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DePuy Synthes' Measured Path To Building A Digital Surgery Capability

by Ashley Yeo

C-SATS has been added to the Johnson & Johnson group's expanding robotics technology base, which really found its momentum in orthopedics when Orthotaxy came into the group.

Bringing together the various assets and capabilities of Johnson & Johnson's *DePuy Synthes* orthopedic division will be a challenge, but it is one that global head of R&D Euan Thomson, PhD, relishes, especially now that the key elements have been brought into the group.

The key 'game-changer' for orthopedics, as Thomson described in an interview with *In Vivo*, was the February 2018 purchase of *Orthotaxy SAS*' robotic-assisted solution that will bring a next-generation robotics technology to market.

With that acquisition, the company will continue the development of the differentiated robotic-assisted tool first for total and partial knee replacement, and later for multiple orthopedic surgery procedures, such as spinal fusion surgery. The terms were not disclosed, but the purchase was significant in terms of giving DePuy Synthes the central technology it needed to participate in orthopedic robotic surgery, bearing in mind *Stryker Corp.*'s *Mako*, *Smith & Nephew PLC*'s *Navio* surgical system (from *Blue Belt Technologies Inc.*) and *Zimmer Biomet Holdings Inc.*'s ongoing work on its *Rosa* platform. The X-ray based Rosa is

Ortho Demand Pull: DePuy Synthes Shaping Its Digital And Robotic Surgery Strategy Around Patient Needs

By Ashley Yeo

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Johnson & Johnson's DePuy Synthes orthopedic business has taken a measured view of digital and robotic capabilities, rather than acquiring assets that perhaps do not fully meet its strategic needs. For the business's global R&D head Euan Thomson, any new

scheduled for limited launch in the second half of 2018, the company having completed a fully functional demo for knee application.

technology must augment the group's abilities to drive meaningful outcomes.

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Targeting Personalized Orthopedic Patient Care

DePuy Synthes' idea is to use it as part of a holistic approach to orthopedic surgery across the episode of care to enhance surgical efficiency, promote better clinical outcomes and increase patient satisfaction. Orthotaxy's technology will be a critical part of a complete solution that uses enabling technologies to personalize orthopedic patient care, optimize surgery, and bring value to customers and patients, says DePuy Synthes. (Also see "*J&J Adds To Robotic Focus With French Firm Acquisition* " - Medtech Insight, 22 Feb, 2018.)

The platform enables the use of innovative solutions, which include surgical planning software and patient-specific surgical guides. In turn, surgeons can plan implant placements on preoperative CT or MRI images. The system also includes guides designed to fit patients' anatomies, help insert surgical instruments, and perform surgery in accordance with a planned strategy.

Orthotaxy, a simplified joint-stock company, was founded by Stéphane Lavallée, a robotics entrepreneur, and is based in La Tronche, Grenoble. Its R&D is now being done by a "distributed effort," says Thomson, but the Orthotaxy R&D team stays in France, while DePuy Synthes has also started to build up the team in the US to support its work.

The surgical procedures and release timings are not being disclosed, but as Jefferies equity research managing director Ray Denhoy tells *In Vivo*, DePuy Synthes now has "a dog in the fight" in orthopedic robotics.

In a period of intense focus on building out its robotic capability, DePuy Synthes kept the momentum going with the mid-April 2018 decision to offer a solution from C-SATS (Crowd-Sourced Assessment of Technical Skills), a Seattle, WA-based start-up that uses technology to facilitate performance reviews for surgeons.

Founded in 2014 and spun out of the University of Washington, C-SATS has built a cloud-based performance management system that evaluates surgeons and helps improve their skills. It uses operating room cameras to record a surgeon's performance, and is seen as a scalable platform powered by data capture, analytics and artificial intelligence.

Exhibit 1.

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C-SATS' technology will be integrated into the *Johnson & Johnson* Institute education and training platform.It will enable J&J to partner with health care systems in a differentiated way and change how surgeons learn by allowing them to anonymously receive input on actual cases to improve their technical skills. The notion goes that internal peer reviews can be open to bias. C-SATS' CEO is Derek Streat.

Predating both of these and helping to build out the horizons for both what is possible and what is DePuy Synthes' preferred route in robotic assisted surgery was the October 2017 purchase by Johnson & Johnson Medical GmbH of Germany-based software company Surgical Process Institute (SPI). SPI specializes in the standardization and digitalization of surgical workflows in the operating room, and provides innovative software solutions to improve patient outcomes and OR efficiency by reducing variability in surgical procedures.

Thomson's view is that successful surgery is dependent not only on surgeon performance, but also on many steps during a procedure with diverse surgical teams that have to work seamlessly together.

SPI stole a march on the competition with its Surgical Procedure Manager (SPM) proprietary software solution, which standardizes surgery by translating the whole surgical experience into a detailed, step-by-step checklist that follows best-in-class standards. Gunter Trojandt is managing director of SPI. The group's technology is available in the EMEA region, with full worldwide availability targeted for 2019.

Robots should be just a part of a platform for digital surgery – the J&J view

These digital capabilities were acquired within an intense seven-month period from October 2017 to April 2018. Two and a half years earlier, in March 2015, Johnson & Johnson and Google set up the joint venture for development of a next-generation surgical robotic system, which in December 2015 was named Verb Surgical. (Also see "*Exec Chat: How Verb Surgical Will Deliver On Surgery 4.0*" - Medtech Insight, 14 Nov, 2017.) Verb Surgical CEO Scott Huennekens shares Thomson's assertion that robots should be just part of a platform for digital surgery, among many other factors.