Daily physical activity levels in cardiac rehabilitation program participants

Makoto AYABE
Doshisha University
Wake Forest University
Appreciate for your helps
Core Competencies for Cardiac Rehabilitation/Secondary Prevention Professionals: 2010 Update

Physical activity counseling

Ability to perform the following:

• Assess current physical activity level using both questionnaires and available activity-monitoring devices
• Assist patients in setting realistic incremental goals for future physical activity
• Recommendations for increasing the level of safe and appropriate daily physical activity and structured exercise
• Assess physical and metabolic requirements for activities of daily living, occupational, and recreational activities
• Communication/behavioral strategies that will improve compliance with regular physical activity recommendations
• Measure and report outcomes for physical activity at the conclusion of rehabilitation
Associations between average exercise energy expenditure per session and total cholesterol (top) and LDL cholesterol (bottom) in women.

Energy expenditure per session in CRP is not enough to obtain maximal benefits

Energy Expenditure (kcal/session)

- 64.8 yr. (Schairer et al., 1998, JCR.)
- <65 yr. (Savege et al., 2000, AHJ)
- >65yr. (Savege et al., 2000, AHJ)
Accelerometer; Objective assessment of amount and intensity of daily physical activity

LifeCorder can accurately assess intensity and amount of daily physical activity.

Fig. 5. The relationship between measured metabolic equivalents (MET) and the activity levels recorded by the accelerometer (LifeCorder; Suzuken Co. Ltd, Nagoya, Japan) at a velocity ranging from 2.4 to 7.8 km/h (n 10) (study 2). For details of subjects and procedures, see Table 1 and p. 237. The quadratic equation regression was calculated as follows: $r^2 = 0.929; P<0.001$, standard error of the estimate 0.46 MET.

Accelerometer; Objective assessment of amount and intensity of daily physical activity
The Physical Activity Patterns of Cardiac Rehabilitation Program Participants

Table 2: The Amount and Intensity of Daily Physical Activity in Cardiac Rehabilitation Participants

<table>
<thead>
<tr>
<th></th>
<th>All (n = 77)</th>
<th>Men (n = 53)</th>
<th>Women (n = 24)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (SD)</td>
<td>Range</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Amount*, kcal/day</td>
<td>228 (121)</td>
<td>57–651</td>
<td>254 (125)</td>
</tr>
<tr>
<td>Light, min/day</td>
<td>54 (18)</td>
<td>24–103</td>
<td>55 (19)</td>
</tr>
<tr>
<td>Moderate, min/day</td>
<td>17 (15)</td>
<td>0–80</td>
<td>19 (16)</td>
</tr>
<tr>
<td>Vigorous, min/day</td>
<td>1 (2)</td>
<td>0–11</td>
<td>1 (2)</td>
</tr>
</tbody>
</table>

Amount, amount of physical activity. Light, time spent for light intensity physical activity corresponding to < 3 METs. Moderate, time spent for moderate intensity physical activity corresponding to 3 to 6 METs. Vigorous, time spent for vigorous intensity physical activity corresponding to > 6 METs.

*Significant difference between men and women at P < .05.

Ayabe et al. JCR (2004)
The Physical Activity Patterns of Cardiac Rehabilitation Program Participants

Variation of physical activity levels by accelerometer averaged every 2 minutes over a 24-hour period on a cardiac rehabilitation program day and a non-CRP day.

Ayabe et al. JCR (2004)
The Physical Activity Patterns of Cardiac Rehabilitation Program Participants

Comparison MET) between CRP period (7 to 9 AM) and the non-CRP period (9 AM to midnight).

Ayabe et al. JCR (2004)
The Physical Activity Patterns of Cardiac Rehabilitation Program Participants

Comparison of the calorie expenditure, the time spent in physical activity at light and moderate-to-vigorous intensity between CRP days and non-CRP days.

Ayabe et al. JCR (2004)
The Physical Activity Patterns of Cardiac Rehabilitation Program Participants

• The amount of physical activity was generally adequate on CRP days, but failed to reach target levels on non-CRP days.
• CRP participants, when it is medically appropriate, should be encouraged to incorporate lifestyle physical activity, additional exercise, or both on non-CRP days to supplement their caloric expenditure from CRP exercise sessions.

Ayabe et al. JCR (2004)
Target Step Count for the Secondary Prevention of Cardiovascular Disease

Steps; Alternative assessment of MVPA?

<table>
<thead>
<tr>
<th></th>
<th>Accelerometer</th>
<th>Pedometer</th>
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<tbody>
<tr>
<td>Intensity of PA</td>
<td>☆</td>
<td></td>
</tr>
<tr>
<td>Amount of PA</td>
<td>☆</td>
<td>☆</td>
</tr>
<tr>
<td>Accuracy</td>
<td>☆</td>
<td></td>
</tr>
<tr>
<td>Cost</td>
<td></td>
<td>☆</td>
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<tr>
<td>Data treatment</td>
<td></td>
<td>☆</td>
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<tr>
<td>User-friendly</td>
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<td>☆</td>
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</table>
Target Step Count for the Secondary Prevention of Cardiovascular Disease

Steps; Alternative assessment of MVPA?

Relationship of the step counts with physical activity energy expenditure (PAEE) and the time spent in moderate to vigorous intensity physical activity (MVPA) by participants in a cardiac rehabilitation program.

How do patients accumulate MVPA?
Self-monitoring moderate-vigorous physical activity versus steps/day is more Effective in chronic disease exercise programs

Simple MVPA monitor (MIN) vs Pedometer (STE)

Baseline (1 week) and follow-up (4 weeks) group levels of steps/day for self-monitored minutes of moderate- to vigorous intensity physical activity versus steps/day.

Both group significantly improved steps.

How do patients accumulate MVPA?

Self-monitoring moderate-vigorous physical activity versus steps/day is More Effective in chronic disease exercise programs

Simple MVPA monitor (MIN\(\triangle\)) vs Pedometer (STE\(\uparrow\))

The MIN significantly improved MVPA, but not in STE.

How do patients accumulate MVPA?
Self-monitoring moderate-vigorous physical activity versus steps/day is More Effective in chronic disease exercise programs

• Individuals with chronic disease conditions can more effectively increase levels of physical activity, expressed as both MVPA/day and steps/day, by self-monitoring MVPA rather than STE.

Conclusion

- The CRP participants generally failed to reach target levels of PA due to the lower PA levels in non-CRP days.
- The activity monitors (pedometers, accelerometer, etc) would be an useful optional tool to maximize current guidelines of PA.
Acknowledgements

Co-investigators

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