Reducing the cost of frequent hospital admissions for congestive heart failure: a randomized trial of a home telecare intervention

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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.

CRD summary
This study evaluated the costs of two remote care, hospital discharge models, for patients with congestive heart failure. The authors concluded that substantial cost savings might be achieved by adopting distance technologies, and that video conferencing might not offer more benefit than telephone follow-up, but it was more expensive. The study methods were satisfactory, but the small sample and lack of reporting of effectiveness outcomes, make it unclear if the authors' conclusions are appropriate.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to assess the impact on the costs and clinical outcomes, of two remote care, discharge models, for patients with congestive heart failure, who were aged 40 or older, with no severe vision, hearing, comorbidity, depression or cognitive difficulties.

Interventions
Three hospital discharge care models were assessed. Two were delivered remotely, over the 60 days after hospital discharge. One was delivered by a two-way video-conference device, with an integrated electronic stethoscope, and the other was nurse telephone calls. These were compared with the usual out-patient care.

Location/setting
USA/primary care.

Methods
Analytical approach:
The cost-effectiveness analysis was based on a clinical study. The time horizon was the follow-up in the study, which was six months. The authors stated that the analysis was conducted from the perspective of the health care system.

Effectiveness data:
A pilot randomised controlled trial was conducted at the University of California Davis Hospital, between July 1999 and June 2000. Patients were assessed using intention-to-treat, with 13 receiving video conferencing, 12 receiving telephone care, and 12 receiving usual care. The primary outcome was the number of readmissions. Secondary outcomes were the Short Form (SF-36) Health Survey score, and the Minnesota Living with Heart Failure Questionnaire (MLHFQ) score. The SF-36 and MLHFQ were completed by all patients, at initial home nurse visit (shortly after discharge), and at a second home nurse visit about 60 days later. Patient satisfaction with care was assessed at both visits, using the eight-item Client Satisfaction Questionnaire (CSQ).

Monetary benefit and utility valuations:
Not applicable.

Measure of benefit:
The main measures of health benefit were the comparative SF-36 and MLHFQ scores. The focus of the analysis was on the benefits measured by readmission cost reductions.
Cost data:
The main cost category was the mean readmissions for congestive heart failure. Other costs were all-cause readmissions, and emergency department visits. The total costs were hospitalisation, emergency department care, and the nursing intervention, including visit and equipment charges. Resource use was measured over 180 days, and included admissions to other local facilities for patients with capitated health insurance. The costs were derived using standard University of California, Davis Hospital charges and manufacturer charges for equipment. They were reported in US $.

Analysis of uncertainty:
Standard deviations were reported for the cost outcomes.

Results
There were no significant between-group differences in mean health status (SF-36 and MLHFQ) and satisfaction scores, at 60-day follow-up. Two patients in the telephone group died during the 180-day cost tracking period.

Mean hospital readmission charges for congestive heart failure were $5,850 (SD 21,094) in the video conferencing group, $7,320 (SD 24,440) in the telephone group, and $44,479 (SD 121,214) in the usual care group, (p=0.262).

The mean emergency department charges for congestive heart failure were $399 (SD 1,438) for the video group, $1,036 (SD 2,387) for the telephone group, and $2,882 (SD 4,166) for the usual care group, (p=0.0487).

The mean total care charges were $29,701 (SD 49,219) for the video group, $28,888 (SD 38,799) for the telephone group, and $93,686 (SD 192,976) in the usual care group, (p=0.7144).

Authors’ conclusions
The authors concluded that substantial cost savings could be achieved by adopting distance technologies. Video conferencing might not offer more benefit than telephone follow-up, but it was more expensive.

CRD commentary
Interventions:
The interventions were clearly and comprehensively described. The standard care was less well described. The authors mentioned the existence of alternative care models, involving home nurses. They justified the exclusion of these alternatives, by stating that they were associated with unsustainably high intervention costs.

Effectiveness/benefits:
Most of the trial details were clearly reported, including patient inclusion criteria, numbers, and baseline demographics. The method of randomisation was not reported, so it is unclear if it was appropriate. The methods used to measure the health outcomes were clearly reported, but no specific values were reported. The authors stated that there were no significant between-group differences, but the values would have allowed an independent assessment of the results. Especially as the low power of the study (small sample) means that between-group differences may have been present, but not statistically significant. The authors suggested two reasons why video-based care was not more effective than telephone follow-up; home care for congestive heart failure did not require visual assessment, and the technology was of limited use.

Costs:
The costs were clearly reported and were appropriate for the study population. The price year was not reported. The authors gave two reasons why the cost results might not have represented the costs in practice; the charges for outpatient continuity clinic visits were not included, and health care charges at an academic medical centre were likely to be much higher than usual health care costs. They stated that the relative charge differences should still be informative for other settings. Future costs and benefits were not discounted, which was appropriate, given the short time horizon.

Analysis and results:
A key limitation of the analysis was the small sample, which meant that the study was not powered to identify small between-group outcome differences. It also resulted in significant uncertainty in the results, as shown by the large standard deviations around the cost outcomes. This significant uncertainty should be considered when using the results.
The authors recommended that a much larger trial should be conducted, across diverse populations, to adequately assess between-group differences.

Concluding remarks:
The study methods were satisfactory, but the small sample and lack of reporting of effectiveness outcomes, make it unclear if the authors' conclusions are appropriate.

Funding
Funded by a grant from the University of California Davis (UCD) School of Medicine, USA.

Bibliographic details

PubMedID
11606877

Original Paper URL
http://journals.lww.com/lww-medicalcare/Abstract/2001/11000/Reducing_the_Cost_of_Frequent_Hospital_Admissions.10.aspx

Indexing Status
Subject indexing assigned by NLM

MeSH
Adult; Aftercare /methods; Aged; Analysis of Variance; California; Cost Control /methods; Cost of Illness; Female; Heart Failure /economics /therapy; Home Care Services, Hospital-Based; Hospital Charges; Humans; Male; Middle Aged; Patient Discharge; Patient Readmission /economics /statistics & numerical data; Pilot Projects; Telemedicine /methods; Telephone; Television

AccessionNumber
22001008278

Date bibliographic record published
17/08/2001

Date abstract record published
25/06/2013