

EvaluateMedTech®

World Preview 2017, Outlook to 2022



Welcome to the EvaluateMedTech® World Preview 2017, Outlook to 2022

Our sixth annual EvaluateMedTech® World Preview brings together many of our analyses to provide a top level insight into the expected performance of the medtech industry between now and 2022. Based on EvaluateMedTech®'s coverage of the world's leading medical device and diagnostic companies, the World Preview highlights trends in medtech including: consensus sales forecasts of leading industry analysts by device area to 2022; the top 20 companies in 2022; R&D spend current and future; FDA approvals; M&A; venture financing and IPOs. Complimentary copies of the full report can be downloaded at:

www.evaluate.com/MedtechWorldPreview2017

About EvaluateMedTech®

EvaluateMedTech® provides trusted global medtech market intelligence and consensus forecasts delivered through a single integrated and standardised platform, that easily integrates with your own analytical models. It allows medtech companies, financial institutions, consultancies, service providers and others to efficiently track, benchmark and forecast the sector so more time can be spent examining insights and making effective decisions to optimise performance.

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Foreword

In the 2017 edition of the EvaluateMedTech® World Preview we can reveal that the global medtech industry is expected to grow at 5.1% per year between 2016 and 2022, culminating in 2022 global sales of \$522bn (pages 8-9). The analysis is based on in-depth forecast models for the top 300 global medtech companies available within EvaluateMedTech®. This sales forecast represents the only current consensus view from equity analysts of the entire medtech market.

Climbing the ladder

Medtronic is forecast to be the largest company by medical device revenues in 2022, with sales just shy of \$38bn (pages 12-13). Moving up the ranking the fastest, however, is Abbott. The closing of its \$25bn acquisition of St. Jude Medical means it will jump five places to become the third largest group in 2022: its sales are forecast to reach \$19.5bn.

More M&A transactions are in the offing, and could alter the table in future. Becton Dickinson's merger with C. R. Bard is expected to close this autumn, and the extra revenue could allow it to jump four places to become the fourth largest group in 2022. Its sales could top \$18bn.

Mergers back in a big way

After a slow year in 2016 as companies that had made large buys the year before paused to digest their purchases of 2015, M&A activity is once again on the up. At \$49bn, the total value of mergers closed in the first half of 2017 has already eclipsed the total for all of 2016 (pages 30-31).

Despite this the number of deals struck has been falling. Just 97 mergers and acquisitions closed in the first half of this year, compared with 134 in the equivalent period a year before. Mergers are getting bigger, but also scarcer.

Foreword

Ten-year approvals high

A similar pattern can be seen in the analysis of venture capital fundraising rounds. The total raised by medtech companies from VC investors in the first half of this year, \$4bn, is fast approaching the full-year total for 2016, \$4.9bn (pages 32-33). But the first-half total includes two rounds of unprecedented size: Grail's \$900m series B and the \$800m raised by Verily, sister company to Google.

But far fewer VC deals have been done. 168 VC rounds were raised in the first half of 2017, an 11% decrease from the 189 in the first half of 2016. The steady decline in the number of VC deals evident since 2013 looks likely to continue when the final reckoning of 2017's total is made.

It would be going too far to suggest that 2017 might see a return to the kind of M&A pyrotechnics that distinguished 2015. But business development activity is picking up; if dealmaking continues at the same pace in the second half of the year the industry could be a very different place a year hence.

Emily Muir

Emily Mo

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Medtech Reporter

Analysis Highlights

- Worldwide medtech sales forecast to reach \$522bn by 2022
- Worldwide prescription drug market only forecast to grow at a marginally faster rate than the medtech market, with a CAGR of 5.2% between 2016 and 2022, versus 5.1% for medtech
- Total value of MedTech M&A deals rises by a massive 178% in H1 2017 despite drop in deal count
- Abbott's acquisition of St. Jude results in it becoming the second largest cardiology company
- Medtronic remains the largest medtech company in 2016 with sales of almost \$30bn
- ...and Medtronic will remain at the top in 2022 with sales forecast to reach \$37.7bn; Abbott to jump to third place
- Global medtech R&D spend set to grow by 3.7% (CAGR) to \$33.5bn by 2022
- Medtronic top medtech R&D spender in 2022; Abbott to knock Johnson & Johnson off second place spot
- In vitro diagnostics is expected to remain the largest medtech segment in 2022 with annual sales of \$70bn; Roche remains top player with expected sales of \$12.8bn in 2022
- Diagnostic imaging sales forecast to reach \$48bn in 2022; Siemens, General Electric and Philips dominate the market
- Johnson & Johnson continues to lead the orthopedic Market in 2022
- Approval rate for innovative devices increases in the first eight months of 2017; cardiology outperforms other areas
- Following the ten-year high in 2015, number of first-time PMAs and HDEs down 22% in 2016
- Total value of MedTech venture financing deals rises 56% in H1 2017 despite the number of deals falling by 11%
- Total value of Medtech IPOs continues to fall in H1 2017 to \$122m

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Worldwide Medtech Sales by Device Area in 2022



Worldwide medtech sales forecast to grow by 5.1% to \$522bn by 2022; in vitro diagnostics retains its number one spot in 2022.

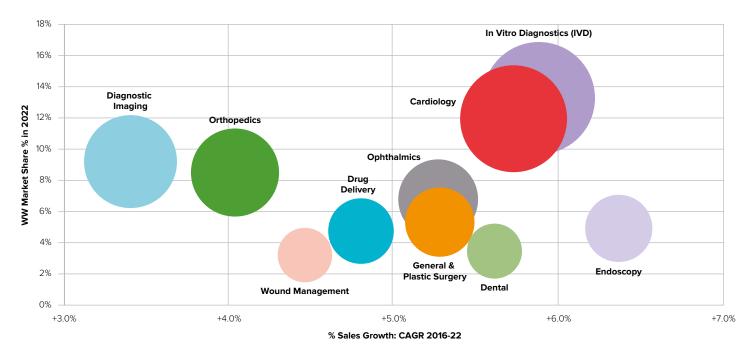
Evaluate consensus forecasts find that the value of the worldwide medtech market will reach \$521.9bn by 2022, growing at a rate of 5.1% per year between 2016 and 2022.

In vitro diagnostics is expected to remain the largest segment in 2022 with annual sales of \$69.6bn, well ahead of second placed cardiology.

Neurology is again forecast to be the fastest-growing device area, with sales expected to rise to \$11.6bn in 2022, representing 7.8% market growth per year between 2016 and 2022.

Analysis on Top 10 Device Areas in 2022, Market Share & Sales Growth (2016-2022)

Source: Evaluate, September 2017



Note: Size of Bubble = WW Sales in 2022



Worldwide Medtech Sales by EvaluateMedTech® Device Area: Top 15 Categories & Total Market (2016 & 2022)

Source: Evaluate, September 2017

		WW Sal	es (\$bn)	CAGR	WW Mar	ket Share		Rank
Rank	Device Area	2016	2022	% Growth	2016	2022	Chg. (+/-)	Chg. (+/-)
1.	In Vitro Diagnostics (IVD)	49.4	69.6	+5.9%	12.8%	13.3%	+0.6pp	-
2.	Cardiology	44.6	62.3	+5.7%	11.5%	11.9%	+0.4pp	-
3.	Diagnostic Imaging	39.2	48.0	+3.4%	10.1%	9.2%	-1.0pp	-
4.	Orthopedics	35.0	44.4	+4.0%	9.0%	8.5%	-0.5pp	-
5.	Ophthalmics	26.0	35.4	+5.3%	6.7%	6.8%	+0.1pp	-
6.	General & Plastic Surgery	20.4	27.8	+5.3%	5.3%	5.3%	+0.0pp	-
7.	Endoscopy	17.8	25.7	+6.4%	4.6%	4.9%	+0.3pp	+1
8.	Drug Delivery	18.6	24.6	+4.8%	4.8%	4.7%	-0.1pp	-1
9.	Dental	12.8	17.8	+5.6%	3.3%	3.4%	+0.1pp	+1
10.	Wound Management	13.0	16.9	+4.5%	3.4%	3.2%	-0.1pp	-1
11.	Diabetic Care	11.0	16.2	+6.6%	2.9%	3.1%	+0.2pp	+1
12.	Nephrology	11.1	14.6	+4.6%	2.9%	2.8%	-0.1pp	-1
13.	General Hospital & Healthcare Supply	11.0	12.8	+2.5%	2.8%	2.4%	-0.4pp	-
14.	Neurology	7.4	11.6	+7.8%	1.9%	2.2%	+0.3pp	+3
15.	Ear, Nose & Throat (ENT)	8.0	11.1	+5.5%	2.1%	2.1%	+0.0pp	-1
	Top 15	325.4	438.6	+5.1%	84.1%	84.0%	-0.1pp	
	Other	61.4	83.3	+5.2%	15.9%	16.0%	+0.1pp	
	Total WW Medtech Sales	386.8	521.9	+5.1%	100.0%	100.0%		

Note: Analysis is based on the top 300 medtech companies. Sales in 2016 based on company reported data. Sales forecasts to 2022 based on a consensus of leading equity analysts' estimates for segmental sales.

Worldwide Medtech Sales in 2016: Top 20 Companies



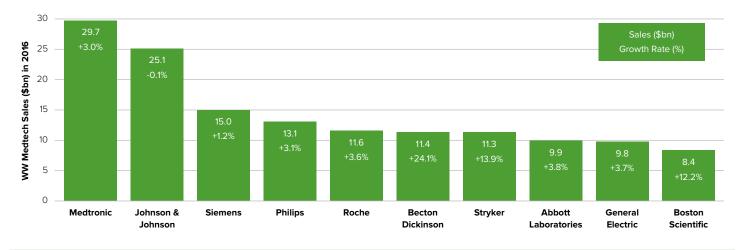
Medtronic remains the largest medtech company in 2016 with sales of almost \$30bn.

Evaluate finds that Medtronic remained the number one company in the medtech industry in 2016, achieving medical device sales of \$29.7bn, which gave it a 7.7% market share.

