

Illinois Heart & Lung Associates - Patient Services

Cardiopulmonary Exercise Testing (CPX)

Cardiopulmonary exercise testing is a non-invasive and objective method of evaluating both cardiac and pulmonary function. It allows a very accurate assessment of possible cardiac failure. Cardiac function is evaluated in terms of aerobic capacity and respiratory function is evaluated by measuring direct airflow in the lungs during exercise.



CPX may be used in all age groups to evaluate cardiac function objectively. It may be used to evaluate the treatment of cardiac disease, whether from myocardial ischemia or cardiac failure. Respiratory function may be evaluated dynamically by measuring the amount of air entering and leaving the lungs during exercise thus detecting exercise induced asthma as well as restrictive and obstructive lung disease. Additional measurements can be made which can assist in diagnosing suspected pulmonary artery hypertension.

The patient is connected to a computerized 12-lead ECG machine that monitors both the heart rate and rhythm. A small mouthpiece, connected to a special machine, is placed in the mouth and small clamp is placed on the nose. The patient is then exercised on a stationary bicycle ergometer. The patient is then asked to pedal the ergometer against periodically increasing resistance. Sometimes a standard treadmill machine may be used instead and the patient is asked to walk with an increasing incline, increasing speed, or both. While the patient is exercising, the inhaled and exhaled air is sampled and analyzed for oxygen consumption and carbon dioxide production. The ECG is also analyzed for any changes that would suggest decreased blood flow to the heart muscle. The test is usually planned to last around 10 minutes once the exercise portion is started.

Before the Test.

In general, you should not eat or smoke for at least two hours before the test, but follow your doctor's specific instructions. Wear comfortable shoes or sneakers and shorts or loose fitting clothing. Women will be asked to wear a patient gown. When you arrive, you will be greeted by our respiratory therapist and asked to complete a medical history sheet and a consent form.

How is a CPX performed?

Your skin will be prepared with a mild abrasive pad and ECG patches and wires are attached to your chest. A blood pressure cuff will be placed on an arm, and a baseline electrocardiogram and blood pressure are recorded. A small mouthpiece, connected to a special machine is placed in your mouth and a clamp is placed on your nose. After the doctor arrives, he or she will determine at what level you should start exercising and you will begin pedaling on the bicycle ergometer or walking on the treadmill. Your ECG, blood pressure, and inhaled and exhaled air will all be monitored and measured throughout your test as well as into the recovery period.

If you develop any dizziness, a drop in blood pressure, severe chest pain, severe shortness of breath, or cardiac arrhythmias during your test, it will most likely be stopped early. Otherwise the test will continue until you reach an endpoint that is determined by the doctor.

What are the risks of CPX?

As with other types of exercise testing, CPX is really quite safe. The risk of death is very low, and careful monitoring of your blood pressure and ECG during the test, further adds to its safety. Sometimes, however, any type of exercise test can bring on a heart attack or cardiac rhythm problem. These can be a result of insufficient blood flow to the heart muscle. The staff is trained to deal with these problems and the room in which you perform the test is equipped with a

defibrillator and emergency medications.

After the test.

Depending on the results, you will rest until your heart rate, blood pressure, and other vital signs return to normal. If there are no complications, the blood pressure cuff and electrodes are removed and you may dress and depart the office.

Obtaining the results.

The test results will need to be analyzed by the doctor. You will be asked to make a follow up appointment with your doctor to discuss the results and what their significance are to your health. Any further treatment or testing recommendations will be made at that time.