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Lung Function Tests

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Test Overview

Lung function tests check to see how well your lungs work. The tests can find lung problems, measure how serious they are, and check to see how well treatment for a lung disease is working.

The tests look at:

- How much air your lungs (See figure 1 in appendix) can hold.
- How quickly you can move air in and out of your lungs.
- How well your lungs put oxygen into and remove carbon dioxide from your blood.

Types of lung function tests include:

- Spirometry.
- Gas diffusion.
- Body plethysmography.
- Inhalation challenge test.
- Exercise stress test.

You may also hear the tests called pulmonary function tests, or PFTs.

Lung function results are measured directly in some tests and are calculated in others.

No single test can check for all of the lung function values, so more than one type of test may be done. Some tests may be repeated after you inhale medicine that enlarges your airways (bronchodilator).

There are several different types of lung function tests.

Spirometry

Spirometry is the most common lung function test. It measures how much and how quickly you can move air

out of your lungs. You breathe into a mouthpiece attached to a machine called a spirometer. The machine records your results.

This test can measure many different things about the way you breathe. These include how much air you can exhale, how much air you can breathe in and out in 1 minute, and the amount of air left in your lungs after a normal exhale.

Gas diffusion tests

Gas diffusion tests measure the amount of oxygen and other gases that move through the lungs' air sacs (alveoli (See figure 2 in appendix)) per minute. These tests let you know how well gases are being absorbed into your blood from your lungs. Gas diffusion tests include:

- Arterial blood gases. This test shows the amount of oxygen and carbon dioxide in your bloodstream.
- Carbon monoxide diffusion capacity (also called DLCO). This test measures how well your lungs transfer a small amount of carbon monoxide (CO) into the blood. Two different methods are used for this test.
 - Single-breath or breath-holding method: You take a breath of air from a container. The air contains a very small amount of carbon monoxide. Measurements are taken as you breathe in.
 - Steady-state method: You do the same thing, but measurements are taken as you breathe out.

Body plethysmography

Body plethysmography may be used to measure:

- Total lung capacity (TLC). This is the total amount of air your lungs can hold. For this test, you sit inside a small airtight room. You breathe through a mouthpiece while pressure and air flow measurements are collected.
- Residual volume (RV). This is the amount of air that remains in your lungs after you exhale as much as you can. For this test, you sit inside the booth and breathe while the pressure of the booth is monitored. You may need to breathe through a mouthpiece while you are in the booth.

Inhalation challenge tests

Inhalation challenge tests are done to measure how your airways respond to substances that may be causing asthma or wheezing. These tests are also called provocation studies.

During the test, you inhale increasing amounts of a substance through a nebulizer. This is a device that uses a face mask or a mouthpiece to deliver the substance in a fine mist (aerosol). Spirometry readings are taken to look at lung function before, during, and after you inhale the substance.

Exercise stress tests

Exercise stress tests look at how exercise affects your lungs. Spirometry readings are done after exercise and then again at rest.

Multiple-breath washout test

The multiple-breath washout test is done to check people who have cystic fibrosis. For this test, you breathe through a tube. First you breathe air that contains a tracer gas. Then you breathe regular air while the amount of tracer gas you exhale is monitored. Test results are reported as a lung clearance index (LCI). A high LCI value means that the lungs aren't working well.

Credits

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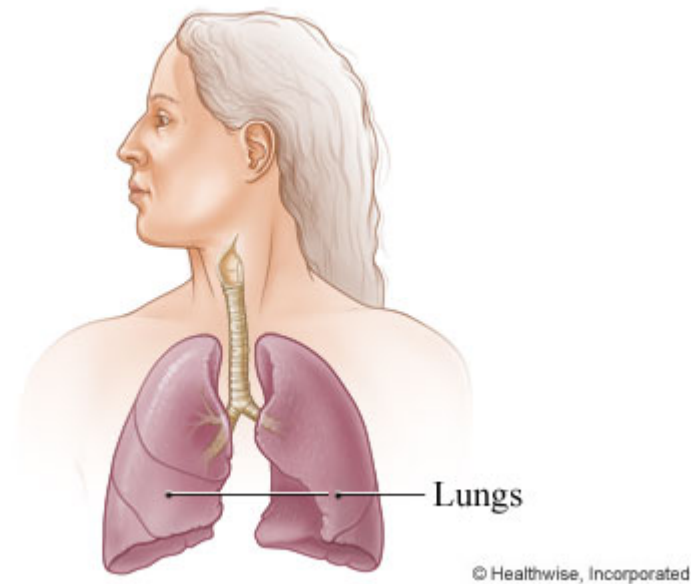
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Appendix

Topic Images

Figure 1

Lungs

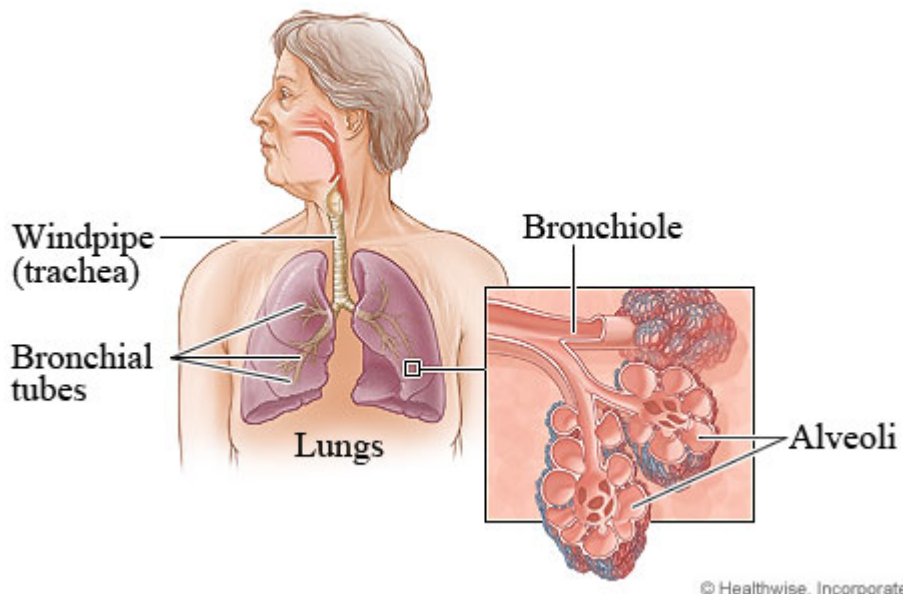


The lungs are the organs in the chest involved in breathing. The lungs are surrounded and protected by the rib cage. The lung on the left side of the body is a little smaller than the lung on the right.

The lungs transfer oxygen from the air to the bloodstream and remove carbon dioxide (a waste material) from the blood. When you breathe in, oxygen moves out of the air sacs of the lungs into the blood vessels. At the same time, carbon dioxide moves out of your blood and into the air sacs. You remove the carbon dioxide from your lungs when you breathe out. This process is called respiration.

Figure 2

Airways Inside the Lungs



The lungs' airways (bronchial tubes) divide into smaller and smaller branches (bronchioles). The airways end in air sacs (alveoli) where oxygen moves into the blood.

Note: The "printer friendly" document will not contain all the information available in the online document. Some information (e.g. cross-references to other topics, definitions or medical illustrations) is only available in the online version.



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