Multidisciplinary strategies for the management of heart failure patients at high risk for admission: a systematic review of randomized trials
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CRD summary
This review investigated whether multidisciplinary out-patient interventions for patients with heart failure (HF) improve clinical outcomes. The results showed that a variety of multidisciplinary interventions reduce hospitalisation for HF, and that strategies which include follow-up by trained staff and/or access to HF clinics can reduce mortality and all-cause hospitalisations.

Authors' objectives
To update a previous meta-analysis on the effectiveness of multidisciplinary strategies for managing heart failure (HF), and to investigate which types of strategies are most effective.

Searching
MEDLINE (from 1966 to 2003), EMBASE (from 1980 to 2003), CINAHL (from 1982 to 2003), SIGLE, (from 1980 to 2003), AMED (from 1985 to 2003), the Cochrane Controlled Trial Register and the Cochrane EPOC Register of trials were searched; the search terms were given. No language restrictions were applied. The authors also contacted content experts and authors of original studies, and checked the bibliographies of included studies. Studies published in abstract form only were excluded.

Study selection
Study designs of evaluations included in the review
The inclusion criteria stated that all evaluations included had to be randomised controlled trials (RCTs).

Specific interventions included in the review
Studies of out-patient multidisciplinary management strategies were eligible for inclusion. In all included studies, the key component of the intervention was patient education. For analytical purposes, the interventions were assigned to one of the following groups:

- a multidisciplinary HF clinic;
- a multidisciplinary team not within a HF clinic;
- telephone follow-up or telemonitoring;
- educational programmes.

Details of the intervention in each study were given. The duration of the intervention ranged from one visit to 30 months. The control groups received usual care which, according to the authors, was not well defined in the original papers.

Participants included in the review
The inclusion criteria specified patients with HF. The majority of patients in the included studies had recently been discharged from hospital. The mean age of the included participants ranged from 56 to 80 years. They were recruited from studies in several European countries, as well as North America, Australia and New Zealand. No details on the gender of the included participants were given.

Outcomes assessed in the review
Only studies reporting mortality or hospitalisation rates were eligible for inclusion. The primary outcomes were all-
cause mortality, all-cause hospitalisation rate, HF hospitalisation rate, the total number of hospitalisations and the total number of hospitalisations for HF. These were assessed over the follow-up time of the individual studies, which ranged from 3 to 30 months. Additional outcomes were prescribing rates, patient compliance, and quality of life or functional status.

How were decisions on the relevance of primary studies made?
Two authors reviewed studies for inclusion, with any disagreements resolved by consensus.

Assessment of study quality
The authors stated that for the sensitivity analysis they assessed validity using the Jadad scale. They made no mention of the effect on the results of the validity assessment of including or excluding studies. The authors did not state how the validity assessment was performed.

Data extraction
The authors stated that two authors extracted the outcome data independently, with any disagreements resolved by consensus. Risk ratios (RRs) and 95% confidence intervals (CIs) were calculated for the primary outcomes of individual studies. The authors stated that the analysis was conducted on an intention-to-treat basis.

Methods of synthesis
How were the studies combined?
Summary RRs were estimated using the random-effects model of DerSimonian and Laird. The authors stated that they made an a priori decision that, in the presence of statistical heterogeneity (P<0.20), they would examine the data separately for each of the intervention groups (see Specific Interventions Included in the Review). In the paper, the authors reported summary RRs for all primary outcomes, but only provided a narrative summary of the secondary outcomes. Adjusted indirect comparisons were calculated to compare the effectiveness of different types of interventions.

How were differences between studies investigated?
Statistical heterogeneity was investigated using Cochran’s Q test. Sensitivity analyses, defined a priori, were conducted according to the effects of duration of the intervention, quality of the trial, length of follow-up and year of study completion.

Results of the review
Twenty-nine trials (5,039 participants) were included in the review.

All-cause mortality (22 trials, 3,781 participants).

