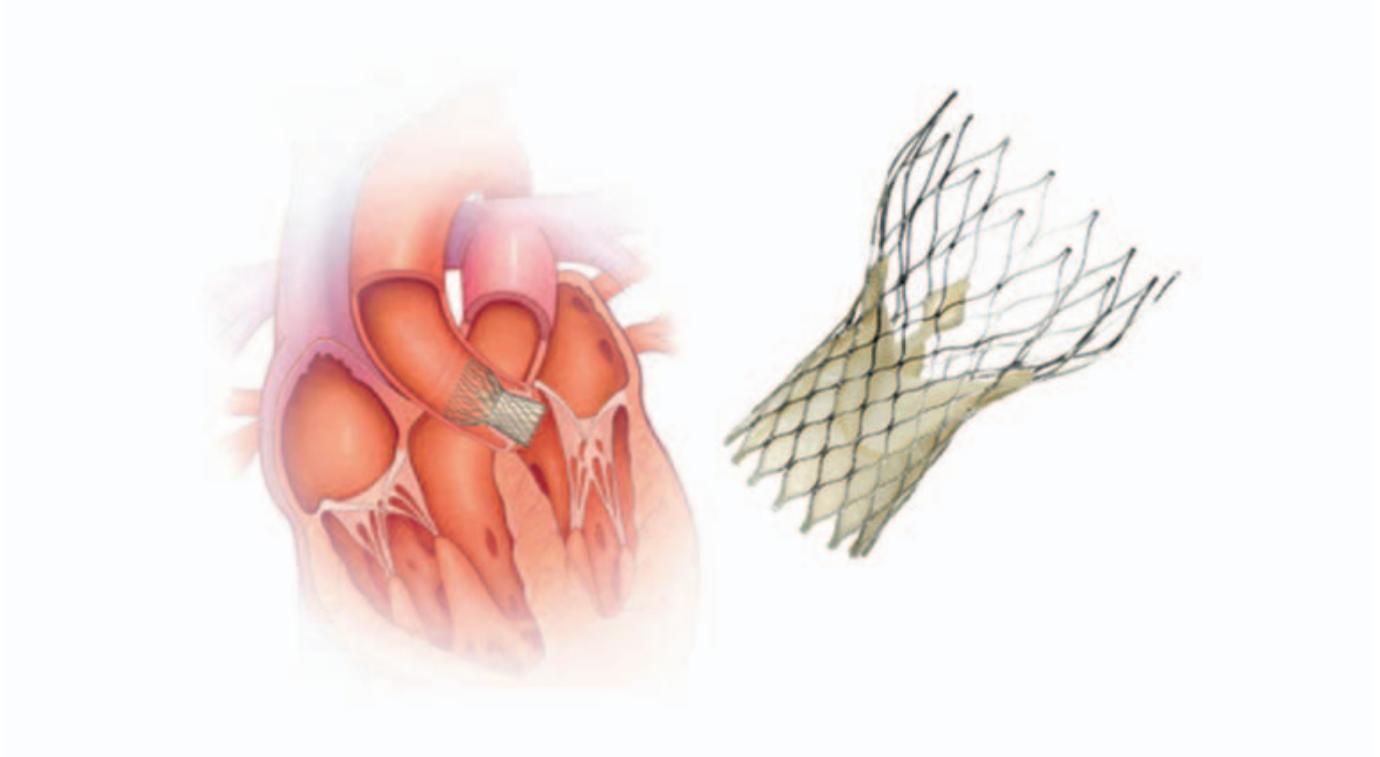


Transcatheter aortic valve implantation (TAVI)



Information for patients
Sheffield Teaching Hospitals



Introduction

You have been found to have a condition known as aortic stenosis, in which there is significant narrowing of the aortic valve. This is the main valve through which blood is pumped out of the heart to be supplied to the body. Aortic stenosis is a potentially serious condition which can cause symptoms of breathlessness, chest pain, dizziness, and blackouts. If left untreated, these symptoms can be fatal.

One of the ways this condition can be treated is by a procedure known as **Transcatheter Aortic Valve Implantation (TAVI)**. Your doctors will have already discussed this with you and are considering this procedure for you.

