

**Patient
Information**

Bubble contrast echocardiogram (echo)

Introduction

This leaflet has been written to give you information about your planned bubble contrast echocardiogram.

What is a bubble contrast echocardiogram?

You may have already had an echocardiogram (sometimes just called 'echo') performed. This is a non-invasive imaging test using ultrasound to look at your heart. Ultrasound is very high-frequency sound which cannot be heard by the human ear. It is used to gain information regarding the structure and function of the heart muscles, chambers of the heart and structures within the heart such as the valves. The test is painless and does not use radioactivity.

A bubble contrast echocardiogram uses imaging ultrasound combined with an injection of microbubble contrast to help determine additional information.

Why am I being asked to come for this test?

Your doctor suspects that you may have a hole in your heart. The majority of significant holes in your heart are detected in childhood. However, if there is a small defect or hole in the wall (inter-atrial septum) separating the left and right upper chambers of the heart (atria), this may not come to light until adulthood.

The microbubble contrast allows for the detection of these small holes as they do not usually show up on a normal echocardiogram.

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Why might there be a defect in this part of my heart?

During the normal development of the foetal heart, there is an opening through the inter-atrial septum which allows blood to bypass the lungs which are not being used. Normally, this opening closes in the first few days or weeks after birth, but if it does not, the child will have a communication between the left and right atria.

This may take the form of a hole (Atrial Septal Defect – ASD) or a small channel (Patent Foramen Ovale – PFO) which behaves rather like a ‘trapdoor’. The defect will often correct itself without any medical intervention before the child reaches the age of 2, but about 25 to 30% of adults in the general population are said to have a PFO.

What happens if I have a PFO?

Many people do not have any symptoms or problems because of this defect, and it is detected by chance. However, some people have symptoms of breathlessness or fatigue (tiredness) due to some of the blood circulation bypassing the lungs (known as a shunt).

In other people, symptoms can result from blood clots forming in one of the veins in the leg (a deep vein thrombosis – DVT) and then a fragment of clot (embolus) passes from the right to the left side of the heart; this then may block an artery resulting in:

- Stroke (loss of brain function)
- Heart attack (damage to the heart muscle)

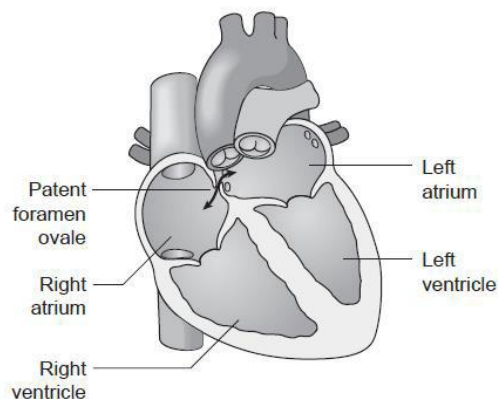


Figure 1: Position of the PFO

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- Extra communications (small holes) between blood vessels in your lungs (known as pulmonary arterio-venous malformations)
- Chronic liver disease

What does the echo involve?

- You will be taken into a room with usually a doctor and a sonographer
- You will be asked to undress to the waist and will be offered a hospital gown that should be left open to the front (like a coat). You will then be asked to lie on a couch. ECG stickers will be attached to your chest and connected to the echocardiogram machine. This will monitor your heart rate and rhythm during the test
- You will have a small plastic tube (cannula) inserted into one of the veins in your arm. This will be used later for the injection of microbubbles. You will then be asked to lie onto your left hand side. If you are unable to lie on your left side, we can carry out the echo while you are lying on your back. The test is performed in semi-darkness so the lights will be dimmed once you are comfortable
- The sonographer will place the echocardiogram probe on your chest (this is like a thick blunt pen) and cold lubricating jelly (this helps to get good contact with the skin)
- If you have already had an echocardiogram, we will go straight on to perform the bubble contrast study. If not, a number of pictures of the heart will be recorded from different areas of your chest
- Once the baseline study has been completed, we will go on to the bubble contrast study. The bubbles are made up in a syringe using sterile saline (salty water) mixed with a little bit of air and a little bit of your blood drawn back from the vein via the cannula

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- These are rapidly mixed up to make very tiny microbubbles which are then injected into your vein. We will record pictures and watch carefully to see if any bubbles cross through from the right to the left side of the heart
- You will then be asked to cough and sniff, and with further injections you will need to perform a special breathing and blowing technique called the Valsalva manoeuvre; this will be carefully explained to you and practiced afterwards before we undertake this part of the test on the day
- The test will take about 30 to 45 minutes to complete

Do I need to take any special precautions before the test?

No, you should take all of your usual medication as normal on the day of the test. You can also eat and drink normally. We advise that you keep hydrated (having plenty to drink) and keep yourself warm before the test. This increases the chance that we can access a vein for the cannula insertion during the test.

Is injecting air into the bloodstream harmful?

If a large amount of air was injected into a vein as a large bubble, it could potentially cause harm. However the bubbles injected in this test are very small. If there is no hole in the inter-atrial septum, the bubbles will simply be filtered out by the lungs.

If you have a Patent Foramen Ovale (PFO) some bubbles will appear on the left side of the heart and then will gradually make their way through the circulation and be filtered out through the lungs.

Risks, contra-indications and side effects

- The Valsalva manoeuvre involves breathing techniques to change the pressure in your chest. This may lead to your ears 'popping' or a slight headache. **If you have any ear problems, you should let the doctor know at the start of the test**

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- Some people find performing the Valsalva manoeuvre difficult, but we will help you practice as much as we need to and can often still get reasonable images even if the technique cannot be perfected
- The test does not carry any specific risks; ultrasound waves are harmless (they are used on pregnant women), no chemicals or contrast agents are used, so even if you have been allergic to X-ray contrast in the past that does not stop you having this test
- If you are taking any blood thinning medication, you may bleed or bruise more easily when the cannula is removed

After the procedure

You may be given the results immediately, but some findings take longer to interpret and may need a second opinion. If there is a hole, the doctor will explain this. The results will be sent to your referring doctor.

Contact information

If you have any questions about your planned bubble contrast echocardiogram, please contact:

Cardiology Investigations Department

Gloucestershire Royal Hospital
Great Western Road
Gloucester
GL1 3NN

Tel: 0300 422 8281

Monday to Friday, 9:00am to 4:30pm

Alternatively you can contact your consultant's secretary.

Further information

Patient Website:

www.patient.co.uk/health/echocardiogram

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