The substantial revenue growth seen in Becton Dickinson in 2016, of 24.1%, reflects the inclusion of a full 12 months of CareFusion sales, which helped the company jump three places to become the sixth largest device manufacturer. Zimmer Biomet's strong growth is similarly down to the inclusion of a full year of Biomet sales and this has seen it rise up four places in the rankings to 12th.

Worldwide Medtech Sales: Top 10 Companies (2016)

Source: Evaluate, September 2017



Worldwide Medtech Sales in 2016: Top 20 Companies & Total Market

Source: Evaluate, September 2017

			ww	Medtech Sale	s (\$bn)	W	W Market Sha	are	Rank	
Rank	Company	Country	2015	2016	% Growth	2015	2016	Chg. (+/-)	Chg. (+/-)	
1.	Medtronic	USA	28.8	29.7	+3.0%	7.8%	7.7%	-0.1pp	-	
2.	Johnson & Johnson	USA	25.1	25.1	-0.1%	6.8%	6.5%	-0.3pp	-	
3.	Siemens	Germany	14.8	15.0	+1.2%	4.0%	3.9%	-0.1pp	-	
4.	Philips	The Netherlands	12.7	13.1	+3.1%	3.4%	3.4%	-0.0pp	-	
5.	Roche	Switzerland	11.2	11.6	+3.6%	3.0%	3.0%	-0.0pp	-	
6.	Becton Dickinson	USA	9.2	11.4	+24.1%	2.5%	2.9%	+0.5pp	+3	
7.	Stryker	USA	9.9	11.3	+13.9%	2.7%	2.9%	+0.2pp	-1	
8.	Abbott Laboratories	USA	9.6	9.9	+3.8%	2.6%	2.6%	-0.0pp	-1	
9.	General Electric	USA	9.5	9.8	+3.7%	2.6%	2.5%	-0.0pp	-1	
10.	Boston Scientific	USA	7.5	8.4	+12.2%	2.0%	2.2%	+0.2pp	+1	
11.	Danaher	USA	7.6	7.8	+3.4%	2.0%	2.0%	-0.0pp	-1	
12.	Zimmer Biomet	USA	6.0	7.7	+28.1%	1.6%	2.0%	+0.4pp	+4	
13.	B. Braun Melsungen	Germany	6.8	7.2	+5.3%	1.8%	1.9%	+0.0pp	-1	
14.	Baxter International	USA	6.6	6.9	+3.9%	1.8%	1.8%	-0.0pp	-1	
15.	Essilor International	France	6.5	6.9	+6.2%	1.7%	1.8%	+0.0pp	-1	

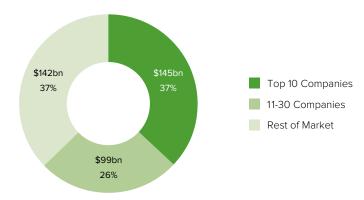
Top 16-20 continued over...

Source: Evaluate, September 2017

		wwi	Medtech Sales	s (\$bn)	w	Rank			
Rank	Company	Country	2015	2016	% Growth	2015	2016	Chg. (+/-)	Chg. (+/-)
16.	St. Jude Medical	USA	5.5	6.0	+9.2%	1.5%	1.6%	+0.1pp	+1
17.	Novartis	Switzerland	6.0	5.8	-3.1%	1.6%	1.5%	-0.1pp	-2
18.	Olympus	Japan	5.1	5.3	+4.8%	1.4%	1.4%	+0.0pp	+1
19.	3M	USA	5.1	5.2	+2.0%	1.4%	1.3%	-0.0pp	-1
20.	Smith & Nephew	United Kingdom	4.6	4.7	+0.8%	1.2%	1.2%	-0.0pp	-
	Total Top 20		198.2	208.9	+5.4%	53.4%	54.0%	+0.6pp	
	Other		172.9	177.8	+2.9%	46.6%	46.0%	-0.6pp	
	Total		371.1	386.8	+4.2%	100.0%	100.0%		

Percentage Composition of Worldwide Medtech Market in 2016

Source: Evaluate, September 2017



Note: Analysis is based on the top 300 medtech companies. Sales based on company reported data.

Revenues for St. Jude Medical are not included in Abbott's 2016 reported sales. Abbott completed the acquisition of St. Jude on 4 January 2017.

Revenues for Alere are not included in Abbott's 2016 reported sales as acquisition has not yet closed.

Revenues for C. R. Bard are not included in Becton Dickinson's 2016 reported sales as acquisition has not yet closed.

Revenues for Spectranetics are not included in Philips's 2016 reported sales. Philips completed the acquisition of Spectranetics on 9 August 2017.

Revenues for Abbott Medical Optics are included in Abbott's 2016 revenues, not Johnson & Johnson & Johnson & Johnson acquired Abbott Medical Optics from Abbott on 27 February 2017.

Worldwide Medtech Sales in 2022: Top 20 Companies



Medtronic to hold onto top spot in 2022; Abbott to jump to third place.

Evaluate consensus forecasts find that Medtronic will continue to be the number one medtech company in 2022, holding an impressive 7.2% share of the market and achieving sales in excess of \$37bn. However, since the EvaluateMedTech World Preview 2016 was published in October 2016, the 2022 forecast for Medtronic has dropped by over \$2bn. Evaluate found that this was predominantly due to equity analysts lowering their forecasts for Medtronic's cardiology & vascular group. A further drop off in sales is expected when equity analysts adjust their forecasts following the disposal

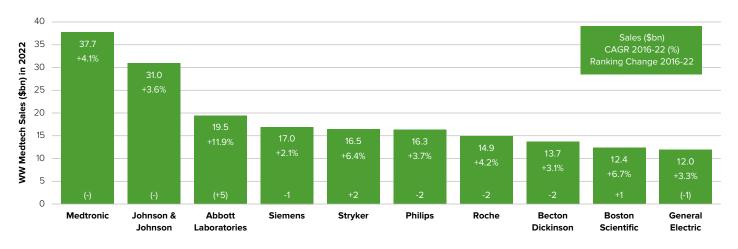
of Medtronic's medical supplies business to Cardinal Health, which currently brings in around \$2.3bn annually.

Abbott's acquisition of St. Jude will see it jump five places to become the third largest player in 2022. The company's sales forecast could well rise further, following Abbott's acquisition of Alere later this year, and sales of over \$22bn in 2022 could be achieved.

Becton Dickinson is currently forecast to be the eighth biggest medtech company in the world. However, following its acquisition of C.R. Bard, the combined company could achieve sales of over \$18bn in 2022, which would place it fourth in the rankings.

Worldwide Medtech Sales: Top 10 Companies (2022)

Source: Evaluate, September 2017



Worldwide Medtech Sales: Top 20 Companies & Total Market (2016 & 2022)

Source: Evaluate, September 2017

			WW Medtech Sales (iales (\$bn)	s (\$bn) 2022 Change		WW Market Share		
Rank	Company	Country	2016	2022	% CAGR 16-22	vs. Sep 16 (\$bn)	2016	2022	Chg. (+/-)	Chg. (+/-)
1.	Medtronic	USA	29.7	37.7	+4.1%	-2.1	7.7%	7.2%	-0.5pp	-
2.	Johnson & Johnson	USA	25.1	31.0	+3.6%	+0.4	6.5%	5.9%	-0.6pp	-
3.	Abbott Laboratories	USA	9.9	19.5	+11.9%	+6.8	2.6%	3.7%	+1.2pp	+5
4.	Siemens	Germany	15.0	17.0	+2.1%	-0.7	3.9%	3.3%	-0.6pp	-1
5.	Stryker	USA	11.3	16.5	+6.4%	+0.4	2.9%	3.2%	+0.2pp	+2
6.	Philips	The Netherlands	13.1	16.3	+3.7%	+0.5	3.4%	3.1%	-0.3pp	-2
7.	Roche	Switzerland	11.6	14.9	+4.2%	+0.1	3.0%	2.9%	-0.2pp	-2
8.	Becton Dickinson	USA	11.4	13.7	+3.1%	-1.0	2.9%	2.6%	-0.3pp	-2
9.	Boston Scientific	USA	8.4	12.4	+6.7%	+1.1	2.2%	2.4%	+0.2pp	+1
10.	General Electric	USA	9.8	12.0	+3.3%	+0.0	2.5%	2.3%	-0.2pp	-1
11.	Danaher	USA	7.8	10.6	+5.2%	+1.5	2.0%	2.0%	+0.0pp	-
12.	Essilor International	France	6.9	10.1	+6.6%	-0.1	1.8%	1.9%	+0.2pp	+3
13.	Zimmer Biomet	USA	7.7	9.2	+3.1%	-0.4	2.0%	1.8%	-0.2pp	-1

Top 14-20 continued over...

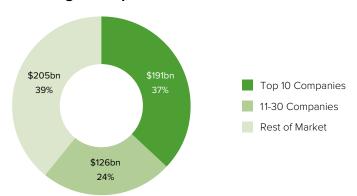


Source: Evaluate, September 2017

Source: Evaluate, September 2017

			WW Medtech Sales (\$bn)			2022 Change	are	Rank		
Rank	Company	Country	2016	2022	% CAGR 16-22	vs. Sep 16 (\$bn)	2016	2022	Chg. (+/-)	Chg. (+/-)
14.	Baxter International	USA	6.9	8.7	+4.0%	+0.0	1.8%	1.7%	-0.1pp	-
15.	B. Braun Melsungen	Germany	7.2	8.7	+3.2%	-0.2	1.9%	1.7%	-0.2pp	-2
16.	Olympus	Japan	5.3	7.2	+5.1%	-1.1	1.4%	1.4%	-0.0pp	+2
17.	Novartis	Switzerland	5.8	7.0	+3.1%	-0.9	1.5%	1.3%	-0.2pp	-
18.	3M	USA	5.2	6.5	+3.8%	-0.3	1.3%	1.2%	-0.1pp	+1
19.	Terumo	Japan	4.4	6.5	+6.9%	+0.5	1.1%	1.2%	+0.1pp	+2
20.	Smith & Nephew	United Kingdom	4.7	5.9	+3.8%	-0.3	1.2%	1.1%	-0.1pp	-
	Total Top 20		207.2	271.2	+4.6%	+4.4	53.6%	52.0%	-1.6pp	
	Other		179.5	250.7	+5.7%		46.4%	48.0%	+1.6pp	
	Total		386.8	521.9	+5.1%		100.0%	100.0%		

Percentage Composition of Worldwide Medtech Market in 2022



Note: Analysis is based on the top 300 medtech companies. Sales in 2016 based on company reported data. Sales forecasts to 2022 based on a consensus of leading equity analysts' estimates for segmental sales.

