



Transcatheter Aortic Valve Implantation

What is aortic stenosis?

The aortic valve controls the flow of blood leaving the heart. In some people the valve leaflets become calcified (like 'limescale') and stiff leading to narrowing of the valve (aortic stenosis). Aortic stenosis reduces the flow of blood to the body and causes the main pumping chamber (left ventricle) to work harder. Aortic stenosis can be present for some time before causing symptoms. Patients may then develop breathlessness, chest pain, light-headedness, blackouts, breathlessness at night and ankle swelling. Around 6–8% of patients aged 80 years have severe aortic stenosis.

Once aortic stenosis causes symptoms (even if mild) the condition is serious and needs prompt treatment. Aortic stenosis is a progressive condition and the valve continues to narrow. Without treatment symptoms quickly worsen and eventually the heart fails and causes early death. Aortic stenosis significantly reduces the quality of life and results in frequent hospitalisation. The only effective treatment is replacement of the valve, either by open heart surgery or Transcatheter Aortic Valve Implantation (TAVI). Medications may temporarily relieve symptoms but do not alter the progression or outcome.

What is TAVI and why have I been referred for this?

TAVI is a relatively new treatment and is an alternative to open heart surgery, when the risk of surgery is felt to be high. TAVI is much less invasive than open heart surgery and patients recover faster, can be discharged sooner and are able to resume normal activity faster. You have been referred to the TAVI Team at the Queen Elizabeth Hospital Birmingham because it is felt you may benefit from TAVI. TAVI involves implanting a new, biological aortic valve, contained within a stent, into the narrowed aortic valve. TAVI differs from open heart surgery in that the calcified aortic valve is not removed (as it is in open heart surgery) but is pushed open by the TAVI valve and helps to anchor the new valve.

Usually, this can be undertaken via a keyhole procedure through the top of the leg (transfemoral TAVI). However, if leg arteries are unsuitable the new valve may require implant via a keyhole, through the chest wall (trans-axillary TAVI) or via a keyhole procedure through a vein in the groin (trans-caval TAVI). TAVI is reserved for patients who are considered unsuitable or at high risk from open heart surgery.

What investigations will I undergo to assess whether I am suitable for TAVI?

To determine your suitability for TAVI you will need to undergo a few tests. These will usually include an:

1. Echocardiogram
2. CT scan
3. Coronary angiogram (sometimes)

- **Echocardiogram** – in this test an ultrasound probe is passed over the chest wall to look at the heart and its valves. This test uses sound waves, like sonar, is painless and harmless.
 - Occasionally a transoesophageal echocardiogram will be needed to give more information. This test uses the same technology but this time the probe is passed down the food pipe (the oesophagus). This allows a better view of the aortic valve and is usually done under light sedation
- **CT scan** – This test involves X-rays and looks at all the vessels that may be used to undertake TAVI. It allows us to decide the best route for implanting the valve and the size and type of valve that will be best for you
- **Coronary angiogram** – this involves X-rays. A small tube is inserted to look at the arteries supplying the heart in more detail, either via the wrist or the leg

The tests above will usually be done as an outpatient.

What are the risks and benefits of TAVI?

TAVI improves the symptoms of aortic stenosis and also prolongs life.

The benefits of TAVI compared with opened-heart surgery are a shortened hospital stay, a less invasive procedure, faster recovery, less atrial fibrillation (a common arrhythmia) and a lower need for blood transfusion.

