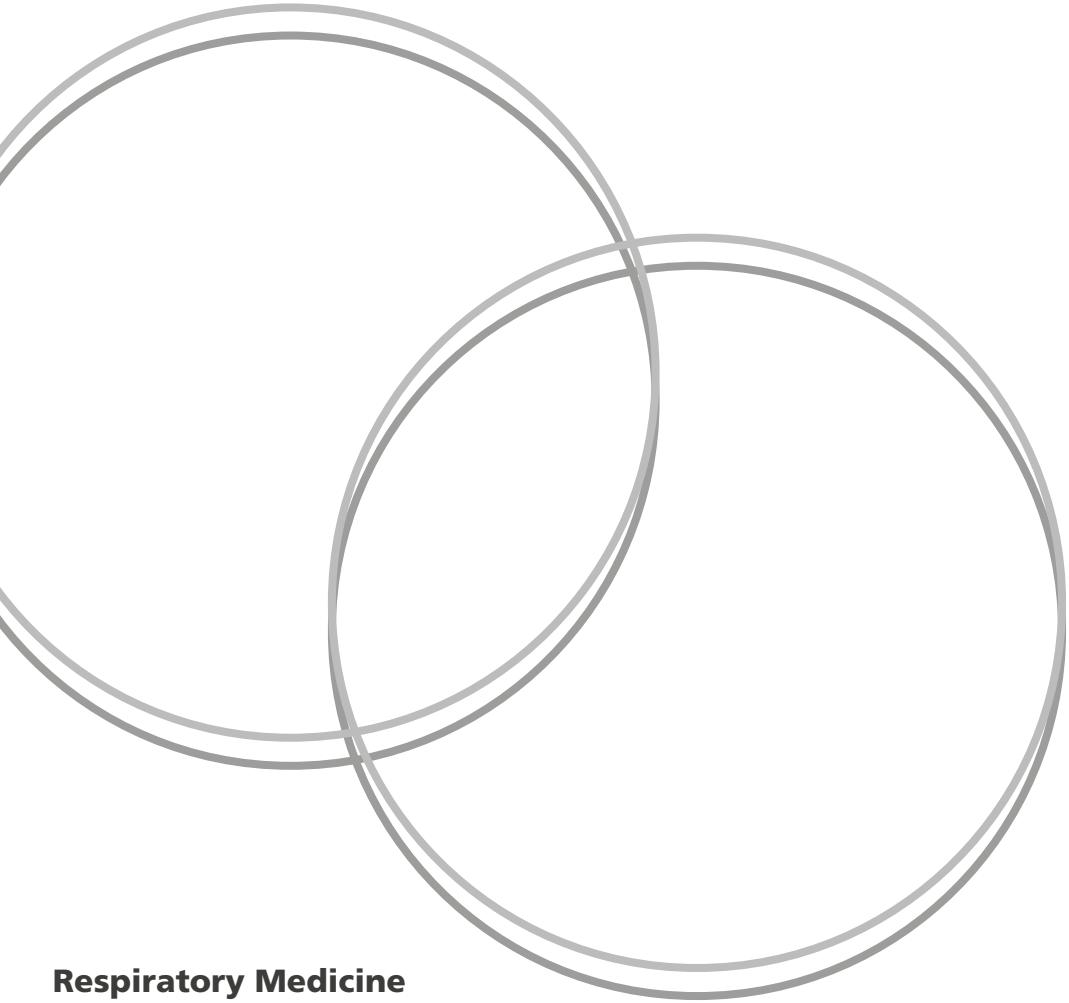
Oxford University Hospitals
NHS Foundation Trust

Lung Function Tests

Information for patients



Respiratory Medicine

What are lung function tests?

Lung function tests look at how well your lungs work. They usually include spirometry, lung volumes and reversibility tests. The lung function tests are painless and non-invasive. They involve breathing in and blowing out into specialised devices. The full set of tests takes between 20 to 60 minutes.

- **Spirometry** is a test that shows how well you breathe in and out. A device called a spirometer is used to take the measurements.

  The respiratory physiologist will ask you to breathe in fully and to then blow out as hard and fast as you can into the mouthpiece of the spirometer. You may be asked to repeat this a number of times.