Medtronic's 2022 forecast still includes the Patient Care, Deep Vein Thrombosis and Nutritional Insufficiency businesses which Medtronic sold to Cardinal Health on 30 July 2017. Sales from this division are approximately \$2.3bn annually.

Revenues for St. Jude Medical are included in Abbott's 2022 forecast but not in the 2016 reported sales. Abbott completed the acquisition of St. Jude on 4 January 2017. St. Jude Medical was estimated to have sales of \$6bn in 2016.

Abbott's 2022 forecast does not include Alere as the acquisition has not yet closed. Alere is forecast to have sales of \$2.8bn in 2022.

Philips's 2022 forecast does not include Spectranetics. Philips completed the acquisition of Spectranetics on 9 August 2017. Spectranetics is forecast to have sales of \$561m in 2022.

Becton Dickinson's 2022 forecast does not include C. R. Bard as the acquisition has not yet closed. C. R. Bard is forecast to have sales of \$4.9bn in 2022.

Revenues for Abbott Medical Optics are included in Abbott's 2016 revenues, not Johnson & Johnson & Johnson & Johnson acquired Abbott Medical Optics from Abbott on 27 February 2017.

Worldwide Medtech vs. Prescription Drug Sales (2009-2022)



Worldwide prescription drug market only forecast to grow at a marginally faster rate than the medtech market.

Evaluate consensus forecasts find that the worldwide market for prescription drugs is set to narrowly outperform the medical device market with a 5.2% market growth per year between 2016 and 2022, versus a 5.1% growth rate per year for medical devices.

Overall, in 2022, the medtech industry will be 50.0% of the size of the prescription drug market, not showing much variation from 2016.

Both industries returned to growth in dollar terms in 2016 after contracting in 2015 as a result of the weakness in the Euro, as US companies recognised fewer dollars for sales in the Eurozone.

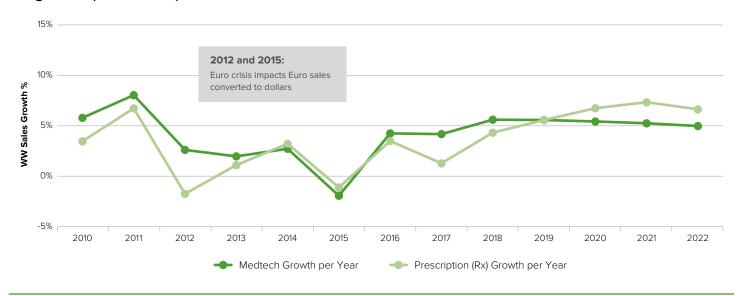
Worldwide Medtech vs. Prescription Drug Sales (2009-2022)

Source: Evaluate, September 2017



Worldwide Growth Rate: Medtech vs. Prescription Drug Sales (2010-2022)

Source: Evaluate, September 2017



Worldwide Medtech vs. Prescription Drug Sales (2009-2022)

Source: Evaluate, September 2017

		WW Sales (\$bn)												
Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
WW Medtech Sales	308	326	352	362	369	379	371	387	403	425	449	473	497	522
Growth per Year		+5.8%	+8.0%	+2.6%	+2.0%	+2.7%	-2.0%	+4.2%	+4.1%	+5.5%	+5.5%	+5.4%	+5.2%	+5.0%
Medtech as % of Rx	46.5%	47.5%	48.2%	50.3%	50.7%	50.5%	50.0%	50.4%	51.8%	52.5%	52.4%	51.8%	50.8%	50.0%
WW Prescription (Rx)	664	686	732	719	727	750	741	768	777	810	855	913	979	1,043
Growth per Year		+3.4%	+6.7%	-1.8%	+1.1%	+3.2%	-1.2%	+3.4%	+1.2%	+4.3%	+5.5%	+6.7%	+7.3%	+6.6%

CAGR 2016-22

WW Medtech Sales +5.1%

WW Prescription Drug Sales +5.2%

Note: Prescription drug sales based on top 500 pharmaceutical and biotech companies from EvaluatePharma®.

Sales to 2016 based on company reported sales data. Sales forecasts to 2022 based on a consensus of leading equity analysts' estimates for segmental sales.

Worldwide Medtech R&D Spend (2009-2022)



Global medtech R&D spend set to grow by 3.7% (CAGR) to \$33.5bn by 2022.

Evaluate consensus forecasts find that medtech companies worldwide will spend \$33.5bn on R&D in 2022,

with spending expected to grow by 3.7% per year. The R&D investment rate, as a percentage of sales, is expected to decline from 6.9% in 2016 to 6.4% in 2022.

Worldwide Medtech R&D Spend (2009-2022)

Source: Evaluate, September 2017



Worldwide Medtech R&D Spend (2009-2022)

Source: Evaluate, September 2017

		WW Medtech R&D & Medtech Sales (\$bn)												
Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Medtech R&D Spend	20.0	21.2	23.3	24.0	24.6	25.2	25.5	26.9	27.1	28.2	29.5	30.8	32.1	33.5
R&D Spend Growth per Year %		+5.6%	+10.2%	+2.7%	+2.8%	+2.4%	+0.9%	+5.5%	+0.9%	+4.3%	+4.4%	+4.4%	+4.3%	+4.2%
WW Medtech Sales	308.5	326.3	352.4	361.5	368.6	378.6	371.1	386.8	402.8	425.1	448.5	472.7	497.3	521.9
R&D as % of Medtech Sales	+6.5%	+6.5%	+6.6%	+6.6%	+6.7%	+6.7%	+6.9%	+6.9%	+6.7%	+6.6%	+6.6%	+6.5%	+6.5%	+6.4%
R&D as % of Medtech Sales (Top 20 in 2022)								5.7%						5.1%

CAGR 2016-22 on Medtech R&D Spend +3.7% Cumulative 5 year R&D Spend (2012-16) \$126.2bn CAGR 2009-16 on Medtech R&D Spend +4.3%

Note: Analysis is based on the Top 300 medtech companies. R&D spend in 2016 based on company reported data.

Forecast medtech R&D spend based on a consensus of leading equity analysts' estimates for company level R&D spend, extrapolated to medtech R&D when a company has non-medtech R&D activity. Medtech R&D is not disclosed by a number of companies and this analysis is limited to those companies with sufficient disclosure.

Medtech R&D Spend in 2022: Top 20 Companies



Medtronic top medtech R&D spender in 2022; Abbott to knock Johnson & Johnson off second place spot.

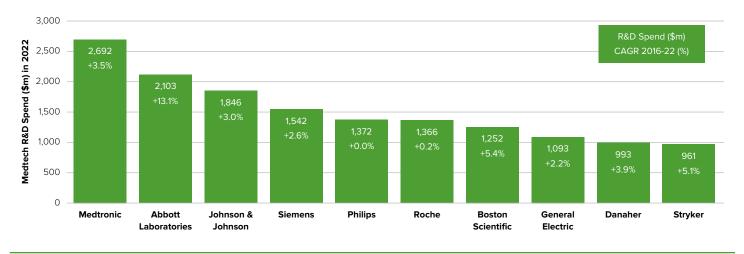
Evaluate consensus forecasts find that Medtronic will continue to occupy the top spot for R&D expenditure, spending approximately \$2.7bn on R&D in 2022. Abbott is expected to take the number two

spot following its acquisition of St. Jude.

Of the top 20, bioMérieux and Edwards Lifesciences are forecast to invest the most into R&D as a percentage of medtech sales, both at 15.2%.

Worldwide Medtech R&D Spend: Top 10 Companies (2022)

Source: Evaluate, September 2017



Worldwide Medtech R&D Spend: Top 20 Companies & Total Market (2016 & 2022)

Source: Evaluate, September 2017

		ı	Medtech R&	D (\$m)	2022 Change R&D as a % of Medtech Sales			ech Sales	Rank
Rank	Company	2016	2022	CAGR 16-22	vs. Sep 16 (\$bn)	2016	2022	Chg. (+/-)	Chg. (+/-)
1.	Medtronic	2,193	2,692	+3.5%	-149	7.4%	7.1%	-0.2pp	-
2.	Abbott Laboratories	1,003	2,103	+13.1%	+805	10.0%	10.8%	+0.8pp	+4
3.	Johnson & Johnson	1,548	1,846	+3.0%	-12	6.2%	6.0%	-0.2pp	-1
4.	Siemens	1,320	1,542	+2.6%	-61	8.8%	9.1%	+0.3pp	+1
5.	Philips	1,367	1,372	+0.0%	+51	10.5%	8.4%	-2.0pp	-2
6.	Roche	1,347	1,366	+0.2%	-89	11.6%	9.2%	-2.4pp	-2
7.	Boston Scientific	914	1,252	+5.4%	+41	10.9%	10.1%	-0.8pp	+1
8.	General Electric	960	1,093	+2.2%	+32	9.8%	9.1%	-0.6pp	-1
9.	Danaher	788	993	+3.9%	+91	10.1%	9.4%	-0.7pp	+1
10.	Stryker	715	961	+5.1%	-34	6.3%	5.8%	-0.5pp	+2
11.	Becton Dickinson	828	914	+1.7%	+41	7.3%	6.7%	-0.6pp	-2
12.	Edwards Lifesciences	443	734	+8.8%	+42	15.0%	15.2%	+0.2pp	+3
13.	Baxter International	567	641	+2.1%	-53	8.2%	7.4%	-0.9pp	-
14.	3M	442	554	+3.8%	-26	8.5%	8.5%	+0.0pp	+2
15.	Novartis	486	534	+1.6%	+47	8.4%	7.7%	-0.7pp	-1

Top 16-20 continued over...

