

Economic Benefit to the Society at Large of TKA in the Young Patient: A Markov Analysis

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Introduction: The economic implications of total knee arthroplasty (TKA) to society at large have not been assessed when specifically considering the young, working population with osteoarthritis (OA) of the knee. The goal of this study is to use Markov analysis to estimate the overall average cost to society in terms of medical expenses and lost wages of delaying early TKA in favor of non-operative treatment for end-stage knee OA in a hypothetical 50-year-old patient.

Methods: A Markov state-transition decision model was constructed to compare the overall average cost of TKA to non-operative treatment in a 50-year-old patient with end-stage OA over 30 years. Earned income, lost wages, and direct medical costs related to non-operative treatment and TKA, including revisions and complications, were considered. Sensitivity analysis was performed to assess the effect that variation of key model parameters have on the overall outcome of the model.

Results: This Markov model favors early TKA compared to non-operative treatment across all plausible values for most input parameters assessed during one-way sensitivity analysis. TKA was shown to be more expensive for the first 3.5 years due to higher initial cost, but over 30 years, the cost benefit was \$69,800 in favor of TKA. Only when lost wages were less than 17.7 equivalent work days per year in patients treated non-operatively, or when the rate of returning to work after TKA was less than 81% did the model favor non-operative treatment.

Conclusions: The results of this study demonstrate that the total economic cost to society for treatment of severe knee OA in a young, working patient is markedly lower with TKA compared to non-operative treatment. Increasing financial restrictions on health care providers in the United States necessitate careful consideration of the economic impact of different treatment options from the societal perspective.

