condensed consolidated financial statements have been prepared in accordance with generally accepted accounting principles in the United States ("GAAP") and applicable rules and regulations of SEC regarding interim financial reporting.

The interim condensed consolidated financial statements are unaudited. The unaudited condensed consolidated financial statements have been prepared on the same basis as the annual consolidated financial statements and, in the opinion of management, reflect all adjustments, which include only normal recurring adjustments, necessary to present fairly the Company's consolidated financial position, results of operations and cash flows. The results of operations for the three and six months ended June 30, 2019 are not necessarily indicative of the results to be expected for the year ending December 31, 2019 or for any other future annual or interim period. The condensed consolidated balance sheet as of December 31, 2018 included herein was derived from the audited financial statements as of that date. These condensed consolidated financial statements should be read in conjunction with the Company's audited consolidated financial statements included in the prospectus dated March 6, 2019 ("Prospectus") that forms a part of the Company's Registration Statements on Form S-1 (File No. 333-229590), as filed with the SEC pursuant to Rule 424(b)(4) promulgated under the Securities Act of 1933, as amended.

Cash, Cash Equivalents, and Restricted Cash

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.

Restricted cash as of June 30, 2019 and December 31, 2018 relates to a letter of credit established for a lease entered into in May 2018 and is recorded as other assets on the condensed consolidated balance sheets.

The following table provides a reconciliation of cash, cash equivalents, and restricted cash reported within the condensed consolidated balance sheets that sum to the total of the same amounts shown in the condensed consolidated statements of cash flows:

	June 30, 2019	December 31, 2018
	(in thousands)	
Cash and cash equivalents	$ 41,924	$ 39,643
Restricted cash	450	450
Total cash, cash equivalents, and restricted cash	$ 42,374	$ 40,093

Short-Term Investments

Short-term investments have been classified as available-for-sale and are carried at estimated fair value 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.

Fair Value of Financial Instruments

The Company's cash and cash equivalents, restricted cash, short-term investments, accounts receivable, accounts payable and accrued liabilities approximate their fair value due to their short maturities. Management believes that its term notes bear interest at the prevailing market rates for instruments with similar characteristics; accordingly, the carrying value of this instrument approximates its fair value.

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.

Leases

The Company adopted Accounting Standards Update (ASU) No. 2016-02, *Leases (Topic 842)* using the modified retrospective approach with a cumulative-effect adjustment as of January 1, 2019.

Upon adoption of Topic 842, on January 1, 2019, the Company recorded operating right-of-use assets of $2.9 million and operating lease liabilities of $3.0 million and derecognized the deferred rent liability of $0.1 million. Results for the three and six months ended June 30, 2019 are presented under Topic 842. Prior period amounts have not been adjusted and continue to be reported in accordance with the Company's historical accounting under previous lease guidance, ASC 840: Leases (Topic 840).

For its long-term operating lease, the Company recognized a right-of-use asset and a lease liability on its condensed consolidated balance sheet. The lease liability is determined as the present value of future lease payments using an estimated rate of interest that the Company would have to pay to borrow equivalent funds on a collateralized basis at the lease commencement date. The right-of-use asset is based on the liability adjusted for any prepaid or deferred rent. The lease term at the commencement date is determined by considering whether renewal options and termination options are reasonably assured of exercise.

Rent expense for the operating lease is recognized on a straight-line basis over the lease term and is included in operating expenses on the condensed consolidated statements of operations and comprehensive loss. Variable lease payments include lease operating expenses.

The Company elected to exclude from its balance sheets recognition of leases having a term of 12 months or less (short-term leases) and elected to not separate lease components and non-lease components for its long-term real estate leases.

Deferred Offering Costs

Offering costs, consisting of legal, accounting, printer and filing fees related to the IPO, were deferred until the completion of the IPO. As of December 31, 2018, $1.5 million of deferred offering costs were recorded as other assets on the condensed consolidated balance sheet. In March 2019, upon the closing of the IPO, the deferred costs were offset against the Company's IPO proceeds.

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. The carrying value of the warrants will continue to be adjusted until such time as these instruments are exercised, expire or convert into warrants to purchase shares of the Company's common stock upon the completion of a liquidation event, including the completion of the IPO, which occurred on March 11, 2019. At that time, the preferred stock warrant liability was reclassified to additional paid-in capital, a component of stockholders' equity (deficit).

Revenue

The Company records product revenue primarily from the sale of its IVL catheters. The Company sells its products to hospitals, primarily through direct sales representatives, as well as through distributors in selected international markets. Additionally, a significant portion of the Company's revenue is generated through a consignment model under which inventory is maintained at hospitals.

Revenue is recognized when a customer obtains control of promised goods or services, in an amount that reflects the consideration which the entity expects to receive in exchange for those goods or services. To determine revenue recognition for arrangements that an entity determines are within the scope of ASC 606, the Company performs the following five steps: (i) identify the contract(s) with a customer; (ii) identify the performance obligations in the contract; (iii) determine the transaction price; (iv) allocate the transaction price to the performance obligations in the contract; and (v) recognize revenue when (or as) the entity satisfies a performance obligation.

For products sold through direct sales representatives, control is transferred upon delivery to customers. For products sold to distributors internationally and certain customers that purchase stocking orders in the United States, control is transferred upon shipment or delivery to the customer's named location, based on the contractual shipping terms. For consignment inventory, control is transferred at the time the IVL catheters are consumed in a procedure.

The Company generally provides for the use of an IVL generator and connector cable under an agreement to customers at no charge to facilitate use of the IVL catheters. These agreements do not contain contractually enforceable minimum commitments and are generally cancellable by either party with 30 days' notice.

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:

	June 30, 2019			
	Level 1	Level 2	Level 3	Total
	(in thousands)			
Assets:				
U.S. Treasury securities	$ 63,782	$ —	$ —	$ 63,782
Money market funds	29,389	—	—	29,389
Commercial paper	—	16,413	—	16,413
Corporate bonds	—	3,018	—	3,018
Total assets	$ 93,171	$ 19,431	$ —	$ 112,602

	December 31, 2018			
	Level 1	Level 2	Level 3	Total
	(in thousands)			
Assets:				
Money market funds	$ 21,680	$ —	$ —	$ 21,680
Total assets	$ 21,680	$ —	$ —	$ 21,680
Liabilities:				
Convertible preferred stock warrant liability	$ —	$ —	$ 313	$ 313
Total liabilities	$ —	$ —	$ 313	$ 313

There were no transfers between Levels 1, 2 or 3 for the periods presented.

The change in the fair value of the warrant liability for the six months ended June 30, 2019 is summarized below (in thousands):

Balance at December 31, 2018	$ 313
Change in fair value of warrant liability	609
Net exercise of warrants	(133)
Conversion of Series A preferred stock warrants to common stock warrants upon the closing of the IPO	(789)
Balance at June 30, 2019	$ —

The change in the fair value of the warrant liability for the six months ended June 30, 2018 is summarized below (in thousands):

Balance at December 31, 2017	$ 577
Exercise of warrants	(316)
Expiration of warrants, included in change in fair value of warrant liability	(133)
Change in fair value of warrant liability	82
Balance at June 30, 2018	$ 210

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 condensed consolidated statements of operations and comprehensive loss.