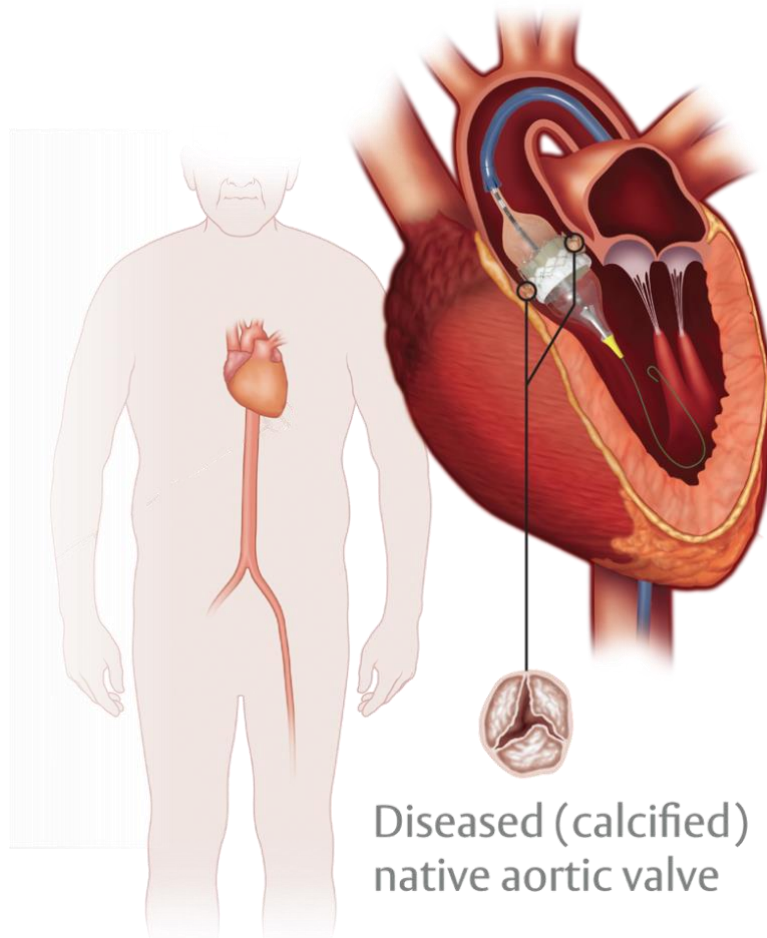
Although TAVI is much less invasive than open heart surgery, it nevertheless involves risks. The most important risks that you should be aware of are listed below.

Over 4 years (2022–2026) just over 1200 procedures took place at QEHB. The risks quoted below are based on this period and reflect current practice.

1. The risk of not surviving TAVI at Queen Elizabeth Hospital Birmingham is 1.2% (<2 in 100)
2. There is a small risk of a stroke during, or shortly after TAVI, in the order of 0.9% (<1 in 100)
3. There is a risk that you may need to have a pacemaker. This would usually be undertaken immediately after the procedure or before discharge. The chance of needing this depends on the type of valve implanted and is 4.7% (<5 in 100)
4. There is a 4.5% (<5 in 100) risk of complications related to the site where the valve is inserted into the body. This may require a stent or a small operation to repair the damage
5. There is a less than 0.2% risk (<1 in 200) that you may require temporary kidney dialysis after the procedure. The risk is increased if your kidney function is very abnormal or if a significant complication occurs
6. There is a 0.7% risk of tamponade (bleeding around the heart)
7. There is around a 0.31% (<1 in 200) risk of an emergency open heart operation, should a serious complication occur

How will my TAVI procedure be performed? Most TAVIs at QEHB (around 96%) are undertaken via the artery at the top of the leg. Nearly all TAVI procedures done via the leg are undertaken with 'conscious sedation'. This means you will be awake, but relaxed, during the procedure.

Transfemoral approach



*Illustrations reproduced with kind permission from Edwards Lifesciences

Sometimes, the leg arteries are unsuitable and a trans-axillary or trans-caval procedure may be necessary. This may require a general anaesthetic but is still much less invasive than open-heart surgery and is undertaken through a keyhole.

How long can I expect to be in hospital for the procedure?

You will usually come in the evening before your procedure. Patients who undergo a transfemoral TAVI, with conscious sedation, are usually able to go home the day after the procedure. This means you will usually be in hospital for two nights.

If the TAVI is undertaken via the artery under the collarbone (trans-axillary) or through a vein in the leg (trans-caval), the recovery period is a little longer, but in an uncomplicated procedure, you may expect to go home 1–2 days after the procedure.

Other frequently asked questions:

Will I need Warfarin?

No. All the TAVI valves consist of a metal frame within which is suspended a valve made from animal (cow or pig) tissue. This type of valve does not require you to take Warfarin. You will normally be advised to take Clopidogrel or Aspirin indefinitely after the procedure.

Will I need to take any anti-rejection treatments?

