Cardiac rehabilitation outcomes: modifiable risk factors
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CRD summary
This review concluded that cardiac rehabilitation effectively countered risk factors over time and was able to induce a considerable improvement in lifestyle habits. Given the limitations of the review and available evidence, the conclusion seems overly strong.

Authors' objectives
To determine the outcomes of cardiac rehabilitation.

Searching
PubMed was searched for studies published in English between 1995 and July 2012; search terms were reported. The reference lists of included articles were searched for additional studies.

Study selection
Studies of any design were eligible for inclusion if they assessed the effectiveness of supervised or unsupervised structured cardiac rehabilitation in adults with either coronary heart disease who had myocardial infarction, coronary artery bypass graft, percutaneous coronary intervention, heart failure or a heart transplant. The rehabilitation programme could be undertaken in an in-patient, out-patient, community or home-based setting. Most studies included patients with coronary heart disease and evaluated a comprehensive intervention. Most participants were male. The authors did not state how many reviewers selected studies for the review.

Assessment of study quality
There did not appear to be a systematic assessment of study quality, although some study limitations were identified.

Data extraction
Data were extracted on the rates of all-cause and cardiac mortality, cardiac morbidity, modifiable risk factors, psychological outcomes, functional capacity, return to work and quality of life. The authors did not state how many reviewers extracted data.

Methods of synthesis
The studies were combined in a narrative synthesis ordered by outcome. Study details were summarised in a table.

Results of the review
Sixteen studies met the inclusion criteria (8,932 patients; 10 to 3,241); four studies were randomised controlled trials, two were longitudinal studies, two were cross-sectional, six were prospective and one was retrospective. Mean follow-up ranged from three weeks to 9.7 years. Cardiac rehabilitation resulted in improvements in diet (two studies), reductions in fasting blood sugar (two studies) and measures of obesity (three out of four studies), reduction in blood lipids (four studies), reduction in smoking and/or alcohol consumption (one out of two studies), improvements in measures of physical activity (10 studies), and reduction in anxiety and/or depression (five studies), but no effect on the proportion of patients who reached target blood pressure levels (one study).

Authors' conclusions
Cardiac rehabilitation effectively countered risk factors over time and was able to induce a considerable improvement in lifestyle habits; a reduction in cholesterol and body mass index was observed. In addition, patients tended to quit smoking and increase their exercise activity. This suggested that establishment and development of cardiac rehabilitation services was essential for the most effective management of heart condition.

CRD commentary
The review addressed a clear question supported by broad but reproducible inclusion criteria. The search was limited both in terms of the sources searched and the restriction to studies published in English. It was not reported whether...
methods were used to reduce error and bias during the review process.

Although some study limitations were highlighted, a systematic assessment of study quality was not undertaken, so the risk of bias was unclear. With the level of clinical heterogeneity across the studies, the use of a narrative synthesis was appropriate. A more detailed description of the interventions would have been helpful to the reader. Ten of the sixteen studies had a follow-up of six months or less.

Given the limitations of the review and available evidence, the conclusion seems overly strong.

### Implications of the review for practice and research

**Practice:** The authors recommended that clinicians use disease-specific quality of life questionnaires in order to assess the real problems patients face. They also stated that the establishment of cardiac rehabilitation programmes and the development of cardiac rehabilitation centres was a significant tool to reduce healthcare costs; a reduction in cardiovascular events resulted in fewer rates of hospital admissions, in-hospital days and less prescribed medication.

**Research:** The authors did not state implications for research.

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### Record Status

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.