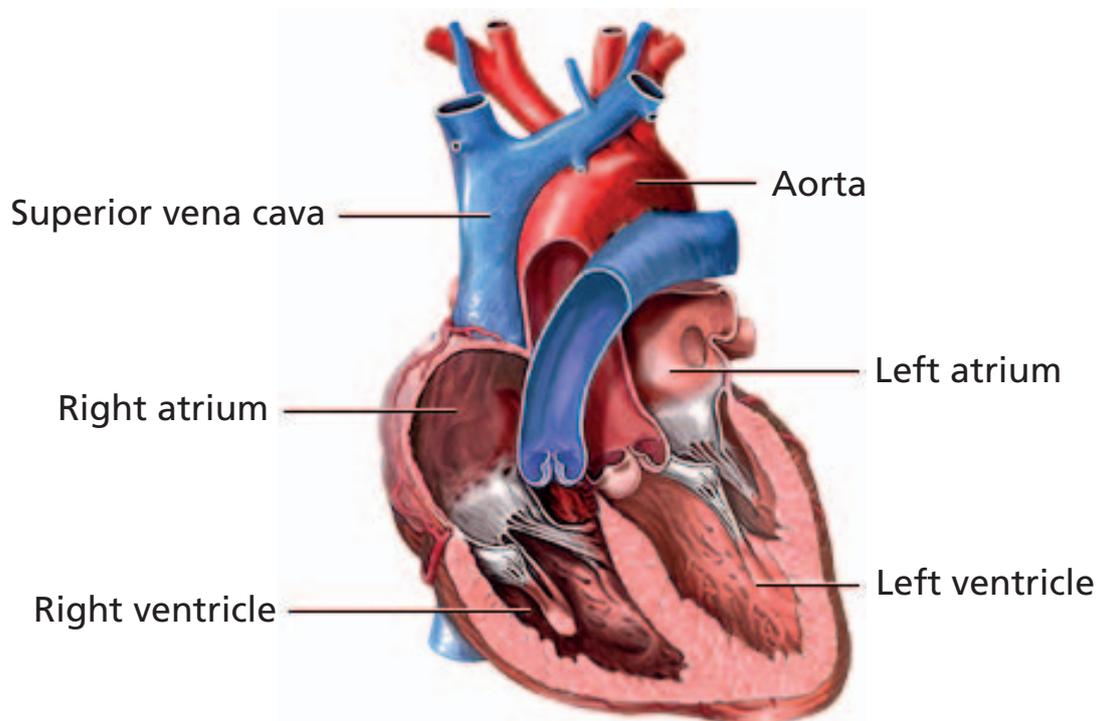
This information sheet provides details of the procedure, in order to help you to decide, along with your doctors, whether or not to go ahead with this procedure.

Understanding your heart

The heart has four chambers:

- two atria (upper chambers)
- two ventricles (lower chambers)

During each heartbeat both of the atria contract first pumping blood into the ventricles. Then both ventricles contract to pump blood out of the heart into the arteries.

