
Replacing your heart's leaking tricuspid valve with a trans catheter valve (TTVR)

Department of Cardiology
Information for Patients

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You are going to have a repair to your tricuspid valve. This booklet will tell you about what to expect before, during and after your procedure. If you have any questions, please ask the nursing or medical staff looking after you. We do not yet have enough information to know how long this new valve treatment will last. For people who are too unwell for open-heart surgery or cannot have a repair procedure, putting in a new valve through a thin tube (catheter) is another treatment option. For these patients, the benefits are likely to be greater than the risks while doctors collect more information about the treatment over time.

What is tricuspid regurgitation (TR)?

You have a heart valve condition called tricuspid regurgitation. The tricuspid valve is 1 of 4 heart valves. They control blood flow in and out of the heart. It is between the right upper chamber (right atrium) and right lower chamber of the heart (right ventricle).

This valve manages blood flow from the right atrium into the right ventricle. The tricuspid valve is a tough, fibrous ring. It supports 3 flaps. These flaps open when your heart relaxes. They let blood flow from the right atrium into the right ventricle. They close when the heart contracts. This stops blood from flowing back into the right atrium.

Tricuspid regurgitation happens when the valve does not close properly. Blood leaks back through the valve into the right atrium when it closes. This leakage:

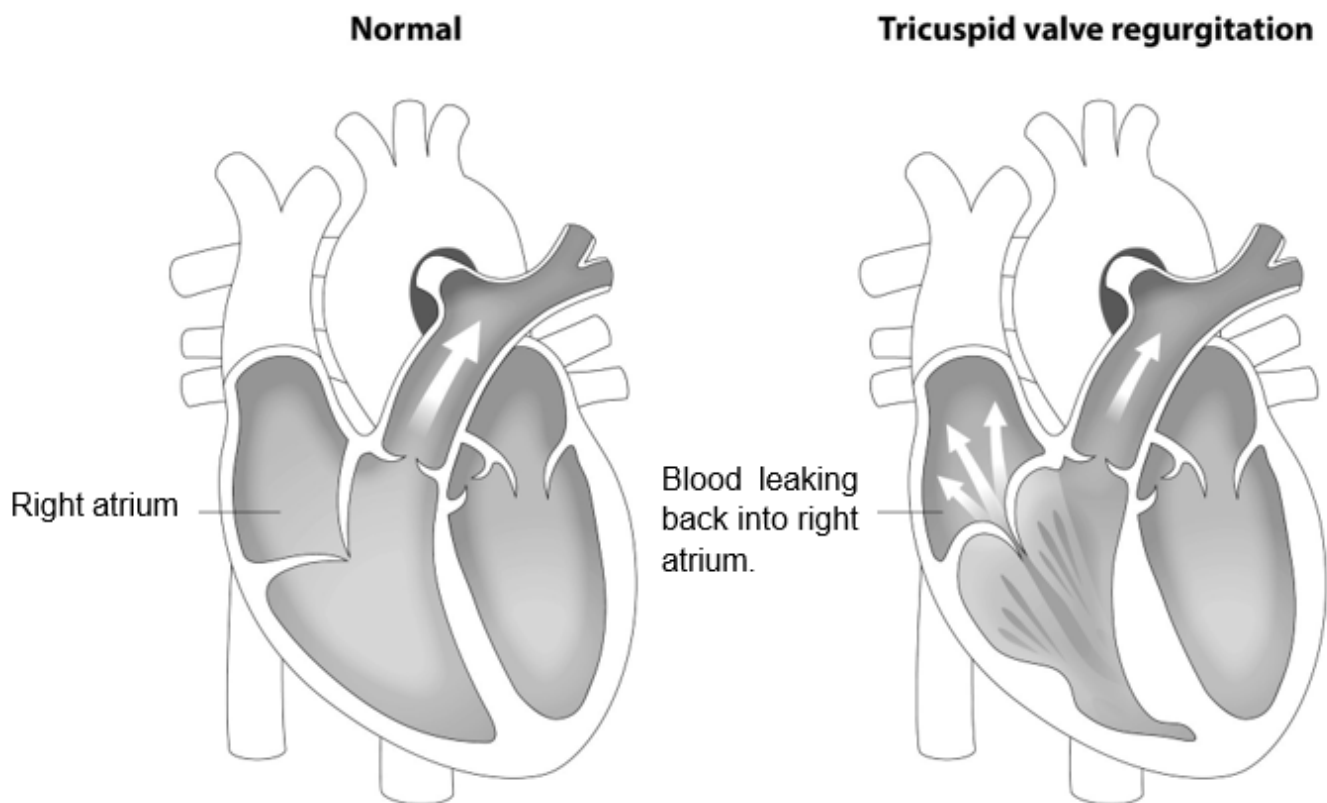
- reduces blood flow,
- makes the heart work harder,
- less blood reaches your lungs,

