

Maura Gabriela FELEA,  
Gr. T. Popa University of Medicine and Pharmacy of Iasi – Romania,  
Faculty of Medicine, Ist Medical Department  
Florin MITU,  
Gr. T. Popa University of Medicine and Pharmacy of Iasi – Romania,  
Faculty of Medicine, Ist Medical Department  
Cardiovascular Rehabilitation Clinic of the Rehabilitation Hospital of Iasi, Romania  
Maria M. LEON  
Gr. T. Popa University of Medicine and Pharmacy of Iasi – Romania,  
Faculty of Medicine, Ist Medical Department  
Cardiovascular Rehabilitation Clinic of the Rehabilitation Hospital of Iasi, Romania

# MULTIPLE FACETS OF REHABILITATION IN ELDERLY PATIENTS AFTER CARDIAC SURGERY

Literature review

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Cardiac rehabilitation referral,  
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## JEL Classification

I23; P46; Y80; Z13

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## Abstract

*The elderly rehabilitation program after coronary artery bypass graft (CABG) encompasses endurance training performed on a cycloergometer and physical rehabilitation, the results being exceeded by adding strength and balance exercises. Early initiation of mobilization exercises can prevent problems of posture, as well as thoraco-pulmonary and scapular-humeral articulation conditions often encountered after cardiac surgery. The results of special functional training in elderly can be assessed by six minute walk perimeter and quality of life questionnaire. This article describes the extents of multiple dimensions facets of cardiac rehabilitation program, like effort capacity and psycho-social benefits, morbidity and cost-effectiveness. Referral to cardiac rehabilitation for primary and secondary prevention programs remains low in developing countries. There is a need for a network intelligence schema in order to address patients' needs and to improve health care professionals' education.*

## Introduction

Since 1993, the American Heart Association made statements to guide clinical evaluation and prevention of cardiovascular diseases (Balady et al., 1994). Besides the consequences of cardiovascular illness regarding morbidity and mortality, there is a far-reaching network of implications touching the field of sociology, psychology and economics, translated into quality-adjusted life-years (QALY), health care system burden and the necessity to change or adapt health policies. In 1994, almost 14% of almost 56 billion dollars were the costs subsequent to coronary revascularization procedures and secondary disabilities (AHA, 1994). Other studies emphasize the high costs of cardiac surgery versus centre-based or in home-based programs (Taylor et al., 2007).

In this respect, rehabilitation come to complete the drug and surgical interventions expecting to improve patient's quality of life, in terms of physical, psychological, social, and vocational status. Cardiac rehabilitation (CR) is a complementary direction in the management of cardiac diseases that aims to improve functional capacity, reduce disability (WHO, 1993), control or minimize symptoms, and waive or restore within normal ranges the modifiable cardiovascular risk factors in patients with an overt diagnosis of an acute or a chronic heart disease (Balady et al., 2011).

CR is a comprehensive secondary prevention program merging together recommendations for lifestyle changes, exercise training and medication (Balady et al., 2007).

The elderly rehabilitation program after coronary artery bypass graft (CABG) encompasses endurance training performed on a cycloergometer and physical rehabilitation, the results being exceeded by adding strength and balance exercises. Early initiation of mobilization exercises can prevent problems of posture, as well as thoraco-pulmonary and scapular-humeral articulation conditions often encountered after cardiac surgery. The results of special functional training in elderly can be assessed by six minute walk perimeter and quality of life questionnaire.

### Multiple Dimensions Facets in Cardiac Rehabilitation

This article describes the extents of multiple dimensions facets of cardiac rehabilitation program, like effort capacity and psycho-social benefits, morbi-mortality and cost-effectiveness.

#### 1. Effort Capacity

Specific recommendations for prescribing exercise training are available for older adults (Williams et al., 2002). Improvement in functional capacity represented by cardiorespiratory fitness, muscular endurance and strength, together with lower signs and symptoms caused by inadequate coronary blood flow need at effort was recorded in many

trials. European Association of Cardiovascular Prevention and Rehabilitation stated the core components of cardiac rehabilitation program that can be commonly applied for every clinical overt cardiovascular condition (Piepoli et al., 2010). Recommendations for physical activity comprise a minimum of 30 minutes/session of moderately intense aerobic activity, daily or at least 3–4/week. The exercise training should slowly be increased and included in daily lifestyle activities, and adjusted to age, comorbidities and disabilities. The everyday physical activity will improve aerobic fitness and the fulfilment of domestic tasks, prevent further disabilities and prolong life (Marchionni et al., 2003).

The first phase of CR program will be in-hospital performed in order to control symptoms, adapt effort to physical tolerability. The second phase is the continuation of the training in out-patient care facilities or home-based care for at least 8-12 weeks.

