Ruolo della riabilitazione nel paziente anziano coronaropatico
Obiettivi della Cardiologia Riabilitativa multidisciplinare

A breve termine

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

Ridurre la progressione dell'aterosclerosi

Migliorare la capacità funzionale ed i sintomi

A medio-lungo termine

Migliorare la adesione:
- ai programmi di prevenzione secondaria
- alla terapia farmacologica

Ridurre il rischio di eventi cardiovascolari

Ridurre la progressione dell'aterosclerosi
Exercise-Based Cardiac Rehabilitation for Coronary Heart Disease
Cochrane Systematic Review and Meta-Analysis

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

Results consistent across case mix, type of CR, exercise dose, setting, publication year, study location

- Total mortality close to significant (decrease 9%) (CI: 0.82-1.01) in 20 studies with total and CV mortality
- Improvement in Quality of life

Population characteristics
- Age, yrs: 56.0 (49.3-71.0)
- Sex:
  - Males only: 18 (29)
  - Females only: 1 (2)
  - Both males and female: 41 (65)
  - Not reported: 3 (5)

Diagnosis:
- Post-myocardial infarction only: 31 (49)
- Revascularization only: 2 (3)
- Angina only: 5 (8)
- Mixed CHD population: 25 (40)
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
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

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Class</th>
<th>Level</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td>I</td>
<td>A</td>
<td>555, 556</td>
</tr>
<tr>
<td>Preventive programmes for therapy optimisation, adherence and risk factor management are recommended for stable patients with CVD to reduce disease recurrence.</td>
<td>I</td>
<td>B</td>
<td>557–560</td>
</tr>
<tr>
<td>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.</td>
<td>IIa</td>
<td>B</td>
<td>557, 558</td>
</tr>
<tr>
<td>Nurses and allied health professional led programmes should be considered to deliver CVD prevention across healthcare settings.</td>
<td>IIa</td>
<td>B</td>
<td>550–552, 561</td>
</tr>
</tbody>
</table>

## 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

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Class</th>
<th>Level</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is recommended that regular aerobic exercise is encouraged in patients with HF to improve functional capacity and symptoms.</td>
<td>I</td>
<td>A</td>
<td>321, 618–621</td>
</tr>
<tr>
<td>It is recommended that regular aerobic exercise is encouraged in stable patients with HFrEF to reduce the risk of HF hospitalization.</td>
<td>I</td>
<td>A</td>
<td>618, 619</td>
</tr>
<tr>
<td>It is recommended that patients with HF are enrolled in a multidisciplinary care management programme to reduce the risk of HF hospitalization and mortality.</td>
<td>I</td>
<td>A</td>
<td>622–625</td>
</tr>
<tr>
<td>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.</td>
<td>IIb</td>
<td>B</td>
<td>626, 627</td>
</tr>
<tr>
<td>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.</td>
<td>IIb</td>
<td>B</td>
<td>628, 629</td>
</tr>
<tr>
<td>Multiparameter monitoring based on ICD (IN-TIME approach) may be considered in symptomatic patients with HFrEF (LVEF &lt;35%) in order to improve clinical outcomes.</td>
<td>IIb</td>
<td>B</td>
<td>630</td>
</tr>
</tbody>
</table>
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 Monovaso

