

What you need to know about the
Cardio-Pulmonary Exercise Test

What is it?

This is an exercise test where an individual's heart function (*cardio*) and lung function (*pulmonary*) are carefully monitored during a steadily increasing workload. The reasons why an individual has a limited exercise capacity or is short of breath can be complicated and can involve multiple body systems. A cardio-pulmonary exercise test may be recommended for you when your shortness of breath or exercise limitation cannot be fully explained by simpler tests. The specific body systems that will be tested during an exercise tests are:

1. the ability of your lungs to get oxygen into and carbon dioxide out of your bloodstream;
2. your ability to get air in and out of your lungs (ventilation);
3. how effectively your heart is pumping blood to your body.

Shortness of breath and a limited exercise capacity can occur when any one or a combination of these body systems are not working as well as they should. This test is safe and there should be no lasting effects.

What should you expect?

This test requires specialized equipment and will only be performed in a hospital laboratory. You should have a baseline spirometry test performed, and then EKG electrodes will be put on your chest. You will either be seated on a stationary bicycle or asked to stand on a treadmill. An oximeter probe will be clipped to your finger or to an earlobe. A blood pressure cuff will be placed on your arm. Your nose will be clipped and you will be breathing through a mouthpiece throughout the test.

During the test your blood pressure will be measured every two or three minutes. The test will start with a baseline period where you either sit or stand quietly for several minutes. When the baseline period is over, you will be asked to start pedaling if you are on a bicycle, or to start walking if you are on a treadmill. It will be easy to pedal or to walk when the test first starts but it will get harder and harder to do these things as the test goes on.

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Cardio-Pulmonary Exercise Test

This test will make you short of breath and tired. This is normal. You should try to pedal or walk as long as you possibly can and to keep your lips snug on the mouthpiece so that air does not leak. Your test will be stopped if there are any unsafe changes to your blood pressure or EKG, or if your oxygen saturation levels drop too low, or if you have chest pain. When you can no longer keep pedaling the bicycle or keep up with the treadmill the test will be stopped. You may be asked to pedal quietly or walk slowly for another minute while a last set of measurements are taken.

When the test is over the mouthpiece and nose clip will be removed. The oximeter probe will be taken off your finger and the blood pressure cuff will be taken off your arm. Your EKG may be monitored for a while longer and you will be disconnected from the EKG machine when your heart rate and EKG have returned to your baseline. The EKG electrodes will be removed from your chest and you will be asked to perform another spirometry test.

The mouthpiece and nose clips used for the exercise test and the spirometry test should be new and clean at the start of the testing session. The oximeter probe and blood pressure cuff should be cleaned before they are put on. The staff performing your test should be wearing gloves or at a minimum should have performed hand hygiene before your testing session.

What is a normal measurement?

The exercise test measures a wide variety of physiological values from your heart and your lungs. At a minimum these should include:

1. how much oxygen your lungs were able to take up;
2. the oxygen saturation of your blood;
3. how much air your lungs were able to move;
4. your heart rate;
5. your blood pressure.

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The predicted values for oxygen uptake and heart rate come from population studies and your values will be compared to values from patients with your age, height and gender. Your ability to ventilate your lungs is based on the results from your spirometry test. These comparisons are usually expressed as a percent of predicted. Trying to read an exercise test through individual values is confusing and this is because the results are extremely interdependent and each value needs to be considered in relation to others.

What affects test quality?

Oxygen uptake and ventilation will be underestimated if there are any leaks around the mouthpiece or nose clip.

Poor motivation.