



The Walden Group

2018 Q2 Strategic Healthcare M&A Report

At a glance ...

- *Be Prepared - New EU Medical Device Regulations Take Effect in 2020*
- *At last, Alcon will be spun out and operate independent of Novartis, following the approach of other medtech giants to de-diversify*
- *The Trump Tariffs hit the U.S. healthcare industry*
- *Performance Metrics of Leading Healthcare Companies*
- *Top Deals of 2018 > \$100m in Transaction Value*
- *Expert analysis of more than 60 M&A Transactions announced or closed in Q2 2018*

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The Strategic Healthcare M&A Report analyzes important merger, acquisition and strategic transactions taking place in the healthcare industry.

The Walden Group is a healthcare mergers & acquisition advisory firm. We represent privately-owned companies seeking to divest operations or find a fitted "home" within a larger operating company or an appropriate private equity firm. We also represent corporate buyers seeking to make acquisitions of healthcare businesses. Our approach is discerning and "full-immersion", with more than 25 years of healthcare experience, deep industry knowledge, a worldwide network of close relationships and a lengthy track record of completed transactions.

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Sweeping New EU Regulations, taking effect in 2020, will create upheavals in the European Medtech and IVD Markets. The time to prepare is now.



Starting in 2020 medtech firms will be competing in a significantly more complicated European market. **New Medical Devices Regulations (MDR)** were written to strengthen device safety standards but they will make it far more onerous and expensive for medtech firms to market their products in Europe.

Because of the MDR, many smaller companies may not be able to comply, and their futures may be uncertain. Larger device manufacturers who saw Europe as a quicker path to market than the U.S. may now rethink that strategy and deal with the FDA and the US market first. The European Parliament also adopted a similar new regime for IVD products --- the In Vitro Diagnostic Medical Devices Regulation (IVDR) last year -- which will have similar effects.

Under the MDR, all medical devices will have to be resubmitted for clearance. There are grace periods depending on device type, but eventually everything will have to comply to the new standard. No existing medical devices in the EU will be allowed to be sold under the old rules.

Key changes include:

- **New Classification.** New complicated classification rules are added for new devices that weren't previously classified, as

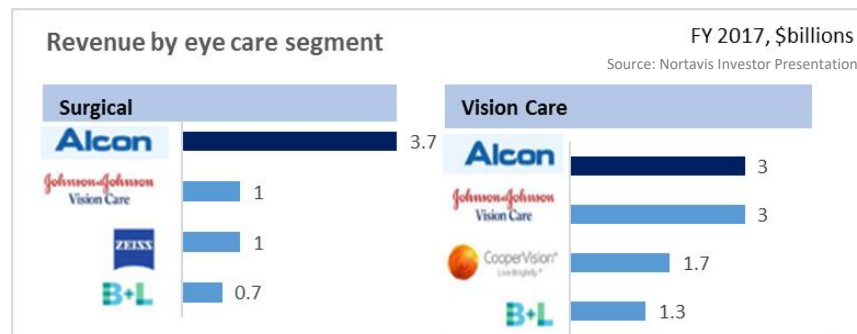
well as new categories that will put some devices in a different level.

- **New Equivalence Process.** The majority of new devices in the U.S. are launched under the FDA's 510(k) clearance process. Under the new EU regulations, any equivalence claims must come with significant documentation supporting the device to which equivalence is claimed.
- **New Post-Market Clinical Requirements.** Device makers will be required to provide a post-market clinical follow-up (or post-market performance follow-up for IVDs) in their post-market surveillance process. The summary of safety and clinical performance must be updated annually.
- **Unique Device Identification ("UDI") System.** MDR requires that each component that is considered a medical device and that can be purchased separately will be assigned a separate UDI. The new EU UDI system is designed imposes: (a) new labeling requirements (device and product identifiers), (b) data submission mandates via the central UDI database, and (c) and storage/traceability submissions. UDI information assigned to medical devices would have to be tracked by manufacturers, authorized representatives, importers and distributors and in some cases, also by healthcare institutions and professionals. This implies that all parties in the supply chain would need to modify their quality management system to ensure information is not lost but stored in a proper, systematic way.
- **Increased Transparency.** Companies must use the European Data Bank on Medical Devices (EUDAMED) electronic system for reporting pre- and post-market to relevant "Competent Authorities".

Novartis, Abbott, J&J, GE, Siemens, and other healthcare giants are reversing previous diversification strategies.

Novartis/Alcon

After assessing strategic options for **Alcon**, **Novartis** is spinning it out to shareholders. As a result, both companies will now rivet on their core strengths—pharmaceuticals and ophthalmic devices, respectively. When Novartis acquired Alcon in 2011 for \$52b, the business included surgical, vision care and ophthalmic pharmaceuticals. In 2016, Novartis absorbed Alcon's drug business, leaving Alcon as pure play ophthalmic surgical device and diagnostic company. For years, Novartis had been seeking to drive Alcon to more profitability – its revenue topped \$1.8m, a 7% increase and its operating income improved to \$90m in Q1 2018 after losses in 2017. Now, Alcon can be expected to be a stronger competitor in the ophthalmic surgery space, where it already dominates.



Other companies are also adopting a tighter strategy. After a tumultuous M&A binge of buying up rare drug and other biopharmas, gutting R&D, and then raising prices to astronomical levels, **Valeant Pharmaceuticals** is changing its name to **Bausch Health Cos.**, another step toward remaking the company and distancing it from past controversies. The company plans to increase R&D spending by about 15% this year to \$425m and embrace its most storied businesses. Bausch & Lomb, founded in 1853 as an optician's shop in Rochester, N.Y. Valeant still faces stiff challenges. Its debt was more than \$25b at the end of 2017 and sales have slowed, partly because the company sold assets to pay down debt. Valeant's market cap is about \$6.3b, well below the peak three years ago of \$90b,

Abbott Laboratories



At the start of 2013, **Abbott Laboratories** spun off its branded pharmaceutical business, which has traded since then as **Abbvie Inc.** Prior to the split, Abbott Laboratories was a massively diversified healthcare firm with operations in

diagnostics, medical devices, nutrition and pharmaceuticals. At the time, investors were skittish about AbbVie, as more than 50% of its revenue was dependent upon Humira, a drug used to treat rheumatoid arthritis that was facing a patent cliff in 2016. Now, five years later, non-Humira sales are anticipated to grow from approximately \$9.6b in 2017 to more than \$16b in 2020, and then to grow to over \$35b in 2025. Abbott Labs remains a diversified titan, with a great range of branded consumer products that cover cardiovascular treatments, diabetes, diagnostics, medicines, neuromodulation and nutrition.

But it too is shedding noncore assets. In 2017 Abbott sold to **J&J** its **Abbott Medical Optics (AMO)** franchise for \$4.3b. J&J rebranded the business "**J&J Vision**", which operates cataract surgery, laser refractive surgery and consumer eye health segments.

Johnson & Johnson

J&J has been pruning and reshaping its businesses for years.

Selected divestitures include:



- 2018 - the divestiture of its **Advanced Sterilization Product** unit to **Fortive Corporation** (which itself is a spinout of Danaher) for \$2.8b. See analysis in this report.
- 2017 – the sale of its **Codman Neurosurgery** business to **Integra LifeSciences** for \$1.05b
- 2015 – the sale of its **Cordis Vascular Technology** unit to **Cardinal Health** for \$1.9b.
- 2014 – the sale of Ortho-Clinical **Diagnostics** to **Carlyle** for \$4.15b.

GE Healthcare

In June 2018 **GE** announced plans to spin off its healthcare unit as a standalone business. GE is looking to streamline operations and focus on its aviation, power, and renewable energy units.



Siemens

Seeking to simplify its corporate structure, Siemens listed 15% of its medical imaging and diagnostics unit, now called Healthineers, which now functions more autonomously from the parent.

Amazon enters the Prescription Drug Market, Novartis the "EpiPen/Epinephrine Market; and Stryker and Boston Scientific Flex their Muscles.

Amazon announced it is entering the online pharmacy market by buying **PillPak**, which allows customers to buy drugs in pre-made doses. Although PillPack expects sales to exceed only about \$100m this year, Amazon's huge customer base and existing shipping infrastructure could allow the company to scale up quickly and upend prescription drug distribution. Amazon could also negotiate directly with pharmaceutical companies, giving them the ability to offer cheap generic drugs. But it will face stiff competition in CVS Health, Walgreen



Boots Alliance and Walmart. Pharmacy chains and drug wholesalers lost about \$14b in market value in reaction to Amazon's announcement. See analysis later in this report.

