

# Cost-Effectiveness of Accelerated Perioperative Care and Rehabilitation After Total Hip and Knee Arthroplasty

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**Background:** Accelerated perioperative rehabilitation protocols following total hip and knee arthroplasties are currently being implemented worldwide, but the cost-effectiveness of these protocols from a societal perspective is not known. We compared the cost-effectiveness of an accelerated perioperative care and rehabilitation protocol with that of a more standard protocol for patients treated with total hip and knee arthroplasty.

**Methods:** A cost-effectiveness study was undertaken as a study piggybacked on a randomized clinical trial comparing early outcomes of an accelerated and intensive postoperative rehabilitation regimen with those of a more standard rehabilitation protocol. We assessed eighty-seven patients (forty-two who received the standard protocol and forty-five who received the accelerated protocol) for a total of twelve months. Costs from the time of the patient's visit immediately before the operation to one year postoperatively were calculated with use of activity-based costing analysis. Postoperative quality-adjusted life-years (QALYs) were calculated from validated patient diaries and questionnaires at fifteen time points. The primary objective was to determine whether one intervention was dominant over the other during a twelve-month period or, if neither was dominant, to determine the incremental cost-effectiveness ratio.

**Results:** The result of the randomized clinical trial showed the accelerated intervention to be effective, with a reduction in the length of the hospital stay and a gain in health-related quality of life at the three-month follow-up time point. The cost-effectiveness study showed the accelerated protocol to be significantly less expensive than the standard protocol ( $p = 0.036$ ), with an average reduction in cost of 18,880 Danish kroner (95% confidence interval, 1899 to 38,152) (approximately US \$4000). Patients treated with the accelerated protocol following hip arthroplasty had an additional average gain of 0.08 QALY (95% confidence interval, 0.02 to 0.15) compared with the patients who received the standard protocol ( $p = 0.006$ ); this led to a 98% dominance of the accelerated protocol over the standard protocol. No significant or clinically relevant difference in the numbers of QALYs associated with the two protocols was observed for the patients treated with knee arthroplasty.

**Conclusions:** An accelerated perioperative care and rehabilitation protocol can be both cost-saving and clinically more effective after total hip arthroplasty, whereas it can be cost-saving with no observed significant difference in effect, from a societal perspective, after knee arthroplasty.

**Level of Evidence:** Economic and decision analysis Level I. See Instructions to Authors for a complete description of levels of evidence.

In Denmark, 12,000 total hip and knee arthroplasties are performed each year<sup>1</sup>. The total hospital costs for those procedures were approximately 700 million Danish kroner (DKK) (110 million U.S. dollars) in 2005<sup>2</sup>. New protocols designed to optimize perioperative care and rehabilitation have been given several different names, such as "accelerated in-

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