Congestive heart failure case management: a fiscal analysis
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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 use of a community hospital-based Chronic Disease Management Programme (CDMP) for patients with congestive heart failure (CHF). The multidisciplinary programme was intended to support patients with CHF in an outpatient setting. It targeted compliance with medications, understanding of the CHF disease process and associated signs and symptoms, and dietary management within a facility with access to medical care. The programme included a two-hour group education session within 1 to 2 weeks of hospital discharge, a 30-minute tutorial with a hospital nutritionist, a 1-hour tutorial with the hospital pharmacist, and a weekly telephone follow-up by a case manager.

Type of intervention
Patient care management.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients with a diagnosis of CHF, and who had been hospitalised for CHF at least once in the past. Patients in New York Heart Association Class IV heart failure were excluded.

Setting
The setting was outpatient. The economic study was carried out at the Griffin Hospital in Derby (CT), USA.

Dates to which data relate
The effectiveness and resource use data were gathered from June 1997 to April 1998. 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 in the post-intervention phase, and retrospectively in the pre-intervention phase.

Study sample
Power calculations to determine the sample size were not carried out. Eligible patients were identified from those referred by their physicians at the Griffin Hospital during the study period. Thirty patients were initially recruited, but three did not participate in any treatment protocol and were excluded. Thus, the final sample comprised 27 patients. The mean age was 72 (+/- 11.5) years. There were 17 men (mean age: 74.4 +/- 9.9 years) and 10 women (mean age:
69.2 +/- 13.9 years). Fourteen patients had follow-up data available for 6 months pre- and post-intervention, while the remainder (13 patients) had follow-up data available for 12 months pre- and post-intervention.

**Study design**
This was a within-group comparison study that was conducted in a single centre. The patients were followed post-intervention for 6 or 12 months, depending on whether pre-intervention data were available for 6 or 12 months, in order to have a comparable time frame before and after the implementation of the CDMP. No loss to follow-up was reported. The patients kept a log of their weight, compliance with medication, dietary intake and activity patterns. These patient logs were reviewed regularly with case managers.

**Analysis of effectiveness**
All of the patients included in the initial study sample were considered in the effectiveness analysis. The primary outcomes used in the study were hospital admissions, emergency room visits and outpatient visits.

**Effectiveness results**
The number of hospital admissions per patient was 0.926 in the pre-intervention period and 0.444 in the post-intervention period. The change of -52% was statistically significant, (p=0.0250).

The number of emergency room visits per patient was 0.519 in the pre-intervention period and 0.259 in the post-intervention period. The change of -50% failed to reach statistical significance, (p=0.1476).

The number of outpatient visits per patient was 4.444 in the pre-intervention period and 5.741 in the post-intervention period. The change of -28% did not reach statistical significance, (p=0.0937).

**Clinical conclusions**
The effectiveness analysis showed that the CDMP was effective in reducing the number of hospitalisations required by CHF patients. There was also a substantial reduction in the number of emergency room visits, but the difference between the pre- and post-intervention periods failed to reach statistical significance.

**Measure of benefits used in the economic analysis**
The health outcomes were left disaggregated and no summary benefit measure was used in the economic study. The study was, in effect, a cost-consequences analysis.

**Direct costs**
Discounting was irrelevant because the costs were not incurred for longer than two years. The unit costs were not reported separately from the quantities of resources used, but the unit costs of primary care, physician and specialist visits were provided. The health services in the economic analysis were emergency room, inpatient and outpatient services, and length of stay. The cost/resource boundary of the study was not explicitly stated. Resource use was estimated using individualised data coming from the hospital charts of the patients involved in the effectiveness study. Data on the pre-intervention period were estimated from self-reported information provided by each patient. This information was then confirmed by contacts with the relevant admitting department or the patient physician. The hospital costs came from the finance department of the Griffin Hospital. The primary care and specialist costs were estimated from a panel of experts that included three primary care physicians and three cardiologists. The price year was not reported.

