POLICY & REGULATION
More debate on regulation of laboratory-developed tests, p. 7

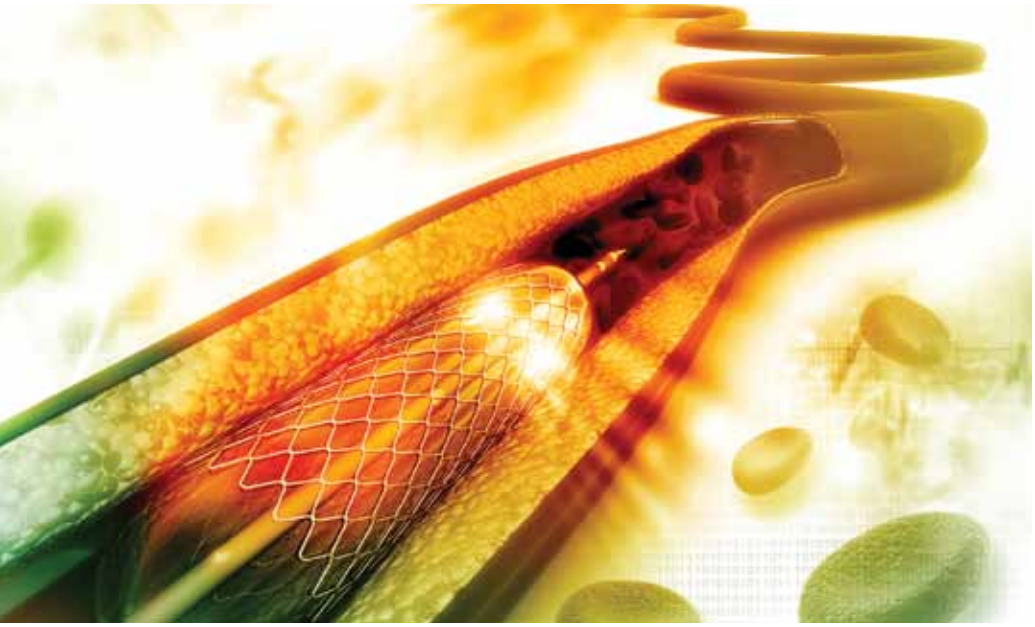
COMMERCIAL
GE puts up $50m to back global start-ups, p. 18

R&D
Medtronic's artificial pancreas gets another boost, p. 15

Medtech Insight
Issue 12
medtech.pharmamedtechbi.com

Pharma Intelligence Informa

October 3, 2016



Shutterstock: hywards

Robert Byrne: On Absorb, Synergy, And The Future Of Coronary Stents

REED MILLER reed.miller@informa.com

Coronary intervention technology is at a crossroads. The promise of drug-eluting stents has been realized, and current DES are highly deliverable, dramatically reduce in-stent restenosis compared to bare-metal stents, and the risk of stent thrombosis with DES appears to be mostly manageable.

But the risk of late-stent thrombosis with DES still persists at around 1%, so many companies believe that if they solve this problem they will have the next dominant technology in coronary intervention.

Abbott Laboratories Inc. believes its *Absorb GT1 Bioresorbable Vascular Scaffold* (BVS) represents the first in a series of fully resorbable stents that will solve the problem of late events in stent patients by disappearing, but that hypothesis has not yet been proven. Meanwhile, **Elixir Medical Corp.** is developing the *DESolve* novolimus-eluting bioresorbable coronary scaffold system, **REVA Medical Inc.** is working on the *Fantom* sirolimus-eluting bioresorbable coronary scaffold, and **Biotronik SE & Co. KG** believes its *Magmaris* bioresorbable magnesium scaffold offers advantages over other dissolving polymer stents.

Rival **Boston Scientific Corp.** believes its *Synergy* metal stent with a bioresorbable polymer represents the way forward. Bot stents elute sirolimus to prevent in-stent restenosis, but the Absorb completely dissolves over a few years while Synergy's "backbone" remains intact, with only the polymer that bound the drug to the stent dissolving. Boston Scientific believes the polymer is the main source of late-stent thrombosis and that metal is such a vastly superior material for making strong-yet-deliverable stents that its advantages will ultimately outweigh any long-term risks of leaving metal in the vessel.

In the "polymerless" category, **Medtronic PLC** is pursuing a novel "drug-filled" metal stent technology which, it hopes, can outperform any metal or polymer stent. **Biosensors International Group Ltd.** is developing the *BioFreedom* stent with a unique micro-structured outer surface to carry and release the drug Biolimus A9 without a polymer coating.

Robert Byrne, a cardiologist at Deutsches Herzzentrum in Munich and medical director of the ISARESEARCH Centre there, is familiar with all of these develop-

CONTINUED ON PAGE 20

Medtech Insight
Pharma intelligence | informa

advertise with us and take your business to the next level.

you won't believe the transformation

Contact our sales executive to learn about our various advertising opportunities available to you!

Christopher Keeling
+44 203 377 3183
christopher.keeling@informa.com
Customer Care: +1 888-670-8900 (USA)

medtech.pharmamedtechbi.com


6


12


18

explore more:

exclusive online content

Boston Scientific bags endoscopy buy
http://bit.ly/2d3uhLN

Boston Scientific is making a significant investment in its endoscopy portfolio as it strikes a $210m deal to buy colonoscopy specialist EndoChoice. The Natick, Mass., US firm added that it will be "evaluating strategic options" for EndoChoice's Fuse colonoscope.

EU reform watch
http://bit.ly/2cVI4ls
http://bit.ly/2dzELBr

Go online for the latest entries in our ongoing "EU Regulation Recap" series detailing the pending EU regulations for devices and diagnostics, and read an expert column on increased clinical data requirements to come in the region.

Antibiotic tests
http://bit.ly/2cCmhmO

In a new draft guidance, US FDA recommends antimicrobial drug developers and sponsors of antimicrobial susceptibility tests coordinate their regulatory submissions to get their products on the market together faster.

More on bioresorbable stents: KOL webinar
http://bit.ly/2cARlP0

Get the full transcript of a recent webinar with four internationally well-known experts on coronary stent technology, discussing the pros and cons of new bioabsorbable polymer stent technologies.

Device Week
http://bit.ly/2cKnuqE

Our weekly podcast, where Medtech Insight journalists discuss topics they are covering that impact the device and diagnostics sector.

medtech.pharmamedtechbi.com

inside:

Medtech insight

DAVID FILMORE @MEDTECHDAVID
david.filmore@informa.com

TINA TAN @MEDTECHTINATAN
tina.tan@informa.com

SHAWN M. SCHMITT @MEDTECHSHAWN
shawn.schmitt@informa.com

REED MILLER @MEDTECHREED
reed.miller@informa.com

AMANDA MAXWELL @MEDTECHAMANDA
amanda.maxwell@informa.com

SUE DARCEY @MEDTECH_INSIGHT
sue.darcey@informa.com

DANNY AL-FARUQUE @ALFARUQUE
danny.al-faruque@informausa.com

ELIZABETH ORR @ELIZABETHJORR
elizabeth.orr@informa.com

CATHERINE LONGWORTH @MEDTECHCATE
catherine.longworth@informa.com

ASHLEY YEO @ASHLEYPYEO
ashley.yeo@informa.com

MAUREEN KENNY @SCRIPREGMAUREEN
maureen.kenny@informa.com

NEENA BRIZMOHUN @SCRIPREGNEENA
neena.brizmohun@informa.com

VIBHA SHARMA @SCRIPREGVIBHA
vibha.sharma@informa.com

JANET HANIAK SENIOR DESIGNER

GAYLE REMBOLD FURBERT DESIGN SUPERVISOR

RICHARD FAINT HEAD OF MEDTECH
richard.faint@informa.com

PHIL JARVIS MANAGING DIRECTOR

Editorial office:
52 Vanderbilt Avenue, 11th Floor, New York, NY 10017
phone 240-221-4500, fax 240-221-2561

CUSTOMER CARE:
1-888-670-8900 OR 1-908-547-2200
FAX 646-666-9878
clientservices@pharmamedtechbi.com

▶ join the conversation

We are tweeting, chatting, liking and sharing the latest industry news and insights from our global team of editors and analysts — join us!

@Medtech_Insight

Glaukos' Micro-Bypass Stents Work As First-Line Glaucoma Therapy

REED MILLER reed.miller@informa.com

New randomized trial data show that multiple implantations of **Glaukos Corp.**'s *iStent Trabecular Micro-Bypass* stents should be considered as an initial treatment option instead of travoprost ophthalmic solution in patients with newly diagnosed primary open-angle glaucoma.

The trial, led by Steven Vold of Vold Vision in Fayetteville, Ark., US, was designed to compare the intraocular-pressure-lowering effect of two iStent devices versus standard medical therapy in eyes with primary open-angle glaucoma, pseudoexfoliative glaucoma, or ocular hypertension that was not previously treated. Results of the 101-patient trial were published online, ahead of print, by the journal *Ophthalmology and Therapy.*

US FDA approved iStent in 2002, and it is currently indicated for the reduction of intraocular pressure in adult patients with mild-to-moderate open-angle glaucoma treated with ocular hypotensive medication, making it the first "micro-invasive" glaucoma surgery (MIGS) device. The heparin-coated titanium stent can be inserted from within the anterior chamber of the patient's eye through the trabecular meshwork and into the Schlemm's canal, where it is drains excess fluid and restores the natural shape of the aqueous humor. At 1.0 mm long and 0.33 mm wide, iStent is the smallest medical device ever approved by FDA, according to Glaukos.

In this trial, Vold and colleagues enrolled subjects with previously untreated primary open-angle glaucoma and intraocular pressures ranging from 21 mmHg to 40 mmHg, and randomized them to either implantation of two stents (54 patients) or topical treatment with travoprost, a synthetic prostaglandin analog sold as *Travatan* by **Alcon Inc.** (47 patients). Some patients subsequently received additional medication for elevated intraocular pressure or glaucomatous optic nerve findings. The mean pre-treatment intraocular pressure was 25.5 mmHg in stent-treated eyes and 25.1 in medication-treated eyes.

