New scientific advances in Cardiac Rehab

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Chairman
Cardiac Rehabilitation Section, EACPR

No conflict
Section Cardiac Rehabilitation, EACPR

promoting cardiac rehabilitation in Europe

www.escardio.org/EACPR
Quality of Care continuum in Cardiac Rehabilitation

Research

Guidelines

1994, 98, 2003, 07, ..12

Implementation

Position papers
Consensus doc.

Audit

EBM, meta-analyses, reviews

ECRIS

EuroCaReD

www.escardio.org/EACPR
The Joint European Guidelines on cardiovascular disease prevention

- They reflect the consensus arising from a multi-disciplinary partnership between the major European professional bodies
- to assist physicians and other health professionals to fulfil their role in this endeavour, to achieve effective preventive measures in day-to-day clinical practice

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Barriers to implementation
Pearson 1996; European Guidelines 4th Joint Task Force 2007

- Physician
- Patient (Person)
- Health Care Settings
- Community/Society
Enough of WHY, we need more NOW
Bengt Kayser - University of Geneva

• Humans are genetically programmed for “laziness” and excessive intake

The modern environment is toxic and “obesogenic”

• The health costing of inactivity and bad nutrition is getting excessive

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Geneva Stair Study
(Meyer 2010)

• Small changes, big effects:
  – From 5 to 20 floors/days for 3 months
  – < BMI, BP, cholesterol, body fat, waist circumference, physical activity ...

Original Scientific Paper

Stairs instead of elevators at workplace: cardioprotective effects of a pragmatic intervention
Philippe Meyer a, Bengt Kayser b, Michel P. Kossovsky b, Philippe Sigaud a, David Carballo a, Pierre-F. Keller a, Xavier Eric Martin c, Nathalie Farpour-Lambert c, Claude Pichard d and François Mach a

A= inactive
B= active
C= trained

Dose-response effect

minimum

Starting point

maximum
Secondary prevention through cardiac rehabilitation: from knowledge to implementation. A position paper from the Cardiac Rehabilitation Section of the European Association of Cardiovascular Prevention and Rehabilitation

Massimo Francesco Piepoli, Ugo Corrà, Werner Benzer, Birna Bjarnason-Wehrens, Paul Dendale, Dan Gaita, Hannah McGee, Miguel Mendes, Josef Niebauer, Ann-Dorthe Olsen Zwisler and Jean-Paul Schmid

Heart Failure Unit, Cardiac Department

Received 19 January 2009 Accepted 13 July 2009

Secondary prevention through cardiac rehabilitation: physical activity counselling and exercise training

Key components of the position paper from the Cardiac Rehabilitation Section of the European Association of Cardiovascular Prevention and Rehabilitation

EACPR Committee for Science Guidelines: Ugo Corrà (Chairperson), Massimo F. Piepoli, François Carré; Peter Heuschmann; Uwe Hoffmann; Monique Verschuren; Julian Halcox

Document Reviewers: Pantaleo Giannuzzi, Hugo Saner, David Wood
A Policy Statement from the EACPR

Practical Recommendation on How to Implement Cardiovascular Prevention in Clinical Practice

Aims

1. Descriptions of components, standards, outcome measures
2. To present systematic interventions capable to influence cardiovascular outcomes,
3. To describe initiatives and model of cares, based on life style and cardio-protective drug interventions

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Targets of Preventive Cardiology.

Preventive cardiology

Comprehensive professional lifestyle interventions

The apparently healthy individuals in the general population at high risk of developing CVD because of risk factors, (e.g. hypertension, dyslipidemia, diabetes)

Patients with established cardiovascular disease
Standards and Outcomes in Preventive Cardiology.

- Standards and outcomes measures
- Referral
- Quality of care
- Modalities and settings
- Process measures
- Audit and monitor process of response and progress
- Outcome analysis and quality improvement
- Discharge plan and long-term approach
Standards and Outcomes in Preventive Cardiology.

