UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 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: 001-37557

Penumbra, Inc .

(Exact name of registrant as specified in its charter)

Delaware	**05-0605598**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)

One Penumbra Place
Alameda , CA 94502
(Address of principal executive offices, including zip code)

(510) 748-3200
(Registrant's telephone number, including area code)

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

Title of each class	Trading Symbol	Name of each exchange on which registered
Common Stock, Par value $0.001 per share	PEN	The New York Stock Exchange

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 a smaller reporting company or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer	☒	Accelerated filer	☐
Non-accelerated filer	☐	Smaller reporting company	☐
Emerging growth company	☐		

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with 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: ☒

As of July 23, 2019 , the registrant had 34,792,984 shares of common stock, par value $0.001 per share, outstanding.

Penumbra, Inc.
FORM 10-Q
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PART I - FINANCIAL INFORMATION

ITEM 1. CONDENSED CONSOLIDATED FINANCIAL STATEMENTS.

Penumbra, Inc.
Condensed Consolidated Balance Sheets
(unaudited)
(in thousands)

	June 30, 2019	December 31, 2018
Assets		
Current assets:		
Cash and cash equivalents	$ 77,261	$ 67,850
Marketable investments	109,996	133,039
Accounts receivable, net of doubtful accounts of $2,708 and $2,782 at June 30, 2019 and December 31, 2018, respectively	99,011	81,896
Inventories	132,735	115,741
Prepaid expenses and other current assets	15,601	12,200
Total current assets	434,604	410,726
Property and equipment, net	37,940	35,407
Operating lease right-of-use assets	42,476	—
Intangible assets, net	26,031	27,245
Goodwill	7,765	7,813
Deferred taxes	34,661	32,940
Other non-current assets	1,632	875
Total assets	$ 585,109	$ 515,006
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	$ 8,743	$ 8,176
Accrued liabilities	57,276	57,886
Current operating lease liabilities	3,742	—
Total current liabilities	69,761	66,062
Deferred rent	—	7,586
Non-current operating lease liabilities	46,146	—
Other non-current liabilities	15,019	18,943
Total liabilities	130,926	92,591
Commitments and contingencies (Note 9)		
Stockholders' equity:		
Common stock	35	34
Additional paid-in capital	419,220	415,084
Accumulated other comprehensive loss	(1,514)	(1,942)
Retained earnings	36,350	9,064
Total Penumbra, Inc. stockholders' equity	454,091	422,240
Non-controlling interest	92	175
Total stockholders' equity	454,183	422,415
Total liabilities and stockholders' equity	$ 585,109	$ 515,006

See accompanying notes to the unaudited condensed consolidated financial statements

Penumbra, Inc.
Condensed Consolidated Statements of Operations
(unaudited)
(in thousands, except share and per share amounts)

	Three Months Ended June 30,		Six Months Ended June 30,	
	2019	2018	2019	2018
Revenue	$ 134,201	$ 109,638	$ 262,640	$ 212,339
Cost of revenue	40,273	37,386	84,802	73,530
Gross profit	93,928	72,252	177,838	138,809
Operating expenses:				
Research and development	13,462	8,193	25,129	16,206
Sales, general and administrative	67,665	54,776	128,756	109,275
Total operating expenses	81,127	62,969	153,885	125,481
Income from operations	12,801	9,283	23,953	13,328
Interest income, net	784	720	1,517	1,469
Other expense, net	(71)	(340)	(47)	(630)
Income before income taxes and equity in losses of unconsolidated investee	13,514	9,663	25,423	14,167
Benefit from income taxes	(2,735)	(4,948)	(1,280)	(6,886)
Income before equity in losses of unconsolidated investee	16,249	14,611	26,703	21,053
Equity in losses of unconsolidated investee	—	(1,230)	—	(2,181)
Consolidated net income	$ 16,249	$ 13,381	$ 26,703	$ 18,872
Net loss attributable to non-controlling interest	(339)	—	(583)	—
Net income attributable to Penumbra, Inc.	$ 16,588	$ 13,381	$ 27,286	$ 18,872
Net income attributable to Penumbra, Inc. per share:				
Basic	$ 0.48	$ 0.39	$ 0.79	$ 0.56
Diluted	$ 0.46	$ 0.37	$ 0.75	$ 0.52
Weighted average shares outstanding:				
Basic	34,694,228	34,072,223	34,601,270	33,959,997
Diluted	36,214,321	36,116,254	36,214,362	36,030,304

See accompanying notes to the unaudited condensed consolidated financial statements

Penumbra, Inc.
Condensed Consolidated Statements of Comprehensive Income
(unaudited)
(in thousands)

	Three Months Ended June 30,		Six Months Ended June 30,	
	2019	**2018**	**2019**	**2018**
Consolidated net income	$ 16,249	$ 13,381	$ 26,703	$ 18,872
Other comprehensive income (loss), net of tax:				
Foreign currency translation adjustments, net of tax	850	(3,400)	(248)	(2,014)
Net change in unrealized gains (losses) on available-for-sale securities, net of tax	214	102	676	(216)
Total other comprehensive income (loss), net of tax	1,064	(3,298)	428	(2,230)
Consolidated comprehensive income	$ 17,313	$ 10,083	$ 27,131	$ 16,642
Net loss attributable to non-controlling interest	(339)	—	$ (583)	$ —
Comprehensive income attributable to Penumbra, Inc.	$ 17,652	$ 10,083	$ 27,714	$ 16,642

See accompanying notes to the unaudited condensed consolidated financial statements

Penumbra, Inc.
Condensed Consolidated Statements of Stockholders' Equity
(unaudited)
(in thousands, except share amounts)

	Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Loss	Retained Earnings	Total Penumbra, Inc. Stockholders' Equity	Non-Controlling Interest	Total Stockholders' Equity
	Shares	Amount						
Balance at December 31, 2018	34,437,339	$ 34	$ 415,084	$ (1,942)	$ 9,064	$ 422,240	$ 175	$ 422,415
Issuance of common stock	140,598	—	1,071	—	—	1,071	—	1,071
Shares held for tax withholdings	(14,284)	—	(2,098)	—	—	(2,098)	—	(2,098)
Stock-based compensation	—	—	5,457	—	—	5,457	—	5,457
Other comprehensive loss	—	—	—	(636)	—	(636)	—	(636)
Net income	—	—	—	—	10,698	10,698	(244)	10,454
Balance at March 31, 2019	34,563,653	$ 34	$ 419,514	$ (2,578)	$ 19,762	$ 436,732	$ (69)	$ 436,663
Issuance of common stock	259,080	1	1,194	—	—	1,195	—	1,195
Issuance of common stock under employee stock purchase plan	46,065	—	4,779	—	—	4,779	—	4,779
Shares held for tax withholdings	(82,295)	—	(11,281)	—	—	(11,281)	—	(11,281)
Stock-based compensation	—	—	5,014	—	—	5,014	—	5,014
Capital contribution from non-controlling interest	—	—	—	—	—	—	500	500
Other comprehensive income	—	—	—	1,064	—	1,064	—	1,064
Net income	—	—	—	—	16,588	16,588	(339)	16,249
Balance at June 30, 2019	34,786,503	$ 35	$ 419,220	$ (1,514)	$ 36,350	$ 454,091	$ 92	$ 454,183

	Common Stock		Additional Paid-in Capital	Accumulated Other Comprehensive Income (Loss)	Retained Earnings	Total Penumbra, Inc. Stockholders' Equity	Non-Controlling Interest	Total Stockholders' Equity
	Shares	Amount						
Balance at December 31, 2017	33,685,146	$ 33	$ 396,810	$ 1,569	$ 1,996	$ 400,408	$ —	$ 400,408
Issuance of common stock	232,943	1	1,328	—	—	1,329	—	1,329
Issuance of common stock pursuant to royalty buy-out	53,256	—	5,256	—	—	5,256	—	5,256
Shares held for tax withholdings	(38,677)	—	(3,530)	—	—	(3,530)	—	(3,530)
Stock-based compensation	—	—	4,435	—	—	4,435	—	4,435
Impact of the adoption of ASC 606, ASU 2016-16, and ASU 2018-02 [1]	—	—	—	—	464	464	—	464
Other comprehensive income	—	—	—	1,068	—	1,068	—	1,068
Net income	—	—	—	—	5,491	5,491	—	5,491
Balance at March 31, 2018	33,932,668	$ 34	$ 404,299	$ 2,637	$ 7,951	$ 414,921	$ —	$ 414,921
Issuance of common stock	288,750	—	1,843	—	—	1,843	—	1,843
Issuance of common stock under employee stock purchase plan	39,576	—	3,584	—	—	3,584	—	3,584
Shares held for tax withholdings	(81,370)	—	(10,315)	—	—	(10,315)	—	(10,315)
Stock-based compensation	—	—	5,082	—	—	5,082	—	5,082
Impact of the adoption of ASC 606, ASU 2016-16, and ASU 2018-02 [1]	—	—	—	—	1	1	—	1
Other comprehensive income	—	—	—	(3,298)	—	(3,298)	—	(3,298)
Net Income	—	—	—	—	13,381	13,381	—	13,381
Balance at June 30, 2018	34,179,624	$ 34	$ 404,493	$ (661)	$ 21,333	$ 425,199	$ —	$ 425,199

(1) Cumulative effect adjustments relate to the adoption of Accounting Standard Update ("ASU") No. 2014-09 - Revenue from Contracts with Customers ("Topic 606"), ASU No. 2016-16 - Income Taxes ("Topic 740"), and ASU No. 2018-02 - Income Statement - Reporting Comprehensive Income ("Topic 220")

. See accompanying notes to the unaudited condensed consolidated financial statements

Penumbra, Inc.
Condensed Consolidated Statements of Cash Flows
(unaudited)
(in thousands)

	Six Months Ended June 30,	
	2019	2018
CASH FLOWS FROM OPERATING ACTIVITIES:		
Net income	$ 26,703	$ 18,872
Adjustments to reconcile consolidated net income to net cash (used in) provided by operating activities:		
Depreciation and amortization	3,737	2,948
Stock-based compensation	10,230	9,139
Loss on non-marketable equity investments	—	2,181
Inventory write-downs	1,668	670
Deferred taxes	(1,721)	(7,514)
Change in fair value of contingent consideration	—	725
Other	603	388
Changes in operating assets and liabilities:		
Accounts receivable	(17,552)	(16,297)
Inventories	(18,521)	(3,948)
Prepaid expenses and other current and non-current assets	(3,812)	1,405
Accounts payable	415	625
Accrued expenses and other non-current liabilities	(1,915)	1,638
Net cash (used in) provided by operating activities	(165)	10,832
CASH FLOWS FROM INVESTING ACTIVITIES:		
Contributions to non-marketable investments	—	(868)
Purchases of marketable investments	(29,550)	(61,495)
Proceeds from sales of marketable investments	2,700	236
Proceeds from maturities of marketable investments	50,800	77,869
Purchases of property and equipment	(6,208)	(5,105)
Other	(1,000)	—
Net cash provided by investing activities	16,742	10,637
CASH FLOWS FROM FINANCING ACTIVITIES:		
Proceeds from exercises of stock options	2,265	3,171
Proceeds from issuance of stock under employee stock purchase plan	4,779	3,584
Payment of employee taxes related to vested common and restricted stock	(13,379)	(13,845)
Payment of asset acquisition-related and business acquisition-related obligations (Note 5)	(1,183)	(4,431)
Proceeds from capital contribution from non-controlling interest	500	—
Other	—	(415)
Net cash used in financing activities	(7,018)	(11,936)
Effect of foreign exchange rate changes on cash and cash equivalents	(148)	(465)
NET INCREASE IN CASH AND CASH EQUIVALENTS	9,411	9,068
CASH AND CASH EQUIVALENTS—Beginning of period	67,850	50,637
CASH AND CASH EQUIVALENTS—End of period	$ 77,261	$ 59,705
NONCASH INVESTING AND FINANCING ACTIVITIES:		
Common shares issued as consideration in connection with a buyout agreement (Notes 9 and 10)	$ —	$ 5,256
Purchase of property and equipment funded through accounts payable and accrued liabilities	$ 1,290	$ 1,126

See accompanying notes to the unaudited condensed consolidated financial statements

Penumbra, Inc.
Notes to Condensed Consolidated Financial Statements
(unaudited)

1. Organization and Description of Business

Penumbra, Inc. (the “Company”) is a global healthcare company focused on innovative therapies. The Company designs, develops, manufactures and markets medical devices and has a broad portfolio of products that addresses challenging medical conditions and significant clinical needs.

