

# Cost-effectiveness of treatment strategies for non-displaced osteoporotic femoral neck fractures in older adults in Ontario, Canada

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**INTRODUCTION:** This economic evaluation study assessed the cost-effectiveness of six treatment strategies for non-displaced osteoporotic femoral neck fractures (NDFNFs) in older adults using a Markov cohort model from the Ontario public payer perspective.

## **METHODS:**

A probabilistic Markov chain Monte Carlo decision analysis model was developed to compare six strategies: (1) cemented femoral fixation total hip arthroplasty (cemented THA), (2) cementless THA, (3) cemented hip hemiarthroplasty (HHA), (4) cementless HHA, (5) internal fixation (IF), and (6) conservative treatment. The base case cohort consisted of Canadian patients presenting with a NDFNF aged 65-year-old, modeled with a lifetime horizon. Outcomes included quality-adjusted life months (QALMs), lifetime costs (discounted at 1.5% annually), net monetary benefits (NMBs), and incremental cost-effectiveness ratios (ICERs). All costs are presented in Canadian dollars (CAD, \$). The cost-effectiveness threshold ( $\lambda$ ) was \$4,166.67 per QALM.

## **RESULTS:**

The estimated mean costs were \$6,054 (IF), \$11,995 (cemented THA), \$11,011 (cemented HHA), \$11,854 (cementless HHA), \$15,405 (cementless THA), and \$7,617 (conservative treatment). Cemented THA yielded the highest QALMs (192.7). Cemented THA had the highest NMB (\$790,784). Cementless THA, cementless HHA, and conservative treatment were absolutely dominated while cemented HHA was extendedly dominated. After excluding dominated strategies, the ICER for cemented THA vs. IF was \$127.5 per QALM, indicating that cemented THA is cost-effective relative to IF. At a  $\lambda$  of \$4,166.67/QALM, cemented THA was the most cost-effective strategy in 48.7% of simulations, followed by cemented HHA (31.2%) and IF (17.9%).

## **DISCUSSION AND CONCLUSION:**

Cemented THA is the most cost-effectiveness treatment for NDFNFs in 65-year-old patients. When evaluated against a  $\lambda$  of \$4,166.67/QALM, cemented THA outperforms cementless THA, HHA, IF and conservative treatment.