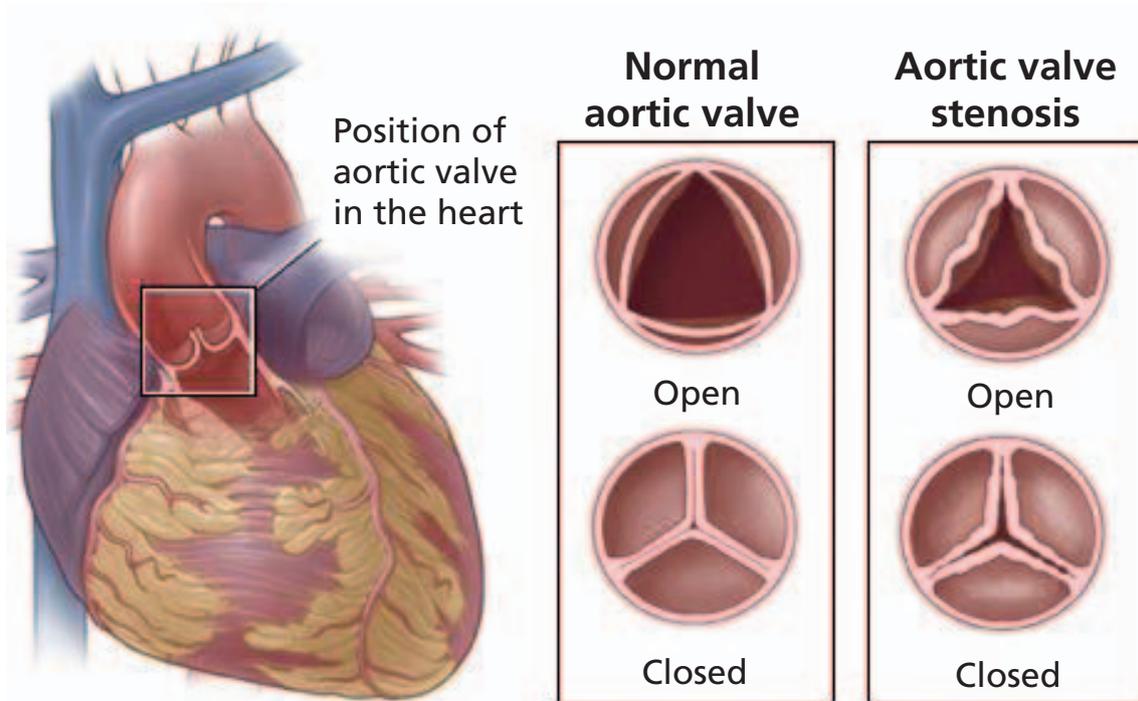


Heart chambers are separated by structures called heart valves. Heart valves ensure the blood flows in one direction through the heart. The valve positioned between the main pumping chamber of the heart (left ventricle) and the main blood vessel of the body (aorta) is called the aortic valve.

The aortic valve opens when blood is pumped from the heart into the aorta and around the body. When the heart relaxes the aortic valve closes to ensure the blood flows in the right direction.

What is aortic valve stenosis?

Aortic valve stenosis is the term used to describe a narrowing and thickening of the aortic valve. The valves are made of flaps of soft tissue which only allow the movement of blood in one direction. When they are stenosed this obstructs blood flow out of the heart. As people age these flaps sometimes become thickened and rigid. As thickening worsens, the main pumping chamber of the heart (left ventricle) has to work harder to overcome the obstruction. Over time this puts strain on the heart.



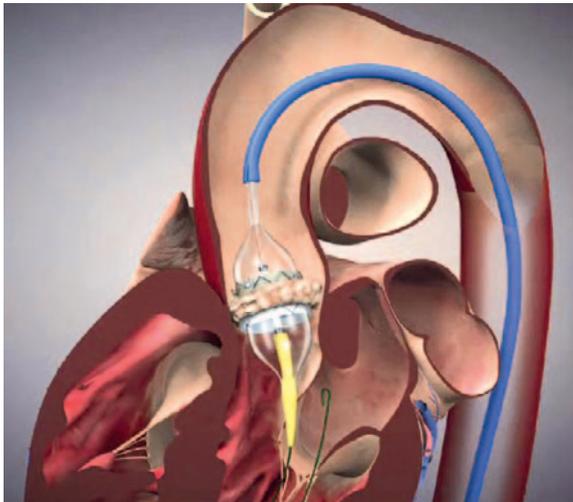
Treatment for aortic valve stenosis

For many years doctors have treated aortic stenosis by replacing the aortic valve using open-heart surgery. This is a well-established and very effective operation. However, in some patients, such as older patients, those with other medical problems, or those who have had previous cardiac surgery, the risks of surgical aortic valve replacement are very high. The surgeon, in conjunction with the patient, may decide that the risks are unacceptable.

Transcatheter aortic valve implantation allows the aortic valve to be replaced without the need for open-heart surgery, and is therefore a good option for patients in whom the risks of open-heart surgery are unacceptably high.

What does the procedure involve?