2. Summary of Significant Accounting Policies

Basis of Presentation and Consolidation

The accompanying condensed consolidated balance sheet as of June 30, 2019 , the condensed consolidated statements of operations , the condensed consolidated statements of comprehensive income , and the condensed consolidated statements of stockholders’ equity for the three and six months ended June 30, 2019 and 2018 , and the condensed consolidated statements of cash flows for the six months ended June 30, 2019 and 2018 are unaudited. The unaudited condensed consolidated financial statements included herein have been prepared by the Company in accordance with accounting principles generally accepted in the United States of America (“U.S. GAAP”) and the applicable rules and regulations of the U.S. Securities and Exchange Commission (the “SEC”) for interim financial information. Accordingly, they do not include all of the information and notes required by U.S. GAAP for complete financial statements. The condensed consolidated balance sheet as of December 31, 2018 was derived from the audited financial statements as of that date.

The unaudited condensed consolidated financial statements have been prepared on the same basis as the audited consolidated financial statements and, in the opinion of management, reflect all adjustments of a normal recurring nature considered necessary to state fairly the Company’s financial position as of June 30, 2019 , the results of its operations for the three and six months ended June 30, 2019 and 2018 , the changes in comprehensive income and stockholders’ equity for the three and six months ended June 30, 2019 and 2018 , and the cash flows for the six months ended June 30, 2019 and 2018 . The results for the three and six months ended June 30, 2019 are not necessarily indicative of the results that may be expected for the year ending December 31, 2019 or for any other future annual or interim period.

The information included in this Quarterly Report on Form 10-Q should be read in conjunction with the audited consolidated financial statements and notes thereto for the year ended December 31, 2018 , included in the Company’s Annual Report on Form 10-K. There have been no changes to the Company’s significant accounting policies during the six months ended June 30, 2019 , as compared to the significant accounting policies described in the Company’s Annual Report on Form 10-K for the fiscal year ended December 31, 2018 , other than changes to the Company’s leasing policy described below in connection with the adoption of the guidance under Accounting Standards Codification (“ASC”) 842.

The condensed consolidated financial statements include the accounts of the Company, its wholly-owned subsidiaries and its majority-owned subsidiary. The portion of equity not attributable to the Company is considered non-controlling interest and is classified separately in the condensed consolidated financial statements. Any subsequent changes in the Company’s ownership interest while the Company retains its controlling interest in its majority-owned subsidiary will be accounted for as equity transactions. All intercompany balances and transactions have been eliminated in consolidation.

Use of Estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities and equity accounts; disclosure of contingent assets and liabilities at the date of the financial statements; and the reported amounts of revenues and expenses during the reporting period. On an ongoing basis, the Company evaluates its estimates, including those related to marketable investments, provisions for doubtful accounts, the amount of variable consideration included in the transaction price, warranty reserve, valuation of inventories, useful lives of property and equipment, operating lease right-of-use (“ROU”) assets and liabilities, income taxes, contingent consideration and other contingencies, among others. The Company bases its estimates on historical experience and on various other assumptions that are believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other data. Actual results could differ from those estimates.

Segments

The Company determined its operating segment on the same basis that it uses to evaluate its performance internally. The Company has one business activity: the design, development, manufacturing and marketing of innovative devices, and operates as one operating segment. The Company's chief operating decision-maker, its Chief Executive Officer, reviews its consolidated operating results for the purpose of allocating resources and evaluating financial performance.

Recently Adopted Accounting Standards

On January 1, 2019, the Company adopted Accounting Standard Update ("ASU") No. 2016-02 , Leases (Topic 842) , and its associated amendments using the modified retrospective transition approach by applying the new standard to all leases existing at the date of initial application and not restating comparative periods. There was no cumulative-effect adjustment recorded to retained earnings upon adoption. Under the standard, a lessee is required to recognize a lease liability and ROU asset for all leases. The new guidance also modified the classification criteria and requires additional disclosures to enable users of financial statements to understand the amount, timing, and uncertainty of cash flows arising from leases. Consistent with current guidance, a lessee's recognition, measurement, and presentation of expenses and cash flows arising from a lease continues to depend primarily on its classification. The Company elected the package of practical expedients permitted under the transition guidance, which allowed the Company to carryforward its historical lease classification, its assessment on whether a contract was or contains a lease, and its initial direct costs for any leases that existed prior to January 1, 2019. In addition, the Company elected the following transitional practical expedients: (1) the short-term lease exception and (2) to not separate its non-lease components for its real estate, vehicle and equipment leases. The impact of adoption and additional disclosures required by the ASU have been included in "Significant Accounting Policies - Leases" below and in Note " 8. Leases ."

Significant Accounting Policies - Leases

The Company adopted the guidance under ASC 842 on January 1, 2019 using the modified retrospective transition approach. There was no cumulative-effect adjustment recorded to retained earnings upon adoption.

Under ASC 842, the Company determines if an arrangement is a lease at inception. In addition, the Company determines whether leases meet the classification criteria of a finance or operating lease at the lease commencement date considering: (1) whether the lease transfers ownership of the underlying asset to the lessee at the end of the lease term, (2) whether the lease contains a bargain purchase option, (3) whether the lease term is for a major part of the remaining economic life of the underlying asset, (4) whether the present value of the sum of the lease payments and residual value guaranteed by the lessee equals or exceeds substantially all of the fair value of the underlying asset, and (5) whether the underlying asset is of such a specialized nature that it is expected to have no alternative use to the lessor at the end of the lease term. As of June 30, 2019 , the Company's lease population consisted of real estate, equipment and vehicle leases. As of the date of adoption of ASC 842 and June 30, 2019 , the Company did not have material finance leases.

Operating leases are included in operating lease right-of-use assets, current operating lease liabilities, and non-current operating lease liabilities in our condensed consolidated balance sheet. ROU assets represent the Company's right to use an underlying asset for the lease term and lease liabilities represent the Company's obligation to make lease payments arising from the lease. Operating lease ROU assets and liabilities are recognized at the lease commencement date based on the present value of lease payments over the lease term. In determining the present value of lease payments, the Company uses its incremental borrowing rate based on the information available at the lease commencement date if the rate implicit in the lease is not readily determinable. The determination of the Company's incremental borrowing rate requires management judgment including, the development of a synthetic credit rating and cost of debt as the Company currently does not carry any debt. The operating lease ROU assets also include adjustments for prepayments, accrued lease payments and exclude lease incentives. The Company's lease terms may include options to extend or terminate the lease when it is reasonably certain that the Company will exercise such options. Operating lease cost is recognized on a straight-line basis over the expected lease term. Lease agreements entered into after the adoption of ASC 842 that include lease and non-lease components are accounted for as a single lease component. Lease agreements with a noncancelable term of less than 12 months are not recorded on the Company's condensed consolidated balance sheet. For more information about the impact of adoption and disclosures on the Company's leases, refer to Note " 8. Leases ."

Recent Accounting Guidance

Recently Issued Accounting Standards

In June 2016, the Financial Accounting Standards Board (" FASB") issued ASU No. 2016-13, Financial Instruments—Credit Losses. The standard changes how entities will measure credit losses for most financial assets and certain other instruments that are not measured at fair value through net income. The Company will recognize an allowance for credit losses on available-for-sale securities rather than deductions in amortized cost. In April 2019, the FASB issued ASU No. 2019-04 which provides additional clarification and addresses stakeholders' specific issues about certain aspects of the amendments in the previously issued ASU No. 2016-13. In May 2019, the FASB issued ASU No. 2019-05 which further amends ASU No. 2016-13 by providing an option to irrevocably elect the fair value option for certain financial assets previously measured at amortized cost basis. The standard is effective for fiscal years and interim periods beginning after December 15, 2019. Early adoption is permitted for all periods beginning after December 15, 2018. The Company is currently evaluating the impact of adopting this standard.

In August 2018, the FASB issued ASU 2018-13, Disclosure Framework—Changes to the Disclosure Requirements for Fair Value Measurement . The primary focus of the standard is to improve the effectiveness of the disclosure requirements for fair value measurements. The standard is effective for fiscal years and interim periods beginning after December 15, 2019. An entity is permitted to early adopt the removed or modified disclosures upon the issuance of the standard and may delay adoption of the additional disclosures until their effective date. The Company is currently evaluating the impact of adopting this standard.

3. Investments and Fair Value of Financial Instruments

Marketable Investments

The Company’s marketable investments have been classified and accounted for as available-for-sale. The following table presents the Company’s marketable investments as of June 30, 2019 and December 31, 2018 (in thousands):

	June 30, 2019			
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Commercial paper	$ 3,457	$ —	$ —	$ 3,457
U.S. treasury	7,321	3	(3)	7,321
U.S. agency and government sponsored securities	7,718	31	(5)	7,744
U.S. states and municipalities	1,528	—	—	1,528
Corporate bonds	89,796	187	(37)	89,946
Total	$ 109,820	$ 221	$ (45)	$ 109,996

	December 31, 2018			
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value
Commercial paper	$ 13,701	$ —	$ (3)	$ 13,698
U.S. treasury	6,400	—	(22)	6,378
U.S. agency and government sponsored securities	7,699	18	(27)	7,690
U.S. states and municipalities	5,134	—	(12)	5,122
Corporate bonds	100,606	14	(469)	100,151
Total	$ 133,540	$ 32	$ (533)	$ 133,039

The following tables present the gross unrealized losses and the fair value for those marketable investments that were in an unrealized loss position for less than twelve months or for twelve months or more as of June 30, 2019 and December 31, 2018 (in thousands):

	June 30, 2019					
	Less than 12 months		12 months or more		Total	
	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
U.S. treasury	$ —	$ —	$ 2,397	$ (3)	$ 2,397	$ (3)
U.S. agency and government sponsored securities	—	—	4,222	(5)	4,222	(5)
Corporate bonds	4,686	(4)	22,717	(33)	27,403	(37)
Total	$ 4,686	$ (4)	$ 29,336	$ (41)	$ 34,022	$ (45)

Penumbra, Inc.
Notes to Condensed Consolidated Financial Statements
(unaudited)

	December 31, 2018					
	Less than 12 months		12 months or more		Total	
	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses	Fair Value	Gross Unrealized Losses
Commercial paper	$ 12,208	$ (3)	$ —	$ —	$ 12,208	$ (3)
U.S. treasury	—	—	6,378	(22)	6,378	(22)
U.S. agency and government sponsored securities	1,436	(5)	2,759	(22)	4,195	(27)
U.S. states and municipalities	1,529	(5)	3,593	(7)	5,122	(12)
Corporate bonds	58,961	(176)	33,215	(293)	92,176	(469)
Total	$ 74,134	$ (189)	$ 45,945	$ (344)	$ 120,079	$ (533)

The following table presents the contractual maturities of the Company’s marketable investments as of June 30, 2019 and December 31, 2018 (in thousands):

	June 30, 2019	December 31, 2018
	Fair Value	Fair Value
Due in less than one year	$ 39,759	$ 83,391
Due in one to five years	70,237	49,648
Total	$ 109,996	$ 133,039

Fair Value of Financial Instruments

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability (an exit price) in an orderly transaction between market participants at the measurement date. The accounting guidance establishes a three-tiered hierarchy, which prioritizes the inputs used in the valuation methodologies in measuring fair value:

Level 1 - Quoted prices in active markets for identical assets or liabilities.

Level 2 - Inputs other than Level 1 that are observable, either directly or indirectly, such as quoted prices 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 assets or liabilities.

Level 3 - Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

The categorization of a financial instrument within the valuation hierarchy is based on the lowest level of input that is significant to the fair value measurement.

The Company classifies its cash equivalents and marketable investments within Level 1 and Level 2, as it uses quoted market prices or alternative pricing sources and models utilizing market observable inputs.

The Company determined the fair value of its Level 1 financial instruments, which are traded in active markets, using quoted market prices for identical instruments.

Financial instruments classified within Level 2 of the fair value hierarchy are valued based on other observable inputs, including broker or dealer quotations or alternative pricing sources. When quoted prices in active markets for identical assets or liabilities are not available, the Company relies on non-binding quotes from its investment managers, which are based on proprietary valuation models of independent pricing services. These models generally use inputs such as observable market data, quoted market prices for similar instruments, or historical pricing trends of a security relative to its peers. To validate the fair value determination provided by its investment managers, the Company reviews the pricing movement in the context of overall market trends and trading information from its investment managers. In addition, the Company assesses the inputs and methods used in determining the fair value in order to determine the classification of securities in the fair value hierarchy.

