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Macluumaadkaan waxaa loo heli karaa qaab kale, sida ugu akhrinta ugu fudud, ama far waa weyn, waxana laga yabaa in lagu heli luuqaado Kale, haddii la codsado. Wixii macluumaad dheeraad ah, kala hadal kooxda xarunta caafimaadka.

Bu bilgi, kolay okunurluk veya büyük baskılar gibi alternatif biçimlerde sunulabilir, ve talep üzerine Alternatif Dillerde sunulabilir. Daha fazla bilgi için klinik ekibinizle irtibata geçin.

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Please contact us if you need general information or advice about Trust services: www.bartshealth.nhs.uk/pals

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All our patient information leaflets are reviewed every three years.

Patient information

Trans-catheter Aortic Valve Implantation (TAVI)

Information leaflet for patients and their families



Introduction

The aortic valve is one of the four heart valves that control the flow of blood in and out of the heart. If the aortic valve becomes abnormally narrow (aortic stenosis) or leaks (aortic regurgitation), the heart must work harder to pump the same amount of blood. As a result, the heart muscle thickens, and the chambers of the heart may enlarge.



Image courtesy of Abbott Laboratories

In patients with severe aortic stenosis or severe aortic regurgitation, the only effective long-term treatment is to replace the valve. If aortic valve disease is left untreated, it may lead to breathlessness, chest pain, blackouts, heart failure and eventually death.

Aortic valve replacement can be performed by open heart surgery or by a minimally invasive procedure called TAVI (Transcatheter Aortic Valve Implantation). Your doctor will discuss with you the treatment options that are best suited to your individual circumstance. This leaflet will provide you with information about the TAVI procedure, as well as what to expect before and after the procedure.

“I was diagnosed with severe aortic stenosis in January 2022. For some months I have suffered distressing bouts of chronic shortness of breath when even the slightest exertion would leave me needing time to recover. When I had news that I was considered to undergo the TAVI treatment I was thrilled.

The people at Barts were very kind and good-natured and made me feel very much at home. On the day of the procedure, I was wheeled into the theatre and helped up onto the table where everything was done to make me comfortable. I had no sedation, though the anaesthetist stood by me just in case she was needed. I didn't think much of the background music, so I chose something more to my taste which is why my procedure was done to the accompaniment of Louis Armstrong and Ella Fitzgerald.

I felt no pain during the procedure apart from mild discomfort when it was necessary for the surgeon to push on my groin to gain access to the heart. It all took about an hour and a half. It did make me wonder at the skill and care of the team and the miracle of what was being done to my heart. When it was over, I had to lie still while I was moved from the table back onto my bed; we laughed a lot during the process.

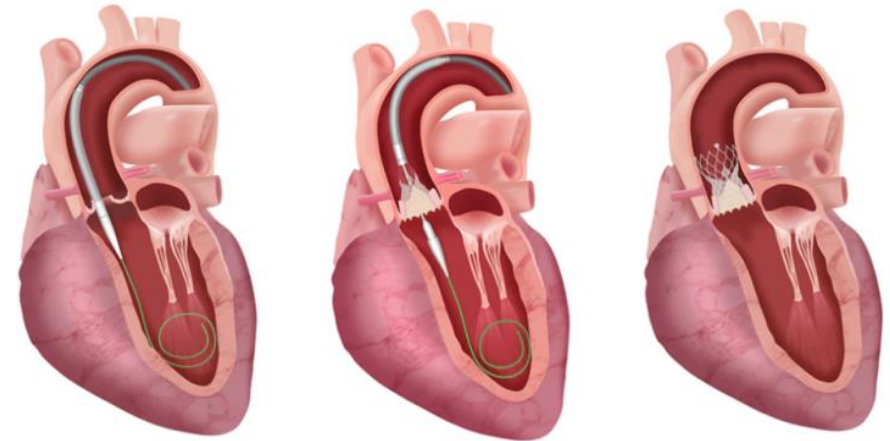
A few hours of carefully monitored bed rest followed but I was very quickly back on my feet even though I had to tow the monitor with me. After a good night's sleep, I was fit to go home, still marvelling at the brilliance of the TAVI team and forever grateful for the privilege of being treated so beautifully. Here's to the Good Ship TAVI and all who serve there.”

