

# Performance

## VO2 Max/Metabolic Testing



VO2MAX is a measure of the volume of oxygen your body is utilizing at a given exercise intensity, and is an important measure for endurance athletes. Testing with us is a valuable way to ensure that every training session will be done with a purpose.

Your consultation following the test will provide exact heart rate information defining your specific heart rate training zones, and how you can incorporate this information into your training. Knowing your heart rate zones will allow you to train smarter and more efficiently, especially for endurance sports like triathlon, cycling and running.

## FAQ

### What is it?

- VO2MAX is an abbreviation for the maximum (MAX) volume (V) of oxygen (O2) an individual body can use to make energy.

### Why is it important?

- Minimum levels of oxygen consumption are necessary to complete daily tasks.

- VO<sub>2</sub> is oftentimes used as an overall indicator of cardiovascular fitness. The higher the VO<sub>2</sub> value, the better the individuals overall cardiovascular fitness. Therefore, each of us should strive to achieve and maintain a minimum level of VO<sub>2</sub>MAX.

## **What will I learn from these tests?**

- Each test ends with a consultation where we will tell you the following: What your individual results are, what your results mean to you and your overall goals, and how this information can be applied into an exercise prescription to help you meet your specific goals.
- With testing at regular intervals (every 2 to 3 months) your individual progress can be measured and adjustments can be made to your exercise prescription to continuously maximize and maintain your cardiovascular health.

## **Who benefits from this test?**

- Everyone!!
- Athletes can add structure and purpose to their training programs and gain a competitive edge through application of sport science principles.
- Former couch potatoes can begin an exercise program that they will enjoy and be able to maintain thereby promoting positive health benefits.
- Those not getting results can make changes to their current program to make each training session effective and beneficial.

## **How test is run?**

- Running tests: The test will begin with a warm-up on the treadmill. Once the warm-up is complete, a comfortable mask will be placed over your mouth and nose so that information regarding your gas exchange can be obtained by the metabolic cart. The treadmill will then begin moving at an easy, comfortable pace and will increase in speed every two minutes, up to a point that is slightly faster than your race pace speed. At this point, the incline will then be increased 1% every minute until the athlete feels unable to continue with the protocol. During this test our exercise physiologist will be monitoring the rate at which your body consumes oxygen, as well as your heart rate and rate of perceived exertion (RPE). The level of oxygen consumed will increase as the exercise intensity increases. After you have reached your peak level of oxygen consumption, a two minute cool-down period will begin to assess how quickly your cardiovascular system recovers. Total time for the test will be about 90 minutes, including time for warm-up, the running assessment, and an overview of the results.

- **Cycling tests:** Using your individual bike, the test will begin with a warm-up on the CompuTrainer. Once the warm-up is complete, a comfortable mask will be placed over your mouth and nose so that information regarding your gas exchange can be obtained by the metabolic cart. Work on the CompuTrainer will then begin at a low and comfortable wattage for the first 5 minutes, and will increase in wattage every three minutes thereafter. During this time our exercise physiologist will be monitoring the rate in which your body consumes oxygen, as well as your heart rate and rate of perceived exertion (RPE). The level of oxygen consumed will increase as the exercise intensity (wattage on CompuTrainer) increases. After you have reached your peak level of oxygen consumption, a two minute cool-down period will begin to assess how quickly your cardiovascular system recovers. Total time for the test will be about 90 minutes, including time for warm-up, the cycling assessment, and an overview of the results.

## **Why should I train by heart rate?**

- Eliminate the guesswork. Measured heart rate zones allow you to train more efficiently and specifically throughout the season.
- You will be able to comfortably complete workouts on consecutive days with quicker recovery, while maximizing your fitness.
- Heart rate training is a great way to reduce your likelihood of developing overuse injuries, or drifting into the uneasy state of being overtrained.

## **What is the price for the testing?**

- Individual: The first test is \$199.
- Group Pricing: We do offer special discounts for groups of 10 or more. Please call (480)556-8406 for rates.

## **Who performs this test?**

- The testing at Endurance Rehabilitation is done by our exercise physiologist. Contact [nate@endurancerehab.com](mailto:nate@endurancerehab.com) with questions.

## **What is the equipment for this test?**

- The metabolic cart used at Endurance Rehabilitation is the same unit you would find at professional level clinical and research facilities, including the Mayo Clinic in Scottsdale.

- Cycling tests are done on the CompuTrainer, which uses your own bike for the protocol, taking out any of the guess work in making sure that the fit for the test is one you are comfortable with.

## **How often should I be tested?**

- Those doing events regularly should be tested every 3 to 4 months.
- Regular testing allows for a thorough review of your progress, which shows if the training methods used are helping you reach your goals.
- As your fitness changes, so will your heart rate zones. Testing every 3 to 4 months keeps you on a steady track to improvement.

