Bronchoscopy, bronchogram and optical coherence tomography studies: information for families

This information sheet from Great Ormond Street Hospital (GOSH) explains about bronchoscopy and bronchogram (B&B) studies and also the optical coherence tomography (OCT) study, which can be carried out during the same procedure. It explains why these may be suggested and what to expect. This combination of tests is carried out in the Interventional Radiology department. Other forms of bronchoscopy studies are carried out in other departments at GOSH – these are explained in our other information sheets.

Bronchoscopy and bronchogram (B&B) is a combination of two tests.

Firstly, a camera contained in a flexible tube (bronchoscope) is inserted into the airway to look closely at the airway wall. This allows us to see if the lining of the airway is inflamed or compressed.

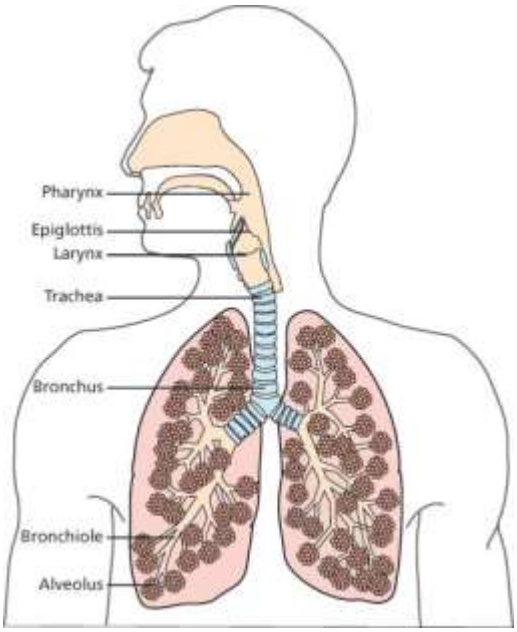
Secondly, a tiny amount of contrast – a substance that shows up well on x-rays – is put into the airway and x-rays are taken from various angles to give us accurate measurements of the size of the airway.

An optical coherence tomography (OCT) test gives us images of the cartilage rings which make up the airway wall. A thin plastic tube containing a light at the end is passed into the airway and the images are video recorded.

Why might they be suggested?

A B&B is usually suggested if your child has breathing difficulties, such as a condition called tracheomalacia, where their trachea is floppy and collapses inwards during breathing. Sometimes, these tests might be suggested for children who are using a ventilator to help them breathe, if the doctors need to work out why they are having trouble breathing. A B&B may also be used to monitor your child's progress after surgery or treatment for breathing difficulties, such as after surgery for tracheal stenosis.

An OCT may be suggested if your child has a narrow airway or is having difficulties breathing.



What happens before the test?

B&B studies, with or without an OCT, are always carried out while your child is under general anaesthetic. It can be carried out while your child is on a ventilator or as a day case procedure.

Day case procedures only

It is important that your child does not eat or drink anything for a few hours before the anaesthetic. This is called 'fasting' or 'nil by mouth'. Fasting reduces the risk of stomach contents entering the lungs during and after the procedure. You will be informed the night before the procedure of the time that your child should be 'nil by mouth' – in other words, have nothing to eat or drink before the anaesthetic.

It is equally important to keep giving your child food and drink until those times to ensure they remain well-hydrated and get adequate nutrition. This may involve waking your child in the night to give them a drink which we recommend.

You will already have received information about how to prepare your child for the procedure in your admission letter. The doctor will explain the procedure in more detail, discuss any questions you may have and ask you to sign a consent form giving permission for your child to have the test.

What does the test involve?

If your child is on a ventilator in intensive care when it is suggested and they are being given medicines to keep them still, the doctors may have to gradually reduce these medicines so that your child is able to breathe on their own. Your child will remain on the ventilator when they are being transferred to the Interventional Radiology department but will be taken off it briefly for the B&B studies. An experienced anaesthetist will stay with your child throughout the studies to monitor their airway.

The bronchoscopy is the first part of the study. This involves putting a camera inside a flexible tube into your child's airway through the breathing tube.