Penumbra, Inc.
Notes to Condensed Consolidated Financial Statements
(unaudited)

The following tables set forth the Company's financial assets measured at fair value by level within the fair value hierarchy as of June 30, 2019 and December 31, 2018 (in thousands):

	As of June 30, 2019			
	Level 1	Level 2	Level 3	Fair Value
Financial Assets				
Cash equivalents:				
Money market funds	$ 29,460	$ —	$ —	$ 29,460
Marketable investments:				
Commercial paper	—	3,457	—	3,457
U.S. treasury	7,321	—	—	7,321
U.S. agency and government sponsored securities	—	7,744	—	7,744
U.S. states and municipalities	—	1,528	—	1,528
Corporate bonds	—	89,946	—	89,946
Total	$ 36,781	$ 102,675	$ —	$ 139,456
Financial Liabilities:				
Contingent consideration obligations [1]	$ —	$ —	$ 1,256	$ 1,256
Total	$ —	$ —	$ 1,256	$ 1,256

[1] More information on the contingent consideration obligations and the changes in fair value are presented below.

	As of December 31, 2018			
	Level 1	Level 2	Level 3	Fair Value
Financial Assets				
Cash equivalents:				
Commercial paper	$ —	$ 10,967	$ —	$ 10,967
Money market funds	12,087	—	—	12,087
Marketable investments:				
Commercial paper	—	13,698	—	13,698
U.S. treasury	6,378	—	—	6,378
U.S. agency and government sponsored securities	—	7,690	—	7,690
U.S. states and municipalities	—	5,122	—	5,122
Corporate bonds	—	100,151	—	100,151
Total	$ 18,465	$ 137,628	$ —	$ 156,093
Financial Liabilities:				
Contingent consideration obligations [1]	$ —	$ —	$ 2,571	$ 2,571
Total	$ —	$ —	$ 2,571	$ 2,571

[1] More information on the contingent consideration obligations and the changes in fair value are presented below.

Contingent Consideration Obligations

As of June 30, 2019 and December 31, 2018 , the Company's contingent consideration liability relates to milestone payments due in connection with the 2017 acquisition of Crossmed S.p.a. ("Crossmed") and is classified as a Level 3 measurement for which fair value is derived from various inputs, including forecasted revenues during the earn-out milestone periods, revenue volatilities, discount rates, and estimates in the likelihood of achieving revenue-based milestones. The fair value of the contingent consideration liability is remeasured each reporting period. The following table presents quantitative information about certain unobservable inputs used in the Level 3 fair value measurement of the Company's contingent consideration liability, other than the forecasted revenues during the earn-out milestone period:

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	Fair Value at June 30, 2019 (in thousands)	Valuation Method	Unobservable Inputs	Input (range where applicable)
Crossmed: Revenue-based milestones	$ 1,256	Monte Carlo Simulation	Earn-out period over which revenue-based milestone payments are made	2019
			Risk-adjusted discount rate	15%
			Revenue volatilities for each type of revenue-based milestone	5.1% and 18.4%

The following tables summarize the changes in fair value of the contingent consideration obligation for the six months ended June 30, 2019 and June 30, 2018 (in thousands):

	Fair Value of Contingent Consideration
Balance at December 31, 2018	$ 2,571
Payments of contingent consideration liabilities	(1,296)
Changes in fair value	—
Foreign currency remeasurement	(19)
Balance at June 30, 2019	$ 1,256

	Fair Value of Contingent Consideration
Balance at December 31, 2017	$ 4,675
Payments of contingent consideration liabilities	(3,017)
Changes in fair value	725
Foreign currency remeasurement	17
Balance at June 30, 2018	$ 2,400

During the three and six months ended June 30, 2019 , there were no changes to the fair value of the contingent consideration obligation. During the three and six months ended June 30, 2018 , the fair value of the contingent consideration obligation increased by $0.3 million and $0.7 million , respectively, which was recorded in sales, general and administrative expense in the condensed consolidated statements of operations. The fair value of the contingent consideration increased as a result of updates to the underlying forecasts based on actual results to date and changes in estimates. For more information related to the payment of the contingent consideration liabilities refer to Note " 5. Asset Acquisitions and Business Combinations ."

During the three and six months ended June 30, 2019 and 2018 , the Company did not record impairment charges related to its marketable investments and the Company did not hold any Level 3 marketable investments as of June 30, 2019 or December 31, 2018 . During the six months ended June 30, 2019 and 2018 , the Company did not have any transfers between Level 1, Level 2 or Level 3 of the fair value hierarchy. Additionally, the Company did not have any financial assets and liabilities measured at fair value on a non-recurring basis as of June 30, 2019 or December 31, 2018 .

4. Balance Sheet Components

Inventories

The following table shows the components of inventories as of June 30, 2019 and December 31, 2018 (in thousands):

	June 30, 2019	December 31, 2018
Raw materials	$ 21,367	$ 18,829
Work in process	17,028	10,630
Finished goods	94,340	86,282
Inventories	$ 132,735	$ 115,741

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Accrued Liabilities

The following table shows the components of accrued liabilities as of June 30, 2019 and December 31, 2018 (in thousands):

	June 30, 2019	December 31, 2018
Payroll and employee-related cost	$ 29,150	$ 33,838
Accrued expenses	6,864	4,088
Sales return provision	2,220	2,986
Product warranty	2,079	1,875
Contingent consideration & other acquisition-related costs [1]	4,622	4,439
Other accrued liabilities	12,341	10,660
Total accrued liabilities	$ 57,276	$ 57,886

[1] Amount consists of the current portion of contingent liabilities related to (1) the cash milestone payments and working capital adjustment liabilities for the 2017 acquisition of Crossmed and (2) an anti-dilution provision for the 2018 asset acquisition of MVI Health Inc ("MVI"). Refer to Note " 5. Asset Acquisitions and Business Combinations " for more information on the acquisition of Crossmed and asset acquisition of MVI.

The following table shows the changes in the Company's estimated product warranty accrual, included in accrued liabilities, as of June 30, 2019 and December 31, 2018 (in thousands):

	June 30, 2019	December 31, 2018
Balance at the beginning of the period	$ 1,875	$ 1,088
Accruals of warranties issued	515	1,336
Settlements of warranty claims	(311)	(549)
Balance at the end of the period	$ 2,079	$ 1,875

Other Non-Current Liabilities

The following table shows the components of other non-current liabilities as of June 30, 2019 and December 31, 2018 (in thousands):

	June 30, 2019	December 31, 2018
Deferred tax liabilities	$ 4,006	$ 4,171
Licensing-related cost [1]	10,278	11,506
Other non-current liabilities	735	3,266
Total other non-current liabilities	$ 15,019	$ 18,943

[1] Amount relates to the non-current liability recorded for probable future milestone payments to be made under the licensing agreement described in Note " 6. Intangible Assets ." Refer therein for more information.

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5. Asset Acquisitions and Business Combinations

Payments Related to 2017 Crossmed Acquisition

On July 3, 2017, the Company completed its acquisition of Crossmed, a joint stock company organized under the laws of Italy. As of June 30, 2019 and December 31, 2018 , the Company's condensed consolidated balance sheet included $1.3 million and $2.6 million , respectively, in current liabilities primarily related to additional consideration due to the sellers of Crossmed (the "Sellers") for revenue-based milestone payments, based on net revenue in the years ending December 31, 2018 and 2019, and other working capital and financial debt adjustments. During the six months ended June 30, 2019 , the Company made $1.3 million in milestone payments of which $0.6 million is presented in operating activities and $0.7 million is presented in financing activities in the condensed consolidated statement of cash flows. During the six months ended June 30, 2018 , the Company made $4.4 million in payments to the Sellers which is presented in financing activities in the condensed consolidated statement of cash flows.

Payments Related to 2018 MVI Asset Acquisition

In 2017, the Company and Sixense Enterprises, Inc. ("Sixense") formed MVI Health Inc. ("MVI") as a privately-held joint venture for the purpose of exploring healthcare applications of virtual reality technology, with each party holding 50% of the issued and outstanding equity of MVI. On August 31, 2018 (" Transfer Agreement Closing Date "), the Company completed its asset acquisition to obtain a controlling interest of MVI pursuant to a Stock Transfer Agreement (the "Transfer Agreement") between the Company, MVI and Sixense to obtain a controlling interest of MVI for $20.0 million , excluding the additional $4.5 million of probable future payments relating to an anti-dilution provision in the Transfer Agreement. Following the Transfer Agreement Closing Date , the Company owns a 90% controlling interest in MVI and Sixense retains the remaining 10% minority interest. As of December 31, 2018 , the Company's condensed consolidated balance sheet included $1.5 million and $2.5 million , respectively, in current and non-current liabilities related to the anti-dilution provision in the Transfer Agreement . During the six months ended June 30, 2019 , the Company contributed $0.5 million to MVI related to the anti-dilution provision which is presented in financing activities in the condensed consolidated statement of cash flows. A s of June 30, 2019 , the Company's condensed consolidated balance sheet included $3.0 million and $0.5 million , respectively, in current and non-current liabilities related to the anti-dilution provision in the Transfer Agreement.

6. Intangible Assets

Acquired Intangible Assets

The following tables present details of the Company's acquired finite-lived and indefinite-lived intangible assets, as of June 30, 2019 and December 31, 2018 (in thousands, except weighted-average amortization period):

June 30, 2019	Weighted-Average Amortization Period	Gross Carrying Amount	Accumulated Amortization	Net
Customer relationships	15.0 years	$ 6,781	$ (904)	$ 5,877
Trade secrets and processes	20.0 years	5,256	(394)	4,862
Other	5.0 years	1,748	(699)	1,049
Total intangible assets subject to amortization	16.2 years	$ 13,785	$ (1,997)	$ 11,788
Intangible assets related to licensed technology		14,243	—	14,243
Total intangible assets		$ 28,028	$ (1,997)	$ 26,031

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December 31, 2018	Weighted-Average Amortization Period		Gross Carrying Amount		Accumulated Amortization		Net
Customer relationships	15.0 years	$	6,823	$	(681)	$	6,142
Trade secrets and processes	20.0 years		5,256		(263)		4,993
Other	5.0 years		1,759		(528)		1,231
Total intangible assets subject to amortization	16.0 years	$	13,838	$	(1,472)	$	12,366
Intangible assets related to licensed technology			14,879		—		14,879
Total intangible assets		$	28,717	$	(1,472)	$	27,245

The customer relationships and other intangible assets subject to amortization relate to the acquisition of Crossmed during the third quarter of 2017. The gross carrying amount and accumulated amortization of these intangible assets are subject to foreign currency translation effects. Refer to Note " 5. Asset Acquisitions and Business Combinations " for more information. The Company's $5.3 million trade secrets and processes intangible asset was recognized in connection with a royalty buyout agreement during the first quarter of 2018, which is discussed further in Note " 9. Commitments and Contingencies " and Note " 10. Stockholders' Equity ."

The following table presents the amortization expense recorded related to the Company's finite-lived intangible assets for the three and six months ended June 30, 2019 and June 30, 2018 (in thousands):

	Three Months Ended June 30,				Six Months Ended June 30,			
	2019		2018		2019		2018	
Cost of revenue	$	66	$	101	$	131	$	131
Sales, general and administrative		198		210		399		427
Total	$	264	$	311	$	530	$	558

Licensed technology

During the third quarter of 2017, the Company entered into an exclusive technology license agreement (the "License Agreement") that required the Company to pay an upfront payment to the licensor of $2.5 million and future revenue milestone-based payments on sales of products covered by the licensed intellectual property. The Company recorded an intangible asset equal to the total payments made and expected to be made under the License Agreement and a corresponding contingent liability for the probable future milestone payments not yet paid. As of June 30, 2019 , the licensed technology is accounted for as an indefinite-lived intangible asset. Upon the commercialization of the underlying product utilizing the licensed technology, the capitalized amount will be amortized over its estimated useful life.

At the end of each reporting period the Company adjusts the contingent liabilities to reflect the amount of future milestone payments that are probable to be paid. Prior to the commercialization of products utilizing the underlying technology, any changes in the contingent liability are recorded as an adjustment between the liability balances and the gross carrying amount of the indefinite-lived intangible asset. During the three and six months ended June 30, 2019 , the contingent liability related to the exclusive technology license agreement decreased by $0.6 million . The changes in the contingent liability balance were due to changes in the underlying revenue forecasts used to estimate the probable future milestone payments. As of June 30, 2019 , the balance of the contingent liability related to probable future milestone payments under the License Agreement was $11.8 million , of which $1.5 million and $10.3 million were included in accrued liabilities and other non-current liabilities on the condensed consolidated balance sheet, respectively. As of December 31, 2018 , the balance of the contingent liability related to probable future milestone payments under the License Agreement was $12.4 million , of which $0.9 million and $11.5 million were included in accrued liabilities and other non-current liabilities on the consolidated balance sheet, respectively.

