

Key drivers in the medical technology deal landscape

Venture capital investment in devices remains lackluster, but megamergers and startups in digital health, drug delivery and minimally invasive technology are providing new impetus to today's evolving medical technology industry.

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The first word that comes to mind when thinking about recent dealmaking trends in the MedTech space is 'megamerger'. This trend was epitomized by Medtronic's acquisition of Covidien for \$49.9 billion in January 2015. The new combined company is by far the largest in the MedTech space, with more than 85,000 employees in 160 countries, \$27.8 billion in revenues in 2014 and \$2 billion in R&D spending. But that was not the only example of consolidation in the top tier: Zimmer Holdings acquired Biomet for \$14 billion in June 2015, and Becton Dickinson bought CareFusion for \$11.7 billion in March 2015 (Table 1).

Although the early-stage MedTech space remains much smaller than biotech, companies pioneering minimally invasive technology have been spurring recent deal activity. Indeed, at least 19 of the 102 acquisitions during 2014 and the first 6 months of 2015 were in this space. Two other key developments in the space have been a spurt of activity around drug delivery devices and startups in the digital health space.

A consolidating industry

As is often the case when industries undergo consolidation among top-tier companies, increasing the bottom line via cost synergies is a clear driver of deal trends. Although such types of deals will likely continue given the amount of cash the larger MedTech companies have on hand, both large

and medium-sized companies also have shown an appetite for smaller companies, albeit those with marketed, de-risked, innovative products. Medtronic, for example, spent billions to acquire at least nine additional companies in 2014 and the first half of 2015, all but one of which have marketed products.

Elsewhere, other companies have been refocusing their businesses on more profitable sectors. Wright Medical, for example, has used mergers and acquisitions to refocus its business on biologics and on orthopedics products for the extremities. According to Julie Tracy, the company's SVP and chief communications officer, the upper extremity, lower extremity and biologics markets are three of the fastest growing areas in orthopedics. She believes that all of these areas are underpenetrated and will continue to benefit from product innovation. To achieve these ends, in 2014 Wright unloaded its OrthoRecon hip and knee business to MicroPort Scientific for \$290 million and acquired OrthoPro, Solana Surgical and Tornier. For \$32.5 million plus up to \$3.5 million in revenue-based earn-outs, the OrthoPro deal gave Wright numerous foot and ankle devices, as well as some tissue grafts. Solana Surgical, acquired for \$90 million, provides numerous foot bone implants and other musculoskeletal surgical products. Wright's largest deal was the \$1.2 billion all-stock acquisition of Dutch company Tornier NV. Billed as a merger, the deal granted Wright

shareholders 52% of the combined entity. Tornier offers nearly 100 upper and lower extremity products for joint replacement, bone repair and soft tissue repair, plus several biologics. Tracy said the company expects to perform more acquisitions in the future, but it is currently focused on closing the Tornier transaction.

Such deals are taking place in a MedTech ecosystem that not only remains much smaller than biopharmaceuticals but also has languished in a prolonged downcycle for most of the past decade as a result of poor returns, regulatory and reimbursement challenges and limited access to public financing markets. While the public markets certainly opened in 2014 and the first half of 2015, with 43 IPOs averaging \$55.8 million, biotech's numbers have still outshone MedTech's. Timothy Haines, managing director at VC firm Abingworth, says that the macro-economic environment is very important to future trends in public investment. Given the general attitude towards public equities since the Chinese markets began tumbling this summer, Haines believes that public investors may soon find MedTech's low-risk, low-reward profile to be more attractive than high-risk drug developers.

Innovation in the space has also been constrained by a limited number of active venture funds, including Abingworth, Canaan Partners, Domain, Lightstone Ventures, NEA, Orbimed and Versant Ventures. In this respect, a positive development in the area is the increasing influx of cash into MedTech from corporate venture funds. Whereas pharma companies' corporate venture funds have been an important source of investment for biopharma startups for more than a decade, MedTech corporate venture funds have been few and far between. Haines says he has seen more activity in this area, with larger companies seeding new startups. For example, Boston Scientific led a series A round of \$5.9 million for InterVene in March 2015. The startup is developing a minimally invasive, catheter-based approach to treat chronic venous insufficiency. The technique creates new deep vein valves from a patient's own vein wall tissue, with aims of being the first to correct the underlying cause of disease.

