Test Your Cardio Fitness

A good measure of your aerobic, or cardio-respiratory fitness, is the volume of oxygen per minute per kilogram of body weight (called VO_{2max}) you can process during hard exercise. Higher values of VO_{2max} indicate better aerobic fitness.

For example, a 25 year-old man in excellent physical condition can process about 50 milliliters of oxygen per minute per kilogram of body weight; compared to less than 20 mL/min/kg for a 70 year-old woman in poor condition.

By performing a relatively simple self assessment test you can determine the fitness level of your cardio-respiratory system.

The U.S. Walking Test

One of the best self assessment tests for VO_{2max} is the Rockport Walking Test. This is a field test, not a laboratory test, and consists of walking one mile as rapidly as you can.

At the end of the test you record your pulse and the time required to complete the walk. You then convert the time to completion and your pulse into VO_{2max} using the formulae (on the following page). Lastly, you enter Table 1 (also on the next page) with your calculated VO_{2max} and determine your cardio-respiratory fitness level.

Risks & Precautions

There is some risk if you take the Rockport Fitness Walking Test without prior conditioning. That is why the following precautions are suggested.

1) Be sure to have a medical exam before taking the one-mile walking test.

2) If you are over 30 years old, postpone the walking test until you have been exercising regularly for at least one month.

3) You must be able to comfortably walk at least two miles before you take the walking test.

4) When you take the test, if you feel exhausted, experience shortness of breath, become dizzy or light headed, or nauseous, stop the test. You should probably see your doctor. Do not attempt a retest until you have exercised regularly for at least another three months, when your fitness level should have improved.

One-Mile Walking Test Procedure

If available, walk on a school track or a measured and marked flat trail with a smooth surface. (A standard track is one-quarter mile, so walk four laps on the inside lane for the one-mile test.) You also can use a treadmill rather than a track. Although not as accurate, if need be you can walk a street course you have driven and measured.

Before you start the test, warm up for several minutes with easy walking and stretching. Rest for about one minute. Then start the test.

Walk as briskly as possible for one mile, but remember you'll probably walk at least 12 minutes, so don't start too fast. Pick up the pace on the last lap if you still feel strong. When you finish the test, it's important to immediately measure your pulse. At the conclusion of the test, you should feel slightly winded, but you should not be gasping for air. Your goal is to end the test feeling tired but not exhausted. Remember to cool down by continuing to walk slowly for a few minutes.

Gender	Age	Cardio-Respiratory Fitness Level			
		Poor	Fair	Good	Excellent
	20-29	33.0 - 36.4	36.5 - 42.4	42.5 - 46.4	46.5 - 52.4
	30-39	31.5 - 35.4	35.5 - 40.9	41.0 - 44.9	45.0 - 49.4
Men	40-49	30.2 - 33.5	33.6 - 38.9	39.0 - 43.7	43.8 - 48.0
	50-59	26.1 - 30.9	31.0 - 35.7	35.8 - 40.9	41.0 - 45.3
	60+	20.5 - 26.0	26.1 - 32.2	32.3 - 36.4	36.5 - 44.2
	20-29	23.6 - 28.9	29.0 - 32.9	33.0 - 36.9	37.0 - 41.0
	30-39	22.8 - 26.9	27.0 - 31.4	31.5 - 35.6	35.7 - 40.0
Women	40-49	21.0 - 24.4	24.5 - 28.9	29.0 - 32.8	32.9 - 36.9
	50-59	20.2 - 22.7	22.8 - 26.9	27.0 - 31.4	31.5 - 35.7
	60+	17.5 - 20.1	20.2 - 24.4	24.5 - 30.2	30.3 - 31.4

Table 1: VO_{2max} versus Fitness Level

Calculating VO_{2max} (in U.S. units)

VO_{2max} is a function of quite a few variables: gender, weight, age, heart rate and time to complete the one-mile test walk. Although the formulae are relatively complex, I have tried to simplify the calculation as much as possible.

The formula for women is: $VO_{2max} = 133 - W - H - A - T$

The formula for men is: $VO_{2max} = 139 - W - H - A - T$

where $W = 0.077 \times$ Your Weight $A = 0.39 \times$ Age
$H = 0.157 \times$ Heart rate $T = 3.26 \times$ Time for mile

Example (U.S. units): Determine VO_{2max} and the fitness level of a 29 year-old woman who weighs 150 pounds. She finished the one-mile walking test in 14 minutes and 30 seconds (which is 14.5 minutes) with a heart rate of 145 beats per minute.

The first step is to determine values for W, H, A and T.

W = 0.077 × Weight = 0.077 × 150 lbs = 11.55

H = 0.157 × Heart rate = 0.157 × 145 beats/min = 22.77

A = 0.39 × Age = 0.39 × 29 years = 11.31

T = 3.26 × Time = 3.26 × 14.5 minutes = 50.53

Then calculate VO_{2max} using the formula for women.

$$VO_{2max} = 133 - W - H - A - T$$
$$= 133 - 11.55 - 22.77 - 11.31 - 50.53$$
$$= 36.84$$

Finally, enter Table 1 for a 29 year-old woman with VO_{2max} = 36.8 and find her fitness level is good (33.0 to 36.9 is good), actually very good bordering on excellent.

The Metric Walking Test

This field test consists of walking 1706 meters as rapidly as you can.

At the end of the test you record your pulse and the time you required to complete the walk. Then convert the time to completion and your pulse into VO_{2max} using the formulae (on the following page). Lastly, you enter Table 1 with your calculated VO_{2max} to determine your cardio-respiratory fitness level.

Calculating VO_{2max} (in metric units)

Again VO_{2max} is a function of gender, weight, age, heart rate and time to complete the 1609 meter test walk.

The formula for women is: $VO_{2max} = 133 - W - H - A - T$

The formula for men is: $VO_{2max} = 139 - W - H - A - T$

where $W = 0.017 \times$ Weight (kg) $\quad A = 0.39 \times$ Age
$H = 0.157 \times$ Heart rate $\quad T = 3.26 \times$ Time for 1609 m

Example (metric units): Determine VO_{2max} and the fitness level of a 29 year-old woman who weighs 68.2 kg. She finished the 1609 meter walking test in 14 minutes and 30 seconds (which is 14.5 minutes) with a heart rate of 145 beats per minute.

The first step is to determine values for W, H, A and T.

$W = 0.077 \times \text{Weight} = 0.17 \times 68.2 \text{ kg} = 11.59$

$H = 0.157 \times \text{Heart rate} = 0.157 \times 145 \text{ beats/min} = 22.77$

$A = 0.39 \times \text{Age} = 0.39 \times 29 \text{ years} = 11.31$

$T = 3.26 \times \text{Time} = 3.26 \times 14.5 \text{ minutes} = 50.53$

Then calculate VO_{2max} using the formula for women.

$$\begin{aligned} VO_{2max} &= 133 - W - H - A - T \\ &= 133 - 11.59 - 22.77 - 11.31 - 50.53 \\ &= 36.80 \end{aligned}$$

Finally, enter Table 1 for a 29 year-old woman with VO_{2max} = 36.8 and find her fitness level is good (33.0 to 36.9 is good), actually very good bordering on excellent.

The preceding excerpt is from:

TOTAL FITNESS – U.S. Edition by Vince Antonetti, Ph.D.

Readers outside the U.S.A. would probably prefer one of the following eBooks also published by NoPaperPress:

- **TOTAL FITNESS – Metric Edition by Vince Antonetti, Ph.D.**
- **TOTAL FITNESS – U.K. Edition by Vince Antonetti, Ph.D.**