The fair value of the warrants, which were converted to common stock warrants upon the closing of the IPO in March 2019, was determined using the Black-Scholes option pricing model and the following assumptions:

	Six Months Ended June 30,	
	2019	**2018**
Expected term (in years)	5.28	5.97-6.21
Expected volatility	43.9%	42.8%
Risk-free interest rate	2.49%	2.62-2.82%
Expected dividend yield	0%	0%

4. Cash Equivalents and Short-Term Investments

The following is a summary of the Company's cash equivalents and short-term investments:

	June 30, 2019			
	Amortized Cost Basis	**Unrealized Gains**	**Unrealized Losses**	**Fair Value**
	(in thousands)			
U.S. Treasury securities	$ 63,713	$ 69	$ —	$ 63,782
Money market funds	29,389	—	—	29,389
Commercial paper	16,413	—	—	16,413
Corporate bonds	3,012	6	—	3,018
Total	$ 112,527	$ 75	$ —	$ 112,602
Reported as:				
Cash equivalents				$ 29,389
Short-term investments				$ 83,213
Total				$ 112,602

	December 31, 2018			
	Amortized Cost Basis	Unrealized Gains	Unrealized Losses	Fair Value
	(in thousands)			
Money market funds	$ 21,680	$ —	$ —	$ 21,680
Total	$ 21,680	$ —	$ —	$ 21,680
Reported as:				
Cash equivalents				$ 21,680
Total				$ 21,680

The Company recognized no material gains or losses on its cash equivalents and short-term investments in the periods presented.

5. Balance Sheet Components

Inventory

Inventory consists of the following:

	June 30, 2019	December 31, 2018
	(in thousands)	
Raw material	$ 1,978	$ 1,084
Work in progress	748	634
Finished goods	4,950	2,313
Consigned inventory	615	1,100
Total inventory	$ 8,291	$ 5,131

Accrued Liabilities

Accrued liabilities consist of the following:

	June 30, 2019	December 31, 2018
	(in thousands)	
Accrued employee compensation	$ 4,067	$ 3,135
Accrued research and development costs	1,247	1,115
Accrued professional services	1,018	1,391
Other	1,046	576
Total accrued liabilities	$ 7,378	$ 6,217

6. Commitments and Contingencies

Operating Leases

In August 2012, the Company entered into a lease for office space located in Fremont, California. In October 2018, the Company extended the term of the lease to June 30, 2019 and in February 2019, the Company exercised the option to extend the lease further until September 30, 2019. The Company is using the facility for office, manufacturing and research and development purposes. In connection with the lease, the Company recorded an operating lease right-of-use asset of $0.1 million as of June 30, 2019 and an aggregate lease liability of $0.1 million on its condensed consolidated balance sheet. The remaining lease term is three months.

In May 2018, the Company entered into a new lease agreement for office and laboratory space which consist of approximately 35,000 square feet located in Santa Clara, California. The lease term commenced in September 2018 and ends in August 2022. In connection with the lease, the Company maintains a letter of credit in the amount of $0.5 million, which is secured by restricted cash recorded as other assets on the condensed consolidated balance sheets. In connection with the lease, the Company has an operating lease right-of-use asset of $2.3 million as of June 30, 2019 and an aggregate lease liability of $2.4 million on its condensed consolidated balance sheet. The remaining lease term is three years and one month.

The Company also leases vehicles for use by employees. In connection with the vehicle leases, the Company has an operating lease right-of-use asset of $0.1 million as of June 30, 2019 and an aggregate lease liability of $0.1 million on its condensed consolidated balance sheet. The weighted average remaining lease term is 11 months.

The weighted average incremental borrowing rate used to measure the operating lease liability is 6.93%.

Rent expense for the three months ended June 30, 2019 and 2018 was $0.3 million and $0.1 million, respectively. Rent expense for the six months ended June 30, 2019 and 2018 was $0.6 million and $0.2 million, respectively.

Short-term leases are leases having a term of 12 months or less. The Company recognizes short-term leases on a straight-line basis and does not record a related lease asset or liability for such leases.

The following is a maturity analysis of the annual undiscounted cash flows reconciled to the carrying value of the operating lease liabilities as of June 30, 2019:

	(in thousands)
Remainder of 2019	$ 519
2020	861
2021	855
2022	581
Total minimum lease payments	$ 2,816
Less: imputed interest	(278)
Total lease liability	$ 2,538

7. Convertible Preferred Stock and Stockholders' Equity (Deficit)

Convertible Preferred Stock

Immediately prior to the closing of the Company's IPO, 18,670,259 shares of outstanding convertible preferred stock converted into 18,670,259 shares of common stock. As discussed in Note 1, the fractional shares resulting from the Reverse Stock Split, aggregating to 45 whole shares of common stock and 69 whole shares of convertible preferred stock were settled in cash in fiscal 2019.

Preferred Stock

The Company's amended and restated certificate of incorporation, which became effective upon the completion of the IPO, authorizes 5,000,000 shares of preferred stock, of which no shares were issued or outstanding as of June 30, 2019.

Preferred Stock Warrants

Upon the closing of the IPO, all of the outstanding convertible preferred stock warrants were converted into 54,903 common stock warrants, which resulted in the reclassification of the convertible preferred stock warrant liability of $0.8 million to additional paid-in capital. In April 2019, all of these common stock warrants were net exercised into 49,321 shares of common stock.

Common Stock Warrants

Upon the IPO, 91,446 common stock warrants held by related parties were net exercised based on the IPO price of $17.00 per share into 79,632 shares of common stock.

In February 2018, in connection with the execution of a Loan and Security Agreement with Silicon Valley Bank for a term loan and revolving line of credit (the "2018 Loan and Security Agreement"), the Company issued warrants to purchase shares of the Company's common stock. In April 2019, all of these common stock warrants were net exercised into 29,887 shares of common stock.

The key terms of the outstanding common stock warrants are summarized in the following table:

	Warrants Outstanding June 30, 2019	Warrants Outstanding December 31, 2018	Exercise Price	Expiration
Related party common stock warrants	—	141,778	$ 2.196	May 2025
Common stock warrants issued in connection with the 2018 Loan and Security Agreement	—	34,440	$ 4.026	February 2028
Total common stock warrants	—	176,218		

8. Stock-Based Compensation

Total stock-based compensation was as follows:

	Three Months June 30,		Six Months June 30,	
	2019	2018	2019	2018
	(in thousands)		(in thousands)	
Cost of product revenue	$ 48	$ 16	$ 75	$ 31
Research and development	204	50	276	99
Sales and marketing	201	76	309	119
General and administrative	365	175	570	336
Total stock-based compensation	$ 818	$ 317	$ 1,230	$ 585

Determination of Fair Value

The Company estimates the grant-date fair value of the Company's option awards using the Black-Scholes option pricing model. The assumptions for the Black-Scholes model for the six months ended June 30, 2019 and 2018 were as follows:

	Six Months Ended June 30,	
	2019	2018
Expected term (in years)	6.08	6.08
Expected volatility	42.4%-42.9%	40.8%-45.9%
Risk-free interest rate	2.4%-2.6%	1.9-2.9%
Expected dividend yield	0%	0

2009 Equity Incentive Plan and 2019 Equity Incentive Plan

On June 17, 2009, the Company adopted the 2009 Equity Incentive Plan (the "2009 Plan") under which the Board had the authority to issue stock options to employees, directors and consultants.

