
Osteoporosis case manager for patients with hip fractures: results of a cost-effectiveness analysis conducted alongside a randomized trial

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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.

CRD summary

The objective was to examine the cost-effectiveness of a hospital-based case manager in comparison with usual care, for the management of patients receiving osteoporosis treatment, after hip fracture. The authors concluded that, compared with usual care, the use of a case manager improved osteoporosis treatment and reduced the costs from the perspective of the third-party payer. The study appears to have been based on valid methodology and was well reported. The authors' conclusions appear to be valid.

Type of economic evaluation

Cost-utility analysis

Study objective

The objective was to examine the cost-effectiveness of a hospital-based case manager, in comparison with usual care, for the management of elderly patients, receiving osteoporosis treatment, after hip fracture.

Interventions

The hospital-based case manager provided four supportive services to patients with osteoporosis, who were receiving bisphosphonate therapy (alendronate sodium, 70mg weekly). These services were patient education, arrangement of the interpretation of bone mineral density (BMD) tests, provision of prescriptions and medication counselling, and communication with the primary care physician.

Location/setting

Canada/hospital out-patient.

Methods

Analytical approach:

This economic evaluation was based on a Markov model with a lifetime horizon. This model resembled a framework used in a previous publication. The authors stated that the perspective of the third-party payer was adopted.

Effectiveness data:

The clinical data came from a selection of known, relevant studies. The data on the first year of treatment implementation came from a randomised controlled trial (RCT), which was carried out, by this publication's authors, in three Canadian hospitals, with consecutively admitted patients, aged 50 years or older. There were 110 patients in each group. The data on disease progression were obtained from a large Canadian cohort study and the data on the effect of alendronate, in reducing the risk of fractures, were taken from published systematic reviews, which were supplemented by authors' assumptions. The key clinical input was the reduction in fracture risk with treatment.

Monetary benefit and utility valuations:

The utility estimates were derived from two published studies, whose details were not given.

Measure of benefit:

Quality-adjusted life-years (QALYs) were used as the summary benefit measure, and were discounted at an annual rate of 3%.

Cost data:

The health service costs were those of the personnel (case manager, nurse, and primary care physician), BMD test, medications, hospital stay, procedures, out-patient rehabilitation, and emergency visits. A breakdown of cost items was provided. The resource use and cost data associated with the intervention came from time-motion studies conducted on a random sample of patients from the RCT. The costs of osteoporosis treatment and fractures were based on the provincial or national databases of the reimbursement authority and the resource use was based on several assumptions. Future costs were discounted at an annual rate of 3%. All costs were in Canadian dollars (CAD) and the price year was 2006.

Analysis of uncertainty:

A conventional one-way sensitivity analysis was carried out on the following inputs: intervention and treatment costs, treatment persistence, treatment effect in reducing fractures, proportion of patients obtaining a BMD test, duration of treatment, and discount rate. A comprehensive probabilistic sensitivity analysis was also carried out by assigning probability distributions to all the model inputs. Alternative values for the deterministic analysis and probability distributions were based on authors' opinions.

Results

The expected lifetime costs were CAD 33,043 with the intervention and CAD 35,619 with usual care and the QALYs were 5.958 with the intervention and 5.918 with usual care. So, under these base-case conditions, the case manager strategy was dominant, which means it was less expensive and more effective than usual care. This dominance held in all the deterministic sensitivity analyses.

The most influential model input was the ability of the intervention programme to provide BMD tests. The intervention was dominant in 82% of the 10,000 simulations of the probabilistic analysis.

Authors' conclusions

The authors concluded that, compared with usual care, the use of a case manager improved osteoporosis treatment and reduced the costs from the perspective of the third-party payer.

CRD commentary

Interventions:

The selection of the comparator was appropriate in that the proposed strategy was compared with usual care in the authors' setting.

Effectiveness/benefits:

The clinical analysis was based on data derived from selected sources. The key estimates on treatment efficacy were derived from a RCT carried out by this publication's authors. The key details of this trial were reported, although the RCT had already been published. The information reported and the conventional strengths of a RCT should have ensured the validity of the clinical estimates. Other data were based on studies, which appear to have been appropriate. The authors undertook extensive sensitivity analyses on the uncertain inputs. The use of QALYs as the measure of benefit was appropriate and will allow comparisons to be made with other studies. Few details were given on the sources of the utility weights.

Costs:

The analysis of costs was consistent with the study perspective and all the relevant cost categories appear to have been included. The sources of data were reported, but costs were only presented as macro-categories and unit costs and resource quantities were not given. Other details such as the price year, use of discounting, and probability distributions assigned to the costs were reported.

Analysis and results:

The costs and benefits were synthesised using an incremental approach, which was appropriate, given the superior profile of one strategy over the other. The issue of uncertainty was extensively addressed. The findings of both the base case and the sensitivity analyses were clearly presented. The authors pointed out that conservative assumptions were made, which were biased against the intervention and should have favoured the comparator. The authors acknowledged

some of the potential limitations of their analysis, including the mixed sources of data, the relatively small sample size and short time horizon of the RCT, and the fact that the majority of patients were men, which might have made the sample less representative. Other concerns about whether the results were generalisable were also pointed out, such as the fact that nursing home patients were excluded from the analysis.

Concluding remarks:

The study appears to have been based on valid methodology and was well reported. The authors' conclusions appear to be valid.

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Bibliographic details

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Other publications of related interest

Majumdar SR, Beaupre LA, Harley CH, et al. Using a case manager to improve osteoporosis treatment after hip fracture: results of a randomized controlled trial. Arch Intern Med 2007;167:2110-5.

Johnell O, Jönsson B, Jönsson L, et al. Cost effectiveness of alendronate for the treatment of osteoporosis and prevention of fractures. Pharmacoeconomics 2003;21:305-14.

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Tosteson AN, Jönsson B, Grima DT, et al. Challenges for model-based economic evaluations of postmenopausal osteoporosis interventions. Osteoporos Int 2001;12:849-57.

Indexing Status

Subject indexing assigned by NLM

MeSH

Aged; Aged, 80 and over; Bone Density /physiology; Case Management /economics; Cost Savings; Cost-Benefit Analysis; Diphosphonates /therapeutic use; Female; Follow-Up Studies; Fracture Fixation, Intramedullary /economics /methods; Health Care Costs; Hip Fractures /economics /mortality /radiography /surgery; Humans; Male; Markov Chains; Middle Aged; Osteoporosis /drug therapy /prevention & control; Probability; Quality of Life; Reference Values; Survival Rate; Treatment Outcome

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