Even so, it is hard to see innovative startup activity taking off in MedTech without more exit opportunities for investors. Particularly in the context of few IPOs, most venture capitalists (VCs) are faced with a rather limited pool of buyers. This pool includes such companies as Abbott, Boston Scientific, CR Bard, GE Healthcare, Johnson & Johnson, Medtronic, St. Jude Medical, Stryker, Wright Medical and Zimmer. But with this small selection, there is a restricted number of trade-sale exits that can happen each year. Compared with big pharma, there is also less impetus for

Table 1. Recent high-value MedTech mergers and acquisitions.

Date	Headline	Companies	Deal value (US\$M)
January 2015	Medtronic buys Covidien PLC	Medtronic PLC and Covidien PLC	49,900
June 2015	Zimmer buys Biomet	Zimmer Biomet Holdings, Inc. and Biomet, Inc.	14,000
March 2015	Becton Dickinson acquires CareFusion	Becton Dickinson & Co. and CareFusion Corp.	11,771
July 2015	St. Jude Medical buys Thoratec	St. Jude Medical, Inc. and Thoratec Corp.	3,474
January 2015	EQT acquires Siemens audiology business	EQT and Siemens AG, Siemens Audiology Solutions and Siemens Healthcare	2,700
March 2015	Mallinckrodt buys Ikaria	Mallinckrodt PLC and Ikaria, Inc.	2,300
September 2014	Danaher Corp. acquires Nobel Biocare Holdings AG	Danaher Corp. and Nobel Biocare Holdings AG	2,265
June 2015	Hill-Rom acquires Welch Allyn	Hill-Rom Holdings, Inc. and Welch Allyn, Inc.	2,049
March 2015	Cardinal Health buys Cordis	Cardinal Health, Inc., Cordis Corp. and Johnson & Johnson	1,944
May 2014	Smith & Nephew acquires ArthroCare	Smith & Nephew PLC and ArthroCare Corp.	1,500

*Data sourced from Informa's *Strategic Transactions* (<https://www.pharmamedtechbi.com/deals>).

these large MedTech companies to look for innovations, because they don't face the same pressures of immediate generic competition and patent cliffs.

One dark-horse buyer new to the MedTech space is healthcare services company Cardinal Health. Cardinal distributes pharmaceuticals and medical products to hospitals, ambulatory surgery centers, clinical laboratories and physician offices, in addition to operating the largest network of radiopharmacies in the United States. The company expanded into the MedTech arena in April 2014 by acquiring AccessClosure for \$320 million. With the acquisition, Cardinal gained the Mynx femoral artery sealing system and the Flash ostial system dual-balloon angioplasty catheter for stent apposition procedures. In May 2015, Cardinal made its biggest purchase, paying \$1.9 billion for Johnson & Johnson's Cordis stent business. Cardinal also entered the wound-management business by acquiring Innovative Therapies and orthopedic trauma—products manufacturer Emerge Medical. Whether other healthcare services companies will also take advantage of their distribution networks to sell their own branded products remains to be seen.

Of the remaining sectors that have seen significant deal activity, one of the most active has been minimally invasive technologies.

Minimally invasive technology

Interest in minimally invasive technology is nothing new. Several years ago, Medtronic splashed out \$800 million on Ardian, a medical device startup pioneering the approach of renal denervation. That approach involved a minimally invasive endovascular catheter-based procedure in which radiofrequency (RF) waves were aimed at renal nerves with the aim of treating hypertensive patients resistant to standard therapies. Unfortunately, shortly after the acquisition, the device failed to meet its endpoint in a pivotal phase 3 trial. This not only sent shockwaves through the sector but also curbed the appetite of large companies for startups with experimental and innovative products.

That relatively conservative attitude may now be changing again. Donald E. Bobo, Jr., corporate VP of corporate strategy and corporate development for Edwards Lifesciences, notes that there is a broad focus in MedTech on making procedures or monitoring less invasive, either through catheter-based approaches or through minimally invasive therapies and technologies. Of 19 acquisitions for minimally invasive technologies during 2014 and the first 6 months of 2015, 12 were for products that accounted for the top two areas of acquisition: surgical equipment and devices (7) and cardiovascular (5) according to data from Informa's *Strategic Transactions*.

