The added effectiveness of early geriatrician involvement on acute orthopaedic wards to orthogeriatric rehabilitation

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
The health technology appeared to be the use of a geriatrician to assess patients, on admission to an acute orthopaedic ward. The comparator was standard care, whereby geriatrician input was by consultation only on request of the orthopaedic medical staff.

Type of intervention
Treatment

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised people aged at least 65 years with femoral neck fractures.

Setting
The setting was secondary care. The economic study was carried out in Christchurch, New Zealand.

Dates to which data relate
The effectiveness evidence, resources used and cost data were obtained from 1993.

Source of effectiveness data
The effectiveness data were derived from a single study.

Study sample
All patients aged over 65 with a femoral neck fracture, admitted to the intervention or non-intervention (standard care) wards over a 4-month period, were evaluated. Sixty-one patients in one orthopaedic ward received the intervention, and 57 patients in an adjacent orthopaedic ward received standard care. The study was pragmatic, and so the patients evaluated were appropriate for the study question. Power calculations were performed retrospectively on the existing sample.

Study design
This was a single-centre, retrospective, non-randomised controlled trial. Follow-up was until point of discharge from the hospital. There was no loss to follow-up since all the included patients included were followed to point of discharge.
Analysis of effectiveness
The analysis appeared to be based on intention to treat. The primary outcomes used were total mean length of stay, mean length of stay in rehabilitation, and percentage discharged to a higher level of care (a proxy for dependency).

The groups appeared to have been comparable in terms of age, gender ratio and percentage admitted from home, although formal statistical tests of baseline comparability were not performed. The two wards had the same mean length of stay prior to the intervention being introduced. Compared with the non-intervention ward, the intervention ward had slightly less patients admitted from a rest home and slightly more from hospital.

Effectiveness results
The total mean length of stay was 20.7 days (95% confidence interval, CI: 17.4 - 23.9) for the intervention group versus 26.3 days (95% CI: 21.2 - 31.4) for the non-intervention group (p=0.06).

The mean length of stay in the rehabilitation ward was 12.7 days (95% CI: 9.0 - 16.3) for the intervention group versus 18.9 days (95% CI: 13.6 - 24.2) for the non-intervention group (p<0.05).

The proportions of patients discharged to a higher level of care were 11 and 23% for the intervention and non-intervention groups, respectively.

The death rate was 8.2% for the intervention group, compared with 7.0% for the non-intervention group.

Clinical conclusions
The length of stay was reduced as a result of regular geriatrician involvement. This was achieved without the need of increased dependence since fewer patients were discharged to a higher level of care.

Measure of benefits used in the economic analysis
The authors demonstrated that the intervention reduced dependency as fewer patients were discharged to a higher level of care. The authors therefore adopted a cost-minimisation approach.

Direct costs
The length of stay was reported separately from the total costs. No unit costs were reported. The costs related to 1993 and were based on hospital data. The direct cost to the hospital of treating the patient was calculated. This was based on (1) the average ward-day cost for housekeeping charges, nursing input, pharmaceutical input and doctor input; and (2) patient-specific costing based upon operating time, prosthesis used, therapist time and social work input. These inputs and costs were taken from the hospital database. It is likely that such costs relate to average costs. Direct costs were not discounted since the timeframe of the study was less than one year.

Statistical analysis of costs
The total cost and length of stay were compared using Student's unpaired t-test.

Indirect Costs
Indirect costs were not reported.

Currency
New Zealand dollars (NZ$)

Sensitivity analysis
No sensitivity analysis was performed.

**Estimated benefits used in the economic analysis**
See effectiveness results reported previously.

**Cost results**
The mean cost per patient was NZ$9,400 (95% CI: 8,300 - 10,500) for the intervention group versus NZ$11,500 (95% CI: 9,900 - 13,200) for the non-intervention group (p=0.05). The results related to the length of stay, i.e. duration of treatment, as reported previously. The possibility of adverse events was not considered in the analysis.

**Synthesis of costs and benefits**
Not applicable.

**Authors’ conclusions**
The intervention benefits, namely shorter hospital stay and reduced hospital cost, were achieved without the need for increased patient dependency. Reduced dependency not only reduces the likely cost of ongoing care, but also has quality of life implications since many people may prefer to live in their own home.

**CRD COMMENTARY - Selection of comparators**
The comparator to the intervention was justified because it represented standard care in the hospital. You, as a user of the database, should decide whether this standard care is the same as that in your own setting.

**Validity of estimate of measure of effectiveness**
The authors used length of stay and final destination on discharge as their measure of effectiveness. Given the age of the study population and the issues associated with long-term care, such as reduced independence and high costs, this was an important outcome.

The length of stay should not be viewed as an effectiveness measure as reduced (or increased) length of stay may result in better or worse health status for patients. The length of stay and its associated cost, as defined in this abstract, were incorporated into the costing.