- **Lung volumes** measure the total size of your lungs and can give more details about any lung condition you may have. The respiratory physiologist will explain this test to you.

- **Reversibility** testing can help to assess if inhaled (nebulised) medication can open up your airways. Nebulisers are used to turn liquid medicines into a fine mist, which can be inhaled into the lungs. During this test, the respiratory physiologist will ask you to use your inhaler or other medications, wait 15 to 30 minutes, then repeat the tests you have already carried out (spirometry and /or lung volumes).

There are various spirometer devices used in the Lung Function Laboratories, but they all measure the same thing. Some spirometers are more high-tech and can give more detailed results.

Why do I need lung function tests?

There are several reasons for carrying out these tests, including:

- To help make a diagnosis, for example, it can show whether your breathing is obstructed by narrowed, inflamed airways.
- To grade how severe your lung condition is.
- To assess the progress of your existing lung condition, by comparing current results with previous results.
- To see how your lung condition improves with different treatments.
- To help assess your fitness before surgery.

If you are not sure why you have been asked to come for the tests, please ask your doctor or nurse, who will be happy to explain.

Are there any risks or side effects?

There are no known risks associated with these tests, and we would not expect you to have any side effects during or after the tests. You may feel a little tired afterwards, as you are likely to have to do the breathing tests a number of times. This is normal and you should recover quickly.

If you have any chest pain or other problems, such as dizziness or feeling light-headed during a test, please tell the respiratory physiologist. They will stop the test and wait until you feel well enough to continue, or give you treatment if necessary.

Preparing for the lung function tests

Before the tests, to help us get the most accurate results, please follow these instructions:

- Please read the 'Inhalers and other medication' section.
- Wear loose fitting clothing to your appointment, to allow your chest to expand freely. You will be asked to take deep breaths in and blow out hard during the tests.
- Do not take part in any vigorous exercise for 30 minutes before the appointment. This may tire you out too much before the tests, leading to low results.
- Do not eat a large meal within 2 hours before the tests. This may make you feel uncomfortable whilst taking the tests.

Inhalers and other medication

The respiratory doctor may ask the respiratory physiologist to check your breathing response to certain types of inhaled medication. This will be done by measuring your breathing before and after taking inhalers or nebulisers.

To get more accurate readings, you will need to stop using certain inhalers or medications that control your chest conditions for a limited time before the tests.

Please bring your current inhalers to your appointment, along with a list of any other medication you take regularly.

Also make a list of any over the counter medications or herbal remedies you are taking for your breathing or for sinus congestion or allergies.

If you find it difficult to manage without your inhaler, please continue to use your reliever inhaler (short-acting bronchodilator). Tell us when you arrive what you have used and when you last used it.

You can take all other medication as usual.

Medication name:	Examples of brand names:	How long to stop medication for before lung function tests:
Short-Acting Bronchodilators Inhalers and Nebules		
Salbutamol	Airomir, AirSalb, Salamol, Ventolin	4 hours
Terbutaline sulphate	Bricanyl	
Ipratropium bromide	Atrovent	6 hours
Long-Acting Bronchodilator Inhalers		
Formoterol	Atimos, Foradil, Oxis	8 hours
Salmeterol	Serevent, Soltel	
Aclidinium	Eklira	24 hours
Glycopyrroniu	Seebri	
Indacaterol	Onbrez	36 hours
Olodaterol	Striverdi	
Tiotropium	Braltus, Spiriva	
Umeclidinium	Incruse	
Long-Acting Bronchodilator (within combination inhalers)		
Formoterol	Bevespi, DuoResp, Flutiform, Fostair, Fobumix, Luforbec Symbicort, Trixeo	8 hours
Salmeterol	Aerivio, AirFluSal, Aloflute, Sereflo, Sirdupla, Seretide	
Aclidinium	Duaklir	24 hours
Glycopyrronium	Bevespi, Trixeo, Trimbow	
Indacaterol	Ultibro	
Tiotropium	Spiolto	36 hours
Umeclidinium	Trelegy	
Vilanterol	Anoro, Relvar	
Other Medication		
Theophylline modified release tablets	Nuelin, Slo-Phyllin, Uniphyllin Continus	24 hours

Coming for the tests

Before the tests start, the respiratory physiologist will ask you some questions. These are to check whether there is a medical reason why you should not do the tests.