Transcatheter aortic valve implantation is usually performed under a general anaesthetic, although can be performed under local anaesthetic with sedation. Your doctors will tell you which approach they plan to use for you.



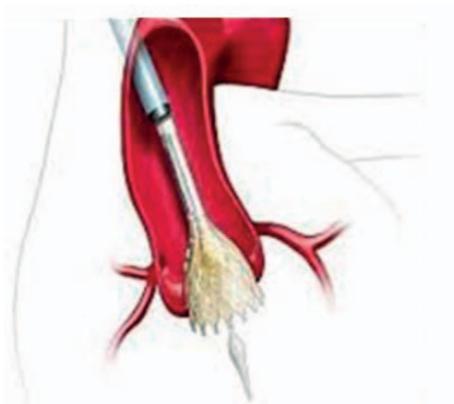
Tubes are passed into the arteries either through the groin or through the artery under your collarbone.

Through one of these tubes the doctors pass a large balloon into the aortic valve and inflate the balloon to stretch open the narrowed valve.

A long tube or 'delivery sheath' is then passed through the artery in the groin and up to the heart.

The new aortic valve is contained within this tube.

The valve is a 'tissue valve' made out of the lining of a pig or cow heart and then sewn into a metal tubular frame.



The delivery sheath is passed across the aortic valve, and then pulled back to deliver the new valve.

The metal tubular frame containing the valve expands of its own accord, pushing your old valve out of the way, and allowing the new valve to start working immediately.

What are the benefits of the procedure?

Having a new aortic valve implanted may relieve both the short and long term symptoms of you aortic stenosis. In most patients with previously severe symptoms, such as breathlessness and/or chest pain, and/or dizziness and blackouts, the symptoms are either abolished completely or are only mild after the procedure. This should result in a considerable improvement in your exercise capacity and quality of life.

What are the risks of the procedure?

Aortic stenosis is a serious condition and without treatment there is a risk that your symptoms will gradually worsen and lead to heart failure or even death. As with any procedure there are some risks associated with TAVI. Although it does not involve open-heart surgery, it is still regarded as a high risk procedure. This is partly because of the procedure itself and partly because patients undergoing the procedure are often older people and/or have other medical problems.

Major risks include:

- Stroke, 3.5%
- Heart attack, less than 2%
- Kidney failure (acute kidney injury), 2-5%
- Significant bleeding requiring surgery, 5-7%
- Requirement of a permanent pacemaker, 16%
- Death, 2.5%

Other possible risks include:

- Infection (heart valve, chest or wound)
- Allergic reaction to x-ray contrast
- Anaesthetic complications
- Bruising around the wound site
- A leak around the replacement valve (para-valvular leak)

What are the alternatives?

The alternative options are to undergo aortic valve replacement by open-heart surgery, or to continue with drug treatment alone. Surgical aortic valve replacement is a well-established and very effective procedure, but which carries a high risk in some patients.

Your case will be reviewed by an experienced Heart Team involving at least two Consultant Cardiologists and a Consultant Cardiac Surgeon who specialises in open-heart surgery, and, after discussion with you, the doctors will arrive at a final management plan which may indicate that the risks of surgical aortic valve replacement would be very high, and that percutaneous aortic valve replacement (TAVI) is a more suitable option.

Drug treatment can sometimes help the symptoms caused by the narrowed aortic valve. However, the effectiveness of drug treatment alone is limited. Without a procedure to replace the narrowed valve, your symptoms are likely to remain very troublesome, and indeed to deteriorate over the months to come. Without permanent treatment the condition is usually fatal in time.

Assessing your suitability for a TAVI procedure

You will only be suitable for TAVI if the doctors think you would be at high risk during open-heart surgery or if open-heart surgery is not seen as appropriate. To assess whether you are suitable for a TAVI you will need to have a range of tests and investigations undertaken.

