

## Danish Centre for Evaluation and Health Technology Assessment

# CARDIAC REHABILITATION – a Health Technology Assessment

Evidence from the literature and the DANREHAB trial – summary

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**Cardiac Rehabilitation – a Health Technology Assessment  
Evidence from the literature and the DANREHAB trial**

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# Summary

## Introduction

Ischemic heart disease is not only a frequent cause of death, but also a chronic disease, and about 200.000 people in Denmark is currently suffering from the disease.<sup>1</sup> This is placing new demands on cardiac health care services, and cardiac rehabilitation has been suggested as solution. Current guidelines in Denmark and elsewhere recommend cardiac rehabilitation as part of comprehensive cardiac care, but far from all people with ischemic heart disease are today getting a cardiac rehabilitation offer in Denmark.

In this report a health technology assessment on hospital based comprehensive cardiac rehabilitation is presented. The evidence on cardiac rehabilitation is systematically reviewed and the results of a Danish cardiac rehabilitation trial (DANREHAB trial) are presented. The report also presents an organisational analysis on diffusion of cardiac rehabilitation in Denmark and translation of the cardiac rehabilitation idea into clinical practise at a local hospital. The DANREHAB trial was carried out at a hospital. The cardiac rehabilitation programme offered however resembles the programmes that are under construction in the coming local health care centres in the municipalities. Thus experiences from the DANREHAB trial can be used as source of inspiration in the future extension of hospital-based as well as community based cardiac rehabilitation programmes.

## Cardiac rehabilitation – definition, legislation and guidelines

Cardiac rehabilitation is based on the idea on re-establishing a normal life and ensuring the best possible physical, psychical and social functioning of people with heart disease. In Denmark there are no specific legislation on cardiac rehabilitation, but the revision of the Health-legislation coming into force by 2007 has great influence on the field.

Current guidelines in Denmark recommend comprehensive, individual tailored cardiac rehabilitation offered during three phases: I) in-hospital; II) outpatient; and III) community-based services. Cardiac rehabilitation programmes should be based on patient education, exercise training, dietary guidance, smoking cessation, psychosocial support, risk factor management and clinical follow-up assessment. Initial diagnosis, clinical assessment and acute treatment are prerequisites for cardiac rehabilitation. The target group is people with ischemic heart disease. Also people with chronic heart failure and people with a high risk of developing ischemic heart disease are considered to be target group for cardiac rehabilitation.

## Evidence

### **The patient**

Patient participation and satisfaction are reviewed in the report. Studies show that between 15% and 59% are willing to participate in cardiac rehabilitation, and 50-79% of these patients stick to the programme. Studies indicate that people who participate in cardiac rehabilitation are satisfied with the follow-up treatment to a high extend, and one randomised trial has shown that patient satisfaction is higher in the cardiac rehabilitation group than in the usual care group. Knowledge on patient satisfaction is still lacking.

<sup>1</sup> Patients with ischemic heart disease includes patients with myocardial infarction, patients going through by-pass operation or percutaneous coronary intervention and patients with stable angina pectoris, and patients with chronic heart failure on ischemic basis.

### **The technology**

A total of 49 randomised trials on the effect of cardiac rehabilitation have been identified. A meta-analysis of the trials shows that cardiac rehabilitation reduces total mortality by 19% (OR 0,81 (95% CI 0,69-0,95)), and cardiac mortality by 26% (OR 0,74 (95%CI 0,61-0,90)). The trials primarily include men below 65 years of age with myocardial infarction, and it is still uncertain whether the effect can be extrapolated to a wider target group. Further the quality of the trials can be questioned leaving the risk of overestimating the effect of cardiac rehabilitation. Based on the 3 high quality trials there is no statistical significant evidence for the effect of cardiac rehabilitation on total mortality (OR 0,92 (95% CI 0,40-2,14)) or cardiac mortality (OR 0,70 (95% CI 0,35-1,41)). There is no evidence on the effect of cardiac rehabilitation on re-infarction-rate or re-vascularisation-rate. Cardiac rehabilitation has a significant effect on cardiac risk factors: blood pressure, lipids and smoking. However, this effect might be due to bias. Some trials show an effect of cardiac rehabilitation on re-hospitalisation and total bed days. Studying quality of life there is no evidence of cardiac rehabilitation being superior to usual care. More high quality trials on this topic are needed.

Based on a number of large observational studies the risk of cardiac rehabilitation and physical training in patients with ischemic heart disease is considered to be low: 1 serious cardiac event in 100.000 training hours.

### **Economy**

The direct cost of cardiac rehabilitation is calculated to be in the range of 2.300 DKK to 8.120 DKK. per patient in international studies. Studies show that the total national health care and social costs are lower in people participating in cardiac rehabilitation compared to usual care, however there is a large variation in the amount saved.

### The Danish trial

The DANREHAB trial was conducted at Bispebjerg Hospital from March 2000 to February 2003 based on the criteria of high quality trials. The trial includes 770 patients randomised to twelve month of comprehensive cardiac rehabilitation or usual care. The final results from the trial will be presented when 3 years follow-up is reached. In this report the results of the one-year follow-up are presented.

Compared to other studies the DANREHAB trial has a high program-participation and -adherence. The trial confirms a high level of patient-satisfaction with cardiac rehabilitation. The results from the one-year do not change the overall effect of cardiac rehabilitation on mortality or morbidity. In concordance with earlier trials the DANREHAB trial finds a positive effect on lifestyle and risk factors. The evidence on lower re-hospitalisation-rates and total bed days is strengthened by the trial results. The direct costs of cardiac rehabilitation in the DANREHAB trial are in the same range as calculated from international programmes.

### Diffusion and translation of the idea to clinical practice

The diffusion of cardiac rehabilitation in Denmark has been moving slowly and is not yet fully implemented at hospitals in Denmark. Especially rehabilitation in the communities is lacking. An analysis of the written coverage in scientific, administrative and press medias in the period from 1997 to 2004 shows a rising professional and political acceptance of cardiac rehabilitation – an acceptance that was not reflected in organisational actions through out the health care sector.

The local study demonstrates that a cardiac rehabilitation programme in accordance with the current guidelines can be organised and implemented at a Danish hospital. Experiences from the local

programme however also show that implementation of cardiac rehabilitation also involves a wide number of organisational challenges that must be taken into consideration when establishing and developing cardiac rehabilitation at hospitals and the coming health care centres in Denmark.

## Conclusions

This health technology assessment report shows that cardiac rehabilitation increases patient satisfaction, and that patients are willing to participate in the treatment offer. Evidence indicates that cardiac rehabilitation has a positive impact on heart healthy lifestyle and risk profile. Cardiac rehabilitation seems to reduce acute re-hospitalisation rate and total bed days spent in the hospital, which raises a potential for reducing the total health care costs. Cardiac rehabilitation is not fully implemented at hospitals in Denmark. A number of organisational challenges exist in the implementation process of cardiac rehabilitation, thus a local study shows that it is possible to implement cardiac rehabilitation in accordance with the current guidelines in Denmark.

Knowledge on how to organise and run cardiac rehabilitation in details is still sparse. There is a need of gathering experiences from existing programmes as well as programmes that are under development. The effect of cardiac rehabilitation must be studied in large high quality trials before final conclusions of the effect can be made.