Source: Evaluate, September 2017

			Medtech R&	D (\$m)	2022 Change	R&D as a % of Medtech Sales			Rank
Rank	Company	2016	2022	CAGR 16-22	vs. Sep 16 (\$bn)	2016	2022	Chg. (+/-)	Chg. (+/-)
16.	bioMérieux	301	453	+7.1%	+71	16.1%	15.2%	-1.0pp	+5
17.	Terumo	312	450	+6.3%	+29	7.2%	6.9%	-0.3pp	+2
18.	Zimmer Biomet	366	403	+1.6%	-56	4.8%	4.4%	-0.4pp	-1
19.	B. Braun Melsungen	322	390	+3.2%	+13	4.5%	4.5%	+0.0pp	-1
20.	Intuitive Surgical	240	376	+7.8%	+73	8.9%	7.5%	-1.3pp	+4
	Total Top 20	16,463	20,668	+3.9%		5.7%	5.1%	-0.6pp	
	Other	10,393	12,811	+3.5%					
	Total	26,856	33,479	+3.7%		6.9%	6.4%		

Note: Analysis is based on the top 300 medtech companies. R&D spend in 2016 based on company reported data.

Forecast medtech R&D spend based on a consensus of leading equity analysts' estimates for company level R&D spend, extrapolated to medtech R&D when a company has non-medtech R&D activity. Medtech R&D is not disclosed by a number of companies and this analysis is limited to those companies with sufficient disclosure.

R&D expenditure of St. Jude Medical is included in Abbott's 2022 forecast but not in the 2016 reported R&D spend. Abbott completed the acquisition of St. Jude on 4 January 2017. St. Jude Medical was estimated to have spent \$751m on R&D in 2016.

Abbott's 2022 R&D expenditure forecast does not include Alere as the acquisition has not yet closed. Alere forecast to spend \$114m on R&D in 2022.

Philips's 2022 R&D expenditure forecast does not include Spectranetics. Philips completed the acquisition of Spectranetics on 9 August 2017. Spectranetics forecast to spend \$106m on R&D in 2022. Becton Dickinson's 2022 R&D expenditure forecast does not include C. R. Bard as acquisition has not yet closed. C. R. Bard forecast to spend \$362m on R&D in 2022.

FDA Regulatory Analysis (2009-2016)



Following the ten-year high in 2015, number of first-time PMAs and HDEs down 22% in 2016; 510(k) clearances decrease 2% to 2,993.

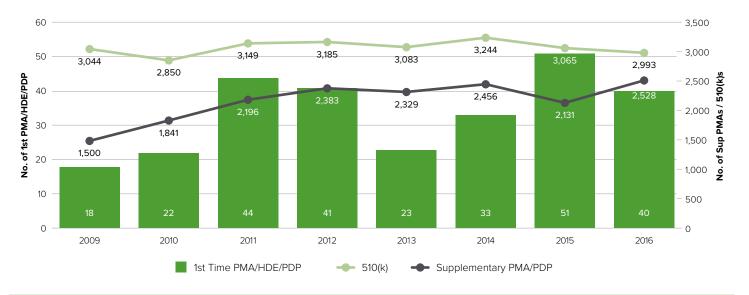
Evaluate found that the FDA approved 40 new PMAs/HDEs/PDPs (first time approvals) in 2016, a huge 22% drop from the 2015 figure of 51, which represented a 10 year high.

Even though Roche was awarded the biggest number of first-time PMAs, Medtronic once again had the highest number of total approvals and clearances in 2016, with 803.

In total, the number of regulatory approvals in 2016 increased 6% from the year before.

Count of first PMA/HDE/PDPs, 510(k)s & Supplementary PMA/PDPs Per Year (2009-2016)

Source: Evaluate, September 2017



Count of first PMA/HDE/PDPs, 510(k)s & Supplementary PMA/PDPs (2009-2016)

Source: Evaluate, September 2017

Year	2009	2010	2011	2012	2013	2014	2015	2016
1st Time PMA/ HDE/ PDP	18	22	44	41	23	33	51	40
% Chg.		+22%	+100%	-7 %	-44%	+43%	+55%	-22%
Supplementary PMA/ PDP	1,500	1,841	2,196	2,383	2,329	2,456	2,131	2,528
% Chg.		+23%	+19%	+9%	-2%	+5%	-13%	+19%
510(k)	3,044	2,850	3,149	3,185	3,083	3,244	3,065	2,993
% Chg.		-6%	+10%	+1%	-3%	+5%	-6%	-2%
Total	4,562	4,713	5,389	5,609	5,435	5,733	5,247	5,561
% Chg.		+3%	+14%	+4%	-3%	+5%	-8%	+6%

Count of PMA/HDE/PDPs, 510(k)s & Medtech R&D Spend (2016)

Source: Evaluate, September 2017

Rank	Company	PMA/HDEs - First Approval	PMA/PDPs - Suppl.	510(k) Clearance	Total Approvals	2016 R&D Spend (\$m)
1.	Medtronic	4	723	76	803	2,193
2.	Boston Scientific	2	361	22	385	914
3.	Abbott Laboratories	5	294	23	322	1,754
4.	Johnson & Johnson	0	106	49	155	1,548
5.	Roche	5	109	16	130	1,347
6.	Edwards Lifesciences	1	63	7	71	443
7.	W. L. Gore & Associates	1	63	1	65	n/a
8.	LivaNova	1	59	0	60	166
9.	Siemens	0	15	44	59	1,320
10.	Zimmer Biomet	0	24	35	59	366
	Total	40	2,528	2,993	5,561	

Note: Based on Devices@FDA data.

PMA (Premarket Approval): a class III device which is a 'life-sustaining or life-supporting implantable device'; usually require trials.

510(k): "substantially equivalent" to a legally marketed Class I, II, III device (where PMA not required).

HDE (Humanitarian Device Exemption): a device for treating or diagnosing a disease/condition that affects <4,000 individuals in the US per year.

Note: W. L. Gore & Associates R&D spend is not disclosed

Abbott's approval counts include all of St. Jude Medical's approvals, but do not include Alere's approvals. To allow a comparison between the numbers of company approvals in 2016 versus the R&D spend in that year, Abbott's 2016 R&D Spend figure includes the R&D spend estimated for St. Jude Medical in 2016.

2017 FDA First-Time PMAs, HDEs & 510(k) De Novo Clearances



Approval rate for innovative devices increases in the first eight months of 2017; cardiology outperforms other areas.

Evaluate found that the FDA has so far signed off 30 new premarket approvals (PMAs), two HDEs and 20 de novo 510(k) clearances in

2017 to August 31st. This represents an increase in the number of 'new' approvals from the same period in 2016, which saw 42. The therapy area that saw the most approvals in the first eight months of 2017 was cardiology, where 14 devices were granted PMAs.

2017 FDA First-Time PMAs (to 31 August 2017)

Source: Evaluate, September 2017

EvaluateMed	Tech [®] Device Classific	cation					
Level 1	Level 2	Level 3	Decision Date	FDA Review Time (mths)	Company	Product Code Name	Device Name (Approval Code)
Cardiology	Cardiac Assist Devices	Ventricular Assist Devices	06 Jun 17	9.8	Berlin Heart	Ventricular (Assist) Bypass	EXCOR PEDIATRIC VENTRICU- LAR ASSIST DEVICE (P160035)
Cardiology	Cardiac Prosthetic Devices	Tissue Heart Valves	31 Jul 17	5.9	Medtronic	Heart-Valve, Non-Allograft Tissue	AVALUS(TM) BIOPROSTHESIS (P170006)
Cardiology	Cardiac Prosthetic Devices	Tissue Heart Valves	29 Jun 17	18.0	Edwards Lifesciences	Heart-Valve, Non-Allograft Tissue	EDWARDS PERICARDIAL AORTIC BIOPROSTHESIS (P150048)
Cardiology	Cardiac Rhythm Management (CRM)	External Defibrillators	26 May 17	11.8	Asahi Kasei	Automated External Defibrillators (Non-Wearable)	AED PLUS AND FULLY AUTOMATIC AED PLUS (P160015)
Cardiology	Cardiac Rhythm Management (CRM)	External Defibrillators	12 Jan 17	9.8	Stryker	Automated External Defibrillators (Non-Wearable)	HEARTSINE TECHNOLOGIES LLC'S SAMARITAN PUBLIC ACCESS AUTOMATED EXTERNAL DEFIBRILLATORS (SAM 350P, SAM 360P AND SAM 450P) (P160008)
Cardiology	Cardiac Rhythm Management (CRM)	Pacemakers	31 Jan 17	25.3	Abbott Laboratories	Implantable Pacemaker Pulse-Generator	ASSURITY MRI AND ENDURITY MRI PACEMAKERS, TENDRIL MR LEAD, MRI ACTIVATOR, MERLIN PCS PROGRAMER SOFTWARE (P140033)
Cardiology	Interventional Cardiology	Drug-Eluting Coronary Stents	28 Apr 17	7.0	Medtronic	Coronary Drug-Eluting Stent	RESOLUTE ONYX ZOTAROLI- MUS-ELUTING CORONARY STENT SYSTEM (P160043)
Cardiology	Interventional Cardiology	Non-Drug- Eluting Coronary Stents	21 Feb 17	15.8	Tryton Medical	Stent, Coronary	TRYTON SIDE BRANCH STENT (P150039)
Cardiology	Interventional Cardiology	Non-Drug- Eluting Coronary Stents	21 Feb 17	9.7	CeloNova BioSciences	Stent, Coronary	COBRA PZF NANOCOATED CORONARY STENT SYSTEM (P160014)
Cardiology	Interventional Cardiology	Non-Drug- Eluting Coronary Stents	14 Feb 17	12.9	BIOTRONIK	Stent, Coronary	PRO-KINETIC ENERGY COBALT CHROMIUM (COCR) CORONARY STENT SYSTEM (P160003)
Cardiology	Interventional Cardiology	Drug-Eluting Balloons	26 Jul 17	8.7	Spectranetics	Drug-Eluting Peripheral Transluminal Angioplasty Catheter	STELLAREX 0.035 OTW DRUG-COATED ANGIOPLASTY BALLOON (P160049)
Cardiology	Interventional Cardiology	Peripheral Vascular Devices	24 Apr 17	9.1	C. R. Bard	lliac Covered Stent, Arterial	LIFESTREAM BALLOON EXPANDABLE VASCULAR COVERED STENT (P160024)
Cardiology	Interventional Cardiology	Peripheral Vascular Devices	23 Mar 17	8.0	BIOTRONIK	Stent, Superficial Femoral Artery	ASTRON PULSAR STENT SYSTEM, PULSAR-18 STENT SYSTEM (P160025)
Cardiology	Interventional Cardiology	Peripheral Vascular Devices	27 Jan 17	6.8	W. L. Gore & Associates	lliac Covered Stent, Arterial	GORE VIABAHN VBX BALLOON EXPANDABLE ENDOPROSTHESIS (P160021)

continued over...