> iStent may offer benefits over topical medications as an initial therapy for glaucoma patients because patient compliance with these drugs is often low, the authors note.

Of the 101 patients in the trial, 100 subjects have reached the two-year follow-up and 73 have made it at least three years. In the patients who reached the three-year follow-up, 91% of the stent eyes reached an intraocular pressure of 18 mmHg or less without additional therapy, and 62% reached pressures of 15 mmHg or less. In the travoprost-treated eyes 79% had a three-year intraocular pressure of 18 mmHg or less and 21% dropped to 15 mmHg or less.

In the patients studied for three years, the mean intraocular pressure was 14.6 mmHg in stented eyes, with additional medication provided in 6 eyes, and 15.3 mmHg in the travoprost-treated eyes, with a second medication added in 11 eyes. In the subset of eyes that did not require any additional medical therapy, the mean intraocular pressure was 14.5 mmHg and 15.7 mmHg in the respective groups.

Safety was acceptable in both groups. Two complications were reported during stent insertion in the surgery group attributed to the patient moving during surgery. Both of these issues were resolved quickly. Visual acuity was stable over time for both groups. Over the three years of follow-up, 11 eyes in the stented group and eight in the travoprost group showed progression of cataract.

Vold and colleagues point out that prior studies of trabecular micro-bypass stents focused on patients with mild-to-moderate glaucoma who had already received previous medical or surgical treatment, but few trials have looked at therapies for newly diagnosed glaucoma patients. "The present study showing clinical outcomes of two-iStent implantation in treatment-naïve eyes fills a key gap in the literature," they explain. "These findings may be increasingly relevant as more surgeons are considering iStent implantation as initial treatment for their newly diagnosed glaucoma patients."

The authors also suggest that iStent may offer benefits over topical medications as an initial therapy for glaucoma patients because patient compliance with these drugs is often low. Side-effects of the drugs can include itchiness, redness and discomfort and the cost of both brand-name and generic versions of the drugs can be a considerable financial burden for newly diagnosed glaucoma patient. "This may be particularly important in glaucoma patients, the majority of whom have at least one additional chronic condition requiring medication," the authors explain.

The authors add that future trials of the iStent technology should incorporate other measures such as diurnal measurements of intraocular pressure and grading of the crystalline lens. Future trials may also incorporate standard guidelines for when to perform cataract surgery and blinding of the patients or physicians to the treatments. Longer follow-up might also help clarify the long-term advantages or disadvantages of bypass with iStent as well as cost-effectiveness considerations.

Glaukos' next-generation MIGS device, the *iStent inject* includes two stents preloaded in an auto-injection mechanism that allows surgeons to inject stents into multiple trabecular meshwork locations through a single corneal entry point. iStent inject has earned a CE mark and regulatory approval in Canada and the US. The company is sponsoring two different US clinical trials to support FDA approval – one for a version of the device suitable as an adjunct to cataract surgery and another for standalone procedures.

Published online 09/26/16

US FDA Agrees To CLIA Waiver Process Reforms, But More Is Needed, Coalition Says

FERDOUS AL-FARUQUE danny.al-faruque@informa.com

US FDA's process for reviewing test-waiver applications under the Clinical Laboratory Improvement Amendments (CLIA) is set to undergo enhancements based on a draft user-fee reauthorization agreement.

In the deal that was inked last month, the agency says it will establish a centralized management group for CLIA waiver review, and also implement updated performance measures and make other changes designed to ensure smoother reviews.

That's all well and good, says an attorney who leads a coalition that lobbies for improved CLIA waiver policies, but the user-fee commitments do not address the bigger need for reforms.

The CLIA waiver process is designed to determine if tests are simple and error-proof enough to be used by "waived" labs such as doctor's offices and health clinics, as well as at the bedside at hospitals. It's the regulatory pathway that drives the growing point-of-care testing market.

"It's like there's a hole in the boat and we've got a Dixie cup now to help bail it out, but we know we need to fix the hole," said James Boiani, an attorney with the law firm Epstein Becker Green, who founded the Coalition for CLIA Waiver Reform in 2014 to push for changing FDA's underlying standard for granting a CLIA waiver, an issue not addressed in the user-fee agreement. But it is an issue that has received attention in ongoing deliberations in the US Congress.

In addition to creating a centralized management group for CLIA waivers, the tentative FDA-industry deal would implement a "no submission left behind" policy, which requires follow-up if a CLIA waiver submission extends past a review performance-goal deadline. It would also improve on FDA response times for different pre-market submissions. However, the agency says it plans to achieve all this without adding additional resources targeted at the CLIA program.

Boiani says the centralized approach will likely help improve consistency. Currently, he explains, there are three separate divisions within the device center's Office of In Vitro Diagnostics and Radiological Health that, in his opinion, have been applying CLIA waiver policies inconsistently. He says diagnostics firms often face uncertainty because requirements and flexibility may differ based on the division they are assigned to.

"I think centralizing it is potentially a positive step forward in resolving that and making more consistent application of the standards, [but] I still disagree with how FDA is applying the standards in the first place," Boiani added. "I think consistency will be helpful overall, provided we eventually get to the right standards."

Boiani is also skeptical of the agency's decision to not hire more staff for the CLIA waiver program, arguing that reorganizing and developing a central management structure suggests FDA will need more officers and resources.

Shutterstock: angelo.gif.co

"It's like there's a hole in the boat and we've got a Dixie cup now to help bail it out, but we know we need to fix the hole," attorney James Boiani says.

Also in the MDUFA IV deal FDA says it has decoupled pre-submissions from performance goals for dual 510(k) and CLIA waiver applications, which is an alternative to seeking 510(k) clearance and subsequently submitting CLIA waiver application. At the same time, industry acknowledged that FDA will continue its approach of requiring pre-submissions to precede dual applications because the requirement has been shown to be critical to the success of these applications.

Boiani says this gives industry some flexibility but really doesn't change the current policy. It typically is a good idea to hold pre-submission meetings with FDA so companies can understand the agency's most current thinking. He notes the meetings don't cost anything and only require some extra time. He also speculates there may be scenarios in the future where certain types of products may benefit from not having to go through the pre-submission process when filing dual applications, specifically for product types that the agency has a lot of experience with.

"But really this dual-submission process hasn't been used that frequently, so I think we don't really have a good track record for people to rely on to say, 'This is how you do dual submission for this type of product," added Boiani. "Down the road it might be

helpful but right now, just go through the [pre-submission] and budget that into your schedule. It takes about 75 to 90 days to get a response from FDA and get a meeting with them."

CORE ISSUE IS ACCURACY STANDARD

But these are minor issues compared to what Boiani says is a major current flaw in the CLIA waiver program. His group says FDA's 2008 guidance document on CLIA waivers misinterprets the legal standards for the CLIA waiver program clarified in the FDA Modernization Act of 1997. Specifically, the guidance established an accuracy threshold against a gold-standard reference method as necessary to gain a CLIA waiver, rather than basing the determination on whether tests can be performed equally well in a complex lab with "trained" users versus a waived lab with "untrained" users.

"In practical terms, this additional requirement for CLIA waived tests means FDA will clear a 510(k) or approve a pre-market application for use of the test in a moderate-complexity CLIA lab that has trained laboratory users, but deny the CLIA waiver that is needed to use the test in physician offices, health clinics, and urgent-care centers, even though the professionals in those environments – which FDA calls 'untrained users' – can perform it just as well as trained techs," he said.

Boiani says FDA's current interpretation contributed to delaying waivers for tests that have significant public health implications, such as tests that can detect HIV during patients' most infectious phase, and tests for syphilis, which reemerged as a significant problem during the years that a CLIA-waived point-of-care test option was unavailable.

"These tests were eventually waived, but only after years of delay, and independent patient advocacy and public interest groups implored FDA to waive tests that were held up in review," he added. "These problems would probably have been avoided if FDA had just followed FDAMA."

The CLIA Waiver Coalition is urging FDA to reissue a new CLIA waiver guidance to address these concerns and Boiani says he has already sat down with the agency on a few occasions and plans to do so in the future to discuss his concerns and hopes to persuade the agency to reform their thinking.

"We're happy with the steps being taken as part of the MDUFA negotiations in terms of improving the review process," he said. "But there is much more to do on the substance of CLIA waiver reviews, starting with changing the thinking at FDA and revising the 2008 guidance."

Meanwhile, the group has made more progress in Congress. A provision that would require FDA to revise its current CLIA waiver guidance to remove the accuracy standard and clarify the tests necessary to compare the performance of a test as performed by a waived and moderately complex user has been included in the House 21st Century Cures Act, and in a parallel medical innovation package in the Senate that still have a chance of being considered by Congress this year.

"It shouldn't be that if a doctor does it they have to be better than a lab tech; that's not going to happen," said Boiani. "They need to be able to do just as well in their doctor's office as a lab tech can do in a lab."

Published online 09/22/16

Sen. Alexander Wants To 'Start From Scratch' In Regulating Lab-Developed Tests

SUE DARCEY sue.darcey@informa.com

Sen. Lamar Alexander, D-Tenn., said at a Sept. 20 Health, Education, Labor and Pensions Panel hearing that perhaps Congress should create "an entirely new regulatory agency" to handle regulation of laboratory-developed tests (LDTs), in part because US FDA regulation of the tests would be too slow and expensive.

"Sometimes I think starting from scratch is a good idea," he told *Medtech Insight* following the hearing. "Actually starting from scratch … would be preferable to the situation we have now," Alexander said.

LDTs are tests developed and performed by the same lab as a service. FDA has promised to issue final guidance documents establishing a regulatory framework for LDTs this year after decades of deferring to CMS oversight of labs under the Clinical Laboratory Improvement Amendments (CLIA).

CMS is the US Centers for Medicare and Medicaid Services.

