

Richard Hughes, PhD



“Consumer Reports” for Hip and Knee Replacement Implants Based on a State-wide Registry

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There is wide variation in the quality of total hip and knee arthroplasty (“replacement”) implants. A major quality indicator of an implant is the percentage of patients needing a revision surgery to replace implant components. National registries in Australia, Sweden, Norway, New Zealand report revision risk for individual implant models. Surgeons have used these data to choose better implants, resulting in improved quality. National registries also forced DePuy to recall its ASR hip resurfacing device by publicly reporting the poor outcomes for that implant. The only registry in the United States publicly reporting implant performance is the Michigan Arthroplasty Registry Collaborative Quality Initiative (MARCQI). MARCQI is a state-wide collaborative of hospitals and surgeons dedicated to improving the quality of care for hip and knee replacement patients. It collects and analyzes data from over 95% of all elective total hip and knee replacement patients performed in the state of Michigan. It uses these data to compute revision risk data for implants and publicly reports the results in an annual report. This talk will explain MARCQI and its first annual report that was released in 2017. The report is a “consumer reports” of hip and knee replacement implants. Possibilities for using Bayesian network and linear programming models to improve causal inference will be presented.

Richard Hughes received his Ph.D. in Industrial and Operations Engineering (IOE) at the University of Michigan in 1991. In 1998 he returned to the University of Michigan as faculty in the Department of Orthopaedic Surgery. In the interim, he completed a post-doctoral fellowship at the Mayo Clinic and worked at the Centers for Disease Control and Prevention. His work today focuses on quality improvement in hip and knee arthroplasty. Along with Dr. Brian Hallstrom, M.D., Dr. Hughes is Co-Director of the Michigan Arthroplasty Registry Collaborative Quality Initiative (MARCQI). MARCQI is a network of 67 hospitals across Michigan that work together to improve quality of care for hip and knee arthroplasty patients by sharing best practices. He also developed and teaches IOE 413 Optimization Modeling in Health Care.

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