2017 FDA First-Time PMAs (to 31 August 2017) contd.

Source: Evaluate, September 2017

Evaluatemen	Tech® Device Classifi	Cation					
Level 1	Level 2	Level 3	Decision Date	FDA Review Time (mths)	Company	Product Code Name	Device Name (Approval Code)
Diagnostic Imaging	Computed Tomography (CT)	Other Computed Tomography (CT)	10 Jan 17	5.3	FUJIFILM Holdings	Digital Breast Tomosynthesis	ASPIRE CRISTALLE DIGITAL BREAST TOMOSYNTHESIS OPTION (P160031)
Diagnostic Imaging	Other Diagnostic Imaging	Image Analyser Systems	24 Mar 17	11.6	iCAD	Analyzer, Medical Image	POWERLOOK® TOMO DETECTION SOFTWARE (P160009)
General & Plastic Surgery	Surgical Instruments & Accessories	Other Surgical Instruments & Accessories	28 Jun 17	18.7	SciBase	Electrical Impedance Spectrometer	NEVISENSE (P150046)
General & Plastic Surgery	Surgical Prosthetic Devices	Dermal Fillers	04 Aug 17	10.4	Prollenium Medical Technologies	Implant, Dermal, For Aesthetic Use	REVANESSE ULTRA (P160042)
In Vitro Diagnostics (IVD)	Histology & Cytology	Immunohisto- chemistry	01 May 17	6.3	Roche	Immunohistochemistry Assay, Antibody, Programmed Death- Ligand 1	VENTANA PD-L1 (SP263) ASSA' (P160046)
In Vitro Diagnostics (IVD)	Immunoassays	Viral Immunoassays	21 Jun 17	12.6	Roche	Test, HIV Detection	ELECSYS HIV COMBI PT (BP160050)
In Vitro Diagnostics (IVD)	Molecular Diagnostics	Infectious Dis- ease Molecular Diagnostics	01 Jun 17	8.3	Roche	Cytomegalovirus (CMV) DNA Quantitative Assay	COBAS CMV (P160041)
In Vitro Diagnostics (IVD)	Molecular Diagnostics	Infectious Disease Molecular Diagnostics	18 May 17	7.4	Abbott Laboratories	Cytomegalovirus (CMV) DNA Quantitative Assay	ABBOTT REALTIME CMV (P160044)
In Vitro Diagnostics (IVD)	Molecular Diagnostics	Infectious Disease Molecular Diagnostics	14 Mar 17	9.2	Siemens	Assay, Genotyping, Hepatitis C Virus	VERSANT HCV GENOTYPE 2.0 ASSAY (LIPA) (P160016)
In Vitro Diagnostics (IVD)	Molecular Diagnostics	Infectious Disease Molecular Diagnostics	13 Feb 17	7.2	Hologic	Assay, Hybridization And/ Or Nucleic Acid Amplification For Detection Of Hepatitis C RNA,Hepatitis C Virus	APTIMA HCV QUANT DX ASSAY (P160023)
In Vitro Diagnostics (IVD)	Molecular Diagnostics	Oncology Molecular Diagnostics	01 Aug 17	5.9	Abbott Laboratories	Somatic Gene Mutation Detection System	ABBOTT REALTIME IDH2 (P170005)
In Vitro Diagnostics (IVD)	Molecular Diagnostics	Oncology Molecular Diagnostics	29 Jun 17	9.9	Illumina	Next Generation Sequencing Oncology Panel, Somatic Or Germline Variant Detection System	PRAXIS EXTENDED RAS PANEL (P160038)
In Vitro Diagnostics (IVD)	Molecular Diagnostics	Oncology Molecular Diagnostics	22 Jun 17	8.2	Thermo Fisher Scientific	Next Generation Sequencing Oncology Panel, Somatic Or Germline Variant Detection System	ONCOMINE DX TARGET TEST (P160045)
In Vitro Diagnostics (IVD)	Molecular Diagnostics	Oncology Molecular Diagnostics	28 Apr 17	7.8	Invivoscribe Technologies	Somatic Gene Mutation Detection System	LEUKOSTRAT CDX FLT3 MUTATION ASSAY (P160040)
Obstetrics & Gynecology (OB/GYN)	Obstetrics & Gynecology (OB/GYN) Therapeutic Devices	Endometrial Ablation Devices	14 Jun 17	7.6	Aegea Medical	Device, Thermal Ablation, Endometrial	AEGEA VAPOR SYSTEM, AEGEA VAPOR PROBE PROCEDURE KIT, AEGEA VAPOR GENERATOI AND AEGEA VAPOR GENERA- TOR ACCESSORY KIT (P160047)
Orthopedics	Orthobiologics	Viscosupple- mentation	29 Aug 17	5.9	Bioventus	Acid, Hyaluronic, Intraarticular	DUROLANE (P170007)
Average PMA	FDA Review Time (r	mths)		10.0			



2017 HDE Clearances (to 31 August 2017)

Source: Evaluate, September 2017

EvaluateMed [*]	Tech [®] Device Classif	fication					
Level 1	Level 2	Level 3	Decision Date	FDA Review Time (mths)	Company	Product Code Name	Device Name (Approval Code)
Cardiology	Cardiac Prosthetic Devices	Septal Occluders	10 Jan 17	114.9	Abbott Laboratories	Transcatheter Septal Occluder	AMPLATZER™ POST-INFARCT MUSCULAR VSD OCCLUDER (H070005)
Gastroenter- ology	Gastrointestinal Therapeutic Devices	Other Gastrointestinal Therapeutic Devices	12 May 17	16.7	Cook Group	Pediatric Esophageal Atresia Anastomosis Device	FLOURISH™ PEDIATRIC ESOPHAGEAL ATRESIA DEVICE (H150003)
Average HDE	FDA Review Time (mths)		65.8			

2017 FDA 510(k) De Novo Clearances (to 31 August 2017)

Source: Evaluate, September 2017

EvaluateMed	Tech® Device Classificati	on					
Level 1	Level 2	Level 3	Decision Date	FDA Review Time (mths)	Company	Product Code Name	Device Name (Approval Code)
Cardiology	Interventional Cardiology	Other Interventional Cardiology	01 Jun 17	8.4	Claret Medical	Temporary Catheter, Embolic Protection, Transcatheter Intracardiac Procedures	SENTINEL CEREBRAL PROTEC- TION SYSTEM (DEN160043)
Diagnostic Imaging	Other Diagnostic Imaging	Other Diagnostic Imaging	19 Jul 17	3.4	Quantitative Insights	Computer-Assisted Diagnostic Software For Lesions Suspicious For Cancer	QUANTX (DEN170022)
In Vitro Diagnostics (IVD)	Clinical Chemistry	Other Test Systems	05 May 17	9.7	ARK Diagnostics	Voriconazole Test System	ARK VORICONAZOLE II ASSAY TEST SYSTEM (DEN160033)
In Vitro Diagnostics (IVD)	Clinical Chemistry	Clinical Laboratory Instruments	18 May 17	1.9	SCIEX	25-Oh-Vitamin D Mass Spectrometry Test System	VITAMIN D 200M ASSAY FOR THE TOPAZ SYSTEM (DEN170019)
In Vitro Diagnostics (IVD)	Hematology	Automated & Semi-Automat- ed Hematology Devices	29 Jun 17	8.8	Danaher	Flow Cytometric Test System For Hematopoietic Neoplasms	CLEARLLAB T1, CLEARLLAB T2, CLEARLLAB B1, CLEARLLAB B2, CLEARLLAB M (DEN160047)
In Vitro Diagnostics (IVD)	Histology & Cytology	Other Histology & Cytology Devices	12 Apr 17	4.3	Philips	Whole Slide Imaging System	PHILIPS INTELLISITE PATHOLOGY SOLUTION (DEN160056)
In Vitro Diagnostics (IVD)	Immunoassays	Viral Immunoassays	06 Feb 17	9.8	Centers for Disease Control and Prevention	Variola Virus Nucleic Acid-Based Detection Assay	VARIOLA VIRUS REAL-TIME PCR ASSAY (DEN160016)
In Vitro Diagnostics (IVD)	Molecular Diagnostics	Infectious Disease Molecular Diagnostics	18 Aug 17	13.7	ID-FISH Technology	Fish (Fluorescence In Situ Hybridization) Kit, Nucleic Acid, Plasmodium Sp.	ID-FISH PLASMODIUM GENUS TEST KIT, ID-FISH PLASMODIUM FALCIPARUM AND P. VIVAX COMBO TEST KIT (DEN160025)
In Vitro Diagnostics (IVD)	Molecular Diagnostics	Oncology Molecular Diagnostics	06 Apr 17	9.3	23andMe	Genetic Variant Detection And Health Risk Assessment System	23ANDME PERSONAL GENOME SERVICE (PGS) GENETIC HEALTH RISK TEST FOR HEREDITARY THROMBOPHILIA (DEN160026)
In Vitro Diagnostics (IVD)	Molecular Diagnostics	Oncology Molecu- lar Diagnostics	04 Mar 17	9.4	Roche	Cervical Intraepithelial Neoplasia (CIN) Test System	CINTEC HISTOLOGY (50 TESTS), CINTEC HISTOLOGY (250 TESTS) (DEN160019)
In Vitro Diagnostics (IVD)	Molecular Diagnostics	Other Molecular Diagnostics	27 Mar 17	8.8	QIAGEN	JAK2 Gene Mutation Detection Test	IPSOGEN JAK2 RGQ PCR KIT (DEN160028)

continued over...

