

**Summary:** Aerobic capacity is the most important fitness measure. It is the maximum amount of oxygen you can consume at a high intensity exercise intensity. It is a measure of aerobic ability, functional capacity, and power. It is also known as VO2 Max. It is expressed as METS and milliliter of oxygen/kilogram of body weight/per minute of exercise. Aerobic capacity can be used to determine whether you are at risk of developing heart disease. High aerobic fitness is linked with longevity and endurance performance.

An easy test is to warm up and do two or three incremental stages of 3 minutes on an exercise machine and then achieve your peak intensity (METS, WATTS, or MPH/ INCLINE) that you can **SUSTAIN** for 3 minutes. Then take that number and convert it to METS and see how you score in MET chart provided. Also, see sub maximal version. ***Read on for details.***



## PERFORMANCE 101: How can I determine my aerobic fitness?



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In simplest terms, aerobic capacity is the maximum amount of oxygen you can consume at a high intensity exercise intensity. When you perform any form of exercise, your lungs take in oxygen from the air you breathe. From the lungs, your body delivers oxygen to your bloodstream. From there, your heart and blood vessels move that oxygen to your skeletal muscles, allowing them to go to work. Think of aerobic capacity as the volume of oxygen pumped through your body in a given amount of time. It is highly impacted by genetic factors, age, gender, and bodyweight. If you start a regular exercise program, your overall oxygen consumption (and efficiency) will increase. In other words, the faster, and more efficiently you can pump oxygen through your body, the more capable your body will be at handling high-intensity exercise. Why knowing your aerobic capacity matters. It is valuable because it helps you gauge improvements in your cardio fitness level. Aerobic capacity can be used to determine whether you are at risk of developing heart disease, high blood pressure (hypertension), or other risk factors. High aerobic fitness is linked with longevity and the endurance performance. With resistance training aka strength training you can track improvements through increases in strength, such as weight lifted. It's difficult to note improvements in aerobic exercise, such as HIIT workouts., unless you are timing yourself over a distance. As mentioned, if your can do the same WATTS, METS, MPH, at the same RPE (rating of perceived exertion) you are getting fitter. But some people want a defined number or rating to judge where they stand. There are many tests available but I feel the test below is the easiest and can be done at either a sub maximal or maximal level, where the maximal test is most accurate.

- A. Choose a Machine to test yourself on (treadmill, bike, elliptical). Make sure you are healthy enough to test yourself (See PAR Q Form).**
- B. Choose an Intensity: non-maximal intensity **A. (Non-PEAK)** or maximal intensity **B. (PEAK)**. If **Non-PEAK work at a Somewhat Difficult to Difficult Level (RPE of 5-6 see chart)**. If **PEAK work at a MAXIMAL Level**. I suggest the **Non-PEAK Test** for most. Only people who consider themselves fit should attempt a **PEAK Test**.**
- C. Find the highest Intensity you can sustain for 3 minutes after a warm up period of 2-3 incremental 2-3 minute stages (INTENSITY VALUES=METS, WATTS, MPH & INCLINE). Most exercise machines display a MET value. If you used WATTS use a calculation to convert to METS (see calculation, must include body weight). If you used MPH/INCLINE use a calculation to convert to METS (see calculation, must include body weight).**
- D. Compare your MET Intensity to Chart Below. If you did a Non-PEAK Test multiply that MET value by 1.3.**
- E. If your MET value was <20 percentile your health may be at risk because of low fitness. If between 30-50 percentile you are in a somewhat healthy category. If between 50-70 your are in a Fit Category. If 70 percentile and greater you are in a high fitness category.**

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## Simple way to determine Aerobic Fitness STEPS A-E.



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- D. Compare your MET Intensity to Chart Below. If you did a **Non-PEAK Test multiply that MET value by 1.3**.
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### WHAT MET VALUE DID YOU SUSTAIN? What are METS?

#### Aerobic Capacity Testing for Women

Maximum Aerobic Capacity Achieved (in METs) by age

Percentile	20-29	30-39	40-49	50-59	60+
• 90	12.5	11.7	11.3	10.1	10.0
• 80	11.7	11.0	10.4	9.2	8.9
• <b>70</b>	<b>10.9</b>	<b>10.5</b>	<b>9.7</b>	<b>8.8</b>	<b>8.4</b>
• <b>50</b>	<b>10.0</b>	<b>9.7</b>	<b>8.8</b>	<b>8.1</b>	<b>7.4</b>
• <b>30</b>	<b>9.2</b>	<b>8.7</b>	<b>8.1</b>	<b>7.3</b>	<b>6.8</b>
• 10	8.1	7.6	7.2	6.4	6.0

#### Aerobic Capacity Testing for Men

Maximum Aerobic Capacity Achieved (in METs) by age

Percentile	20-29	30-39	40-49	50-59	60+
• 90	14.7	14.4	13.8	12.9	12.1
• 80	13.8	13.4	12.6	11.7	10.9
• <b>70</b>	<b>13.4</b>	<b>12.7</b>	<b>11.9</b>	<b>11.0</b>	<b>10.1</b>
• <b>50</b>	<b>12.1</b>	<b>11.7</b>	<b>10.9</b>	<b>10.1</b>	<b>9.1</b>
• <b>30</b>	<b>11.3</b>	<b>10.7</b>	<b>10.0</b>	<b>9.2</b>	<b>8.2</b>
• 10	9.9	9.3	8.8	8.0	6.6