As of June 30, 2019 , the gross carrying amount of the indefinite-lived intangible asset was $14.2 million . During the six months ended June 30, 2019 , the Company noted no events or circumstances that indicate the carrying value of the licensed technology may no longer be recoverable and that an impairment loss may have occurred.

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7. Goodwill

The following table presents the changes in goodwill during the six months ended June 30, 2019 (in thousands):

	Total Company
Balance as of December 31, 2018	$ 7,813
Foreign currency translation	(48)
Balance as of June 30, 2019	$ 7,765

Goodwill Impairment Review

The Company reviews goodwill for impairment annually during the fourth quarter, on October 31st, or more frequently if events or circumstances indicate that an impairment loss may have occurred. During the six months ended June 30, 2019 , there were no events or changes in circumstances which triggered an impairment review .

8. Leases

Adoption of ASC Topic 842, "Leases"

The Company adopted the guidance under ASC 842 on January 1, 2019 using the modified retrospective transition approach. Therefore the comparative prior year information has not been adjusted and continues to be reported under ASC 840.

The impact of the adoption of ASC 842 on the Company's condensed consolidated balance sheet as of January 1, 2019 was as follows (in thousands):

	December 31, 2018	Adjustments due to the adoption of Topic 842	January 1, 2019
Assets			
Prepaid expenses and other current assets (1)	12,200	(424)	11,776
Total current assets	410,726	(424)	410,302
Operating lease right-of-use assets (1)	—	43,277	43,277
Total assets	$ 515,006	$ 42,853	$ 557,859
Liabilities and Stockholders' Equity			
Current liabilities:			
Accrued liabilities (2)	57,886	(132)	57,754
Current operating lease liabilities (2)	—	3,608	3,608
Total current liabilities	66,062	3,476	69,538
Deferred rent (2)	7,586	(7,586)	—
Non-current operating lease liabilities (2)	—	46,963	46,963
Total liabilities	92,591	42,853	135,444
Total liabilities and stockholders' equity	$ 515,006	$ 42,853	$ 557,859

(1) Upon the adoption of ASC 842, prepaid rent is included in the operating lease right-of-use assets.
(2) Upon the adoption of ASC 842, current and non-current deferred rent is included in the current and non-current operating lease liabilities.

Lease Overview

As of December 31, 2018 and June 30, 2019 , the Company's contracts that contained a lease consisted of real estate, equipment and vehicle leases.

The Company leases real estate for office and warehouse space primarily under non-cancelable operating leases that expire at various dates through 2031 , subject to the Company's option to renew certain leases for an additional five to fifteen years . The Company also leases other equipment and vehicles primarily under non-cancelable operating leases that expire at various dates through 2024 . As of December 31, 2018 and June 30, 2019 , the Company did not have material finance leases.

The following table presents the components of the Company's lease cost, lease term and discount rate during the three and six months ended June 30, 2019 (in thousands, except years and percentages):

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	Three Months Ended June 30, 2019	Six Months Ended June 30, 2019
Operating lease cost	$ 1,686	$ 3,453
Variable lease cost [1]	846	1,604
Total lease costs	$ 2,532	$ 5,057

Weighted Average Remaining Lease Term	
Operating leases	10.3 years
Weighted Average Discount Rate	
Operating leases	6.2%

(1) Variable lease costs represent payments that are dependent on usage, a rate or index. Variable lease cost primarily relates to common area maintenance charges for its real estate leases as the Company elected not to separate non-lease components from lease components upon adoption of ASC 842.

Prior to January 1, 2019, the Company recorded operating lease rent expense under ASC 840 on a straight-line basis over the non-cancellable lease term . Rent expense for the three and six months ended June 30, 2018 was $1.4 million and $2.9 million , respectively.

During the third quarter of 2018, the Company signed a fifteen year lease for a manufacturing facility in Roseville, California (the “Roseville Lease”) which has not yet commenced as of June 30, 2019 . The Roseville Lease is expected to commence upon substantial completion of lessor owned improvements to the building which the Company anticipates will be in 2020.

The following table is a schedule, by years, of maturities of the Company's lease liabilities as of June 30, 2019 (in thousands):

	Lease Payments [1]
Remainder of 2019	$ 3,267
Year ending December 31, 2020	6,884
Year ending December 31, 2021	6,195
Year ending December 31, 2022	6,087
Year ending December 31, 2023	6,060
Year ending December 31, 2024	5,980
Thereafter	33,935
Total undiscounted lease payments	$ 68,408
Less imputed interest	(18,520)
Present value of lease liabilities	$ 49,888

(1) The table above excludes the estimated future minimum lease payment for the Roseville Lease, due to the uncertainty around the timing of when the Roseville Lease will commence and payments will be due. The total estimated lease payments over the fifteen year lease term is approximately $40.9 million . In addition, the Company anticipates to make approximately $14 million in prepaid rental payments to the lessor prior to the lease commencement date. The table also excludes lease payments that were not fixed at commencement or modification.

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The following table below shows the maturities of the Company's operating lease liabilities previously disclosed under ASC 840 as of December 31, 2018 (in thousands):

		Lease Payments [(1)]
Year Ending December 31:		
2019	$	6,575
2020		6,571
2021		5,809
2022		5,772
2023		5,735
Thereafter		40,194
Total future minimum lease payments	$	70,656

(1) The table above excludes the estimated future minimum lease payment for the Roseville Lease, due to the uncertainty around the timing of when the Roseville Lease will commence and payments will be due.

Supplemental cash flow information related to leases during the six months ended June 30, 2019 are as follows (in thousands):

		Six Months Ended June 30, 2019
Cash paid for amounts included in the measurement of lease liabilities:		
Operating cash flows from operating leases	$	3,354
Right-of-use assets obtained in exchange for lease obligations:		
Operating leases	$	1,111

9. Commitments and Contingencies

Royalty Obligations

In March 2005, the Company entered into a license agreement that requires the Company to make minimum royalty payments to the licensor on a quarterly basis. As of both June 30, 2019 and December 31, 2018 , the license agreement required minimum annual royalty payments of $0.1 million in equal quarterly installments. On each January 1, the quarterly calendar year minimum royalty shall be adjusted to equal the prior year's minimum royalty adjusted by a percentage equal to the percentage change in the "consumer price index for all urban consumers" for the prior calendar year as reported by the U.S. Department of Labor. Unless terminated earlier, the term of the license agreement shall continue until the expiration of the last to expire patent that covers that licensed product or for the period of fifteen years following the first commercial sale of such licensed product, whichever is longer. The first commercial sale of covered products occurred in June 2007.

In April 2012, the Company entered into an agreement that requires the Company to pay, on a quarterly basis, a 5% royalty on sales of products covered under applicable patents. The first commercial sale of covered products occurred in April 2014. Unless terminated earlier, the royalty term for each applicable product shall continue for fifteen years following the first commercial sale of such patented product, or when the applicable patent covering such product has expired, whichever is sooner.

In November 2013, the Company entered into an agreement that required the Company to pay, on a quarterly basis, a 3% royalty on the first $5.0 million in sales and a 1% royalty on sales thereafter of products covered under applicable patents. The agreement was terminated effective January 1, 2018.

In April 2015, the Company entered into a royalty agreement that required the Company to pay a 2% royalty on sales of certain products covered by the agreement, on a quarterly basis, in exchange for certain trade secrets and processes which were used to develop such covered products. The Company began the first commercial sale of the covered products in July 2015. In the first quarter of 2018, the Company entered into a buyout agreement (the "Buyout Agreement") in which future royalty payments under the royalty agreement were canceled in exchange for shares of the Company's common stock with a fair value of $5.3 million . The Company recorded an intangible asset equal to the $5.3 million buyout amount which will be amortized into cost of sales over the period in which the Company receives future economic benefit . After determining that the pattern of future cash flows associated with this intangible asset could not be reliably estimated with a high level of precision, the Company concluded that the intangible asset will be amortized on a straight-line basis over its estimated useful life. For more information refer to Note " 10. Stockholders' Equity ."

Royalty expense included in cost of revenue for the three months ended June 30, 2019 and 2018 , was $1.1 million and $0.8 million , respectively, and for the six months ended June 30, 2019 and 2018 , was $2.2 million and $1.6 million , respectively.

Contingencies

From time to time, the Company may have certain contingent liabilities that arise in the ordinary course of business. The Company accrues a liability for such matters when it is probable that future expenditures will be made and such expenditures can be reasonably estimated. Refer to Note " 3. Investments and Fair Value of Financial Instruments ," Note " 5. Asset Acquisitions and Business Combinations " and Note " 6. Intangible Assets " for more information on contingent liabilities recorded on the condensed consolidated balance sheet.

Indemnification

The Company enters into standard indemnification arrangements in the ordinary course of business. In many such arrangements, the Company agrees to indemnify, hold harmless, and reimburse the indemnified parties for losses suffered or incurred by the indemnified parties in connection with any trade secret, copyright, patent or other intellectual property infringement claim by any third-party with respect to the Company's technology. The Company also agrees to indemnify many indemnified parties for product defect and similar claims. The term of these indemnification agreements is generally perpetual. The maximum potential amount of future payments the Company could be required to make under these agreements is not determinable because it involves claims that may be made against the Company in the future, but have not yet been made.

The Company has entered into indemnification agreements with its directors and officers that may require the Company to indemnify its directors and officers against liabilities that may arise by reason of their status or service as directors or officers, other than liabilities arising from willful misconduct of the individual.

The Company has not incurred costs to defend lawsuits or settle claims related to these indemnification agreements. No liability associated with any of these indemnification requirements has been recorded to date.

Litigation

From time to time, the Company is subject to other claims and assessments in the ordinary course of business. The Company is not currently a party to any such litigation matter that, individually or in the aggregate, is expected to have a material adverse effect on the Company's business, financial condition, results of operations or cash flows.

10. Stockholders' Equity

Common Stock

In the first quarter of 2018, the Company issued 53,256 fully vested restricted stock units with a fair value of $5.3 million in connection with the Buyout Agreement, as discussed in Note " 9. Commitments and Contingencies ." The Company recorded the $5.3 million fair value of the shares issued to additional-paid in capital on the condensed consolidated balance sheet upon the issuance of the awards, with the associated expense being amortized into cost of sales over the period in which the Company receives future economic benefit from the buyout.

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Equity Incentive Plans

Stock Options

Activity of stock options under the Penumbra, Inc. 2005 Stock Plan, the Penumbra, Inc. 2011 Equity Incentive Plan and the Amended and Restated Penumbra, Inc. 2014 Equity Incentive Plan (collectively the "Plans") during the six months ended June 30, 2019 is set forth below:

	Number of Shares	Weighted-Average Exercise Price
Balance at December 31, 2018	1,688,881	$ 18.91
Exercised	(188,064)	12.08
Canceled/Forfeited	(3,259)	21.94
Balance at June 30, 2019	1,497,558	19.76

Restricted Stock and Restricted Stock Units

Activity of unvested restricted stock awards and restricted stock units under the Plans during the six months ended June 30, 2019 is set forth below:

	Number of Shares	Weighted -Average Grant Date Fair Value
Unvested at December 31, 2018	451,463	$ 57.29
Granted	150,413	143.28
Vested	(211,614)	29.23
Canceled/Forfeited	(12,737)	81.89
Unvested at June 30, 2019	377,525	106.45

As of June 30, 2019 , 359,695 restricted stock awards and restricted stock units are expected to vest.

Stock-based Compensation

The following table sets forth the stock-based compensation expense included in the Company's condensed consolidated statements of operations for the three and six months ended June 30, 2019 and 2018 (in thousands):

	Three Months Ended June 30,		Six Months Ended June 30,	
	2019	2018	2019	2018
Cost of revenue	$ 329	$ 198	$ 620	$ 417
Research and development	677	375	1,201	743
Sales, general and administrative	4,129	4,412	8,409	7,979
Total	$ 5,135	$ 4,985	$ 10,230	$ 9,139

As of June 30, 2019 , total unrecognized compensation cost was $34.8 million related to unvested share-based compensation arrangements which is expected to be recognized over a weighted average period of 2.8 years .

The total stock-based compensation cost capitalized in inventory was $0.5 million and $0.4 million as of June 30, 2019 and December 31, 2018 , respectively.