2017 FDA 510(k) De Novo Clearances (to 31 August 2017) contd.

Source: Evaluate, September 2017

Level 1	Level 2	Level 3	Decision Date	FDA Review Time (mths)	Company	Product Code Name	Device Name (Approval Code)
Neurology	Neurology Diagnostic Devices	Other Neurology Diagnostic Devices	16 Feb 17	27.3	LGCH	Physiological Signal Based Seizure Monitoring System	COMPANION (DEN140033)
Neurology	Neuromodulation Devices	Transcranial Magnetic Stimulation Devices	14 Apr 17	18.0	ElectroCore	Non-Invasive Vagus Nerve Stimulator - Headache	GAMMACORE (DEN150048)
Obstetrics & Gynecology (OB/GYN)	Obstetrics & Gynecology (OB/GYN) Surgical Devices	Other Obstetrics & Gynecology (OB/GYN) Surgical Devices	27 Jul 17	20.3	Safe Obstetric Systems	Fetal Head Elevator	FETAL PILLOW (DEN150053)
Ophthalmics	Ophthalmic Therapeutic Devices	Other Ophthal- mic Therapeutic Devices	24 Apr 17	9.6	Allergan	Intranasal Electrostimulation Device	OCULEVE INTRANASAL TEAR NEUROSTIMULATOR DEVICE (DEN160030)
Urology	Male Urology Devices	Prostatic Devices	21 Jun 17	10.5	Merit Medical Systems	Agents, Embolic, For Treatment Of Benign Prostatic Hyperplasia	EMBOSPHERE MICROSPHERES (DEN160040)
Wound Management	Wound Dressings	Hemostats	30 Jun 17	15.5	Z-Medica	Temporary, internal use hemostatic	D2 DRESSING (DEN160012)
In Vitro Diagnostics (IVD)	Microbiology	Microorganism Differentiation & Identification Devices	23 Feb 17	7.5	Accelerate Diagnostics	Positive blood culture identification and AST kit	ACCELERATE PHENO SYSTEM, ACCELERATE PHENOTEST BC KIT (DEN160032)
In Vitro Diagnostics (IVD)	Molecular Diagnostics	Infectious Disease Molecular Diag- nostics	14 Feb 17	3.9	bioMérieux	Biothreat microbial agents multiplex nucleic acid detection system	FILMARRAY NGDS WARRIOR PANEL (DEN160048)
In Vitro Diagnostics (IVD)	Clinical Chemistry	Enzyme Test Systems	03 Feb 17	18.0	Baebies	alpha-D-galactosidase A (GLA) newborn screening test system	SEEKER SYSTEM (DEN150035)
Average 510(k) De Novo FDA Review	Time (mths)		10.9			

Note: Based on Devices@FDA data to 31 August 2017.

PMA (Premarket Approval): a class III device which is a 'life-sustaining or life-supporting implantable device'; usually require trials.

HDE (Humanitarian Device Exemption): a device for treating or diagnosing a disease/condition that affects <4,000 individuals in the US per year.

510(k) De Novo Clearance: a device which poses a low risk and could ordinarily be cleared via the 510(k) route, but which is sufficiently innovative that no existing device may be used as a predicate.

In Vitro Diagnostics (IVD) Market to 2022



Worldwide IVD sales forecast to reach \$70bn in 2022; Roche remains top player.

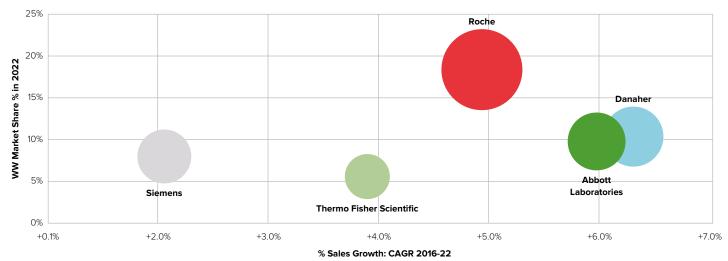
Evaluate consensus forecasts find that Roche will remain the leading IVD company with global sales expected to reach \$12.8bn in 2022. Following the acquisition of Cepheid in the final quarter

of 2016, Danaher has seen its 2022 forecast rise by \$1.4bn, consolidating its second place in the company rankings.

Abbott is currently the third largest IVD company, but this could soon change. The acquisition of Alere will add almost \$3bn to its IVD revenue, making it significantly larger than Danaher in 2022.

Worldwide In Vitro Diagnostics Sales, Market Share & Sales Growth (2016-2022)

Source: Evaluate, September 2017



Note: Bubble = WW Sales in 2022

Worldwide In Vitro Diagnostics Sales: Top 10 Companies & Total Market (2016 & 2022)

Source: Evaluate, September 2017

		WW Sal	es (\$m)	CAGR	2022 Change	WW Mar	ket Share	Rank Change
Rank	Company	2016	2022	2016-22	vs. Sep 16 (\$m)	2016	2022	2016-22
1.	Roche	9,599	12,812	+4.9%	+12	19.4%	18.4%	-
2.	Danaher	5,038	7,251	+6.3%	+1428	10.2%	10.4%	-
3.	Abbott Laboratories	4,813	6,822	+6.0%	+232	9.7%	9.8%	+1
4.	Siemens	4,914	5,551	+2.1%	-211	9.9%	8.0%	-1
5.	Thermo Fisher Scientific	3,106	3,903	+3.9%	+49	6.3%	5.6%	-
6.	Sysmex	2,108	3,577	+9.2%	-258	4.3%	5.1%	+2
7.	Becton Dickinson	2,710	3,544	+4.6%	+151	5.5%	5.1%	-1
8.	bioMérieux	1,856	2,979	+8.2%	+264	3.8%	4.3%	+1
9.	Alere	2,180	2,652	+3.3%	-170	4.4%	3.8%	-2
10.	Ortho-Clinical Diagnostics	1,700	1,948	+2.3%	-49	3.4%	2.8%	-
	Top 10	38,025	51,039	+5.0%		76.9%	73.3%	
	Other	11,406	18,587	+8.5%		23.1%	26.7%	
	Total Industry	49,431	69,626	+5.9%		100.0%	100.0%	

Note: Excludes Glucose Test Systems which are included in diabetic care classification.

Revenues for Alere not included in Abbott's 2016 reported sales or 2022 forecast as the acquisition has not yet closed

Cardiology Market to 2022



Abbott's acquisition of St. Jude results in it becoming the second largest cardiology company.

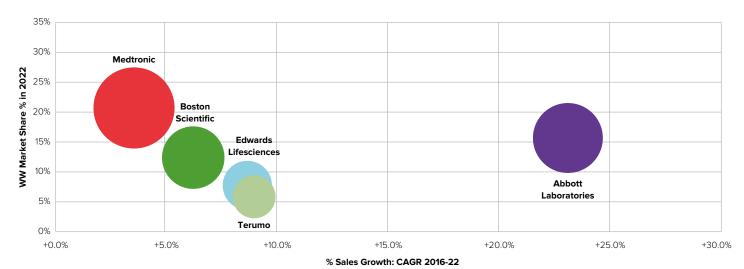
The main event in the cardiology market this year was the acquisition of St. Jude Medical by Abbott for \$25bn. Abbott is now expected to achieve sales of over \$9.7bn in 2022, causing it to jump three places to second in the company rankings.

Medtronic will remain the number one cardiology company despite equity analysts lowering their 2022 forecasts for the company's cardiac & vascular group by over \$1bn since last year's World Preview was published.

The cardiology industry is expected to grow at 5.7% per year to \$62.3bn in 2022.

Worldwide Cardiology Sales, Market Share & Sales Growth (2016-2022)

Source: Evaluate, September 2017



Note: Bubble = WW Sales in 2022

Worldwide Cardiology Sales: Top 10 Companies & Total Market (2016 & 2022)

Source: Evaluate, September 2017

		WW Sal	les (\$m)	CAGR	2022 Change	WW Mar	ket Share	Rank Change
Rank	Company	2016	2022	2016-22	vs. Sep 16 (\$m)	2016	2022	2016-22
1.	Medtronic	10,498	12,931	+3.5%	-1176	23.5%	20.8%	-
2.	Abbott Laboratories	2,798	9,724	+23.1%	+6659	6.3%	15.6%	+3
3.	Boston Scientific	5,385	7,725	+6.2%	+656	12.1%	12.4%	-
4.	Edwards Lifesciences	2,964	4,836	+8.5%	+237	6.6%	7.8%	-
5.	Terumo	2,173	3,622	+8.9%	+433	4.9%	5.8%	+1
6.	Johnson & Johnson	1,849	2,739	+6.8%	+238	4.1%	4.4%	+1
7.	W. L. Gore & Associates	1,596	2,121	+4.9%	+0	3.6%	3.4%	+1
8.	Lepu Medical Technology	519	1,800	+23.0%	+389	1.2%	2.9%	+10
9.	Asahi Kasei	1,260	1,750	+5.6%	-234	2.8%	2.8%	+1
10.	Getinge	1,380	1,621	+2.7%	-103	3.1%	2.6%	-1
	Top 10	30,422	48,869	+8.2%		68.2%	78.5%	
	Other	14,167	13,394	-0.9%		31.8%	21.5%	
	Total Industry	44,589	62,262	+5.7%		100.0%	100.0%	

Note: General Electric & Philips do not disclose cardiology sales.

Revenues for St. Jude Medical are included in Abbott's 2022 forecast but not in the 2016 reported sales. Abbott completed the acquisition of St. Jude Medical on 4 January 2017. St. Jude Medical was estimated to have cardiology sales of \$5.5bn in 2016.

Diagnostic Imaging Market to 2022



Diagnostic imaging sales forecast to reach \$48bn in 2022; Siemens, General Electric and Philips dominate the market.

