The prognostic effect of cardiac rehabilitation in the era of acute revascularization and statin therapy a systematic review and meta-analysis of randomized and non-randomized studies. The Cardiac Rehabilitation Outcome Study (CROS)

Constantinos H. Davos[1], Patrick Doherty[2], Heinz Völler[3], Annett Salzwedel[3], Daniel Saure[4], Maria-Inti Metzendorf[5], Katrin Jensen[4], Jean-Paul Schmid[6], Bernhard Rauch[7]

[1]Biomedical Research Foundation, Academy of Athens, Greece; [2]University of York, Department of Health Sciences, York, UK; [3]University of Potsdam, Centre of Rehabilitation Research, Potsdam, Germany; [4]University of Heidelberg, Institute of Medical Biometry & Informatics , Heidelberg, Germany;[5]Cochrane Metabolic and Endocrine Disorders Group, Institute of General Practice, Dusseldorf, Germany: [6]Spital Tiefenau, Department of Cardiology, Bern, Switzerland; [7]Institut für Herzinfarktforschung, Ludwigshafen am Rhein, Germany

*on behalf of the "Cardiac Rehabilitation Section", European Association of Cardiovascular Prevention & Rehabilitation (EACPR)**

Background: Although recent studies, meta-analyses, and guidelines, suggest a beneficial effect of cardiac rehabilitation (CR) in patients with coronary artery disease (CAD), considerable scientific doubt is still apparent because:

- The type of CR offered varies considerably between and within the countries with respect to content, duration, intensity, and volume
- There are no accepted minimal standards worldwide to judge quality of CR delivery, leaving doubt about the effectiveness of CR
- Developments within the past 20 years (interventional therapies, surgery, medication) had a large impact on the quality of care delivered to patients participating in CR

Aim of the study: To evaluate CR-effectiveness on clinical prognosis after a recent cardiac event exclusively in the modern era of statin therapy and acute revascularization for acute coronary syndromes (ACS). To better reflect actual clinical practice, RCTs and controlled cohort studies (CCS) were included into the meta-analysis

Population	After ACS	After CABG	Mixed population
Age	No restriction		
Time of events	1995 or later		
Acute treatment	in-hospital standard therapy according to actual guidelines		
Intervention Multi-component cardiac rehabilitation (CR)			
Start	Not later than 3 months after hospital discharge		
Supervision	CR under supervision and responsibility of a rehabilitation center (center-based CR)		
Definition of "multi-component"	CR including supervised and structured physical exercise at least twice a week as basic requirement plus at least one, preferably more, of the following components: Information, motivational techniques, education, psychological support and interventions, social and vocational support		
CR setting	In-patient, out-patient or mixed. Tele-rehabilitation included if the major part of CR sessions was center-based and all other predefined criteria were fulfilled		
Control Usual care	Patients with index event, but not participating in CR. They may be supervised by GPs and/or cardiologists and participate in non-structured, non-supervised exercise programs outside a CR program		

**The authors of this presentation do not have competing interest to declare*

Records identified through database searching: **n=24,610**
Medline (PubMed): n=8,965
Central (Cochrane Library): n=2,178
Enbase (Ovid): n=9,780
CINAHL (Ebsco): n=2,358
LILACS (iAHx): n=177
CIRRIE: n=791
ICTPR: n=401
Remaining records after removing duplicates: **n=18,534**

↓

Primary selection (Studies potentially meeting CROS criteria): **n=243**

Ongoing studies of potential relevance: n=17

↓

Studies selected for full text evaluation: **n=67**

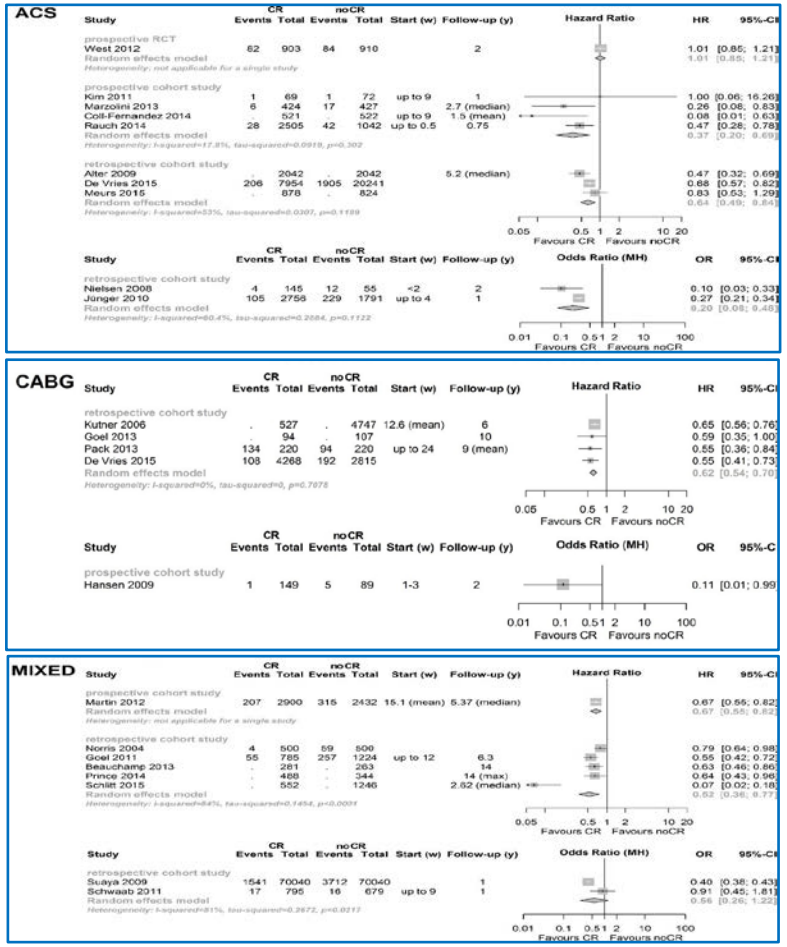
↓

Studies selected for structured study evaluation, qualitatitive analysis: **n=39**

↓

Studies included into meta-analysis quantitative analysis: **n=25**

Study evaluation: Cochrane risk of bias table was used for RCTs. The checklists of methodological issues on non-randomized studies and the Newcastle Ottawa Scale was used for CCSs



Conclusion: From the basis of 24 CCS including 218,524 patients and reflecting routine clinical care in 9 countries worldwide, participation in structured multi-component CR is associated with reduced mortality after an acute coronary event even in the era of statins and acute revascularizations