He reiterated pathologist David Klimstra's testimony before the committee, where Klimstra described how cancer-diagnosing LDTs at his lab – Memorial Sloan Ketting Cancer Center in New York City – not only must be developed in a CLIA-certified lab, but also must demonstrate validity to NYS Department of Health laboratory authorities.

Klimstra, who is the pathology department chairman at the cancer center, part of Weill Medical College at Cornell University in New York, noted in his testimony that the process of putting new molecular tests through the state's department of health "takes up to 12 to 15 months, depending upon the complexity of the test and novelty of the technology employed."

When FDA releases its final LDT framework, updated from a draft policy first circulated in 2014, "the same test would have to be regulated by FDA," Alexander said. "If I were a cancer patient at Memorial Sloan Cancer Center in New York, I wouldn't want it to take that long."

Klimstra testified that the expense of going through FDA regulation for the 350 LDTs the center relies upon would

Shutterstock: Alexander Raths

"Sometimes, if you own an old house, and you invite a contractor in, he looks the house over and says, 'It would be easier, quicker and cheaper to tear it down and start over, than try to remodel it,' so maybe that's what needs to be done here," Sen. Lamar Alexander says.

be so exorbitant, "We'd have to close down the lab."

Alexander told *Medtech Insight* that, according to a PWC report, the per-test cost of submitting an LDT to FDA for clearance or approval would average between $30m-$75m. Alexander said he understands "that rather than spending billions of dollars on FDA approval of his tests, Dr. Klimstra would rather shut down his lab."

The senator also seemed to be willing to entertain other proposals for regulating LDTs, telling reporters after the hearing, "Previously, there were several senators on this committee – including Democrats – who came up with the idea of 'breakthrough' handling of innovative new drug treatments by FDA. Maybe if we apply some of those same talents, this panel could come up an innovative solution for LDTs."

ONCOLOGISTS DON'T ALWAYS KNOW IF TESTS HAVE FDA APPROVAL

But Sen. Patty Murray, D-Wash., expressed concerns that newer, molecular-based tests "can't provide assurances" that test results are correct and reliable. As an example, the HELP Committee's ranking member pointed to a Sept. 16 safety communication by FDA about ovarian cancer screening tests not reviewed by the agency that had proven to be unreliable.

"Many of the lab tests on which medical decisions are based are not subject to FDA review," she stated, "something that most Americans aren't aware of when they go to the doctor."

Also, according to a recent survey of oncologists, one in five practicing oncologists don't know if the tests they are using are approved or reliable, Jeff Allen, CEO of Friends of Cancer Research, told Murray under questioning.

Tests that undergo FDA scrutiny – including test kits made by diagnostic manufacturers – frequently are subject to a battery of studies, Brad Spring, VP of regulatory affairs and compliance for **BD Life Sciences**, told Murray. Based on the risk and classification of the test, these studies would include analytical validity of the test, and sometimes, clinical testing of the diagnostic.

Murray agreed that such rigorous reviews for test kits subject to FDA oversight are necessary to show that the diagnostics are "accurate, precise and clinically meaningful."

NOT ALL LDTS REQUIRE PMAS

Sen. Alexander's suggestion to create an entire new agency – neither FDA nor CMS – to regulate LDTs met with some skepticism by panel witnesses. For example, responding to the senator's question about the 60,000 existing laboratory-developed tests that are not now regulated by FDA, and what should be done about them, Jeff Allen, CEO of Friends of Cancer Research, recommended: "We start by letting FDA regulate those that are the highest risk to patients as the highest priority."

"And while our discussion here recently was about more advanced technology tests, and not the old screening tests, we should probably start by comparing the new tests to the older tests that purportedly do the same thing," he added.

"And I don't think 60,000 [of the newer] tests will have to require a full FDA PMA submission," Allen remarked. "That would make it a much faster process, and some labs are already doing that, showing that their new tests are analytically equivalent to the older ones that have already demonstrated clinical validity, or have accurate reference material."

Alexander rejoined: "But sometimes, if you own an old house, and you invite a contractor in, he looks the house over and says, 'It would easier, quicker and cheaper to tear it down and start over, than try to remodel it,' so maybe that's what needs to be done here.

"For someone like Dr. Klimstra, who has to go through so many regulatory agencies, how much regulation is enough regulation?" Alexander asked. "Do we want CLIA plus the FDA – plus the state agency? Or should we create a new regulatory agency?" the Senator queried.

"CMS is too busy," Alexander continued. "We have far too many decisions that need to be made there. And FDA, doesn't have the resources. They'll be asking us to appropriate millions of dollars for them next year just to meet the existing responsibilities they have. So in this really exciting area [of precision medicine] that affects so many people, why not start from scratch and create the ideal regulatory program?"

SOME WANT MAJOR ROLE FOR FDA

"Personally, I would advocate that FDA have a primary role in validating these tests," Allen responded. "Because they do have the medical personnel there; they have an understanding of the underlying disease. So, for example, the agency has been moving toward establishing an FDA Oncology Center of Excellence, to try to align the clinical expertise around all cancer products, including therapeutics and diagnostics."

"Why wouldn't that be a new regulatory agency?" Alexander persisted. "Particularly if it is independent, and has a separate set of experts. Because Dr. Califf has told us that this is his biggest problem: He doesn't have the right people, so he needs more money to hire the right health experts because he doesn't have medical personnel to get the work done."

Referring to the efforts of pathology groups such as the Association of Molecular Pathologists (AMP) and CAP (College of American Pathologists), who have been working with each other and labs that develop LDTs on ways to best regulate next-generation sequencing tests, Klimstra told Alexander, "I think there is a great deal of expertise out there," and pathologists and scientists "who would be willing to develop something novel, like you are describing."

There are already multiple proposals from experts circulating on Capitol Hill. In the summer of 2015, AMP sent a proposed regulatory framework to HELP committee staff working on LDT proposals. The AMP guidelines called for third-party review of high-risk LDTs to help FDA plow its way through regulation of 60,000 lab developed tests.

And in the spring of 2015, the "Diagnostic Test Working Group," a coalition including laboratories **Mayo Clinic**, **Laboratory Corp. of America Holdings** and **ARUP Laboratories** and *in vitro* diagnostic kitmakers **Becton Dickinson & Co.** and **Roche**, persuaded the Senate panel to start vetting its proposal for regulating IVDs and LDTs under new diagnostic-specific regulations overseen by a newly created FDA center.

"We have to have some sort of grandfathering involved," Brad Spring of BD, also recommended to Alexander."Dr. Allen mentioned some sort of prioritization of higher risk tests first, then other tests later."

Spring also said that FDA has come up with some innovative ideas, such as relying on analytical bench-testing and other useful principles.

"I do agree that FDA should be the ones regulating LDTs," the BD regulatory affairs officials remarked.

"And you think that CMS should be kept out of it?" asked Alexander.

"No, I think there should be clear lines of jurisdiction," Spring responded. A chart supplied in his testimony showed that CMS should be in charge of laboratory operations, including reagent preparation, test runs and results reporting. Meanwhile, he said, FDA should regulate test design, development, validation, preparation of reagents, and regulate platform manufacturing.

Spring added: "I talked about the seven basic principles that came out of collaboration with colleagues who work on laboratory issues, and I think these basic principles work for all stakeholders – the patients, the labs, the test manufacturers and others involved in this." Among the seven principles that Spring discussed in his testimony were:

- Any regulatory framework would have to protect patients and ensure their access to innovative diagnostic tests;
- Diagnostic tests must all be regulated the same way, regardless of if they were developed in a laboratory or by a diagnostic company;
- Regulatory standards should be focused on test accuracy and reliability through analytical and clinical validity;
- The level of oversight of the test should be based on the level of risk of the test to patients;
- There needs to be clear jurisdiction between FDA, CMS and state governments;
- Improved transparency and predictability regarding approval requirements is needed; and
- Expedited pathways should be created for tests serving unmet needs.

"Stakeholders, including BD, are beginning to coalesce" around these principles, Spring said.

But at the conclusion of the hearing, Sen. Alexander told reporters, "I think we are in the early part of our legislation discussions on LDTs," and that his committee "is still looking at this [issue] very carefully. I think though … that starting with regulating the high-risk tests makes sense."

Published online 09/21/16

FDA Panel Supports Class II For Wound Dressings, But More Controls When Antibiotics Are Added

SUE DARCEY sue.darcey@informa.com

Panelists at a Sept. 21 advisory committee meeting recommended US FDA place the majority of solid-, liquid- and cream-based wound dressings that include drugs into class II. However, dressings including antibiotics deserved more consideration, and in some cases, should go into class III to prevent a rise in antimicrobial resistance, some of the advisors said.

The agency's General & Plastic Surgery Advisory Panel met in Gaithersburg, Md., to provide FDA with feedback on the risks and benefits of wound-care dressings and make recommendations on their classification.

"Overwhelmingly, most of these products should go into class II, except for the indwelling catheter dressing, which should go into class I," said panelist and surgeon James Holmes, who specializes in burn care at Wake Forest University School of Medicine. Most of the panel experts, a mix of dermatologists, pathologists, plastic surgeons, and burn-care and infection-control specialists, agreed with Holmes.

However, several panelists, including L. Barth Reller, a Duke University pathologist, expressed concern that any wound dressings contain antibiotics might bolster antimicrobial resistance or lead to toxicity problems.

ANTIBIOTIC-CONTAINING DRESSINGS INTO CLASS III?

Reller recommended, "For the polymixin and bacitracin [containing] dressings, I'd put them in class III, and with copper and the other compounds that [are] linked with antimicrobial resistance, I'd put them on a watch list. The others could go into class II, special controls.

"Further, I'd pay special attention to absorption toxicity, since toxicity has been an issue," Reller added.

Jean Patel, who is the director of the Office of Antimicrobial Resistance at the Centers for Disease Control and Prevention, agreed with the need for special consideration of dressings containing antibiotics. "I'd ask for class II, special controls for most of [the products]. But I agree that we need something different for genticin and other antibiotics."

But Yusef Sayeed, an occupational medicine physician and consumer representative for the panel, said he did not think that risk-mitigation measures generally used for class II products would be sufficient for many products in this category.

