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CONGRESSO  
NAZIONALE

61° Congresso Nazionale della  
Società Italiana di Gerontologia e Geriatria  
Napoli, 2 dicembre 2016

STIAMO  
LAVORANDO  
PER FARTI  
INVECCHIARE  
MEGLIO

Ruolo della riabilitazione nel paziente  
anziano coronaropatico

NAPOLI  
30 Novembre - 3 Dicembre 2016

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17  
CORSO  
INFERMIERI

NAPOLI  
1-2 Dicembre 2016

# Obiettivi della Cardiologia Riabilitativa multidisciplinare

## A breve termine

### Assicurare:

- la stabilizzazione clinica
- la continuità assistenziale
- la ottimizzazione terapia

### Assicurare:

- una corretta stratificazione prognostica
- la valutazione del rischio residuo

## A medio-lungo termine

### Migliorare la adesione:

- ai programmi di prevenzione secondaria
- alla terapia farmacologica

Ridurre la progressione dell'aterosclerosi

Migliorare la capacità funzionale ed i sintomi

Ridurre il rischio di eventi cardiovascolari

# Exercise-Based Cardiac Rehabilitation for Coronary Heart Disease

Cochrane Systematic Review and Meta-Analysis

JACC 2016

63 studies; 14,486 pts with AMI, CABG, PTCA CAD, mean 12 months follow up

## Exercise-based Rehabilitation Vs. Usual Care: Cardiovascular Mortality

Study ID  
 Wilhelmsen 1975  
 Kallio 1979  
 Vecchio 1981  
 Shaw (NEDHP) 1981  
 Sivarajan 1982a  
 Sivarajan 1982b  
 Vermeulen 1983  
 WHO 1983  
 Roman 1983  
 Miller 1984  
 Haskell (SCRIP) 1984  
 Bethell 1990  
 Ornish 1990  
 Schuler 1992  
 Debusk 1994  
 Specchia 1996  
 Dugmore 1999  
 Hofman-Bang 1999  
 Toobert 2000  
 La Rovere 2002  
 Hambrecht 2004  
 Briffa 2005  
 Montero 2005  
 Aronov 2010  
 Belardinelli 2001  
 Seki 2008  
 Munk 2009  
 Houle 2012  
 Maddison 2014  
 Overall (I-squared = 0.0%, p = 0.699)

### Population characteristics

#### Sex

Males only

18 (29)

Females only

1 (2)

Both males and female

41 (65)

Not reported

3 (5)

Age, yrs

56.0 (49.3-71.0)

#### Diagnosis

Post-myocardial infarction only

31 (49)

Revascularization only

2 (3)

Angina only

5 (8)

Mixed CHD population

25 (40)

RR = 0.74 (0.64, 0.86)