The authors provided no effectiveness measure specific to functional ability. An example of such a measure is the Activities of Daily Living. If used, this could have indicated the functional ability of the patient before their fracture, at transfer to a rehabilitation ward, and at discharge. This would have provided important information regarding treatment decisions and the frailty of the patients being treated. Consequently, the results of the study would have been more generalisable to other settings. In addition to this limitation, there was no longer-term follow-up measure. Patients discharged home after a shorter length of stay, may find that they cannot cope and may be readmitted to hospital or enter long-term care. This should be investigated further before implementing the intervention in your own setting.

The study population was appropriate for the study question, as these people are most at risk of femoral neck fractures. The two groups were comparable across most characteristics at baseline. However, the intervention group contained slightly more patients admitted from hospital and slightly less from a rest home. In the absence of other health status measures, place of pre-fracture residence may be a proxy for health status: those from a rest home are more likely to be frailer, suggesting that the intervention ward had a relatively fitter population who could be discharged earlier.

One of the roles of the geriatrician is to ensure that medication and care of elderly patients is appropriate. Since part of this care included appropriateness of discharge destination, it would have been informative to have seen how place of pre-fracture residence was correlated with discharge destination. Furthermore, as the authors acknowledged, the extra care provided by the geriatrician, for example through decreased or more appropriate use of medication, was not
captured within this study.

No statistical analysis, other than percentages, was reported for the differences in discharge to a higher level of care. It is questionable whether a difference of 12% should be classed clinically significant, given the potential differences in baseline characteristics reported.

**Validity of estimate of measure of benefit**
The authors showed that, in terms of dependency, the intervention was at least comparable with, if not better, than standard care. Consequently, focus was placed on the relative costs of the two treatment approaches.

**Validity of estimate of costs**
All categories of cost adopted were relevant for the perspective taken by the authors. The costs and length of stay were obtained from the hospital database and were reported separately; this helped to make the results more generalisable. It is likely that length of stay was the major cost driver in the total costs, although the authors reported neither the average cost per day nor the percentage of costs accounted for by length of stay.

The intervention not only reduced the length of stay, but also reduced the number of days required in the orthogeriatric rehabilitation unit. The authors commented that this could lead to cost-savings through the reduced number of beds needed in this ward or unit.

The authors did not report the amount of geriatrician input and any resulting costs, for example additional drugs, tests and nurse monitoring requested, used for investigating the main differences in therapeutic input between the two wards. It was also unclear how many times the patients saw the geriatrician, and this may be an important variable for decision-makers.

It is possible that extra geriatrician input would not outweigh the cost-savings from the intervention. Furthermore, as the intervention reduced the need for a higher level of care, it also resulted in cost-savings in terms of reduced long-term care costs. This should be of importance to NHS and Social Services decision-makers, particularly those with pooled budgets. Decision-makers should be aware that no measure of home care costs, such as domiciliary rehabilitation and home help, was estimated. This would have cost implications, and the ability to discharge patients earlier would also be dependent on community support available locally.

The authors performed a statistical analysis on costs and length of stay using Student's unpaired t-test. This requires that the data are normally distributed, particularly for smaller sample sizes. It is unlikely that length of stay, and therefore the associated costs, are normally distributed. However, mean costs were presented, and this provides the decision-maker with the total treatment cost for the whole group of patients. The results showed large differences in outcomes between the two arms, yet they were only statistically significant at the 5% level. This may be because the study was underpowered. Further research with larger sample sizes is necessary before firm conclusions can be drawn.

**Other issues**
The authors compared their conclusions with those of other published studies and guidelines looking at the role of the geriatrician for older patients with femoral neck fractures. They concluded that their findings support other findings that geriatricians provide additional health benefit, either at the same or lower cost than normal standard care.

The main limitation of this study was that it was not a randomised clinical/controlled trial. It is unclear if patients were recruited into the trial, and treatment was received on the basis of the ward to which they were allocated. There is a potential for bias, since staff responsible for admission may make their choice of ward based on their interpretation of the patient's ability to benefit from the treatment provided in each of the two wards. This may overestimate the benefits of the intervention and, at the same time, underestimate the benefits of standard care.

It appeared that the main reduction in length of stay resulting from the intervention occurred in the rehabilitation stage of the patients’ treatment and recovery. Decision-makers may wish to consider the possibility that this provides a justification for intermediate care facilities, particularly if unit costs are lower than an acute orthopaedic ward, or
pressure on acute beds is high.

**Implications of the study**
The authors concluded that, through the use of the early involvement of a geriatrician on an acute orthopaedic ward, benefits in terms of length of stay, cost and patient outcome could be achieved.

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None stated.

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**Other publications of related interest**

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