Multidisciplinary interventions reduced the risk of all-cause mortality (RR 0.83, 95% CI: 0.70, 0.99); this result is just statistically significant at the 5% level. Subgroup analyses revealed that this effect was limited to those programmes in which multidisciplinary teams provided specialised follow-up care (RR 0.75, 95% CI: 0.59, 0.96), but was not evident with those interventions that used telephone follow-up (RR 0.91, 95% CI: 0.65, 1.29) or self-care activities (RR 1.14, 95% CI: 0.67, 1.94). The between-intervention differences were confirmed by the results of the indirect comparison analyses.

All-cause hospitalisation rate (23 trials, 4,313 participants).

Multidisciplinary interventions reduced the all-cause hospitalisation rate (RR 0.84, 95% CI: 0.75, 0.93), but there was statistical heterogeneity. Subgroup analyses revealed that the effect was seen in those programmes in which multidisciplinary teams provided specialised follow-up care (RR 0.81, 95% CI: 0.71, 0.92) or self-care activities (RR 0.73, 95% CI: 0.57, 0.93), but was not evident with those interventions that used telephone follow-up (RR 0.98, 95% CI: 0.80, 1.20). The between-intervention differences were confirmed by the results of the indirect comparison analyses.
Multidisciplinary interventions reduced the HF hospitalisation rate (RR 0.73, 95% CI: 0.66, 0.82). Subgroup analyses revealed that the beneficial effect was seen with all the different types of intervention used.

Total number of hospitalisations (21 trials, number of participants not stated).

Multidisciplinary interventions reduced the hospitalisation rate (RR 0.70, 95% CI: 0.62, 0.80). Subgroup analyses revealed that the beneficial effect was seen with all the different types of intervention used.

Total number of HF hospitalisations (20 trials, number of participants not stated).

Multidisciplinary interventions reduced the HF hospitalisation rate (RR 0.57, 95% CI: 0.49, 0.67). Subgroup analyses revealed that the beneficial effect was seen with all the different types of intervention used.

The authors stated that the results of the sensitivity analyses did not reveal any statistical differences, but did not present these data.

**Cost information**

Of the 18 trials which report cost information, 15 reported that the intervention was cost-saving; the other three reported that the intervention was cost-neutral. No formal cost-effectiveness analyses were conducted.

**Authors’ conclusions**

A variety of multidisciplinary interventions to manage patients with HF reduced HF hospitalisations. Strategies that include follow-up by trained staff and/or access to specialised HF clinics can reduce mortality and all-cause hospitalisations.

**CRD commentary**

The authors appear to have conducted a thorough literature search, which included several medical databases and attempts to obtain further studies through content experts and authors of primary studies. With this strategy, with no language restriction applied, it is unlikely that the authors missed many studies. However, since the authors excluded studies which were reported in abstract form only, there is a potential for publication bias.

It was not entirely clear how individual studies were included or excluded on the basis of their definition of the intervention. Information on the intervention in each study was given. However, little information about co-morbidities, severity of disease (although most had been hospitalised), or the gender of the included participants was provided. This makes it hard to hypothesise on the generalisability of the results. One of the strengths of the review, however, was the inclusion of participants from several countries, each with different health systems. Although the review categorised the multidisciplinary interventions, each category comprised a variety of different types of intervention and it was therefore difficult to tell which specific intervention or components worked well.

Owing to the wide range of interventions studied, it might be argued that pooling across the studies, even within the intervention categories, was not valid. Furthermore, the validity of indirect comparison analyses is questionable given that the authors acknowledged that the controls were poorly defined. Although the authors stated that for the sensitivity analysis they assessed study validity using the Jadad scale, these results were not presented.

Overall, the findings of the review appear reliable, although the variety of interventions from which the conclusions are drawn should be borne in mind. The conclusions of the review follow on from the results presented.

**Implications of the review for practice and research**

Practice: The authors recommended that policy makers use the evidence from the review to plan for dealing with the discharge of HF patients.
Research: The authors stated that studies designed to test different types or intensities of multidisciplinary interventions for patients with HF are needed, to allow direct comparisons to be made.

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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.