

University of Michigan Orthopedics: SBM developed a training system which simulates important components of knee replacement surgery, giving training residents a simulated experience of surgery. The system aims to improve overall surgical outcome by providing feedback parameters to analyze forces applied on the cutting block. Typical knee replacement surgery involves the use of a hand-operated power bone saw and a positioning cutting block to produce a sequence of beveled face cuts of the femur and/or tibia. Experienced surgeons can use a bone saw without it binding onto the cutting block, however novice surgeons often do not possess the experience and coordination to execute these cuts as successfully. The system developed by SBM comprises strain gauge-based load sensors and a computer interface for real-time visual feedback of stresses and strains on the cutting block as they are being applied by the cutting tool. In addition to real-time feedback, the system saves user profiles and cut data, allowing the assessment of surgical skill level for analysis and improvement. This system has been approved for use by the University of Michigan Internal Review Board (IRB) and is currently being used in initial evaluative studies.

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