



Pulmonary Function Tests

Pulmonary function tests (PFT's) are breathing tests to find out how well you move air in and out of your lungs and how well oxygen enters your body. The most common PFT's are *spirometry* (spy-RAH-me-tree), *diffusion studies* and *body plethysmography* (ple-thiz-MA-gra-fee). Sometimes only one test is done, other times all tests will be scheduled, often on the same day.



Lung function tests can be used to:

- Compare your lung function with known standards that show how well your lungs should be working.
- Measure the effect of chronic diseases like asthma, chronic obstructive lung disease (COPD), or cystic fibrosis on lung function.
- Identify early changes in lung function that might show a need for a change in treatment.
- Detect narrowing in the airways.
- Decide if a medicine (such as a bronchodilator) could be helpful to use.
- Show whether exposure to substances in your home or workplace have harmed your lungs.
- Determine your ability to tolerate surgery and medical procedures.

To get the most accurate results from your breathing tests:

- Do not smoke for at least 1 hour before the test.
- Do not drink alcohol for at least 4 hours before the test.
- Do not exercise heavily for at least 30 minutes before the test.
- Do not wear tight clothing that makes it difficult for you to take a deep breath.
- Do not eat a large meal within 2 hours before the test.
- Ask your health care provider if there are any medicines that you should not take on the day of your test.

What is spirometry?

Spirometry is one of the most commonly ordered lung function tests. The spirometer measures how much air you can breathe into your lungs and how much air you can quickly blow out of your lungs. This test is done by having you take in a deep breath and then, as fast as you can, blow out all of the air. You will be blowing into a tube connected to a machine (spirometer).

The spirometry test is often repeated after giving you a breathing medicine (bronchodilator) to find out how much better you might breathe with this type of medicine. You will be asked to repeat this test two or three times to get an accurate measure of your lung function. It can take practice to be able to do spirometry well. The staff person will work with you to learn how to do the test correctly.

It usually takes 30 minutes to complete this test.

What should I know before taking this test?

- You may be asked not to take your breathing medicines before this test.
- Instructions will be given on how to do this test. If you do not understand them, ask the technician to repeat them.
- It takes effort to do this test and you may become tired. This is expected.
- If you become light-headed or dizzy during this test, immediately stop blowing and let the technician know.

What are diffusion studies?

Diffusion tests find out how well the oxygen in the air you breathe into your lungs moves from your lungs into your blood. Like spirometry, this test is done by having you breathe into a mouthpiece connected to a machine. You will be asked to empty your lungs by gently breathing out as much air as you can. Then you will breathe in a quick but deep breath, hold your breath for 10 seconds, and then breathe out as instructed. It usually takes about 15 minutes to complete this test.

What should I know before taking this test?

- Do not smoke and stay away from others who are smoking for at least 4 hours before this test.
- If you are on oxygen, you will usually be asked to be off oxygen for a few minutes before taking this test.

What is body plethysmography?

Body plethysmography is a test to find out how much air is in your lungs after you take in a deep breath, and how much air is left in your lungs after breathing out as much as you can. No matter how hard you try, you can never get all of the air out of your lungs. Measuring the total amount of air your lungs can hold and the amount of air left in your lungs after you breathe out gives your health care providers information about how well your lungs are working and helps guide them in your treatment. This test requires that you sit in an enclosed plastic box that you can see through. You will be asked to wear a nose clip and you will be given instructions on how to breathe through a mouthpiece. It usually takes about 15 minutes to complete this test.

What should I know before taking this test?

- If you are on oxygen, you will usually be asked to be off oxygen during this test.
- Let the technician know if you have difficulty in closed spaces.

What are normal results for lung function tests?

Because everyone's bodies and lungs are different sizes, normal results differ from person to person.

For instance, taller people and males tend to have larger lungs whereas shorter people and females have smaller lungs. A person's lungs grow until they are in their mid-twenties and then after that, lung function falls slightly every year.

There are standards that your health care provider uses that are based on your height, weight, age, and gender. These numbers are called the predicted values. If your numbers match the standard, the percent of the predicted number will be 100%. Your own lung function can be tracked over time to help see if you have had a change.

Authors: Bonnie Fahy, RN, MN; Marianna Sockrider, MO, DrPh; Suzanne Lareau, RN, MS.

Sources:

1. P. Meek, S.C. Lareau, B. Fahy, E. Austegard. ATS/ERS Standards for the Diagnosis and Management of Patients with COPD, Patient Section. www.thoracic.org/COPD/pdf/copdpatient.pdf
2. ATS/ERS Task Force: Standardization of Lung Function Testing. Eds. V. Brusasco, R. Crapo & G. Viegi. www.thoracic.org/adobe/statements/pft1.pdf

Additional Lung Health Information

American Thoracic Society
www.thoracic.org

National Lung Health Education Program
www.nlhep.org

Canadian Lung Association
www.lung.ca

Rx Key Points

- 4 Ask questions if you do not understand the instructions for the lung function test.
- 4 If you have a cold or flu, let the test center know because they may want to reschedule your test.
- 4 If you have difficulty with closed spaces (claustrophobia), let the test center know in case one of the tests involves being enclosed
- 4 Ask if there are any medicines you should stop taking before being tested and for how long you should stop it.
- 4 After your pulmonary function testing is over, you can return to your normal activities.

Health Care Provider's Office Telephone:
