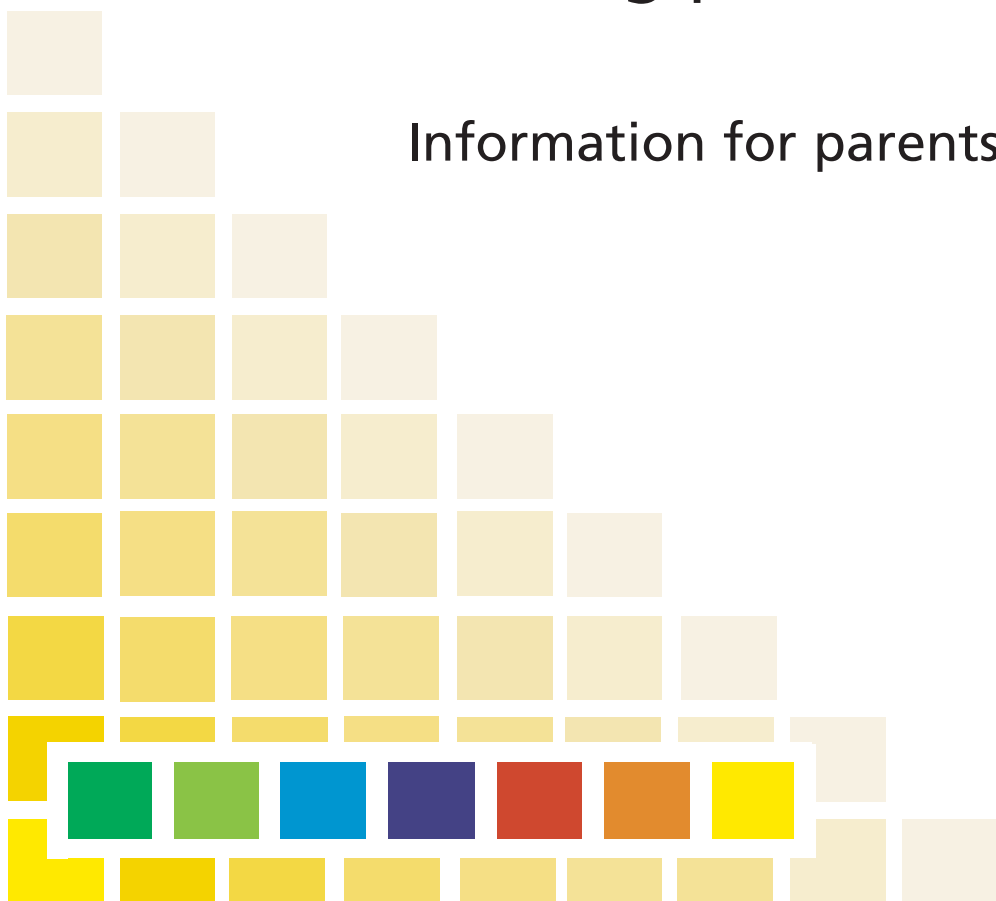


# Coming to hospital to explore your child's breathing problems

Information for parents



When your child comes to the Paediatric Outpatient department at Royal Brompton Hospital, our respiratory doctors will check a number of aspects of his/her health.

The information that you and your child can tell us about the problem he/she has is very important.

An examination by one of our doctors, looking at all aspects of your child's health, may be all that is needed to find out more about the problem. With this information we can then plan your child's care and treatment.

At other times, our doctors may need to collect a variety of detailed information about your child's health in order to fully understand the problem. The results from these investigations will help us to plan the best treatment.

Each test will mean different things for each child. We will take time to fully explain every procedure to you and your child beforehand. We will do our best to answer any of the questions that you may have. Many of the tests have more detailed written explanations that you can read before the test takes place, if you wish.

The following are some of the tests and investigations that children with breathing problems might have when they come to Royal Brompton Hospital.

## Lung function tests

### Spirometry

Children older than the age of five may be asked to take a deep breath and blow very fast through a tube into a machine, until they cannot breathe out any further.

This will measure the amount of air in the lungs and how well it flows out. This test can be done with the nurse in Outpatients and takes less than five minutes. If a more detailed test is needed, the spirometry can be done in our lung function department and may take an hour.