Standards and outcome measures

Process measures

Clinical, functional psychological assessment

Risk score assessment
Physical activity counseling
Exercise training
Diet nutritional counseling
Weight control
Lipid control
Blood pressure control
Smoking Cessation

Psycho-Social and behavioural
EuroCaReD

web-based electronic entry and database to prospectively collect data on the CR programmes and the patients enrolled across Europe
**EuroCaReD - Aims**

- Characteristics of patients referred to CR in Europe
- Characteristics and effects of different CR programmes in Europe
- Comparison of CR in Europe with other intervention programmes
- Comparison of *EuroCaReD* with other registries and surveys
EuroCaReD - countries and patients

31 March 2011

8 countries
1236 patients

Russia
Denmark
Belgium
Germany
Austria
Switzerland
Spain
Greece
Effects of Exercise Training on Myocardial Perfusion and Left Ventricular Function After Acute Myocardial Infarction: a Gated SPECT Imaging Study

F. Giallauria, W. Acampa, A. Vitelli, L. Maresca, M. Mancini, A. Grieco, A. Cuocolo, C. Vigorito

University of Naples “Federico II”
STUDY DESIGN

Cardiopulmonary Exercise Testing (CPX)
Gated Single Photon EmissionComputed Tomography (SPECT)

Exercise-based Cardiac Rehabilitation Program

Usual Care

6m Hospital OP-based exercise-training program 3 time/week. Each session: 30 minute on a bicycle ergometer -60-70% VO2peak

TRAINING GROUP (n=24)

CONTROL GROUP (n=26)

RANDOMIZATION

50 consecutive patients after acute ST elevation myocardial infarction

BASELINE

6-MONTH FOLLOW-UP

www.escardio.org/EACPR
# RESULTS -1
CARDIOPULMONARY STRESS TESTING

<table>
<thead>
<tr>
<th></th>
<th>Training Group (n=24)</th>
<th>P value</th>
<th>Control Group (n=26)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>6 months</td>
<td>Baseline</td>
<td>6 months</td>
</tr>
<tr>
<td>( \text{VO}_2 \text{peak} ) (ml/kg/min)</td>
<td>13.9 ± 3.4</td>
<td>17.0 ± 4.6</td>
<td>&lt;.000</td>
<td>14.2 ± 4.5</td>
</tr>
<tr>
<td>( \text{VE/VE} \text{CO}_2 \text{slope} )</td>
<td>30.3 ± 4.1</td>
<td>27.9 ± 3.2</td>
<td>&lt;.00</td>
<td>30.1 ± 3.8</td>
</tr>
<tr>
<td>( \text{O}_2 \text{ pulse} ) (ml/beat)</td>
<td>9.9 ± 2.4</td>
<td>11.1 ± 2.4</td>
<td>&lt;.05</td>
<td>10.1 ± 3.3</td>
</tr>
</tbody>
</table>

Trained patients showed a significant improvement in all cardiopulmonary parameters compared to untrained patients.
## RESULTS - 2
### GATED SPECT LEFT VENTRICULAR FUNCTION

<table>
<thead>
<tr>
<th></th>
<th>Training Group (n=24)</th>
<th>P value</th>
<th>Untrained Group (n=26)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>6 months</td>
<td>Baseline</td>
<td>6 months</td>
</tr>
<tr>
<td><strong>AT REST</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDV (ml/m²)</td>
<td>117.7 ± 38.0</td>
<td>117.2 ± 37.6</td>
<td>0.88</td>
<td>110.8 ± 31.8</td>
</tr>
<tr>
<td>ESV (ml/m²)</td>
<td>65.8 ± 28.8</td>
<td>62.8 ± 30.2</td>
<td>0.29</td>
<td>61.3 ± 27.8</td>
</tr>
<tr>
<td>LVEF (%)</td>
<td>45.8 ± 8.4</td>
<td>48.4 ± 9.6</td>
<td>0.10</td>
<td>46.2 ± 9.8</td>
</tr>
<tr>
<td>WMSI</td>
<td>21.4 ± 9.6</td>
<td>16.4 ± 9.7</td>
<td>0.005</td>
<td>23.3 ± 13.7</td>
</tr>
<tr>
<td>WTSI</td>
<td>14.3 ± 7.6</td>
<td>11.2 ± 6.7</td>
<td>0.02</td>
<td>15.9 ± 12.4</td>
</tr>
<tr>
<td><strong>STRESS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDV (ml/m²)</td>
<td>120.3 ± 41.2</td>
<td>120.2 ± 42.1</td>
<td>0.98</td>
<td>111.5 ± 31.2</td>
</tr>
<tr>
<td>ESV (ml/m²)</td>
<td>66.7 ± 30.1</td>
<td>65.9 ± 31.2</td>
<td>0.81</td>
<td>60.3 ± 27.2</td>
</tr>
<tr>
<td>LVEF (%)</td>
<td>46.7 ± 10.2</td>
<td>48.9 ± 9.9</td>
<td>0.30</td>
<td>47.3 ± 8.7</td>
</tr>
<tr>
<td>WMSI</td>
<td>22.3 ± 10.2</td>
<td>14.6 ± 9.9</td>
<td>0.002</td>
<td>23.2 ± 10.2</td>
</tr>
<tr>
<td>WTSI</td>
<td>15.8 ± 9.5</td>
<td>9.7 ± 6.9</td>
<td>0.003</td>
<td>16.1 ± 10.1</td>
</tr>
</tbody>
</table>
RESULTS - 3
GATED SPECT MYOCARDIAL PERFUSION

