Comprehensive discharge planning for the hospitalized elderly: a randomized clinical trial
Naylor M, Brooten N, Jones R, Lavizzourey R, Mezey M, Pauly M

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
Comprehensive hospital discharge plan protocol for the elderly.

Type of intervention
Disease management; early discharge.

Economic study type
Cost-effectiveness analysis.

Study population
Patients aged 70 years and older, hospitalised in selected medical and surgical cardiac diagnostic related groups.

Setting
Hospital. The economic study was carried out in Pennsylvania (USA).

Dates to which data relate
Effectiveness and resource data were collected during the period 1989-1992. Price date was not specified.

Source of effectiveness data
Single study.

Link between effectiveness and cost data
The resource data were collected on the same patient sample used in the effectiveness analysis. It is not clear if this was done retrospectively or prospectively.

Study sample
No power calculations were reported. Of the 364 patients enrolled during the study period, 276 patients constituted the final sample of patients, of which 140 and 134 in the intervention and comparator groups respectively. The patients in the control group were further grouped in medical (72) and surgical (68) DRGs. Similarly, the patients in the intervention group were further grouped in medical (70) and surgical (66) DRGs. There was a group of 125 caregivers: 74 and 51 in the intervention and comparator groups respectively.

Study design
Randomised controlled trial, single-centre study. Duration of follow up was at 2, 6 and 12 weeks after discharge. Of the initial sample of 364 patients, 36 died (17 and 19 patients in the intervention and comparator groups respectively); 52
either refused to continue their participation or could not be conducted after discharge.

**Analysis of effectiveness**
The analysis was conducted on the analysis of treatment completers only. Effectiveness outcomes were length of time between initial discharge and readmission; re-hospitalisation rates; functional and mental status; perception of health, self-esteem and affect outcomes. The medical intervention and comparator groups were similar in terms of sociodemographic and clinical features. The surgical intervention and comparator groups were similar in sociodemographic and clinical features, with the exception of sex.

**Effectiveness results**
The mean length of time between initial discharge and readmission for patients in medical DRGs was 45.6 and 31 days for the intervention and comparator groups respectively (P=0.12). For patients in surgical DRGs the values for these variables were 28.9 and 21.4 respectively (P=0.34). During the initial 2-week period after discharge, 3 (4%) patients in the medical intervention group were readmitted, compared to 11 (16%) patients in the control group (P=0.02; 95% CI -22% to -2%). Afterwards, the percentages of patients readmitted were similar for the intervention and comparator groups. The difference between the number of readmissions reported by the surgical intervention and comparator groups was not statistically significant, as well as the difference for any other outcomes. When cumulative data are considered, 10% of patient were readmitted during the first six weeks after discharge, compared with 23% of control patients (p=9.94; -25% to 1%).

**Measure of benefits used in the economic analysis**
Effectiveness outcomes were length of time between initial discharge and readmission; re-hospitalisation rates; functional and mental status; perception of health, self-esteem and affect outcomes.

**Direct costs**
Health service costs were considered. These included hospital stay (including re-hospitalisation) and health service after discharge (i.e. visits to emergency rooms, physician's offices, home visits by nurses, and the services of the nurse specialists). Actual charge data were used to calculate the costs of initial hospitalisation and of the health services following discharge. 'Ad hoc' calculations were carried out for hospital readmission costs and nurse’ services. The price date was not specified.

**Statistical analysis of costs**
Mean values and standard deviations, 95% confidence intervals and p-values were reported for the resources measured.

**Currency**
US dollars ($).

**Sensitivity analysis**
A sensitivity analysis was not carried out.

**Estimated benefits used in the economic analysis**
The mean length of time between initial discharge and readmission for patients in medical DRGs was 45.6 and 31 days for the intervention and comparator groups respectively (P=0.12). For patients in surgical DRGs the values for these variables were 28.9 and 21.4 respectively (P=0.34). During the initial 2-week period after discharge, 3 (4%) patients in the medical intervention group were readmitted, compared to 11 (16%) patients in the control group (P=0.02; 95% CI -22% to -2%). Afterwards, the percentages of patients readmitted were similar for the intervention and comparator groups. The difference between the number of readmissions reported by the surgical intervention and comparator
groups was not statistically significant, as well as the difference for any other outcomes.

**Cost results**
Total charges for re-hospitalisation of the medical intervention group were lower than those for the control group by $170,248 at 2 weeks after discharge (P=0.001; 95% CI -253 to -87), and lower by $137,508 between 2 and 6 weeks after discharge (P=0.001; 95% CI -210 to -67). The difference between intervention and comparator groups for the costs of health services after discharge was not statistically significant. However, when cumulative data were considered, total charges after discharge at 6 weeks for the medical intervention group were $295,598 less than charges for the control group (P=0.02). The mean charges for the intervention group 6 weeks after discharge were $2453, compared with $6746 for the control group (P=0.01).

**Synthesis of costs and benefits**
The intervention was the dominant strategy.

**Authors' conclusions**
The authors concluded that a comprehensive discharge planning designed specifically for elderly patients improves clinical outcomes and is cost saving.

**CRD Commentary**
Information such as that relating to the power calculations and price date are lacking. Moreover, a sensitivity analysis would have been useful to evaluate the external validity of the study. There was a significant difference between the surgical control and intervention groups in terms of sex, which may have affected the results. Only data from the first re-hospitalisation were included (for some patients there was more than one re-hospitalisation) so it may underestimate the costs.

**Source of funding**
National Institute of Nursing Research

**Bibliographic details**

**PubMedID**
8185149

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Aged; Aged, 80 and over; Caregivers; Clinical Protocols; Fees, Medical; Female; Health Care Costs; Humans; Length of Stay /economics; Male; Nurse Clinicians /economics; Outcome Assessment (Health Care); Patient Discharge; Patient Readmission /economics

**AccessionNumber**
21995007014

**Date bibliographic record published**
09/09/1996
Date abstract record published
09/09/1996