The tests may include the following:

- **Electrocardiogram (ECG)** to record your heart rhythm
- **Blood tests:** a range of blood tests will be taken to
 - assess kidney function
 - assess that your blood clots properly
 - assess that your blood has enough haemoglobin to carry oxygen around the body
- **Trans-thoracic echocardiogram (ECHO):** an ultrasound (sound waves) scan of your heart which looks at the structure of your heart and the heart valves, and also gives information on the function and pumping action of your heart
- **Trans-oesophageal echocardiogram (TOE):** an ultrasound scan of your heart which involves swallowing a soft flexible tube as the pictures are taken via the gullet (food pipe). This allows detailed pictures of your heart to be taken. This test requires a day-case admission to the hospital
- **Angiogram:** this procedure is carried out by inserting a small plastic tube (catheter) into your artery in your groin or wrist. The test allows x-ray pictures of your heart arteries to be obtained
- **A computerised tomography (CT)** scan uses x-rays and a computer to create detailed images of the inside of your body. We will particularly be looking at pictures of your arteries in your chest and abdomen
- **Lung function tests** (also called pulmonary function tests or PFTs) check how well your lungs work. The tests determine how much air your lungs can hold, how quickly you can move air in and out of your lungs, and how well your lungs put oxygen into and remove carbon dioxide from your blood

The team of doctors will look at the results of all the tests and investigations and decide whether you will be suitable for the TAVI procedure. Your doctor will then help you to make an informed decision about the treatment of your aortic valve stenosis.

What happens before my TAVI procedure?

Once you have been accepted for a TAVI procedure we will arrange a date for it to be undertaken. You may be invited to a pre-admission clinic where you will have some tests and your TAVI procedure will be discussed with you in more detail.

If you take anti-coagulation medication (such as Warfarin, Apixaban or Rivaroxaban) or anti-platelet medication (such as Clopidogrel, Prasugrel or Ticagrelor) you may be asked to stop this medication a few days before your procedure. This decision is made on an individual patient basis and it will be confirmed with you before admission. If you have diabetes and take metformin we will ask you to stop taking this medication on the day of and for two days after your procedure.

Further information about your tablets will be given to you before your admission. It is important to bring an up to date list of all your medications to any pre-assessment appointments so we can understand what medications you are taking.

What can I expect during the procedure?

The TAVI procedure may be done under general anaesthetic or deep sedation by a team of specialists. During the procedure x-rays and ultrasound scans are used to place the TAVI valve in the correct position. The TAVI valve can be implanted through your groin or through the artery under your collarbone. Your doctor will advise you which route will be used prior to the procedure.

What happens after the procedure?

After the procedure you will be transferred to a ward where you will be closely monitored overnight. During your recovery you will need further tests. It is likely you will be in hospital for 3-7 days after your TAVI procedure, depending on how quickly you recover. After your procedure your doctor will ask you to take blood thinning medication.

What do I need to do after I go home?

We strongly recommend that you have someone at home to care for you for the first few days after discharge.

It is very important to remember that it takes time to recover from your TAVI procedure. It will take some time to regain your normal energy and to stop feeling weak and tired. Many people find they can be quite active one day and very tired the next. This is normal and will improve over time.

Wound care

You will have an incision/scar in your groin or on your chest, depending on where we made the cut to perform your TAVI. It is normal for these to be tender for a few days and also for a bruise to develop.

Femoral approach TAVI (groin)

During your procedure, tubes will have been inserted into both groins. These will be removed after the procedure. There may be bruising, therefore it is important to check for swelling or bleeding. Inform your GP if you notice any of the following:

- A hard tender lump under the skin around the area of incision (a very tiny, pea-sized lump is normal)
- Any increased pain, swelling, redness and/or discharge at the groin site
- A cold hand or foot on the same side as the procedure
- Raised temperature or fever

In the unlikely event that your groin starts to bleed you should lie down. Apply pressure to the area, keeping your leg as straight as possible. If the bleeding does not stop after 10 minutes you must seek immediate medical attention at your local A&E. Do not drive yourself.

The stitches in your groin area should be dissolvable and therefore will not need removing.

Sub-clavian approach TAVI (collarbone)

Your dressing should be removed before you go home. If the wound is clean and dry, you need not have the wound re-dressed.

You will have some stitches which should be dissolvable and therefore do not need removing. Your nurse will advise you if this is not the case and they do need removing.