Evaluate consensus forecasts finds that Siemens will continue to be the number one company in the diagnostic imaging industry and is expected to generate \$11.4bn of sales in 2022 representing a market share of 23.8%.

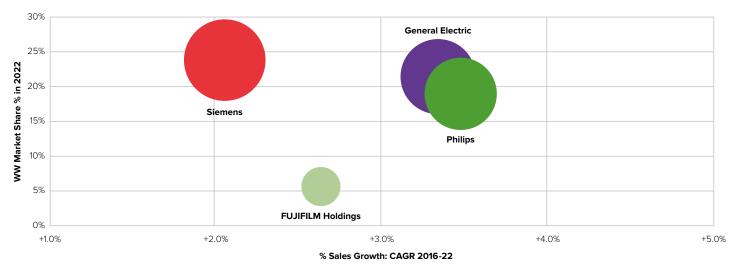
Following the acquisition of Toshiba Medical Systems at the end

of last year, Canon has entered the diagnostic imaging market in fourth place, with sales forecast to be in excess of \$4bn in 2022. Varex Imaging is also a new entry to the market, following its spin-off from Varian Imaging, with sales of \$1.5bn forecast for 2022.

Again, the diagnostic imaging market is forecast to be one of the slowest growing areas in the whole medical device industry, with growth between 2016 and 2022 expected to be just 3.4% per year.

Worldwide Diagnostic Imaging Sales, Market Share & Sales Growth (2016-2022)

Source: Evaluate, September 2017



Note: Bubble = WW Sales in 2022

Worldwide Diagnostic Imaging Sales: Top 10 Companies & Total Market (2016 & 2022) Source: Evaluate, September 2017

		WW Sa	les (\$m)	CAGR	2022 Change	WW Mar	ket Share	Rank Change
Rank	Company	2016	2022	2016-22	vs. Sep 16 (\$m)	2016	2022	2016-22
1.	Siemens	10,117	11,428	+2.1%	-452	25.8%	23.8%	-
2.	General Electric	8,414	10,246	+3.3%	+36	21.4%	21.4%	-
3.	Philips	7,397	9,078	+3.5%	-51	18.8%	18.9%	-
4.	Canon	-	4,122	n/a	n/a	-	8.6%	New Entry
5.	FUJIFILM Holdings	2,294	2,681	+2.6%	-575	5.8%	5.6%	-
6.	Carestream Health	1,261	1,597	+4.0%	-189	3.2%	3.3%	-
7.	Varex Imaging	-	1,513	n/a	n/a	-	3.2%	New Entry
8.	Hitachi	1,172	1,308	+1.8%	-75	3.0%	2.7%	-1
9.	Konica Minolta	832	1,004	+3.2%	-139	2.1%	2.1%	-1
10.	Shimadzu	595	668	+1.9%	-132	1.5%	1.4%	+2
	Top 10	32,082	43,643	+5.3%		81.8%	91.0%	
	Other	7,160	4,322	-8.1%		18.2%	9.0%	
	Total Industry	39,242	47,965	+3.4%		100.0%	100.0%	

Note: Segment sales include servicing of equipment.

Canon entered the diagnostic imaging market in December 2016 following the acquisition of Toshiba Medical Systems. Toshiba Medical Systems' diagnostic imaging sales were \$3.07bn in 2016

Canon not displayed in bubble chart as it only recently entered the industry and therefore the growth rate is non-meaningful.

Varex Imaging entered the diagnostic imaging market in January 2017 following its spin-off from Varian Medical Systems. It subsequently acquired the Diagnostic Imaging business of PerkinElmer in May 2017. Varian Medical Systems' diagnostic imaging sales were \$598m in 2016 and PerkinElmer's were \$177m.

Orthopedics Market to 2022



J&J continues to lead the orthopedic market in 2022.

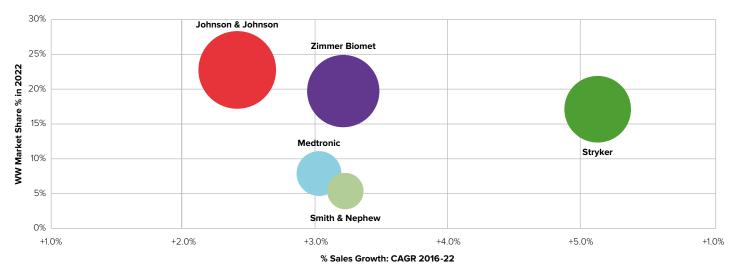
Evaluate consensus forecasts find that Johnson & Johnson will remain the world's largest orthopedic company, with sales forecast to reach \$10.1bn in 2022 and compound annual growth expected to be at a rate of 2.4% between 2016 and 2022.

Zimmer Biomet grew by 28% in 2016 as it began to benefit from the extra revenue from the Biomet acquisition, but the growth rate is expected to slow down to 3.2% between 2016 and 2022.

The orthopedics market is set to slowly grow at 4.0% per year to \$44.4bn in 2022.

Worldwide Orthopedics Sales, Market Share & Sales Growth (2016-2022)

Source: Evaluate, September 2017



Note: Bubble = WW Sales in 2022

Worldwide Orthopedics Sales: Top 10 Companies & Total Market (2016 & 2022)

Source: Evaluate, September 2017

		WW Sal	es (\$m)	CAGR	2022 Change	WW Mar	ket Share	Rank Change
Rank	Company	2016	2022	2016-22	vs. Sep 16 (\$m)	2016	2022	2016-22
1.	Johnson & Johnson	8,775	10,120	+2.4%	-512	25.1%	22.8%	-
2.	Zimmer Biomet	7,256	8,766	+3.2%	-339	20.7%	19.8%	-
3.	Stryker	5,634	7,598	+5.1%	+173	16.1%	17.1%	-
4.	Medtronic	2,945	3,521	+3.0%	+394	8.4%	7.9%	-
5.	Smith & Nephew	2,004	2,423	+3.2%	+19	5.7%	5.5%	-
6.	Arthrex	1,713	2,174	+4.0%	+83	4.9%	4.9%	-
7.	NuVasive	887	1,304	+6.6%	+8	2.5%	2.9%	-
8.	Wright Medical Group	690	1,276	+10.8%	+38	2.0%	2.9%	-
9.	Globus Medical	564	908	+8.3%	-94	1.6%	2.0%	-
10.	Orthofix International	410	486	+2.9%	-30	1.2%	1.1%	+1
	Top 10	30,879	38,575	+3.8%		88.2%	86.9%	
	Other	4,112	5,792	+5.9%		11.8%	13.1%	
	Total Industry	34,992	44,367	+4.0%		100.0%	100.0%	

Ophthalmics Market to 2022



Essilor set to be the dominant player in the ophthalmics market in 2022.

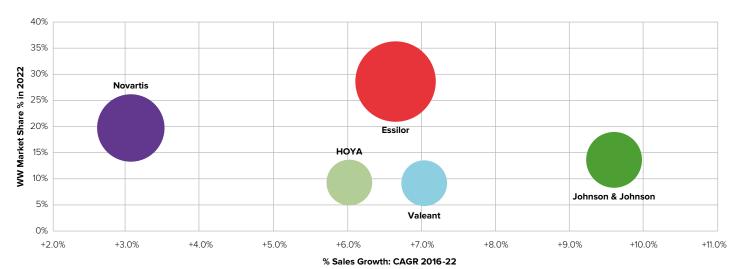
Evaluate consensus forecasts find that Novartis will remain the second placed ophthalmic company despite equity analysts lowering their 2022 forecasts for the company by over \$900m since last year's World Preview was published. Novartis is currently

reviewing all options for its underperforming Alcon unit.

J&J's acquisition of Abbott Medical Optics for \$4.3bn was the second largest M&A deal in the medical device industry in the first half of this year, leading to high expectations for J&J's growth between 2016 and 2022. J&J's sales are forecast to reach in excess of \$4.8bn in 2022.

Worldwide Ophthalmics Sales, Market Share & Sales Growth (2016-2022)

Source: Evaluate, September 2017



Note: Bubble = WW Sales in 2022

Worldwide Ophthalmics Sales: Top 10 Companies & Total Market (2016 & 2022)

Source: Evaluate, September 2017

		WW Sal	les (\$m)	CAGR	2022 Change	WW Mar	ket Share	Rank Change
Rank	Company	2016	2022	2016-22	vs. Sep 16 (\$m)	2016	2022	2016-22
1.	Essilor International	6,879	10,122	+6.6%	-89	26.5%	28.6%	-
2.	Novartis	5,812	6,960	+3.1%	-942	22.4%	19.7%	-
3.	Johnson & Johnson	2,785	4,827	+9.6%	+1555	10.7%	13.6%	-
4.	НОУА	2,318	3,291	+6.0%	-273	8.9%	9.3%	-
5.	Valeant Pharmaceuticals	2,162	3,248	+7.0%	-171	8.3%	9.2%	-
6.	Carl Zeiss	2,089	2,632	+3.9%	-24	8.0%	7.4%	-
7.	The Cooper Companies	1,577	2,276	+6.3%	+128	6.1%	6.4%	-
8.	TOPCON	397	622	+7.8%	-56	1.5%	1.8%	+1
9.	NIDEK	348	480	+5.5%	-28	1.3%	1.4%	+1
10.	Nikon	187	270	+6.3%	+0	0.7%	0.8%	+1
	Top 10	24,554	34,727	+5.9%		94.5%	98.2%	
	Other	1,437	643	-12.5%		5.5%	1.8%	
	Total Industry	25,991	35,370	+5.3%		100.0%	100.0%	

Note: Revenues for Abbott Medical Optics are included in J&J's 2022 forecast but not in the 2016 reported sales. J&J completed the acquisition of Abbott Medical Optics on 27 February 2017. Abbott Medical Optics had sales of \$1.2bn in 2016.

M&A Analysis: 2012 to H1 2017



Total value of MedTech M&A deals rises by a massive 178% in H1 2017; deal count drops.

Evaluate found that total medtech M&A deal values came to \$49bn in H1 2017, an increase of 178% on the \$17bn in H1 2016 and \$6bn more than the total for all of 2016.