Favors CR

Favors Control

## Exercise-based Rehabilitation Vs. Usual Care: Hospitalization

Study ID

(CI:0.82-1.01) in 20 studies with total and CV mortality

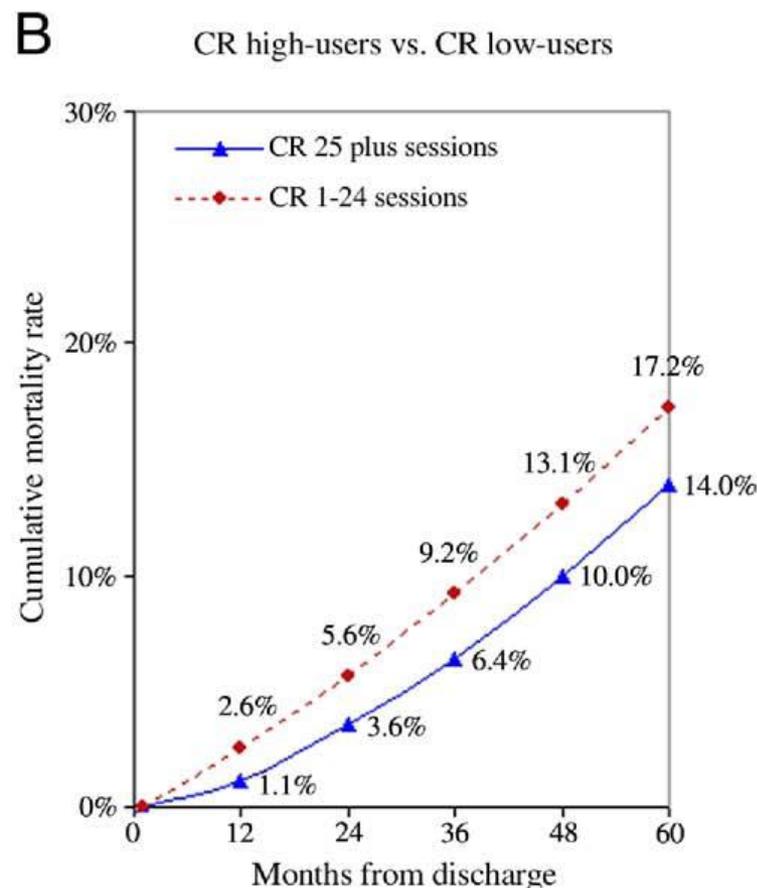
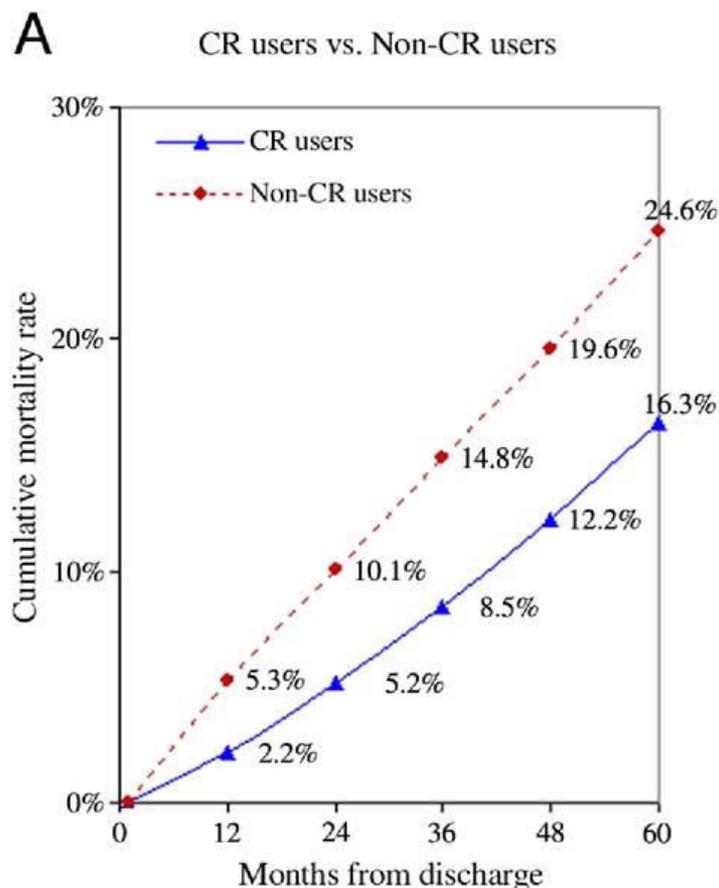
- Improvement in Quality of life