In February 2019, the Company adopted the 2019 Stock Option and Incentive Plan (the "2019 Plan"), which became effective in connection with the IPO. As a result, effective as of March 6, 2019, the Company may not grant any additional awards under the 2009 Plan. The 2009 Plan will continue to govern outstanding equity awards granted thereunder. The Company has initially reserved 2,000,430 shares of common stock for the issuance of a variety of awards under the 2019 Plan, including stock options, stock appreciation rights, awards of restricted stock and awards of restricted stock units. In addition, the number of shares of common stock reserved for issuance under the 2019 Plan will automatically increase on the first day of January for a period of up to ten years, commencing on January 1, 2020, in an amount equal to 3% of the total number of shares of the Company's capital stock outstanding on the last day of the preceding year, or a lesser number of shares determined by the Company's board of directors. As of June 30, 2019, there were 1,510,901 shares available for issuance under the 2019 Plan.

Stock Options

Option activity under the 2009 Plan and 2019 Plan is set forth below:

	Number of Shares	Weighted-Average Exercise Price Per Share	Weighted-Average Remaining Term (in years)	Aggregate Intrinsic Value (in thousands)
Balance, December 31, 2018	3,636,358	$ 3.54	7.79	$ 11,267
Options granted	442,858	14.69		
Options exercised	(154,123)	2.07		
Options forfeited	(28,733)	3.39		
Balance, June 30, 2019	3,896,360	$ 4.83	7.74	$ 203,610
Vested and exercisable, June 30, 2019	1,843,529	$ 2.95	6.71	$ 99,803

Restricted Stock Units

Restricted stock units ("RSUs") are share awards that entitle the holder to receive freely tradable shares of the Company's common stock upon vesting. The RSUs cannot be transferred and the awards are subject to forfeiture if the holder's employment terminates prior to the release of the vesting restrictions. The RSUs generally vest over a four-year period with straight-line vesting and a 25% one year cliff or over a three year period in equal amounts on a semi-annual basis, provided the employee remains continuously employed with the Company. The fair value of the RSUs is equal to the closing price of the Company's common stock on the grant date.

RSU activity under the 2019 Plan is set forth below:

	Number of Shares	Weighted-Average Grant Date Fair Value Per Share
Balance, December 31, 2018	—	$ —
RSUs granted	173,750	36.76
Balance, June 30, 2019	173,750	$ 36.76

Employee Share Purchase Plan (ESPP)

In February 2019, the Company adopted the 2019 Employee Stock Purchase Plan ("ESPP"), which became effective as of March 6, 2019. The Company has initially reserved 300,650 shares of common stock for purchase under the ESPP. Each offering to the employees to purchase stock under the ESPP will begin on each September 1 and March 1 and will end on the following February 28 or 29 and August 30, respectively. The first offering period is expected to begin on September 1, 2019 and end on February 29, 2020. On each purchase date, which falls on the last date of each offering period, ESPP participants will purchase shares of common stock at a price per share equal to 85% of the lesser of (1) the fair market value per share of the common stock on the offering date or (2) the fair market value of the common stock on the purchase date. The occurrence and duration of offering periods under the ESPP are subject to the determinations of the Company's Compensation Committee, in its sole discretion.

9. 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:

	June 30,	
	2019	2018
	(in thousands)	
Convertible preferred stock on an as-converted basis	—	17,579,720
Common stock options issued and outstanding	3,896,360	3,238,845
Restricted stock units	173,750	—
Early exercised options subject to future vesting	—	41,240
Convertible preferred stock warrants	—	54,903
Common stock warrants	—	176,218
Total	4,070,110	21,090,926

10. Segment and Geographic Information

The following table represents the Company's product revenue based on the location to which the product is shipped:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2019	2018	2019	2018
	(in thousands)		(in thousands)	
United States	$ 5,172	$ 1,527	$ 8,808	$ 2,424
Germany	873	267	1,516	518
Rest of Europe	3,309	471	6,045	602
All other countries	658	14	913	57
Product revenue	$ 10,012	$ 2,279	$ 17,282	$ 3,601

As of June 30, 2019 and December 31, 2018, the Company's long-lived assets are all held in the United States with the exception of certain equipment on loan to customers held internationally, which was not material as of each period end.

Item 2. 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 condensed financial statements and related notes included in this Quarterly Report on Form 10-Q and our audited consolidated financial statements and related notes thereto for the year ended December 31, 2018, included in our prospectus dated March 6, 2019 (the "Prospectus"), as filed with the Securities and Exchange Commission (the "SEC"), pursuant to Rule 424(b)(4) under the Securities Act of 1933, as amended, (the "Securities Act"), relating to our Registration Statement on Form S-1 (File No. 333-229590).

This Quarterly Report on Form 10-Q contains "forward-looking statements" within the meaning of Section 27A of the Securities Act and Section 21E of the Securities Exchange Act of 1934, as amended, (the "Exchange Act"). In some cases, you can identify these statements by forward-looking words such as "may," "will," "expect," "believe," "anticipate," "intend," "could," "should," "estimate," or "continue," and similar expressions or variations. Such forward-looking statements are subject to risks, uncertainties and other factors that could cause actual results and the timing of certain events to differ materially from future results expressed or implied by such forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those identified below, and those discussed in the section titled "Risk Factors" included in this Quarterly Report on Form 10-Q and the Prospectus. The forward-looking statements in this Quarterly Report on Form 10-Q represent our views as of the date of this Quarterly Report on Form 10-Q. Except as may be required by law, we assume no obligation to update these forward-looking statements or the reasons that results could differ from these forward-looking statements. You should, therefore, not rely on these forward-looking statements as representing our views as of any date subsequent to the date of this Quarterly Report on Form 10-Q.

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") 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 aortic stenosis ("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 drug-coated balloons ("DCB") or drug-eluting stents ("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.

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 covering 35 countries. We are actively expanding our international field presence through new distributors, additional sales and clinical personnel and are adding new U.S. sales territories.

For the three months ended June 30, 2019 and 2018, we generated product revenue of $10.0 million and $2.3 million, respectively, and a loss from operations of $11.3 million and $10.2 million, respectively. For the three months ended June 30, 2019 and 2018, 48% and 33%, respectively, of our product revenue was generated from customers located outside of the United States.

For the six months ended June 30, 2019 and 2018, we generated product revenue of $17.3 million and $3.6 million, respectively, and a loss from operations of $23.4 million and $20.0 million, respectively. For the six months ended June 30, 2019 and 2018, 49% and 33%, respectively, of our product revenue was generated from customers located outside of the United States.

Initial Public Offering

On March 11, 2019, we closed on our initial public offering ("IPO") of 6,555,000 shares of common stock at an offering price of $17.00 per share, which included the full exercise of the underwriters' over-allotment option to purchase 855,000 additional shares of our common stock. We raised a total of $111.4 million in gross proceeds from the IPO, or approximately $99.9 million in net proceeds after deducting underwriters' discounts and commissions of $7.1 million and offering costs of $4.4 million. Concurrent with the IPO, we issued 588,235 shares of common stock in a private placement (the "Private Placement") for net proceeds of $10.0 million.