Recently, [The Wall Street Journal](#) reported **Stryker** had made a takeover approach to **Boston Scientific**. This deal may not materialize but in the meantime, Boston Scientific is paying \$202m for the 65% stake it does not own in **Cryterion Medical**, which developed a "single-shot" cryoablation balloon technology to treat A-fib. See analysis later in this report.

Novartis has obtained up exclusive distribution rights in the U.S. and elsewhere to a key EpiPen rival, Adamis Pharmaceuticals' (NASDAQ:ADMP0). Marketed by **Mylan NV** and with few competitors, EpiPen is an injection that contains epinephrine, a chemical that narrows blood vessels and opens airways in the lungs. EpiPens have become a necessity for families with children suffering from severe allergies to counter effects like wheezing, uneven breathing, increased or decreased heart rate, swelling and other potentially fatal reactions. Between 2004 and 2016, Mylan raised the price of EpiPens by nearly 500%, but with few comparable alternatives, physicians continued to prescribe EpiPen the majority of the time. The move by Novartis' Sandoz unit comes as Mylan faces growing EpiPen shortages due to manufacturing problems. It subcontracts production of the auto-injector to Meridian Medical, a division of Pfizer.

The Impact of Trump's Tariffs

President Trump's tariffs on Chinese imports could cost American medical device makers more than \$1.5b annually, according to some estimates. MRIs, CT scanners, pacemakers, sonograms and other imaging components were all included in the list of items subject to the 25% tariffs that went into effect on June 6. Also included are a variety of medical supplies and instruments made in China. Some device makers may choose to scale back operations and cut R&D budgets. For years, device makers have been staking out quality and low cost "China manufacturing solutions". While tariff exemptions are possible, uncertainty prevails. Dozens of drugs and medical devices are among the Chinese products and ingredients that the Trump administration targeted. Chinese manufacturing of medical equipment has undergone a major shift from low-end surgical gloves to more complicated products like magnetic resonance imaging scanners. An International Trade Commission report in January said the fastest growth was in sales of implantable orthopedic devices, plates and screws, mostly made of titanium and used for surgery and sports medicine. One analyst estimates that about 12% of medical devices imported into the U.S. come from China. Device makers are now adjusting to tariffs and costs are likely to be passed on to patients and payors.

Performance of Leading Healthcare Companies (as of July 9, 2018)

Sector	Company	Market Cap (millions)	EV (millions)	EV/ EBITDA	EV/ SALES	52 WK Perf	Revenue (millions)	Revenue Growth	Gross Margin
Benefits	Aetna, Inc.	\$60,909	\$65,128	-	1.1x	21.0%	\$61,000	-3.3%	-
	Express Scripts	\$44,977	\$51,849	7.1x	0.5x	28.1%	\$100,000	-0.1%	7.3%
	UnitedHealth	\$240,976	\$251,176	-	1.2x	33.4%	\$208,000	9.8%	-
Biopharm	GlaxoSmithKline	\$101,720	\$120,285	10.1x	3.0x	-2.9%	\$40,000	5.7%	66.0%
	Merck & Co.	\$167,337	\$164,057	14.1x	4.0x	-1.5%	\$41,000	2.8%	68.6%
	Novartis	\$178,838	\$217,556	14.2x	4.3x	-6.3%	\$50,000	4.2%	65.3%
	Pfizer	\$217,078	\$244,762	11.9x	4.7x	11.3%	\$53,000	0.1%	69.7%
Devices	Becton, Dickinson and Co.	\$64,893	\$79,290	23.1x	5.9x	22.8%	\$14,000	9.6%	46.0%
	Boston Scientific	\$46,375	\$42,789	17.0x	4.6x	21.8%	\$9,000	8.0%	66.0%
	Edwards Lifesciences	\$31,096	\$29,566	27.9x	8.6x	24.8%	\$3,450	9.4%	74.1%
	Integra LifeSciences	\$5,643	\$6,061	20.6x	4.7x	19.7%	\$1,290	26.9%	63.0%
	Intuitive Surgical	\$56,133	\$46,206	36.6x	14.0x	57.4%	\$3,300	18.6%	70.1%
	Medtronic	\$117,099	\$125,674	13.1x	4.2x	-1.5%	\$30,000	0.8%	63.9%
	Stryker	\$64,693	\$66,720	19.5x	5.2x	22.7%	\$13,000	8.0%	62.6%
	Zimmer Biomet	\$23,173	\$31,657	11.4x	4.0x	-10.3%	\$7,860	1.4%	64.8%
Diagnostics	Quest Diagnostics	\$15,006	\$17,790	11.3x	2.3x	0.7%	\$7,690	1.9%	37.5%
	Danaher Corporation	\$69,389	\$78,943	17.7x	4.2x	19.6%	\$19,000	0.6%	55.9%
	Hologic	\$11,218	\$13,113	13.4x	4.1x	-8.9%	\$3,190	10.2%	50.4%
	Qiagen	\$8,367	\$8,271	16.8x	5.7x	11.0%	\$1,450	7.9%	64.9%
	Thermo Fisher	\$83,361	\$103,786	18.7x	4.7x	16.7%	\$22,000	17.4%	43.7%
Distribution	Cardinal Health	\$15,516	\$27,160	8.2x	0.2x	-35.3%	\$134,000	4.7%	4.9%
	Henry Schein	\$11,675	\$12,909	12.0x	1.0x	-17.1%	\$13,000	8.3%	27.2%
	Mckesson	\$27,821	\$34,470	8.9x	0.2x	-16.3%	\$208,000	4.9%	5.1%
Diversified	Abbott	\$108,978	\$123,826	20.8x	4.4x	28.3%	\$28,000	27.5%	49.7%
	Johnson & Johnson	\$337,280	\$367,422	14.0x	4.7x	-5.1%	\$79,000	8.9%	66.5%
Healthcare IT	Cerner	\$20,891	\$19,043	12.6x	3.7x	-4.2%	\$5,170	5.2%	77.6%
Services	Fresenius Medical Care	\$30,300	\$41,067	12.2x	2.0x	3.3%	\$20,000	9.5%	32.6%

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Top Deals of 2018 Thorough July 9th > \$100m in Transaction Value (announced or closed)

Sector	Trans-Value (millions)	Acquiror	Target	Target Sales (millions)	Target EBITDA (millions)	Sales Multiple	EBITDA Multiple
Biopharmaceuticals	\$62,000	Takeda Pharmaceutical Co.	Shire plc	\$15,200.0	\$6,400.0	4.1x	9.7x
	\$13,000	GlaxoSmithKline plc (GSK)	36.5% stake in a consumer health joint venture Novartis AG	\$10,900.0	\$1,929.0	1.2x	6.7x
	\$11,600	Sanofi SA	Bioverativ Inc.	\$1,100.0	\$454.8	10.5x	25.5x
	\$9,000	Celgene Corp.	Juno Therapeutics Inc.	-	-	-	-
	\$4,800	Sanofi SA	Ablynx nv	\$75.7	-	63.4x	-
	\$2,400	Les Laboratoires Servier	The oncology business of Shire Plc	\$261.7	-	9.2x	-
	\$2,400	Advent International	The Zentiva generics division Zentiva from Sanofi SA	\$930.0	-	2.6x	-
	\$1,600	Eli Lilly and Company	ARMO BioSciences, Inc.	-	-	-	-
	\$1,400	CDH Investments	Sirtex Medical Limited	\$177.2	\$42.3	7.9x	33.1x
	\$1,285	Varian Medical Systems Inc.	Sirtex Medical Limited	\$234.3	\$52.3	5.5x	24.6x
	\$1,200	Mallinckrodt plc	Sucampo Pharmaceuticals, Inc.	\$250.5	\$107.2	4.8x	11.2x
	\$1,100	Celgene Corporation	Impact Biomedicines, Inc.	-	-	-	-
	\$626	Takeda Pharmaceutical Co. Ltd.	TiGenix NV	-	-	-	-
	\$614	Seattle Genetics, Inc.	Cascadian Therapeutics, Inc.	-	-	-	-
	\$394	Merck & Co.	Viralytics Ltd.	-	-	-	-
	\$225	Astellas Pharma Inc.	Mitobridge, Inc.	-	-	-	-
	\$214	Laborie Medical Technologies	Cogentix Medical Inc.	\$56.0	\$2.4	3.8x	89.2x
	\$190	Endo International plc	Somerset Therapeutics, LLC, and its India-based affiliate.	-	-	-	-
	\$140	Johnson & Johnson Janssen Biotech	BeneVir Biopharm Inc.	-	-	-	-