11. Accumulated Other Comprehensive Loss

Other comprehensive income (loss) consists of two components: unrealized gains or losses on the Company's available-for-sale marketable investments and gains or losses from foreign currency translation adjustments. Until realized and reported as a component of net (loss) income, these comprehensive income (loss) items accumulate and are included within accumulated other comprehensive loss. Unrealized gains and losses on the Company's marketable investments are reclassified from accumulated other comprehensive loss into earnings when realized upon sale, and are determined based on specific identification of securities sold. Gains and losses from the translation of assets and liabilities denominated in non-U.S. dollar functional currencies are included in accumulated other comprehensive loss.

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The following table summarizes the changes in the accumulated balances during the three and six months ended June 30, 2019 and June 30, 2018 , and includes information regarding the manner in which the reclassifications out of accumulated other comprehensive loss into earnings affect the Company’s condensed consolidated statements of operations and consolidated statements of comprehensive income (in thousands):

	Three Months Ended June 30, 2019			Three Months Ended June 30, 2018		
	Marketable Investments	Currency Translation Adjustments	Total	Marketable Investments	Currency Translation Adjustments	Total
Balance at beginning of the period	$ (38)	$ (2,540)	$ (2,578)	$ (553)	$ 3,190	$ 2,637
Other comprehensive income (loss) before reclassifications:						
Unrealized gain — marketable investments	214	—	214	132	—	132
Foreign currency translation gains (losses)	—	850	850	—	(3,400)	(3,400)
Income tax effect — benefit (expense)	—	—	—	(30)	—	(30)
Net of tax	214	850	1,064	102	(3,400)	(3,298)
Amounts reclassified from accumulated other comprehensive income to earnings:						
Income tax effect — expenses	—	—	—	—	—	—
Net of tax	—	—	—	—	—	—
Net current-year other comprehensive income (loss)	214	850	1,064	102	(3,400)	(3,298)
Balance at end of the period	$ 176	$ (1,690)	$ (1,514)	$ (451)	$ (210)	$ (661)

	Six Months Ended June 30, 2019			Six Months Ended June 30, 2018		
	Marketable Investments	Currency Translation Adjustments	Total	Marketable Investments	Currency Translation Adjustments	Total
Balance at beginning of the period	$ (500)	$ (1,442)	$ (1,942)	$ (235)	$ 1,804	$ 1,569
Other comprehensive (loss) income before reclassifications:						
Unrealized gain (losses) — marketable investments	676	—	676	(253)	—	(253)
Foreign currency translation (losses)	—	(248)	(248)	—	(1,792)	(1,792)
Income tax effect — benefit (expense)	—	—	—	37	(222)	(185)
Net of tax	676	(248)	428	(216)	(2,014)	(2,230)
Amounts reclassified from accumulated other comprehensive income to earnings:						
Income tax effect — expense	—	—	—	—	—	—
Net of tax	—	—	—	—	—	—
Net current-year other comprehensive (loss) income	676	(248)	428	(216)	(2,014)	(2,230)
Balance at end of the period	$ 176	$ (1,690)	$ (1,514)	$ (451)	$ (210)	$ (661)

12. Income Taxes

The Company’s income tax expense, deferred tax assets and liabilities, and reserves for unrecognized tax benefits reflect management’s best assessment of estimated current and future taxes to be paid. The Company is subject to income taxes in both the United States and foreign jurisdictions. Significant judgment and estimates are required in determining the consolidated income tax expense.

During interim periods, the Company generally utilizes the estimated annual effective tax rate method which involves the use of forecasted information. Under this method, the provision is calculated by applying an estimate of the annual effective tax rate for the full fiscal year to “ordinary” income or loss (pretax income or loss excluding unusual or infrequently occurring discrete items) for the reporting period. Jurisdictions with tax assets for which the Company believes a tax benefit cannot be realized are excluded from the computation of its annual effective tax rate.

The Company’s benefit from income taxes for the three months ended June 30, 2019 was $2.7 million , compared to $4.9 million of tax benefit for the three months ended June 30, 2018 . The Company’s effective tax rate changed to (20.2)% for the three months ended June 30, 2019 , compared to (51.2)% for the three months ended June 30, 2018 . The Company’s benefit from income taxes for the six months ended June 30, 2019 was $1.3 million , compared to $6.9 million of tax benefit for the six months ended June 30, 2018 . The Company's effective tax rate changed to (5.0)% for the six months ended June 30, 2019 , compared to (48.6)% for the six months ended June 30, 2018 . The Company's benefit from income taxes for the three and six months ended June 30, 2019 and 2018 was primarily due to excess tax benefits from stock-based compensation attributable to the Company's U.S. jurisdiction, offset by income taxes attributable to its worldwide profits. The Company's change in effective tax rate was primarily attributable to lower stock-based compensation excess tax benefits, and higher worldwide profits diluting the impact of such tax benefits on the Company's effective tax rate for the three and six months ended June 30, 2019, when compared to the three and six months ended June 30, 2018.

The 2017 Tax Reform Act significantly revised the U.S. corporate income tax regime. In addition, the Securities and Exchange Commission issued Staff Accounting Bulletin 118 ("SAB 118"), which provided a measurement period, that should not extend beyond one year from the Tax Reform Act enactment date. As such, the Company completed its accounting for the tax effects of the Tax Reform Act under FASB ASC 740 "Income Taxes" based on authoritative guidance available as of the year ended December 31, 2018. Going forward, the Company will continue to evaluate further legislative guidance associated with the Tax Reform Act and determine the tax impact on the financial statements, if any.

Significant domestic deferred tax assets ("DTAs") were generated in recent years, primarily due to excess tax benefits from stock option exercises and vesting of restricted stock. The Company evaluates all available positive and negative evidence, objective and subjective in nature, in each reporting period to determine if sufficient taxable income will be generated to realize the benefits of its DTAs and, if not, a valuation allowance to reduce the DTAs is recorded. As of June 30, 2019 and 2018, the Company maintains a valuation allowance against its Federal Research and Development Tax Credit and California DTAs as the Company could not conclude at the required more-likely-than-not level of certainty, that the benefit of these tax attributes would be realized prior to expiration. As of June 30, 2019 , the Company also maintains a valuation allowance against DTAs acquired from MVI which are subject to Separate Return Limitation Year ("SRLY") rules that limit the utilization of the pre-acquisition tax attributes to offset future taxable income solely generated by MVI.

The Company maintains that all foreign earnings, with the exception of a portion of the earnings of its German subsidiary, are permanently reinvested outside the United States and therefore deferred taxes attributable to such are not provided for in the Company's financial statements as of June 30, 2019 . The Company will repatriate foreign earnings only to the extent doing so will not result in any material U.S. tax consequences. Thus, deferred taxes on any potential future repatriation of a portion of the earnings of its German subsidiary were not reflected in the Company's financial statements as of June 30, 2019 .

13. Net Income Attributable to Penumbra, Inc. Per Share

The Company's basic net income attributable to Penumbra, Inc. per share is calculated by dividing the net income attributable to Penumbra, Inc. by the weighted average number of shares of common stock outstanding for the period. The diluted net income per share is computed by giving effect to all potential dilutive common stock equivalents outstanding for the period. For purposes of this calculation, options to purchase common stock, restricted stock, restricted stock units and stock sold through the Company's employee stock purchase plan are considered common stock equivalents.

A reconciliation of the numerator and denominator used in the calculation of the basic and diluted net income per share for the three and six months ended June 30, 2019 and 2018 is as follows (in thousands, except share and per share amounts):

	Three Months Ended June 30,		Six Months Ended June 30,	
	2019	2018	2019	2018
Numerator:				
Net income attributable to Penumbra, Inc.	$ 16,588	$ 13,381	$ 27,286	$ 18,872
Denominator:				
Weighted average shares used to compute net income:				
Basic	34,694,228	34,072,223	34,601,270	33,959,997
Effect of dilutive securities from stock-based benefit plans, as calculated using treasury stock method	1,520,093	2,044,031	1,613,092	2,070,307
Diluted	36,214,321	36,116,254	36,214,362	36,030,304
Net income attributable to Penumbra, Inc. per share from:				
Basic	$ 0.48	$ 0.39	$ 0.79	$ 0.56
Diluted	$ 0.46	$ 0.37	$ 0.75	$ 0.52

Outstanding common stock equivalents of 45 thousand and 8 thousand shares for the three months ended June 30, 2019 and 2018 , respectively, and 48 thousand and 63 thousand shares for the six months ended June 30, 2019 and 2018 , respectively, were excluded from the computation of diluted net income attributable to Penumbra, Inc. per share because their effect would have been anti-dilutive.

Penumbra, Inc.
Notes to Condensed Consolidated Financial Statements
(unaudited)

14. Revenues

Revenue Recognition

Revenue is recognized in an amount that reflects the consideration the Company expects to be entitled to in exchange for goods or services. All revenue recognized in the income statement is considered to be revenue from contracts with customers.

The following table presents the Company's revenues disaggregated by geography , based on the destination to which the Company ships its products, for the three and six months ended June 30, 2019 and 2018 (in thousands):

	Three Months Ended June 30,		Six Months Ended June 30,	
	2019	2018	2019	2018
United States	$ 86,374	$ 71,279	$ 168,885	$ 137,080
Japan	12,231	10,614	21,753	21,296
Other International	35,596	27,745	72,002	53,963
Total	$ 134,201	$ 109,638	$ 262,640	$ 212,339

The following table presents the Company's revenues disaggregated by product category, for the three and six months ended June 30, 2019 and 2018 (in thousands):

	Three Months Ended June 30,		Six Months Ended June 30,	
	2019	2018	2019	2018
Neuro	$ 81,547	$ 74,196	$ 163,018	$ 145,624
Vascular	52,654	35,442	99,622	66,715
Total	$ 134,201	$ 109,638	$ 262,640	$ 212,339

Performance Obligations

Delivery of products - The Company's contracts with customers typically contain a single performance obligation, delivery of Penumbra products. Satisfaction of that performance obligation occurs when control of the promised goods transfers to the customer, which is generally upon shipment for non-consignment sale agreements and upon utilization for consignment sale agreements.

Payment terms - The Company's payment terms vary by the type and location of our customer. The timing between fulfillment of performance obligations and when payment is due is not significant and does not give rise to financing transactions. The Company did not have any contracts with significant financing components as of June 30, 2019 .

Product returns - The Company may allow customers to return products purchased at the Company's discretion. The Company estimates the amount of its product sales that may be returned by its customers and records this estimate as a reduction of revenue in the period the related product revenue is recognized. The Company currently estimates product return liabilities using its own historic sales information, trends, industry data, and other relevant data points.

Warranties - The Company offers its standard warranty to all customers and it is not available for sale on a standalone basis. The Company's standard warranty represents its guarantee that its products function as intended, are free from defects, and comply with agreed-upon specifications and quality standards. This assurance does not constitute a service and is not a separate performance obligation.

Transaction Price

Revenue is recorded at the net sales price, which includes estimates of variable consideration such as product returns utilizing historical return rates, rebates, discounts, and other adjustments to net revenue. To the extent the transaction price includes variable consideration, the Company estimates the amount of variable consideration that should be included in the transaction price. When determining if variable consideration should be constrained, management considers whether there are factors that could result in a significant reversal of revenue and the likelihood of a potential reversal. Variable consideration is included in revenue only to the extent that it is probable that a significant reversal of the revenue recognized will not occur when the uncertainty associated with the variable consideration is subsequently resolved. These estimates are re-assessed each reporting period as required. During the three and six months ended June 30, 2019 , the Company made no changes in estimates for variable consideration. When the Company performs shipping and handling activities after control of goods is transferred to the customer, they are considered as fulfillment activities, and costs are accrued for when the related revenue is recognized. Taxes collected from customers relating to product sales and remitted to governmental authorities are excluded from revenues.

ITEM 2. MANAGEMENT’S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS.

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with the unaudited condensed consolidated financial statements and the related notes thereto included elsewhere in this Quarterly Report on Form 10-Q and the audited consolidated financial statements and notes thereto and management’s discussion and analysis of financial condition and results of operations for the year ended December 31, 2018 , included in our Annual Report on Form 10-K filed with the Securities and Exchange Commission (“SEC”) on February 26, 2019 .

This Quarterly Report on Form 10-Q contains “forward-looking statements” within the meaning of 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 our Annual Report on Form 10-K for the year ended December 31, 2018 . 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

Penumbra (“we,” “our,” “us,” “Penumbra,” and the “Company”) is a global healthcare company focused on innovative therapies. We design, develop, manufacture and market medical devices and have a broad portfolio of products that addresses challenging medical conditions and significant clinical needs across our major markets. Our team focuses on developing, manufacturing and marketing products for use by specialist physicians to drive improved clinical outcomes. We believe that the cost-effectiveness of our products is attractive to our hospital customers.