Please look at your wound daily in a mirror. Please report any extra swelling, redness, oozing of wound, hotness to touch and/or excessive pain to your GP.

Activity

For a minimum of 6 weeks please **do not**:

- Carry heavy shopping
- Vacuum
- Do any gardening
- Do any activity which requires you to take weight through your arms and may cause a strain on your chest or stomach
- Do any strenuous exercise, including swimming, dancing and cycling. However, you should aim to walk every day

Walking is the best exercise following a TAVI procedure and it is essential for your recovery. You should plan your exercise so you don't tire yourself. You may find that the amount you can manage varies from day to day.

For the first one to two weeks after your procedure it is important you exercise little and often. Begin by walking around the house and taking short walks outside. Once you are comfortable walking on flat ground, try walking up hills slowly, resting as necessary.

Aim for two 15 minute walks, one in the morning and one in the afternoon, each day. At week three or four, gradually increase this. Your aim is to be able to walk for 30 minutes, five days a week.

You may find this difficult if you have mobility problems, so just do what you can manage as it is important to be as active as possible.

When can I return to normal activity?

Everyone is different so recovery times can vary. As soon as you are walking comfortably around the home you can carry out light housework such as washing-up, dusting, laundry, small amounts of ironing (while sitting down) and light weeding in the garden. None of these activities should make you feel extremely breathless: if they do, you are working too hard and need to slow down.

You may feel a little short of breath when you first start walking. **However, if you experience any of the following symptoms please contact your GP or NHS 111:**

- Chest pain
- Extreme shortness of breath (you can't speak)
- Palpitations causing dizziness / fainting
- Increased swelling in your ankles
- Any signs of infection (a red or inflamed wound, temperature, fever or excessive sweating)

Follow-up care

Before your follow-up appointment we will arrange a 24 hour ECG monitor at your local hospital. This will involve you going to your local hospital where a portable monitor will be attached to you. You will then be allowed to go home, returning the next day to have the monitor removed. This is so that we can assess if there is any long term effect of the procedure on your heart rhythm.

You will then be sent an appointment for an out-patient clinic 6-8 weeks following your procedure where you will see your Doctor or the TAVI Specialist Nurse. On the day of your appointment you will have a repeat echocardiogram in the morning and your out-patient appointment in the afternoon.

Stress and emotional reactions

If you experience any problems either physically or emotionally after the procedure, it is important to mention these to your GP so that he/she can monitor them.

Medication

Your medication is very likely to change and the ward staff will take you through all of your medicines before you are discharged from hospital.

Nearly all patients will take aspirin life long and Clopidogrel for 3 months only, unless you are already on anti-coagulation therapy such as warfarin or the newer agents, like Apixiban, Rivaroxaban, Dabigatran or Edoxaban.

Driving

Your consultant recommends that you do not drive for 4 weeks after the procedure. If you drive and do not hold a commercial driving licence you do not need to inform the DVLA. If you hold a commercial licence you have to inform the DVLA and they will advise you further.

We do advise you to contact your insurance company to avoid problems with any future claims you may make. You can contact the British Heart Foundation Heart Line on 0300 330 3311 for further details.

Travel and flying

We would advise you not to fly for at least six weeks after your procedure. If you wish to fly within three months of your procedure we advise you to contact your doctor and the airline for further information. Also ensure you have valid travel insurance. If you are unsure, contact the British Heart Foundation on the number above for further advice and support on this matter.

What should I do if I have a problem at home?

If, after discharge, you have any further queries or general concerns, please do not hesitate to contact us. We are always happy to help.

Please contact the TAVI nurse specialist, Melanie Neville or the TAVI Co-ordinator, Dawn Devonald on:

- **0114 226 9280**
(Monday to Friday, 9.00am to 5.00pm)

If you have a question outside these hours please contact the ward that you were discharged from. Explain that you were a TAVI patient and tell them the day that you were treated. A nurse or a doctor will happily answer your question if possible, or advise you of the best course of action to take.

Contact numbers

Chesterman 1: **0114 271 4518**

Chesterman 2: **0114 271 4346**

Firth 7: **0114 226 6215**

Coronary Care Unit: **0114 271 4226**



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