Exercise intensity for Aerobic Exercise.
The following are guidelines. A key issue relates to the individual and how that individual responds to an exercise challenge. Ref: Modified from Centers for Disease Control and Prevention (2008)

<table>
<thead>
<tr>
<th>Test/activity</th>
<th>Light</th>
<th>Moderate</th>
<th>Vigorous</th>
</tr>
</thead>
<tbody>
<tr>
<td>% HR max</td>
<td>35-54</td>
<td>55-69</td>
<td>&gt;70</td>
</tr>
<tr>
<td>% HRR or % VO₂max</td>
<td>20-39</td>
<td>40-59</td>
<td>&gt;60</td>
</tr>
<tr>
<td>MET level</td>
<td>&lt;3</td>
<td>3 to &lt;6</td>
<td>≥6</td>
</tr>
<tr>
<td>Perception of heart rate and breathing</td>
<td>Minimal increases</td>
<td>Noticeable increases</td>
<td>Substantial increases</td>
</tr>
<tr>
<td>Talk test</td>
<td>Could sing</td>
<td>Comfortable conversation</td>
<td>Winded, too out of breath to share a conversation</td>
</tr>
<tr>
<td>Borg’s 20 point RPE (Borg, 1998)</td>
<td>&lt;12</td>
<td>12-14 “somewhat hard”</td>
<td>15-20 ≥ “heavy (hard)”</td>
</tr>
<tr>
<td>Borg’s CR-10 Perceived exertion (Borg, 1998)</td>
<td>0-3 “easy”</td>
<td>4-6 “somewhat strong” to “strong (heavy)”</td>
<td>7-10 ≥ “very strong”</td>
</tr>
<tr>
<td>Walking</td>
<td>Slow</td>
<td>Brisk</td>
<td>Race walking</td>
</tr>
<tr>
<td>Golf</td>
<td>Power cart</td>
<td>Pull cart</td>
<td>Carry clubs</td>
</tr>
<tr>
<td>Swimming</td>
<td>Treading water</td>
<td>Recreational swim</td>
<td>Fast lap swim</td>
</tr>
<tr>
<td>Gardening</td>
<td>Pruning</td>
<td>Power mower</td>
<td>Hand mower</td>
</tr>
<tr>
<td>Housework</td>
<td>Dusting &amp; vacuuming</td>
<td>Scrubbing floors, washing windows</td>
<td>Moving furniture</td>
</tr>
</tbody>
</table>

PAR-Q
Ref: Canadian Society for Exercise Physiology (2002)
The PAR-Q use is restricted to the format available from http://uwfitness.uwaterloo.ca/PDF/par-q.pdf Use the standard form when screening subjects.

According to Howley and Franks (2007), question 5 on the PAR-Q: “Do you have a bone or joint problem (for example, back, knee, hip) that could be made worse by a change in your physical activity?” elicits a large number of false positives.

In some instances the PAR-Q may elicit insufficient information to assess risk associated with the protocol (e.g., a participant with an implanted electronic device must not be tested using bioelectric impedance) or a targeted population (e.g., participants who have asthma are at greater risk during vigorous activity). In these instances use the Health History Questionnaire3.


3 Health History Questionnaire (HHQ)  

Refer to ACSM (2014, p. 25) for an example of a health history questionnaire. This questionnaire is used to determine known disease, signs and symptoms, and coronary artery disease risk (CAD) factors. The health history questionnaire must also include protocol-specific questions to identify additional risks associated with the protocol (e.g., a participant with an implanted electronic device must not be tested using bioelectric impedance) or a targeted population (e.g., older adults may be at greater risk for falling in a weight bearing activity).

4 Major Signs and Symptoms or Known Disease or Condition

1. Major signs or symptoms suggestive of CV, Pulmonary or Metabolic Disease:
   a. Pain, discomfort in the chest, neck, jaw, arms or other areas that may result from ischemia.
   b. Shortness of breath at rest or with mild exertion.
   c. Dizziness or fainting
   d. Difficulty breathing when lying down or during sleep
   e. Swelling in one or both ankles
   f. Heart rate irregularities
   g. Acute cramp like pain in muscles when exercising that subsides when exercise is stopped
   h. Known heart murmur
   i. Unusual fatigue or shortness of breath with usual activities

2. Known Disease or Condition
   a. Cardiovascular: cardiac, peripheral vascular, or cerebrovascular disease
   b. Pulmonary: COPD, asthma, interstitial lung disease, or cystic fibrosis
   c. Metabolic: Diabetes mellitus (Types 1 and 2) or renal disease


d. Thyroid or Liver disease

e. Other considerations (e.g., pregnancy)

5 Coronary Artery Disease Risk Factors  

Ref: ACSM (2010, 2014)

1. Age: men ≥45 years, women ≥55 years.
2. Family History of heart disease: Sudden death, heart attack or coronary revascularization surgery in one or more close relative. Father or brother younger than 55 yr; mother or sister younger than 65 yr.
3. Cigarette Smoking: Current smoker or having quit within the last 6 months, or exposed to environmental tobacco smoke.
4. Sedentary lifestyle: Not participating in at least 30 min of moderate intensity physical activity on at least three days of the week for at least three months.
5. Obesity: BMI ≥30 kg/m² or waist girth > 102 cm (40 inches) for men and > 88 cm (35 inches) for women. Allied health professionals ought to use clinical judgment when evaluating this risk factor as thresholds for obesity vary. Individuals with large muscle mass may have a high BMI and waist circumference in the absence of obesity.
6. *High Blood Pressure: On medication for blood pressure OR blood pressure at or above 140/90 mmHg (either number high) on ≥2 occasions.
7. *Blood lipids: On medication for lowering blood lipids OR one of the following: LDL (bad) cholesterol over ≥130 mg/dl; or HDL (good) cholesterol <40 mg/dl. If only total cholesterol level available: use ≥200 mg/dl;
8. *Prediabetes. Impaired fasting glucose ≥100 mg/dl but <126 mg/dl or impaired glucose tolerance test ≥140 mg/dl but <200 mg/dl on ≥2 occasions. Note: glucose >126 mg/dl represents a symptom of metabolic disease, not a risk factor.
Notes:
1. *Blood pressure, blood lipids and glucose should be confirmed on ≥ 2 occasions.
2. If HDL cholesterol ≥ 60 mg/dl, subtract one risk factor from total.
3. If information for a risk factor is not available it should be counted as a risk except for prediabetes. Count missing glucose as a risk factor for men and women ≥45 years w/ BMI ≥25 kg/m²; and for men and women under 45 who have a BMI ≥25 kg/m² and have one or more additional risk factors for prediabetes (e.g. excess abdominal fat, inactivity, family history of diabetes mellitus).
4. Missing values are not considered a risk factor if the person has had an assessment of the risk factor (e.g., blood pressure, cholesterol, etc.), does not know his or her numbers, but was told they were acceptable in the past year.


**The Exercise Decision Trees serve as guidelines for the Institutional Review Board. If a researcher wishes to deviate from the guidelines s/he must provide justification for any modifications.**
REFERENCES FOR AEROBIC EXERCISE DECISION TREE FOR ADULTS