# Cardiac Rehabilitation and Survival in Older Coronary Patients

601,099 U.S. elderly Medicare beneficiaries after acute event in 1997

**only 73,334 elderly pts (12.2%) entered in CR**

5 years follow up

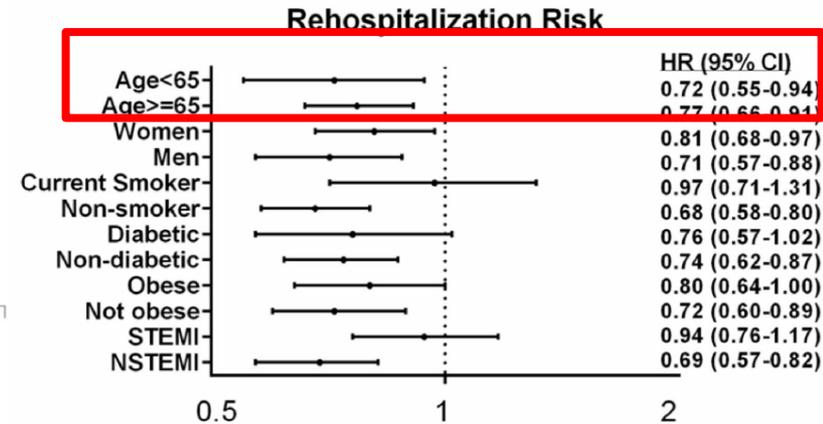
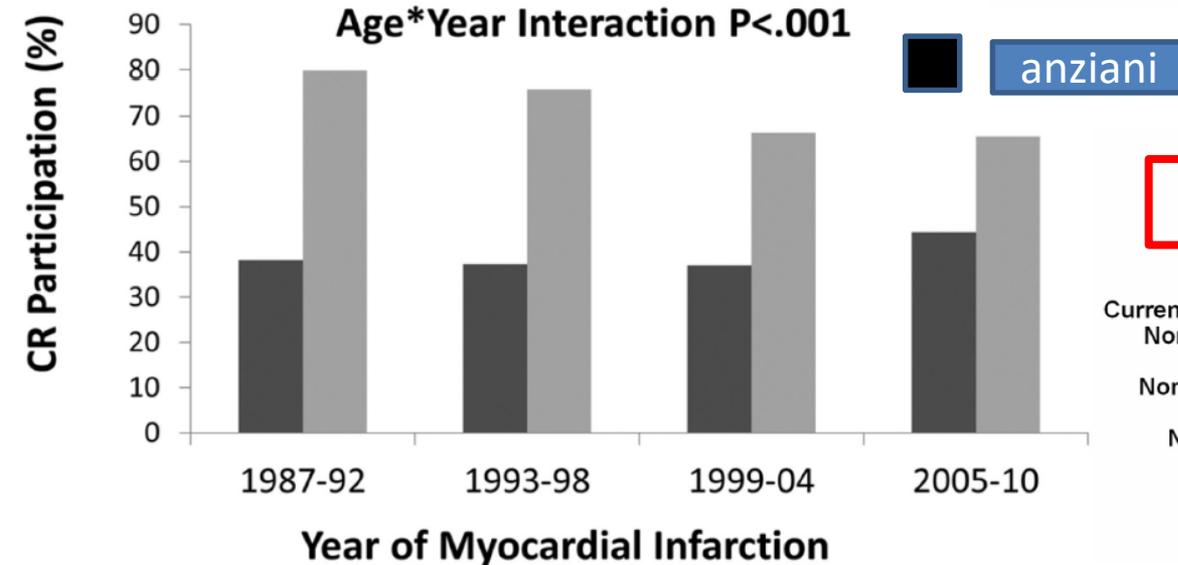
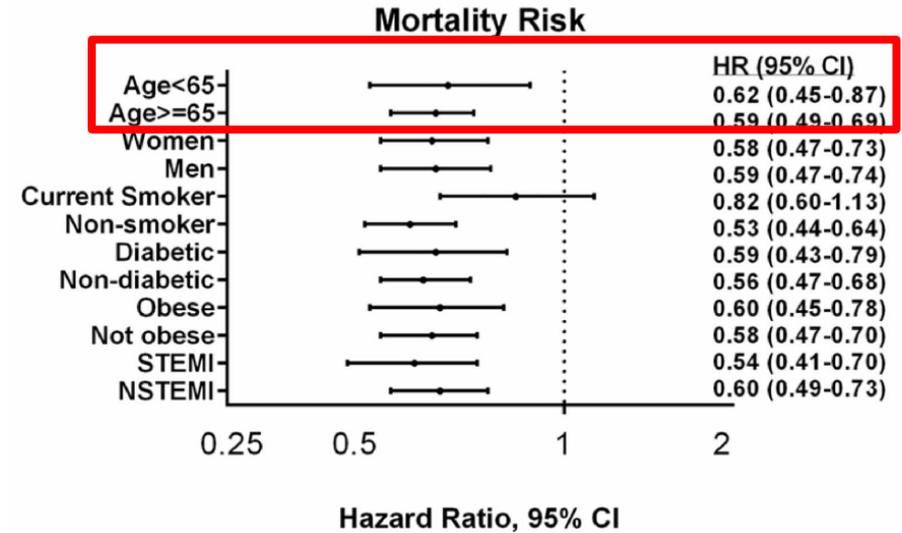


\*propensity-based matched groups *Suaya JA et al, J Am Coll Cardiol 2009;54:25-33*

# Participation in Cardiac Rehabilitation, Readmissions and Death After Acute Myocardial Infarction

Population-based surveillance study of residents discharged from the hospital following their first AMI in Olmsted County from January 1, 1987 to September 30, 2010.