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Sector	Trans-Value (millions)	Acquiror	Target	Target Sales (millions)	Target EBITDA (millions)	Sales Multiple	EBITDA Multiple
	\$110	Eli Lilly and Company	AurKa Pharma, Inc	-	-	-	-
	\$105	Agilent Technologies Inc.	Lasergen, Inc.	-	-	-	-
Data Management/ Healthcare IT	\$1,900	Roche Holding AG	Flatiron Health	-	-	-	-
	\$100	Allscripts Healthcare Solutions, Inc.	Practice Fusion, Inc.	-	-	-	-
Diagnostics	\$2,400	Roche Holding AG	Foundation Medicine, Inc.	-	-	-	-
	\$2,100	Platinum Equity	LifeScan, Inc.	\$1,500.0	-	1.4x	-
	\$800	Fujifilm Corporation	Irvine Scientific Sales Company Inc. and IS Japan Co., Ltd.	-	-	-	-
	\$575	Bio-Techne Corporation	Exosome Diagnostics, Inc.	-	-	-	-
	\$375	Myriad Genetics Inc	Counsyl Inc	-	-	-	-
	\$250	Agilent Technologies Inc.	Advanced Analytical Technologies, Inc.	-	-	-	-
	\$147	Qiagen NV	STAT-Dx	-	-	-	-
	\$103	Astellas Pharma	Universal Cells	-	-	-	-
Distribution	\$815	AmerisourceBergen Corporation	H. D. Smith & Co.	-	-	-	-
Medical Devices	\$25,000	Alcon	Novartis AG	\$6,000.0	-	4.2x	-
	\$8,300	Sivantos Pte. Ltd	Widex A/S	\$1,870.0	-	4.4x	-
	\$2,800	Fortive Corporation	The Advanced Sterilization Products (ASP) business of Johnson & Johnson	\$775.0	-	3.6x	-
	\$1,700	Compagnie Générale des Établissements Michelin (Michelin)	Fenner PLC	\$866.0	\$113.1	2.0x	15.0x
	\$737	TPG Capital	Exactech, Inc.	\$257.6	\$43.2	2.9x	17.1x

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Sector	Trans-Value (millions)	Acquiror	Target	Target Sales (millions)	Target EBITDA (millions)	Sales Multiple	EBITDA Multiple
	\$600	MedPlast Inc.	The advanced surgical and orthopedics (AS&O) product lines of Integer Holdings Corp.	\$400.0	-	1.5x	-
	\$375	NN, Inc.	Paragon Medical, Inc.	\$141.0	\$40.3	2.7x	9.3x
	\$306	Boston Scientific Corporation	NxThera	-	-	-	-
	\$292	Koninklijke Philips N.V.	Environment Planning Development (EPD) Solutions Ltd	-	-	-	-
	\$200	LivaNova Plc	TandemLife	-	-	-	-
	\$153	Baxter International Inc.	The two hemostat and sealant products from Mallinckrodt plc	-	-	-	-
	\$150	Boston Scientific Corporation	nVision Medical Corporation	-	-	-	-
	\$100	Merit Medical Systems, Inc.	The soft tissue core needle biopsy products of Becton, Dickinson and Company	-	-	-	-
Medical Services	\$68,000	CIGNA Corporation	Express Scripts Inc.	\$100,000.0	\$7,100.0	0.7x	9.6x
	\$2,500	WellCare Health Plans, Inc.	Meridian Health Plan of Michigan, Inc., Meridian Health Plan of Illinois, Inc., and MeridianRx.	\$4,300.0	-	0.6x	-
	\$800	Charles River Laboratories International, Inc.	MPI Research Inc.	\$240.0	\$76.2	3.3x	10.5x
	\$735	McKesson Corporation	RxCrossroads Specialty Solutions	-	-	-	-

M&A Deal-by-Deal Analysis—Q2 2018 (announced or closed)

The information contained in the table below was derived from publicly available sources. Transaction analysis is inferential and not intended to be relied upon as pronouncements by the transaction participants or for any other reason. Transactions are pending or closed.

Sector	Acquiring Party	Transferring Party	Comments/Rationale
Biopharmaceuticals	Advent International , a global private equity firm	The Zentiva generics division Zentiva from Sanofi SA , a France-based biopharmaceutical company.	A new platform for Advent. Sanofi's Zentiva operates in 50 countries and sells cardiovascular, central nervous system, gastrointestinal and metabolic disorders drugs. In 2016, Sanofi' sold its animal health unit Merial in an asset swap with Boehringer Ingelheim, getting BI's consumer health business in return. Sanofi has been reshaping its business in recent months, spending more than \$16 billion to buy biotech company Ablynx and U.S. haemophilia specialist Bioverativ, but also selling off some assets. The planned Zentiva sale follows a move by Shire to sell its oncology business to unlisted French drug maker Servier for \$2.4 b. Deal value -- \$2.4b on sales of \$930 (2.58x).
Biopharmaceuticals	Agilent Technologies Inc. (NYSE: A) , a \$4.62b provider of bio-analytical and electronic measurement solutions.	Lasergen, Inc. , a biotechnology company focused on research and development of technologies for DNA sequencing.	Agilent is buying the remaining 52% stake in Lasergen it does not already own for \$105m. Lasergen has expertise in NGS chemistry, which combines with Agilent's leadership in target enrichment, clinical interpretation support software, and strong technologies in automation and microfluidics. Deal value -- \$105m.
Biopharmaceuticals	CDH Investments , a China-based private equity firm.	Sirtex Medical Limited , an Australia-based developer of novel treatments for liver cancer.	Sirtex's main commercialized product is a targeted radioactive treatment for liver cancer called SIR-Spheres® Y-90 resin microspheres used to deliver targeted internal radiation therapy directly to liver tumors via the hepatic artery. The therapy is performed using minimally invasive surgical techniques by an interventional radiologist. Clinical evidence suggests SIR-Spheres Y-90 resin microspheres may approximately double

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Sector	Acquiring Party	Transferring Party	Comments/Rationale
			the rate of tumor shrinkage and tumor remission. Over 86,000 doses of SIR-Spheres Y-90 resin microspheres have been supplied to treat liver cancer patients at over 1,160 medical centers in over 40 countries. The product has PMA approval from FDA, the European Union (CE Mark) and Australia's Therapeutic Goods Administration (TGA). Manufacturing facilities are in the U.S., Singapore and Germany. CDH broke up a deal with Varian Medical Systems with a higher bid. Deal value -- \$1.4b on sales of \$177.2m (7.9x) and operating cash flow of \$42.m (33.1x).
Biopharmaceuticals	Celgene Corp. (NASDAQ:CELG) , a \$12.5b developer of therapies for cancer and inflammatory diseases.	Juno Therapeutics Inc. , a Seattle-based biotech company making cutting-edge cancer immunotherapy treatments	Expands Celgene's portfolio of blood-cancer drugs. Juno is one of leaders in a new kind of cancer treatment, known as CAR-T, that takes a patient's own immune cells, modifies them and then sets them loose to hunt down and attack tumors. Deal Value - \$9b, on sales of \$13b(0.69x), and \$4.3b in EBITDA(2.09x).
Biopharmaceuticals	Eli Lilly and Company (NYSE: LLY) , a \$22.9b biopharmaceutical company.	ARMO BioSciences, Inc. , a developer of immunotherapies for cancer, cardiovascular diseases, fibrosis and inflammation.	ARMO is a late-stage immuno-oncology company that is developing a pipeline of novel, proprietary product candidates designed to activate the immune system of cancer patients to recognize and eradicate tumors. ARMO's main product has demonstrated clinical benefit to treat pancreatic cancer and has had earlier-Phase trials in lung and renal cell cancer, melanoma and other tumor types. Deal value - \$1.6b.
Biopharmaceuticals	Eli Lilly and Company (NYSE: LLY) , a \$22.9b biopharmaceutical company.	AurKa Pharma, Inc , a developer of oncology compound AK-01, an Aurora kinase A inhibitor.	AurKa focuses on a family of enzymes that play a role in cell division of cancer cells. These enzymes, called Aurora kinases, are abundant in tumors and have emerged as potential targets for new cancer drugs. Deal Value - \$110m.