This test should not be uncomfortable but if children feel breathless at any time, they can pause or stop if needed.

### **Exercise Testing**

This test will show at what level your child's airways might tighten after exercise or how fit they are. This is done by asking children to run on a treadmill (this is a running machine often seen in gyms). They will be watched carefully and may be given medication at the end of the test to help their breathing to return to normal. This test is done in the lung function department. It should not be uncomfortable and is helped by wearing comfortable clothing, trainers and not eating a big meal or drinking fizzy drinks beforehand.

### **Bronchodilator Challenge**

This test may be done in Outpatients. The nurse will ask your child to inhale five to ten doses of bronchodilator medication using a 'spacer' device. A spacer is a clear plastic container that attaches to the inhaler, making it easier to use and meaning that more medication reaches the lungs. Your child's spirometry (see page one) will be checked both before and 15 minutes after the medication has been given to measure the amount of air in his/her lungs. This test should not involve any discomfort and is done at a gentle pace in case your child feels dizzy after taking deep breaths.

## Histamine Challenge

Histamine is made by the body in the airways in response to an irritation such as grass pollen. This reaction causes the airways to tighten. This test is used to understand how sensitive your child's lungs are to histamine. Firstly, we will check your child's spirometry to see how much air is in his/her lungs and to make sure the test can be done safely. Your child will then be asked to breathe in a fine mist containing a very dilute solution of histamine for 30 seconds.

This step will then be repeated with stronger solutions. Between each repetition, the amount of air in your child's lungs (spirometry) is checked twice - after two minutes and after ten minutes.

The test ends when the amount of air that your child can breathe out in one second reaches a certain level, which is safe. Your child's chest may sometimes feel 'tight' but often children do not sense the change. All children are given some medication afterwards to help their breathing return to normal. They will stay in the Outpatients department until this has happened. The whole test can last two hours.

## Measuring inflammation

### Nitric Oxide (NO) test

Nitric Oxide (NO) is a gas that is produced naturally within the lungs. More NO is produced from the airways if there is inflammation. This test measures the level of NO in the air passages of the lungs or the nasal passages. Your child will be asked to sit before a monitor and either blow steadily through a tube or hold a small tube to a nostril and hold his/her breath for 20-30 seconds.

This will be repeated three to five times. This test is not at all uncomfortable and should take no more than ten minutes.

## Sputum production

Sputum is extra mucus that we produce in response to an irritation or infection in the lungs.

In sputum there are cells that we can look at under a microscope to measure the level of inflammation. As it is not always easy to cough up sputum, this test involves breathing a fine salty mist through a tube while sitting down. Some children find this test unpleasant because of the salty taste. However, it will make your child cough up sputum and should mean that the lungs feel clearer.

The process may take an hour. Medication will be given either at the start or the end of the test to stop any tightening of the airways.

## Testing for infection

### X-ray

An x-ray is a picture that shows the inside of the body such as the organs and bones. If the doctor thinks that there may be an infection in your child's lungs, a chest x-ray may be needed. X-rays can be taken during the Outpatient appointment and the results can be discussed with the doctor. To take the X-rays your child will be asked to stand still behind a metal plate. Parents may accompany their child but will be asked to wear a protective coat or to stand behind a screen while the X-rays are taken.

## Cough swab

Your child may be asked to cough onto a long sterile cotton bud that is put into the back of the mouth. It does not touch the sides of the mouth or throat and takes only a few seconds. Alternatively, if your child is coughing up sputum, he/she will be asked to spit some into a tube that will be sent for analysis.

## Blood test

As part of our investigations, a sample of your child's blood may be needed. All children are offered a cream to numb the skin over the vein that is to be used. Although many children do not like blood tests, our staff can reassure and support them so they cope with the test and are less frightened by it. Please ask for psychological support if your child has difficulties with blood tests.

## Testing for allergies

### Skin prick testing

Skin prick testing can help us find out what is triggering your child's allergy. Small drops of the substance being tested are placed on the inside of the forearm; a very fine pointed stick is then used to touch the skin through the droplet to make a tiny break in the skin's surface.

The results are reviewed after 15 minutes. We measure any itchy red bumps that may appear. These will go away after an hour but we can also offer a soothing cream at the end of the test. Although some children are more sensitive than others, most do not find the experience at all painful. The results can be discussed as soon as the test is at an end.

