

Transcatheter Aortic Valve Implantation (TAVI)

A patient's guide

Valvular heart disease

The heart is a muscle which pumps blood to your lungs and around the body. There are four valves within the heart. These valves normally open to let blood flow through, or out, of the heart, and then shut to prevent blood flowing backwards.

If a valve becomes diseased or damaged this can affect the flow of blood in two ways:

1. If the valve does not open fully it will obstruct the flow. This is called valve stenosis.
2. If the valve does not close properly it will allow blood to flow backwards in the wrong direction. This is called valve regurgitation.

Aortic valve stenosis

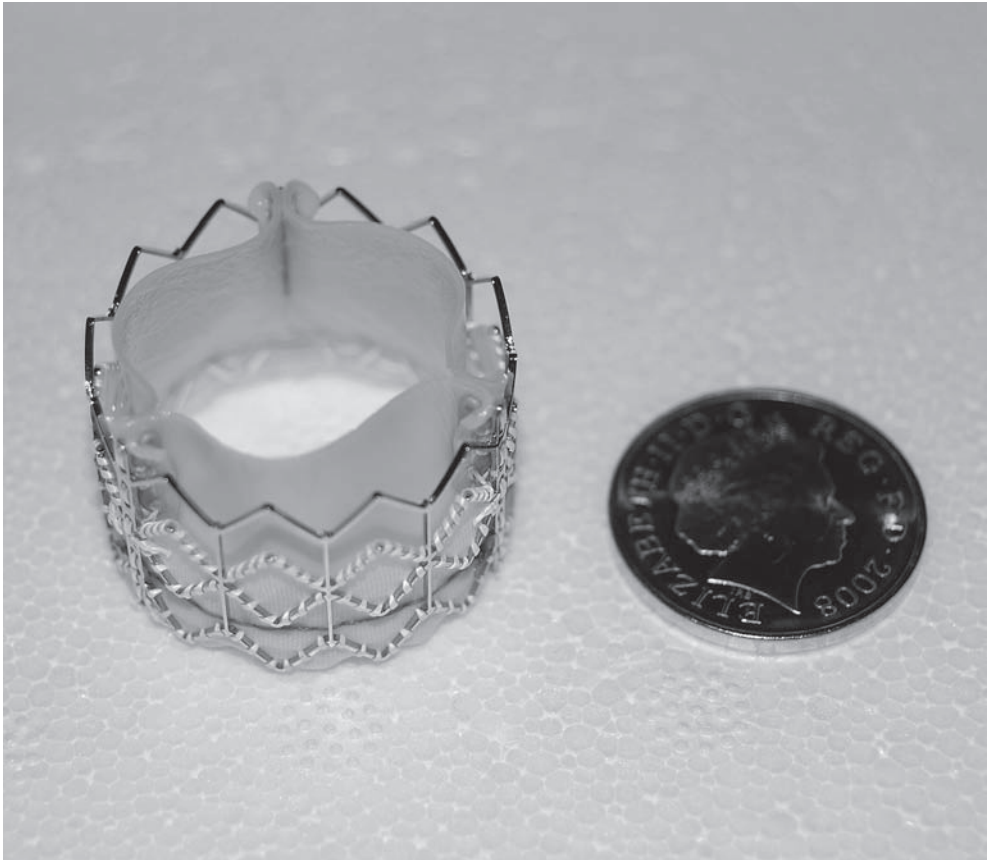
You have been diagnosed with aortic valve stenosis. The aortic valve is on the left side of the heart. When the valve opens blood is normally pumped from the left pumping chamber of the heart (ventricle) around the body. When the aortic valve is narrowed the blood flow out of the heart is restricted.

This can cause symptoms of chest pain, breathlessness and/or dizziness when exercising, and can lead to fainting. The restriction may also put a strain onto your heart pump, leading to heart muscle weakness, fluid on the lungs or swollen ankles.

The preferred treatment for severe symptomatic aortic valve stenosis is conventional aortic valve replacement. This involves open-heart surgery to replace the narrowed valve with a new artificial one. However, due to your overall medical condition, you are considered a high-risk candidate for conventional surgery, but may be suitable for a transcatheter aortic valve replacement.

What is Transcatheter Aortic Valve Implantation?

Transcatheter aortic valve implantation (TAVI) involves inserting a new artificial heart valve inside the old tight valve using a balloon catheter. The valve is made up of a metal frame (stent) and the outer lining (pericardium) of a cow's heart. The procedure is carried out under general anaesthetic.