**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

<table>
<thead>
<tr>
<th>Author</th>
<th>Patients n./age</th>
<th>Diagnosis</th>
<th>Frailty criteria</th>
<th>Frailty %</th>
<th>Outcome (frail vs non frail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ekerstad N et al. Circulation. 2011;124:2397-2404.</td>
<td>Patients aged 75 years or older</td>
<td>NSTEMI</td>
<td>CSHA Clinical Frailty Scale &gt;5</td>
<td>48.5%</td>
<td>Frailty was independently associated with 1-year mortality after adjusting for CV risk and comorbidity (HR 4.3, 95% CI 2.4-7.8).</td>
</tr>
<tr>
<td>Sanchis J. et al. Am Heart J 2014;168:784-791</td>
<td>342 patients Mean age 77 years</td>
<td>ACS</td>
<td>Fried score &gt;3</td>
<td>Green score&gt;5 /12</td>
<td>Fried: 34%</td>
</tr>
<tr>
<td>Sujino Y et al. J Cardiol 2015;66:263-268.</td>
<td>62 patients aged &gt;85 years</td>
<td>STEMI</td>
<td>CSHA Clinical Frailty Scale &gt;6</td>
<td>35.5 %</td>
<td>CSHA-CFS &gt;6 (p=0.002, OR: 16.69) was an independent predictor of failure of discharge to home</td>
</tr>
<tr>
<td>White HD TRILOGY ACS investigators. Eur Heart J Acute Cardiovasc Care 2016;5:231-242.</td>
<td>4996 patients aged &gt;65 years</td>
<td>ACS</td>
<td>Fried score • Pre-frail (1-2 items) • Frail (≥3 items)</td>
<td>Frail: 4.7 %</td>
<td>Pre-frail: 23.0%</td>
</tr>
<tr>
<td>Graham MM et al. Canadian Journal of Cardiology 2013;29:1610-1615</td>
<td>183 patients aged 65 years</td>
<td>ACS</td>
<td>Edmonton Frail Scale score &gt;7</td>
<td>30%</td>
<td>Frailty, comorbidities and SF-36 improved prediction of death and death/MI over Mayo Clinic risk score</td>
</tr>
<tr>
<td>Singh M et al. Circ Cardiovasc Qual Outcomes 2011;4;496-502</td>
<td>628 patients aged &gt;65 years</td>
<td>PTCA</td>
<td>Fried score Intermediate frail (1-2 items) Frail (≥3 items)</td>
<td>Frail: 18.6 % Intermediate Frailty: 46 %</td>
<td>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</td>
</tr>
<tr>
<td>Murali-Krishnan R et al. Open Heart 2015;2:e000294</td>
<td>745 patients Mean age 62 years</td>
<td>PTCA</td>
<td>CSHA Clinical Frailty Scale score ≥5</td>
<td>Frail: 10.8 %</td>
<td>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&lt;0.001)</td>
</tr>
</tbody>
</table>
Frailty and cardiac rehabilitation: A call to action from the EACPR Cardiac Rehabilitation Nucleus

Carlo Vigorito¹, Ana Abreu², Marco Ambrosetti³, Romualdo Belardinelli⁴, Ugo Corrà⁵, Margaret Cupples⁶, Constantinos H Davos⁷, Stefan Hoefer⁸, Marie-Christine Iliou⁹, Jean-Paul Schmid¹⁰, Heinz Voeller¹¹,¹², and Patrick Doherty¹³

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 ultrasettantennne cardioperoperato

Elderly patient-centered rehabilitation after cardiac surgery

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

BPOMA

F = 15.5
p < 0.0001

GET-UP-AND-GO

F = 33.3
p < 0.0001

ARM CURL

F = 25.6
p < 0.0001

CHAIR STAND

F = 41
p < 0.0001

CHAIR SIT-AND-REACH

F = 8.7
p = 0.0002

BACK SCRATCH

F = 14.1
p < 0.0001

DISTANCE WALKED

F = 122
p < 0.0001

EUROQUOL

F = 36
p < 0.0001
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)

<table>
<thead>
<tr>
<th>n. session</th>
<th>Length of sessions</th>
<th>set</th>
<th>n. repetitions</th>
<th>intensity</th>
<th>Program duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-3/week</td>
<td>20-90 min</td>
<td>1 to 3</td>
<td>6 to 12 repetitions</td>
<td>40-65% RM</td>
<td>3-12 mo</td>
</tr>
</tbody>
</table>

Falls: +++/- -  
Mobility: ++++/- -  
Balance: +/ - -  
Functional ability: ++/- -  
Strength: +++++/- -  
Body composition: ++/- -  
Frailty: +

*de Labra C et al. BMC Geriatrics (2015) 15:154*
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

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

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.