Tricuspid regurgitation can get worse over time. You may not have symptoms until the condition becomes severe.

There are 2 types of tricuspid regurgitation:

1. **Primary TR:** This is also called degenerative. It is most often caused by an abnormality of the valve structure.
2. **Secondary TR:** This is also called functional. It is caused by right ventricle or right atrium abnormalities/disease.

Without treatment it often gets worse over time. Medications can help manage the symptoms of tricuspid regurgitation. However, the leak in the tricuspid valve may continue to worsen. It can lead to heart failure symptoms such as breathlessness, fatigue, and fluid overload. When these issues happen, surgical intervention or trans-catheter tricuspid valve repair may be needed to fix the leaking valve.



What causes tricuspid regurgitation?

- Wear and tear of the valve as you get older.
- Damage to the valve after a bacterial infection.
- Problems with the heart muscles.
- The right atrium can get bigger if the heartbeat is uneven (atrial fibrillation).
- Some people are born with a heart problem that changes the shape or how the valve works (congenital heart defect).
- Rheumatic fever. This is how the body reacts to infection that can damage the tricuspid valve.
- Chest injury. This can be a hit to the chest or car accident that can damage the valve.

What are the symptoms of tricuspid regurgitation?

- Swelling in the ankles, feet and/or tummy
- Shortness of breath
- Fatigue
- Dizziness
- Irregular heartbeat
- Less able to exercise

How is it treated?

If you have mild symptoms, we can use medicine to manage them. If the medicines does not work, we may need to try to repair or replace the valve. There are only a few medicines to treat TR, and they may not fix what is really causing the problem.

What other treatment options are there?

- **Open heart surgery:** This is the most common way to fix the valve. We make a cut through the breastbone to repair or replace the weakened valve.
- **Transcatheter edge-to-edge repair (TEER):** TEER is a less invasive treatment to repair your own valve. It can be used with some patients who cannot have open-heart surgery. It is not suitable for everyone. Your doctor will advise you on this.
- **Transcatheter Tricuspid Valve Replacement (TTVR):** TTVR is a less invasive treatment. Instead of fixing your own value, we put in a new one. The replacement valve is a bioprosthetic heart valve that is placed inside your original Tricuspid valve. The valve has a self-expanding metal frame made from Nitinol. This is an alloy of nickel and titanium. The valve leaflets (the parts that open and close to control blood flow) are made from **bovine pericardial tissue**. **This means the tissue comes from the protective covering around the heart of cattle.** The tissue is specially treated and prepared so that it can be safely used in a biological heart valve.

What are the benefits of this procedure?

The procedure is carried out to:

- lower tricuspid regurgitation.
- reduce shortness of breath and chest pain.
- improve quality of life.
- improve heart failure symptoms.

The treatment does often help reduce the problem with the heart valve. However, this does not always mean you will feeling better. Around 7 in 10 patients feel better after the procedure. How much better they feel is different for each person. The benefits may be different for you. Please talk to your consultant about this.

What are the risks of the procedure?

Every medical procedure has risks. These are different for each person. It is important to think about these risks before consenting to a procedure. There are a number of risks when having TTVR that you need to think about.

