Cost-effectiveness analysis of screening for risk of in-hospital falls using physiotherapist clinical judgement

Haines T, Kays SS, Morrison G, Clarke J, Bew P

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
This study examined the cost-effectiveness of the clinical judgement of a physiotherapist in preventing falls in a geriatric rehabilitation hospital ward. The authors concluded that preventing falls with a targeted fall prevention programme, based on initial screening by a physiotherapist, was a cost-effective alternative to no intervention. The study appears to have been based on valid methodology, but was not extensively reported, especially for the economic sources. Caution is required when interpreting the authors’ conclusions.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to examine the cost-effectiveness of the clinical judgement of a physiotherapist in preventing falls in a geriatric rehabilitation hospital ward.

Interventions
The three comparators were: no screening and no intervention; screening and targeted intervention, where the intervention was allocated to patients on the basis of their fall risk, which was clinically judged by a physiotherapist; and complete intervention for all patients, with no screening.

The fall prevention intervention was a patient education programme, consisting of four individual face-to-face 30-minute sessions with a senior health professional. To judge the fall risk, physiotherapists were asked “Will this patient experience one or more falls during their rehabilitation period?”.

Location/setting
Australia/hospital rehabilitation unit.

Methods
Analytical approach:
The economic evaluation was based on data derived from various sources, including a single study, by the authors of this paper, and published evidence. A six-month time horizon appears to have been considered. The authors stated that the perspective of the health service provider was taken.

Effectiveness data:
The clinical data came from two key sources. The accuracy of the physiotherapist in identifying those who would fall was derived from a prospective, multi-centre study that was carried out at 17 geriatric rehabilitation units. Complete data were available for 1,123 patients, with a mean age of 75 years and 40% men. The effectiveness of the educational intervention was derived from a previous study, but its details were not given. The intervention was assumed to reduce the risk of a patient falling in both the complete and targeted comparisons. The key clinical endpoint was the accuracy of the physiotherapist's assessment, which included the sensitivity, specificity, positive and negative predictive value, and Youden Index (the sensitivity plus the specificity minus one).

Monetary benefit and utility valuations:
Measure of benefit:
The summary benefit measure was the reduction in falls.

Cost data:
The economic analysis considered the costs of treating patients who had fallen and the cost of the health professional's time. All the economic data on the treatment of patients who had fallen were derived from a previous study, but its details were not given. The cost of professional time came from an official source. All costs were in Australian dollars (AUD) and the price year was 2007.

Analysis of uncertainty:
The confidence intervals (CIs) for each clinical outcome were calculated using bootstrap re-sampling. The overall issue of uncertainty was investigated by means of cost-effectiveness acceptability curves. A deterministic analysis was undertaken on three key elements of the model: the effectiveness of the intervention, cost of treatment for a fall, and accuracy of screening.

Results
For physiotherapist judgement, the sensitivity was 0.61 (95% CI 0.54 to 0.67); the specificity was 0.82 (95% CI 0.80 to 0.85); the Youden Index was 0.43 (95% CI 0.36 to 0.50); the positive predictive value was 0.43 (95% CI 0.37 to 0.49); and the negative predictive value was 0.90 (95% CI 0.88 to 0.92).

Compared with no intervention, the targeted intervention (screening) prevented 2.2 patients from falling and saved AUD 2,704 per 100 patients treated. As it was more effective and cheaper, the targeted intervention was dominant, regardless of the stakeholder's willingness to pay (WTP) for preventing a patient from falling. This result was maintained in the sensitivity analysis except when the educational intervention effectiveness dropped to 10% (20% in the base case).

Compared with no intervention, the complete intervention prevented an additional 3.67 patients from falling, at an additional cost of AUD 1,192 per 100 patients. The complete intervention was preferred, with 95% probability, at WTP values of AUD 685 or more.

Compared with the targeted intervention, the complete intervention prevented an additional 1.48 patients from falling, at an extra cost of AUD 3,896. The relative cost-effectiveness of these options depended on the WTP threshold for preventing patients from falling: at a threshold under AUD 1,872 the targeted intervention had a 95% probability of being preferred, while at a threshold over AUD 3,716 the complete intervention had a 95% probability of being preferred.

Authors' conclusions
The authors concluded that preventing falls in hospital using a targeted fall prevention programme, based on initial screening by the clinical judgement of a physiotherapist, was a cost-effective alternative to no intervention.

CRD commentary
Interventions:
The rationale for the selection of the comparators was clear in that the proposed interventions were compared with the standard care in the authors' setting. The authors noted the wide variability in the screening accuracy, which depended on the expertise of the physiotherapists. The educational intervention was chosen because the published evidence indicated that it was the most effective intervention.

Effectiveness/benefits:
The accuracy of the physiotherapist judgement was taken from a prospective, multi-centre study, which included a large sample of patients over an appropriate time horizon. The main limitation of this data was that falls were evaluated by the same physiotherapists who made the risk judgement and their evaluation could have been biased if they did not want to appear to have made a mistake. The efficacy of the intervention came from published evidence, but the details...
of this were not reported and so the validity of the data cannot be objectively assessed. Extensive sensitivity analyses were conducted to assess the uncertainty in the clinical data. The benefit measure was disease-specific and will be difficult to compare with the benefits of other health care interventions. It also did not fully capture the impact of the screening programme on the patients’ health.

Costs:
The categories of costs were consistent with the perspective adopted. The price year and currency conversions were reported. The cost of managing a fall was the main cost driver and was tested in the sensitivity analysis. However, the sources of costs were not clearly described. The bulk of evidence for the cost of falls in hospital was derived from a US study and its methodology was not reported. The authors also did not discuss the issue of the applicability of the US accounting system to the Australian setting. Information on the unit costs and quantities of resources used was only provided for professional time.

Analysis and results:
The analytic approach was described in detail and appears to have been valid. The expected costs and benefits were reported. The issue of uncertainty was appropriately investigated. The authors acknowledged some limitations, to their analysis, that mainly related to the assumptions made on the effectiveness of the educational intervention, which was a very uncertain parameter.

Concluding remarks:
The study appears to have been based on valid methodology, but was not extensively reported, especially for the economic sources. Caution is required when interpreting the authors’ conclusions.

Funding
Not stated.

Bibliographic details

PubMedID
19279510

DOI
10.1097/MLR.0b013e318190ccc0

Original Paper URL
http://journals.lww.com/lww-medicalcare/Abstract/2009/04000/Cost_Effectiveness_Analysis_of_Screening_for_Risk.11.aspx

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM
MeSH
Accidental Falls /economics /prevention & control /statistics & numerical data; Aged; Australia; Cost-Benefit Analysis; Forecasting; Humans; Inpatients; Judgment; Longitudinal Studies; Mass Screening /economics; Physical Therapy Specialty; Prospective Studies; Reproducibility of Results; Risk Assessment /economics

AccessionNumber
22009101346

Date bibliographic record published
13/05/2009

Date abstract record published
23/12/2009