

THE POWER OF pOssAbility

World-leading veterinary medical device company OssAbility is turning bright ideas into a viable business – and reinventing the field in canine cruciate surgery along the way. **Matt Philp** reports.

YOU CAN IMAGINE the scene. A highly experienced veterinary surgeon and a clever engineering PhD candidate are discussing a potential business venture at the engineer's Christchurch flat, overlooking Hagley Park. They take turns drawing with a whiteboard marker on a window, the surgeon outlining problems he'd encountered during his day of surgery and the engineer sketching possible solutions – both speculating how to turn bright ideas into a viable business.

Fast forward to today, and those window doodles have given birth to a world-leading veterinary medical device company. Based in Christchurch, OssAbility manufactures 3D-printed titanium implants and instruments for canine cruciate surgery. More than that, it is reinventing the field in how it engages with veterinary surgeons, collaborating with them on tailored surgical plans and offering a thorough follow-up – all with the goal of making surgery safer.

“Rather than just creating and selling technology, we want to work with surgeons on every case,” says veterinarian Brent Higgins, the surgical foil to the engineering smarts of his co-founder Seamus Tredinnick.

It was Brent who got the ball rolling for OssAbility. While training in the UK, he spent time working with television's ‘Supervet’ Noel Fitzpatrick, an experience that sharpened his interest in finding ways to leverage biomedical engineering that would simplify surgery.

In 2009 he returned to Christchurch, where pioneering human orthopaedic implant company Osis was starting to make real progress with 3D-printed titanium implants. As chance would have it, Seamus had interned with Osis as a Bachelor of Engineering undergraduate, and had since embarked on a PhD aimed at developing a new type of printed implant to better integrate with a patient's bone.

When they met, Brent spoke about the protracted learning curve every surgeon had to undergo to adopt a new technique – the traditional ‘practice makes perfect’ approach.

“I didn't like the model; I thought it delivered issues for the patients,” he says. “Over a beer, I shared that frustration with Seamus, who was working at the time in human medicine on these really complex hip replacements. He said, ‘Brent, you're looking in the wrong places. The true way to find excellence is by using the principles of engineering and technology.’ It was clear there was an opportunity to bring that thinking into the veterinary space.”

The pair launched OssAbility in 2013, funding it from their own savings. The initial R&D phase involved a lot of talking with surgeons and developing approaches that could be scaled beyond patient-specific surgeries.

“We ran a course in Christchurch with 11 local veterinary surgeons who were interested in technology – we called them ‘OssAbility Developers,’” says Brent. “They used the first product and gave us great feedback.”

The key offering was an advanced 3D-printed titanium wedge that Seamus developed from his PhD work. Essentially it's a porous scaffold, rather than a solid implant.

“It's about encouraging the body to heal,” explains Seamus. “The implant can stimulate the bone around it to grow into the scaffold, and that healing provides the mechanical stability, which gets the patient active again. Also, we're able to use it without a bone graft, making the surgery faster and reducing the impacts of harvesting. The patient can be rehabbed faster and the surgery site is stronger.”

“Patients literally walk out of hospital on the day of surgery or the day after, using that leg confidently,” adds Brent. “It's pretty amazing.”



Other hardware includes a stainless-steel osteotomy guide that can be reconfigured for every surgery, meaning that each cut is appropriate for that particular patient.

The idea, says Brent, is to simplify the procedure and limit the potential for complication.

"I'm always trying to solve a problem by looking at it from the surgeon's point of view, leveraging Seamus's expertise: 'How can we make this really simple for the surgeon, so it's easy for them to apply what is relatively complex technology to their patient, given the limited amount of time, expertise and knowledge they might have?'"

To date, most sales of hardware and OssAbility expertise have been to New Zealand and Australia, but their ambitions are greater.