While the camera is in your child's airway, the radiologist will record a video of your child's breathing, which will either be used for analysis or to compare with previous or future recordings. Using the flexible tube, they may also wash out the area if it is full of mucus and take samples for examination.

The second part of the study is the bronchogram. This involves inserting a tiny amount of contrast into your child's airway through the same breathing tube. The radiologist will watch your child's breathing by recording a series of pictures for two to three breaths. This gives them a real-time view of your child's breathing and can show if they have tracheomalacia, for instance.

If your child is having an OCT during the same procedure, this will be the final part. The bronchoscope will be removed from your child's airway and a thinner tube containing an infra-red light is passed. This records a film of your child's airway which can be examined closely after the study has been completed.

The entire B&B study takes around 30 minutes, and OCT adds about five minutes to the procedure. Depending on the results of the studies, the radiologist may decide to treat your child's breathing difficulties during the same procedure or plan treatment for another occasion.

Are there any risks?

This is a very safe test. It is possible to cause a small amount of bleeding from the wall of the airway, which will stop of its own accord. It is also possible that your child would need to be on a ventilator for a short period of time following the procedure. This is extremely rare.

If your child is already on a ventilator, the intensive care doctors may need to increase the

settings for a short time. An experienced anaesthetist will stay with your child to monitor your child throughout the study.

Are there any alternatives?

A CT scan can show the structure of your child's airway but not how it functions during breathing. The advantage of a B&B study is that it gives a real-time view of how your child's airway functions during breathing. OCT is the only test which shows the detail of the cartilage in the airway wall.

What happens afterwards?

If your child was in intensive care before the study, they will return there once stable on the ventilator again. The medicines to keep your child still may be restarted again, depending on their condition.

If your child was not on a ventilator previously, they will return to the ward to recover from the general anaesthetic.

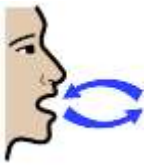
During the procedure, the doctors may have needed to put some local anaesthetic spray on your child's vocal cords, so that the airway tube could be inserted safely. This makes your child's throat numb and could make swallowing difficult. If your child has local anaesthetic spray, they will not be able to eat for two hours after the procedure until the effects of the local anaesthetic have worn off and it is easier and safer to swallow.

Some children feel sick and vomit after a general anaesthetic. Your child may have a headache or sore throat or feel dizzy, but these side effects are usually short-lived and not severe. The nursing staff will let you know when your child can start to eat and drink. Your child will be able to go home in the evening, once they are eating and drinking normally.

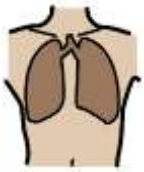
Further information and support

If you have any questions, please telephone 020 7405 9200 and ask for the ward from which your child was discharged.

Having a bronchoscopy and bronchogram



When you breathe, air goes into your nose and mouth, down the tube to your lungs. The air we breathe has oxygen (said: ock-see-jen) in it. Your body needs oxygen.



You have two lungs inside your chest. The oxygen moves from your lungs to the rest of your body by your blood cells.

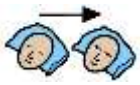
Some children find it hard to breathe or they make a lot of noise when they breathe in and out.

A bronchoscopy (said bron-kos-kop-ee) lets the doctors look at your breathing tubes. This helps them work out why breathing is hard for you.

You will have an anaesthetic (said an-ess-thet-ick) for the bronchoscopy. You will not be able to feel anything or know what is happening.

First, we will put a bendy tube with a camera in it into your mouth and down to your lungs. We will make a video of your breathing to look at later.

Next, we will put a tiny bit of liquid into the tube and take some x-ray pictures. The liquid shows up as a different colour on the pictures.

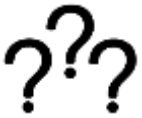


At the end of the test, we will remove the bendy tube from your mouth. You can then start to wake up from the anaesthetic.

The nurses will check you regularly to make sure are getting better.

The doctor may have sprayed some numbing medicine on your throat. You will not be able to feel your throat so it could make it unsafe to swallow.

The medicine wears off gradually so you will be able to eat and drink about 2 hours afterwards. Your throat may be sore when the medicine wears off. Tell us if it hurts.



Please ask us if you have any questions.