2991 patients with incident AMI, 1569 (52.5%) participated in CR following hospital discharge



## 2016 European Guidelines on cardiovascular disease prevention in clinical practice

### Recommendations for specialized prevention programmes

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>	Ref <sup>c</sup>
Participation in a CR programme for patients hospitalized for an acute coronary event or revascularization, and for patients with HF, is recommended to improve patient outcomes.	I	A	555, 556
Preventive programmes for therapy optimisation, adherence and risk factor management are recommended for stable patients with CVD to reduce disease recurrence.	I	B	557–560
Methods to increase referral to and uptake of CR should be considered such as electronic prompts or automatic referrals, referral and liaison visits, structured follow-up by physicians, nurses or therapists, and early starts to programmes after discharge.	IIa	B	557, 558
Nurses and allied health professional led programmes should be considered to deliver CVD prevention across healthcare settings.	IIa	B	550–552, 561

## 2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure

### Recommendations for exercise, multidisciplinary management and monitoring of patients with heart failure

Recommendations	Class <sup>a</sup>	Level <sup>b</sup>	Ref <sup>c</sup>
It is recommended that regular aerobic exercise is encouraged in patients with HF to improve functional capacity and symptoms.	I	A	321, 618–621
It is recommended that regular aerobic exercise is encouraged in stable patients with HFrEF to reduce the risk of HF hospitalization.	I	A	618, 619
It is recommended that patients with HF are enrolled in a multidisciplinary care management programme to reduce the risk of HF hospitalization and mortality.	I	A	622–625
Referral to primary care for long-term follow-up may be considered for stable HF patients who are on optimal therapy to monitor for effectiveness of treatment, disease progression and patient adherence.	IIb	B	626, 627
Monitoring of pulmonary artery pressures using a wireless implantable haemodynamic monitoring system (CardioMems) may be considered in symptomatic patients with HF with previous HF hospitalization in order to reduce the risk of recurrent HF hospitalization.	IIb	B	628, 629
Multiparameter monitoring based on ICD (IN-TIME approach) may be considered in symptomatic patients with HFrEF (LVEF ≤35%) in order to improve clinical outcomes.	IIb	B	630

# Limitations of meta-analysis on Cardiac rehabilitation

The population of CHD patients in the published literature remains predominantly middle-aged males, outpatient following MI or PTCA, at low risk and no comorbidities

It is possible that patients who would have benefited most from the intervention were excluded from the studies

More well-designed, and adequately reported RCTs in groups of CHD patients more representative of usual clinical practice are still needed

**Women**  
**Elderly**  
**Comorbidities**  
**Disabilities**  
**Low socioeconomic status**

# Riabilitazione Cardiologica per tutti o per pazienti selezionati ? Quale intervento per quale paziente? Quali modelli organizzativi e percorsi clinici ?

## Non complicato

**Giovane**  
**Riperfusione completa**  
**Funzione VS ok**  
**CAD Monovasale**



## Complicato

**Riperfusione incompleta**  
**Disfunzione VS**  
**CAD Multivasale**  
**Ischemia**  
**Aritmie**



## Complesso

**Molto anziano**  
**Donna**  
**Comorbilità**  
**Disabilità**  
**Scompenso**  
**ATS pluridistr.**

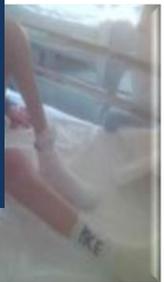


# Who is the real life elderly cardiovascular patient ?

- Age-related changes
- Altered presentation of diseases
- More severe cardiac disease
- Comorbidities
- Polipharmacotherapy
- Cognitive/psychologic deterioration
- Disability
- Geriatric syndromes
  - Delirium
  - Dementia
  - Sensory impairments (hearing and vision loss)
  - Risk of Falls