Common risks:

- Bruising/discomfort at the place the tube is inserted.
- 20 in 100 people might need pacemaker.
- Less than 1 in 100 people have a risk of stroke.
- 1 in 100 people have a risk of heart attack.
- 5 to 10 in 100 people have a risk of it not working well.
- 1 to 3 in 100 people have a risk of fluid or blood building up around the heart. You may need drainage or surgery.
- 3 in 100 people have a risk of death.
- 10 in 100 people have a risk of major bleeding from the catheter site at the top of the thigh.
- 1 to 5 in 100 people have a risk of causing irregular heartbeat (arrhythmia).
- 1 to 4 in 100 people have a risk of infection related to the procedure. This includes infection of the valve itself.
- 5 in 100 people have a risk of the blood flowing the wrong way in the heart as the tricuspid valve does not close properly.
- Less than 1 in 100 people have a risk of device moving out of position after the implant.

Rare risks:

- Less than 1000 to 10,000 people have a risk of getting cancer caused by radiation or by using X-ray machine for the procedure.
- There is a small risk of damage to the teeth, throat or food pipe (oesophagus). During the procedure, the doctor will put a flexible tube (a probe) down your throat into your food pipe (oesophagus). This is a transoesophageal echo (TOE). It helps the doctor see the heart clearly. Fewer than 1 in 1,000 people have serious complications from a TOE like damage to teeth, throat or oesophagus.
- Complications with general anaesthetic. These are different for each patient. The anaesthetist will explain this to you. In some patients who are frail and in poor general health recovery after anaesthesia can be slow. They may have delayed recovery of lung function, chest infection, confusion episodes, and kidney failure.
- Needing blood transfusion. This is very unlikely.
- Sometimes, another procedure or even emergency heart surgery may be needed if there are problems with blood flow in the body.

Your pre-admission appointment

You may eat and drink as normal for this appointment.

Before your admission, you need to attend an appointment at Clinic in Glenfield Hospital. You will stay for about 2 to 3 hours.

- We will do a simple test to check your heart's rhythm and electrical activity (ECG) (electrocardiograph) and blood tests.
- We will take swab samples from your nose, between your legs (perineum) and visible skin wounds to check for MRSA.
- If you have been hospitalised in the UK or abroad in the last 12 months, we will take an extra swab from your back passage (rectum) to test for CRO infection.
- A nurse will look at your health problem. They will review your medical history. During this appointment, you will get more information. You can also ask any questions you may have.
- If you are taking any blood-thinning medications or have diabetes, the nursing staff will tell you which medicines you need to stop before the procedure. Please remember to bring all your regular medicines to your pre-assessment appointment and on the day of admission.
- Please let us know if you have any allergies. This can be allergies to medicines or other substances.

Giving your consent for the procedure

You need to give your consent for having this procedure. You will sign a consent form during your outpatient appointment with the heart consultant or when you are admitted.

It is important that you ask any questions or raise any concerns before signing.

Admission to hospital

- You will be admitted to the hospital the day before your procedure.
- In the admission ward, we may do some blood tests again.

What happens on the day?

- You cannot eat solid food for 6 hours and drink water for 2 hours before the procedure. The ward staff will tell you when you need to stop eating.
- You will have any hair in the groin area shaved off before being taken for your procedure.
- You will need to shower with an antibacterial wash. You will need to put on a gown.
- An anaesthetic doctor and your heart doctor (cardiologist) will see you on the ward before leaving for your procedure.
- You will be asleep (general anaesthesia) for this procedure.

How is the Transcatheter Tricuspid Valve replacement (TTVR) done?

We do this procedure in a cardiac catheter laboratory or in a specially equipped theatre by a cardiology team under general anaesthetic.

When you arrive in the catheter room or in theatre:

- You will see that there is a lot of machinery. Do not be alarmed. This is special monitoring and X-ray equipment.
- You will need to lie on your back on an X-ray table. We will attach heart monitor wires to you.
- The anaesthetic doctor will insert a small needle in your hand.
- You will get some oxygen from a mask.
- The anaesthetist will give you injections to make you sleep. We will give you 1 dose of antibiotics just before the procedure to prevent infection.
- Once you are asleep, we will put a tube in your windpipe. This will let the anaesthetist support your breathing during the procedure.
- We will then put an ultrasound probe (trans-oesophageal probe) into your food pipe (gullet). We can then study the tricuspid valve during the procedure. This will help your consultant in positioning the catheters and your new valve.