Training Group (n=24)

Untrained Group (n=26)
Adherence to cardioprotective drugs after CR programs after coronary revascularization: data from Icaros study

M. Ambrosetti et al.

THE ITALIAN SURVEY ON CARDIAC REHABILITATION AND SECONDARY PREVENTION AFTER CARDIAC REVASCULARIZATION

www.escardio.org/EACPR
Adherence to cardioprotective drugs after CR programs after coronary revascularization: data from Icaros study

M. Ambrosetti et al.

<table>
<thead>
<tr>
<th>Metric</th>
<th>Nº pts</th>
<th>1 year Mean (DS)</th>
<th>Patients at Target at 1 year (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>1089</td>
<td>22.7 (3.2)</td>
<td>62.9</td>
</tr>
<tr>
<td>WC males</td>
<td>838</td>
<td>98.7 (10.5)</td>
<td>68.3</td>
</tr>
<tr>
<td>WC females</td>
<td>219</td>
<td>94.2 (12.4)</td>
<td>31.5</td>
</tr>
<tr>
<td>BP Systolic</td>
<td>1090</td>
<td>127 (13.7)</td>
<td>71.9</td>
</tr>
<tr>
<td>BP Diastolic</td>
<td>1090</td>
<td>75.1 (8.5)</td>
<td>86.7</td>
</tr>
<tr>
<td>Total Cholesterol</td>
<td>1042</td>
<td>162.8 (33.2)</td>
<td>66.6</td>
</tr>
<tr>
<td>LDL-Cholesterol</td>
<td>735</td>
<td>91.2 (28.3)</td>
<td>69.3</td>
</tr>
<tr>
<td>LDL-Chol. in diabetic pts</td>
<td>299</td>
<td>89.8 (31.3)</td>
<td>43.8</td>
</tr>
<tr>
<td>HDL-Cholesterol</td>
<td>1037</td>
<td>46.1 (11.9)</td>
<td>72.3</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>1037</td>
<td>128.5 (57.5)</td>
<td>92.1</td>
</tr>
<tr>
<td>FG</td>
<td>737</td>
<td>95.3 (13.1)</td>
<td>90.4</td>
</tr>
<tr>
<td>FG in diabetic pts</td>
<td>304</td>
<td>129.8 (39.5)</td>
<td>60.5</td>
</tr>
<tr>
<td>HbA1c</td>
<td>262</td>
<td>7.07 (1.79)</td>
<td>60.1</td>
</tr>
</tbody>
</table>

Target: BMI 20-25; WC male <102cm, female <88cm; systolic blood pressure 130mmHg, diastolic blood pressure 80mmHg; total cholesterol ≤175mg/dl; LDL <100mg/dl; LDL in diabetic pts <80 mg/dl; HDL >40 mg/dl; triglycerides <200 mg/dl; FG <110mg/dl; FG in diabetic pts <130mg/dl; hemoglobin A1c ≤7%
SBP changes during recovery

Dritsas et al (2001)

Heart rate changes during recovery

Dritsas et al (2001)

waiting with music prior to exercise test

Dritsas et al (2001)

musical therapy as cardiac rehabilitation programs in future

Dritsas, Athens
Telemonitoring in CR
S. Scalvini – Fondazione S Maugeri, Italy

1. Case Definition
2. Patient’s evaluation
3. Therapeutic objectives
4. Development of a care plan
5. Monitoring
6. Patient’s education
7. Appropriate use of the services
Methods

1. Patients in Tele-training: 3-5 times/week

2. Devices, ECG and BP telemonitoring

3. Service Center

4. Nurse-tutor

2° opinion consultation

S. Scalvini, EuroPRevent 2011, Geneve 14 April 2011
Cardiac Rehabilitation Training Course
Bern Sept 2010
Bern 17-22 Sept 2012

Exercise Rehabilitation and Long Term Management of Heart Failure Patients
27th October – 29th October 2011

http://www.escardio.org/
EuroPREvent
The European Meeting Place for Science in Preventive Cardiology

Audit
Research
Guidelines

Implementation

Dublin
Ireland
3-5 May 2012

4 November 2011
Abstract Submission

6 February 2012
Early bird Registration

2 April 2012
Advance Registration

FROM RESEARCH TO IMPLEMENTATION

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