## Multidimensional geriatric evaluation

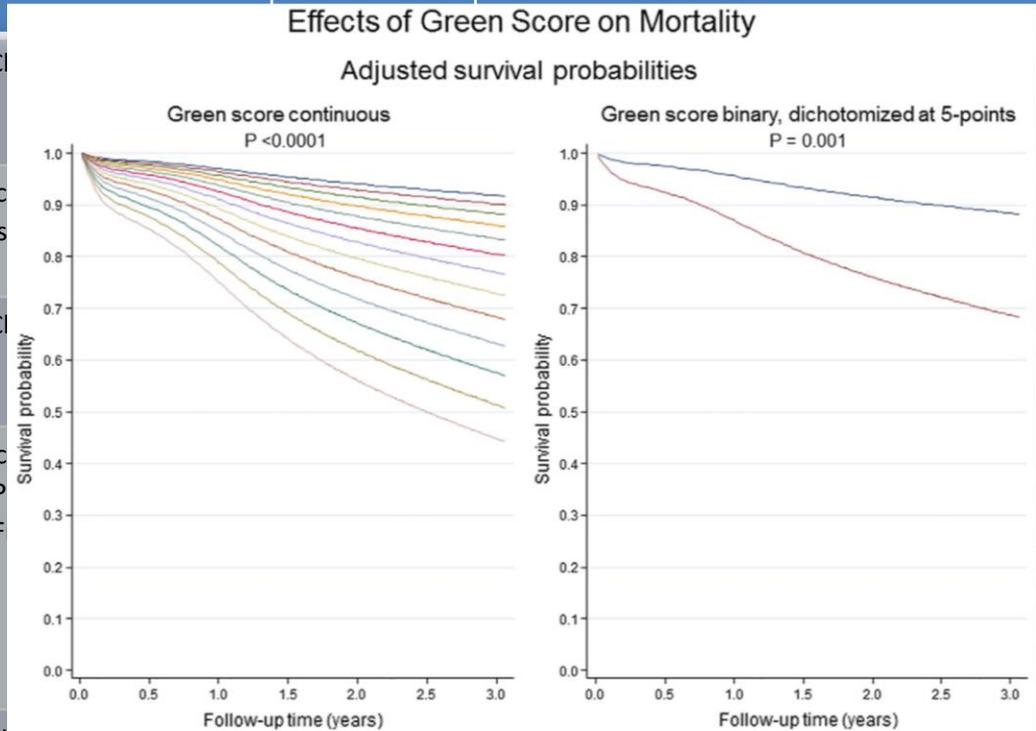


## Frailty

dynamic age-related condition of **increased vulnerability to minor stress** characterized by declines across multiple physiologic systems and associated with an **increased risk of negative outcomes, i.e., disability, institutionalization and death**

# Frailty in patients with Acute coronary syndromes

Author	Patients n./age	Diagnosis	Frailty criteria	Frailty %	Outcome (frail vs non frail)
Ekerstad N et al. Circulation. 2011;124:2397-2404.	Patients aged 75 years or older	NSTEMI	CSHA C		
Sanchis J. et al. Am Heart J 2014;168:784-791	342 patients Mean age 77 years	ACS	Fried sc Green s		
Sujino Y et al. J Cardiol 2015;66:263-268.	62 patients aged >85 years	STEMI	CSHA C		
White HD TRILOGY ACS investigators. Eur Heart J Acute Cardiovasc Care 2016;5:231-242.	4996 patients aged >65 years	ACS	Fried sc • P • F		
Graham MM et al. Canadian Journal of Cardiology 2013;29:1610-1615	183 patients aged 65 years	ACS	Edmonton Frail Scale score >7	50%	After adjusting for confounders, the HR for mortality for EFS > 7 compared with EFS 0-3 was 3.49 (95% [CI],1.08-7.61; p<0.002)
Singh M et al. Circ Cardiovasc Qual Outcomes 2011;4:496-502	628 patients aged >65 years	PTCA	Fried score Intermediate frail (1-2 items) Frail (≥3 items)	Frail: 18.6 % Intermediate Frailty: 46 %	Three-year mortality was 28% for frail patients, and 6% for non-frail patients. Frailty, comorbidities and SF-36 improved prediction of death and death/MI over Mayo Clinic risk score
Murali-Krishnan R et al. Open Heart 2015;2:e000294	745 patients Mean age 62 years	PTCA	CSHA Clinical Frailty Scale score ≥5	Frail: 10.8 %	Frailty was associated with increased 30-day (HR 4.8,95% CI 1.4 to 16.3, p=0.013) and 1 year mortality (HR 5.9, 95% CI 2.5 to 13.8, p<0.001)