To begin the procedure the doctor (cardiologist) will:

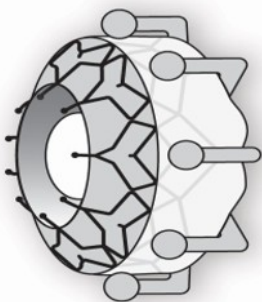
- Clean your left and right groin areas with a cold antiseptic liquid.
- They will cover you with sterile sheets to keep a sterile working area.
- They will inject you with local anaesthetic in the correct groin area to numb the area.
- They will then make a small cut in your groin to access your femoral vein.
- The new valve is squeezed (crimped) into a tube. The tube (catheter) will be put into the blood vessel and guided into the right atrium.
- Using special cameras, the doctor guides the tube with the new valve to the right place in the heart. The doctor then puts the new valve in position so it helps stop blood leaking.
- Once they are happy it is in the right place, they release it into place.
- At the end of the procedure the sheath used for the valve will be removed and the small incision in your groin closed.
- A team member may press on your groin to help stop any bleeding. This is often done while you are still asleep.
- We will put a small sterile dressing on the area once the bleeding has stopped.
- The procedure takes 2 to 3 hours. You will be asleep for most of this time. Once you wake up, the recovery team will assist you.

After the procedure

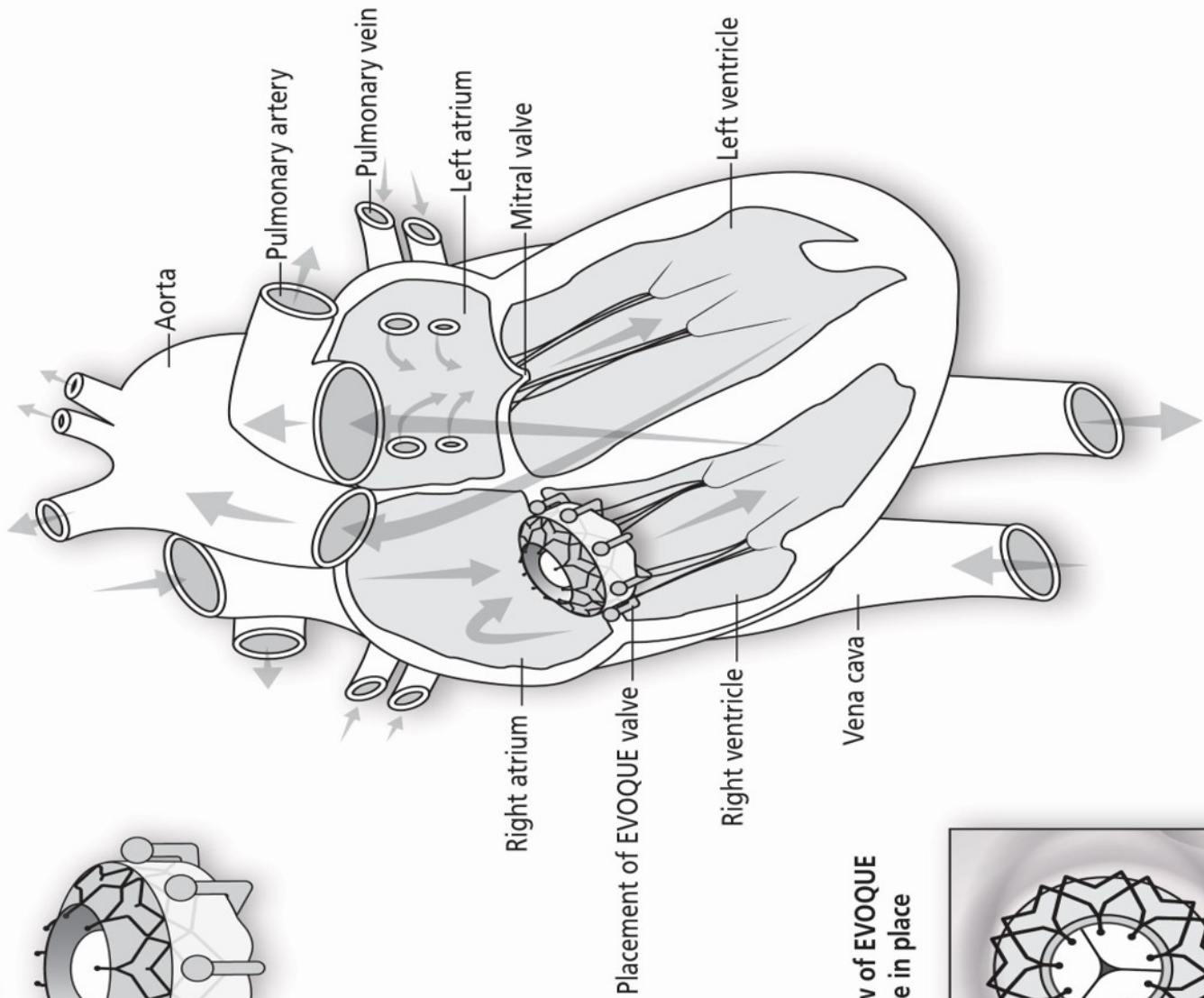
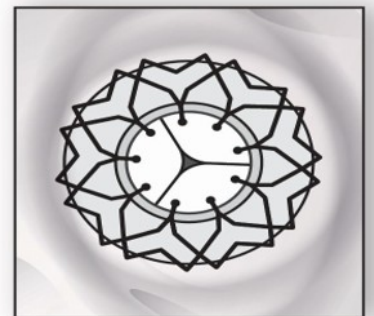
- You will stay in the recovery unit until you wake up.
- Once you are recovered from the anaesthesia your nurse will collect you from the recovery area and take you to the ward.
- When you return to the ward, the nurse will check your blood pressure, pulse and pulses in your feet (called 'pedal pulses'). We will also do an ECG (electrocardiograph) or heart tracing. These are all normal checks. They are needed in case you start having any issues.
- You will need to lie for a minimum of 2 hours so that you do not start bleeding.
- If you have short-term loss of feeling (numbness) or weakness in your leg, we will make sure you are safe when you first get up.
- If you need to pee and your leg is numb, it may not be safe to walk to the bathroom. You will use a urinal or bedpan instead.
- You can go home when your doctor says it is okay.
- Tell your nurse right away if you have:
 - a fever,
 - chest pain,
 - swelling at the groin
 - pain in your groin or leg, or
 - bleeding at your groin site.
- You will also be connected to a drip or an IVI (intravenous infusion).