**Statistical analysis of costs**
The costs estimated in the pre- and post-intervention periods were compared using the paired t-test.
**Indirect Costs**
The indirect costs were not included in the economic evaluation.

**Currency**
US dollars ($).

**Sensitivity analysis**
Sensitivity analyses were not performed.

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

**Cost results**
The total charges were $15,746.57 in the pre-intervention period and $5,777.06 in the post-intervention period. The reduction in charges ($9,969.85) was statistically significant, (p=0.0242).

The total charges/patient per month were $2,097.57 in the pre-intervention period and $722.91 in the post-intervention period. The reduction in charges ($1,347.65) was statistically significant, (p=0.0289).

**Synthesis of costs and benefits**
The costs and benefits were not combined because a cost-consequences analysis was performed.

**Authors' conclusions**
The Chronic Disease Management Program (CDMP) was a feasible strategy for the management of patients with congestive heart failure (CHF). It led to both significant cost-savings and clinical benefits, measured as reduced admissions to the hospital and emergency room.

**CRD COMMENTARY - Selection of comparators**
The authors selected standard care as the basic comparator used in the analysis. This choice appears to have been appropriate to detect the net value of the CDMP. Details of usual care were not provided, but it appears that standard outpatient visits based on primary care referral were included in the basic approach. You should decide whether this represents a valid comparator in your own setting.

**Validity of estimate of measure of effectiveness**
The analysis of effectiveness used a within-group comparison study, which was use to compare the same group of patients observed in the pre- and post-intervention periods. The authors acknowledged that the use of a randomised study with an external comparison group would have been more appropriate. However, they also stated that a randomly assigned control group would not have been ethical, given the anticipated benefits of the study intervention. They further added that non-randomly selected patients were not recruited because they would have been systematically different from the sample of those who participated in the study programme. The study sample was derived from a single study, thus it was unclear whether it could be representative of the eligible study population. A further limitation to the validity of the analysis was the small sample size, although the authors noted that even within the small group of patients, changes in the number of hospitalisations reached statistical significance. The use of a sample with higher power would have permitted the detection of statistically significant differences in the other outcome measures.

The effectiveness measures used in the analysis were not clinical end points directly related to patient health. Rather, intermediate measures, such as hospitalisations and admissions, were used. However, the authors stated that, due to the
progressive nature of CHF, the shorter and fewer admissions that were observed in the post-intervention period provided evidence that the study programme reduced the degree of deterioration observed in the pre-intervention phase.

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

Validity of estimate of costs
The perspective of the study was not explicitly stated. Thus, it was unclear whether all the relevant categories of costs were included in the analysis. The source of the costs was reported. The costs estimated in the two groups were compared through statistical tests. No data on the unit costs and resources were reported and no price year was given. This makes replication of the study and reflation exercises difficult. Charges were used as proxies for the costs and no conversion to true costs was carried out. These factors limit the validity of the economic analysis. It would be difficult to transfer the economic analysis to other settings due to the lack of detailed information on the data used.

Other issues
The authors compared their findings with those from other studies that showed the clinical and economic benefits of the multidisciplinary approach for CHF patients. However, the issue of the generalisability of the study results was not addressed and sensitivity analyses were not performed. Therefore, the external validity of the analysis was low and caution is required when extrapolating the study results to other settings. The authors noted some limitations of their study, which have been mentioned already. Patients with CHF were enrolled and this was reflected in the conclusions of the study.

Implications of the study
The authors suggested that further studies should be carried out to confirm the benefits and cost-savings associated with the CDMP for patients with CHF. The main implication of the analysis is that third-party payers should cover the programme expenses.

Source of funding
None stated.

Bibliographic details

Other publications of related interest

Indexing Status
Subject indexing assigned by CRD

MeSH
Adult; Aged; Costs and Cost Analysis; Diet Therapy; Exercise; Female; Health Care Costs; Heart Failure /prevention & control /therapy; Hospitalization; Hospitals, Community; Humans; Length of Stay; Male

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