Components of Our Results of Operations

Product revenue

Product revenue is primarily from the sale of our IVL catheters.

We sell our products to hospitals, primarily through direct sales representatives, as well as through distributors in selected international markets. For products sold through direct sales representatives, control is transferred upon delivery to customers. For products sold to distributors internationally and certain customers that purchase stocking orders in the United States, control is transferred upon shipment or delivery to the customer's named location, based on the contractual shipping terms. Additionally, a significant portion of our revenue is generated through a consignment model under which inventory is maintained at hospitals. For consignment inventory, control is transferred at the time the catheters are consumed in a procedure.

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 the 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.

Our gross margin has been and will continue to be affected by a variety of factors, primarily production volumes, the cost of direct materials, product mix, geographic mix, discounting practices, manufacturing costs, product yields, headcount and cost-reduction strategies. We expect our gross margin percentage 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 percentage. While we expect gross margin percentage 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 consist of marketing and promotional activities, including trade shows and market research. 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 consist of professional services fees, including legal, audit and tax fees, insurance costs, outside consultant fees 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.

Results of Operations

Comparison of the Three Months Ended June 30, 2019 and 2018

The following table shows our results of operations for the three months ended June 30, 2019 and 2018:

	Three Months Ended June 30,		Change	Change
	2019	2018	$	%
	(in thousands, except percentages)			
Revenue:				
Product revenue	$ 10,012	$ 2,279	$ 7,733	339%
Operating expenses:				
Cost of product revenue	4,133	1,179	2,954	251%
Research and development	6,926	5,530	1,396	25%
Sales and marketing	6,961	4,372	2,589	59%
General and administrative	3,245	1,392	1,853	133%
Total operating expenses	21,265	12,473	8,792	70%
Loss from operations	(11,253)	(10,194)	(1,059)	10%
Interest expense	(250)	(40)	(210)	525%
Change in fair value of warrant liability	—	10	(10)	(100)%
Other income, net	913	138	775	562%
Net loss before taxes	(10,590)	(10,086)	(504)	5%
Income tax provision	18	21	(3)	(14)%
Net loss	$ (10,608)	$ (10,107)	$ (501)	5%

Product revenue

Product revenue increased by $7.7 million, or 339%, from $2.3 million during the three months ended June 30, 2018 to $10.0 million during the three months ended June 30, 2019. The increase was primarily due to an increase in the number of customers and an increase in purchase volume of our products both within the United States and internationally. We sold to fewer customers in the United States and to fewer distributors in less countries internationally for the three months ended June 30, 2018 as compared to the three months ended June 30, 2019. The C2 catheter was launched internationally in June 2018 and contributed less revenue for the three months ended June 30, 2018 as compared to the three months ended June 30, 2019.

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 $1.5 million within the United States and $0.8 million for all other countries in the three months ended June 30, 2018 compared to $5.2 million within the United States and $4.8 million for all other countries in the three months ended June 30, 2019.

Cost of product revenue and gross margin percentage

Cost of product revenue increased by $3.0 million, or 251%, from $1.2 million during the three months ended June 30, 2018 to $4.1 million during the three months ended June 30, 2019. The increase was primarily due to growth in sales volume. Gross margin percentage was 48.3% for the three months ended June 30, 2018. Gross margin percentage improved to 58.7% for the three months ended June 30, 2019. This change in gross margin percentage was primarily due to lower fixed costs per unit from increased sales volume of our IVL catheters and efficiencies from improvements to operations and production.

Research and development expenses

The following table summarizes our R&D expenses incurred during the periods presented:

	Three Months Ended June 30,	
	2019	2018
	(in thousands)	
Compensation and personnel-related costs	$ 3,173	$ 2,656
Clinical-related costs	2,257	1,326
Material and supplies	481	541
Facilities and other allocated costs	577	425
Outside consultants	260	383
Other research and development costs	178	199
Total research and development expenses	$ 6,926	$ 5,530

R&D expenses increased by $1.4 million, or 25%, from $5.5 million during the three months ended June 30, 2018 to $6.9 million during the three months ended June 30, 2019. The change was primarily due to a $0.9 million increase in clinical-related costs and a $0.5 million increase in compensation and personnel-related costs to support clinical trials. Clinical-related costs during the three months ended June 30, 2019 were primarily related to the CAD III and CAD IV clinical trials.

Sales and marketing expenses

Sales and marketing expenses increased by $2.6 million, or 59%, from $4.4 million during the three months ended June 30, 2018 to $7.0 million during the three months ended June 30, 2019. The change was primarily due to a $2.0 million increase in compensation and personnel-related costs, which included a $0.8 million increase in commission expense, as a result of increased headcount and increased sales of our products. Marketing and promotional expenses increased by $0.4 million to support the commercialization of our products.

General and administrative expenses

General and administrative expenses increased by $1.9 million, or 133%, from $1.4 million during the three months ended June 30, 2018 to $3.2 million during the three months ended June 30, 2019. The change was primarily due to a $0.7 million increase in professional services and general corporate expenses incurred in connection with becoming a public company, a $0.5 million increase in legal fees, a $0.5 million increase in compensation and personnel-related costs, and a $0.2 million increase in costs associated with outside consultants.

Comparison of the Six Months Ended June 30, 2019 and 2018

The following table shows our results of operations for the six months ended June 30, 2019 and 2018:

	Six Months Ended June 30,		Change	Change
	2019	2018	$	%
	(in thousands, except percentages)			
Revenue:				
Product revenue	$ 17,282	$ 3,601	$ 13,681	380%
Operating expenses:				
Cost of product revenue	7,205	1,973	5,232	265%
Research and development	14,410	11,046	3,364	30%
Sales and marketing	12,831	7,810	5,021	64%
General and administrative	6,247	2,768	3,479	126%
Total operating expenses	40,693	23,597	17,096	72%
Loss from operations	(23,411)	(19,996)	(3,415)	17%
Interest expense	(495)	(58)	(437)	753%
Change in fair value of warrant liability	(609)	51	(660)	(1,294)%
Other income, net	1,133	323	810	251%
Net loss before taxes	(23,382)	(19,680)	(3,702)	19%
Income tax provision	25	21	4	19%
Net loss	$ (23,407)	$ (19,701)	$ (3,706)	19%

Product revenue

Product revenue increased by $13.7 million, or 380%, from $3.6 million during the six months ended June 30, 2018 to $17.3 million during the six months ended June 30, 2019. The change was primarily due to an increase in the number of customers and an increase in purchase volume of our products both within the United States and internationally. We sold to fewer customers in the United States and to fewer distributors in less countries internationally for the six months ended June 30, 2018 as compared to the six months ended June 30, 2019. The C^2 catheter was launched internationally in June 2018 and contributed less revenue for the six months ended June 30, 2018 as compared to the six months ended June 30, 2019.

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 $2.4 million within the United States and $1.2 million for all other countries in the six months ended June 30, 2018 compared to $8.8 million within the United States and $8.5 million for all other countries in the six months ended June 30, 2019.