Since our founding in 2004, we have invested heavily in our product development capabilities in our major markets: neuro and vascular. We launched our first neuro product in 2007, our first vascular product in 2013 and our first neurosurgical product in 2014. We expect to continue to develop and build our portfolio of products based on our thrombectomy, embolization and access technologies. Generally, when we introduce a next generation product or a new product designed to replace a current product, sales of the earlier generation product or the product replaced decline. Our research and development activities are centered around the development of new products and clinical activities designed to support our regulatory submissions and demonstrate the effectiveness of our products.

To address the challenging and significant clinical needs of our two key markets, we developed products that fall into the following broad product offering families:

<u>Our neuro products fall into four broad product families:</u>

- Neuro thrombectomy - Penumbra System designed for mechanical thrombectomy, including Penumbra JET and ACE reperfusion catheters, aspiration tubing, aspiration pump, and the 3D Revascularization Device
- Neuro embolization - Penumbra SMART COIL, Penumbra Coil 400, POD400, PAC400 and PX SLIM
- Neuro access - delivery catheters, consisting of Neuron, Neuron MAX, Select, BENCHMARK and DDC
- Neurosurgical - Artemis Neuro Evacuation Device

<u>Our vascular products fall into two broad product families:</u>

- Vascular thrombectomy - Indigo System designed for mechanical thrombectomy, including aspiration catheters, separators, aspiration pump and accessories
- Vascular embolization - Ruby Coil System, POD System (POD and POD Packing Coil) and the LANTERN Delivery Microcatheter

We sell our products to hospitals primarily through our direct sales organization in the United States, most of Europe, Canada and Australia, as well as through distributors in select international markets. In the six months ended June 30, 2019 and 2018 , 35.7% and 35.4% of our revenue, respectively, was generated from customers located outside of the United States. Our sales outside of the United States are denominated principally in the euro and Japanese yen, with some sales being denominated in other currencies. As a result, we have foreign exchange exposure, but do not currently engage in hedging.

We generated revenue of $262.6 million and $212.3 million for the six months ended June 30, 2019 and 2018 , respectively, an increase of $50.3 million . We generated operating income of $24.0 million and $13.3 million for the six months ended June 30, 2019 and June 30, 2018 , respectively.

Factors Affecting Our Performance

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

- The rate at which we grow our salesforce and the speed at which newly hired salespeople become fully effective can impact our revenue growth or our costs incurred in anticipation of such growth.
- Our industry is intensely competitive and, in particular, we compete with a number of large, well-capitalized companies. We must continue to successfully compete in light of our competitors' existing and future products and their resources to successfully market to the specialist physicians who use our products.
- We must continue to successfully introduce new products that gain acceptance with specialist physicians and successfully transition from existing products to new products, ensuring adequate supply. In addition, as we introduce new products, we generally hire and train additional personnel and build our inventory of components and finished goods in advance of sales, which may cause quarterly fluctuations in our operating results and financial condition.
- Publications of clinical results by us, our competitors and other third parties can have a significant influence on whether, and the degree to which, our products are used by specialist physicians and the procedures and treatments those physicians choose to administer for a given condition.
- The specialist physicians who use our products may not perform procedures during certain times of the year, such as those periods when they are at major medical conferences or are away from their practices for other reasons, the timing of which occurs irregularly during the year and from year to year.
- Most of our sales outside of the United States are denominated in the local currency of the country in which we sell our products. As a result, our revenue from international sales can be significantly impacted by fluctuations in foreign currency exchange rates.

In addition, we have experienced and expect to continue to experience meaningful variability in our quarterly revenue, gross profit and gross margin percentage as a result of a number of factors, including, but not limited to: the number of available selling days, which can be impacted by holidays; the mix of products sold; the geographic mix of where products are sold; the demand for our products and the products of our competitors; the timing of or failure to obtain regulatory approvals or clearances for products; increased competition; the timing of customer orders; inventory write-offs due to obsolescence; costs, benefits and timing of new product introductions; costs, benefits and timing of the acquisition and integration of businesses and product lines we may acquire; the availability and cost of components and raw materials; and fluctuations in foreign currency exchange rates. We may experience quarters in which we have significant revenue growth sequentially followed by quarters of moderate or no revenue growth. Additionally, we may experience quarters in which operating expenses, in particular research and development expenses, fluctuate depending on the stage and timing of product development.

Components of Results of Operations

Revenue. We sell our products directly to hospitals and through distributors for use in procedures performed by specialist physicians to treat patients in two key markets: neuro and vascular disease. We sell our products through purchase orders, and we do not have long term purchase commitments from our customers. Revenue from product sales is recognized either on the date of shipment or the date of receipt by the customer. With respect to products that we consign to hospitals, which primarily consist of coils, we recognize revenue at the time hospitals utilize products in a procedure. Revenue also includes shipping and handling costs that we charge to customers.

Cost of Revenue. Cost of revenue consists primarily of the cost of raw materials and components, personnel costs, including stock-based compensation, inbound freight charges, receiving costs, inspection and testing costs, warehousing costs, royalty expense, shipping and handling costs and other labor and overhead costs incurred in the manufacturing of products. We manufacture substantially all of our products in our manufacturing facility at our campus in Alameda, California.

Operating Expenses

Research and Development (R&D). R&D expenses primarily consist of product development, clinical and regulatory expenses, materials, depreciation and other costs associated with the development of our products. R&D expenses also include salaries, benefits and other related costs, including stock-based compensation, for personnel and consultants. We expense R&D costs as they are incurred.

Sales, General and Administrative (SG&A). SG&A expenses primarily consist of salaries, benefits and other related costs, including stock-based compensation, for personnel and consultants engaged in sales, marketing, finance, legal, compliance, administrative, facilities and information technology and human resource activities. Our SG&A expenses also include marketing trials, medical education, training, commissions, generally based on sales, to direct sales representatives, amortization of acquired intangible assets and acquisition-related costs.

Income Tax Expense. We are taxed at the rates applicable within each jurisdiction in which we operate. The composite income tax rate, tax provisions, deferred tax assets and deferred tax liabilities will vary according to the jurisdiction in which profits arise. Tax laws are complex and subject to different interpretations by management and the respective governmental taxing authorities, and require us to exercise judgment in determining our income tax provision, our deferred tax assets and deferred tax liabilities and the potential valuation allowance recorded against our net DTAs. Deferred tax assets and liabilities are determined using the enacted tax rates in effect for the years in which those tax assets are expected to be realized. A valuation allowance is established when it is more likely than not that the future realization of all or some of the DTAs will not be achieved.

Results of Operations

The following table sets forth the components of our condensed consolidated statements of operations in dollars and as a percentage of revenue for the periods presented:

	Three Months Ended June 30,				Six Months Ended June 30,			
	2019		2018		2019		2018	
	(in thousands, except for percentages)				(in thousands, except for percentages)			
Revenue	$ 134,201	100.0 %	$ 109,638	100.0 %	$ 262,640	100.0 %	$ 212,339	100.0 %
Cost of revenue	40,273	30.0	37,386	34.1	84,802	32.3	73,530	34.6
Gross profit	93,928	70.0	72,252	65.9	177,838	67.7	138,809	65.4
Operating expenses:								
Research and development	13,462	10.0	8,193	7.5	25,129	9.6	16,206	7.6
Sales, general and administrative	67,665	50.4	54,776	50.0	128,756	49.0	109,275	51.5
Total operating expenses	81,127	60.5	62,969	57.4	153,885	58.6	125,481	59.1
Income from operations	12,801	9.5	9,283	8.5	23,953	9.1	13,328	6.3
Interest income, net	784	0.6	720	0.7	1,517	0.6	1,469	0.7
Other expense, net	(71)	(0.1)	(340)	(0.3)	(47)	—	(630)	(0.3)
Income before income taxes and equity in losses of unconsolidated investee	13,514	10.1	9,663	8.8	25,423	9.7	14,167	6.7
Benefit from income taxes	(2,735)	(2.0)	(4,948)	(4.5)	(1,280)	(0.5)	(6,886)	(3.2)
Income before equity in losses of unconsolidated investee	16,249	12.1	14,611	13.3	26,703	10.2	21,053	9.9
Equity in losses of unconsolidated investee	—	—	(1,230)	(1.1)	—	—	(2,181)	(1.0)
Consolidated net income	$ 16,249	12.1 %	13,381	12.2 %	$ 26,703	10.2 %	$ 18,872	8.9 %
Net loss attributable to non-controlling interest	(339)	(0.3)	—	—	(583)	(0.2)	—	—
Net income attributable to Penumbra, Inc.	$ 16,588	12.4 %	$ 13,381	12.2 %	$ 27,286	10.4 %	$ 18,872	8.9 %

Three Months Ended June 30, 2019 Compared to the Three Months Ended June 30, 2018

Revenue

	Three Months Ended June 30,		Change	
	2019	2018	$	%
	(in thousands, except for percentages)			
Neuro	$ 81,547	$ 74,196	$ 7,351	9.9%
Vascular	52,654	35,442	17,212	48.6%
Total	$ 134,201	$ 109,638	$ 24,563	22.4%

Revenue increase d $24.6 million , or 22.4% , to $134.2 million in the three months ended June 30, 2019 , from $109.6 million in the three months ended June 30, 2018 . Our revenue growth resulted from further market penetration of our existing products and sales of new products. Sales within our neuro and vascular businesses accounted for approximately 30% and 70% of the revenue increase, respectively, in the three months ended June 30, 2019 . These revenue increases take into account a shift in revenue from neuro to vascular as a result of our peripheral embolization launch in Japan in the fourth quarter of 2018.

Revenue from our neuro products increased $7.4 million , or 9.9% , to $81.5 million in the three months ended June 30, 2019 , from $74.2 million in the three months ended June 30, 2018 . This was primarily attributable to increased sales of our Penumbra System, which accounted for approximately 110% of the total change in neuro revenue . Our neuro thrombectomy product sales experienced strong momentum due to further market penetration and growth in the market for endovascular treatment of stroke, which led to an increase in the number of procedures performed by specialist physicians using these products. This growth was partially offset by a decrease in sales of our neuro embolization products, which decreased by approximately 60% of the total change in neuro revenue, as demand for our neuro embolization products fluctuates from period to period due to the number of procedures performed. The decrease was also attributable to shifts in revenue from neuro to vascular as discussed above. Prices for our neuro products remained substantially unchanged during the period.

Revenue from our vascular products increased $17.2 million , or 48.6% , to $52.7 million in the three months ended June 30, 2019 , from $35.4 million in the three months ended June 30, 2018 . This increase was driven by sales of our Indigo System products which accounted for approximately half of the vascular revenue increase in the three months ended June 30, 2019 . This was primarily attributable to further market penetration which led to increases in the number of procedures performed by specialist physicians using our products. Prices for our vascular products remained substantially unchanged during the period.

Revenue by Geographic Area

The following table presents revenue by geographic area and from countries that exceeded 10% of our total revenue, based on our customers' shipping destinations:

	Three Months Ended June 30,				Change	
	2019		2018		$	%
	(in thousands, except for percentages)					
United States	$ 86,374	64.4%	$ 71,279	65.0%	$ 15,095	21.2%
Japan	12,231	9.1%	10,614	9.7%	1,617	15.2%
Other International	35,596	26.5%	27,745	25.3%	7,851	28.3%
Total	$ 134,201	100.0%	$ 109,638	100.0%	$ 24,563	22.4%

Revenue from sales in international markets increased $9.5 million , or 24.7% , to $47.8 million in the three months ended June 30, 2019 , from $38.4 million in the three months ended June 30, 2018 . Revenue from international sales represented 35.6% and 35.0% of our total revenue for the three months ended June 30, 2019 and 2018 , respectively.

Gross Margin

	Three Months Ended June 30,		Change	
	2019	2018	$	%
	(in thousands, except for percentages)			
Cost of revenue	$ 40,273	$ 37,386	$ 2,887	7.7%
Gross profit	$ 93,928	$ 72,252	$ 21,676	30.0%
Gross margin %	70.0%	65.9%		

Gross margin increased 4.1 percentage points to 70.0% in the three months ended June 30, 2019 , from 65.9% in the three months ended June 30, 2018 . The increase in gross margin was primarily due to a more favorable revenue mix and lower production variances.

