Paper #22

Cost-Effectiveness of Total Knee Arthroplasty vs. Nonoperative Management in Non-Obese, Overweight, Obese, Severely-Obese, Morbidly-Obese and Super-Obese Patients

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Introduction: The purpose of this study is to estimate the cost-effectiveness of performing total knee arthroplasty (TKA) versus nonoperative management (NM) in non-obese (BMI 18.5-24.9), overweight (25-29.9), obese (30-34.9), severely-obese (35-39.9), morbidly-obese (40-49.9), and super-obese (50+) patients.

Methods: We constructed a state-transition Markov model to compare the cost-utility of TKA and NM in the six above mentioned BMI groups over a 15-year time period. Model parameters for transition probability (i.e. risk of revision, re-revision, death), utility, and costs were estimated from the literature. Direct medical costs of managing knee arthritis were accounted in the model. Indirect societal costs were not included. A 3% annual discount rate was used for costs and utilities. The primary outcome was the incremental cost-effectiveness ratio (ICER) of TKA versus NM. One-way and probabilistic sensitivity analysis of the model parameters were performed to determine the robustness of the model.

Results: Over the 15-year time period, the ICERs for the TKA versus NM for the different BMI categories were non-obese ($4,269/QALY), overweight ($3,757/QALY), obese ($3,841/QALY), severely-obese ($4,393/QALY), morbidly-obese ($6,155/QALY), and super-obese ($12,196/QALY). The higher BMI groups tended to have higher incremental QALYs, and also higher incremental costs. The probabilistic sensitivity analysis with an ICER threshold of $25,000/QALY, showed that TKA would be cost-effective in 100% of non-obese, overweight, obese, and severely-obese; 99.99% of morbidly obese; and 98.18% of super-obese simulations.

Conclusion: The average Medicare bundled payments is approximately $25,000 for 90 days of care. At this payment value, our model showed that in the vast majority of cases TKA would be cost effective for all obesity levels, and that BMI cut-offs for TKA may lead to unnecessary loss of healthcare access.

Notes