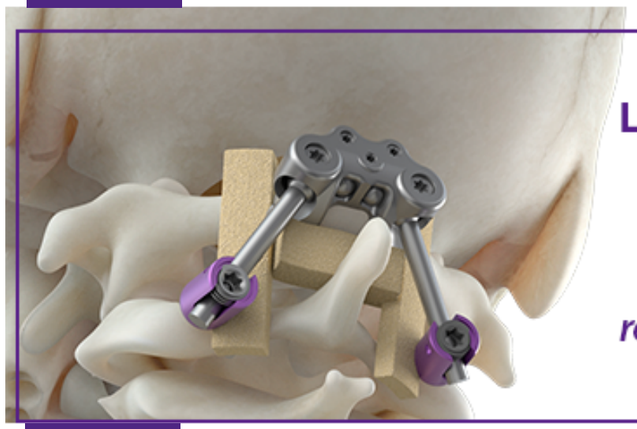

London start-up raises the bar on spinal implants:

Taking home-grown research to the international market

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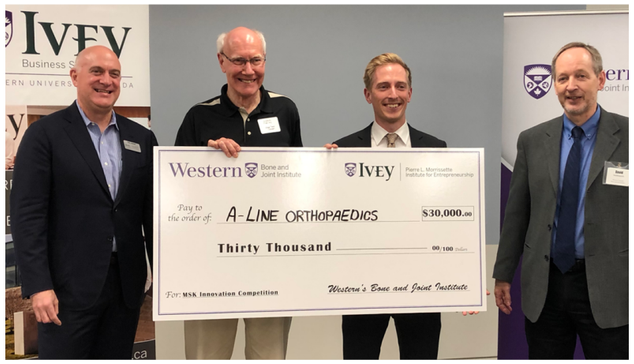
" Bringing engineering expertise together with first-hand clinical insights, Lasswell and Rasoulinejad cofounded London-based start-up, A-Line Orthopaedics "

Western University's Bone and Joint Institute (BJI) is helping local startups take their musculoskeletal (MSK) innovations beyond the academic research setting. For Tim Lasswell, MASc, and BJI member Dr. Parham Rasoulinejad, this support led to commercializing their revolutionary product with an international medical device company.

Upper cervical spine fractures are the number one spine injury in patients over the age of 70 and only a small percentage of patients with these fractures qualify for surgical intervention because of the risks associated with upper cervical spine fusion — the standard surgical treatment.



"It's very controversial whether or not you even operate on these patients today based on the technical challenges of the spinal fusion surgery," says Tim Lasswell. "If you opt for conservative treatment like a cervical brace, however, the fracture rarely heals, and the mortality rate is quite high."

In addition to operative risks and challenges, according to Lasswell and Rasoulinejad, the anatomy that allows the rotation in your neck is unique and not well suited for the screw placement – a requirement for spinal fusion surgery.

Bringing engineering expertise together with first-hand clinical insights, Lasswell and Rasoulinejad cofounded London-based start-up, A-Line Orthopaedics, and partially funded by the BJI Catalyst Grants Program, they developed a new spinal implant that could revolutionize an otherwise invasive treatment for upper cervical spine fractures. Their new implant, the Edge Upper Cervical System, is designed specifically for the upper cervical spine anatomy and uses a clamp system that is safer, faster and less invasive than the traditional screw implants.

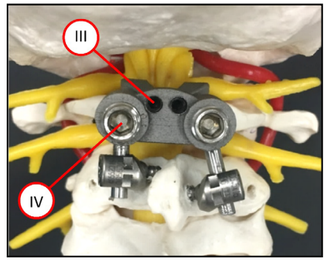
"Our implant is less invasive and yet stronger than the current standard procedure. That's a rare combination."

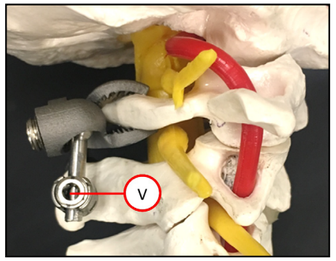
"Implants are often a compromise between how invasive the procedure is and how strong the fixation is," says Rasoulinejad. "Our implant is less invasive and yet stronger than the current standard procedure. That's a rare combination."

Having completed research and development steps along with validation of the market opportunity, problem and value proposition, the pair faced their next challenge of commercializing their product. BJI's Inaugural MSK Innovation Competition in the spring of 2019 could not have come at a better time to support Lasswell and Rasoulinejad's next steps.

The competition, a product of the BJI in partnership with the Morrissette Institute for Entrepreneurship at Western's Ivey Business School, strives to enhance, support and celebrate entrepreneurship and the commercialization of MSK innovations. The competition invites London-based entrepreneurial MSK experts to participate in a five-stage competition that includes a workshop, initial proposal, team selection, mentorship and a final pitch to a panel of judges. This annual event is sponsored by BJI and offers $30,000 to the team with the most promising project.

"The MSK Innovation Competition is designed to drive real change" says Eric Morse, Executive Director of the Morrissette Institute for Entrepreneurship. "The annual competition connects BJI researchers with industry professionals. This collaboration and mentorship opportunity creates a pathway to commercialization and a model for engaging more researchers to get into market."





Both Lasswell and Rasoulinejad noted the unique value of the MSK Innovation Competition was its ability to fund the less-tangible costs associated with furthering commercialization efforts.

"(Their) eventual, hard-earned win took their research well beyond the academic setting."

In addition to the opportunity to secure the funding they needed for the commercialization stage, the competition could facilitate introductions to meaningful industry contacts. From the right lawyer and regulatory consultant to local mentors with shared experiences, the team says the MSK competition is part of an evolving healthcare innovation hub in London.

Rasoulinejad's and Lasswell eventual, hard-earned win took their research well beyond the academic setting. The MSK Innovation funds they secured were used to work with regulatory consultants, perform literature reviews and compile data on competing products so that a pre-submission package could be reviewed by the FDA. These efforts ultimately enabled them to have the Edge Upper Cervical System acquired by an international medical device company; FDA approval is expected later this year. The success of the Edge Upper Cervical System goes beyond the implant itself. This work will establish a path for future implant development as well as commercialization opportunities at Western, including attracting highly-qualified personnel to London and contributing to the economic growth of start-up communities in Southwestern Ontario.

According to Lasswell and Rasoulinejad, the greatest wins are the improved outcome that their product will bring to patients and surgeons, as well as the benefits to the healthcare system, including a 30-minute reduction in the operating time needed for the procedure.

"It's a win for the patient because the surgery becomes shorter with potentially less blood loss and therefore lower intraoperative and postoperative complications," says Rasoulinejad. "It's a win for the surgeon because it means a less complex and less stressful process. And ultimately, it's also a win for healthcare systems because reduced operative time means reduced complication rates and an overall healthcare savings."

To learn more, please visit the BJI Catalyst Grants Program and the MSK Innovation Competition on the BJI website at: boneandjoint.uwo.ca.