- **To book Barts Hospital transport:** 0207 767 3344 (please arrange your transport at least 3 days prior to your appointment/ admission date)
- **For Diagnostic test appointments: Mon- Fri 8am-5pm**

Cardiac CT scan	0203 465 6114/ 56117
Echocardiogram/ TOE	0207 377 7000 Ext: 58154
Clinic 1	0207 377 7000 Ext: 56457

Paul's TAVI patient story

Paul is an 82-year-old, retired broadcaster who suffered from long-term intrusive shortness of breath. After having a successful TAVI procedure, he is now satisfactorily recovering and resuming normal activities. Here is his story:



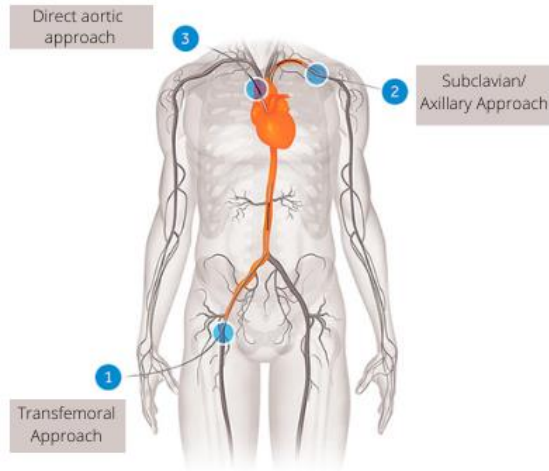
Reproduced with permission of Medtronic

What is TAVI?

TAVI stands for **T**ranscatheter **A**ortic **V**alve **I**mplantation, and this is a procedure whereby a replacement aortic valve is implanted using a catheter (tube) introduced via an artery, most commonly in the groin ('transfemoral approach') without the need for open heart surgery. The valve is advanced to the heart over a guidewire that has been placed across the narrowed aortic valve.

The size of the blood vessels in your body are assessed by a scan which will be performed prior to your procedure. In patients who have narrowed arteries in their legs, TAVI can also be carried out via other access routes. For example, an artery in the shoulder ('axillary/ subclavian approach'), via a small cut in the chest under the left breast ('transapical approach'), or via the vein in the leg by creating a connection between the vein and artery in the abdomen ('transcaval').

The choice of which approach to use will be discussed with you by the medical team once they have had a chance to review your scans.



Reproduced with permission of Medtronic

None of these methods require the breast bone to be cut or open-heart surgery to be performed. They are therefore less invasive than conventional surgical aortic valve replacement. The new valve is fitted inside your old, damaged valve, which is not removed but used to help anchor the new valve in place.

The new aortic valve is made of porcine (pig) or bovine (from a cow) tissue mounted on a metal stent (a small mesh metal tube which holds the valve in place). There are a number of devices available and in use, but the most common types are:

- **TAVI has been approved by the National Institute for Health and Care Excellence (NICE).**
You can find more details on their website: www.nice.org.uk/guidance/ipg421/informationforpublic.
- **British Heart Foundation** www.bhf.org.uk
The website contains helpful information on all aspects of heart disease including the conditions, tests, treatments, and rehabilitation.
- **Heart Valve Voice** www.heartvalvevoice.com
This charity provides information and support for people with heart valve disease.

Useful contacts

- **Clinical Nurse Specialist (CNS) Team: 0203 765 8627**
(Mon- Fri 8am-4pm)
- **For clinic appointment queries: Mon- Fri 8am-5pm**

Medical Secretary to: Dr Simon Kennon Dr Sumanto Mukhopadhyay Dr Michael Mullen Dr Mick Ozkor	Imran Ali	0203 765 8638
Medical Secretary to: Prof. Andreas Baumbach	Cheryle Spice	0203 765 8639
Medical Secretary to: Prof. Anthony Mathur	Kay Willis	0203 765 8715

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

We recommend that there is someone with you in the first 24 hours after the discharge.