"I continue to believe that these devices should be class III devices, with the exception of those used with indwelling catheters," Sayeed said. "We should be doing the right thing, and the right thing is having nice, robust studies to understand how the special controls are working. Right now, we don't have enough detail to decide."

As part of their presentations during the first day of the meeting on Sept. 20, FDA staff noted that a review of randomized clinical trial data for wound dressings with antimicrobials found:

- There is a lack of appropriate trials supporting the use of antimicrobial dressings versus non-antimicrobial dressings; and
- For diabetic ulcers, venous ulcers, surgical wounds and burns, there is not evidence to support that antimicrobial dressings versus non-antimicrobial dressings provide a meaningful difference in preventing wound infections.

> "We should be doing the right thing, [using] nice, robust studies to understand how the special controls are working. We don't have enough detail," Dr. Yusef Sayeed says.

With the lack of sufficient data on the effectiveness of adding antibiotic drugs to wound dressings, and the possible increase of antimicrobial resistance from use of them, Geetika Sood, an infectious disease expert with Johns Hopkins University School of Medicine, said there should be more restrictions on wound dressings with antibiotics.

"I would do class II, special controls for almost all of them. And I would actually divide them into three categories: the antibiotics, the antiseptics, and the ones with moderately risk drugs and then the not risky. And for the devices in the moderately risky [category], I would limit their use."

Published online 09/23/16

Clinical Trial Design, Precision Medicine Added To CDRH Science Priorities

DAVID FILMORE david.filmore@informa.com

Improving clinical trial design and better leveraging precision medicine and biomarkers to predict device performance were added to the US FDA device center's Top 10 list of science priorities.

CDRH issued its fiscal year 2017 science priorities on Sept. 20, repeating some of the points highlighted in the 2016 list while raising the profile of some additional issues. The device center started publicly disclosing its regulatory science priority list two years ago for FY 2015. It serves as one view into how the agency will be directing its resources on regulatory science efforts.

"I really would encourage everyone... to go through this document and to use this as an impetus to drive further work on the collaborative front," said Suzanne Schwartz, CDRH's associate director for science and strategic partnerships, during a Sept. 21 Medical Device Innovation Consortium meeting in Washington, D.C.

The new additions to the FY 2017 list for clinical trial design and precision medicine reflect feedback from an outreach effort to CDRH's staff, the agency says.

CDRH says it wants to "develop methods and tools to improve and streamline clinical trial design," including better applications of adaptive trials, strategies for studying rare disease, and novel methods for using placebo controls.

"A significant number of clinical trials fail due to false hypothesis or endpoints that do not capture all failure modes," the center's science-priorities report notes. "The traditional concept of placebo controls borrowed from drug-trial designs is not always applicable to medical devices, particularly for active implants."

Also included in CDRH's new priorities is a goal to "leverage precision medicine and biomarkers for predicting medical device performance, disease diagnosis and progression."

Top 10 CDRH regulatory science priorities, FY 2017

- Leverage "big data" for regulatory decision-making.
- Modernize biocompatibility and biological risk evaluation of device materials.
- Leverage real-world evidence and employ evidence synthesis across multiple domains in regulatory decision-making.
- Advance tests and methods for predicting and monitoring medical device clinical performance.
- Develop methods and tools to improve and streamline clinical trial design.
- Develop computational modeling technologies to support regulatory decision-making.
- Enhance the performance of digital health and strengthen medical device cybersecurity.
- Reduce health-care-associated infections by better understanding the effectiveness of antimicrobials, sterilization and reprocessing of medical devices.
- Collect and use patient input in regulatory decision-making.
- Leverage precision medicine and biomarkers for predicting medical device performance, disease diagnosis and progression.

"An emphasis on precision medicine during the device lifecycle could be a means to obtaining better focused indications and clinical studies as well as device optimization," the agency notes. "Regulatory science for precision medicine includes research efforts such as developing patient-specific cell models to test medical devices."

With regards to biomarkers, FDA points to the need for more work to identify biomarkers for mild or early stages of diseases to support earlier diagnoses.

One FY 2016 priority topic that was dropped from the FY 2017 list is human-factors engineering. FDA issued multiple guidance documents on human factors testing issues in February.

"Although the area of human factors is not prominently identified as a priority, it is still an unmet need and is reflected in the descriptions of other FY 2017 Top 10 priorities," the latest report states, referencing infection control and the development of tests and methods to predict the clinical performance of devices as regulatory science areas where human-factors engineering plays an important role.

Also compared to the last year's list, FDA combined two separate goals, one on the use of patient-reported outcome measures and the other on application of patient-preference information, into one priority for collecting and using "patient input" in regulatory decision-making. The device center also expanded its goal about improving reprocessing of reusable devices to include a broader focus on reducing health-care associated infections.

Published online 09/22/16

South Africa Finally Gets Medtech Regulations Over The Start Line

ASHLEY YEO ashley.yeo@informa.com

There is progress to report in South Africa, with the first solid building blocks of the local dedicated medical technology regulatory system (both devices and IVDs) starting to be put in place as of this summer and fall.

Medical device and IVD manufacturers, importers and distributors are required to license their companies with the Medicines Control Council between Aug. 1, 2016, and Feb. 28, 2017. This news emerged from a recent MCC-hosted workshop on licensing of medical device and IVD manufacturers, importers and distributors.

Other foundation stones in the new system will follow, including the establishment of the new South African Health Products Regulatory Agency, which is due to be operational from March 1, 2017, according to current plans.

SAHPRA, which will assume the role of device regulator from the MCC, will henceforth handle the registration of medical device products using the new risk-based classification (see below). This process – product registration – will be a phased approach and will be done according to risk class. The agency's activities will be funded by registration fees, which have yet to be published.

PLAUDITS FOR SAMED

This forward motion is good news for all players in the South African market, and is particularly gratifying for the local industry association, SAMED (the South African Medical Device Industry Association), which has long lobbied for a separate and distinct regulatory system for medical technology ([A#MT040754]). SAMED has thus succeeded in conveying the message that device registration is a substantially self-declaratory process in which the onus of oversight is more on the industry than the regulator.

SAMED executive officer Tanya Vogt is guardedly optimistic about progress so far and yet to come. While she notes that these moves show that the MCC realizes that the business model for medical devices is different to that of medicines, she is also aware that this is only the beginning of a long process. Moreover, it is a process that will require the regulator and industry to work closely together to ensure a smooth journey along the regulatory path.

LICENSING PROCEDURES

When applying for a license for their establishment (before Feb. 28, 2017), medical device and IVD companies are required to also include a listing of all products and a classification of them. There are to be two types of license: a license to manufacture, allowing importations, manufacture, distribution and exporting; and a license to distribute, allowing importations, distribution and exporting.

Products will be classified into four categories: Class A (low-risk), Class B (low- to moderate-risk), Class C (moderate- to high-risk) and Class D (high-risk). Although all companies will need a license, most Class A medical devices will not have to be registered. Implants are now considered as Class D. The MCC may decide to reclassify self-declared classifications for products in HIV/AIDS, TB, Malaria and oncology.

Shutterstock - Irybex

This process will require the regulator and industry to work closely together to ensure a smooth journey along the regulatory path, SAMED executive officer Tanya Vogt says.

Companies with combination medical device products that are currently registered as medicines are advised to contact the MCC registrar, Dr. Joey Gouws, to provide reasons as to why their product would fit better on the medical device register and request that it be transferred to that register. At the same time, the company should apply for an establishment license.

LICENSE COSTS

The costs of acquiring a new license have been set at Rand 21,000 ($1,470) for a manufacturer and Rand 13,000 for a distributor. An annual renewal fee of Rand 3,000 will apply across the board. Licenses will be valid for five years, whereafter a license renewal will be required (Rand 19,000 and Rand 10,900, respectively). The license application form will be posted at http://www.mccza.com/Publications.

Below are other key points to note:

- Licenses must be in the name of a natural person or legal entity, however, an authorized representative (AR) must be a natural person.

Recent regulatory chronology

South Africa's amendment Bill 6, which became Act 14 of 2015, was signed into law in December 2015, but will only be brought into operation once Act 72 of 2008 is proclaimed by the president. Act 72 is the instrument that amends the overarching Act 101 of 1965, and effectively introduces a regulatory system in South Africa based on the principles of the International Medical Device Regulators Forum. Act 14 allows for SAHPRA to be established. But the final regulations are yet to published. They are at present being translated into Pedi and Zulu and will be published within the next few months – this will be the final set that is being made ready for implementation. No further consultations will be made.

- Amendments, updates or changes to a license are not classed as renewals, rather as an amendment, for which no fee applies. But the MCC must be notified of amendments.
- The MCC does not have a policy on turnaround times/speeds.
- Repackaging, refurbishment, servicing and/or maintenance or sterilization of products in South Africa will be deemed to be "manufacture," necessitating a license to manufacture.
- All storage sites must be listed.
- A hard copy and a CD-Rom or an electronic version must be supplied. If a hard copy is not received, the application will be deemed incomplete.
- According to parliamentary debates, reprocessing of single-use devices will not be allowed.
- Class C and D medical devices may not be advertised to the public and may not be sold over-the-counter.
- Custom-made devices for a single patient are generally exempt, but amending them for a variety of patients would necessitate licensing.
- Electromedical equipment companies are also required to obtain a license from the MCC. It is envisaged that an act covering radiation-emitting products will emerge, in time.
- At this point, manufacturers or distributors of only Class A devices need not apply for a license.

ARS' QUALIFICATIONS

There is no specific AR qualification in South Africa, but companies are urged to consider what other qualifications are required for an AR (for instance, a life sciences degree, experience in the medical device industry and/or understanding fiduciary responsibility).

SANAS, the South African National Accreditation System, which carries out accreditations in respect of conformity assessment, will do the accreditation of conformity assessment bodies (akin to EU notified bodies) for auditing companies to local ISO 13485 on quality management systems (QMS). It is a work-in-progress, however, and local companies are urged to use the international ISO 13485:2016 as their QMS guide. The MCC is likely to call for proof of ISO 13485:2016 within the five-year license-holding period.