No. TAVI valves do not require any anti-rejection treatment.

What type of valve will I have?

The team will choose a TAVI valve best suited to your particular anatomy. Two different types of valve are mainly used at QEHB.



**Edwards Sapien 3™ Ultra Resilia
(cow pericardium)**



**Medtronic Evolut™ FX+
(pig pericardium)**

Will I be a candidate for TAVI?

The final decision on whether TAVI is appropriate for you will depend on a number of factors. A multi-disciplinary team meeting will be held in order to discuss your case in detail and decide what the best treatment is. This will be attended by a variety of specialists including interventional cardiologists, cardiothoracic surgeons, cardiac anaesthetists, cardiologists with specialist imaging expertise and sometimes a care of the elderly physician. In the end, some patients will be recommended to undergo conventional open-heart surgery and others who are considered high risk for conventional surgery, will be offered TAVI. Some patients will be left to continue on medical treatment. TAVI is not appropriate for everyone.

Am I too old for TAVI?

TAVI is generally undertaken in patients who are elderly and considered high risk for conventional open-heart surgery. The average age of patients undergoing TAVI in the UK is about 81 and the oldest patient successfully treated at the Queen Elizabeth Hospital Birmingham was 101 years.

How long will my TAVI valve last?

Because this is still a relatively new device there is no definitive data on how long your new valve will last. Current evidence shows the longevity of TAVI valves is similar to surgically implanted biological valves at 10 years.

How many TAVIs have been performed at the QEHB?

At the time of writing of this information leaflet (July 2026), the TAVI team at the QEHB have undertaken over 2600 procedures since the program started in 2008.

How long does the TAVI procedure take?

The TAVI procedure normally takes around 60–90 minutes.

What happens after the procedure?

Most patients go back to the main cardiac ward (727). A few may need recovery in coronary care or intensive care. After a trans-femoral TAVI you will usually be able to sit up at 30 mins, walk after 3 hours and go home the next day.

How mobile will I be at discharge?

Most patients are self-caring at discharge and able to return to their own homes, without special care arrangements.

How soon can I drive after TAVI?

DVLA stipulate that you may resume driving **2 weeks** after the TAVI procedure:

www.gov.uk/guidance/cardiovascular-disorders-assessing-fitness-to-drive#heart-valve-surgery--including-percutaneous-valve-intervention

What happens next?

We will normally wish to see you in clinic and it is a good idea if someone close to you comes along. If you are keen to be considered, and if the doctor feels TAVI is the right treatment for you, then we will arrange the investigations mentioned above. After all the test results are available, we will discuss you in a multidisciplinary meeting (MDT) and decide if TAVI is the right treatment for you. If the decision is to offer TAVI we will undertake this as quickly as possible.

Who should I contact if I have further questions?

If you have further questions, please contact Anne Morris (secretary to Prof Sagar Doshi) on **0121 371 4613**, or TAVI nurse practitioners: Ewa Lawton (07464 908049) or Dionne Parsley (07920 139771).

Please watch the animations below explaining your procedure and the recovery.

TAVI procedure

Type www.explainmyprocedure.com/uhbtavi/qr/tavi into your phone or computer browser
Or scan QR code



You will be prompted to add the following **password: uhb2110**

TAVI recovery

Type www.explainmyprocedure.com/uhbtavi/qr/tavi-recovery into your phone or computer browser
Or scan QR code



You will be prompted to add the following **password: uhb2110**

Information governance

We participate in the National Cardiac Audit program to ensure that the quality of the care we provide is independently assessed, compared to National and International guideline defined standards, and compared to all other centres undertaking these procedures in England and Wales. To this end we send patient identifiable information in a secure and encrypted manner to the National Institute for Cardiovascular Outcomes Research (NICOR). All NICOR audits and registries have approval under Section 251 of the NHS Act 2006, which means NICOR can use patient identifiable data, without obtaining patient consent, in order to monitor and help improve quality of care. All personal identifiers are anonymised before any of the analyses are made available. A Patient Information leaflet and all other details about the NICOR audits and the information governance associated with the use of clinical data can be found on the NICOR website at www.nicor.org.uk/about-us/information-governance

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