If you have any worries about any of these issues, please talk to your consultant.

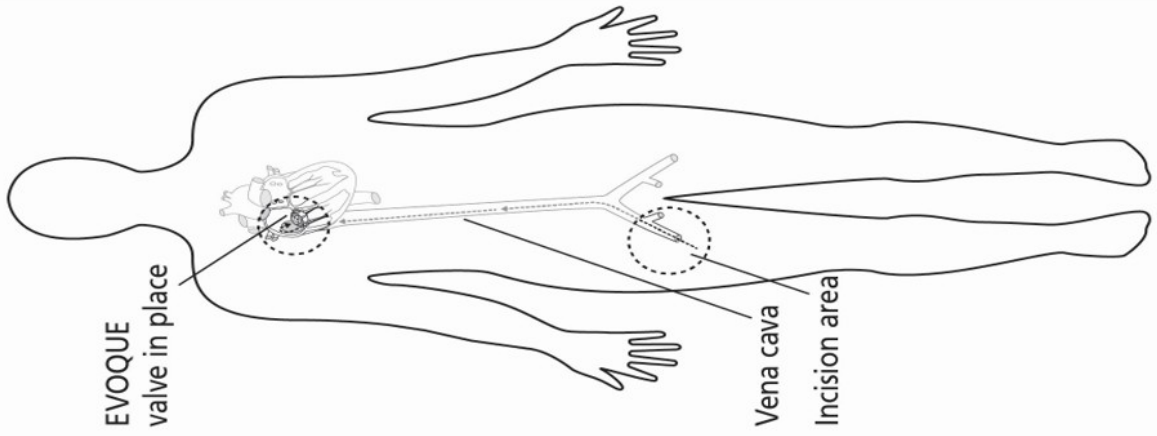
EVOQUE valve



Top view of EVOQUE valve in place



Transcatheter tricuspid valve placement



Before discharge

On the evening of the procedure, we will check your medicines. We will start your medicines again. Sometimes you will be asked to do a repeat scan of your heart (echocardiogram) before discharge.