Device-makers use ISO 13485 to ensure quality systems compliance with regulators in different countries, including Canada, Japan, Australia and the 28 member-states of the European Union. The standard's requirements for device manufacturers are similar – but not identical – to US FDA's Quality System Regulation.

ASSISTANCE AND GUIDELINES

The MCC has posted several new guidelines on its website, on:

- Licencing of Medical Devices and IVDs Manufacturers, Importers and Distributors;
- Medical Device and IVD Essential Principles of Safety & Performance; and
- Classification of Medical Devices and IVDs.

Two application forms have also been posted on the MCC website. SAMED is holding monthly workshops for device industry members to go through the application forms and to offer Q&As.

Published online 09/21//16

Deadline Reprieve Mooted For Russian Registration Replacements

ASHLEY YEO ashley.yeo@informa.com

Time is running short for companies that still need to replace their pre-2013 Russian medical technology registration certificates with new versions, as provided for in the recent regulatory overhaul introduced with Resolution 1416.

Under new medtech registration procedures that came into force on Jan. 1, 2013, manufacturers will have to replace, by Jan. 1, 2017, their certificates for both medical equipment and medical products with medical device certificates – a new single category to replace the former categories.

The previous twin-category system had conferred a discounted VAT rate of 10% on medical products. After 2006, Russian products and equipment were cleared without expiry dates; the new rules also retain the no-expiry date provision, but under 1416, manufacturers must still replace these certificates. (Prior to 2006, Russian medical technology was cleared with 10-year expiry periods.)

This replacement process can be quite quick – taking as little as five days, according to local regulatory expert, Alexey Stepanov. Stepanov, who is attached to a major global medtech group, notes that Roszdravnadzor (the Federal Service for Surveillance in Healthcare) quotes it as being a 30-day process. But as things stand, if their certificates are not renewed, the products will lose their registrations and will be invalid. "Companies should get moving," Stepanov advises.

A month ago, Roszdravnadzor said that fewer than 9,200 files for replacement certificates had so far been submitted to the authorities by medical device manufacturers. Given that there are some 37,500 registration certificates that require certificate replacements, matters risk becoming acute for companies that continue to delay.

A month on from those figures, Stepanov tells *Medtech Insight* that officially little has changed, and many companies still need to come forward to replace their certificates. Companies based outside Russia might be among those that are being slow to react.

Unofficially, change might be afoot, with both the Russian ministry of health and the powerful Moscow-based industry association, IMEDA (the International Medical Device Manufacturers Association), considering or pressing for change.

The ministry is thought to be weighing up the contemporaneous complications that the impending Eurasian Economic Union (EAEU) system of medtech registration might bring. The planned EAEU system will require medical device manufacturers to re-register their products by the end of 2021.

IMEDA officially lobbied the government in August for an extension of the Russian certificate replacement deadline. It is suggesting a postponement of "old" registration certificate replacements until the end of 2021.

For the time being, matters remain as they are. Roszdravnadzor seems to be maintaining a hard line, in the belief that medical device manufacturers have enough time to organize their new registration certificates. Publicly, the agency appears to have little sympathy with claims about potential problems in the medical device market in 2017. If the ministry and industry can convince otherwise, industry might gain valuable breathing space.

Published online 09/23/16

FDA Issues How-To On Computational Modeling Reports

ELIZABETH ORR @elizabethjorr elizabeth.orr@informa.com

Device-makers can draw on a newly finalized guidance document from US FDA when drafting computational modeling and simulation (CM&S) reports for inclusion with FDA submissions. The guidance document discusses 15 elements that these reports should include.

"This guidance is intended to provide recommendations to industry on the formatting, organization and content of reports for CM&S studies that are used as valid scientific evidence to support medical device submissions," FDA explained in a Sept. 21 *Federal Register* notice announcing the guidance.

In recent years, FDA has encouraged the use of computer modeling to reduce the expense and time needed for conventional clinical trials.

The guidance states that CM&S reports should lead with an executive summary providing "a concise and complete overview of the report of the computational modeling and/or simulation study." Specifically, the summary should identify the report's context of use, including the specific quantity of interest it was trying to evaluate. In addition, the guidance recommends the summary contain the scope and type of analysis used, as well as the conclusions reached.

Finally, the agency asks that manufacturers identify up to five keywords describing the modeling modality, the device product code, any relevant device materials, the type of analysis, and where the device is used in the body, if applicable. FDA analysts plan to use the keywords to text-mine CM&S reports to better understand how the guidance document is being used.

The guidance document further recommends that the CM&S report should include a background and introduction briefly describing the device system and intended use, as well as the context of the analysis. Further, the report needs to describe the software

quality assurance and numerical code verification that the manufacturer performed, which helps establish the correctness of the software code, as well as the correctness and fidelity of the numerical algorithms.

CM&S reports, the guidance states, should also include elements such as system geometry; governing equations or constitutive laws; system properties; system conditions; system discretization; numerical implementation; validation; results; discussion; limitations; conclusions; and references.

In addition to describing the 15 general elements, the guidance also includes appendices that detail the agency's recommended structure and specific terminology for use in CM&S reports that are related to fluid dynamics and mass transport; solid mechanics; electromagnetics and optics; ultrasound; or heat transfer.

The agency issued a draft guidance version of the document in January 2014.

Published online 09/23/16

Medtronic Artificial Pancreas Trial Results Published

ELIZABETH ORR elizabeth.orr@informa.com

Medtronic PLC's artificial pancreas technology got another boost recently, as the *Journal of the American Medical Association* published pivotal trial results that seem to establish the *Hybrid* closed-loop system is safe and improves certain patient outcomes.

The trial found that patients who used the Hybrid system experienced less glycemic variability, more time in the target range, less exposure to hypoglycemia and hyperglycemia, and reduced A1c compared to baseline data available for patients treated with sensor-augmented pumps that require some type of outside intervention. The study did not include a control group. The company concurrently released the data at the European Association for the Study of Diabetes annual meeting in Munich, Germany.

The 10-center study, which enrolled 124 people with type 1 diabetes, was the first US pivotal trial of artificial pancreas technology, according to Medtronic. It is also the largest and longest outpatient study of closed-loop systems, tracking data from 12,000 patient days.

Patients in the study saw their daily dose of insulin rise from 47.5 U/d to 50.9 U/d, while average weight changed from 76.9 kg to 77.6 kg. And the percentage of sensor glucose values within the target range changed from 66.7% at baseline to 72.2% at the end of the study.

The trial results also show 20 device-related adverse events during the trial period, including 18 incidents of hyperglycemia. Of the hyperglycemia cases, 12 were classified as severe.

The researchers, led by Richard Bergenstal, of the International Diabetes Center in Minneapolis, cautioned that the study was not without flaws. "Limitations include lack of a control group, restriction to relatively healthy and well-controlled patients, the relatively short duration and an imbalance between the length of the study periods," the article states.

US FDA is now reviewing a PMA for the Hybrid closed-loop system, which Medtronic submitted in June 2016. It is the first artificial pancreas to reach FDA for review, and Medtronic hopes for a 2017 approval. Several insulin pump companies have been working to develop competing systems, including **Tandem Diabetes Care Inc.**, **Animas Corp.**, **Insulet Corp.**, and start-ups like Beta Bionics Inc. and **Bigfoot Biomedical Inc**. Most of the competitors use glucose meter technology developed by **Dexcom Inc.**.

Published online 09/22/16

AMS Seeks To Stitch In More M&A Deals

CATHERINE LONGWORTH catherine.longworth@informa.com

Advanced Medical Solutions Group PLC (AMS), the surgical and advanced wound-care specialist, is aiming to expand its business with technology acquisitions that "leverage its global OEM customer base, plus branded routes to market" following a period of strong financial growth in the first half of 2016.

The company released interim results on Sept. 14 which showed revenue jumped 20%, year-over-year, to £39.2m ($50.8m), and pre-tax profit grew 13% to £9m. CEO Chris Meredith said the results put AMS in a strong cash position – which, at £41.1m as of June 30, 2016, was nearly twice the amount recorded the same time last year – to launch its acquisition strategy.

"We have a lot of support from shareholders to use the funds to accelerate the growth of the business, and we are looking at what we might be able to do to supplement organic growth with acquisitions that we believe are a good fit. The cash facility that we've got gives us a reasonable amount of firepower to do that," Meredith told *Medtech Insight*.

Winsford, UK-based AMS disclosed that it had been looking at a potential acquisition in the first half of the year but decided to not go ahead with the deal. The interim report noted that an exceptional charge of £0.4m was incurred relating to the activity. The company said it was continuing to review technologies within wound care and surgery that would complement its existing product lines and businesses that would help expand sales geographically.

AMS's products are currently manufactured in the UK, the Netherlands, Germa-

Photo credit: AMS

"The cash facility that we've got gives us a reasonable amount of firepower [to make acquisitions]."

– Chris Meredith, CEO of Advanced Medical Solutions

ny and the Czech Republic, and are sold via distributors and the company's own direct sales force. In 2009, AMS acquired the remaining 50% stake of Netherlands-based hydrophilic polyurethane manufacturer Corpura, its joint venture with Reticel, followed by the 2011 acquisition of Resorba, a wound-care and wound-closure business headquartered in Germany. The acquisition was noted by AMS as a strategic move to expand its technology portfolio and provide direct sales to Germany, Czech Republic and Russia.

Overall, the company's two leading brands, Resorba and Liquiband, performed well in the first half of the year. Direct sales of *Resorba* products, which comprise a range of absorbable and non-absorbable sutures, into Germany and the Czech Republic increased by 9% to £6.4m in the first six months of the year, and AMS indicated they were starting to see the benefits of tender wins in 2015. Sales of Resorba in the rest of the world via distributors were also up 8% to £1.6m.