Sector	Acquiring Party	Transferring Party	Comments/Rationale
Biopharmaceuticals	Endo International plc (NASDAQ: ENDP) , a \$3.4b generics and specialty branded pharmaceutical company.	Somerset Therapeutics, LLC, and its India-based affiliate. , a specialty pharmaceutical company that develops and markets sterile injectable and ophthalmic drugs.	Secures the supply chain for Endo's Par Sterile injectable business. Focusing on the fast-growing U.S. sterile injectable drugs market, Somerset Therapeutics' portfolio includes 8 commercial products as well as a pipeline of more than 40 products, over 25 of which have been submitted for approval to the FDA. Here, Endo significantly increases the number of filed injectable applications. Deal value -- \$190m.
Biopharmaceuticals	Humco , a diversified global pharmaceutical company.	Fagron BV , a provider of pharmaceutical compounding and personalized medicine.	Founded in 1872, Humco serves over 45,000 pharmacies and is anchored by its leading non-sterile, innovative patented delivery vehicles (including topical and transdermal creams, syrups and suspensions) and branded pharmaceutical products. Humco adds value to customers through Fagron's extensive line of Active Pharmaceutical Ingredients, product portfolio and strong research and development. Deal value -- \$70m.
Biopharmaceuticals	Johnson & Johnson Janssen Biotech (NYSE:JNJ) , a \$72.52b manufacturer of pharmaceuticals, medical devices and consumer healthcare products.	BeneVir Biopharm Inc. , a developer of novel cancer treatments.	BeneVir's proprietary T-Stealth Oncolytic Virus Platform that can be used to develop oncolytic viruses used to infect and destroy cancer cells. Oncolytic viruses are a growing field in immuno-oncology, as they have been shown to make a difference in treating various cancers. In 2015 the FDA approved the first oncolytic virus therapy for melanoma, Amgen's Imlygic. Multiple companies have jumped into the field, including Merck, which acquired Australia-based Viralytics Limited and its oncolytic immunotherapy treatments for \$394 million. BeneVir's unique technology platform complements Janssen's immuno-oncology research. Deal value -- \$140m plus up to \$900m in milestone payments.
Biopharmaceuticals	LabCorp (NYSE: LH) , a \$10b provider of clinical laboratory services.	Sciformix Corporation , a scientific process outsourcing company.	Strengthens LabCorp's position in the later phases of drug and device development, particularly for post-marketing pharmacovigilance and market access solutions. Sciformix is a scien-

Sector	Acquiring Party	Transferring Party	Comments/Rationale
			tific process outsourcing company focused on pharmacovigilance and regulatory solutions for biopharmaceutical and medical devices clients. The acquisition will add about 1,100 employees to its workforce, with most working in Asia. Terms not announced.
Biopharmaceuticals	Laborie Medical Technologies , a provider of pelvic health and gastroenterology medical diagnostics and devices.	Cogentix Medical Inc. , a \$54.01m developer of fiberoptic and video endoscopy products.	Provides product and channel scale to LABORIE'S existing Urology Strategic Business Unit (SBU) diagnostic and therapeutic portfolio, particularly in the areas of OAB (overactive bladder) and SUI (stress urinary incontinence), Cogentix products include: Urgent PC Neuromodulation System - non-drug, non-surgical treatment for OAB and associated symptoms of urinary urgency, urinary frequency and urge incontinence; PrimeSight Cystoscopy System & EndoSheath - Cystoscopy system combined with a single-use, protective barrier with an integrated working channel; and Macroplastique - Injectable, a soft-tissue bulking agent used to treat female SUI primarily due to intrinsic sphincter deficiency. It is estimated that 42 million people in the U.S. have Overactive Bladder (OAB), of which approximately 38 million remain untreated or under-treated. OAB occurs when bladder muscles become overly sensitive or overactive, which typically results from damage to the nervous system or to the nerves and muscles associated with bladder contractility. Symptoms of OAB include urinary urgency, urinary frequency or urge incontinence. Deal value -- \$214m on revenue of \$56.0m (3.8x) and EBITDA of \$2.4m (89.2x).
Biopharmaceuticals	Les Laboratoires Ser-vier , a privately-owned France-based manufacturer of cardiovascular drugs.	The oncology business of Shire Plc , an Ireland-based pharmaceutical maker.	The transaction covers the transfer of Shire's Oncology business including in-market products ONCASPAR® (peg-aspargase), a component of multi-agent treatment for acute lymphoblastic leukemia (ALL) and ex-U.S. rights to ONIVYDE® (irinotecan pegylated liposomal formulation), a component of

Sector	Acquiring Party	Transferring Party	Comments/Rationale
			<p>multi-agent treatment for metastatic pancreatic cancer post gemcitabine-based therapy. The portfolio also includes two early stage immuno-oncology pipeline collaborations. The deal enables Servier to meet its strategic ambitions to become a key player in oncology globally, a major step in the transformation establishing a direct commercial presence in the US, as well as strengthening its portfolio of marketed products in the ex-US territories where Servier is already present. Takeda Pharmaceutical made a \$60b takeover for Shire in competition with Allergan. Shire rejected Takeda's offer and this divesture to Servier was a move to deter Takeda's interest to acquire Shire, since oncology was one of the areas it highlighted for pursuing Shire, along with gastrointestinal medicine and neuroscience. Deal value -- \$2.4b on sales of \$261.7m (9.17x).</p>
Biopharmaceuticals	<p>Madison Dearborn Partners, LLC, a major private equity firm.</p>	<p>Alcami Corporation, a leading contract development and manufacturing organization (CDMO) serving the biopharma sector.</p>	<p>With 10 locations across the globe, Alcamo provides contract solutions tailored to small and mid-size pharmaceutical and biotechnology companies. It offers a faster pathway for products through the clinic toward commercialization, as well as individualized development, and manufacturing services. Alcamo's services include active pharmaceutical ingredient (API) development and manufacturing, solid state chemistry, formulation development, analytical development and testing services, drug product manufacturing (oral solid dose and parenteral), and packaging and stability services. A new platform for Madison Dearborn. This deal is the latest in a string of insurance-sector deals in recent months. Pharmacy chain CVS Health Corp. has announced it plans to buy Aetna Inc., while Cigna Corp. plans to buy pharmacy-benefits manager Express Scripts Holding Co. Terms not announced.</p>

Sector	Acquiring Party	Transferring Party	Comments/Rationale
Biopharmaceuticals	Takeda Pharmaceutical Co. , a \$16.7b Japan-based global biopharma company.	Shire plc , a biotechnology company, researches, a maker of medicines for rare diseases and other specialized conditions.	After a battle to buy Shire, Takeda is making the biggest-ever overseas acquisition by a Japanese company. The sweetened deal, if completed, would make Takeda one of the top pharma companies in the world. It gets drugs for rare diseases such as hemophilia, a field that is luring a growing number of drug makers because they can charge more for unique life-saving drugs than for routine treatments. Takeda has ramped up its ambitions seeking growth overseas amid patent expirations and a shrinking domestic population. The two companies have more than 50,000 employees between them worldwide, and layoffs will happen, if the deal happens. Deal value \$62b on revenue of \$15.2b (4.07x) and EBITDA of \$6.4b (9.7x). More than \$1b of "cost cuts" are expected.
Biopharmaceuticals	Water Street Healthcare Partners and JLL Partners , private equity firms.	Dohmen Life Science Services , a provider of biopharma and medical device companies with a wide array of outsourced services and capabilities in the areas of patient support, supply chain, compliance, finance and technology.	A new platform for Water Street. DLSS provides biopharma and medical device companies with a wide array of outsourced services and capabilities in the areas of patient support, supply chain, compliance, finance and technology. With the addition of DLSS, the platform will become a leading independent provider of commercialization services to life sciences companies, serving > 300 top pharmaceutical, biotech and medical device companies with a portfolio of solutions designed to simplify commercialization, optimize market access and build share for new and existing therapies. Terms not disclosed.
Data Management/ Healthcare IT	Inspirata Inc , a provider of cancer diagnostics solutions.	Caradigm USA LLC , a healthcare analytics and population health service provider	Enables Inspirata to accelerate its Cancer Information Data Trust (CIDT) development to address key trends in oncology care. Caradigm's main product, aggregates data across clinical, social, operational and financial sources from disparate source systems. Inspirata is aiming at leveraging the core strengths of this platform to accelerate their Cancer Information Data Trust (CIDT) development. The CIDT will address key trends in oncology care. GE Healthcare and Microsoft

