The costs and outcomes of multifaceted interventions designed to improve the care of congestive heart failure in the inpatient setting: a review of the literature

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CRD summary
This review of interventions based on a team approach concluded that such interventions appear to be useful since there is little evidence to show that they are ineffective. The search was limited, review methods were not described and little information was given on the participants. Despite these methodological limitations, the authors' conclusions appear suitably conservative.

Authors' objectives
To combine evidence from studies of in-patient multifaceted interventions for people with heart failure.

Searching
MEDLINE was searched from 1988 to 2000 for English language studies; the search terms were provided. The 'Related Articles' function of PubMed was also used and bibliographies of relevant papers were checked.

Study selection

Study designs of evaluations included in the review
The authors were primarily interested in randomised controlled trials (RCTs) but they also looked for pre-intervention post-intervention studies for a secondary analysis.

Specific interventions included in the review
The inclusion criteria were multifaceted interventions based on a team approach, which were aimed at improving the patients' health status, reducing admission rates and possibly prolonging life. At least three of the following components had to be included: coordination of care by a multidisciplinary team, medication review and/or planning, hospital-based education programme, comprehensive discharge planning, home or ambulatory care-based education, or home care by a licensed clinician.

The interventions in the included studies consisted of: in-hospital coordination of care, social services, medication review, patient education and comprehensive discharge planning; or out-patient components of home care, telephone follow-up and periodic re-evaluation of discharge plan. The duration of follow-up ranged from 12 to 24 weeks. The studies were all conducted in university medical centres in urban settings.

Participants included in the review
People with congestive heart failure were included. No other inclusion criteria were given. The patients in the included studies were aged over 65 years or over 70 years. Some had to have documented or radiological evidence of CHF and be responsive to diuretics. Participants considered at low risk were excluded from one study. In some studies the people were grouped as 'medical' and 'surgical' patients, but there was no further information on these definitions.

Outcomes assessed in the review
The inclusion criteria did not consider outcomes. The primary outcomes in the included studies were the readmission rates and average length of stay (LOS). Quality of life measures, death, survival without readmission and deaths without readmission were reported in some studies.

How were decisions on the relevance of primary studies made?
The authors did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The authors discussed the quality of the RCTs, in the tables and narrative, in terms of the strengths and weaknesses of the study designs and reporting, sample size and length of follow-up. The authors did not state how the papers were assessed for quality, or how many reviewers performed the quality assessment.

Data extraction
The authors did not state how the data were extracted for the review, or how many reviewers performed the data extraction. Data were extracted on the intervention, the strengths and weaknesses of each study (in relation to study design and reporting), and the principle results.

Methods of synthesis
How were the studies combined?
The studies were combined in a narrative discussion, grouped by study design.

How were differences between studies investigated?
Differences between the studies were discussed within the narrative and in the tables.

Results of the review
Four RCTs (858 participants) were included. Three pre-intervention post-intervention studies (number of participants not given) were found.

RCTs.

The readmission rates for moderate-risk patients in one study were 42.2% lower in the intervention group than in the control (P=0.01), whilst in high-risk patients no differences were seen between the comparison groups. However, the time to readmission was shorter with the intervention. In another study, the overall readmission rates were reduced by 44.5% in the treatment group compared with the control (P=0.02), and admissions for heart failure were reduced by 56.2% in the treatment group (P=0.01). In a third study, the readmission rates for medical patients were significantly lower with the intervention at 2 and 6 weeks, but not at 12 weeks. For surgical patients in the same study, there was no significant effect of the intervention. In a fourth study of medical patients, those in the intervention group were less likely to be readmitted two or more times (P=0.05).

In one study, LOS was reduced by 36.6% in the treatment group (P=0.04). In a second study, the average LOS was significantly lower for medical patients at 2 and 6 weeks, but not at 12 weeks. There was no significant effect of the intervention in surgical patients. In a third study, for medical patients, the hospital days per patient were lower in the treatment group (2.3) than for the control (5.0), (P=0.05). There was no significant effect for surgical patients in this study. A fourth study found no significant effect of the intervention on the average LOS.

In one study the quality of life scores were higher in the treatment group than in the control: 22.1 out of 28 versus 11.3 out of 28, respectively (P=0.001).

The effect on mortality in all studies was limited by the short follow-up times.

Pre-intervention post-intervention studies.

One study reported an 85% reduction in hospital admissions (P<0.0001), whilst a second showed a reduced LOS with the intervention (P=0.001). A third study showed that the LOS did not decrease substantially with the intervention.

Cost information
Cost analyses from the included studies were adjusted to constant year 2000 US dollars for comparability. In three RCTs the cost-savings were estimated to be $2,251, $4,492 and $19,699 per patient per year, respectively. In the second study, the authors reported that they were unclear whether the cost of the intervention itself was included and they commented that this may not represent longer term savings. One pre-intervention post-intervention study reported
a cost-saving of $10,793 per patient.

Authors' conclusions
These interventions appear to be useful since little evidence has surfaced to show that they are ineffective.

CRD commentary
This review updated an earlier one on these complex interventions (see Other Publications of Related Interest). The aims were only partially stated since the inclusion criteria for the types of participants were not described clearly. The database search was restricted to MEDLINE and to English language studies. In addition, the search terms appeared limited given the diverse nature of the interventions. It is possible that studies were missed. The methods of the review (study selection, data extraction, quality assessment) were not described; subjective decisions made in these processes may result in bias. The authors described the purpose and components of the interventions, although they commented that some descriptions in the included studies were neither full nor clear. There was little information on the included participants and, as the authors suggested, it may be difficult to generalise from these studies to other populations. The authors stated that a meta-analysis would have been inappropriate because the interventions varied. A narrative discussion of the results appears to have been appropriate. The authors made it clear that evidence from pre-intervention post-intervention studies was not comparable with that from RCTs. The authors' conclusions were suitably conservative.

Implications of the review for practice and research
Practice: The authors stated that cautious implementation of these programmes is better than waiting for further evidence.

Research: The authors stated that institutions should consider piloting and evaluating these programmes. They also suggested that it would be useful to determine which are the most effective components of these complex interventions.

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Other publications of related interest

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.