"We need to think about solving this problem on a global scale," remarks Seamus, who adds that the company is poised to pursue either the North

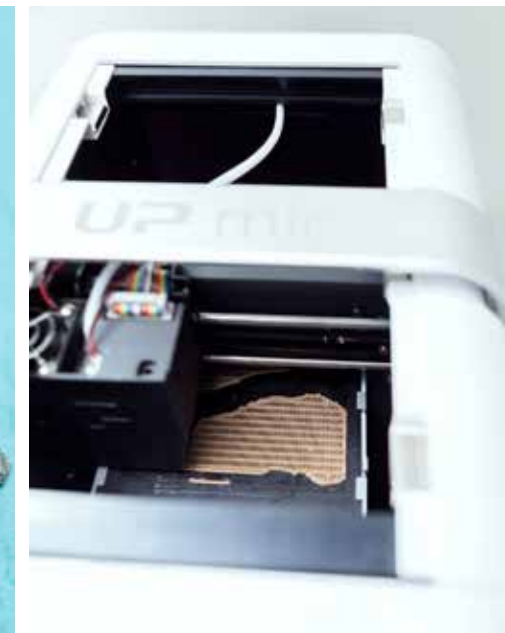
American market, where there is plenty of competition, or the faster-growing veterinary markets in countries such as China. Either way, they have the advantage of lower barriers to entry than those that apply to human medical device equivalents.

And the veterinary industry is by no means a poor cousin any longer. The cruciate treatment market, for example, was worth US\$1.3 billion in the US alone in 2003. Fourteen years on, it's growing at seven percent in developed markets, and double that elsewhere.

"We are seeing some heavy-hitting corporate players enter this space. People like buying that new toy for



Previous page: The osteotomy guide is configured to each patient. This page, clockwise from left: OssAbility uses computer-aided design to iterate and refine its products; the surgeon and engineer team of Brent Higgins (left) and Seamus Tredinnick. Next page, left and middle: OssAbility wedge implants are made from titanium alloy using 3D printing. Right; the OssAbility Stifle System, which can be learnt in a one-day workshop.



their animals, or the shampoo. When given an opportunity of medical and surgical treatment that can improve the lives of their furry babies, there's a huge opportunity to create value for those owners," says Seamus. "It's pretty cool to be going into that market as a startup, and to know you can't touch the ceiling by jumping."

How do they market themselves internationally? Veterinarians put a lot of trust in their peers, he says.

"For us, it's about identifying key opinion leaders and working with people who are our ideal users and who are respected in their communities – the 'trusted friend' introduction, as opposed to any fancy marketing approach. We're not trying to sell some fancy new widget; it's about people understanding that we're here to help them treat patients.

"That means that our products are continually honed, and there is a high service aspect – it's not only about choosing the right product, but about knowing how to apply it appropriately for each product."

"We help the veterinarian to identify surgical risks before surgery," adds Brent. "In some cases, we'll recommend

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an alternative cruciate treatment if that's the right thing for the patient."

They have established a potent partnership: the mechanically focused engineer and the veterinary specialist with a keen sense of how a particular instrument should fit in a veterinary surgeon's hand, and how that surgeon needs to present a product to a client.

"Seamus and I look at solving veterinarians' problems in different ways," says Brent. "We have wonderful discussions to come to a solution we both like. In the end, it's a very different solution from any that we could create on our own."

That said, they are both scientists with a deep commitment to understanding how well OssAbility's products work in clinical practice. Whereas traditional manufacturers might be content with performing trials to demonstrate cohort effects, Seamus says they try to collect information about every patient treated with their products, describing the approach as "a bit revolutionary" in the veterinary industry.

"Along with Brent's and my experience in that area, we have a PhD student who is analysing that data as it comes in. It means we have a watchful eye not only on how our products are being used in aggregate, but on how well they're being used by individual surgeons and how well they're working for individual patients."

To date, they've noted and presented a "significant reduction" in complications compared with traditional treatments. The results are to be published in a well-respected scientific journal, he says.

For Brent, it's a hugely exciting time.

"Starting a medical technology company that is working for hundreds of surgeons to solve real-life daily problems has been a dream of mine for years," he says. "I love it!"