US sales for the company's *LiquiBand* tissue adhesive range, which are through AMS' distribution partners, soared, with revenues up 83% to £6m and the company's share of the US tissue adhesive market expanded to 19% in the combined hospital and non-hospital market. Direct sales of LiquiBand in the UK also went up by 9%, reversing a decline from last year.

Meredith said: "LiquiBand in the US is one key growth driver for us that continues to do very well. We launched a new LiquiBand device last year, so we're in our second year of sales and that's opened up key markets to us and getting two product approvals through last year on the wound-care foam side that have allowed us to generate sales of new products."

An example is the *PHMB Antimicrobial Foam Wound Dressing* for chronic and acute wounds, which was CE-marked in August 2015. Sales into the EU were reported as £0.5m in the first-half of this year.

One product that showed flat sales was *ActivHeal*, a range of wound dressing products. AMS stated sales of the range into the NHS were lower than expected due to the impact of unusual ordering patterns from UK distributors.

Meredith said the company's overall strong performance was thanks to its strategy of driving growth in a number of markets and "not being wedded to one product."

Published online 09/22/16

Reapplix Seals In More Funding For Diabetic Foot Ulcer Patch

TINA TAN tina.tan@informa.com

Reapplix APS has raised €2.7m ($3.04m) in new capital to support activities that will put the Danish firm on the path to getting that all-important reimbursement for its advanced wound-care product, *LeucoPatch*, before moving ahead on a full commercial launch.

The additional funding came from Reapplix's existing investors – Novo Seeds, SEED Capital and Vækstfonden (The Danish Growth Fund) – that have been backing the Birkerød-based company since it was founded in 2008. This latest cash injection brings the total invested in Reapplix to around €12m and should take the company through to "mid-, second-half of 2017,» at which time the firm would have completed its 250-patient, 32-center randomized controlled trial of LeucoPatch in diabetic foot ulcers, the lead indication for the product. The trial was initiated in 2013 and is expected to be fully enrolled by the end of this year. Data from the trial will enable the firm to begin "a meaningful discussion" with the US Centers for Medical & Medicaid Services (CMS), which is currently assessing evidence from more than 10 trials of platelet-rich products (PRPs), such as LeucoPatch, to support its final reimbursement decision.

"In [the active wound-care market], it's often commented that there is not enough high-level clinical data to support the effectiveness,» Reapplix CEO Graeme Brookes said in an interview with *Medtech Insight*. "With this RCT that we're conducting, we'll be able to provide just that level of clinical data needed to show efficacy and that it can make a difference."

"This will be a completely new reimbursement code for PRPs," Brookes said, adding that the advanced wound-care market is one that has typically "enjoyed high reimbursement," and a product like LeucoPatch could be reimbursed for around $1,400 per treatment.

LeucoPatch has already cleared the necessary hurdles. It is CE-marked, and in February this year it was cleared by US FDA. However, the company has held off doing a full commercial launch of the product, instead conducting a controlled rollout of the product in the EU, at selected KOL centers, including those taking part in this 250-patient RCT, so that it can gather the evidence to support reimbursement. This data, said Brookes, will be the "final part of de-risking the business."

LeucoPatch is currently not reimbursed in any European country either. But with the active wound-care market currently wholly based in US, where it is estimated to be worth $1.1bn and growing at 13% per year, Reapplix's focus will be squarely on the other side of the Atlantic.

If all goes well and reimbursement is secured, Reapplix will be looking to raise between €10-13m in growth capital to support commercialization of LeucoPatch.

The company is leaning toward adopting a hybrid approach to its sales strategy, whereby the firm would embed its own sales people within a third-party distribution organization. "This is the most efficient use of capital and balanced risk. But it requires you to get the right partner," Brookes told *Medtech Insight*.

Aside from producing the data which would hopefully win it reimbursement, the RCT is also useful for Reapplix to learn "tips and tricks and sweet spot indications" for its technology, information that it can leverage for the commercialization of LeucoPatch and for expanding the platform into other markets, said Brookes.

What is LeucoPatch?

LeucoPatch is a triple-layer patch produced on demand, at point-of-care and in approximately 20 minutes, using the patient's own blood. The patch is prepared using Reapplix's blood-processing system: a small sample of the patient's peripheral blood is placed in a proprietary single-use device – a small vacuum container – which is then put in a centrifuge and set to run at a specific cycle, time and speed. The device generates a three-layered patch that includes fibrin to give structure and help retain moisture in the wound; platelets containing "a much higher concentration of cell growth factors than other [active] wound-care products," according to Reapplix CEO Graeme Brookes; and leucocytes, which is at the bottom layer of the patch and in contact with the wound.

A patient being treated for diabetic foot ulcer would typically receive one LeucoPatch a week, and a course would be between six to 10 weekly treatments.

A pilot study of LeucoPatch was conducted in 2013 involving 44 patients with diabetic foot ulcers that had persisted for at least eight weeks and had no or low wound area reduction despite the use of conventional treatments. Results of the study, published in *The Journal of Wound Care* on April 2015, showed that 73% of ulcers were healed when using LeucoPatch and that there were no serious adverse events reported.

Published online 09/26/16

Oncimmune Taps Former Luminex, Abbott Exec To Head Asia Sales

CATHERINE LONGWORTH @MedtechCate catherine.longworth@informa.com

Oncimmune Ltd., the early lung cancer detection company, has appointed Maarten Brusse chief commercial officer, Asia, in a bid to expand sales of its *EarlyCDT* autoantibody test platform to Asian markets.

Brusse has more than two decades of experience in medical devices, with particular expertise in the laboratory diagnostics space and in the Asia region. He was senior director, molecular sales EMEIA, at **Luminex Corp.** since 2013, and prior to that, general manager and commercial director at **Abbott Molecular Inc.** from 2009. He also worked as sales manager, NEMEA, at **AcroMetrix Inc.** between 2007 and 2009.

As Oncimmune's chief commercial officer in Asia, Brusse will be leading the company's sales strategy in that region and will be targeting sales and out-licensing opportunities for its EarlyCDT autoantibody test platform.

Oncimmune launched the first test from this platform, the *EarlyCDT-Lung* for early detection of lung cancer in 2012, and the product is currently sold in the US, the UK and other regions. For Asia, the company told *Medtech Insight* they are expecting to see a mixture of licensees and distributors by territory and is anticipating sales to begin later in 2017 once the tests have regulatory clearance.

Oncimmune had already outlined its plans for Asia at the time of its IPO earlier this year. The company joined AIM, the London Stock Exchange's international market for emerging companies in May after completing its initial public offering and raising £11m ($15.7m) in gross proceeds.

Published online 09/26/16

GE Will Back Start-Ups Shooting For Improved Global Health

TINA TAN tina.tan@informa.com

GE Healthcare has ring-fenced up to $50m to fund startups around the world – "regardless of location" – that are developing health-care technologies and solutions designed for use in developing or low-resource settings.

The accelerator program – called "five.eight" after the estimated 5.8 billion people in the world who lack access to quality and affordable health care – aims to bring in at least 10 startups in the initial phase. These companies would have gone beyond series A funding; as part of the accelerator, they would be able to leverage GE's know-how to scale their technology for emerging economies, with the possibility of GE deciding to take on the distribution of the start-up product or integrating it into the conglomerate's Affordable Care portfolio. Each start-up could also stand to gain up to $5m in funding from GE as the young business evolves.

The initial applicants to five.eight will be portfolio companies from four "social impact investors": **Acumen**, **Aavishkaar-Intellecap Group**, **Unitus Seed Fund** and **Villgro**. These four investors have an extensive global reach, with investments spanning Asia, Africa and Latin America.

GE said it will also consider companies outside of these four investors' portfolios. It stated: "The accelerator is also open to partnerships with global health start-ups directly, or other players within the global health ecosystem, including academia, NGOs or other health-care providers. Interested applicants are encouraged to contact five.eight; applicants will be evaluated and accepted on a rolling basis."

A spokesperson for GE Healthcare's Sustainable Healthcare Solutions unit told *Medtech Insight:* "We're looking to collaborate with global health startups who are fairly mature in their evolution and in a later stage of innovation acceleration. Startup applications should be well evolved from a product/technology readiness perspective and have a clinically proven solution with clear validation from the clinical community."

The accelerator program has already signed on its first company, **Tricog**, a Bangalore-based startup focused on improving survival rates of heart attacks in India. It seeks to achieve this by using cloud-connected electrocardiogram devices in medical centers that enable doctors to diagnose a patient within minutes of their arrival at the clinic, and reduce the time it takes to administer appropriate treatment. GE Healthcare says it will help Tricog scale its solution to more markets globally.

Contact five.eight for more details at five.eight@ge.com

Shutterstock: Africa Studio

Some investments made by GE Healthcare's "social impact" investor partners

- Circ MedTech – developed the *PrePex* device for nonsurgical male circumcision. The procedure is completely bloodless and requires no injected anesthesia, no knives, no sutures and no sterile settings. (Acumen)
- UE Lifesciences – developed the *iBreastExam*, a handheld, wireless mobile device for early detection of breast lesions. The technology uses patented ceramic sensors invested at Drexel University in the US that detect subtle variations in breast tissue stiffness. (Unitus Seed Fund)
- Nayam Innovations – developed an intraocular lens for use in cataract patients. The company claims the implant gives better outcomes then other IOLs but at 1/10th of the cost. (Villgro)
- MeraDoctor – developed a subscription-based app that gives patients affordable access to a network of licensed doctors for consultation. (Aavishkaar)

Published online 09/23/16

CHINA VC WATCH:

Genome, Diagnostics Ventures Attract New Funding

BRIAN YANG brian.yang@informa.com

Beijing-based **Genetron Health** has received an undisclosed amount, but is running into "several hundred millions" of renminbi in a Series B financing led by **VCanbio Cell** and **Gene Engineering**, a biotech company listed on the Shanghai Stock Exchange.

Established two years ago with a focus on genome testing and cancer screening, prevention and treatment, Genetron plans to use the new funding to expand marketing channels, enhance product lines and gather big data, said the company in a statement. Other investors in the round include Share Capital and Yueyin Venture Capital.

