Transcatheter Aortic Valve Implantation

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What is aortic stenosis?
The aortic valve controls the flow of blood leaving the heart. In some people, as they get older, the leaflets of the valve become calcified (hardened like limescale) and result in the valve becoming narrowed (aortic stenosis). This narrowing reduces the flow of blood leaving the heart and also causes the main chamber, the left ventricle, to work harder.

Around 6-8% of patients aged 80 years and over have symptoms due to severe narrowing of the aortic valve. These symptoms may be very limiting and include breathlessness and chest pain on exertion, light-headedness and blackouts, breathlessness when lying flat in bed and ankle swelling. Aortic stenosis causing symptoms is a very serious condition and significantly reduces life expectancy. Unfortunately medications only partially relieve the symptoms and do not change the relentless progression of the narrowing. In the past the only option was for the narrowed valve to be replaced by open heart surgery. There is now an alternative treatment called TAVI.

What is TAVI and why have I been referred for this?
TAVI stands for Transcatheter Aortic Valve Implantation. It is still a relatively new treatment for severe symptomatic aortic stenosis and is an alternative to open heart surgery. TAVI is less invasive than open heart surgery and therefore leads to a much shorter stay in hospital and a shorter recuperation period.

You have been referred to the TAVI Team at the Queen Elizabeth Hospital Birmingham because it is felt that you may benefit from TAVI rather than conventional open heart surgery. TAVI involves implanting a new biological aortic valve, suspended within a stent, to treat the narrowed aortic valve (see figures). This can be undertaken via a small operation through the top of the leg (transfemoral approach). However, if leg arteries are unsuitable the new valve may require implant via a small operation through
the chest wall (trans aortic or trans apical approach). TAVI is currently reserved for patients who are considered unsuitable or at high risk from for open heart surgery.

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

To determine your suitability for TAVI, we will need to undertake a number of investigations. These will include:

1. **Transoesophageal echocardiogram**

   You will by now almost certainly have undergone a transthoracic echocardiogram whereby an ultrasound probe is passed over the chest wall to look at the heart and its valves. A transoesophageal
echocardiogram 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 allows accurate measurements to be taken to assess your suitability for TAVI. The procedure is done under light sedation and can be performed as an outpatient.

2. Coronary angiogram
A coronary angiogram involves placement of a small tube either via the wrist or the artery at the top of the leg to look at the arteries supplying the heart in more detail. You may already have undergone this investigation at your local hospital. If not, this test will need to be done as part of the TAVI assessment.

3. Carotid Doppler
This test is a painless ultrasound scan of the arteries in your neck to determine whether or not they are narrowed. If there are significant narrowings in these arteries, they may need to be treated prior to your treatment by TAVI.

4. Spirometry
This is a simple blowing test to assess your lungs capacity and to determine the risks of anaesthesia.

5. CT aortogram
This test is a CT scan which looks at all of the vessels leading from the artery at the top of the leg right up to the aortic valve. It allows us to decide if the valve can be implanted through the artery in the leg.

Patients are often admitted for 4-5 days for all the above tests to be undertaken. They can be done as an outpatient but this may take longer for all the tests to be completed.
What are the risks and benefits of TAVI?

Relief of aortic stenosis by TAVI leads to an improvement in the symptoms described above and also prolongs life expectancy compared with medical treatment alone. Although a TAVI procedure is a much smaller operation than open heart surgery, it nevertheless still involves risks.

The most important risks that you should be aware of are the following:

1. The risk of not surviving the operation is in the order of 6-10% (between 6 and 10 patients out of every 100 patients undergoing TAVI will not survive). The exact risk depends on several factors such as how the TAVI procedure is performed (through the artery in the leg or through the chest wall) and also on a number of medical factors known as co-morbidities. These are illnesses which may increase the risk of a TAVI procedure.

2. There is a small risk of stroke during or shortly after a TAVI in the order of 2-3%.

3. There is an approximate 5% risk that you may need to have a pacemaker implanted as a result of the TAVI procedure. This would usually be undertaken immediately after the procedure and before discharge.

4. There is a 5% risk of complications related to the insertion of the valve either through your leg or chest wall. This may mean that a small repair operation is required to repair the damage.

5. There is a small risk that you may temporarily require kidney dialysis after the procedure. The risk of this is increased if your kidney function is abnormal prior to TAVI. The doctors will explain more regarding this particularly risk which will also be dependent on some other factors relating to your health.
How long can I expect to be in for the procedure?

You will usually be admitted the day before the operation. Following an uncomplicated TAVI done via the artery in the leg, you may expect to be able to go home between 4-6 days. If the TAVI is undertaken via a small operation through the chest wall, the recovery period is a little longer but in an uncomplicated procedure you may expect to go home at around 7-10 days after the procedure.

Other frequently asked questions

Will I need Warfarin?

The type of valve implanted at the QEHB is an Edwards-Sapien tissue valve. This valve comprises a metal frame within which is suspended a valve made from bovine (from a cow) pericardium. This valve itself does not require you to receive Warfarin. You will normally be advised to take Clopidogrel and Aspirin together for 6 months after the implant.

Will I need to take any anti-rejection treatments?

No. This type of valve does not require any anti-rejection treatment.

Will I definitely 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 to work out the best treatment strategy for you. This will be attended by a variety of specialists including interventional cardiologists, cardiothoracic surgeons, cardiac anaesthetists and cardiologists with specialist imaging expertise. All the information we have obtained about you will be assessed and analysed. In the end, some patients will be recommended to undergo conventional open heart surgery, and others who are considered too high risk for conventional surgery will be offered
TAVI. Some patients will be left to continue on medical treatment. Unfortunately not everyone referred for TAVI is suitable for this procedure.

**Am I too old for TAVI?**

TAVI is generally undertaken in patients who are elderly and considered too high risk for conventional open heart surgery. The average age of patients treated in the UK is about 85, and to date the oldest patient successfully treated at the Queen Elizabeth Hospital was 94 years.

**How long will my TAVI valve last?**

Because this is still a relatively new development there is no definitive data on how long your new valve will last. Our best estimates at this stage are that its longevity will be similar to the standard surgically implanted valve which we know is up to 20 years.

**How many TAVIs have been performed at the QEHB?**

At the time of writing of this information leaflet (January 2013), the TAVI team at the QEHB have undertaken 96 procedures and are considered an experienced centre.

**Will I need a general anaesthetic for TAVI?**

In most cases we recommend that the procedure is done under general anaesthetic.

**How long does the TAVI operation take?**

The TAVI procedure normally takes around 90 minutes.

**What happens after the operation?**

Because it is less invasive than open heart surgery patients are normally up and about 3-4 days after TAVI.
What happens next?

After you have been referred we will normally wish to see you in clinic. 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 known we will discuss you in a TAVI multidisciplinary meeting. All the information will be looked at and the team will decide if it is technically possible to perform TAVI and if this is the right treatment for you. We will write to you after this with the opinion of the team. If the decision is to perform TAVI we will undertake this as quickly as possible.

How mobile will I be at discharge?

As TAVI is less invasive than open heart surgery and recuperation faster most patients are self caring at discharge and able to return to their homes without special arrangements.

Who should I contact if I have further questions?

If you have further questions please contact Mrs Deanne Hastilow (secretary to Dr S N Doshi) on 0121 371 4613.

The Trust provides free monthly health talks on a variety of medical conditions and treatments. For more information visit www.uhb.nhs.uk/health-talks.htm or call 0121 371 4957.