Exactech and KenSci Publish Research on the Impact of Artificial Intelligence to Predict Clinical Outcomes after Shoulder Arthroplasty

Results of a new study involving machine learning can help align patient and surgeon expectations for clinical improvement after surgery

Gainesville, Fla. (May 6, 2020) - Exactech, a developer and producer of innovative implants, instrumentation and computer-assisted technologies for joint replacement surgery, and **KenSci**, a healthcare artificial intelligence (AI) platform company, announced today that a collaborative, foundational study on using machine learning (ML) to predict outcomes after shoulder arthroplasty has been published in *Clinical Orthopaedics and Related Research*, one of the premier scientific journals in orthopaedics.

The research analyzes the potential of ML to use preoperative data to anticipate patients' post-operative results after anatomic total shoulder arthroplasty (aTSA) or reverse total shoulder arthroplasty (rTSA). These results can help surgeons preoperatively identify if a patient will achieve certain clinical improvement thresholds to appropriately risk-stratify patients for these elective procedures.

Specifically, this research explores the efficacy of ML to predict the American Shoulder and Elbow Surgery (ASES), Constant, global shoulder function and VAS pain score, as well as to predict a patient's active range of motion in abduction, forward flexion and external rotation. This research also studies the ability of ML to identify if a patient may achieve clinical improvement that exceeds the minimal clinically important difference threshold as well as the substantial clinical benefit threshold for each outcome measure.

"This is the first published use of machine learning to predict clinical outcomes after shoulder arthroplasty," said Chris Roche, Vice President of Exactech's Extremities business unit. "The predictive accuracy of the algorithms is impressive, particularly considering these techniques only utilize data available prior to surgery to predict what an individual patient will experience multiple years after surgery. And since predictions can be made for different prosthesis types with equivalent accuracy, these algorithms can help better inform surgeons to select treatments that result in the best outcome for a particular patient."

Such predictive models can help the surgeons better identify patients that may benefit from shoulder arthroplasty and better align patient and surgeon expectations for clinical improvement. By leveraging the experiences of previous patients with similar clinical history and treatments, these predictive models can help identify patient-specific improvement and support more-informed treatment decisions.

Prof. Ankur Teredesai, KenSci Co-founder & Chief Technology Officer, said, “Thousands of shoulder arthroplasty patients elect to undergo surgery after trying a multitude of options for pain management, often in later stages of life. ML, when made truly assistive by embodying the principles of fairness, accountability and trust, has immense potential to proactively risk-stratify such patients before a complicated surgical procedure to improve outcomes they can experience post-surgery. We are excited to publish this research and its clinical findings that demonstrate the utility of machine learning methods to anticipate patients’ results after shoulder arthroplasty.”

This study sets a new benchmark in using ML to analyze outcomes after shoulder arthroplasty. KenSci has worked with healthcare providers, payers and device manufacturers to improve clinical and operational outcomes using ML techniques based on extensive research. With the KenSci System of Intelligence platform on the cloud, healthcare organizations around the world are transforming the way they operate and provide better patient outcomes through AI-led prediction and prevention.

About Exactech

Based in Gainesville, Fla., Exactech develops and markets orthopaedic implant devices, related surgical instruments and biologic materials and services to hospitals and physicians. The company manufactures many of its orthopaedic devices at its Gainesville facility. Exactech’s orthopaedic products are used in the restoration of bones and joints that have deteriorated as a result of injury or diseases, such as arthritis. Exactech markets its products in the United States, in addition to more than 30 markets in Europe, Latin America, Asia and the Pacific. Additional information about Exactech can be found at http://www.exac.com.

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About KenSci

Based in Seattle, WA, KenSci is a healthcare AI platform, built to enable development and production of machine learning across care management, hospital operations and healthcare supply chain. For more information, visit www.kensci.com.

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