Discharge

If there are no issues, you will be able to go home 24 to 48 hours (1 to 2 days) after your procedure.

The doctors will speak to you about your results. You will need to have someone to drive you home.

Going home after the procedure

- You should do as little as possible for 3 days. This means:
 - **no heavy lifting,**
 - **no heavy cleaning,**
 - **no heavy shopping,**
 - **no heavy gardening,**
- **Do not drive** for 2 weeks. You do **not** need to contact the DVLA unless you hold a PSV/ HGV license.
- You may get a painful bruise over the puncture wound in your groin. This happens because of bleeding under the skin. If you do get a painful lump, or if your groin becomes painful when you walk, please ask for medical help.
- You may have bruising and discoloration above and below the groin. This can be down to your knee. This discoloration can look blue-purple and slowly become yellow over the course of a week. This may look quite unpleasant. This often does not cause pain and is not serious. If you have minor pain, you can take paracetamol for relief.
- Avoid baths, hot tubs, or swimming pools for the first 5 days or until the wound is closed. You can shower after 24 hours (1 day). Do not let the spray hit the site.
- You may be more likely to faint.
- You may have shortness of breath.

Follow-up

You will continue to have follow-up appointments with the doctor or team who referred you for the procedure.

If there are any concerns or unexpected findings on your echocardiogram, the referring team can contact us for further advice or review.

How long will the procedure take?

How long the procedure takes is different for each person. It often takes between 2 to 3 hours.

How long will I stay in the hospital after the procedure?

You will stay in hospital for 24 to 48 hours (1 to 2 days). Before you leave, your doctor will talk about your aftercare plan with you to help your recovery.

What can I expect after the procedure?

You must have regular check-ups with your doctor. After your procedure, you might be asked to return for a follow-up appointment to have your heart valve checked.

When can I go back to my regular activities?

You must carefully follow your doctor's instructions and take your medicines if needed. Ask your doctor about when you can safely go back to:

- taking other medicines,
- travel,
- exercise,
- other medical procedures like dental work,

Is it safe for me to have an MRI scan?

The EVOQUE valve is MRI-conditional, which means they can be safely scanned under certain conditions. Please tell your physician that you have a tricuspid implant if you maybe having an MRI.

Aftercare advice

- Avoid bending or squatting or any intense activity such as running or lifting anything over 20 pounds (around 9kg) for 1 week.
- Take short 5 to 10 minutes walks. Do this 4 or 5 times a day and build up slowly.
- If in the 1st week of going home you have any doubt or problem with your groin wound, please contact your GP.
- You can go back to work when your consultant say it is okay.

Serious bleeding from the wound is not common when you are home. If you do start to bleed you should lie down:

- do not panic.
- lie down on the floor (not the bed), where you are less likely to faint.
- ask a relative or friend to apply pressure with the flat of the fingers of both hands or a clenched fist over the groin wound for 30 minutes.
- ask someone to **call 999**.

You should get medical advice right away if you feel unwell after the procedure with symptoms of:

- chest pain
- dizziness

How long will my repair device last?

The implant should not need to be replaced. Your cardiologist will regularly check the status of your implant.

Interpreters

Please tell a member of staff if you need someone to help you understand through an interpreter or through speaking another language. We are committed to promoting equality and diversity.

