An economic analysis of outcomes and complications of treating distal radius fractures in the elderly

Shauver MJ, Clapham PJ, Chung KC

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.

CRD summary
The objective was to assess the cost-effectiveness of four alternative treatments for distal radius fractures, in older people. The authors concluded that their study added to the uncertainty in the choice of treatment and a high-power, randomised trial was needed to compare the treatments. There were some limitations to the reporting of the methods, but the authors’ conclusions seem appropriate, as they emphasise the uncertainty in the clinical evidence.

Type of economic evaluation
Cost-utility analysis

Study objective
The objective was to assess the cost-effectiveness of four alternative treatments for distal radius fractures, in older people.

Interventions
The four treatments were cast immobilisation, wire fixation, external fixation, and open reduction with internal fixation.

Location/setting
USA/secondary care, hospital.

Methods
Analytical approach:
A decision tree was developed to synthesise the cost and outcome data from published sources. The authors did not report the study perspective.

Effectiveness data:
The clinical data were from a published systematic review (see Other Publications of Related Interest) and some studies published since the review. The key measures of clinical effectiveness were the probabilities of various complications with each of the treatment options (including carpal tunnel syndrome, malunion, chronic regional pain syndrome, infection, tendon rupture, and nerve injury).

Monetary benefit and utility valuations:
The utility values were from a time trade-off survey, developed by the research team and administered to 50 adults, aged 65 years or older, who had no history of distal radius fracture, and who attended a sports medicine clinic, in July or August 2010.

Measure of benefit:
Quality-adjusted life-years (QALYs) were the summary benefit measure.

Cost data:
The costs included those of the procedures and any complications. Most of the estimates were from Medicare. Those for complications, and their associated resource use, were from the literature. The price year was 2009 and the costs were reported in US $.
Analysis of uncertainty:
The sensitivity analysis involved varying the rates of complications.

Results
Cast immobilisation cost $718 and resulted in 9.4 QALYs. Wire fixation cost $2,946 and resulted in 9.3 QALYs. Internal fixation cost $3,784 and resulted in 9.6 QALYs. External fixation cost $6,695 and resulted in 9.3 QALYs.

Compared with cast immobilisation, wire fixation and external fixation were dominated, as they were more costly and less effective. Internal fixation was associated with an incremental cost-utility ratio of $15,330 per QALY gained, compared with cast immobilisation.

The results were generally robust to changes in the rates of complications.

Authors’ conclusions
The authors concluded that their study added to the uncertainty in the choice of treatment for distal radius fractures, in elderly patients. A high-power, randomised trial was needed to compare the treatment options.

CRD commentary
Interventions:
The choice of interventions was appropriate, in that they were common options, for distal radial fractures, in the authors' setting. It was unclear whether other relevant treatment options could have been considered.

Effectiveness/benefits:
The clinical data were from a systematic review, which was not described, making it difficult to determine if the most up-to-date and relevant data were used. The methods of the studies that supplied the effectiveness data were not reported, making it difficult to comment on their validity. QALYs were an appropriate outcome measure, capturing the impact of the interventions on quality of life and allowing comparisons with other diseases and interventions. The instrument and methods used to elicit the utility weights were reported. The authors did not explicitly state the time horizon, but it appears to have been lifetime (the elderly patients' remaining years).

Costs:
The perspective was not explicitly stated, so it is unclear whether all the relevant costs were included. The source for the cost estimates was appropriate for the authors' setting, but the costs were reported as category totals, rather than unit costs, reducing the transparency of the analysis. Discounting of costs was not performed, and as a time horizon was not reported, it is unclear whether it was necessary or not.

Analysis and results:
The results were clearly presented and an incremental approach was used to identify the preferred strategy. A partial sensitivity analysis was performed, by varying the rates of complications, but no other model inputs. The authors discussed a number of limitations to their analysis, including the assumptions that were required for the decision tree. The results of the study are unlikely to be generalisable to other settings.

Concluding remarks:
There were some limitations to the reporting of the methods, but the authors’ conclusions seem appropriate, as they emphasise the uncertainty in the clinical evidence.

Funding
Supported by grants from the National Institute of Arthritis and Musculoskeletal and Skin Diseases, USA.

Bibliographic details

PubMedID

Indexing Status
Subject indexing assigned by NLM

MeSH
Aged; Bone Wires; Casts, Surgical; Cost-Benefit Analysis; Decision Trees; Female; Fracture Fixation /economics; Humans; Interviews as Topic; Male; Medicare /economics; Outcome Assessment (Health Care) /economics; Postoperative Complications /economics; Quality-Adjusted Life Years; Radius Fractures /economics /therapy; Recovery of Function; United States