Alternatively, a blood test may be taken to show what your child is allergic to (further information about blood tests can be found opposite on page five).

## Coming to Rose Ward

Not all tests can be carried out in the Outpatient department. Your child may need to come in to hospital for a day or to stay as an inpatient on Rose Ward, which is especially for children.

The following tests may be carried out if your child is asked to stay on Rose ward.

### Food challenge

Some children with food allergies 'grow out of' them. A 'challenge', carried out under controlled conditions on the ward, may be used to find out if it is safe to re-introduce a certain food back into your child's diet. At first, the food will be placed on the forearm. Then, if your child has not shown a reaction, the food will be placed on the lips. Your child will then be asked to eat a tiny amount of it.

Each stage of the challenge takes place at twenty minute intervals. The challenge is stopped immediately if there is a reaction. A nurse stays with your child at all times and a doctor is also on hand. The food challenge process can take a day.

### CT scan

This is a special x-ray that lets our doctors see a cross-section picture of the lungs. Your child will need to lie still for ten minutes on a bed that moves inside a large white plastic ring, like a doughnut.

The scan does not hurt although some children can feel anxious about being placed inside the machine. If this is the case, sedation can be given to help your child to relax.

### **Video Fluoroscopy Swallow Study (VFSS)**

This test is a special video recording, using X-rays, that looks in detail at the throat and upper airways to find out if your child has any problems with swallowing. Your child will be asked to swallow different liquids which will show the throat and upper airways clearly in the video recording.

### **Sweat test**

In this test a pad is placed on each of your child's arms to encourage the skin underneath to produce sweat. The pads can have an uncomfortable effect for some, rather like pins and needles, but this only lasts five minutes whilst the pads are in place.

The pads are then replaced by blue discs that are held in place with a strap for one hour to take up any sweat that has been produced. The amount of salt in the sweat is then measured.

### **Bronchoscopy**

Your child will be asleep under general anaesthetic for this investigation. The doctor will pass a fine tube down your child's throat. At the end of this fine tube is a tiny camera which the doctors can use to see what is happening in the lungs. This investigation will be explained to you carefully and you will be given the chance to ask any questions you may have. If your child has this investigation, we will ask for your written permission. This will involve reading and signing a consent form once the investigation has been fully explained.



## **pH probe**

This test involves passing a fine tube through the nose, which is then swallowed.

The end of the tube rests just above the stomach. When the tube is in place in the stomach it can detect any acid that might be 'refluxing' - this means that it comes back up the 'food tube'.

Your child may have this done whilst asleep, at the same time as another investigation such as a bronchoscopy. If not, children are carefully prepared and offered relaxation medicine and support for the whole procedure. The tube can be put in place very quickly but your child may feel uncomfortable for the first ten minutes but this will settle. The tube will need to stay in place for about 20 hours before it is removed.

## **Cilia test**

Cilia look like tiny hairs and they line our airways. They continuously move to sweep our airways clean.

This test involves using a very small brush, inserted into the nostril, to take a sample of the cells lining the nose. Although it is uncomfortable, this is the quickest test of them all - just three seconds.

## **Sleep studies**

Your child's breathing may be affected during sleep. We can monitor breathing whilst children are asleep to collect information such as: levels of oxygen and carbon dioxide, how hard your child has to work on his/her breathing and how air flows in and out. We can also record snoring.

Children need to stay in hospital overnight for this test. Some leads will be attached to your child before he/she goes to sleep. Although this may feel strange, it will not be at all painful.

## Further support

We can offer the support of specialist play workers to both prepare children and support them through any test.

Our clinical psychologists may be able to help if, for example, blood tests frighten your child.

Some test results are ready straight away but others may take longer to become available. If there have been a few tests done together we usually book an appointment so that you can discuss the results with your child's doctor.

## Useful contacts

If you would like to know more about the information provided in this booklet or have any questions, please contact our switchboard on 020 7352 8121 and ask for:

Children's outpatients	ext 4004
Day case nurse	ext 2134
Children's respiratory nurse	ext 8714 / Bleep 1215
Children's respiratory technician	ext. 2256
Appointments direct line	020 7351 8011

## Notes and questions

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