

## PULMONARY CRITICAL CARE AND SLEEP MEDICINE

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# Pulmonary function test

Pulmonary function tests are a group of tests that measure how well the lungs take in and release air and how well they move gases such as oxygen from the atmosphere into the body's circulation.

## How the Test is Performed

In a spirometry test, you breathe into a mouthpiece that is connected to an instrument called a spirometer. The spirometer records the amount and the rate of air that you breathe in and out over a period of time.

For some of the test measurements, you can breathe normally and quietly. Other tests require forced inhalation or exhalation after a deep breath.

Lung volume measurement can be done in two ways:

- The most accurate way is to sit in a sealed, clear box that looks like a telephone booth (body plethysmograph) while breathing in and out into a mouthpiece. Changes in pressure inside the box help determine the lung volume.
- Lung volume can also be measured when you breathe nitrogen or helium gas through a tube for a certain period of time. The concentration of the gas in a chamber attached to the tube is measured to estimate the lung volume.

To measure diffusion capacity, you breathe a harmless gas for a very short time, often one breath. The concentration of the gas in the air you breathe out is measured. The difference in the amount of gas inhaled and exhaled measures how effectively gas travels from the lungs into the blood.

## How to Prepare for the Test

Do not eat a heavy meal before the test. Do not smoke for 4 - 6 hours before the test. Stop using bronchodilators or inhaler medications 4-5 hours before your test. You may have to breathe in medication before the test.

## How the Test Will Feel

Since the test involves some forced breathing and rapid breathing, you may have some temporary shortness of breath or lightheadedness. You breathe through a tight-fitting mouthpiece, and you'll have nose clips.

# Why the Test is Performed

Pulmonary function tests are done to:

- Diagnose certain types of lung disease (especially [asthma](#), [bronchitis](#), and emphysema)
- Find the cause of [shortness of breath](#)
- Measure whether exposure to contaminants at work affects lung function

It also can be done to:

- Assess the effect of medication
- Measure progress in disease treatment

Spirometry measures airflow. By measuring how much air you exhale, and how quickly, spirometry can evaluate a broad range of lung diseases. Spirometry is useful for determining the risk of postoperative pulmonary complications in certain high-risk situations, including patients known to have COPD or asthma, current smokers, and those scheduled for thoracic or upper abdominal surgery.

Lung volume measures the amount of air in the lungs without forcibly blowing out. Some lung diseases (such as emphysema and chronic bronchitis) can make the lungs contain too much air. Other lung diseases (such as fibrosis of the lungs and [asbestosis](#)) make the lungs scarred and smaller so that they contain too little air.

Testing the diffusion capacity (also called the DLCO) allows the doctor to estimate how well the lungs move oxygen from the air into the bloodstream.

## Normal Results

Normal values are based upon your age, height, ethnicity, and sex. Normal results are expressed as a percentage. A value is usually considered abnormal if it is less than 80% of your predicted value.

Normal value ranges may vary slightly among different laboratories. Talk to your doctor about the meaning of your specific test results.

## What Abnormal Results Mean

Abnormal results usually mean that you may have some chest or lung disease.