Cost of product revenue and gross margin percentage

Cost of product revenue increased by $5.2 million, or 265% from $2.0 million during the six months ended June 30, 2018 to $7.2 million during the six months ended June 30, 2019. The increase was primarily due to growth in sales volume. Gross margin percentage was 45.2% for the six months ended June 30, 2018. Gross margin percentage improved to 58.3% for the six months ended June 30, 2019. This change in gross margin percentage was primarily due to lower fixed costs per unit from increased sales volume of our IVL catheters and efficiencies from improvements to operations and production.

Research and development expenses

The following table summarizes our R&D expenses incurred during the periods presented:

	Six Months Ended June 30,	
	2019	2018
	(in thousands)	
Compensation and personnel-related costs	$ 5,886	$ 5,469
Clinical-related costs	4,989	2,516
Material and supplies	967	1,236
Facilities and other allocated costs	1,275	665
Outside consultants	790	695
Other research and development costs	503	465
Total research and development expenses	$ 14,410	$ 11,046

R&D expenses increased by $3.4 million, or 30%, from $11.0 million during the six months ended June 30, 2018 to $14.4 million during the six months ended June 30, 2019. The increase was primarily due to a $2.5 million increase in clinical-related costs and a $0.4 million increase in compensation and personnel-related costs to support clinical trials. Clinical-related costs during the six months ended June 30, 2019 were primarily related to the CAD II, CAD III and CAD IV clinical trials. There was also a $0.6 million increase in facilities and other allocated costs due to increased rent and building expenditures. These increases were partially offset by a $0.3 million decrease in materials and supplies for R&D.

Sales and marketing expenses

Sales and marketing expenses increased by $5.0 million, or 64%, from $7.8 million during the six months ended June 30, 2018 to $12.8 million during the six months ended June 30, 2019. The increase was primarily due to a $4.0 million increase in compensation and personnel-related costs, which included a $1.5 million increase in commission expense, as a result of a higher headcount and increased sales of our products. Marketing and promotional expenses increased by $0.8 million to support the commercialization of our products.

General and administrative expenses

General and administrative expenses increased by $3.5 million, or 126%, from $2.8 million during the six months ended June 30, 2018 to $6.2 million during the six months ended June 30, 2019. The change was primarily due to a $1.3 million increase in professional services and general corporate expenses incurred in connection with our preparation to become a public company and our operations as a public company, a $0.9 million increase in compensation and personnel-related costs, a $0.7 million increase in legal fees, and a $0.6 million increase in costs associated with outside consultants.

Liquidity and Capital Resources

To date, our principal sources of liquidity have been the net proceeds we received through the sale of our common stock in our IPO, private sales of our equity securities, and payments received from customers using our products. On March 11, 2019, we completed our IPO, including the underwriters full exercise of their over-allotment option, selling 6,555,000 shares of our common stock at $17.00 per share. Upon completion of our IPO, we received net proceeds of $99.9 million, after deducting underwriting discounts and commissions and offering expenses. Concurrent with the IPO, we issued 588,235 shares of common stock in our Private Placement for net proceeds of $10.0 million.

In February 2018, we entered into a Loan and Security Agreement with Silicon Valley Bank for a term loan and a revolving line of credit (the “2018 Loan and Security Agreement”). The 2018 Loan and Security Agreement 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 2018 Loan and Security 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. The 2018 Loan and Security 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” included in the Prospectus. We had $15.0 million outstanding under the term loan and no amounts outstanding under the revolving line of credit as of June 30, 2019.

We believe that our cash, cash equivalents and short-term investments as of June 30, 2019 will be sufficient to fund our operations for at least the next 12 months from the date of this filing. As of June 30, 2019, we had $125.1 million in cash, cash equivalents and short-term investments and an accumulated deficit of $150.3 million.

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 and physicians as well as broaden awareness of our products to new hospitals. We also expect to continue to make investments in R&D, 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.

Cash Flows

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

	Six Months Ended June 30,	
	2019	**2018**
	(in thousands)	
Cash used in operating activities	$ (24,933)	$ (21,766)
Cash (used in) provided by investing activities	(83,975)	986
Cash provided by financing activities	111,189	10,464
Net increase (decrease) in cash, cash equivalents and restricted cash	$ 2,281	$ (10,316)

Operating activities

During the six months ended June 30, 2019, cash used in operating activities was $24.9 million, attributable to a net loss of $23.4 million and a net change in our net operating assets and liabilities of $4.3 million, partially offset by non-cash charges of $2.8 million. Non-cash charges primarily consisted of $1.2 million in stock-based compensation, $0.5 million in depreciation and amortization, $0.6 million in change in fair value of warrant liability, $0.5 million in amortization of right-of-use assets and $0.2 million in amortization of debt issuance costs, partially offset by $0.4 million in accretion of discount on available-for-sale securities. The change in our net operating assets and liabilities was primarily due to a $3.2 million increase in inventory and $2.4 million increase in accounts receivable due to an increase in sales, a $0.8 million increase in prepaid and other current assets and a $0.5 million decrease in lease liabilities. These changes were partially offset by a $2.6 million increase in accrued and other current liabilities and accounts payable resulting primarily from expansion in our operating activities and accrued professional services fees.

During the six months ended June 30, 2018, cash used in operating activities was $21.8 million, attributable to a net loss of $19.7 million and a net change in our net operating assets and liabilities of $2.9 million, partially offset by non-cash charges of $0.9 million. Non-cash charges primarily consisted of $0.6 million in stock-based compensation and $0.3 million in depreciation. The change in our net operating assets and liabilities was primarily due to a $2.1 million increase in inventory for anticipated growth in our business and a $1.1 million increase in accounts receivable due to increase in sales. These changes were partially offset by a $0.4 million increase in accounts payable resulting primarily from increases in our operating activities.

Investing activities

During the six months ended June 30, 2019, cash used in investing activities was $84.0 million, attributable to the purchase of available-for-sale securities of $82.8 million and purchase of property and equipment of $1.2 million.

During the six months ended June 30, 2018, cash provided by investing activities was $1.0 million, attributable to maturity of available-for-sale investments of $1.8 million, partially offset by purchase of property and equipment of $0.8 million.

Financing activities

During the six months ended June 30, 2019, cash provided by financing activities was $111.2 million, attributable to net proceeds of $100.8 million from the IPO, net proceeds of $10.0 million from the Private Placement of our common stock and proceeds of $0.4 million from stock option exercises and warrant exercises.

During the six months ended June 30, 2018, cash provided by financing activities was $10.5 million, attributable to net proceeds of $10.0 million from term notes, $0.4 million from stock option exercises and $0.1 million from warrant exercises.

Contractual Obligations and Commitments

During the six months ended June 30, 2019, there have been no material changes to our contractual obligations from those disclosed in "Management's Discussion and Analysis of Financial Condition and Results of Operations" included in the Prospectus.

Off-Balance Sheet Arrangements

During the periods presented, we did not have, nor do we currently 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.

During the six months ended June 30, 2019, there were no material changes to our critical accounting policies or in the methodology used for estimates from those described in "Management's Discussion and Analysis of Financial Condition and Results of Operations" included in the Prospectus.