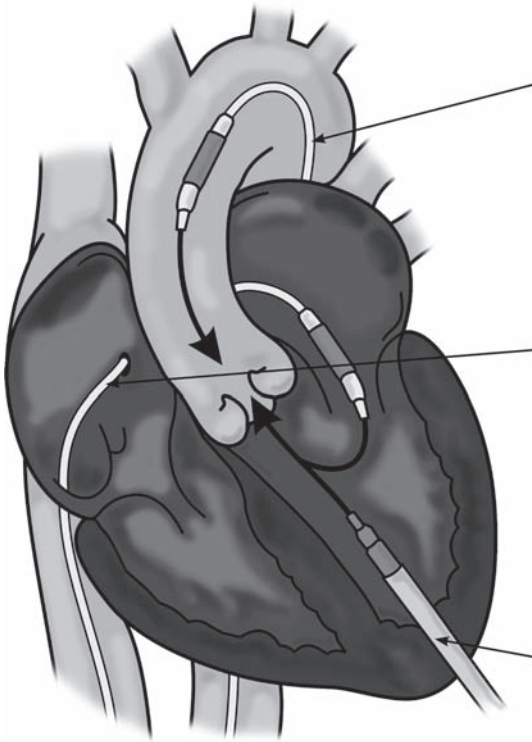
Edwards Sapien Valve (one pence coin to assist with scale)

There are two common routes of new valve insertion:

1. Transfemoral - through the femoral artery, the main artery in your groin which leads back to the heart.

2. Transapical - through a small cut on the left side of your chest to get to the apex (tip) of your heart.

The 'TAVI team', including your cardiologist, cardiac surgeon and anaesthetist will review your medical condition and screening tests to decide the most appropriate treatment and access route for you.



Retrograde Transfemoral Approach

The delivery system is introduced through the femoral artery allowing positioning of the prosthetic valve within the native stenotic aortic valve.

Antegrade Transvenous Approach

The delivery system is advanced through the femoral vein to the right atrium across the interatrial septum and mitral valve to be subsequently positioned in the stenotic aortic valve.

This approach is rarely used.

Transapical Approach

The left ventricular apex is reached by anterolateral minithoracotomy. The valve delivery system is introduced through the left ventricular apex and subsequently positioned in the stenotic aortic valve.

Transcatheter Aortic Valve Implantation Techniques

Screening tests

You may have at varying times:

- A physical examination
- An electrical heart trace (ECG)
- A chest X-ray (CXR)
- Blood tests
- An ultrasound probe and gel placed on the chest to obtain pictures of your heart (transthoracic echocardiogram)
- Possibly a transoesophageal echocardiogram (TOE) if clearer pictures are needed (this involves swallowing an ultrasound probe under sedation)
- An angiogram, which involves passing a tube (catheter) into your groin or wrist artery and taking X-ray pictures of your blood vessels supplying your heart (coronary arteries), your body's main blood vessel (aorta) and groin arteries.
- Other possible tests include CT or MRI body scans

Hospital admission

Once accepted by the medical team, and the funding for your operation is available, you will

be invited in for the operation. You will receive a letter with your admission details. This will usually ask you to stop any blood thinning medications five days before your operation.

You will be asked to come in the day before your procedure for preparation. Before the operation, you will be seen by members of the operating team. You will be kept 'nil by mouth' for a few hours prior to your procedure and the nurses will assist you to shave your chest, wrists and groins and also to shower.

The procedure will be done in the X-ray laboratory (similar room to where you had the coronary angiogram) using contrast dye and echocardiography to guide the valve into the correct position.

Procedure

You will be anaesthetised and then have a drip inserted into your neck and arm and a urinary catheter inserted into your bladder. You will have some tubes put through the blood vessels in your groin to deliver the contrast dye and a pacing wire to speed up the

heart during the valve insertion to ensure correct positioning.

The surgeon will gain access making a small incision either in your groin or chest wall. A catheter (narrow tube) is passed from the femoral (groin) artery to the aorta (transfemoral) or through the heart muscle near to the aortic valve (transapical). The catheter allows a balloon to be placed into your tight valve, the balloon is inflated to stretch the valve open. This part of the procedure is called balloon aortic valvuloplasty (BAV).

The new valve for implantation will be carefully compressed and mounted onto a balloon delivery catheter. When the valve is in the correct position your heart rate will be increased using the temporary pacing wire for a few seconds. This reduces the blood pressure and the motion of the heart making the procedure safer. The balloon is then expanded opening up the replacement valve in to a permanent position. The balloon is deflated and removed leaving the new valve to function immediately.