Research Opportunities:

All members of the cardiology team are involved in heart valve research and are continuously developing new treatments. You may be offered the opportunity to take part in studies where you receive advanced treatments that are not routinely available. Your doctors or the research nurses will contact you during the time you are preparing for your procedure to tell you about the studies and explain how you can take part. Please ask any of the team if you are interested in taking part.

More information on the current research studies can be found on the British Heart Foundation webpage or **contact the research nurses on 0203 765 8740** who will be able to provide you with more information.

<https://www.bhf.org.uk/what-we-do/our-research/heart-conditions-research/heart-valve-disease-research>

Useful links

- **Our TAVI team at Barts Hospital have produced a short information film about the TAVI pathway and procedure in our Trust.**
This video documentation covers the entire patient journey from admission to discharge related to the TAVI procedure. We recommend that all patients (and their loved ones) watch the film as part of the preparation for considering TAVI. You can access the video in our Barts valve webpage.

- **Balloon-expandable valves:** The valve is loaded onto a balloon. When the valve is in position, the balloon is inflated to stretch the valve until it is engaged or 'locked' into place. The balloon is then withdrawn, and the new valve starts to function.



Image courtesy of Edwards Lifesciences Corporation.

- **Self-expanding valves:** The valve is loaded inside a cover or 'sheath'. When the valve is in place, the sheath is withdrawn and the valve expands, due to its 'shape memory', into the locked position.



Image courtesy of Abbott Laboratories

Your doctors will choose the most appropriate valve for you. The new valve will stay in place for the rest of your life and usually has an average life span of 10 years or more depending on each patient.

What are the benefits of TAVI?

TAVI can reduce symptoms caused by a tight or leaking aortic valve, such as shortness of breath, chest pain or fainting. Since this is a “key-hole” procedure, this only requires a smaller incision without the need for an open-heart surgery which means quicker recovery and return to normal activities.

What are the risks of TAVI?

Every procedure carries risks, and they are different for each person. The following risks associated with this procedure are:

Most common risks:

- **Vascular complications such as bruising, bleeding and/or pain:** The artery may get damaged where the catheter is inserted or when the valve is being implanted.
- The **need to have a permanent pacemaker** inserted if your heart rate becomes too slow. This is due to how the electrical system of the heart is close to the location of your aortic valve. The risks of having a pacemaker implanted after the procedure are different for everyone. The choice of the valve and existing underlying abnormalities in the electrical system of the heart will increase this risk.

Infection risk and Dental care

In order to minimise the serious risk of complications after heart surgery, such as infective endocarditis (‘heart muscle infection’), we strongly recommend that your teeth and gums are checked by your dentist regularly.

It is essential for you to inform your dentist about any previous valve surgery including TAVI whenever you are scheduled for any invasive dental procedures which can cause bleeding, such as having a tooth extracted, as you may need antibiotics prescribed prior to these.

These procedures may increase the chances of bacteria entering your bloodstream causing an infection. For further information on this, please refer to:

<https://www.nice.org.uk/guidance/cg64/ifp/chapter/About-this-information>.

When can I fly or travel abroad after TAVI?

You can fly a week after your procedure, but you may wish to wait until after your first follow up appointment. You may want to discuss with the TAVI team before you make any plans to travel abroad. You must also inform your holiday insurance company about the TAVI procedure that you had.

When can I return to work?

This will be different for each person and will depend on many factors, such as the overall state of your health and the type of work that you do. Please discuss this with your TAVI nurse specialists or doctor.

How should I care for my wound?

It is normal for your groin to be tender for a few days after the TAVI. It is also common for a small bruise to develop but this should get better in a few weeks, otherwise, please do let us know. You can shower when you get home but please avoid rubbing the wound site, putting creams, powder or soap for one week. Please do not have a bath for one week. We use specialised stitches and plug to close the top of the groin wound. These help to keep the puncture site together and are dissolvable. It can take a few months for the stitches and plug to dissolve.