# Frailty and cardiac rehabilitation: A call to action from the EACPR Cardiac Rehabilitation Nucleus

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Constantinos H Davos<sup>7</sup>, Stefan Hofer<sup>8</sup>, Marie-Christine Iliou<sup>9</sup>,  
Jean-Paul Schmid<sup>10</sup>, Heinz Voeller<sup>11,12</sup> and Patrick Doherty<sup>13</sup>

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## Abstract

Frailty is a geriatric syndrome characterised by a vulnerability status associated with declining function of multiple physiological systems and loss of physiological reserves. Two main models of frailty have been advanced: the phenotypic model (primary frailty) or deficits accumulation model (secondary frailty), and different instruments have been proposed and validated to measure frailty. However measured, frailty correlates to medical outcomes in the elderly, and has been shown to have prognostic value for patients in different clinical settings, such as in patients with coronary artery disease, after cardiac surgery or transvalvular aortic valve replacement, in patients with chronic heart failure or after left ventricular assist device implantation.

The prevalence, clinical and prognostic relevance of frailty in a cardiac rehabilitation setting has not yet been well characterised, despite the increasing frequency of elderly patients in cardiac rehabilitation, where frailty is likely to influence the onset, type and intensity of the exercise training programme and the design of tailored rehabilitative interventions for these patients.

Therefore, we need to start looking for frailty in patients entering cardiac rehabilitation programmes and become more familiar with some of the tools to recognise and evaluate the severity of this condition. Furthermore, we need to better understand whether exercise-based cardiac rehabilitation may change the course and the prognosis of frailty in cardiovascular patients.

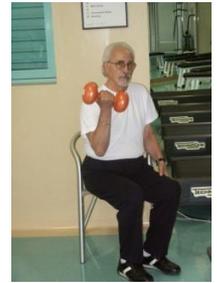
# Benefits of exercise training in frail elderly

## The American College of Sports Medicine's (ACSM) position

- Endurance training
- Strength training
- Respiratory muscle training
- Flexibility exercises
- Mobility exercises
- Balance training

### Beneficial effects of Physical exercise on:

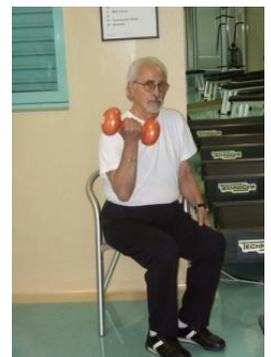
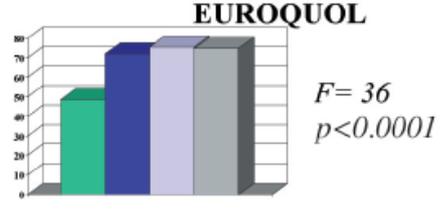
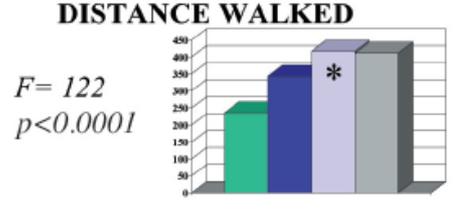
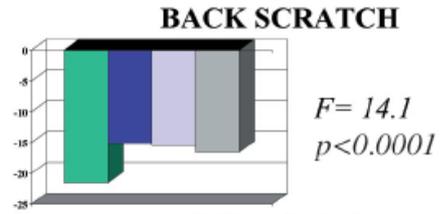
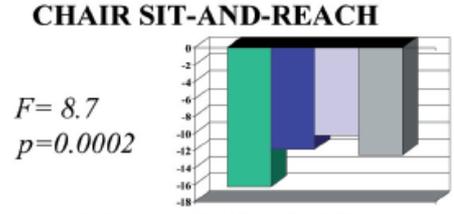
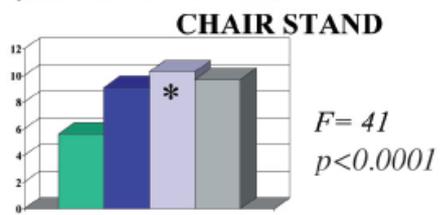
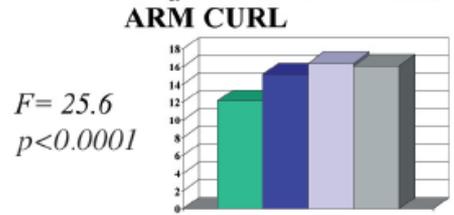
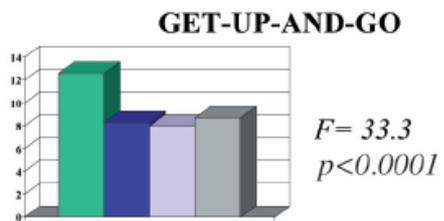
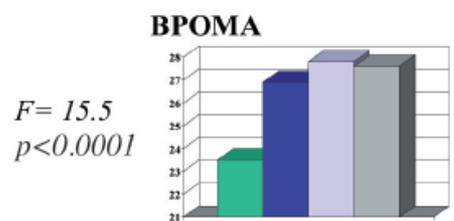
- Risk of falls
- Cognitive function
- Cardiac and pulmonary function
- Physical function
- Balance
- Gait
- Mobility
- Poor muscular power
- Functional capacity
- Frailty



