



*"When you can't breathe...
nothing else matters"*

Lung Function Tests

Lung function tests provide an easy way of measuring the function of the lungs without the need to physically examine the lungs themselves. Lung function or breathing tests are important investigations which:

- Help diagnose suspected lung disease
- Help in planning treatments and deciding whether treatments should be continued, changed, or are no longer needed

How does it feel to perform lung function tests?

Most lung function tests are straightforward and are non-invasive, however they do require maximum effort to provide accurate results. This may occasionally be tiring and make you feel a bit puffed, but is usually not uncomfortable and only lasts a short time.

Types of lung function tests

Spirometry

Common lung conditions, such as asthma and Chronic Obstructive Pulmonary Disease (COPD), cause problems by narrowing the airways (bronchial tubes) resulting in shortness of breath. It is difficult to breathe through narrowed airways - the greater the narrowing, the more difficult breathing becomes. Spirometry is of great value for measuring exactly how much narrowing is present. It also gives an idea of the size of your lungs.

Spirometry involves taking a full breath in and blowing out that breath as hard and as fast as possible until your lungs are completely empty. Depending on the lung disease present, it can take anywhere from 6 to 15 seconds to completely empty the lungs. Measurements such as the forced expiratory volume in 1 second (FEV1) and forced vital capacity (FVC) are made, which indicate the presence, site and severity of airway narrowing (FEV1) and the quantity of air within the lungs (FVC). Patients with lung disease should know their FEV1. Every time you perform spirometry, ask your doctor about it.

The test is usually performed seated, and takes 10 to 20 minutes. It is sometimes carried out before and after inhaling a reliever drug such as Ventolin™ or Bricanyl™ to measure the effect of these drugs. In this case, your doctor may ask you not to take your usual reliever medication on the day of your test.

Gas Diffusion Test

The basic function of the lungs is to transport oxygen into the bloodstream and carbon dioxide out. For this to happen, these gases must cross the very thin membrane which separates the blood flowing through the lungs from air breathed into the lungs. A gas diffusion test measures how easily gases pass through this membrane. This valuable information is used to assess the severity of lung conditions such as emphysema and pulmonary fibrosis where the function of the membrane may be impaired. The test is quick and easy to do. It involves taking a deep breath of a special gas mixture, holding your breath for about 10 seconds, and gently breathing out again into the testing device. The test is performed twice with a rest in between measurements.

Bronchial Provocation Test

Asthma is a condition in which the airways are very sensitive and become narrowed when exposed to certain irritating substances. The bronchial provocation test is used to diagnose asthma and measure its severity.

The test quantitates the amount of an irritant substance (such as methacholine or mannitol) required to provoke airway narrowing after it is inhaled. Starting with a very weak dose, increasing strengths of spray or powder are inhaled during the test until the airway narrows or the protocol is complete. Spirometry measurements are made a minute or two after each dose. Once airway narrowing occurs, reliever medication is administered to re-open the airways. It usually takes about 30 minutes to perform this test. If you are taking breathing medication, your doctor may ask you to stop using it on the day of the test so that the results are accurate.

6 Minute Walk Test

In most cases, enough information can be obtained from lung function tests done while sitting at rest. It is occasionally important to measure lung and heart function under the stress of exercise because some problems only show up during exercise.

A common type of exercise test is the 6 minute walk test, a very simple procedure where measurements are made of how far you can walk in 6 minutes. During the test, your oxygen saturations and heart rate are monitored using an oximeter on the end of your finger. The goal of the test is to walk as far as possible during the 6 minutes. How far you walk, measured in metres, is used to help determine your level of exercise capacity.

When you have an exercise test, be sure to bring comfortable clothing suitable for exercising, such as a tracksuit and comfortable shoes.

Arterial Blood Gases

The main function of the lungs is to transport oxygen into the bloodstream and remove waste carbon dioxide from the blood. When the lungs fail to perform as well as they should, the amount of oxygen in the blood may be lower than normal and the carbon dioxide in the blood may rise above normal values. To measure these gases in the blood, a sample is taken from an artery, usually at the wrist. It is important to tell the doctor, scientist or nurse performing the test if you are on any blood-thinning treatment prior to the test.

Home Oxygen Therapy Assessments

Some lung problems may cause blood oxygen levels to fall low enough to require the use of oxygen therapy at home. Assessments for home oxygen usually involve one or two measurements of arterial blood gases. In some cases you may be asked to perform two sequential 6 minute walk tests, one breathing room air and one breathing oxygen to determine whether oxygen therapy at home would be beneficial.

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