Please tell us if any of the following apply to you:

- You have coughed up any blood in the last two months.
- You have had any surgery in the last two months (including eye surgery).
- You have taken any medicine for chest pain in the last month.
- You have been told by a doctor that you have a blood clot.
- You have had a heart attack in the last three months.
- You have had a stroke in the last three months.
- You have a current chest infection requiring antibiotic treatment, or have had a chest infection within the last two weeks.
- You have uncontrolled blood pressure.
- You have certain types of blood vessel problems (e.g. aortic or cerebral aneurysm).
- You have been told by your doctor that you have a collapsed lung, a broken or cracked rib, or a problem with your neck vertebrae.
- You have chest pain on the day of the test.
- You have had to go to the Emergency Department (for your own care) in the last 3 days.
- You are pregnant or breastfeeding.
- You feel unwell on the day of the test.

What happens during the tests?

The respiratory physiologist will explain the tests to you and answer any questions you may have.

You will have your height and weight measured, as your lung function varies with these factors.

You may have a clip put on your nose, to make sure all the air goes into the sterile mouthpiece of the spirometer and none leaks out of your nostrils.

You will be shown how to blow into the spirometer before starting. It is important to put as much effort into the tests as you can, so that the results are accurate. You may be asked to blow three or more times into the spirometer, to check that the readings are similar each time.

To start with, you will be asked to breathe in deeply and out gently. When the respiratory physiologist is happy with the results, you will move onto the next part of the test. You will then be asked to breathe in again deeply, this time quite fast, and then breathe out as fast and hard as you can until your lungs are empty.

Your respiratory physiologist may then ask you to use your inhaler or other medication, wait 15 to 30 minutes, then repeat the tests. This is called a reversibility test, and is used to see if the inhaler or other medication improves your breathing.

Results of the tests

Spirometry usually measures:

- How much air you can **blow out in a relaxed way**; like a gentle sigh out until your lungs are completely empty. This is called your **slow vital capacity** or **VC**.
- The amount of air you can **blow out in one second**. With healthy lungs and airways, you can normally blow out most of the air from your lungs in one second. This is called your **forced expiratory volume in one second** or **FEV_1**.
- The total amount of air you can blow out in one complete breath after taking a deep breath in. You will be asked to blow out as hard and fast as you can, until your lungs are completely empty. This is called your forced vital capacity or FVC.

Your doctor will look at how much air you can blow out in one second (**FEV_1**) and compare this to the total amount from one complete breath (**FVC**). This will give a percentage of air you can blow out in one second.

Normally, your respiratory doctor will compare your measurements with the 'normal' range of values. They will also look at the results of your spirometer tests.

Getting the results

If these tests were requested urgently by a respiratory doctor or other specialist within the team, to help decide what treatment you should have, the results will be discussed with you as soon as they are available. You may be asked to come back to the outpatient department at short notice.

If the results were not requested by one of the respiratory consultants, they will need to be analysed by a respiratory consultant. They will send their report to the doctor who referred you for the tests. The results will be discussed with you at your next hospital appointment.

If your next hospital appointment is some time away, and the tests show that your treatment needs to be changed, then your hospital appointment may be brought forward or we may send your GP a letter asking them to speak to you.

Further information

If you would like more information, please contact the Centre for Respiratory Medicine at the Churchill Hospital, Oxford.

Centre for Respiratory Medicine

Telephone: **01865 225 252**
(8.00am to 4.00pm, Monday to Friday)

Notes

Further information

If you would like an interpreter, please speak to the department where you are being seen.

Please also tell them if you would like this information in another format, such as:

- Easy Read
- large print
- braille
- audio
- electronic
- another language.

We have tried to make the information in this leaflet meet your needs. If it does not meet your individual needs or situation, please speak to your healthcare team. They are happy to help.

Author: Respiratory Medicine Team
January 2024
Review: January 2027
Oxford University Hospitals NHS Foundation Trust
www.ouh.nhs.uk/information

Leaflet reference number: OMI 99564