Sector	Acquiring Party	Transferring Party	Comments/Rationale
			launched Caradigm in 2012, and in 2016, Microsoft sold its 50% stake in the company to GE Healthcare. Terms not announced.
Data Management/ Healthcare IT	Roche Holdings, Inc. (OTC:RHHBY) , a \$54.1b research-focused, biotechnology company with strengths in pharmaceuticals and diagnostics.	Inception Sciences, Inc. , a provider of regenerative therapies for multiple sclerosis.	The acquisition is the culmination of an alliance between Inception and Roche to discover and develop novel small molecules that promote remyelination of nerve fibers damaged during the progression of multiple sclerosis. Versant Ventures backed the project with equity financing, and Roche provided research funding to secure an option to acquire a specific program upon delivery of an IND-enabling package. The specific target of the acquired program is not disclosed. Terms not announced.
Diagnostics	ACM Global Central Laboratory , a provider of central laboratory diagnostic services.	ABS Laboratories (Rochester Regional Health) , a London-based bioanalytical services provider.	Adds to ACM's growing portfolio focused on bioanalytical, toxicology and central lab testing. ABS Laboratories is a subsidiary of Rochester Regional Health (RRH), specializing in complex assay method development and validation for the quantification of drugs, metabolites and biomarkers in biological samples for preclinical and clinical trials including final regulatory submission. In late 2017, ACM bought DrugScan, Inc. and DSI Medical Services, Inc. Terms not announced.
Diagnostics	bioMérieux S.A. , a \$3.5b France-based in-vitro diagnostic company.	Astute Medical Inc. , a developer of protein biomarkers to serve as the basis for novel diagnostic tests for rapid diagnosis and risk assessment.	Astute Medical develops devices for diagnosing high-risk medical conditions and diseases through the identification and validation of protein biomarkers. Astute developed the NEPHROCHECK® test, an FDA-cleared test for the early risk assessment of acute kidney injuries (AKI) based on the level of two biomarkers, IGFBP-7 (Insulin-like Growth Factor-Binding Protein-7) and TIMP-2 (Tissue Inhibitor Metalloproteinases-2). The deal builds upon the partnership developed in 2015 between Astute and bioMérieux when Astute granted bioMérieux a license to develop and market the NEPHROCHECK® test

Sector	Acquiring Party	Transferring Party	Comments/Rationale
			for the VIDAS® automated immunoassay system. Since 2017, bioMérieux has been a licensed distributor with Astute for the NEPHROCHECK® test on the Astute140 Meter in the US. Terms not announced.
Diagnostics	Bio-Techne Corporation (NASDAQ: TECH) , a \$563m holding company for biotechnology and clinical diagnostic brands.	Exosome Diagnostics, Inc. , a provider of diagnostic solutions.	Extends Bio-techne's core competencies to the science of exosomes and cell free-DNA (cfDNA) biology and their utility as novel diagnostic tools. Exosome Diagnostics manufactures a urine-based test, ExoDx® Prostate (IntelliScore) (EPI), to assist physicians in determining the need for a prostate biopsy in patients with an ambiguous PSA test result. The deal positions Bio-Techne to be a player in the rapidly-growing non-invasive liquid biopsy market and will be Bio-techne's 14th acquisition in the past 5 years. Deal value -- \$250m plus up to \$325m in milestone payments.
Diagnostics	Illumina, Inc. (NASDAQ: ILMN) , a \$2.75b manufacturer of genetic variation analysis systems.	Edico Genome , a leading provider of data analysis acceleration solutions for next-generation sequencing (NGS).	Complements Illumina's sequencing portfolio, accelerating results and improving efficiencies. Edico Genome's DRAGEN® Bio-IT Platform (DRAGEN) uses field programmable gate array (FPGA) technology in conjunction with proprietary software algorithms to reduce both data footprints and time to results. Terms not announced.
Diagnostics	Myriad Genetics Inc (NASDAQ:MYGN) , a \$757.3m developer of predictive, personalized, and prognostic medicine tests.	Counsyl Inc , a provider of genetic testing and deoxyribonucleic acid (DNA) analysis services	Enables Myriad Genetics to be the premier women's health genetic testing company through Counsyl's reproductive testing products. Counsyl offers a test that covers more than 175 clinically actionable conditions across ethnicities, and Reliant, a hereditary cancer panel. This is Myriad's largest deal to date. Previously, the company purchased Rules-Based Medicine in 2011, for \$80m; Crescendo Bioscience in 2014, for \$245m; and Assurex in 2016, for \$225m, plus up to \$185m in performance-based milestones. Deal value- \$375m.

Sector	Acquiring Party	Transferring Party	Comments/Rationale
Diagnostics	Roche Holding AG (OTC: RHHBY) , a \$55.7b Switzerland-based pharmaceuticals and diagnostics company focused on oncology, virology, inflammation, metabolic disorders and CNS.	Foundation Medicine, Inc. , a tumor-testing company.	Three years after acquiring a majority stake in Foundation, Roche has agreed to buy the remaining shares and bring the company's sequencing diagnostics platform under the Roche umbrella and supports Roche's personalized healthcare strategy. Foundation is the leader in the growing area of sequencing the genes of tumor samples. The company was recently approved by the FDA for its F1CDx test, a sequencing test for solid tumors that can detect cancer-causing mutations in 324 genes. The transaction is Roche's second major deal in the personalized healthcare space this year. The company acquired Flatiron Health in April, a provider of oncology-focused electronic health record software, for \$1.9m. Roche is paying \$2.4b for the stock it doesn't own, making the market capital ~\$5.07b. Sales are \$179.4m.
Distribution	McKesson Corporation (NYSE:MCK) , a \$205.4b medical device and pharmaceutical company.	Medical Specialties Distributors , a distributor of healthcare products to home infusion, specialty pharmacy, and oncology markets.	Founded in 1982, MSD provides supply chain, biomedical services, and technology solutions to healthcare providers operating in low cost alternate sites of care, including home infusion, long-term care, home health, and oncology providers. The company serves a diversified, long-tenured customer base across 10,000 sites nationwide with a suite of mission-critical offerings including: supply chain; formulary management; and chronic care supplies that require patient home delivery; Since New Mountain's investment, MSD has continued to strengthen its leadership in the home infusion space while also significantly expanding its presence across the broader post-acute landscape, particularly within the long-term care, home health, and oncology segments. The Walden Group arranged for the sale of Attentus Medical to MSD in 2016. This deal is part of McKesson's multi-year strategic growth initiative, focused on creating innovative new solutions that improve patient care delivery and drive incremental profit growth. Terms not announced.

Sector	Acquiring Party	Transferring Party	Comments/Rationale
Distribution/Retail	Amazon.com, Inc. , a global leader in e-commerce, logistics, payments, hardware, data storage, and media.	PillPack, Inc. , an online pharmacy that allows customers to buy drugs in pre-made doses.	With PiiPack, Amazon is entering the online pharmacy market. Amazon is buying PillPack. Reportedly, PillPack was in talks with Walmart a few months ago for an asking price of \$1b. In 2016, PillPack had a valuation of \$361m. The move can how hot e-health market is becoming, and also how Amazon views it as a key frontier in its bid to be the go-to place for anything a consumer (or medical organization) might want or need in the area of healthcare. In January, Buffett, Amazon's Jeff Bezos, and JP Morgan's Dimon announced they were creating a joint venture to cut healthcare costs and improve services. Although many views this as likely to have an impact on the broader U.S. healthcare market, it appears to be focused primarily on solving the three companies' internal healthcare issues. It is not clear if the acquisition of PillPack is related to this joint venture, although it wouldn't be surprising if it became a component of it.
Distribution/Retail	Medline Industries Inc. , a large privately-owned manufacturer and distributor of a broad array of healthcare products.	Dufort Et Lavigne Ltee , a Quebec-based medical supply distributor.	Extends Medline's presence into Quebec. Dufort have worked with Medline for more than a decade. All of its 76 employees are based in Quebec. Terms not announced.
Medical Devices	Acelity L.P. Inc. , a \$1.8b provider of global advanced wound care and regenerative medicine.	Crawford Healthcare , a UK-based advanced wound care and dermatology company.	Crawford Healthcare develops rapidly growing skin care treatments in the foam and antimicrobial gelling fiber categories. That complements Acelity's collagen and other dressings. Terms not announced.
Medical Devices	Alcon , a global leader in ophthalmic surgical and consumer eyecare products.	Novartis AG , a Switzerland-based healthcare holding company.	After assessing available options for Alcon ranging from retention, sale, IPO to spinoff, Novartis is spinning off Alcon. Novartis would become more focused, as would a standalone Alcon