<b>10</b>	<b>EXTREMELY HARD MAX!</b>	Gasping for Air Sustain 5-20 Seconds
<b>9</b>	<b>VERY, VERY HARD</b>	Breathless, Very Labored Sustain ~1 Minute
<b>8</b>	<b>VERY HARD</b>	Cannot Talk, Labored Sustain a Few Minutes
<b>7</b>	<b>HARD</b>	Deep Forced Breathing Sustainable
<b>6</b>	<b>MODERATELY HARD</b>	Deep Breathing Talking is Challenging
<b>5</b>	<b>SOMEWHAT HARD</b>	Heavy Breathing
<b>4</b>	<b>MODERATE</b>	Talking is Uncomfortable
<b>3</b>	<b>EASY</b>	Light Rhythmic Breathing Can Maintain for Hours
<b>2</b>	<b>VERY EASY</b>	Can Talk in Complete Sentences
<b>1</b>	<b>VERY, VERY EASY</b>	Restful Breathing Can Sing



If you determined your aerobic fitness level and know your PEAK MET. To compare that to this chart by multiplying that value by 3.5. So if you were able to max out at 10 METS during the PEAK Test or 7.7 during the Non-Peak Test your score would be 35 ml/kg/min. [Learn more about Vo2 Max here.](#)

### Female (ml/kg/min)

### VO2Max Chart

Age	Very Poor	Poor	Fair	Good	Excellent	Superior
13-19	<25.0	25.0 - 30.9	31.0 - 34.9	35.0 - 38.9	39.0 - 41.9	>41.9
20-29	<23.6	23.6 - 28.9	29.0 - 32.9	33.0 - 36.9	37.0 - 41.0	>41.0
30-39	<22.8	22.8 - 26.9	27.0 - 31.4	31.5 - 35.6	35.7 - 40.0	>40.0
40-49	<21.0	21.0 - 24.4	24.5 - 28.9	29.0 - 32.8	32.9 - 36.9	>36.9
50-59	<20.2	20.2 - 22.7	22.8 - 26.9	27.0 - 31.4	31.5 - 35.7	>35.7
60+	<17.5	17.5 - 20.1	20.2 - 24.4	24.5 - 30.2	30.3 - 31.4	>31.4

### Male (values in ml/kg/min)

Age	Very Poor	Poor	Fair	Good	Excellent	Superior
13-19	<35.0	35.0 - 38.3	38.4 - 45.1	45.2 - 50.9	51.0 - 55.9	>55.9
20-29	<33.0	33.0 - 36.4	36.5 - 42.4	42.5 - 46.4	46.5 - 52.4	>52.4
30-39	<31.5	31.5 - 35.4	35.5 - 40.9	41.0 - 44.9	45.0 - 49.4	>49.4
40-49	<30.2	30.2 - 33.5	33.6 - 38.9	39.0 - 43.7	43.8 - 48.0	>48.0
50-59	<26.1	26.1 - 30.9	31.0 - 35.7	35.8 - 40.9	41.0 - 45.3	>45.3
60+	<20.5	20.5 - 26.0	26.1 - 32.2	32.3 - 36.4	36.5 - 44.2	>44.2

## PERFORMANCE 101: Summary Aerobic Conditioning?

Aerobic exercise impacts your health in many ways. It reduces the risk of many conditions. Simply put aerobic exercise delivers oxygen and nutrients to your tissues and helps your cardiovascular system work more efficiently. It is activities that can be sustained for more than one minutes like walking, biking, swimming, jogging. I often suggest starting with a basic walking program either on a treadmill or outdoors. Try to move at a pace that feels comfortable, but where you know you are moving (this is moderate). It would be great if you can build up 20 to 45 minutes a day most days per week. As you progress try incorporating vigorous aerobic exercise into your program. Guidelines suggest 75 minutes of vigorous exercise or 150 minutes of moderate per week or a combination of them both. Vigorous is more than moderate where breath is labored, it is hard to speak, and you may sweat. An easy way to perform vigorous exercise is through interval training. You can work between several intervals of 1 minute moderate with 1 minute higher intensity. This is known as high intensity interval training (aka HIIT-see why it is important). Keep it simple :) It is all relative: What might be High Intensity for one person may not be for another. Studies have shown just few minutes a day of vigorous activities like stair climbing and interval training can improve aerobic fitness much more than moderate activity, which is important since increased aerobic fitness is linked to longer life. Aerobic fitness is your ability to do aerobic work, which is maximal oxygen used during continuous human movement that can be sustained form more than a couple of minutes. It's a reflection of your aerobic power and your body's ability to keep performing under strenuous activity for longer periods of time. You have to find what works for you, but it seems that intervals of 45 to 60 seconds seem to give the most cardiovascular benefits. One study found the work to rest ratio of 1 minute on and 1 minute off to be superior to the work to rest ratio 30 secs on and 30 secs off over 10 cycles of on-off. Meeting the current aerobic exercise recommendations mentioned is key but is it worth exceeding that amount? Researchers suggest that pinning down just how much exercise qualifies as “too much” will likely vary between individuals and depend on a variety of factors – including their age, health history and lifestyle. I always suggest to meet or surpass the recommendation but not to exceed 1 hour a day of cardiovascular exercise and to keep HIIT to no more than 3 x a week. When it comes to mental health researcher suggest that the sweet spot is 45 minutes 5 days per week. Judging exercise intensity can be done in a variety of ways. I typically like the RPE chart, which is rating of perceived exertion. You can also judge exercise intensity and aerobic improvement through heart rate. If you heart rate gets slower at the same exercise intensity and or recovers faster that means you are getting fitter. You can also judge exercise intensity and aerobic improvement through METS and WATTS. One MET is the amount of oxygen you need at rest, 3 to 4 is what is needed when walking, and 8 to 9 is running. WATTS is a power output and is commonly provided on exercise machine screens. Generally speaking 100 WATTS is an above average amount of power when doing exercise. If you METS and / or WATTS gets higher at the same exercise RPE you are getting fitter.