Research and Development (R&D)

	Three Months Ended June 30,		Change	
	2019	2018	$	%
	(in thousands, except for percentages)			
R&D	$ 13,462	$ 8,193	$ 5,269	64.3%
R&D as a percentage of revenue	*10.0%*	*7.5%*		

R&D expenses increased by $5.3 million , or 64.3% , to $13.5 million in the three months ended June 30, 2019 , from $8.2 million in the three months ended June 30, 2018 . The increase was primarily due to a $2.7 million increase in product development and testing costs and a $1.7 million increase in personnel-related expenses primarily due to an increase in headcount to support our growth.

We have made investments, and plan to continue to make investments, in the development of our products, which may include hiring additional research and development employees. In addition, we have experienced in the past, and may continue to experience in the future, variability in expenses incurred due to the timing and costs of clinical trials.

Sales, General and Administrative (SG&A)

	Three Months Ended June 30,		Change	
	2019	2018	$	%
	(in thousands, except for percentages)			
SG&A	$ 67,665	$ 54,776	$ 12,889	23.5%
SG&A as a percentage of revenue	*50.4%*	*50.0%*		

SG&A expenses increased by $12.9 million , or 23.5% , to $67.7 million in the three months ended June 30, 2019 , from $54.8 million in the three months ended June 30, 2018 . The increase was primarily due to a $6.5 million increase in personnel-related expenses largely attributable to an increase in headcount to support our growth, a $2.5 million increase related to marketing events and a $1.4 million increase in travel-related expenses.

As we continue to invest in our growth, we have expanded and expect to continue to expand our sales, marketing, general and administrative teams through the hiring of additional employees. In addition, we have experienced in the past, and may continue to experience in the future, variability in expenses incurred due to the timing and costs of investments in infrastructure to support the business.

Provision for (Benefit from) Income Taxes

	Three Months Ended June 30,		Change	
	2019	2018	$	%
	(in thousands, except for percentages)			
Benefit from income taxes	$ (2,735)	$ (4,948)	$ 2,213	(44.7)%
Effective tax rate	*(20.2)%*	*(51.2)%*		

Our benefit from income taxes was $2.7 million for the three months ended June 30, 2019 , compared to $4.9 million of tax benefit for the three months ended June 30, 2018 . Our effective tax rate changed to (20.2)% for the three months ended June 30, 2019 , compared to (51.2)% for the three months ended June 30, 2018 . Our benefit from income taxes for the three months ended June 30, 2019 and 2018 was primarily due to excess tax benefits from stock-based compensation attributable to the Company's U.S. jurisdiction, offset by income taxes attributable to our worldwide profits. Our change in rate was primarily attributable to lower stock-based compensation excess tax benefits, and higher worldwide profits diluting the impact of such tax benefits on our effective tax rate in the three months ended June 30, 2019 , when compared to the three months ended June 30, 2018 .

Six Months Ended June 30, 2019 Compared to the Six Months Ended June 30, 2018

Revenue

	Six Months Ended June 30,		Change	
	2019	2018	$	%
	(in thousands, except for percentages)			
Neuro	$ 163,018	$ 145,624	$ 17,394	11.9%
Vascular	99,622	66,715	32,907	49.3%
Total	$ 262,640	$ 212,339	$ 50,301	23.7%

Revenue increase d $50.3 million , or 23.7% , to $262.6 million in the six months ended June 30, 2019 , from $212.3 million in the six months ended June 30, 2018 . Our revenue growth resulted from further market penetration of our existing products and sales of new products. Increased sales within our neuro and vascular businesses accounted for approximately 35% and approximately 65% of the revenue increase , respectively, in the six months ended June 30, 2019 . These revenue increases take into account a shift in revenue from neuro to vascular as a result of our peripheral embolization launch in Japan in the fourth quarter of 2018.

Revenue from our neuro products increased $17.4 million , or 11.9% , to $163.0 million in the six months ended June 30, 2019 , from $145.6 million in the six months ended June 30, 2018 . This was primarily attributable to increased sales of our Penumbra System products which accounted for slightly less than 100% of the total change in neuro revenue . Our neuro thrombectomy product sales experienced strong momentum due to further market penetration and growth in the market for endovascular treatment of stroke, which led to an increase in the number of procedures performed by specialist physicians using these products. This growth was partially offset by a decrease in sales of our neuro embolization products, which decreased by slightly less than 40% the total change in neuro revenue, as demand for our neuro embolization products fluctuates from period to period due to the number of procedures performed. The decrease was also attributable to shifts in revenue from neuro to vascular as discussed above. Prices for our neuro products remained substantially unchanged during the period.

Revenue from our vascular products increased $32.9 million , or 49.3% , to $99.6 million in the six months ended June 30, 2019 , from $66.7 million in the six months ended June 30, 2018 . This was driven by increased sales of Indigo System products, which accounted for approximately half of the vascular revenue increase. This increase was primarily attributable to further market penetration which led to increases in the number of procedures performed by specialist physicians using our products. Prices for our vascular products remained substantially unchanged during the period.

Revenue by Geographic Area

The following table presents revenue by geographic area and from countries that exceeded 10% of our total revenue, based on our customer's shipping destination, for the six months ended June 30, 2019 and 2018 :

	Six Months Ended June 30,				Change	
	2019		2018		$	%
	(in thousands, except for percentages)					
United States	$ 168,885	64.3%	$ 137,080	64.6%	$ 31,805	23.2%
Japan	21,753	8.3%	21,296	10.0%	457	2.1%
Other International	72,002	27.4%	53,963	25.4%	18,039	33.4%
Total	$ 262,640	100.0%	$ 212,339	100.0%	$ 50,301	23.7%

Revenue from sales in international markets increased $18.5 million , or 24.6% , to $93.8 million in the six months ended June 30, 2019 , from $75.3 million in the six months ended June 30, 2018 . Revenue from international sales represented 35.7% and 35.4% of our total revenue for the six months ended June 30, 2019 and 2018 , respectively.

Gross Margin

	Six Months Ended June 30,		Change	
	2019	2018	$	%
	(in thousands, except for percentages)			
Cost of revenue	$ 84,802	$ 73,530	$ 11,272	15.3%
Gross profit	$ 177,838	$ 138,809	$ 39,029	28.1%
Gross margin %	67.7%	65.4%		

Gross margin increase d 2.3 percentage points to 67.7% in the six months ended June 30, 2019 , from 65.4% in the six months ended June 30, 2018 . The increase in gross margin was primarily due to a more favorable revenue mix and lower production variances.

Research and Development (R&D)

	Six Months Ended June 30,		Change	
	2019	2018	$	%
	(in thousands, except for percentages)			
R&D	$ 25,129	$ 16,206	$ 8,923	55.1%
R&D as a percentage of revenue	*9.6%*	*7.6%*		

R&D expenses increased by $8.9 million , or 55.1% , to $25.1 million in the six months ended June 30, 2019 , from $16.2 million in the six months ended June 30, 2018 . The increase was primarily a $4.2 million increase in product development and testing costs and a $3.0 million increase in personnel-related expenses primarily due to an increase in headcount to support our growth.

We have made investments, and plan to continue to make investments, in the development of our products, which may include hiring additional research and development employees. In addition, we have experienced in the past, and may continue to experience in the future, variability in expenses incurred due to the timing and costs of clinical trials.

Sales, General and Administrative (SG&A)

	Six Months Ended June 30,		Change	
	2019	2018	$	%
	(in thousands, except for percentages)			
SG&A	$ 128,756	$ 109,275	$ 19,481	17.8%
SG&A *as a percentage of revenue*	*49.0%*	*51.5%*		

SG&A expenses increased by $19.5 million , or 17.8% , to $128.8 million in the six months ended June 30, 2019 , from $109.3 million in the six months ended June 30, 2018 . The increase was primarily due to a $11.5 million increase in personnel-related expense primarily attributable to an increase in headcount to support our growth, a $3.6 million increase related to marketing events and a $1.6 million increase in travel-related expenses.

As we continue to invest in our growth, we have expanded and expect to continue to expand our sales, marketing, general and administrative teams through the hiring of additional employees. In addition, we have experienced in the past, and may continue to experience in the future, variability in expenses incurred due to the timing and costs of investments in infrastructure to support the business.

Provision for (Benefit from) Income Taxes

	Six Months Ended June 30,		Change	
	2019	2018	$	%
	(in thousands, except for percentages)			
(Benefit from) provision for income taxes	$ (1,280)	$ (6,886)	$ 5,606	(81.4)%
Effective tax rate	*(5.0)%*	*(48.6)%*		

Our benefit from income taxes was $1.3 million for the six months ended June 30, 2019 , compared to $6.9 million of tax benefit for the six months ended June 30, 2018 . Our effective tax rate changed to (5.0)% for the six months ended June 30, 2019 , compared to (48.6)% for the six months ended June 30, 2018 . Our benefit from income taxes for the six months ended June 30, 2019 and 2018 was primarily due to excess tax benefits from stock-based compensation attributable to the Company's U.S. jurisdiction, offset by income taxes attributable to our worldwide profits. Our change in rate was primarily attributable to lower stock-based compensation excess tax benefits, and higher worldwide profits diluting the impact of such tax benefits on our effective tax rate for the six months ended June 30, 2019, when compared to the six months ended June 30, 2018.

Prospectively, our effective tax rate will likely be driven by (1) permanent differences in taxable income for tax and financial reporting purposes, (2) tax expense attributable to our foreign jurisdictions, and (3) discrete tax adjustments such as excess tax benefits related to stock-based compensation. Our income tax provision is subject to volatility as the amount of excess tax benefits can fluctuate from period to period based on the price of our stock, the volume of share-based grants settled or vested, and the fair value assigned to equity awards under U.S. GAAP. In addition, changes in tax law or our interpretation thereof, and changes to our valuation allowance could result with fluctuations in our effective tax rate.

Liquidity and Capital Resources

As of June 30, 2019 , we had $364.8 million in working capital, which included $77.3 million in cash and cash equivalents and $110.0 million in marketable investments. As of June 30, 2019 , we held approximately 28.8% of our cash and cash equivalents in foreign entities.

In March 2017, we issued and sold an aggregate of 1,495,000 shares of our common stock at public offering price of $76.00 per share, less the underwriters' discounts and commissions, pursuant to an underwritten public offering. We received approximately $106.3 million in net cash proceeds after deducting underwriting discounts and commissions of $6.8 million and other offering expenses of $0.5 million . We will continue to use the net proceeds from this offering for general corporate purposes, including working capital, continued development of our products, including research and development and clinical trials, potential acquisitions and other business opportunities. Pending the use of the net proceeds from this offering, we are investing the net proceeds in investment grade, interest bearing securities.

In addition to our existing cash and cash equivalents and marketable investment balances, our principal source of liquidity is our accounts receivable. We believe our sources of liquidity will be sufficient to meet our liquidity requirements for at least the next 12 months. Our principal liquidity requirements are to fund our operations, which includes, but is not limited to, maintaining sufficient levels of inventory to meet the anticipated demand of our customers, funding research and development activities and funding our capital expenditures. We may also lease or purchase additional facilities to facilitate our growth. We expect to continue to make investments as we launch new products, expand our manufacturing operations and further expand into international markets. We may, however, require or elect to secure additional financing as we continue to execute our business strategy. If we require or elect to raise additional funds, we may do so through equity or debt financing, which may not be available on favorable terms, which could result in dilution to our stockholders and could require us to agree to covenants that limit our operating flexibility.

The following table summarizes our cash and cash equivalents, marketable investments and selected working capital data as of June 30, 2019 and December 31, 2018 :

	June 30, 2019	December 31, 2018
	(in thousands)	
Cash and cash equivalents	$ 77,261	$ 67,850
Marketable investments	109,996	133,039
Accounts receivable, net	99,011	81,896
Accounts payable	8,743	8,176
Accrued liabilities	57,276	57,886
Working capital [(1)]	364,843	344,664

(1) Working capital consists of total current assets less total current liabilities.

The following table sets forth, for the periods indicated, our beginning balance of cash and cash equivalents, net cash flows provided by (used in) operating, investing and financing activities and our ending balance of cash and cash equivalents:

	Six Months Ended June 30,	
	2019	2018
	(in thousands)	
Cash and cash equivalents and restricted cash at beginning of period	$ 67,850	$ 50,637
Net cash (used in) provided by operating activities	(165)	10,832
Net cash provided by investing activities	16,742	10,637
Net cash used in financing activities	(7,018)	(11,936)
Cash and cash equivalents and restricted cash at end of period	77,261	59,705

Net Cash (Used In) Provided By Operating Activities

Net cash (used in) provided by operating activities consists primarily of net income adjusted for certain non-cash items (including depreciation and amortization, stock-based compensation expense, loss on non-marketable equity investments, inventory write-downs, changes in deferred tax balances and changes in the fair value of contingent consideration), and the effect of changes in working capital and other activities.