# Percorso riabilitativo individualizzato dedicato al paziente ultrasettantenne cardioperato

## Elderly patient-centered rehabilitation after cardiac surgery

Antonio Mazza, Federica Camera, Antonella Maestri, Francesco Longoni, Anna Patrignani, Alessandra Gualco, Cristina Opasich, Franco Cobelli



# Effects of physical exercise interventions in frail older adults: a systematic review of randomized controlled trials



Nine RCT, 1067 elderly and frail patients, 71% women, mean age 82,5  
562 Community dwelling, 262 residential care, 243 hospital setting

**Multicomponent Exercise training (Resistance, Balance, Flexibility, Mobility)**

## Progressive resistance training

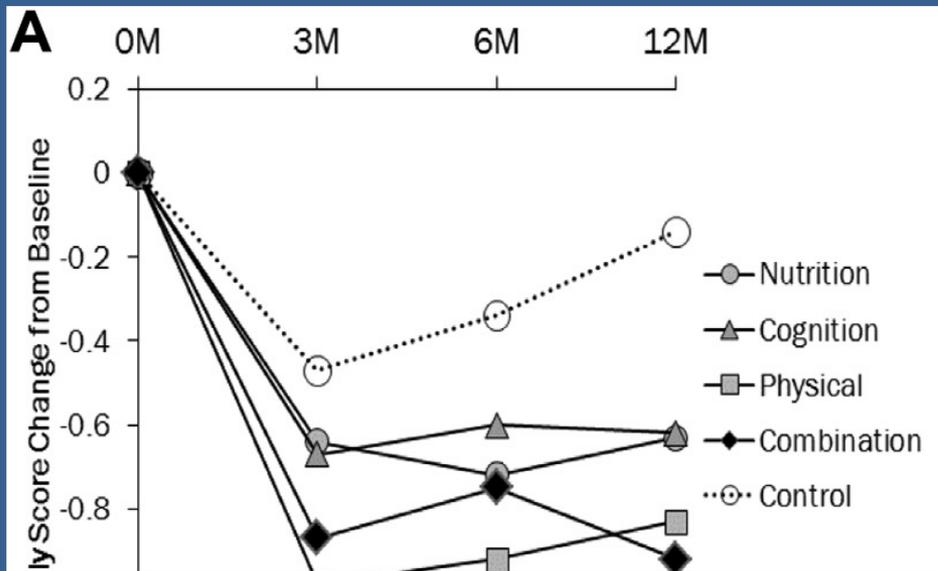
n. session	Length of sessions	set	n. repetitions	intensity	Program duration
2-3/week	20-90 min	1 to 3	6 to 12 repetitions	40-65% RM	3-12 mo