You may be discharged home with dressings (plasters) on your groin. After 24hrs of being at home, you can take the dressings off and leave the wound open to the air. If you notice any signs of infection such as: pain, redness, swelling, oozing from the site, fever, loss of sensation in the foot/leg please contact your GP or our team for further advice. **If your groin starts to bleed, apply firm pressure with your fingers above the bleeding point, and call for help by dialing 999. Do not drive yourself to the GP or A&E.**

Will I have a follow-up appointment?

You will have a follow-up appointment around 2-3 weeks after your procedure. We may carry out an echocardiogram (an ultrasound of the heart) to check the function of the new valve and your heart. We usually will refer you back to your local cardiologist for further follow up appointments.

What medication will I need to take?

You will need to take a medication to prevent blood clots forming on the valve. We will inform your GP about the duration, which is usually for life. We may change other medications, as necessary. The Pharmacist will ensure that you have enough supply of your regular medications before you are discharged from hospital.

Infrequent risks:

- **Stroke:** This can sometimes be treated with 'clot- dissolving' drugs or further catheter-based treatments. This would require a transfer to another hospital within the Trust which specialises in the treatment of strokes.
- **Damage to the kidneys.** The risk is higher if you have poor kidney function before your TAVI. Usually, the kidneys get back to normal without treatment. Rarely may need 'haemodialysis', a procedure where a machine is used to do the kidneys' job of cleaning the blood.
- **Leak around the valve** which can be repaired by stretching the valve with a balloon, a second TAVI or open-heart surgery.
- There is a **small risk of infection on the valve** leading to a condition called "Endocarditis" which may require antibiotics or rarely surgery.

Rare but life-threatening risks:

Overall, the risk of major complication is low.

- **Bleeding around the heart** which may need a drain to be inserted or the **need to change to conventional open-heart surgery** in an emergency which can extend your stay in hospital.
- **Death.** There is a <2% of death from the procedure itself or due to an associated complication surrounding the procedure.

What are the alternative treatment options for aortic valve disease?

Your doctor will discuss with you on what is the best treatment option based on your individual circumstances. Alternative treatments are as follows:

Surgical Aortic Valve Replacement: This involves opening the chest, stopping the heart, and supporting the patient on a heart-lung machine. The diseased valve is removed, and a new valve is sewn in place. Surgical aortic valve replacement is very successful in most patients and can be combined with bypass grafts if necessary. However, in some people the risks of such an operation are considered high and these patients are now considered for a TAVI procedure.

Balloon Aortic Valvuloplasty (BAV): This is a procedure where the valve is opened up/stretched using a balloon. It is effective in reducing symptoms but often only for a few months. It can be used as a temporary treatment until TAVI, or surgery can be performed.

Medical therapy: The aim of giving medication is to reduce both the blood pressure and the force of contraction of the heart in order to manage the symptoms associated with the valve disease. Giving medication is aimed at those patients whose valves are not narrow enough to require intervention or are too unwell for a procedure.

- Always pay attention to how you feel whenever you start or increase your activity or add a new activity. If you have any symptoms (unusual tiredness, shortness of breath, chest pain or dizziness), you must stop the activity and go back to the previous step that did not cause symptoms.

Step 1 (Week 1)	Walk around your home. Go slowly on stairs.
Step 2 (Week 2)	These walks should feel 'light' or 'easy'. Walk for 5 to 10 minutes at a time once or twice a day (like a morning and an afternoon walk).
Step 3 (Week 3)	Stay close to home; avoid hills. These walks should feel 'easy'. Continue to walk once or twice a day. Over several days, make your walks longer. For example, add 5 minutes every day or two.
Step 4 (Week 4)	When a 15-minute walk feels easy, you can increase your walking speed to a level that feels 'moderate'. Continue to lengthen your walks until you are walking a total of 30 to 60 minutes every day.

