Cost analysis of an intensive home follow-up program for first-time post-myocardial infarction patients and their families

Robertson K A, Kayhko K

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
A programme for home follow-up of patients who had experienced a myocardial infarction (MI) for the first time was examined. The intervention consisted of supportive, educative home follow-up delivered for the first 6 weeks after hospital discharge. The first home visit was scheduled within the first or second week of discharge. Subsequent weekly visits were scheduled for the next 3 weeks.

Type of intervention
Other: Supportive care and rehabilitation.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients experiencing an MI for the first time. The inclusion criteria used were:

- age 18 years or older;
- no evidence of either neurological or a psychiatric disorder;
- the patient had not been hospitalised or been receiving daily health care from a physician prior to the MI;
- the patient had not had cardiac surgery during the hospital stay or within the 6 months following MI;
- there were no major cardiac complications such as uncontrolled arrhythmias or congestive heart failure; and
- the patient was able to understand verbal instructions.

Setting
The setting was secondary care. The economic study was carried out in Canada.

Dates to which data relate
The effectiveness and resource use data were gathered from February 1999 to March 2000. The price year was not reported.

Source of effectiveness data
The effectiveness evidence was derived from a single study.
Link between effectiveness and cost data
The costing was conducted prospectively on the same sample of patients as that used in the effectiveness study.

Study sample
The use of power calculations was not reported. All eligible patients admitted via a diagnosis of MI at the study hospital from February 1999 to March 2000, who were able to understand verbal instruction in English and respond to a verbal interview situation, were recruited for the study. The initial study sample comprised 36 patients in the control group and 32 patients in the intervention group. There were 48 men and 20 women participating in the study. The number of participants who had been excluded before was 4 in the control group (one patient died before being discharged and 3 received cardiac surgery) and 8 in the intervention group (one died prior to the first home visit and 7 received cardiac surgery). It was not stated whether some patients refused to participate.

Study design
This was a prospective randomised controlled trial that was carried out in a single centre, a small urban hospital in eastern Canada. The randomisation procedure consisted of patients selecting a pre-sealed envelope containing details of the group allocation. The patients were followed for 6 months overall, although the outcomes were assessed at 6 weeks. No loss to follow-up was reported. The evaluation process was not blind. The data were retrieved using a chart audit of all patients.

Analysis of effectiveness
It appears that the analysis of the clinical study was conducted on an intention to treat basis since no patient was lost to follow-up. The primary outcome measures were the number of patients requiring post-discharge re-hospitalisation and the length of stay (LOS) at 6 weeks. The authors stated that the study groups were similar in terms of the sociodemographics, clinical characteristics and family history. A multivariate analysis of variance was carried out but the results were not reported.

Effectiveness results
At 6 weeks, the number of patients requiring post-discharge re-hospitalisation was 3 in the intervention group and 7 in the control group.

The LOS was 5 days in the intervention group and 7 days in the control group.

One patient in the control group needed re-hospitalisation in the emergency department None of the intervention group patients required re-hospitalisation.

Clinical conclusions
The effectiveness study showed that the implementation of the home follow-up programme was effective in reducing the number and length of post-discharge hospital admissions in comparison with the standard follow-up protocol.

Measure of benefits used in the economic analysis
No summary benefit measure was used in the economic analysis. In effect, a cost-consequences analysis was performed.

Direct costs
Discounting was not relevant because the costs per patient were incurred during 6 months. The unit costs were presented separately from the quantities of resources used, although a detailed breakdown of the cost items was not provided. The health services included in the economic evaluation were hospital readmissions and programme resources (including only registered nurse time). Outpatient and emergency services could not be considered due to variability in
the data. The cost/resource boundary of the health care system was adopted. Resource use was estimated from both the actual consumption of the patients who were included in the effectiveness study, and some assumptions made about the time spent by the registered nurse with each patient. The source of the cost data was not reported. The price year was not given.

Statistical analysis of costs
The costs were treated deterministically.

Indirect Costs
The indirect costs were not considered.

Currency
Canadian dollars (Can$).

Sensitivity analysis
Sensitivity analyses were not performed.

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

Cost results
The total costs of the follow-up intervention were Can$9,984.

The costs of re-hospitalisation were Can$39,200 in the control group and Can$12,000 in the intervention group. The difference of Can$27,200 favoured the intervention.

The total savings associated with the implementation of the follow-up intervention over standard care were Can$17,216.

Synthesis of costs and benefits
The costs and benefits were not combined since a cost-consequences analysis was carried out.

Authors' conclusions
The supportive, home follow-up programme for patients who had experienced a myocardial infarction (MI) for the first time led to fewer hospitalisations and lower costs in comparison with a standard follow-up programme.

CRD COMMENTARY - Selection of comparators
The choice of the comparator was appropriate as it reflected standard follow-up care. It was described in detail. You should decide whether this is a valid comparator in your own setting.

Validity of estimate of measure of effectiveness
The basis of the analysis of effectiveness was a randomised trial. This was appropriate for the study question as the randomisation process, which was described, minimised selection bias. However, the outcome assessment was not blind. Therefore, some assessment bias could have been introduced. The study was conducted in a single centre, which limits the possibility of transferring the results of the analysis to other settings. The length of follow-up does not appear to have been appropriate since the outcomes were assessed over a 6-week period. The authors acknowledged that the
main threat to the internal validity of the analysis was the lack of power calculations and the small sample size. The exclusion of several patients from the initial study groups casts some doubt on how representative the study sample was. The patients' demographics were not reported. The use of a direct measure of the impact of the interventions on patient health, instead of the number of hospitalisations, would have been more appropriate. The authors stated that a multivariate statistical analysis was carried out but the results were not provided. These issues tend to limit the internal validity of the analysis.

**Validity of estimate of measure of benefit**
No summary benefit measure was used in the study because a cost-consequences analysis was conducted.

**Validity of estimate of costs**
The authors stated implicitly which perspective was adopted in the study. Only the costs of the programme and hospitalisation were considered in the analysis. A detailed breakdown of the cost categories was not provided. The source of the cost data was not reported. The price year was not given, which makes reflation exercises in other settings difficult. The costs were treated deterministically and were specific to the study setting. Therefore, caution is required when extrapolating the economic analysis to other settings. Only inpatient resources were considered. The inclusion of other health care resources would have been helpful.

**Other issues**
The authors reported the results of several published studies and found that their conclusions were comparable with the results of the literature on educational-supportive home follow-up programmes. The issue of the generalisability of the study results to other settings was not explicitly addressed and no sensitivity analyses were conducted. This further reduces the external validity of the analysis.

**Implications of the study**
The authors stressed that the main implications of the study refer to the improvement in the role played by nursing practice, which should be of primary importance in the delivery of post-discharge rehabilitation care. They also suggested that larger studies are needed to corroborate the results of the present economic evaluation.

**Source of funding**
None stated.

**Bibliographic details**

**Other publications of related interest**

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Adolescent; Adult; Aftercare /economics; Canada; Continuity of Patient Care /economics; Cost Savings; Costs and Cost Analysis; Direct Service Costs; Follow-Up Studies; Health Care Costs; Home Care Services /economics; Humans; Myocardial Infarction /economics /rehabilitation; Patient Education as Topic /economics; Patient Readmission