Item 3. Quantitative and Qualitative Disclosures About Market Risk.

Interest rate risk

Our cash, cash equivalents and short-term investments as of June 30, 2019 consisted of $125.1 million in 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 June 30, 2019, we had $15.0 million in variable rate debt outstanding. The 2018 Loan and Security Agreement matures in December 2021, with interest-only monthly payments until September 2019. 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% (3.75% as of June 30, 2019).

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 six months ended June 30, 2019 and 2018, approximately 44% and 31% of our product revenue, respectively, 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. A 10% change in exchange rates could result in a change in fair value of $0.6 million and $0.2 million in foreign currency cash and accounts receivable as of June 30, 2019 and December 31, 2018, respectively. 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.

Item 4. Controls and Procedures.

Evaluation of disclosure controls and procedures.

Our management, with the participation and supervision of our Chief Executive Officer and our Chief Financial Officer, have evaluated our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended, or the Exchange Act) as of the end of the period covered by this Quarterly Report on Form 10-Q. Based on that evaluation, our Chief Executive Officer and Chief Financial Officer have concluded that, as of the end of the period covered by this Quarterly Report on Form 10-Q, our disclosure controls and procedures are effective to provide reasonable assurance that information we are required to disclose in reports that we file or submit under the Exchange Act is recorded, processed, summarized, and reported within the time periods specified in SEC rules and forms, and that such information is accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure.

Changes in internal control over financial reporting.

There was no change in our internal control over financial reporting identified in connection with the evaluation required by Rule 13a-15(d) and 15d-15(d) of the Exchange Act that occurred during the period covered by this Quarterly Report on Form 10-Q that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Inherent limitation on the effectiveness of internal control.

Our management, including our Chief Executive Officer and Chief Financial Officer, does not expect that our disclosure controls or our internal control over financial reporting will prevent all errors and all fraud. A control system, no matter how well designed and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. Further, the design of a control system must reflect the fact that there are resource constraints, and the benefits of controls must be considered relative to their costs. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, have been detected. These inherent limitations include the realities that judgments in decision-making can be faulty, and that breakdowns can occur because of a simple error or mistake. Additionally, controls can be circumvented by the individual acts of some persons, by collusion of two or more people or by management override of the controls. The design of any system of controls is also based in part upon certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions; over time, controls may become inadequate because of changes in conditions, or the degree of compliance with policies or procedures may deteriorate. Because of the inherent limitations in a cost-effective control system, misstatements due to error or fraud may occur and not be detected.

PART II—OTHER INFORMATION

Item 1. Legal Proceedings.

Petitions for *inter partes* review of U.S. Pat. Nos. 9,642,673, 8,956,371 and 8,728,091 (the "IPR Patents"), which are three of our issued U.S. patents that relate to our current IVL Technology, were filed in December 2018 at the USPTO's Patent Trial and Appeal Board (the "PTAB") by Cardiovascular Systems, Inc., one of our competitors. The PTAB has decided to institute *inter partes* review proceedings for all three patents, and our responses to the petitions are due in October 2019. The *inter partes* review proceedings could result in the loss or narrowing in scope of the IPR Patents, which could limit our ability to stop others from using or commercializing products and technology similar or identical to ours. For more information regarding the risks presented by such proceedings, please see the section titled "Risk Factors—Risks Related to Our Intellectual Property" included in the Prospectus.

From time to time, we may become involved in various legal proceedings that arise in the ordinary course of our 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.

Item 1A. Risk Factors.

As of the date of this Quarterly Report on Form 10-Q, there have been no material changes from the risk factors disclosed in our Prospectus dated March 6, 2019 as filed by us with the SEC pursuant to Rule 424(b)(4) under the Securities Act, relating to our registration statement on Form S-1 (File No. 333-229590). Any of these factors could result in a significant or material adverse effect on our result of operations or financial conditions. Additional risk factors not presently known to us or that we currently deem immaterial may also impair our business or results of operations. We may disclose changes to such factors or disclose additional factors from time to time in our future filings with the SEC.

Item 2. Unregistered Sales of Equity Securities and Use of Proceeds.

Use of Proceeds from Public Offering of Common Stock

The registration statement on Form S-1 (File No. 333-229590) and the registration statement on Form S-1 (File No. 333-230110) filed pursuant to Rule 462(b) relating thereto, each relating to the IPO of shares of our common stock, became effective on March 6, 2019. The registration statements registered the offer and sale of 6,555,000 shares of our common stock (including 855,000 shares of our common stock subject to the underwriters' over-allotment option). On March 11, 2019, we completed the sale of all 6,555,000 of the shares of our common stock registered thereunder at an initial public offering price of $17.00 per share for an aggregate offering price of approximately $111.4 million. The underwriters of the offering were Morgan Stanley & Co. LLC and Merrill Lynch, Pierce, Fenner & Smith Incorporated. Following the sale of the shares in connection with the closing of the IPO, the offering terminated.

We received net proceeds of approximately $99.9 million after deducting underwriting discount and commissions of $7.1 million and offering costs of $4.4 million. No payments for such expenses were made directly or indirectly to (i) any of our officers or directors or their associates, (ii) any persons owning 10% or more of any class of our equity securities, or (iii) any of our affiliates.

We maintain the funds received from our IPO in a savings account, pending their use. We intend to use the net proceeds from our IPO for sales and marketing activities to support the ongoing commercialization of our IVL System, including, but not limited to, the expansion of our sales force, additional medical affairs and educational efforts and the expansion of our international sales presence, for research and development and clinical studies and for working capital and general corporate purposes. We may also use a portion of the net proceeds of the IPO 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. There has been no material change in the planned use of proceeds from our IPO from that described in the prospectus dated March 6, 2019 filed with the SEC pursuant to Rule 424(b)(4).

Item 3. Defaults Upon Senior Securities.

None.

Item 4. Mine Safety Disclosures.

Not applicable.

Item 5. Other Information.

None.

Item 6. Exhibits.

Furnish the exhibits required by Item 601 of Regulation S-K (§ 229.601 of this chapter).

Exhibit Number	Description	Form	File No.	Exhibit(s)	Filing Date
10.1*	Form of Restricted Stock Unit Agreement				
31.1*	Certification of Principal Executive Officer Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.				
31.2*	Certification of Principal Financial Officer Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.				
32.1*	Certification of Principal Executive Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.				
32.2*	Certification of Principal Financial Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.				
101.INS	XBRL Instance Document				
101.SCH	XBRL Taxonomy Extension Schema Document				
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document				
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document				
101.LAB	XBRL Taxonomy Extension Label Linkbase Document				
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document				

* Filed herewith.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

ShockWave Medical, Inc.

Date: August 6, 2019 By: /s/ Douglas Godshall

Douglas Godshall
President and Chief Executive Officer

Date: August 6, 2019 By: /s/ Dan Puckett

Dan Puckett
Chief Financial Officer

Exhibit 10.1

SHOCKWAVE MEDICAL, INC. 2019 EQUITY INCENTIVE PLAN

NOTICE OF RESTRICTED STOCK UNIT AWARD

Except as otherwise indicated, any capitalized term used but not defined in this Notice of Restricted Stock Unit Award (this "**Notice**") shall have the meaning ascribed to such term in the ShockWave Medical, Inc. 2019 Equity Incentive Plan (as it may be amended from time to time, the "**Plan**").