Sector	Acquiring Party	Transferring Party	Comments/Rationale
			as a publicly traded global medtech leader. When Novartis acquired Alcon in 2011 for \$52b, the business included surgical, vision care and ophthalmic pharmaceuticals. In 2016, Novartis absorbed Alcon's drug business, leaving Alcon as an ophthalmic surgical device and diagnostic company. For years, Novartis has been seeking to turnaround Alcon, and its value is now estimated \$25-35b, although that might be too high. Alcon improved operating profits to \$90m Q1 2018 after losing money in 2017. Revenue exceed \$6.0b.
Medical Devices	Becton, Dickinson and Company , a \$12.09b developer of medical devices, instrument systems, and reagents.	TVA Medical, Inc , a maker of MIS vascular access solutions for patients with chronic kidney disease requiring hemodialysis.	TVA's main product is an endoAVF System, a new endovascular arteriovenous (AV) fistula creation technology. Surgical fistulas are the preferred vascular access option, resulting in lower mortality rates, fewer infections and lower cost of dialysis delivery compared to central venous catheters. This technology complements BD's Peripheral Intervention offerings by providing a minimally invasive option for creating critical AV fistulas for hemodialysis procedures. Terms not announced.
Medical Devices	Belmont Instrument, LLC , a provider of fluid management and critical care medical devices in medical facilities, military combat fields, and EMS settings.	MTRE Advanced Technologies Ltd. , a maker of non-invasive products for body temperature management.	Extends Belmont's portfolio to include non-invasive body temperature management. MTRE's line includes pump-driven thermowrap systems and other temperature management products. Mennen Medical Ltd., an Israel-based leader in patient monitoring and clinical information systems, acquired MTRE in 2006. Terms not announced.
Medical Devices	Biomerics and ATL Technology , two catheter OEMs forming a joint venture for this deal.	Catheter Research Inc. , a manufacturer of interventional catheters, tube sets and other assemblies for medical devices.	Implements Biomerics' strategy to expand and invest in additional production and engineering capabilities to develop a global competitive advantage. CRI's products, manufacturing locations, and technology broadens Biomerics' product offering. The addition of the Costa Rica operations provides a

Sector	Acquiring Party	Transferring Party	Comments/Rationale
			<p>unique low-cost high-volume manufacturing platform. Combining ATLs connector know-how with CRI's catheter capabilities optimizes ATL's catheter engineering capabilities. CRI has manufacturing in Indianapolis and Costa Rica. The employees at these locations will be working closely with teams from ATL and Biomerics throughout the integration process and as they work to expand the Costa Rica operation. Terms not announced.</p>
<p>Medical Devices</p>	<p>Boston Scientific Corporation (NYSE: BSX), a \$9.05b maker of hemophilia, immune disorders and infectious diseases products.</p>	<p>nVision Medical Corporation, a developer of a device for collecting cells from the fallopian tubes to detect ovarian cancer.</p>	<p>Ovarian cancer is the fifth leading cause of cancer death among women. More than 2 million women in the U.S. are at high risk and it occurs more frequently in those with a family history or with gene mutations. There are no recommended early screening tests, and, to date, there has been no effective way to biopsy cells in the fallopian tubes. Boston estimates the market to be \$500m with the potential to grow to \$2b as this device is used by more gynecologists to help even more women. nVision devices effectively collect cells which, when tested, correlate with a post-surgery definitive diagnosis of ovarian cancer. Boston Scientific plans to conduct additional clinical research with the nVision device to further establish how the cells it collects from the fallopian tubes can be used to render a diagnosis prior to surgery and help in the decision-making process for women at increased risk for ovarian cancer. Deal value -- \$150m plus and additional milestone of \$125m.</p>
<p>Medical Devices</p>	<p>Boston Scientific Corporation (NYSE: BSX), a \$9.05b maker of hemophilia, immune disorders and</p>	<p>Securus Medical Group, Inc., a manufacturer of a thermal monitoring system for the continuous measurement of esophageal temperature.</p>	<p>Arrhythmias are commonly treated with cardiac ablation, the process of delivering radiofrequency (heating) or cryothermal (cooling) energy to destroy a small area of heart muscle responsible for the abnormal heart rhythm. Physicians monitor the temperature of the esophagus, which is located behind the area of the heart where the hot or cool energy is applied,</p>

Sector	Acquiring Party	Transferring Party	Comments/Rationale
	infectious diseases products.		during an ablation procedure to avoid thermal injury. The thermal monitoring system developed by Securus is an integrated catheter-based probe and imaging system that generates real-time images of the temperature of the esophagus. Current standards of care for esophageal temperature monitoring only measure temperature at one or a few fixed locations and have a slow temporal response. Securus' system continuously reads the temperature of the esophagus from thousands of points and provides physicians with an intuitive 360-degree view that refreshes every second. The latest system recently received 510(k) clearance and is expected to be integrated into the Boston Scientific portfolio and commercially available in the U.S. in the first half of 2019. Boston Scientific has been an investor in Securus since 2016, and the transaction price for the remaining stake not already owned consists of \$40 million in cash up-front, as well as up to \$10 million in contingent payments based on regulatory achievements and commercial milestones.
Medical Devices	Compagnie Générale des Établissements Michelin (Michelin) (ML.PA) , a \$25.5b manufacturer of tire and rubber products.	Fenner PLC , a UK-based producer of reinforced polymer products for the energy, industrial, and healthcare markets.	Michelin is buying Fenner primarily for its conveyor belt and non-healthcare offerings. Deal value - \$1.7b on sales of \$866m (1.9x) and \$113.1m in EBITDA (15.0x).
Medical Devices	CorneaGen Inc. , a maker of specialty products for cornea surgery.	The Kamra cornea inlay business of AcuFocus Inc. , an ophthalmic company focused on the treatment of presbyopia (age related farsightedness).	The Kamra corneal inlay implant, which received FDA approval in 2015, uses a pinhole effect to extend depth-of-focus for patients with presbyopia, or age-related farsightedness. Corneal implants are a natural fit with CorneaGen's growing family of innovative corneal products and services. The sale allows AcuFocus to focus efforts on bringing its IC-8 small aperture intraocular lens to the U.S. market. The IC-8 is designed to treat

Sector	Acquiring Party	Transferring Party	Comments/Rationale
			presbyopic patients with cataracts. The device has European CE Mark approval but isn't approved by the FDA. AcuFocus is venture-backed and, industry sources say, corneal inlays did not meet the promise they were promoted to meet.
Medical Devices	Eurocoating SpA , a provider of plasma spray coating and additive manufacturing services to orthopedic and dental OEMs.	Nanosurfaces Industries Srl , a One-Stop-Shop for orthopedic & dental applications	Gives Eurocoating high-tech manufacturing capabilities and innovative advanced surface treatments. Nanosurfaces offers design and manufacturing services to OEMs supporting them with machining, finishing, coating and sterile packaging services, providing solutions for both implants and instruments. Terms not announced.
Medical Devices	Fortive Corporation (NYSE: FTV) , a \$6.86b diversified maker of engineered and instrumentation products and a spin-off of Danaher Corp.	The Advanced Sterilization Products (ASP) business of Johnson & Johnson , a \$76.45b manufacturer of pharmaceuticals, medical devices and consumer healthcare products.	ASP provides sterilization and disinfection solutions and low-temperature hydrogen peroxide sterilization technology. Its products include systems for sterilizing instruments and reprocessing and cleaning endoscopes. The deal is part of Fortive's aggressive growth by M&A strategy. It is the latest move of J&J's to streamline its portfolio. after a review of its over-the-counter drugs, diabetes care and medical device properties. It has reported that it was close to selling off its diabetes device unit for \$2.1b. J&J has been focused on building its drug pipeline, after its recent purchase of Actelion for \$30b to strengthen its presence in the rare diseases market. In 2017, Deal Value -- \$2.8b on sales of \$775m(3.61x).
Medical Devices	Halyard Health, Inc. (now called Avanos Medical Inc.) (NYSE: HYH) , a \$1.6b medical device maker with a focus on surgical and infection prevention.	CoolSystems Inc , a provider of cold therapy and compression therapy systems	Extends Halyard's offerings in the orthopedic and sports medicine markets. CoolSystems is the maker of Game Ready, which is used to assist in the pain management and rehabilitation of patients recovering from orthopedic surgery or sports-related injuries. CoolSystems product line includes cold and compression therapy system multi-modality therapy units and a variety