## **What is VO2MAX and what is the test used for?**

VO2MAX is an abbreviation for the maximum amount of oxygen your body is capable of using to make energy. These levels are lowest at rest (where heart rates are lowest), and increase in a linear fashion as exercise intensity, and heart rate, increases. VO2MAX is used in a variety of disciplines because it is an excellent indicator of how well the cardiopulmonary system is functioning. Activities of daily living require a minimum amount of oxygen to complete, therefore it is necessary to maintain as high a VO2 as possible for as long as possible. Additionally, in the field of endurance athletics, a higher VO2MAX is oftentimes a good indicator of performance potential in endurance endeavors like cycling, running and multisport events like triathlons, duathlons and adventure racing.

By completing a VO2MAX test your fitness level can be evaluated more precisely, thereby making changes and improvements to your current training regimen that will help you attain your goals. Incorporating additional VO2MAX tests every few months is a great way to track your progress and measure your health as it improves. As this test is performed in a controlled environment, and is a specific scientific measure of each individual, the information obtained is much more specific than that based on predictions and equations made for large populations. With this exact information, training zones based on your heart rate can be made so that your workouts are organized more efficiently and effectively.

Anyone, from sedentary people to elite athletes can benefit from the VO2MAX test. Whether it is to improve your overall health, or to improve your performance, this test is set up individually to provide you with the information you need to reach your fitness goals by training smarter.

A properly conducted VO2MAX test will last only between 6 and 12 minutes. The test begins at an exercise intensity that you are comfortable with, and gradually increases in intensity until you are working as hard as you can. You will be breathing into a mouthpiece to measure the amount of oxygen consumed and carbon dioxide expired while working at the various exercise intensities. As the exercise intensity increases, so will the amount of oxygen (VO2) you inspire, up to a maximal point known as your VO2MAX.

Upon conclusion of the test, your results will be explained to you personally. Information regarding how to incorporate this information into your training goals will be covered as well. This will include areas such as how frequent you should exercise, what intensity you should exercise at, and for how long you should exercise for. Finally, your specific heart rate zones will be explained to you to aid in a more effective

exercise regimen, specifically designed to reach your overall health and fitness goals.

## **Preparation Sheet (Cycling and Treadmill Tests)**

- Do not exercise 24 hours before the test.
- Do not consume caffeine 3 hours before the test
- Do not consume nicotine 3 hours before the test
- No thermogenic aids (weight loss products/metabolic enhancers) 24 hours prior to the test.
- Do not consume alcohol 24 hours before the test.
- Eat a light meal 3 hours prior to the test, or earlier.
- Complete a Health History Questionnaire and Informed Consent prior to the test.

### **Checklist for Tests**

#### **Checklist for Cycling Test**

- ◆ Personal bicycle you want to be tested on.
- ◆ Cycling shoes used to train/race in.
- ◆ Cycling shorts and shirt/sports top
- ◆ Water bottle
- ◆ Hand towel
- ◆ Hair pulled back if it is long
- ◆ Medications (i.e. inhalers)

#### **Checklist for Treadmill Test**

- ◆ Closed toed athletic shoes comfortable to run in.
- ◆ Athletic shorts and shirt/sports top.
- ◆ Water bottle
- ◆ Hand towel
- ◆ Hair pulled back if it is long
- ◆ Medications (i.e. inhalers)

### **Testing Protocol**

#### **Cycling VO<sub>2</sub>MAX Protocol**

The test will begin with a warm-up on the CompuTrainer. Once the warm-up is complete, a comfortable mask will be placed over your mouth and nose so that information regarding your breathing can be obtained by the metabolic cart. Work on the CompuTrainer will then begin at a low and comfortable wattage, and will increase in wattage at regular intervals. During this time an exercise physiologist will be monitoring the rate in which your body consumes oxygen, as well as your heart rate and rate of perceived exertion (RPE). The level of oxygen consumed will increase as the exercise intensity (wattage on CompuTrainer) increases. After you have reached your peak level of oxygen consumption, a two minute cool-down period will begin to assess how quickly your cardiovascular system recovers. Total time for the test will be about 90 minutes, including time for warm-up, the cycling assessment, and an overview of the results. There are showering facilities on site, please feel free to use these.

## **Treadmill VO2MAX Protocol**

The test will begin with a warm-up on the treadmill. Once the warm-up is complete, a comfortable mask will be placed over your mouth and nose so that information regarding your breathing can be obtained by the metabolic cart. The treadmill will then begin moving at a comfortable pace, and will increase in intensity at regular intervals, usually every one to three minutes. During this time an exercise physiologist will be monitoring the rate at which your body consumes oxygen, as well as your heart rate and rate of perceived exertion (RPE). The level of oxygen consumed will increase as the exercise intensity increases. After you have reached your peak level of oxygen consumption, a two minute cool-down period will begin to assess how quickly your cardiovascular system recovers. Total time for the test will be about 90 minutes, including time for warm-up, the running assessment, and an overview of the results. There are showering facilities on site, please feel free to use these.

## **Scheduling Information**

For scheduling and any additional questions contact Samantha at (480) 556-8406.