Name:

Address:

The undersigned Participant has been granted an Award of Restricted Stock Units (the "**Award**") under the Plan, subject to the terms and conditions of the Plan, this Notice and the attached Restricted Stock Unit Agreement.

Number of Restricted Stock Units:	
Date of Grant:	
Dividend Equivalents:	**Not Included**
Vesting Commencement Date:	
Vesting Schedule:	Subject to Section 2 of the Restricted Stock Unit Agreement, the Award will vest in accordance with the following schedule:

[Twenty-five percent (25%) of the Restricted Stock Units subject to the Award shall vest on each of the first four (4) anniversaries of the Vesting Commencement Date, subject to Participant continuing to be a Service Provider through each such date.]

SHOCKWAVE MEDICAL, INC. 2019 EQUITY INCENTIVE PLAN

RESTRICTED STOCK UNIT AWARD AGREEMENT

The Administrator of the Plan hereby grants to participant ("**Participant**") named in the Notice of Restricted Stock Unit Award (the "**Notice**") to which this Restricted Stock Unit Award Agreement (this "**Agreement**") is attached, an Award (the "**Award**") of Restricted Stock Units pursuant to the ShockWave, Inc. 2019 Equity Incentive Plan (as it may be amended from time to time, the "**Plan**"), subject to the terms of the Notice, this Agreement and the Plan, effective as of the Date of Grant set forth in the Notice (the "**Grant Date**"). Except as otherwise indicated, any capitalized term used but not defined in this Agreement shall have the meaning ascribed to such term in the Plan.

1. **Issuance of Shares.** Each Restricted Stock Unit shall represent the right to receive one Share upon the vesting of such Restricted Stock Unit, as determined in accordance with and subject to the terms of this Agreement, the Plan and the Notice. The number of Restricted Stock Units is set forth in the Notice.

2. **Vesting Schedule.** Subject to Section 3, the Award shall vest pursuant to the Vesting Schedule set forth in the Notice.

3. **Termination of Service.** In the event of Participant's Termination of Service for any reason, any Restricted Stock Units that are not vested as of the date of such Termination of Service will be forfeited.

4. **Change in Control**. In the event of a merger or Change in Control, the Restricted Stock Units will be treated in accordance with Section 15(c) of the Plan.

5. **Voting Rights.** Participant shall have no voting rights or any other rights as a shareholder of the Company with respect to the Restricted Stock Units unless and until Participant becomes the record owner of the Shares underlying the Restricted Stock Units.

6. **Dividend Equivalents.** If dividend equivalents are included in this Award, as determined by the Administrator and indicated in the Notice, and a cash dividend is declared on Shares during the period commencing on the Grant Date and ending on the date on which the Shares underlying the Restricted Stock Units are distributed to Participant pursuant to this Agreement, Participant shall be eligible to receive an amount in cash (a "**Dividend Equivalent**") equal to the dividend that Participant would have received had the Shares underlying the Restricted Stock Units been held by Participant as of the time at which such dividend was declared. Each Dividend Equivalent will be paid to Participant in cash as soon as reasonably practicable (and in no event later than 30 days) after the applicable Vesting Date of the corresponding Restricted Stock Units. For clarity, no Dividend Equivalent will be paid with respect to any Restricted Stock Units that are forfeited.

7. **Distribution of Shares.** Subject to the provisions of this Agreement, upon the vesting of any of the Restricted Stock Units, the Company shall deliver to Participant, as soon as reasonably practicable (and in no event later than 30 days) after the applicable Vesting Date, one Share for each such Restricted Stock Unit. Upon the delivery of Shares pursuant to this Agreement, the Shares delivered shall be fully assignable, alienable, saleable and transferrable by Participant; *provided* that any such assignment, alienation, sale, transfer or other alienation with respect to such Shares shall be in accordance with applicable securities laws and any applicable Company policy.

8. **Responsibility for Taxes.**

(a) Participant acknowledges that, regardless of any action taken by the Company or the Employer, the ultimate liability for all income tax, social insurance, payroll tax, fringe benefits tax, payment on account or other tax-related items related to Participant's participation in the Plan and legally applicable to Participant ("**Tax-Related Items**") is and remains Participant's responsibility and may exceed the amount actually withheld by the Company or the Employer. Participant further acknowledges that the Company and/or the Employer (i) make no representations or undertakings regarding the treatment of any Tax-Related Items in connection with any aspect of the Award, including, but not limited to, the grant, vesting or settlement of the Award, the subsequent sale of Shares acquired upon settlement of the Award and the receipt of any dividends and/or Dividend Equivalents; and (ii) do not commit to and are under no obligation to structure the terms of the grant or any aspect of the Award to reduce or eliminate Participant's liability for Tax-Related Items or achieve any particular tax result. Further, if Participant is subject to Tax-Related Items in more than one jurisdiction, Participant acknowledges that the Company and/or the Employer (or former employer, as applicable) may be required to withhold or account for Tax-Related Items in more than one jurisdiction.

(b) Prior to any relevant taxable or tax withholding event, as applicable, Participant agrees to make adequate arrangements satisfactory to the Company and/or the Employer to satisfy all Tax-Related Items. In this regard, Participant authorizes the Company and/or the Employer, or their respective agents, at their discretion, to satisfy any applicable withholding obligations with regard to all Tax-Related Items in the manner determined by the Company and/or the Employer from time to time, which may include: (i) withholding from Participant's wages or other cash compensation paid to Participant by the Company and/or the Employer; (ii) requiring Participant to remit the aggregate amount of such Tax-Related Items to the Company in full, in cash or by check, bank draft or money order payable to the order of the Company or the Employer; (iii) through a procedure whereby Participant delivers irrevocable instructions to a broker reasonably acceptable to the Administrator to sell Shares obtained upon settlement of the Award and to deliver promptly to the Company an amount of the proceeds of such sale equal to the amount of the Tax-Related Items; (iv) by a "net settlement" under which the Company reduces the number of Shares issued on settlement of the Award by the number of Shares with an aggregate fair market value that equals the amount of the Tax-Related Items associated with such settlement; or (v) any other method of withholding determined by the Company and permitted by applicable law.

(c) Depending on the withholding method, the Company or the Employer may withhold or account for Tax-Related Items by considering applicable minimum statutory withholding rates or other applicable withholding rates, including maximum applicable rates, in which case Participant will receive a refund of any over-withheld amount in cash and will have no entitlement to the equivalent number of Shares. If the obligation for Tax-Related Items is satisfied by withholding in Shares, for tax purposes, Participant is deemed to have been issued the full number of Shares subject to the settled Award, notwithstanding that a number of the Shares are held back solely for the purpose of paying the Tax-Related Items.

(d) Participant agrees to pay to the Company or the Employer any amount of Tax-Related Items that the Company or the Employer may be required to withhold or account for as a result of Participant's participation in the Plan that cannot be satisfied by the means previously described. The Company may refuse to issue or deliver the Shares or the proceeds of the sale of Shares, if Participant fails to comply with Participant's obligations in connection with the Tax-Related Items.

