

## Wireless Assessment of Surgical Performance

Through an exciting collaboration between the Nuffield Department of Orthopaedics, Rheumatology & Musculoskeletal Science, and McLaren Applied Technologies, we have developed a novel wireless method for assessing surgical performance in both operating theatres and surgical skills training centres.

The burden of orthopaedic and musculoskeletal disease is a major problem worldwide. In the UK alone orthopaedic operations are the most frequent in any hospital. Besides joint replacements, arthroscopic (keyhole) surgery has also expanded significantly in the last decade. Skilled and competent surgeons are needed and the acquisition of technical skills remains a fundamental goal of surgical training. However, training has been restructured and there are now restrictions on trainees' working hours, particularly in Europe and North America, that have resulted in a huge reduction in the average number of operative cases per trainee. This reduction is an alarming 80% in the United Kingdom.



While surgical competence consists of a complex combination of technical dexterity, knowledge, decision-making, and communication skills, technical dexterity remains particularly important and underperformance in this domain leads to poorer results. Greater peer and public scrutiny means that improving surgical learning and demonstrating competency is evermore important.



We have previously validated methods of assessing surgical dexterity, studied the learning curves of some procedures, and demonstrated the value of surgical skills simulators. Through our exciting collaboration with McLaren Applied Technologies we have now developed a novel 'wireless' objective surgical dexterity assessment tool that not only assesses surgical dexterity in a simulated setting, but for the first time in the real operating theatre. This wireless elbow-worn motion sensors system now allows for feasible objective assessment of surgical performance. In turn, this is facilitating a programme of surgical simulation and patient outcome research in Oxford that will ultimately improve the delivery of surgical treatments and improve patient outcomes in orthopaedics.



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