Sector	Acquiring Party	Transferring Party	Comments/Rationale
			of product accessories, all of which complement Halyard's existing Pain Management portfolio. Deal-value - \$65m on sales of \$35m(1.85x).
Medical Devices	Innovia Medical, LLC , a niche maker of ENT and other surgical devices.	Network Medical Products Ltd , a UK-based manufacturer of sterile single use products for ENT and Ophthalmic procedures.	Network's line will grow and diversify Innovia's offerings and leverage its capabilities and distribution network. Network's line includes CORONET trephines, EYETEC, Ophthalmic PVA, eye spears, PVA sponges, and disposable instruments. Terms not announced.
Medical Devices	Johnson & Johnson, Inc. (NYSE: JNJ) , a \$72.52b manufacturer of pharmaceuticals, medical devices and consumer healthcare products.	Orthotaxy , a developer of software-enabled surgery technologies, including a differentiated robotic-assisted surgery solution.	With its acquisition of Orthotaxy, Johnson & Johnson joins a growing list of medtech players strengthening surgical robotics offerings expanding the technology's applications. Orthotaxy's is in early-stage development for total and partial knee replacement. The deal helps J&J compete more effectively against Stryker's Mako orthopedic surgical solution, acquired in 2013. In 2015, J&J's Ethicon unit partnered with Verily, Google's life sciences unit, to form Verb, a surgical robotics firm and compete with Intuitive Surgical, the market pioneer and leader with its Da Vinci system. Transenterix, another player in the space, received FDA clearance for the Senhance surgical robot in October 2017. Senhance was the second surgical robot cleared for abdominal entry since Intuitive received an FDA nod in 2000. There are some relatively new players in the surgical robotics space, including Medtronic, which has been developing a new robotics platform named Einstein. Medtronic began focusing on surgical robotics in the orthopedics space through agreements it signed with Mazor Robotics, an Israeli-based company, about two years ago. One agreement called for Medtronic to have a co-promotion and joint, exclusive development and distribution agreement. The other calls for Medtronic to take an equity stake in Mazor. In August 2017, Medtronic further expanded the relationship and made

Sector	Acquiring Party	Transferring Party	Comments/Rationale
			a \$40 million third tranche investment in Mazor. Orthotaxy deal terms not announced.
Medical Devices	Kaha Sciences , a newly formed New Zealand-based developer of telemetry systems.	The lifesciences telemetry unit of Millar, Inc. , a developer of catheter-based, solid-state pressure sensors.	Provides Kaha with an active telemetry operation. Millar is seeking to focus on its Micro-Electro-Mechanical Systems (MEMS) sensor clinical and OEM business. Terms not announced.
Medical Devices	Kohlberg & Company L.L.C , a substantial private equity firm.	Cadence Inc , a leading OEM provider of complex high-precision components and finished devices for advanced surgical and specialty industrial applications.	Cadence innovates and manufactures highly engineered metal and plastics subassemblies and finished devices for leading medical device and specialty industrial companies across the endoscopy, minimally invasive orthopedics, laparoscopy, robotics, life science, and specialty industrial end-markets worldwide. Kohlberg will accelerate the expansion of Cadence's capabilities Cadence employs more than 475 people. Terms not announced.
Medical Devices	Koninklijke Philips N.V. (NYSE: PHG) , a \$17.8b developer of medical systems, consumer electronics and lighting products.	Remote Diagnostic Technologies Ltd (RDT) , a UK-based manufacturer of remote monitoring and resuscitation systems.	Strengthens Philips' leadership position in the EUR 1.4b resuscitation and emergency care market. RDT also complements Philips' portfolio with a product range for ambulance and emergency responders, includingTempus ALS, a modularized monitor and defibrillator that offers premium functionality in a smaller, lighter and more flexible package. Terms not announced.
Medical Devices	Koninklijke Philips N.V. (NYSE: PHG) , a \$17.8b maker of medical systems, consumer electronics and lighting products.	Environment Planning Development (EPD) Solutions Ltd , a developer of image-guided systems for cardiac arrhythmias.	Complements Philips' portfolio of interventional imaging systems, smart catheters, planning and navigation software, and services. EPD's cardiac imaging and navigation system helps electrophysiologists navigate the heart by generating a detailed 3D image of the cardiac anatomy, while also pinpointing the location and orientation of catheters for cardiac arrhythmias. This technology may simplify navigation and treatment

Sector	Acquiring Party	Transferring Party	Comments/Rationale
			and ultimately enhance procedure efficiency. Deal value - \$292.1m plus up to \$325.7m in milestone payments.
Medical Devices	LivaNova Plc (NASDAQ:LIVN) , a \$1.01b England-based developer of cardiac management devices.	TandemLife , a maker of advanced cardiopulmonary temporary support solutions	TandemLife offers product systems, all built around a common pump and controller -- ExtraCorporeal Life Support and Percutaneous Mechanical Circulatory Support -- and they are complementary to LivaNova's offerings in cardiac surgery. Use of ECLS and pMCS systems is on the rise, and technological advancements have made products easier to use and more efficacious, leading to growth in the number of hospitals capable of performing these advanced procedures. With TandemLife, hospitals can deploy a versatile platform consisting of a single pump and controller upon which all of the company's products operate. Each TandemLife system may include a pump, an oxygenator and cannulae for comprehensive, acute cardiac, pulmonary or cardiopulmonary care. Deal value -- \$200m plus a \$50m earnout based on regulatory milestones.
Medical Devices	MedPlast Inc. , a large OEM maker of single use medical devices.	The advanced surgical and orthopedics (AS&O) product lines of Integer Holdings Corp. , a large medical device outsource manufacturer focused on cardiac, neuro-modulation, vascular and portable medical markets.	Broadens MedPlast's offerings, adds scale, new growth opportunities and 10 manufacturing facilities. In addition to expanding MedPlast's offering into a broad range of metals manufacturing capabilities, including machining, stamping, coating, and metal forming, it strengthens MedPlast's front-end design, development and prototyping services. The deal is expected to double MedPlast's size to ~ \$1b in sales and expand its presence in Europe. MedPlast said it will hire around 6,000 engineers, technicians and assembly workers across Asia, Central America, Europe and the U.S. This is MedPlast's third buyout in two years; it bought Vention's medical device manufacturing services division in 2017 and acquired medical device assembler Coastal Life Technologies three months later. Integer is paying down debt and realigning its focus similarly to LivaNova, which sold its Cardiac Rhythm and Management Unit

Sector	Acquiring Party	Transferring Party	Comments/Rationale
			to Microport for \$190m in 2017 to focus on its cardiac surgery and neuromodulation businesses. Deal value -- \$600m on about ~\$400m in sales(1.5x).
Medical Devices	Medtronic PLC (NYSE: MDT) , a \$29.7b manufacturer of cardiovascular and spinal products.	Visionsense Ltd. , an Israel-based medical visualization company.	Visionsense develops a minimally invasive stereoscope camera that enables 3D visualization of difficult areas during surgery. Its R&D is based in Israel, while its management and marketing operations are based in the U.S. The company raised \$21m. Visionsense's has both a European and US clearance. This is Medtronic's ninth investment in Israel in the past 13 years. Deal terms -- \$40m plus \$25m in milestones.
Medical Devices	Molnlycke Health Care AB , a large woundcare company and a unit of Investor AB	SastoMed GmbH , a niche woundcare products company.	SastoMed brings to Molnlycke two innovative and complementary products -- Granulox, a haemoglobin-based topical oxygen therapy spray that is sprayed on wounds for faster wound healing; and Granudacyn, a hypochlorous wound irrigation solution for cleaning, moistening and rinsing of acute, chronic and contaminated wounds, and first and second-degree burns. Terms not disclosed.
Medical Devices	NN, Inc. (NNBR) , a \$620m manufacturer of high-precision metal and plastic components and assemblies.	Paragon Medical, Inc. , a "tier 1" manufacturer of orthopedic instruments, trays, cases and implantable components.	Paragon Medical manufactures orthopedic, case and tray, implant and instrument markets. The deal supports NN's strategy to grow its Life Science revenue to \$300m in 2018, \$150-\$160m of which is orthopaedic. The acquisition also positions NN as one of the 10 largest contract manufacturers in orthopaedics. Post-acquisition, NN's top ten customers overall will include J&J, Medtronic, Stryker and Zimmer Biomet. Beecken Petty O'Keefe bought Paragon in 2013. Deal value -- \$375m on sales of \$141.0m (0.38x) up1.9% YOY, and earnings of \$40.3m. Of its revenue, 23% derives from manufacture of implantable components, 33% from custom delivery systems (cases/trays) and 44% from surgical instrumentation. Adding Paragon will yield 44% of NN's Life Sciences revenues deriving