In addition to its Beijing base, Genetron has set up testing sites in affluent cities Shanghai and Hangzhou, as well as an R&D center in North Carolina, US.

Due to the relatively low market-entry barriers, genome testing service providers have mushroomed in China. In addition to major players such as **BGI-Shenzhen**, others include **Berry Genomics**, **Novogene** and **Annoroad**, which are all based in Beijing where top cancer hospitals are concentrated and many patients come to seek care.

The competitive nature of the market has driven many to rapidly expand their product offerings and to explore new channels, hoping to gain a lead via convenience and coverage.

Some are also beginning to look overseas, and VCanbio has recently set up an R&D and translational research center in the US, located in the suburbs of Boston.

SINGLERA SERIES A

Another Chinese precision medicine firm, **Singlera Genomics**, recently obtained $20m in a Series A financing led by Lilly Asia Fund. Other investors included Pine VC and CDBI Partners.

Based in Shanghai and with an operation in San Diego, Singlera was founded by Johns Hopkins University professor Gao Yuan and University of California, San Diego professor Zhang Kun, with a goal to commercialize their research centered on single-cell sequencing, DNA bisulfite sequencing, and biostatistics.

Shutterstock: HelloRF Zcool

They hope to apply the technology to cancer diagnosis, personalized treatments, and prenatal screening, and the new funding will be used to help transfer the research into products.

Lilly Asia Fund Partner Chen Fei said the potential of early cancer diagnosis in China and Singlera's solid expertise helped seal its investment. "Through our funding and strategic resources injection, we hope to partner with Singlera to achieve its goals of early diagnosis and prevention of cancers and other diseases," Chen said in a statement.

Singlera is led locally in China by former **Thermo Fisher Scientific Inc.** China executive Zhang Jiangli.

TENNOR'S SECOND ROUND

Meanwhile, Suzhou-based biotech **Tennor Therapeutics** has raised $25m in a second round financing, led by Northern Light Capital. Existing investors Frontline Bioventures, **WuXi AppTec Inc.**, Oriza, and Relativity Health Fund also joined the round.

The new funding will be used to progress Tennor's most advanced asset, TNP-2092, which is in early development for gastrointestinal *Helicobacter pylori* and *Clostridium difficile* infections.

Established in 2013, the Suzhou firm obtained its patents through the acquisition of assets from **Cumbre Inc.**, a US startup and nonprofit TB Alliance, according to Tennor's website.

Published online 09/23/16

Recent health-care investments in China

COMPANY	FUNDING	ROUND	LEAD INVESTOR	FOLLOW-ON INVESTORS	USE OF PROCEEDS
Genetron Health	CNY hundreds of millions	Round B	VCanbio	Share Capital, Yueyin Venture Capital	New marketing channels, product lines and big data
Singela Genomics	$15m	Round A	Lilly Asia Fund	Pine VC,CDBI Partners	Commercialization of early cancer diagnostics
Tennor Therapeutics	$25m	Round B	Northern Light	Bioventures, WuXi Apptec, Oriza, Relativity Health Fund	Progress R&D of TNP-2092

Source: company announcements, China Money Network

CONTINUED FROM PAGE 1

ment programs and is one of the world's most experienced interventionalists with bioresorbable stents. His research interests include not only drug-eluting stent development, but drug-coated balloon technology, optical coherence tomography and coronary imaging.

Byrne talked to *Medtech Insight* about his experiences with these technologies, and where he sees the field going in the near future.

Medtech Insight: Since you're in Germany, where more of these technologies are available than just the Absorb and Synergy, can you talk about the technologies that you've used in your clinic?

Robert Byrne: Here, I suppose our "workhorse" stent technology is still very much the conventional metallic drug-eluting stents, which obviously are very high-performance and set a high bar in many respects for competing technologies, which is good news for our patients.

And I suppose we probably use two classes. We still use newer generation, biocompatible durable polymer stents, and of course the most common ones there would be [Boston Scientific's] *Promus* and [Abbott's] *Xience*, and [Medtronic's] *Resolute* zotarolimus-eluting stent. We actually have a new version out called *Resolute Onyx*, which I don't think you have in the United States.

And then what we also use quite a lot of is the biodegradable polymer drug-eluting stent. I suppose in our center we have quite a significant interest in this technology because our people developed it 10 years ago, so for our workhorse stents we use quite a lot of biodegradable polymer drug-eluting stents. I suppose the Synergy stent from Boston is one of them. The *BioMatrix* stent from Biosensors is one that we've used more in the past, but we still have it on the shelf. And then there's another one that's called [**Translumina GMBH**]'s *Yukon Choice PC*, which is certainly not available in the United States, which is kind of a thin, biodegradable polymer drug-eluting stent. Also the *Orsiro* from [**Biotronik SE & Co. KG**], which is … in an approval study for use in the United States and recruiting at present.

Do you use Absorb, the completely absorbable stent, very often?

Byrne: I would say we probably use it in 5-10% of our cases. We tend to restrict it to selected patients, and I think one criteria is [that the] patients [be] young enough that they will derive the potential hypothetical benefit from these stents long term. That's an important consideration.

But then in terms of lesion types, what we've really learned is you've got to be quite selective to use [Absorb]. We avoid certain lesions with any type of moderate to severe calcification, even if you do a thorough lesion preparation. But also I think for bifurcated lesions where two-stent techniques are necessary, we don't also have a great solution at the moment in the bioabsorbable stents.

Is there a certain kind of patient where you want to use the bioabsorbable polymer stent versus just the effective durable drug-eluting stent? Why would you use Synergy versus Xience or one of those DES?

> "For bifurcated lesions, where two-stent techniques are necessary, we don't have a great solution at the moment in bioabsorbable stents."

Byrne: Certainly the newer stent iterations – for example, Synergy; or for example, Orsiro – not only leverage better performance, in terms of the polymer coatings, but also in terms of the stent backbone. And most interventionalists in Europe – where you know the percentage of radial interventions is very high – prefer the newer-generation stents as the workhorse, not just because of the hypothetically better healing rates, but also because of their performance characteristics and deliverability.

I suppose the second issue is actually, whether these bioabsorbable polymer metallic DES have demonstrated late-benefit. The hypothesized benefit is that they'll behave like a bare-metal stent late after implantation. And they have demonstrated late benefit in randomized studies, but really only clearly when compared against first-generation DES like [**Johnson & Johnson/Cordis Corp.**'s] *Cypher* stent.

I think we're among the first groups to present full five-year follow-up of randomized controlled trials [comparing durable versus biodegradable polymer stents], and there what you're seeing is approximately comparable results in terms of adverse clinical events at five years.

Now, you might say it's a little bit disappointing that the hypothesized advantage of having no polymer isn't clearly demonstrated, or you could take the other, glass-half-full point of view, which is all of the things being equal, then a stent that is like a bare-metal stent beyond five years is arguably preferable because studies at ten, 15 years really never get done.

With regard to the stents with a metal backbone but a bioabsorbable polymer, how does the dissolution of the polymer help? It's sort of obvious why having a piece of metal in the vessel for a long time is not such a great idea, but why is it better just to get rid of the polymer, in your experience?

Byrne: That's really actually the key question. The problem is this issue of delayed arterial-healing, which we realized only

after the introduction of first-generation DES. We learned this lesson mainly from autopsy studies from Dr. Renu Virmani and her group [at the Armed Forces Institute of Pathology], and it examined patients who died many years after drug-eluting stent implantation – maybe from other causes like road traffic accidents or other diseases. When you looked at their stents under the microscope, they weren't well healed in the vessel wall, even many years after implantation. And with bare-metal stents, the healing pattern tended to be completely different.

Now, the question is: What caused this? There was a substantial body of work from autopsies but also from animal studies that suggests, that although it's definitely a multifactorial process, that an inflammatory response against the polymer coating played a significant role in this delayed arterial healing. So, I think that's the rationale for wanting to develop stents with a polymer that goes away.

Now, you can say, "What are the consequences of this delayed arterial healing?" And I think there there are three things to consider. One is an association with late-stent thrombosis, which is obviously a pretty catastrophic event that often leads to myocardial infarction. The second is that drug-eluting stents, in comparison to bare-metal stents, tend to have a very slight attrition of their anti-restenotic efficacy late after follow-ups. So, even though they're much better than bare-metal stents, and we saw this in the [NorStent] study last week that was presented [at the European Society of Cardiology congress on Aug.30], and that received some attention. Even though [DES] are clearly better at preventing restenosis in the early phase, there's a slight attrition of this gain over the subsequent years.

And then the third thing is that there seems to be a more rapid type of atherosclerosis that can develop inside the stent after DES [implantation] as compared to a bare-metal stent. And the common thread to these problems, as I said, seems to be this delayed arterial healing, which is linked to inflammatory reactions to the polymer.

There have been some designs to build a stent – like Medtronic's drug-filled stent – that has no polymer at all but still manages to elute a drug. Have you had any experience with those?

Byrne: When you want to get at this problem of delayed arterial healing, I think the biodegradable polymer approach is one that we've just discovered where this polymer breaks down. It serves its useful function really in the first 30 to 60 days. That's when you need a polymer. And then the biodegradable polymers slowly dissolve over somewhere between three and 24 months, depending on the composition of the polymer.

Now, the other approach is to work completely without polymer from the get-go. This is not as easy as you might imagine because the polymer plays such a critical role in determining how effective the stent is. We did a series of studies called the ISAR-TEST series back ten years ago or so where we looked at this in some detail, and what you see is that, without a polymer, the release of sirolimus or paclitaxel that is just really in the first three to five days is too rapid. And the drug doesn't hang around for long enough to inhibit the initial overgrowth of cells that initiates [restenosis].

When we worked with completely polymer-free stents at the start, we saw [some] late-luminal loss, which is the metric you're interested in when you're talking about how effective the stent is, around about 0.45 to 0.50mm. And although this is a lot better than with bare-metal stents, which simply have a late-luminal loss of 1.0mm or more, it's a step back from the best-in-class durable polymer DES, like Xience or like Resolute, which often have, in all-comer populations, a late luminal loss of between 0.20mm and 0.30mm.

