

# VO<sub>2</sub> Max Testing

A GAUGE FOR BOTH THE AVERAGE AND THE ELITE

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HETHER WE'RE TAKING A LONG RUN, HOPPING ON A ROAD bike or walking to keep our hearts healthy, most of us want to see “signs” of improved physical health when we exercise. VO<sub>2</sub> max testing can offer us these signs. Contrary to what many might think, this testing isn't just for elite athletes like Lance Armstrong. Vo<sub>2</sub> max testing offers average individuals several benefits that contribute to improved performance, health and wellness.

## A LITTLE BACKGROUND

The heart and lungs work synergistically to increase delivery of oxygen to various tissues in the body, especially during exercise. Together, they remove metabolic waste, strengthen the heart, prevent heart diseases, regulate physiological function (hormone and enzyme transportation), distribute nutrients to cells and regulate body temperature through fluid distribution.

The respiratory, musculoskeletal and cardiovascular systems are different systems that work together to create a pathway for maximal aerobic power or maximal oxygen uptake. When these systems are under more physiological stress--everything must work harder, more efficiently and more optimally for energy production and metabolic function to actually occur. Maximal aerobic power, or VO<sub>2</sub> max, is the volume of oxygen per kilogram of body weight that is taken up and utilized per minute. During exertion or maximal aerobic output, VO<sub>2</sub> max tests provide a score, in milliliters, based on the volume of oxygen per kilogram of body weight per minute.

## VO<sub>2</sub> MAX: YOUR FITNESS GAUGE

Your VO<sub>2</sub> max is a valuable measure for gauging your level of physical fitness. The more in shape you are, the more your body works as a fine-tuned engine. This means that the body's natural processes work without highly taxing the body. The test provides a wealth of information, including where your heart rate should fall during training, what limits you should follow, the duration of exercise most suitable for your fitness level and the progression that needs to happen for you to reach a higher fitness level.

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## factors affecting VO<sub>2</sub> max

There are six major factors that affect your aerobic power:

▶ **1. Genetics**

Genetics is said to play a 20- to 30-percent role in VO<sub>2</sub> max.

▶ **2. Your age**

After the age of 25, VO<sub>2</sub> max decreases by 1 percent a year. The good news is regular physical activity throughout life can offset much of the decline.

▶ **3. Training status**

Athletic training can alter a person's VO<sub>2</sub> max as much as 20 percent, depending on his/her lifestyle and fitness habits.

▶ **4. Exercise mode**

Measure an athlete's VO<sub>2</sub> max during a treadmill test, a cycle test and finally in a swimming pool; the results will differ significantly. Treadmill running has been shown to produce the highest values.

▶ **5. Your gender**

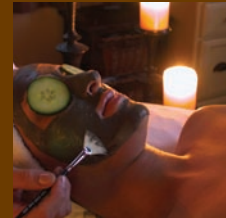
Women generally have VO<sub>2</sub> max values that are 15- to 30-percent lower than men's. This takes into account differences in body weight. With a straight, like-for-like comparison, the difference is even greater.

▶ **6. Your body composition**

Many of the differences in VO<sub>2</sub> max between men and women is attributed to body composition. Although there are other biological differences between the sexes, research suggests VO<sub>2</sub> max decreases as the percentage of body fat increases.



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The variation of VO<sub>2</sub> testing depends on your fitness level, time availability and money. The VO<sub>2</sub> test commonly used by hospitals is one geared to patients with heart disease, such as coronary heart disease, or someone recovering from a triple bypass. The clinical setting tends to conduct either a submaximal or maximal test, depending on the client, and sometimes an electrocardiographic analysis, or ECG test. The ECG method is usually performed in a another setting under different, and perhaps, more serious circumstances than the VO<sub>2</sub> max tests performed in a gym or university setting.

Pure Austin uses a VO<sub>2</sub> max test machine called Cardio Coach, which can be used to determine a person's anaerobic threshold (AT), submaximal VO<sub>2</sub> or maximal VO<sub>2</sub>. In this setting, the client is asked about his or her goals and a resting heart rate and resting blood pressure are measured. Then the fitness specialist enters the client's height, sex, weight, age and the type of test used into the machine--typically a bike or treadmill. The test is administered in stages, with varying levels and speed that are increased every minute. The test typically lasts between eight and 30 minutes, after which time a results page is printed and reviewed with the fitness specialist in a one-on-one setting.

In some cases, stressing the body by exercising to exhaustion--maximal VO<sub>2</sub> testing--is inappropriate. Instead, submaximal tests, which are less demanding and usually less accurate, can be used. These tests are done using the same equipment as noted above or through other modified machines with a partner, coach or trainer. The "Bleep Test," otherwise known as the 20-Yard Shuttle test, the Rockport Walk test and the Step test are just some of the other tests that can help individuals learn about their aerobic output for a reasonable amount of time and money. For more information on these and other tests, visit [www.topendsports.com](http://www.topendsports.com).

Overall, the most important point to recognize is that the body is built to function like a machine--and that applies to the average individual and the elite athlete. Both will find sound results in this scientific type of testing and training. **N**

## results

By knowing your maximal heart rate for a particular activity, you will know your optimal training zones for various types of training and goal-setting. The test results will provide you with the tools to:

- ▶ Burn more fat and total calories by training smarter.
- ▶ Become more efficient and strong at higher and longer intensities of exercise.
- ▶ Recover faster from your workouts.
- ▶ Increase your endurance and/or strength, cardiovascularly and muscularly.
- ▶ Become familiar with the types of fibers your body primarily uses for different activities and understand your strengths and weaknesses in that area (Example: sprinter vs. a marathon runner).
- ▶ Know how to rehabilitate your heart and strengthen the cardiovascular system's efficiency.



For more information on VO<sub>2</sub> max testing, contact Pure Austin Fitness at (512) 474-1800 or (512) 342-2200.