Sector	Acquiring Party	Transferring Party	Comments/Rationale
			from Orthopaedics and Spine. NN's brands include Bridge-medica, DRT Medical, Holmed, Trigon, Precision Engineered Products, etc., all of which have been acquired since 2015.
Medical Devices	Sivantos Pte. Ltd , a Germany-based hearing aid maker previously owned by Siemens.	Widex A/S , A Denmark-based hearing aid maker.	Sivantos, owned by EQT Partners, and Widex are merging to form the 3rd largest hearing aid maker. The merger will likely push back EQT's plans for an IPO of Sivantos by a few years, as the two companies integrate. Increasing R&D investment may allow Sivantos and Widex to compete better with William Demant and GN Store Nord, the industry leaders (both Danish), in areas such as bluetooth and sensors. Other players include Cochlear (Australia), Starkey (US), MED-EL (Austria), SeboTek Hearing Systems (US), Audina Hearing Instruments (US), RION (Japan), Horentek (Italy), Microson (Spain), and Arphi Electronics (India). Hearing aid makers are hoping to attract younger customers by capturing of healthcare data using sensors in the devices. The hearing aid market is expected to reach \$9.8b by 2022 from \$7.0bin 2017 at a CAGR of 7.0% The value of the combined value of the companies is expected to be \$8.3b on combined sales of about \$1.87b(4.43x) in sales. There will be more than 10,000 employees worldwide, including 800 in R&D.
Medical Devices	Straumann Holding AG , a Switzerland-based provider of tooth replacement and orthodontic solutions.	Botiss Medical AG , a German-based provider of biomaterials for oral surgery.	Botiss a provider of biomaterials for oral surgery. Straumann has acquired a 30% stake in Botiss, with which it has vendor relationship. The deal is a further step in Straumann's strategy after investing in its CAD/CAM prosthetics partner Createch. Terms not announced.

Sector	Acquiring Party	Transferring Party	Comments/Rationale
Medical Devices	Surmodics Inc. (NSDQ:SRDX) , a \$73m maker of surface modification technologies for intravascular medical devices.	Embolitech, LLC , an early stage developer of intravascular systems to treat thrombus.	The acquired thrombectomy platform and related IP are designed for use in the peripheral vasculature to remove hard blood clots. SurModics plans to leverage its design, development and manufacturing capabilities (in catheter delivery and surface technologies) to advance the platform into different peripheral and vascular applications. Deal value -- \$5m.
Medical Devices	Symmetry Surgical Inc. , a manufacturer of surgical instruments, orthopedic implants, and sterilization cases and trays.	The general surgery lines of LeMaitre Vascular Inc. , a \$100.87m maker of devices and implants for peripheral vascular disease.	Symmetry strengthens its laparoscopic portfolio through the acquisition of the Reddick® Cholangiogram Catheters and Reddick®-Saye Screw products. The divestiture enables LeMaitre Vascular to rationalize its portfolio and focus on its core customers. Symmetry is a portfolio company of Roundtable Healthcare Partners. Deal value -- \$7.4m.
Medical Devices	Symmetry Surgical Inc. , a provider of surgical instrumentation and a unit of Roundtable Healthcare Partners	Bovie Medical Corporation , a \$40m maker of electro-surgical medical devices.	Bovie is divesting its core business -- electro-surgical products including desiccators, generators, electrodes, electro-surgical pencils, and various ancillary disposable products used during surgical procedures in gynecology, urology, plastic surgery, dermatology, veterinary, and other surgical markets for the cutting and coagulation of tissue. Instead, with more than \$70m of net cash proceeds, Bovie is focusing on its J-Plasma line, a patented helium-based plasma surgical system to cut, coagulate and ablate soft tissue during open and laparoscopic surgical procedures. Here, Symmetry Surgical, a Roundtable portfolio company, will be adding a well-known of electro-surgical instruments to its battery. Deal value -- \$97m.
Medical Devices	Tekni-Plex, Inc. , a globally-integrated OEM provider of packaging materials,	Dunn Industries, Inc. , a manufacturer of specialty extrusion tubing for medical device applications.	Dunn is known for its tight tolerance, small diameter medical device tubing. Tekni-Plex has a significant stake in the medical device market via its Colorite medical compounds and Natvar

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Sector	Acquiring Party	Transferring Party	Comments/Rationale
	medical compounds and precision-crafted medical tubing solutions.		medical tubing business. With speed-to-market a critical concern in this market sector, as well as the desire for additional support from suppliers, the deal helps expand Tekni-Plex's capabilities. Terms not announced.
Medical Devices	TT Electronics plc (TTG.L) , a UK-based \$360m provider of global manufacturing solutions.	Stadium Group plc , a leading UK-based OEM provider of global electronic manufacturing services (EMS) and power supply solutions to the consumer.	Stadium serves several industries -- industrial robotics, medical equipment and aircraft cabin controls. The deal strengthens TTI's engineered electronic wherewithal in Sensors and Specialist Components; Power Electronics, and Global Manufacturing Solutions. Deal value -- \$62,0m plus \$16.0m in assumed debt, on sales of \$61.1m (1.3x) and \$5.9m in EBITDA (13.2x).
Medical Devices	Vyaire Medical Inc. , a developer of products for treating and monitoring respiratory conditions.	Acutronic Medical Systems , a Switzerland and Germany-based global leader in the area of neonatal ventilation equipment.	Vyaire also announced the acquisition of IMTmedical, a developer of acute care mechanical ventilation products utilized in acute care centers, long-term care facilities, home healthcare as well as the emergency services and transport markets. The Acutronic and imtmedical deals enhance Vyaire Medical's ventilation product offering. Apax Partners also completed its purchase of Becton, Dickinson & Company's remaining stake in Vyaire. Terms not announced.
Medical Devices	Young Innovations , a PE-backed, manufacturer and distributor of dental supplies and equipment.	Johnson-Promident , a manufacturer of dental handpieces, preventive consumables, infection control products and rotary instruments.	Johnson-Promident is a manufacturer in the dental industry and also a service provider for repairs and maintenance of dental handpieces. This is Young's 10th acquisition in the last four years. Young Innovations is a unit of The Jordan Company. Terms not announced.
Medical Services	Charles River Laboratories International, Inc. (NYSE: CRL) , a \$1.85b provider of research services, biologics testing solutions & microbial	MPI Research Inc. , a non-clinical contract research organization (CRO).	Enhances Charles River's position as a player in global early-stage CRO. MPI provides comprehensive testing services to biopharmaceutical and medical device companies worldwide. Also enhance Charles River's access to growing end markets, builds scale to meet demand, and augments its scientific bench strength. Deal value -- \$800.0m on revenue of \$240.0m (3.3x) and estimated 2018 EBITDA of \$76.2m (10.5x).

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Sector	Acquiring Party	Transferring Party	Comments/Rationale
	identification services.		
Medical Services	Varian Medical Systems Inc NYSE:VAR , a \$2.75b developer of radiotherapy, radiosurgery, proton therapy, and brachytherapy for cancer.	Cooperative CL Enterprises , a Taiwanese radiotherapy equipment distributor.	Enables Varian to work more closely with their customers in Taiwan and to provide more efficient and comprehensive services. Cooperative employs 45 people and has distributed Varian equipment for more than 40 years. Terms not announced.
Medical Services	WellCare Health Plans, Inc. (NYSE: WCG) , a \$17b managed care company	Meridian Health Plan of Michigan, Inc., Meridian Health Plan of Illinois, Inc., and MeridianRx. , regional healthcare plans and a PBM.	Meridian is one of the largest privately held, for-profit managed care organizations in the U.S. and serves ~1.1 million Medicaid, Medicare Advantage (MA), integrated dual-eligible and Health Insurance Marketplace members in Michigan, Illinois, Indiana and Ohio. Upon closing, WellCare will have the No. 1 Medicaid membership market share in Michigan and Illinois, increasing its leading market position from four to six states. WellCare will also expand its MA business through the addition of Meridian's 27,000 MA members in Michigan, Illinois, Indiana and Ohio. ¹ In addition, as a result of this transaction, the company will add an integrated PBM platform that provides a wide range of services and product offerings to both Meridian's members and third parties. Deal value -- \$2.5b on sales of \$4.3b. \$30-\$40m of synergies are expected.