The challenge, then, is to look at other ways of controlling the drug release without having a polymer on the stent, if you accept the 0.45mm or 0.50mm [late-lumen loss] is just not going to cut it. Here there are two classes of approaches. One is the surface-modified stent. So, maybe you do sandblasting of the stent to create a rough, porous surface, or you hollow out the stent so that you can fill the stent with drug. These are kind of mechanisms which can facilitate a higher loading dose of drug on the stent and delay the elution of the drug by mechanical means.

There are some developments in that field. For example, Medtronic has a drug-filled stent which is reaching clinical testing, and you'll probably hear a bit more about that in the next year. The BioFreedom stent from Biosensors also leverages this surface modified stent technology. But I would say,

> "The challenge is to look at other ways of controlling the drug release without having a polymer on the stent. Here there are two classes of approaches: one is the surface-modified stent, [and] the second approach is is to try to use a second drug that attacks a different element of this restenotic response cascade, in the hope that you can then somehow compensate for the slightly lower efficacy in comparison to a durable polymer stent."

in our experience, on its own it's not quite enough, and our results are slightly disappointing with surface modification.

The second approach, then, if you want to do without a polymer altogether, is to try to use a second drug that attacks a different element of this restenotic response cascade, in the hope that you can then somehow compensate for the slightly lower efficacy in comparison to a durable polymer stent. We did quite a lot of work in that field. There was bench work which suggested that estrogen, for example, would be a good medication to reduce neointimal proliferation, [but] we looked at that in a clinical study and it didn't really pan out.

And then we turned to a substance called probucol, which was used quite a lot in the States in large clinical trials in the '90s to prevent restenosis when given to patients as an oral tablet – as a pill – around the time of angioplasty. [But it doesn't work] giving it as a pill, because it has side effects as a pill. It causes an unfavorable effect on your cholesterol profile and can give you this QT prolongation and rhythm disturbances.

We mixed that with the sirolimus and put it on the stent, and that seemed to give a late-luminal loss that was very, very similar to the drug-eluting stents like Xience and Resolute. We have had some success in that area.

So that concept might move forward?

Byrne: In Europe we have a CE mark for a stent that's derived from this work. It's called the *Coroflex ISAR* from a German company [called **Braun Corp.**] That seems to have good performance characteristics and good late luminal loss. It's used certainly in Europe.

How are the bioresorbable polymer stents different in terms of deliverability compared to high-performing drug-eluting stents from the earlier generation?

Byrne: If you talk about deliverability with the newer generation of conventional metallic DES, this is certainly kind of a "quiet revolution." It has really improved feasibility of complex intervention because the stents are much more deliverable. And the Synergy is a good example of a stent that has high deliverability. And the Orsiro stent, the Promus, and the Resolute – [at least] the new iteration of the Resolute – these are all very deliverable stents.

Now, if you take as the gold standard … the Xience stent, [the deliverability of the newer stents] is clearly an incremental benefit above the Xience stent. And of course, the Xience stent was clearly better than Cypher and [Boston Scientific's] *Taxus* in terms of deliverability. So, there is quite a revolution or an iterative development in terms of deliverability with the newer generation metallic DES. And it's important because, like I said, more and more people are doing radial intervention. Often this has issues with somewhat lower degrees of guide-catheter support, and you really need this extra deliverability. So, I think it's been an important development.

And finally, when you talk about Absorb – now certainly because of its thick struts, the crossing profile of the Absorb, when it's crimped on the balloon, is not so competitive. It's more like first-generation drug-eluting stents like Cypher as opposed to Xience. But, also while Absorb stent has had some issues that you're aware about in terms of thrombosis, for me, the deliverability didn't turn out to be as much of a catch as I thought it was going to be.

So it's not like starting over with a whole new technology.

Byrne: I would say in terms of getting into the lesion, [Absorb] is certainly inferior to what we have in terms of high performance DES that we use day in and day out as our workhorse devices. You can see that if you look at randomized controlled trials. For example, if you take Absorb III, [published] last year in the *New England Journal*, which is a big publication, you can see that there's a higher proportion of patients in the Absorb arm that had to receive another stent because they couldn't get the Absorb stent there. It was about 5% of patients. Whereas, in the Xience arm – which was the comparator group – very few patients required another stent because Xience couldn't get there.

So, there's definitely a difference. But we have used some other bioresorbable stents, which are in various stages of clinical development, and there you notice even more that there is a deliverability issue.

The questions which are surrounding Absorb are not as much to do with the crossing profile and deliverability, but more to do with the radial strength of the stent after you deploy it.

So, even though it's got these thicker struts, it doesn't have the same strength as the metal stents?

Byrne: It's intuitive. Everybody knows that plastic or polymers don't have as much strength as metal. And of course, the engineers behind the stent technology are very clever and have leveraged lots of technological advancement to get the radial strength of these stents to approach that of our conventional metallic stents, but it's not as good. Again, if you look at the randomized trials, which are really a good arbiter of differences between devices, you can see that the difference in radial strength between the devices is quite clear.

Is there any other approaches that we haven't heard about that we might want to be looking forward to that could solve any of these problems that we've talked about?

Byrne: There are a couple of things to consider. The first is there will be a newer generation of bioresorbable stents which are coming online, and hopefully they will have thinner stent struts, but a similar or better radial strength to what they have now. So, that's one class of device.

The second class of device that's just been approved in Europe is [Biotronik's Magmaris] magnesium-based bioresorb-

able stents, that's just been approved with the CE mark for use in Europe, in the past one or two months. We're kind of waiting to get our hands on it now and see how it performs in real-world clinical practice, but the initial studies, of course, look promising.

The third option, when you talk about leaving nothing behind in the vessel wall segment is, of course, drug-coated balloons. Drug-coated balloons are potentially a disruptive technology that could be suitable for using in a significant proportion of our patients with *de novo* cardio disease. In Europe we tend to mainly use it at the moment in patients with in-stent restenosis and with peripheral vascular disease, and in the United States it's only approved for use in peripheral vascular disease, and you don't have any in the coronary area.

But I think as we look to the future, maybe we'll have some more randomized trials that support these balloons in the coronary area for *de novo* disease. So, I think those are the key areas to keep an eye out on.

Is there any space at all for old-fashioned, bare-metal stents, or is that era over now for sure?

Byrne: That's a very good question. Our opinion for many years is that we use exclusively drug-eluting stents because the benefit, in terms of reducing restenosis, is clear across pretty much all subsets of patients and lesions. Especially with the second-generation or the newer-generation drug-eluting stents, which have this improved polymer coating, the issues relating to delayed arterial-healing seem to have improved very considerably.

The only thing that really was stopping us from moving to 100 percent drug-eluting stents is the cost issue. In Europe, in many countries, and in Germany in particular where I work, the cost hasn't been an issue in many years because [DES] cost for us around $100, so it hasn't hindered our adoption of this technology.

So there's no longer much concern about having to use dual-antiplatelet therapy to prevent thrombosis with DES?

Byrne: It seems to be much less an issue with the newer generation of stents. If we just talk about stable patients who are undergoing stent implantation, the guidelines in the United States and in Europe are now clear that these patients should receive six months of dual-antiplatelet therapy. The concern that they would have to be on [DAPT] for 12 months, 24 months, or even longer doesn't really seem to have been borne out. The iteration of the technology means that we're getting very good results with six months of dual-antiplatelet therapy. And that's pretty much the way we're moving.

The largest study to look at this for a long course of dual antiplatelet therapy was the DAPT study, which was funded by [a consortium of device and drug companies] and while that did show some benefit in prolonging dual antiplatelet therapy out to two, or two-and-a-half years, there was a high proportion of patients who were treated with the earlier-generation stents like Taxus, and these seemed to be the patients that really derived the benefit from these prolonged durations of dual antiplatelet therapy.

I think it was a nice idea of a problem that has been to a large extent solved by smart engineers and iteration of technology.

"Our opinion, for many years, is that we use exclusively drug-eluting stents because the benefit, in terms of reducing restenosis, is clear across pretty much all subsets of patients and lesions. The only thing that really was stopping us from moving to 100 percent drug-eluting stents is the cost issue."

Anything else we should be looking out for in this field?

Byrne: We're going to have the three-year result – the primary year results – from the ABSORB II study coming up in October/November. The whole idea behind the technology is that, after three years the stent will be largely degraded and the vessel [should] contract and dilate as normally. They're testing this in a reasonably modified study. We'll have the primary results to see "Does the concept stand up to scrutiny?" later this year. So, I think we're all looking forward to that.

The second thing that's going to be big news in the coming months is that more and more in patients with left-main stent disease are being treated with percutaneous intervention with current-generation drug-eluting stents. You may be aware that we're having two big studies comparing PCI with CABG in left main disease, [the EXCEL and NOBLE trials] and they will also be presented at [the TCT conference in Washington, DC, on Oct. 31], which is something, I think, to look forward to.

And then the third thing that's coming up in this space is a little bit more data on guiding the procedures with intravascular imaging, using this newer generation of very high resolution optical coherence tomography. I think we're going to have some studies on that at TCT. So, I think it's something to look forward to in the coming months.

Published online 09/21/16

Over 100 event types

Over 100 catalyst types

Over 5,000 products

Meddevicetracker
Pharma intelligence | informa

Double the Power

Meddevicetracker with Medtech Insight reports is a new interactive real-time source of in-depth medical technology market intelligence

Meddevicetracker brings you closer to the medtech market, helping you to:

- Identify upcoming device regulatory events/filings
- Search for medtech clinical trial starts and data
- Find historical and forecasted procedure volumes data
- Monitor drug delivery technologies and identify partnership opportunities
- Quantify the market size for devices or diseases
- Discover forecasted market share of devices by type
- Understand the device competitive landscape and identify unmet clinical needs

Request your free demo today:
please visit - **www.meddevicetracker.com**