



**Title** Exercise-Based Cardiac Rehabilitation Programs for Coronary Artery Disease: A Systematic Clinical and Economic Review

**Agency** CCOHTA, Canadian Coordinating Office for Health Technology Assessment  
865 Carling Avenue, Suite 600, Ottawa, Ontario K1S 5S8 Canada;  
Tel: +1 613 226 2553; Fax: +1 613 226 5392

**Reference** CCOHTA Technology Report, Issue 34, March 2003. ISBN 1-894620-20-8 (print);  
ISBN 1-894620-19-4 (electronic): [www.ccohta.ca](http://www.ccohta.ca)

### Aim

- To assess the clinical effectiveness and cost effectiveness of exercise-based cardiac rehabilitation (CR) for secondary prevention of coronary artery disease (CAD)
- To discuss the impact of the evidence on the direction and development of CR services for secondary prevention of CAD in the Canadian healthcare system

### Conclusions and results

**Clinical Effectiveness:** Forty-six clinical trials met the criteria for meta-analysis, including 10 randomized controlled trials (RCTs) not included in the 2001 Cochrane Collaboration review. CR programs with an exercise component – both exercise-only (EX CR) and comprehensive cardiac rehabilitation (CCR) programs – have beneficial effects on cardiac mortality. In total mortality, EX CR programs show a statistically significant reduction, whereas CCR programs show a trend in that direction.

**Cost-Effectiveness:** Three full economic evaluations were analyzed. The results suggest that CR with exercise is cost effective. Analysis of three cost studies suggests that CR with an exercise component may lower costs through reduced rehospitalization and drug use. The literature reports maximum cost effectiveness when patients maintain the required exercise level over the long term.

**Health Sector Impact:** Although the cost studies suggest that switching to CR from standard care would save cost over time, short-run annual expenditures could increase by \$225 million if supervised CR became standard practice in Canada.

### Recommendations

Not applicable.

### Methods

Updating a Cochrane Collaboration review (2001), RCTs of CR programs with an exercise component were systematically reviewed in two groups: CCR vs. usual

care or CR EX vs. usual care. The study included both genders of all ages, in hospital and community-based settings, who had documented CAD. Main outcome measures were all-cause mortality and cardiac mortality. Economic studies (RCT and non-RCT) using the same population and interventions were also systematically reviewed. To assess the potential impact of CR programs on health policy, comprehensive literature searches and consultations with clinical experts were carried out.

### Further research/reviews required

Patients should be tracked to better assess the long-term impact of CR. A prospective RCT in a Canadian setting with a concurrent economic evaluation is needed. Other areas to be explored further include compliance, alternative care settings and delivery approaches, and under-represented populations (females, the elderly, ethnic groups, and higher risk patients).