Falls	Mobility	Balance	Functional ability	Strenght	Body composition	Frailty
+++/- -	++++/- -	+/- -	++/- -	+++++/- -	++/- -	+

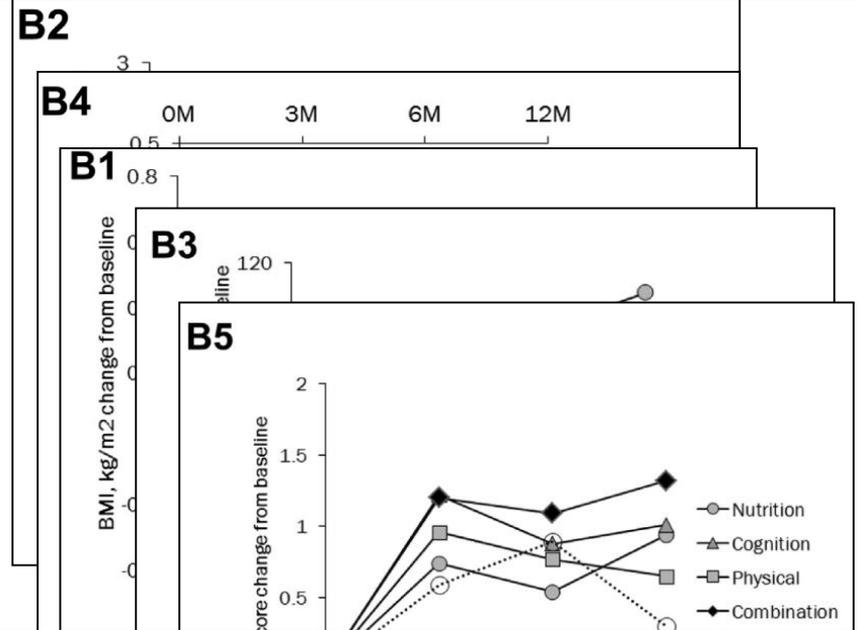
# Nutritional, Physical, Cognitive, and Combination Interventions and Frailty Reversal Among Older Adults: A Randomized Controlled Trial

246 Community-dwelling prefrail and frail (Fried) elderly; mean age 70 years  
 Interventions: physical, cognition, nutrition- 12 months follow up



No major differences between groups were found with respect to the secondary clinical outcomes, including hospitalization, falls, and ADL /IADL

Frailty



Energy

# Emerging modalities of CR delivery

## ICT Based Cardiac Rehabilitation

- Web-based mobile applications
- telephonic coaching
- computer technologies
- Internet
- Various wearable activity-tracking devices (e.g., pedometers and accelerometers)
- Home CR
- Hybrid models

Cardiac Rehabilitation week	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Mentoring sessions themes	Getting started Safety issues Chest Pain Medication Heart attack Goal setting	Activity Angina Smoking Worries Anxiety Relaxation	Sleep Relationship Family Sex Activity Depression	Weight issues Diet Exercise Smoking and medication	Cholesterol High blood pressure Diabetes Exercise Medication	Flu/ Pneumonia Exercise CPR Alcohol
StepCounter	Continuous use					
WellnessDiary	Daily entries					
Tele & Video conference (Mentor) Goals and Plans	Once a week					
SMS (text messages)	2/4 Per day					

Multifactorial individualized telehealth and community- or home-based cardiac rehabilitation are effective alternative models of cardiac rehabilitation, as they have produced similar reductions in cardiovascular disease risk factors compared with hospital-based programmes. *Clark RA. EJPC 2015; 22: 35–74*

# Conclusions

- Frail older adults benefit from exercise interventions, although the optimal program remains unclear and some benefits controversial
- Physical exercise, particularly strength exercise, is fully recommended in elderly people with chronic diseases and disabilities
- Future studies should clarify the outcome of exercise-based cardiac Rehabilitation in frail elderly, particularly concerning disability prevention, cognition and rehospitalization
- More studies in frail populations are needed to adapt the exercise training program to the frailty level in the setting of CR
- Strategies for reducing barriers and improve adherence to Cardiac Rehabilitation programs are needed in these patients