In August 2015, Medtronic announced it was acquiring Twelve for \$458 million up front and \$50 million once the company's transcatheter mitral valve replacement (TMVR) device receives CE-marking in the European Union. Abbott and Edwards Lifesciences also have made large acquisitions in the space in the past few months. In September 2015, Abbott acquired Tendyne Holdings, which is currently enrolling patients in a clinical trial for its bioprosthetic mitral valve

system, for \$250 million plus undisclosed regulatory milestones. Also this year, Edwards Lifesciences acquired CardiAQ, which is currently recruiting patients for two clinical trials of its TMVR system, for \$350 million plus another \$50 million upon reaching a regulatory milestone in Europe.

The largest deal for minimally invasive technologies was Smith & Nephew's \$1.5 billion acquisition of ArthroCare completed in May 2014. ArthroCare develops and markets minimally invasive surgical devices that incorporate its Coblation RF technology. The company utilizes the technology in its two major business segments, sports medicine and ear, nose and throat. The Coblation-equipped instruments operate at lower temperatures than traditional RF-based electrosurgical devices and lasers. As a result, they are able to dissolve tissue in a less invasive manner, thereby decreasing harm to surrounding healthy tissue. ArthroCare also markets more traditional musculoskeletal devices, such as knotless anchors, the Opus AutoCuff suturing system, and PEEK (polyetheretherketone) and titanium anchors for hip and shoulder labral repair.

Drug delivery technology

When it comes to alliances, drug delivery technologies have led the charge and are only increasing. In 2014, there were 14 such deals, and 11 more took place in the first half of 2015.

In the largest of these deals, in November 2014, Intarcia Therapeutics granted Servier exclusive rights to develop and commercialize type 2 diabetes candidate ITCA650 worldwide (excluding the United States and Japan). ITCA650 is a match-stick-sized subdermal pump that delivers exenatide, a glucagon-like peptide 1 (GLP-1) agonist. The product can be implanted via a five-minute in-office procedure and needs to be administered only once or twice each year. The drug-device combination has completed three phase 3 trials and is currently in a fourth. Intarcia received \$171 million up front and is eligible for \$880 million in milestones, plus royalties ranging from the low double-digits to the mid-30s. Haines believes drug delivery deals will become increasingly important, particularly when it comes to delivering larger molecules, cell therapies and gene therapies.

In terms of innovation, substantial funding is now being aimed at the intersection of drug delivery technology and what is known as digital health, in which 'smart' tech converges with healthcare. In June 2014, venture capital fund Canaan led a \$32 million series A round for Chrono Therapeutics, which is developing a drug-device combination for smoking cessation. Chrono's SmartStop is a wearable device that provides programmable, transdermal nicotine-replacement therapy in combination with real-time behavioral support. The device keeps track of daily peak nicotine-craving patterns and automatically varies nicotine levels throughout the day to manage the cravings. Eliminating cravings and withdrawal symptoms, rather than just alleviating them, increases quit rates, according to VC Brent Ahrens, general partner at Canaan.

Digital health

Apart from drug delivery, digital health is making inroads in several other areas, such as consumer



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health. The highest-profile deal in this area was Novartis's Alcon eye-care division's collaboration to develop Google's "smart lens" technology, which embeds noninvasive sensors, microchips or other miniaturized electronics in contact lenses. The partners are first developing a lens that measures glucose levels in tears and transmits the data to a wireless mobile device, eliminating the need for diabetes patients to perform finger pricks throughout the day. The companies' second area of focus is the development of a product that provides accommodative vision correction in the form of a contact lens or intraocular lens for patients with presbyopia.

Overall, according to incubator Rock Health, venture funding for digital health companies in the first half of 2015 reached \$2.1 billion. Five companies—Evolent Health, Fitbit, Invitae, Mindbody and Teladoc—floated successfully on the public markets.

Both Haines and Ahrens are very interested to see what innovations come out of digital health. But a big question remains: how regulatory approval and reimbursement environment will evolve. Ahrens says that most VCs are able to exit their investments in MedTech startups—either by acquisition or by going public—only once they have an approved product on the market, and often only after they have established sales. What has changed in recent years is the number of device clinical trials required by the US Food and Drug Administration, which is higher now than it was in the past. Once a device is on the market, companies also need to generate more cost-effectiveness data in order to satisfy payors' demands. The upshot is that VCs need to put much more money into MedTech firms before they see any returns, and the returns are often smaller. For example, Canaan typically obtains 4x returns in 6–10 years in MedTech companies, compared with between 3x and 15x returns in about 4 years for biotech investments, according to Ahrens. As a result, MedTech startups will need to not only have highly innovative technology to attract early investors, but also understand how their products will navigate and prosper in the regulatory and payor worlds.

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