(e) Notwithstanding any provision of the Plan or this Agreement to the contrary, this Award is intended to be exempt from Code Section 409A; provided, that the Company does not guarantee to Participant any particular tax treatment of the Option. In no event whatsoever shall the Company be liable for any additional tax, interest or penalties that may be imposed on Participant by Code Section 409A or any damages for failing to comply with Code Section 409A.

9. **Provisions of Plan Control.** This Agreement is subject to all the terms, conditions and provisions of the Plan, including the amendment provisions thereof, and to such rules, regulations and interpretations relating to the Plan as may be adopted by the Administrator and as may be in effect from time to time. The Plan is incorporated herein by reference. If and to the extent that this Agreement conflicts or is inconsistent with the Plan, the Plan shall control, and this Agreement shall be deemed to be modified accordingly.

10. **No Guarantee of Continued Service.** PARTICIPANT ACKNOWLEDGES AND AGREES THAT THE VESTING OF THE AWARD 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 AWARD 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.

11. **Transfer of Restricted Stock Units.** Except as may be permitted by the Administrator, neither the Award nor any right under the Award shall be sold, pledged, assigned, hypothecated, or otherwise transferred in any manner other than by will or by the laws of descent and distribution, and any attempt to sell, pledge, assign, hypothecate or otherwise transfer the Award or any right under the Award, other than as permitted by the Administrator, shall be void and of no effect. This provision shall not apply to any portion of the Award that has been fully settled, and shall not preclude forfeiture of any portion of the Award in accordance with the terms herein.

12. **Entire Agreement.** This Agreement, the Plan, the Notice and any other agreements, schedules, exhibits and other documents referred to herein or therein constitute the entire agreement and understanding between the parties in respect of the subject matter hereof and supersede all prior and contemporaneous arrangements, agreements and understandings, both oral and written, whether in term sheets, presentations or otherwise, between the parties with respect to the subject matter hereof.

13. **Severability.** If any provision of this Agreement is or becomes or is deemed to be invalid, illegal or unenforceable in any jurisdiction, or would disqualify the Plan or this Agreement under any law deemed applicable by the Board, such provision shall be construed or deemed amended to conform to applicable laws, or if it cannot be so construed or deemed amended without, in the determination of the Board, materially altering the intent of this Agreement, such provision shall be stricken as to such jurisdiction, and the remainder of this Agreement shall remain in full force and effect.

14. **Amendment; Waiver.** No amendment or modification of any provision of this Agreement that has a material adverse effect on Participant shall be effective unless signed in writing by or on behalf of the Company and Participant; *provided* that the Company may amend or modify this Agreement without Participant's consent in accordance with the provisions of the Plan or as otherwise set forth in this Agreement. No waiver of any breach or condition of this Agreement shall be deemed to be a waiver of any other or subsequent breach or condition, whether of like or different nature. Any amendment or modification of or to any provision of this Agreement, or any waiver of any provision of this Agreement, shall be effective only in the specific instance and for the specific purpose for which such amendment, modification or waiver is made or given.

15. **Assignment.** Neither this Agreement nor any right, remedy, obligation or liability arising hereunder or by reason hereof shall be assignable by Participant.

16. **Successors and Assigns; No Third-Party Beneficiaries.** This Agreement shall inure to the benefit of and be binding upon the Company and Participant and their respective heirs, successors, legal representatives and permitted assigns. Nothing in this Agreement, express or implied, is intended to confer on any Person other than the Company and Participant, and their respective heirs, successors, legal representatives and permitted assigns, any rights, remedies, obligations or liabilities under or by reason of this Agreement.

17. **Dispute Resolution.** All controversies and claims arising out of or relating to this Agreement, or the breach hereof, shall be settled by the Company's or the Employer's mandatory dispute resolution procedures, if any, as may be in effect from time to time with respect to matters arising out of or relating to Participant's employment with the Company or the Employer.

18. **Governing Law; Venue.** All matters arising out of or relating to this Agreement and the transactions contemplated hereby, including its validity, interpretation, construction, performance and enforcement, shall be governed by and construed in accordance with the internal laws of the State of California, without giving effect to its principles of conflict of laws. For purposes of any action, lawsuit or other proceedings brought to enforce this Agreement, relating to it, or arising from it, the parties hereby submit to and consent to the sole and exclusive jurisdiction of the courts of Santa Clara County, California, or the federal courts for the United States for the Northern District of California, and no other courts.

19. **Imposition of other Requirements and Participant Undertaking; Lock-Up Agreement.**

(a) 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).

(b) Participant agrees to execute and deliver such other agreements as may be reasonably requested by the Company or the underwriters that are consistent with the foregoing or 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 19 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 Securities Exchange 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 Award shall be bound by this Section 19.

20. **Imposition of other Requirements and Participant Undertaking.** The Company reserves the right to impose other requirements on Participant's participation in the Plan, on the Award and on any Shares to be issued upon settlement of the Award, to the extent the Company determines it is necessary or advisable for legal or administrative reasons. Participant agrees to take whatever additional action and execute whatever additional documents the Company may deem necessary or advisable to accomplish the foregoing or to carry out or give effect to any of the obligations or restrictions imposed on either Participant or the Restricted Stock Unit pursuant to this Agreement.

Participant acknowledges receipt of a copy of the Plan and represents that Participant is familiar with the terms and provisions thereof, and hereby accepts the Award subject to all of the terms and provisions of the Notice, this Agreement and the Plan. Participant has reviewed the Notice, this Agreement and the Plan in their entirety, has had an opportunity to obtain the advice of counsel prior to executing this Agreement and fully understands all provisions of the Notice and this Agreement. Participant hereby agrees to accept as binding, conclusive and final all decisions or interpretations of the Administrator upon any questions arising under the Notice, this Agreement or the Plan. Participant further agrees to notify the Company upon any change in the residence address indicated below.

PARTICIPANT _____ Signature Print Name Residence Address _____ Email Address	By Print Name Title

Exhibit 31.1

CERTIFICATION PURSUANT TO
RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Douglas Godshall, certify that:

1. I have reviewed this quarterly report on Form 10-Q of ShockWave Medical, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) *Reserved*;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: August 6, 2019

By: /s/ Douglas Godshall
Douglas Godshall
President and Chief Executive Officer

Exhibit 31.2

CERTIFICATION PURSUANT TO
RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Dan Puckett, certify that:

1. I have reviewed this quarterly report on Form 10-Q of ShockWave Medical, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) *Reserved*;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: August 6, 2019

By: /s/ Dan Puckett
Dan Puckett
Chief Financial Officer

Exhibit 32.1

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Quarterly Report of ShockWave Medical, Inc. (the "Company") on Form 10-Q for the period ending June 30, 2019 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and result of operations of the Company.

Date: August 6, 2019

By: /s/ Douglas Godshall
Douglas Godshall
President and Chief Executive Officer

Exhibit 32.2

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Quarterly Report of ShockWave Medical, Inc. (the "Company") on Form 10-Q for the period ending June 30, 2019 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and result of operations of the Company.

Date: August 6, 2019

By: /s/ Dan Puckett
Dan Puckett
Chief Financial Officer