Dear Alice,

I've seen a gazillion articles lately about exercising for "30 minutes at moderate intensity," but they always describe moderate intensity as walking at 4 miles an hour. I can't walk at 4 miles an hour because of mechanics; my legs seem to be just the length to have to switch from walking to jogging at about 4 miles an hour, so I can't do the walk to be able to figure out what "moderate intensity" feels like. Can you give any other measure for what is "moderate" and what is "intense"? percentage of maximum heart rate or METS or anything like that?

?Confused

Answer

Dear Confused,

The American College of Sports Medicine (ACSM) defines exercise intensity by percentage of maximum heart rate, rate of perceived exertion, and METS (metabolic equivalents) in their Position Stand, *Recommended Quantity and Quality of Exercise for Development and Maintenance of Cardiorespiratory and Muscular Fitness and Flexibility in Healthy Adults*. Moderate activity has been defined as 55 - 69 percent of maximum heart rate (MHR). ACSM defines "hard" exercise at 70 - 89 percent MHR, and "very hard" at 90 percent and above, with 100 percent being maximal exertion. Check out Minimum and maximum heart rate for aerobic exercise in the *Go Ask Alice!* archive to learn the calculations and more.

You can also use the "Rate of Perceived Exertion" (RPE), a subjective rating that a person can use to rate his or her exercise intensity. If someone doesn't have any other way to rate workout intensity (i.e., has no watch to use to count heartbeats, or doesn't know how fast s/he is walking or running), RPE is a low-tech method of determining this calculation. For example, a person can consider walking at a leisurely pace a 6, and perhaps a mad dash to catch a bus or a flyaway $100 bill a 19; so, rating activity in-between is a way to rate one's exercise intensity. The ACSM Position Stand uses the original scale from 6 - 19 to identify the perceived level of difficulty of physical activity, as follows:

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 - 8</td>
<td>Very, very light</td>
</tr>
<tr>
<td>9 - 10</td>
<td>Very light</td>
</tr>
<tr>
<td>11 - 12</td>
<td>Fairly light</td>
</tr>
</tbody>
</table>
Moderate intensity, using this scale of a person's self-perception of his or her own exercise difficulty, is 12 - 13, hard exercise is 14 - 16, and very hard activity is at 17-19.

The last measure ? METS ? has nothing to do with baseball players from New York; instead, it refers to metabolic equivalents. One MET is equivalent to your resting metabolic rate; 2 METS is any activity that requires two times your metabolic rate, etc. This measure is determined by the amount of oxygen consumed, which indicates the level of intensity a person is working. At 1 MET, an average man would be consuming 250 milliliters (ml) of oxygen per minute; an average woman would be consuming 200 ml of oxygen per minute. For those of you who wish to be even more exact, one MET is equal to 3.5 ml of oxygen per kilogram (kg) of body weight per minute (1 kg = 2.2 pounds). Since we are not going around measuring how much oxygen a person's body is consuming, assigning a MET equivalent can give us an idea as to how intense an activity is. At 1 MET (resting metabolic rate), a 55 kg female would use about 60 calories per hour, and a 65 kg male would use about 70 calories per hour. Two METS would be double that intensity, or consuming twice the amount of oxygen than at 1 MET. In other words, 2 METS means that one is working at twice his or her resting metabolic rate (which is relatively easy or achievable), 3 METS is 3 times someone's resting metabolic rate, and so on.

The ACSM rates moderate intensity using METS as decreasing with age. For men, moderate intensity by age is:

<table>
<thead>
<tr>
<th>AGE (years)</th>
<th># METS (moderate)</th>
<th># METS (hard)</th>
<th># METS (very hard)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-39</td>
<td>4.8 - 7.1</td>
<td>7.2 - 10.1</td>
<td>&gt;10.2</td>
</tr>
<tr>
<td>40-64</td>
<td>4.0 - 5.9</td>
<td>6.0 - 8.4</td>
<td>&gt;8.5</td>
</tr>
<tr>
<td>65-70</td>
<td>3.2 - 4.7</td>
<td>4.8 - 6.7</td>
<td>&gt;6.8</td>
</tr>
<tr>
<td>80 and over</td>
<td>2.0 - 2.9</td>
<td>3.0 - 4.25</td>
<td>&gt;4.25</td>
</tr>
</tbody>
</table>

For women, mean values are 1 - 2 METS lower than for men.

Some examples of how METS are associated with activity are as follows:

<table>
<thead>
<tr>
<th>METS</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>resting quietly, watching TV, reading</td>
</tr>
<tr>
<td>1.5</td>
<td>eating, writing, desk work, driving, showering</td>
</tr>
<tr>
<td>2</td>
<td>light moving, strolling, light housework</td>
</tr>
<tr>
<td>3</td>
<td>level walking (2.5 mph), cycling (5.5 mph), bowling, golfing using a cart, heavy housework</td>
</tr>
</tbody>
</table>
The Centers for Disease Control and Prevention (CDC) standards for moderate activity are more succinct, defining moderate intensity as an activity allowing for sustained, rhythmic movements that are carried out at:

- an RPE of 11 - 14, or
- 3 - 6 METS, or
- 3.5 - 7.0 calories expended per minute (The number of calories per minute depends on a person's estimated body weight, fitness level, and intensity. Many charts are on the Internet that calculate energy expenditure for various activities, including the Fitness Partner calculator[^3]. An abundance of software, as well as exercise books, are also available for people who want to track this measure.)

Examples of such activity as defined by the CDC include mowing the lawn, dancing, swimming, or biking on a level surface.

Hope these explanations motivate you into moderate activity, so you can reap all its benefits.

[^3]: [Fitness Partner calculator](http://www.fitnesspartner.com)

### Related questions

- CU Move ? Columbia's physical activity program [^7]
- Measuring your basic metabolic rate [^8]
- Are exercise equipment calculations reliable? [^9]
- Can you predict your heart rate when exercising? [^10]

[^7]: [CU Move](http://www.columbia.edu/cu_move)
[^8]: [Measuring your basic metabolic rate](http://www.columbia.edu/cu_move/metabolic_rate.html)
[^10]: [Can you predict your heart rate when exercising?](http://www.columbia.edu/cu_move/heart_rate.html)
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Source URL: http://www.goaskalice.columbia.edu/answered-questions/what-exactly-does-moderate-intensity-mean#comment-0

Links