The operation site is repaired by the cardiac surgeon. A pleural (chest) drain is inserted if access has been via the transapical route, to drain any excess fluid or air from the chest cavity. The procedure takes one to two hours.

Following your procedure

You will go from the X-ray department to the recovery area for several hours where you will be closely monitored. Following this you will return either to the ward or the high dependency unit. Normally you are woken up early after the operation but occasionally you may need to stay asleep so will be kept sedated and if necessary admitted to intensive care.

Over the next 48 hours you will have your drips and drains removed. It is not uncommon to access both groin blood vessels. Whilst there are tubes in your groin you will have to be on bed rest. When these tubes are removed you can sit out and start to walk about.

You will be in hospital for five to ten days depending on how quickly you recover.

Potential benefits of a TAVI procedure

Treatment with the new valve should improve your symptoms. It will give you a more normal aortic valve performance and improve your overall heart function. We would hope this will increase your life expectancy and improve your quality of life.

Potential risks of the procedure

- Risk of heart attack: 1%
- Risk of stroke: 2-3%
- Risk of death during the procedure approximately: 2%
- Risk of requiring a permanent pacemaker: 3%
- Damage to groin arteries
- Bleeding
- Infection
- Kidney failure (if impaired kidney function existed prior to surgery)
- Emergency open heart surgery 0.5%

A TAVI would be recommended only if your doctors feel the risk is lower than conventional aortic valve replacement surgery.

Recovery at home

The following are only general guidelines as everyone's recovery is slightly different. It is advisable that you have someone to care for you for the first week after discharge. Please speak to your nurse or doctor as soon as possible if you think this will be a problem.

Activity

You should avoid strenuous activity for a few weeks, six weeks if your procedure was via the transapical approach. This includes heavy lifting (eg shopping, suitcases) or pushing and pulling (eg cutting grass, vacuum cleaning).

You may feel a little 'washed out' and tired and need to rest in the afternoon. However it is important for your recovery to have a short walk every day. This can be gradually increased.

You do not have to avoid climbing stairs or walking up inclines, you may have to start off at a slower pace. You may feel slightly out of breath on walking, which should improve as your fitness level increases.

There can be some fluid retention as a result of the surgery; you may notice some swelling of your ankles. If this swelling travels further than your ankles please get reviewed by your GP.

Wounds

Your wounds should be healed by the time you leave hospital, if they still require a dressing we will organise a District or practice nurse to continue this. The stitches are dissolvable so do not have to be removed. If your wound becomes red or inflamed please get your GP or practice nurse to check it.

You may have bruising to your groin(s) which is not uncommon and may take several weeks to resolve. You may have a hard lump under the skin due to a collection of blood (haematoma). Please consult your GP if this becomes painful or grows bigger.

Medication

As well as your normal medicines including aspirin, you will usually be discharged with an additional blood thinning medicine called Clopidogrel. This will be required for at least three months. After this you will only need to take the aspirin. People on warfarin may have only aspirin or clopidogrel. You will be discharged with some painkillers which we would recommend you to take regularly until you are no longer getting discomfort from your wound.

Driving

You are not allowed by DVLA to drive for four weeks after your procedure. If you have a LGV or PCV licence you will need to undergo an exercise test before getting your licence back.

Work

If you were working before your procedure there is no reason why you cannot return to this after a period of recovery up to six weeks.

Cardiac rehabilitation

You will be invited to attend cardiac rehabilitation about six weeks after your procedure. This is a programme of graduated exercise and general health discussions. If you live outside the Papworth area you may be referred to your local hospital. Patients who attend generally feel more confident about coping with everyday life. It will also help to increase your fitness level.

Follow-up care

On discharge you will be given a letter for your G.P explaining what you have had done and a list of your medications. The valve nurse specialist will phone you a week after discharge to check on your progress. If you have any concerns you can call on the cardiac support nurse line 01480 364100 (Monday to Friday 08.30 - 18.00). We would like to hear sooner rather than later about any potential problems.

You will be invited to attend an outpatient follow up appointment with the nurse specialist approximately six weeks after your procedure.

During this visit you will have an ECG and if your procedure was transapical also a Chest X-ray. At a further appointment after three months you will have an ultrasound scan of your heart and see the cardiologist. The doctor will then decide about any future appointments.

How to contact us

If you need further information please contact Helen Powell or Elaine Gaines, Valve Nurse Specialists, on 01480 364100

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For more information about Papworth Hospital please visit our website www.papworthhospital.nhs.uk

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