Exercise Guide

Each person will progress at different rates, and that is okay. Remember to listen to your body and know when it needs rest. **If you would like to be referred to your local cardiac rehabilitation service, please contact a TAVI nurse specialist or the Barts Cardiac rehabilitation team on 02034656593 to take this forward.**

Here is an exercise programme that you can follow after a few days of being home:

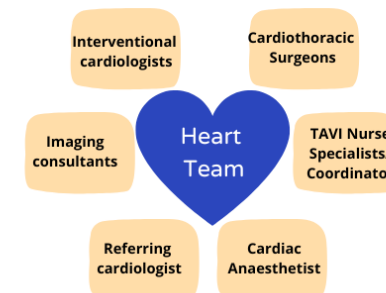
Walking programme

- Daily activity and exercise are an important part of your recovery. Walking is the best form of exercise you can take following a TAVI. You may find that the amount you can manage varies from day to day.
- Begin walking at a comfortable pace on a level surface. Do not include any stairs in your walking programme. Aim to improve approximately one level per week. If the suggested progression is too tiring, or if you miss one day, stay on the same level for another one or two days.
- Be sure to plan your walks and communicate your route with your support person. If you are exercising indoors, please make sure that there is good ventilation and humidity level. Walk in areas that are emergency vehicle accessible and bring a mobile phone with you.

The TAVI assessment process

Before you have your valve replacement procedure, your doctors will carry out a number of tests so that they can find out more about your heart and blood vessels.

Along with routine blood tests, you will have an echocardiogram (an ultrasound scan of your heart to assess your heart pump function and the severity of your aortic valve disease) and a CT scan (an X-ray that produces three-dimensional images of your body) to assess the size and shape of your valve and blood vessels. This is mainly to help your doctor to decide on the best access route to use for the TAVI procedure.



Once these investigations have been completed you will be listed for discussion by the **multi-disciplinary team (MDT)**. This is where a team of specialists will discuss the best treatment options for you using the data from your assessment.

The TAVI clinical nurse specialist will be in touch with you following the discussion. They will inform you of the outcome and if appropriate, agree a date with you for your procedure. A letter will also be sent out to you by post to confirm your admission details.

Dental care prior to TAVI

It is important to maintain a good oral health especially if you have a heart valve disease. Poor dental health increases the risk of a bacterial infection in the blood stream, which can affect the heart valves and may lead to a heart infection called 'Infective Endocarditis'. Hence, it is essential that you have regular dental checks. Please register to a local dental practice if you do not see a dentist regularly.

Prior to hospital admission

A clinical nurse specialist from the TAVI team will conduct a pre-assessment with you which normally takes place by telephone around **two weeks before your admission date**.

However, if necessary, you may need to attend the hospital for blood tests and a face-to-face pre-assessment. The nurse will review your medical history, current medications and briefly explain the procedure and answer any questions or concerns you may have. If you are admitted in another hospital, the medical team will organise everything for your transfer here in Barts Hospital. We will also contact your family or next of kin accordingly should you wish for us to do so.

Patients usually come to hospital the day before their TAVI procedure to allow time for full preparation. Since you are coming in the day prior to your procedure, you can eat and drink water as normal and continue taking your medications as usual. Some of your medications may be stopped at a certain period of time prior to your admission and this will be discussed with you during the nursing pre-assessment.

- Do not lift anything heavier than 5 pounds for example: laundry baskets, grocery bags, telephone, luggage, pets, children or infants. Do not push or pull heavy objects such as furniture or appliances for 1 week post procedure.
- Housework or yard work: Do not do strenuous house work such as sweeping, mopping, scrubbing, hoovering or gardening for the first 1-2 weeks.
- Stairs are safe to use, but not as exercise. Limit use of stairs to once or twice a day for the first 1 to 2 weeks. Take your time, go slow, and pause to rest if you feel tired. Hold onto the handrail.
- **You are not allowed to drive for four weeks after your procedure.** You do not need to inform the DVLA about your procedure unless you hold a commercial license. If this is the case, you will need to call them for further advice. Drivers Medical Group, DVLA, Swansea, SA99 1TU, Tel: 0300 790 6806.
- You can take a shower as soon as you get home however, please avoid baths for 1 week after the procedure or until your groin incision is healed. Avoid extreme temperatures in the bath or shower. Lukewarm water is best and use mild unscented soap.
- Avoid sexual activity until your follow-up appointment with the TAVI team. Upon returning to sexual activity, listen to your body, take your time, and stop and rest if you feel pain or pressure in your chest.