Despite the increase in total deal value, Evaluate found that the total number of deals fell by 28% to 97 in H1 2017.

By far the most significant deal in the first half of 2017 was the acquisition of St. Jude Medical by Abbott for \$25bn. This deal, combined with the imminent acquisition of Alere, puts Abbott on track to be the biggest M&A spender this year, with Becton Dickinson in second place following its upcoming \$24bn takeover of C. R. Bard.

Count of Medtech M&A Deals vs. Total Medtech M&A Value (2012 - H1 2017)

Source: Evaluate, September 2017



Key M&A Deals

H1 2017: Abbott – St. Jude Medical (\$25.0bn); J&J – Abbott's Medical Optics unit (\$4.3bn)

2016: Canon – Toshiba Medical Systems (\$6.0bn); DENTSPLY – Sirona Dental Systems (\$5.5bn); Danaher – Cepheid (\$4.0bn); Stryker – Sage Products (\$2.8bn)

2015: Medtronic - Covidien (\$49.9bn); Zimmer - Biomet (\$14.0bn); Becton Dickinson - CareFusion (\$12.2bn)

2014: Thermo-Fisher – Life Technologies (\$13.6bn); Carlyle Group (PE) – J&J's Ortho-Clinical Diagnostics unit (\$4.2bn)

2013: Valeant Pharmaceuticals - Bausch + Lomb (\$8.7bn); Baxter - Gambro (\$3.9bn)

2012: Johnson & Johnson - Synthes (\$19.7bn); Hologic - Gen-Probe (\$3.7bn)

Count of Medtech Closed M&A Deals vs. Total Medtech M&A Value (2012 - H1 2017)

Source: Evaluate, September 2017

Period	2012	2013	2014	2015	2016	H1 2016	H1 2017
Deal Count	267	255	235	260	250	134	97
% Chg.		-4%	-8%	11%	-4%		-28%
Deal Value (\$bn)	48	29	44	129	43	17	49
% Chg.		-39%	49%	195%	-67%		178%



Top 10 Medtech M&A Deals Closed: Ranked on Deal Value (H1 2017)

Source: Evaluate, September 2017

Rank	Target	Primary Focus	Country (Status)	Acquiror	Completion Date	Deal Value (\$m)
1.	St. Jude Medical	Cardiology	USA (Listed)	Abbott Laboratories	04 Jan 17	25,000
2.	Abbott Medical Optics	Ophthalmics	UK (Business Unit)	Johnson & Johnson	27 Feb 17	4,325
3.	LifeCell business of Acelity	General & Plastic Surgery	USA (Business Unit)	Allergan	01 Feb 17	2,900
4.	BSN medical	Wound Care	Germany (Private)	Svenska Cellulosa Aktiebolaget	03 Apr 17	2,862
5.	ZELTIQ Aesthetics	General & Plastic Surgery	USA (Listed)	Allergan	28 Apr 17	2,475
6.	Blood screening business of Hologic	Blood	USA (Business Unit)	Grifols	31 Jan 17	1,850
7.	Cynosure	General & Plastic Surgery	USA (Listed)	Hologic	22 Mar 17	1,650
8.	Portion of vascular closure business of Abbott	Cardiology	USA (Business Unit)	Terumo	20 Jan 17	1,120
9.	Vascular Solutions	Cardiology	USA (Listed)	Teleflex	17 Feb 17	1,000
10.	Hospira infusion systems business of Pfizer	Drug Delivery	USA (Business Unit)	ICU Medical	06 Feb 17	900
	Other					4,510
	Total					48,592

Note: Analysis based on closing date of deal.

Key M&A deals which have closed in H2 2017: Cardinal Health - Patient Product business of Medtronic (\$2.3bn); Philips - Spectranetics (\$2.2bn); Stryker - Novadaq Technologies (\$0.7bn) Key open M&A deals which are yet to close: Becton Dickinson - C. R. Bard (\$24bn); Abbott - Alere (\$5.3bn); Fresenius - NxStage Medical (\$2bn).

Venture Financing Analysis: 2012 to H1 2017



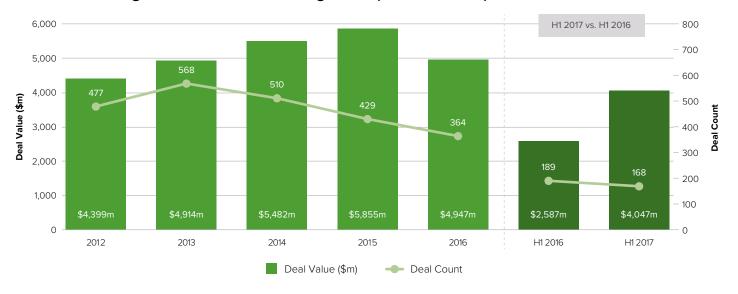
Total value of MedTech venture financing deals rises 56% in H1 2017; deal count decreases by 11%.

Evaluate found a significant increase in the value of venture financing deals in H1 2017 compared with H1 2016, despite the number of deals falling by 11%. The number of VC deals has steadily declined from the peak of 568 seen in 2013.

Two standout rounds were seen in the first half of 2017: Grail, an in vitro diagnostics company developing a DNA-based blood test to screen for cancer, raised \$900m in a series B financing in March; and Verily, part of Google's parent company Alphabet, raised \$800m in January.

Count of Financing Deals vs. Total Financing Value (2012 - H1 2017)

Source: Evaluate, September 2017



Count of Medtech Financing Deals vs. Total Financing Value (2012 - H1 2017)

Source: Evaluate, September 2017

Period	2012	2013	2014	2015	2016	H1 2016	H1 2017
Deal Count	477	568	510	429	364	189	168
% Chg.		19%	-10%	-16%	-15%		-11%
Deal Value (\$m)	4,399	4,914	5,482	5,855	4,947	2,587	4,047
% Chg.		12%	12%	7%	-16%		56%



Top 10 Medtech Venture Financing Deals: Ranked on Deal Value (H1 2017)

Source: Evaluate, September 2017

Rank	Company	Primary Focus	Country	Financing Round	Date	Deal Value (\$m)
1.	Grail	In Vitro Diagnostics (IVD)	USA	Series B	01 Mar 17	900
2.	Verily Life Sciences	Healthcare IT	USA	Seed Capital	26 Jan 17	800
3.	Guardant Health	In Vitro Diagnostics (IVD)	USA	Series E	11 May 17	360
4.	Outset Medical	Nephrology	USA	Series C	02 May 17	76
5.	NeuroPace	Neurology	USA	Series Undisclosed	09 Jan 17	50
6.	Moximed	Orthopedics	USA	Series C	16 Mar 17	50
7.	Impulse Dynamics	Cardiology	Germany	Series Undisclosed	11 May 17	45
8.	Corindus Vascular Robotics	General & Plastic Surgery	USA	PIPE	28 Feb 17	45
9.	Advanced Cardiac Therapeutics	Cardiology	USA	Series E	02 May 17	45
10.	Vertiflex	Orthopedics	USA	Series F	08 Mar 17	40
	Other					1,636
	Total					4,047

Note: Includes investments in medtech companies only. Does not include pharmaceutical, biotech or genomic companies. Includes Private Investment in Public Equity (PIPE). Verily Life Sciences operates as a subsidiary of Alphabet, the parent company for Google. Verily develops tools for the collection and organisation of health data.

Total value of Medtech IPOs continues to fall in H1 2017 to \$122m.

Evaluate found a decrease in the amount of funding raised through initial public offerings in the first half of 2017. By the end of the first half of this year \$122m had been raised in total, a 27% decline from the \$167m raised in H1 2016. Despite the decrease in funding raised, the

number of closed deals increased from 11 to 13.

The largest IPO in medtech history was seen in the last quarter of last year when Convatec, the wound dressings, ostomy bags and catheters manufacturer, raised \$1.9bn from its listing on the London Stock Exchange.

Quarterly Count of IPO Deals vs. Total IPO Value (Q1 2015 - Q2 2017)

Source: Evaluate, September 2017



Count of Medtech IPO Deals vs. Total IPO Value (Q1 2015 - Q2 2017)

Source: Evaluate, September 2017

Quarter	Q1 2015	Q2 2015	Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016	Q1 2017	Q2 2017
Deal Count	9	14	6	6	3	8	3	6	4	9
% Chg. from previous quarter		56%	-57%	0%	-50%	167%	-63%	100%	-33%	125%
Deal Value (\$m)	320	564	592	341	51	116	131	2,177	25	97
% Chg. from previous quarter		77%	5%	-42%	-85%	127%	12%	1,567%	-99%	289%



Top 10 Medtech IPO Deals: Ranked on Deal Value (H1 2017)

Source: Evaluate, September 2017

Rank	Company	Primary Focus	Country	Stock Exchange	Date	Deal Value (\$m)
1.	BoneSupport	Orthopedics	Sweden	Nasdaq Stockholm	21 Jun 17	58
2.	Visioneering Technologies	Ophthalmics	USA	Australian Securities Exchange (ASX)	28 Mar 17	25
3.	Sedana Medical	Anesthesia & Respiratory	Sweden	Nasdaq First North	21 Jun 17	12
4.	ENDRA Life Sciences	Diagnostic Imaging	USA	Nasdaq	09 May 17	10
5.	G Medical Innovations	Patient Monitoring	Cayman Islands	Australian Securities Exchange (ASX)	10 May 17	9
6.	Myomo	Physical Medicine	USA	NYSE	12 Jun 17	5
7.	Integrum	Physical Medicine	Sweden	Nasdaq First North	15 May 17	2
8.	AcuCort	Drug Delivery	Sweden	AktieTorget	24 Apr 17	2
	Total					122

Note: Does not include pharmaceutical or biotech companies.

Excludes the following IPOs: NantHealth Q2 2016, Fitbit Q2 2015, Invitae Q1 2015 for which medtech is not a primary focus

 $Does \ not include \ companies \ which \ listed \ shares \ on \ the \ South \ Korean \ KOSDAQ \ market \ due \ to \ limited \ information \ available.$





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