

Medical Technology & Devices



> Pre-clinical

Problem

With an aging global population, the demand for effective joint replacement solutions is rapidly escalating. The global knee replacement market, currently worth US\$9.8 billion, is projected to grow to around US\$16.1 billion by 2030. Total knee arthroplasty (TKA), a common procedure for advanced osteoarthritis patients, sees an estimated dissatisfaction rate of 5-20% post-surgery. The main cause of dissatisfaction and pain is believed to be inappropriate tensioning of the soft tissue, which often results in follow-up surgeries.

Solution

In response to this issue, our load-sensing device offers a minimally invasive, objective measure of soft tissue tension. The technology has been tested in cadaver tissue, demonstrating its potential in improving surgical outcomes. The device provides real-time feedback to surgeons, allowing for more accurate tension restoration and pain reduction in TKAs and similar procedures.

Currently, surgeons do not have established methods for assessing tension. They primarily do it 'by feel' or, at best, using pressure sensing devices with trial implants to infer soft tissue tension. This device presents a solution to provide an objective and/or patient-specific measure of tension. This concept was validated with 41 practitioners in the industry, all of whom were interested in utilising a soft sensor solution.

The key enabling aspect of this invention is the miniaturisation of an existing sensing principle, which permits its use in small environments such as a surgical operating theatre.

Intellectual Property Status

This technology will be the subject of an Australian provisional patent application.

Potential Commercial Applications

The device has potential applications in biomechanical testing during joint replacement surgery, including knee replacement, shoulder surgeries, hand and wrist nerve repairs, as well as in research, veterinary applications, prosthetics, and wearable assistive robots.

Inventors

Dr Mounir Boudali and A/Prof Elizabeth Clarke



Image from Microsoft

Contact Commercialisation Office

Name: Dr Taylor Syme

Position: Commercialisation Manager (Medicine & Health)

Email: taylor.syme@sydney.edu.au | Phone: +61 468 517 473
sydney.edu.au/innovation-and-enterprise