Glossary of terms

- **Cardiac catheterisation:** A test to see how well your heart is working. It finds out if there are any diseases affecting the heart muscle, valves, or coronary arteries. Doctors insert a long, narrow tube called a catheter into a blood vessel in your arm or leg. They guide it carefully to your heart using a special X-ray machine. They inject contrast dye into the blood vessel through the catheter. This lets us take X-rays of your heart's valves, coronary arteries, and chambers.
- **Catheter laboratory (Cath Lab):** This is an examination room in a hospital or clinic. It has diagnostic imaging tools to see the heart's arteries and chambers. We can do any the treatment of any heart problems.
- **Congenital heart defect:** These are heart problems at birth. Some of these can impact the shape and function of the tricuspid valve. In children, tricuspid valve regurgitation can be linked with a rare condition called Ebstein anomaly. This condition happens when the tricuspid valve does not form correctly and is positioned lower than normal in the lower right chamber of the heart.
- **Contrast dye:** A solution to show organs and tissues more clearly in X-rays, MRI, and CT scans.

- **Carbapenem resistant organisms (CRO):** There are certain germs that normally live in the bowel. They tend to be harmless. They can aid in digestion. They stay harmless because the immune system of a healthy person keeps them in check. It stops them from spreading to other parts of the body. In some cases, these germs can become antibiotic-resistant. This means that certain antibiotics no longer work against them. In specific situations, they can lead to infections. Some of these germs may develop into Carbapenem Resistant Organisms (CRO). They have become resistant to powerful antibiotics known as carbapenems.
- **Electrocardiogram (ECG):** A test used to check your heartbeat and electrical activity. We attach sensors to the skin. They find the electrical signals produced by your heart each time it beats.
- **Echocardiogram (echo):** Uses sound waves (ultrasound) to create a moving picture of your heart. It shows the structure and function of your heart valves and heart chambers. It takes around 20 minutes.
- **Haemodynamic support:** We use medicines and fluids to keep your blood pressure and heart rate within the normal range.
- **Methicillin-resistant staphylococcus aureus (MRSA):** An infection caused by a type of staph bacteria. It has become resistant to many of the antibiotics used to treat ordinary staph infections.
- **Percutaneous:** Checks the inner organs through a needle puncture of the skin.
- **Rheumatic fever:** It is a complication of strep throat that can cause permanent damage to the heart and heart valves. When this happens, it is called rheumatic heart valve disease.
- **Transoesophageal echocardiogram (TOE):** A test is sometimes done to take clearer pictures of the heart. It uses a probe down your throat. You lie down and swallow the thin tube. We may give you some drugs to help you relax before we do this.

More information

NICE Guidance: <https://www.nice.org.uk/guidance/htg771/chapter/1-Recommendations>

British Heart Foundation: www.bhf.org.uk

The British Heart Foundation funds research into all heart and circulatory diseases and the things that cause them. The website contains a lot of helpful information, including:

- Tests for heart conditions
- Heart valve disease
- Caring for someone with a heart condition
- Cardiac rehabilitation

British Heart Valve Society: www.bhvs.org.uk

This is a group made up of medical staff with an interest in heart valve disease. It includes patient representatives. It is linked to the British Cardiovascular Society. It aims to improve the care of patients with valve disease by education and training programmes and online information. It also aims to set standards of care for individuals, services and hospitals.

Heart Valve Voice: www.heartvalvevoice.com

Heart Valve Voice is a collection of people with real experiences of heart valve disease, including a group of experts in the field (cardiologists, cardiac surgeons, GPs), cardiac patient societies, and patients themselves. Leaflets include “Recovering from treatment”, “Post-treatment checklist”, and “10 surprising things you may not be able to do right after your treatment.”

Contact details

Structural heart valve specialist nurse: **0795 087 0853**

(Monday to Friday, 8am to 4pm)

Structural co-ordinator: **0116 258 3361**

(Monday to Friday, 8am to 4pm)

Questions I would like to ask:

[illegible]

Health information and support is available at www.nhs.uk or call 111 for non-emergency medical advice

Visit www.uhleicester.nhs.uk for maps and information about visiting Leicester's Hospitals.

To give feedback about this information sheet, contact uhl-tr.informationforpatientsmailbox@nhs.net

જો તમને અન્ય ભાષામાં આ માહિતી જોઈતી હોય, તો નીચે આપેલ નંબર પર કૃપા કરી ટેલિફોન કરો.

If you would like this information in another language or format such as EasyRead or Braille, please telephone 0116 250 2959 or email uhl-tr.equalitymailbox@nhs.net

We are a research hospital and you may be asked to take part in research