Effectiveness of case management and post-acute services in older people after hospital discharge

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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
The study considered a specific post-discharge intervention, named Post-Acute Care (PAC), which was administered by hospital-based staff. PAC was characterised by a separate budget that enabled co-ordinators to purchase both therapeutic services and supportive services, and to deliver a substantial patient-centred service plan for elderly patients in the immediate post-discharge period.

Type of intervention
Rehabilitation (post-discharge intervention).

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients aged 65 years and older who were discharged between August 1998 and October 1999. The inclusion criteria were patients who were in an acute ward for over 48 hours and were discharged home, the patients were expected to live at least one month post-discharge, and the patients and carers were able to give informed consent. Patients were excluded if they had been admitted from, or discharged to a nursing home or hostel, or if they had been discharged from an emergency department. Obstetric and psychiatric patients were also excluded.

Setting
The setting was the community. The economic analysis was conducted in Victoria, Australia.

Dates to which data relate
The effectiveness and resource data were collected between August 1998 and April 2000. All of the costs were adjusted for 1998 to 1999 values.

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

Link between effectiveness and cost data
The costing was carried out prospectively using the same sample of patients as that used in the effectiveness study.

Study sample
No power calculations to determine the sample size were reported. Of the 946 patients eligible for PAC, 225 declined and 67 were missed. A total of 654 patients were randomised to either the intervention (n=340) or the control group.
(n=314). Of these, 311 patients received PAC (intervention group) and 287 the usual discharge planning (control group).

Study design
The study was a prospective, multi-centre, randomised controlled trial with 6 months of follow-up and with blinded outcome measurement. In the intervention group, 13 patients were lost to follow-up and 5 withdrew. In the control group, 12 patients were lost to follow-up and 3 withdrew.

Analysis of effectiveness
The analysis of the clinical study was conducted on an intention to treat basis. The primary health outcome used in the analysis was hospital readmission in the 6 months after trial recruitment. The secondary health outcomes were quality of life (Assessment of Quality of Life questionnaire) and carer stress (Caregiver Strain Index) one month after discharge and mortality. There were no significant differences between the intervention and control groups in:

- demographic characteristics such as mean age (76.5 versus 76.8 years) and proportion of men (40 versus 43%);
- medical (50 versus 54%) and surgical (50 versus 46%) diagnostic categories;
- co-morbidities (mean: 2.3 versus 2.3);
- the number of medications used (mean: 4.8 versus 4.7);
- other baseline admission characteristics; and
- the duration of hospital stay during the index admission (10 versus 10.4 days).

Effectiveness results
There was no difference between the patient groups in mortality, either in terms of the proportion of patients who died during the 6-month follow-up (6% in both groups; p=0.92) or time to death (log rank analysis, p=0.84).

The PAC group had significantly greater improvements in independent living, (p=0.002), and overall quality-of-life scores, (p=0.02), than the control group.

There was no significant difference in scores for the Caregiver Strain Index between PAC and control patients. The mean score on a scale of 0 to 10 was 3 for both groups.

There were no significant differences in unplanned readmissions to the index hospital between the PAC group (mean 0.4) and control group (mean 0.5), (p=0.19). There was also no significant difference in the emergency department visits between both groups (mean 0.1), (p=0.95).

Clinical conclusions
The PAC programme led to a greater improvement in the overall quality of life at one month after discharge.

Measure of benefits used in the economic analysis
The authors did not develop a summary benefit measure. A cost-consequences analysis was therefore performed.

Direct costs
The direct costs were for the hospital (emergency visits and hospital stays) and community services (meals and wheels, nursing, home care, personal care and other services). Other services were not detailed. The quantities and the costs were analysed separately. The quantities and costs were estimated from actual data. The quantities were obtained from
the clinical trial. The costs of community services were obtained from the providers. All of the costs were adjusted for 1998 to 1999 values. The average costs were calculated.

**Statistical analysis of costs**
The total costs and average cost per patient were compared using a t-test, while the mean difference was compared using log rank analysis.

**Indirect Costs**
The indirect costs were not included.

**Currency**
Dollars ($). Although not explicitly stated, these were likely to have been Australian dollars given the setting of the study.

**Sensitivity analysis**
No sensitivity analysis was carried out.

**Estimated benefits used in the economic analysis**
See the 'Effectiveness Results' section.

**Cost results**
There were no significant differences between the PAC and control groups in the total costs of community services used in the 12 months before the index admission ($216,456 versus $341,314) and the 6 months after discharge ($142,749 versus $150,962).

There were no significant differences between the PAC and control groups in the average costs per patient before and after discharge. Before discharge these costs were $697 versus $1,189, (p=0.13), and after discharge they were $459 versus $526, (p=0.52).

Hospitalisation utilisation costs in the 6 months after discharge were significantly lower in the PAC group than in the control group. The mean difference was $1,770 (95% confidence interval, CI: 237 - 3,304; p=0.02).

The total costs, including the costs of the intervention ($292.40 per PAC client), hospitalisation and use of community services over the 6-month follow-up, were also significantly lower in the PAC group ($2,843,162) than in the control group ($3,067,169). The mean difference was $1,545 (95% CI: 11- 3,078; p=0.048).

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

**Authors' conclusions**
The PAC programme appears to have been beneficial in the transition of older patients from the hospital to the community. This programme led to a greater improvement in the overall quality of life at one month after discharge and a reduction in hospital bed-day utilisation in the 6 months after discharge, with an apparent reduction in health care costs.

**CRD COMMENTARY - Selection of comparators**

A justification was given for the comparator used, which represented usual discharge planning in older patients in the authors’ setting. You should consider whether this is a widely used technology in your own setting.

**Validity of estimate of measure of effectiveness**
The estimate of effectiveness was most likely internally valid given the use of a randomised controlled trial. Power calculations were reported, but the study sample was large and also representative of the study population. The patient groups were shown to be comparable at analysis, which suggested a low risk of confounding factors. The follow-up time was most likely too brief to capture the overall differences in the quality of life (one month) and mortality rate (6 months). However, the authors explained the failure of PAC to reduce mortality by the generic nature of the intervention and the absence of any medical intervention. Appropriate statistical analyses were performed to ensure the accuracy of the comparison.

**Validity of estimate of measure of benefit**
The authors did not develop a summary benefit measure and a cost-consequences analysis was therefore performed.

**Validity of estimate of costs**
The perspective adopted was not reported, which makes it difficult to assess whether all the relevant costs were included. The quantities and the costs were analysed separately, and statistical analyses were performed. However, the authors acknowledged that, in terms of overall accuracy, the use of average costs produced poor estimates of the costs. Also, they noted that because the social work intervention aspects of the control were not costed, the cost-effectiveness of the PAC intervention was underestimated.

**Other issues**
The generalisability of the results was not discussed. With the exception of study design, limited comparisons were made with studies dealing with the same topic. The authors highlighted the limitations of their study. They do not appear to have reported their results selectively.

**Implications of the study**
The authors concluded that the co-ordination and purchase of community services by trained staff confers additional benefits on older patients in the transition from hospital to home.

**Source of funding**
Funded by the Victorian Department of Human Services, and the National Health and Medical Research Council.

**Bibliographic details**

**PubMedID**
12633482

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Age Factors; Aged; Caregivers; Case Management; Community Health Services /economics; Costs and Cost Analysis; Female; Follow-Up Studies; Home Care Services; Hospitalization /economics; Humans; Length of Stay; Male; Patient Discharge; Patient Readmission; Prospective Studies; Quality of Life; Surveys and Questionnaires; Time Factors