Immediate surgery versus waiting list policy in revision total hip arthroplasty: an economic evaluation

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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Immediate surgery versus waiting list policy in total hip arthroplasty revision (THAR).

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Hypothetical male and female patients who were due to undergo a THAR.

Setting
Hospital. The economic study was carried out in Ontario, Canada.

Dates to which data relate
The main effectiveness data were taken from previously published data and expert opinion between 1971 and 1994. Resource and cost data were mainly derived from 1971-1994 sources. The price year was 1995.

Source of effectiveness data
The effectiveness data were derived from previously published sources and expert opinion.

Modelling
A decision tree was used to model the costs and consequences of surgery at the point of consultation versus a waiting list policy for candidates in need of THAR.

Outcomes assessed in the review
The review assessed the following surgical outcome probabilities associated with THAR: the probability of patients worsening due to complications; the probability of remaining the same and the probability of improving. Complication rates were also acquired from the literature as the basis of the input probabilities of the decision tree.

Study designs and other criteria for inclusion in the review
No specific design criteria were identified by the authors for inclusion but the date range was 1970-1995.
Sources searched to identify primary studies
MEDLINE was searched for primary studies.

Criteria used to ensure the validity of primary studies
Not stated.

Methods used to judge relevance and validity, and for extracting data
Not stated.

Number of primary studies included
31 studies were identified.

Methods of combining primary studies
A weighted average based on the number of hips and Harris hip score was applied to the data.

Investigation of differences between primary studies
The primary studies were classified according the different outcomes reported.

Results of the review
The overall probability of a patient worsening, remaining the same or improving as a result of revision surgery was reported as 20%, 12% and 68%, respectively. The main surgical complications of THAR were deep vein thrombosis with pulmonary embolism (20%) and loosening not requiring revision (58%). These data were used as the baseline inputs to the decision tree.

Methods used to derive estimates of effectiveness
Experts' opinion.

Estimates of effectiveness and key assumptions
The probability of worsening or remaining stable while waiting for surgery was 50%. The percentage of patients who would not be helped by the surgery was estimated to be 12% through all arms. 78% of patients were expected to improve as a result of immediate surgery over those patients who wait, while 68% of patients, whose condition worsens while on the waiting list, were estimated to improve. The probability of requiring nursing home care, given a complication, was estimated to be 1%. These data were used as additional baseline inputs to the decision tree.

Measure of benefits used in the economic analysis
The authors did not produce a summary benefit measure for the economic analysis. As such the cost of each strategy was the principal benefit indicator.

Direct costs
Revision surgery, pre and post-surgery devices, medicine and tests, home care, occupational and physical therapy, complications and nursing home care costs were included in the analysis. Resources were analysed separately from costs. Discounting was applied at a rate of 5%. The quantity/cost boundary adopted was that of the hospital. The price year was 1995. The principal source of cost data was published literature which was augmented by the Canadian Home Care Association.
Statistical analysis of costs
Not stated.

**Indirect Costs**
Not assessed.

**Currency**
Canadian dollars (Can$). Conversion was carried out using an exchange rate of Can$1 to US$0.75.

**Sensitivity analysis**
In order to test the variability in the data sensitivity analyses were performed on surgical outcome probabilities, expenditure values and complication rate. The method used was not stated although variation was undertaken at a rate of +/- 50%.

**Estimated benefits used in the economic analysis**
Not applicable as the benefits were based on cost differences alone.

**Cost results**
Total costs were expressed in terms of expenditure per patient. The immediate surgery arm expenditure per patient was Can$22,177.72. The waiting list arm expenditure per patient was Can$31,431.94. Discounting at a rate of 5% was applied. An incremental analysis was performed and showed that the immediate surgery cost per patient was Can$9,254 lower than the waiting-list approach.

**Synthesis of costs and benefits**
Not undertaken as the intervention of immediate surgery was lower in cost, and although not explicitly stated by the authors, was associated with better outcomes for the patient. Under these assumptions it was the dominant strategy. The results of the sensitivity analysis indicated that immediate surgery was the most cost-efficient strategy over a wide range of expenditures and probabilities.

**Authors' conclusions**
Immediate surgery for THAR patients reduces healthcare expenditures when compared with relegation to a waiting list. With a forecast 50% chance of worsening while awaiting surgery, the complication rate would need to approach 45% for immediate surgery to appear less advantageous.

**CRD COMMENTARY - Selection of comparators**
The reason for the choice of the comparator is clear. Waiting lists are a potential alternative to immediate surgery in attempting to reduce medical expenses and improve the clinical outcomes for patients. You, as a user of this database, should consider whether these health technologies apply to your setting.

**Validity of estimate of measure of benefit**
The estimate of measure of benefit (cost) used in the economic analysis is likely to be internally valid as an extensive search of the literature was performed. The data have not been used selectively although it should be noted that a number of estimates were used which the authors identify as a limitation of the study. Validity was tested through extensive sensitivity analysis.
Validity of estimate of costs
Resource quantities were reported separately from the prices. Adequate details of the methods of quantity/cost estimation were given. A comprehensive range of costs was provided but the authors noted that these were based on "conservative estimates" and taken from the U. S. literature which involved a process of extrapolation and conversion. These limitations were diminished by sensitivity analysis performed to test the robustness of the conclusions. Important cost items do not appear to have been omitted.

Other issues
The authors' conclusions are likely to be justified, given the uncertainties in the data. However, the study had limitations due to the lack of a suitable summary benefit measure which took into account the patients' preferences and quality of life. The issue of generalisability to other settings was specifically addressed by the authors and appropriate comparisons were made with other studies. The results were not presented selectively.

Implications of the study
More research is required into surgical outcome probabilities, patients' preferences and quality of life and costs incurred. The authors argue for a suitable RCT to extend their findings.

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