Going home after the TAVI procedure

When can I leave hospital?

Normally, you can expect to be in hospital for approximately two nights. Before you go home, the TAVI team will check your wound and overall well-being. We recommend that you are accompanied by a relative or friend on your journey home. If this is not possible and you need to use our patient transport service, please let us know during your telephone pre-assessment so we can highlight this to the ward team who can arrange this for you upon your discharge.

When can I return to normal activities and what exercises can I do?

Everyone is different so recovery times do vary. As soon as you are walking comfortably around your home, you can carry out light housework and gradually build up your strength.

For the first week, please refrain from any strenuous activity such as: Carrying heavy shopping bags, gardening or strenuous exercises such as jogging, swimming, dancing and cycling. Walking is the best form of exercise you can take following a TAVI. You may find that the amount you can manage varies from day to day.

Activity Guide

On your discharge from hospital, it is fine to return to your normal daily activities with the following precautions:

Transport to hospital - Where possible, we recommend that a relative or friend drives or accompanies you coming in to hospital. If this is not possible, you can also arrange transport services to come to hospital by calling 0207 767 334. You need to arrange your transport at least 3 days prior to your admission date.

What to bring to hospital?

- A list of all the medications you take, including those bought without prescriptions
- Glasses, hearing aids or dentures
- Personal care items if preferred, such as a brush or comb, toothbrush
- Loose-fitting, comfortable clothing
- Mobile phone, if you have one, to provide ease of communication between you and your family
- Items that may help you relax (e.g., book, magazine), as there can sometimes be a wait whilst in hospital.

How is the TAVI procedure performed?

On the day of the procedure, you will arrive in the cardiac cathlab, the team involved will check your details, and you will be transferred onto the operating table. You will be attached to a heart monitor to continuously check your heart rate and rhythm, blood pressure and oxygen levels throughout the entire procedure. Your groin will be cleaned and then plenty of local anaesthesia will be injected to numb the area.

Under local anaesthetic, a small tube (called a sheath) will be inserted in the artery at the top of one of your legs or arm for taking pictures during the procedure. A slightly bigger sheath will be inserted into the artery at the top of your other leg, which the new valve will go through.

Sometimes, a temporary pacemaker will be put into your heart through a vein in your neck or leg in case the doctor needs to speed up your heart during the procedure.

Catheters (small tubes) are passed through the bigger sheath to pass a long 'guide wire' across the narrowed aortic valve. The new aortic valve (TAVI) is then advanced over this wire (like a train on rail tracks) until it is in place inside your narrowed valve and then expanded to push the narrowed valve open, creating a new valve within it. A small balloon ('balloon catheter') may be used to widen your narrowed aortic valve before the new aortic valve is placed. It may also be used to widen the new aortic valve after it has been implanted. During implantation of the valve or ballooning, the heart is made to speed up at higher rates and you may feel palpitations or dizziness during this which should resolve within a few seconds. Once the valve has been successfully implanted, the tubes from your legs will then be removed and closed with dissolvable sutures and a specialised collagen plug to aid in the blood vessel's healing and closure.

Will I feel anything during the procedure?

The majority of procedures can be carried out with local anaesthesia often with little or no sedation. This means you will be awake during the procedure. You may feel some discomfort when the tubes are inserted and during placement of the valve, but this is normally short-lived. In some cases, the blood vessel in the leg is not big enough or may be diseased and therefore the valve has to be inserted via a different route. If we require these alternative routes, as discussed above, a general anaesthetic may be used.

Recovery and Discharge:

After the procedure you will be taken to a recovery ward for close observation. Once you are well enough, you will be moved back to the cardiology ward where you were first admitted. As you recover, you will be closely monitored. You will have to stay in bed for about 4-6 hours after the procedure to allow the blood vessels to heal and close appropriately. After this, you will be gradually sat up and encouraged to walk around the ward to see how you get on. If you experience any pain, this will be treated with pain-relieving drugs. The length of stay in hospital following the procedure is different for everyone. As a general guide, for uncomplicated procedures and majority of the patients are usually ready to go home the **day after their procedure** after having some blood test and a repeat ultrasound scan of their heart.