#### 2. Psycho-Social Benefits

Exercise training (ET) is a way to modify sedentary lifestyle as cardiovascular risk factor, but if it fusions with enjoyable leisure or within group activities it also can attenuate physiological responses to physical challenges, and improve quality of life (Piepoli et al., 2010). Thus, ET may combat loneliness and social isolation, frequently encountered in elderly and in patients with multi morbidities.

The benefits of CR extent to improvements of behavioural characteristics like depression, anxiety, somatization and hostility (Marchionni et al., 2003).

#### 3. Morbi-Mortality

The number of patients who undergo CABG tends to be higher in the elderly group comparative to young and adult groups, as the global trend is towards aging. Moreover, elderly are more likely to have emergent operation, reoperations, to be octogenarian, to be women, to present severe cardiac symptoms or to be asymptomatic, to have a high frequency of vascular comorbidities (like hypertension, heart failure, stroke, and peripheral arterial disease) and chronic lung disease, arthritis, and neuromuscular disorders (Peterson et al., 1995; Williams et al., 2002; Barreiro et al., 2011).

#### 4. Cost-Effectiveness

First studies that focused on the cost-effectiveness of comprehensive secondary prevention programs that included exercise training did not try to compare traditional

supervised programs versus home-based exercise (Ades et al., 1992; Ades et al., 1997).

Other researches performed on fifteen electronic databases on economic evaluation support the cost-effectiveness of supervised cardiac rehabilitation in myocardial infarction and heart failure patients, with a maximum of 28,193 dollars cost per life

year gained and of 16,118 dollars per quality adjusted life year gained (Papadakis et al., 2005).

Outdoor recreation can usefully follow the inhospital rehabilitation program, joining the ambulatory physical activity for cardiac rehabilitation. The most frequent recreation use was walking (Bedimo-Rung et al., 2005), consistent with other leisure activity studies (Cordell et al., 1999). Parks are more prone to offer an accessible way for walking, jogging or viewing scenery, while facilities (Corti et al., 1996) like fitness devices offer an oasis of purified air to exercise (Crompton, 1999).

A systematic review of 16 articles (Wong et al., 2012) framed some economic evaluations of cardiac rehabilitation and compared the cost-effectiveness of different modes of delivery of cardiac rehabilitation.

### **Referral to cardiac rehabilitation**

Referral to cardiac rehabilitation for primary and secondary prevention programs remains low in developing countries.

Disparities in access to cardiac rehabilitation programs include patient-linked factors, and health care system factors.

In elder persons beneficiary of a cardiac surgery, the underuse of these programs (Leon et al., 2005). Piepoli et al. (2010) identified certain groups of people, like elderly, women, patients with transient ischaemic attack or stroke, chronic renal failure, and chronic obstructive pulmonary disease that were in a very low percentage referred to cardiac rehabilitation program.

A recent study analyzed 38 facilities with 6,874 patients, 67.6% being referred to cardiac rehabilitation program (n = 4,644) (Turk-Adawi et al., 2014). The enrollment in CR program was more likely for patients receiving coronary artery bypass grafting, and was also positively impacted by organizational factors like promotion of CR program, certification by the American Association of Cardiovascular Pulmonary Rehabilitation, and a rural location. Elderly patients ( > 65 years old) and patients with myocardial infarction without a cardiac procedure, previous coronary artery bypass grafting, heart failure, diabetes depression, or active smoking patients were less likely to be enrolled.

### **Conclusion**

Exercise training is introduced as a core component of the comprehensive cardiac rehabilitation program in every patient with chronic or acute heart condition. It can be safely performed in elderly patient and after coronary artery bypass graft surgery. For more than 25 years, there has been an increased interest in evaluating the cost-effectiveness of in-hospital or out-patient care.

The benefits of CR resides not only in terms of functional capacity, but also in an increased independent status, in low re-hospitalization rate

for reoccurrence of major cardiac events, in the effect upon modifiable risk factors, and in behavioural and mental status improvement, as well as in preserving the patient social and family role and function.

Enrolment in CR program is advisable to be initiated as early as possible, but the exercise training for thorax and upper limbs should be postponed for 4-6 weeks.

Up to now there have been only partial economic analyses to support the economic value of supervised cardiac rehabilitation compared with standard care, and of home-based cardiac versus in-hospital care, resulting in ambiguous conclusions (Papadakis et al., 2005).

A huge opportunity rise from prevention, but to benefit from cost-efficiency requires a continuous promotion of the benefits within the population and the decision factors.

There is a need for a network intelligence schema involving organizational factors, patient educational process in order to address patients' needs, to lower healthcare costs and to improve healthcare professionals' education.

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