Net cash used in operating activities was $0.2 million during the six months ended June 30, 2019 and consisted of a consolidated net income of $26.7 million and non-cash items of $14.5 million , offset by net changes in operating assets and liabilities of $41.4 million . The change in operating assets and liabilities includes an increase in inventories of $18.5 million t o support our revenue growth, an increase in accounts receivable of $17.6 million , an increase in prepaid expenses and other current and non-current assets of $3.8 million and a decrease in accrued expenses and other non-current liabilities of $1.9 million , partially offset by an increase in accounts payable of $0.4 million as a result of growth in our business activities.

Net cash provided by operating activities was $10.8 million during the six months ended June 30, 2018 and consisted of net income of $18.9 million and non-cash items of $8.5 million , offset by net changes in operating assets and liabilities of $16.6 million . The change in operating assets and liabilities includes an increase in accounts receivable of $16.3 million and an increase in inventories of $3.9 million to support our revenue growth, partially offset by an increase in accrued expenses and other non-current liabilities of $1.6 million , a decrease in prepaid expenses and other current and non-current assets of $1.4 million , and an increase in accounts payable of $0.6 million as a result of the growth in our business activities.

Net Cash Provided By Investing Activities

Net cash provided by investing activities relates primarily to proceeds from maturities and sales of marketable investments, partially offset by purchases of marketable investments, capital expenditures and contributions towards non-marketable investments.

Net cash provided by investing activities was $16.7 million during the six months ended June 30, 2019 and consisted of proceeds from maturities and sales of marketable investments, net of purchases, of $24.0 million , partially offset by capital expenditures of $6.2 million .

Net cash provided by investing activities was $10.6 million during the six months ended June 30, 2018 and consisted of proceeds from maturities and sales of marketable investments, net of purchases, of $16.6 million , partially offset by capital expenditures of $5.1 million and contributions to non-marketable investments of $0.9 million .

Net Cash Used In Financing Activities

Net cash used in financing activities primarily relates to payments of employee taxes related to vested restricted stock and restricted stock units and certain acquisition-related payments, partially offset by proceeds from exercises of stock options.

Net cash used in financing activities was $7.0 million during the six months ended June 30, 2019 and primarily consisted of $13.4 million of payments of employee taxes related to vested restricted stock and restricted stock units and $1.2 million primarily related to contingent consideration payments made in the first quarter of 2019 in connection with our acquisition in 2017. This was partially offset by proceeds from the i ssuance of stock under our employee stock purchase plan of $4.8 million and proceeds from stock option exercises of $2.3 million .

Net cash used in financing activities was $11.9 million during the six months ended June 30, 2018 and primarily consisted of $13.8 million of payments of employee taxes related to vested restricted stock and restricted stock units and $4.4 million of payments made in the 2018 in connection with our acquisition in 2017. This was partially offset by proceeds from the issuance of stock under our employee stock purchase plan of $3.6 million and proceeds from exercises of stock options of $3.2 million .

Contractual Obligations and Commitments

There have been no other material changes to our contractual obligations and commitments as of June 30, 2019 from those disclosed in our Annual Report on Form 10-K for the year ended December 31, 2018 .

Off-Balance Sheet Arrangements

We do not have any significant off-balance sheet arrangements or holdings in variable interest entities.

Critical Accounting Policies and Estimates

We have prepared our financial statements in accordance with U.S. GAAP. Our preparation of these financial statements requires us to make estimates, assumptions, and judgments that affect the reported amounts of assets, liabilities, expenses, and related disclosures at the date of the financial statements, as well as revenue and expenses recorded during the reporting periods. We evaluate our estimates and judgments on an ongoing basis. We base our estimates on 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 could therefore differ materially from these estimates under different assumptions or conditions.

There have been no material changes to our critical accounting policies from those described in “Management’s Discussion and Analysis of Financial Condition and Results of Operations” included in our Annual Report on Form 10-K for the year ended December 31, 2018 , other than the adoption of Accounting Standards Codification (“ASC”) 842 during the first quarter of 2019. The impact of adoption and its effects on our accounting policies and estimates are described in Note “ 2. Summary of Significant Accounting Policies ” and Note “ 8. Leases ” to our condensed consolidated financial statements in Part I, Item 1 of this Quarterly Report on Form 10-Q .

Recently Issued Accounting Standards

For information with respect to recently issued accounting standards and the impact of these standards on our condensed consolidated financial statements, see Note “ 2. Summary of Significant Accounting Policies ” to our condensed consolidated financial statements in Part I, Item 1 of this Quarterly Report on Form 10-Q.

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK.

We are exposed to various market risks, which may result in potential losses arising from adverse changes in market rates, such as interest rates and foreign exchange rates. We do not enter into derivatives or other financial instruments for trading or speculative purposes and do not believe we are exposed to material market risk with respect to our cash and cash equivalents and/or our marketable investments.

Interest Rate Risk. We had cash and cash equivalents of $77.3 million as of June 30, 2019 , which consisted of funds held in general checking and savings accounts. In addition, we had marketable investments of $110.0 million , which consisted primarily of commercial paper, corporate bonds, non-U.S. government debt securities, U.S. agency and government sponsored securities, U.S. states and municipalities and U.S. Treasury. Our investment policy is focused on the preservation of capital and supporting our liquidity needs. Under the policy, we invest in highly rated securities, while limiting the amount of credit exposure to any one issuer other than the U.S. government. We do not invest in financial instruments for trading or speculative purposes, nor do we use leveraged financial instruments. We utilize external investment managers who adhere to the guidelines of our investment policy. A hypothetical 100 basis point change in interest rates would not have a material impact on the value of our cash and cash equivalents or marketable investments.

Foreign Exchange Risk Management. We operate in countries other than the United States, and, therefore, we are exposed to foreign currency risks. We bill most sales outside of the United States in local currencies, primarily euro and Japanese yen, with some sales being denominated in other currencies. We expect that the percentage of our sales denominated in foreign currencies may increase in the foreseeable future as we continue to expand into international markets. When sales or expenses are not denominated in U.S. dollars, a fluctuation in exchange rates could affect our net income. We do not believe our net income would be materially impacted by an immediate 10% adverse change in foreign exchange rates. We do not currently hedge our exposure to foreign currency exchange rate fluctuations; however, we may choose to hedge our exposure in the future.

We do not believe that inflation and changes in prices had a significant impact on our results of operations for any periods presented on our condensed consolidated financial statements.

ITEM 4. CONTROLS AND PROCEDURES.

Evaluation of Disclosure Controls and Procedures

An evaluation as of June 30, 2019 was carried out under the supervision and with the participation of our management, including our principal executive officer and principal financial officer, of the effectiveness of our "disclosure controls and procedures," which are defined in Rule 13a-15(e) under the Securities Exchange Act of 1934, as amended ("the Exchange Act"), as controls and other procedures of a company that are designed to ensure that the information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the Securities and Exchange Commission's rules and forms, and that such information is accumulated and communicated to the company's management, including its principal executive officer and principal financial officer, as appropriate, to allow timely decisions regarding required disclosure. Based upon that evaluation, our principal executive officer and principal financial officer concluded that our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act) were effective at June 30, 2019 .

Changes in Internal Control Over Financial Reporting

There was no change in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) that occurred during the quarterly period ended June 30, 2019 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Limitations on the Effectiveness of Controls

A control system, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. Because of inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues, if any, within a company have been detected. Accordingly, our disclosure controls and procedures are designed to provide reasonable, not absolute, assurance that the objectives of our disclosure control system are met and, as set forth above, our principal executive officer and principal financial officer have concluded, based on their evaluation as of the end of the period covered by this report, that our disclosure controls and procedures were effective to provide reasonable assurance that the objectives of our disclosure control system were met.

PART II - OTHER INFORMATION

ITEM 1. LEGAL PROCEEDINGS.

None.

ITEM 1A. RISK FACTORS.

There have been no material changes to our risk factors reported or new factors identified since the filing of our Annual Report on Form 10-K for the year ended December 31, 2018 , which was filed with the SEC on February 26, 2019 .

ITEM 2. UNREGISTERED SALES OF EQUITY SECURITIES AND USE OF PROCEEDS.

Issuer Purchases of Equity Securities

Period	(a) Total Number of Shares Purchased (1)	(b) Average Price Paid per Share	(c) Total Number of Shares Purchased as Part of Publicly Announced Plans or Programs	(d) Maximum Dollar Value of Shares of Shares that May Yet be Purchased Under the Plans or Programs
April 1, 2019 - April 30, 2019	79,615	$ 137.04	—	—
May 1, 2019 - May 31, 2019	—	—	—	—
June 1, 2019 - June 30, 2019	—	—	—	—
Total	79,615	$ —	—	—

(1) During the three months ended June 30, 2019 , the Company withheld 79,615 shares of restricted stock at an aggregate cost of approximately $10.9 million , as permitted by the applicable equity award agreements, to satisfy employee tax withholding requirements related to the vesting of restricted stock awards.

ITEM 3. DEFAULTS UPON SENIOR SECURITIES.

None.

ITEM 4. MINE SAFETY DISCLOSURE.

None.

ITEM 5. OTHER INFORMATION.

None.

ITEM 6. EXHIBITS.

Exhibit Number	Description	Form	File No.	Exhibit(s)	Filing Date
31.1*	Certification of Principal Executive Officer Required Under Rule 13a-14(a) and 15d-14(a) of the Securities Exchange Act of 1934, as amended.				
31.2*	Certification of Principal Financial Officer Required Under Rule 13a-14(a) and 15d-14(a) of the Securities Exchange Act of 1934, as amended.				
32.1**	Certification of Principal Executive Officer and Principal Financial Officer Required Under Rule 13a-14(b) of the Securities Exchange Act of 1934, as amended, and 18 U.S.C. §1350.				
101*	The following materials from the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2019 formatted in Inline Extensible Business Reporting Language (iXBRL) includes: (i) Condensed Consolidated Balance Sheets as of June 30, 2019 and December 31, 2018, (ii) Condensed Consolidated Statements of Operations for the three and six months ended June 30, 2019 and 2018, (ii) Condensed Consolidated Statements of Comprehensive Income for the three and six months ended June 30, 2019 and 2018, (iii) Condensed Consolidated Statements of Stockholders' Equity for the three and six months ended June 30, 2019 and 2018, (iv) Condensed Consolidated Statements of Cash Flows for the six months ended June 30, 2019 and 2018, and (v) Notes to Condensed Consolidated Financial Statements.				

* Filed herewith.

** Furnished 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 hereunto duly authorized.

	PENUMBRA, INC.
Date: August 6, 2019	
	By: /s/ Sri Kosaraju
	Sri Kosaraju
	Chief Financial Officer and Head of Strategy
	(Principal Financial and Accounting Officer)

Exhibit 31.1

CERTIFICATION OF PRINCIPAL EXECUTIVE OFFICER
PURSUANT TO RULE 13a-14(a) AND 15d-14(a) OF THE SECURITIES EXCHANGE ACT, AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Adam Elsesser, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Penumbra, 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 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)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) 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) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (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 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

/s/ Adam Elsesser
Adam Elsesser
Chairman, Chief Executive Officer and President

Exhibit 31.2

CERTIFICATION OF PRINCIPAL FINANCIAL AND ACCOUNTING OFFICER
PURSUANT TO RULE 13a-14(a) AND 15d-14(a) OF THE SECURITIES EXCHANGE ACT, AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Sri Kosaraju, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Penumbra, 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 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)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) 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) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (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 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

/s/ Sri Kosaraju

Sri Kosaraju
Chief Financial Officer and Head of Strategy

Exhibit 32.1

PENUMBRA, INC.

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 Penumbra, Inc. (the “Company”) on Form 10-Q for the fiscal quarter ended June 30, 2019 , as filed with the Securities and Exchange Commission (the “Report”), Adam Elsesser, Chairman, Chief Executive Officer and President of the Company, and Sri Kosaraju, Chief Financial Officer and Head of Strategy of the Company, respectively, do each hereby certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

- The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- The information in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: August 6, 2019

/s/ Adam Elsesser

Adam Elsesser
Chairman, Chief Executive Officer and President

/s/ Sri Kosaraju

Sri Kosaraju
Chief Financial Officer and Head of Strategy