ESC
European Society of Cardiology

ESC/EACTS Clinical Practice Guidelines for the

Management of Valvular Heart Disease: What Patients Need to Know

Image is for illustrative purposes only

What are Clinical Practice Guidelines?

Clinical Practice Guidelines are documents created by healthcare professionals, scientists and patients. They are primarily intended for healthcare professionals, and offer recommendations based on the best available evidence. Guidelines help ensure that patients receive the best possible care.

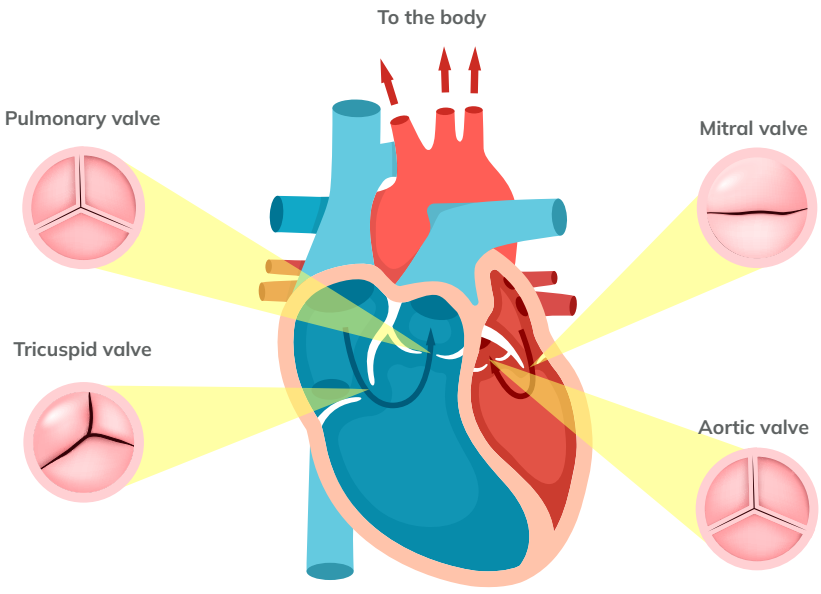
How will this document help me?

This document is based on the European Society of Cardiology (ESC) and European Association for Cardio-Thoracic Surgery (EACTS) Guidelines for the management of valvular heart disease and is designed for patients and their families.

This guide provides an overview of the recommendations for the diagnosis and treatment of different common types of heart valve diseases. It aims to give you confidence to work with your healthcare team to make informed decisions together.

Heart valve disease – what is it?

There are four valves in the heart, positioned between the four chambers. When working normally, the valves ensure that blood flows in the right direction.



If one or more of the valves doesn't open or close properly, this is called heart valve disease or valvular heart disease.

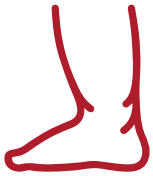
Symptoms and causes

The symptoms of heart valve disease can vary depending on which valve is affected and how badly it is damaged. Symptoms are not always obvious, even when valve disease is severe. The most common symptoms include:

Increased tiredness (more than usual)

Shortness of breath

Feeling faint or dizzy



Leg swelling

Fast or irregular heartbeat called “palpitations”

Some people are born with faulty valves (congenital valve disease), but most often, heart valve disease occurs due to wear and tear with ageing. In addition, other heart conditions such as a previous heart attack can result in valve problems. In rheumatic fever, the response to the infection can slowly damage the heart valves. Acute infections, including endocarditis, can cause much faster damage. Some cancer treatments (e.g. chest radiotherapy and certain types of chemotherapy) are also associated with increased risk of valve disease, usually many years later.

Damage to the heart valves modifies the speed and direction of blood flow through them. Heart valve disease is often first suspected when a stethoscope is used to listen to the heart during a routine medical exam. If a murmur is heard, the patient may be sent for further tests.

Diagnosis and general management

Every person with heart valve disease should ideally receive care from healthcare professionals who have specialist knowledge.

If you have suspected heart valve disease, you should be referred to a **Heart Valve Clinic**. These clinics have standard processes to ensure timely diagnosis, treatment and monitoring of your condition over time.

Clinical examination

If heart valve disease is suspected, a specialist healthcare provider will perform a full physical examination. This will include listening to the sounds of your heart and lungs using a stethoscope. They will check for breathlessness, tiredness, swelling and if you are able to carry out normal daily activities.

Blood tests may also be used to check your heart’s health. High levels of markers, such as brain natriuretic peptide (BNP) or troponin, can indicate heart injury.

Other heart conditions and any other diseases will be noted so the specialists are informed about your overall health.

Heart imaging

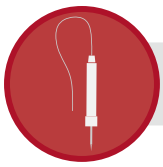
The most common type of imaging is **echocardiography** (or 'echo' for short). This uses ultrasound waves to produce images of different parts of the heart including the valves and the chambers. Usually, transthoracic echocardiography (TTE) is performed, which involves an ultrasound probe being pressed against the skin and moved over the chest.

If the TTE does not show enough detail, transoesophageal echocardiography (TOE) may be required, which takes images from inside the body. The ultrasound probe is gently passed down the patient's throat into the oesophagus (food pipe) to obtain clearer pictures of the heart. The patient may be sedated for this procedure.

Other types of imaging can provide additional information including whether the patient has blocked arteries (coronary artery disease) or other heart conditions. For instance, **cardiac computed tomography** (CCT) provides high-quality 3D images of the heart and surrounding blood vessels. **Cardiac magnetic resonance** (CMR) provides a very detailed picture of your heart's structure and shows how well it is functioning.

Transthoracic echocardiography (TTE)

- Commonly used to check heart valves and chambers
- Assesses heart function and damage
- Used for diagnosis and for monitoring



Transoesophageal echocardiography (TOE)

- Provides greater details if TTE is insufficient
- Usually performed prior to a heart valve procedure

Cardiac computed tomography (CCT)

- Provides a detailed picture of the heart and blood vessels

Cardiac magnetic resonance (CMR)

- Checks the function and structure of the heart

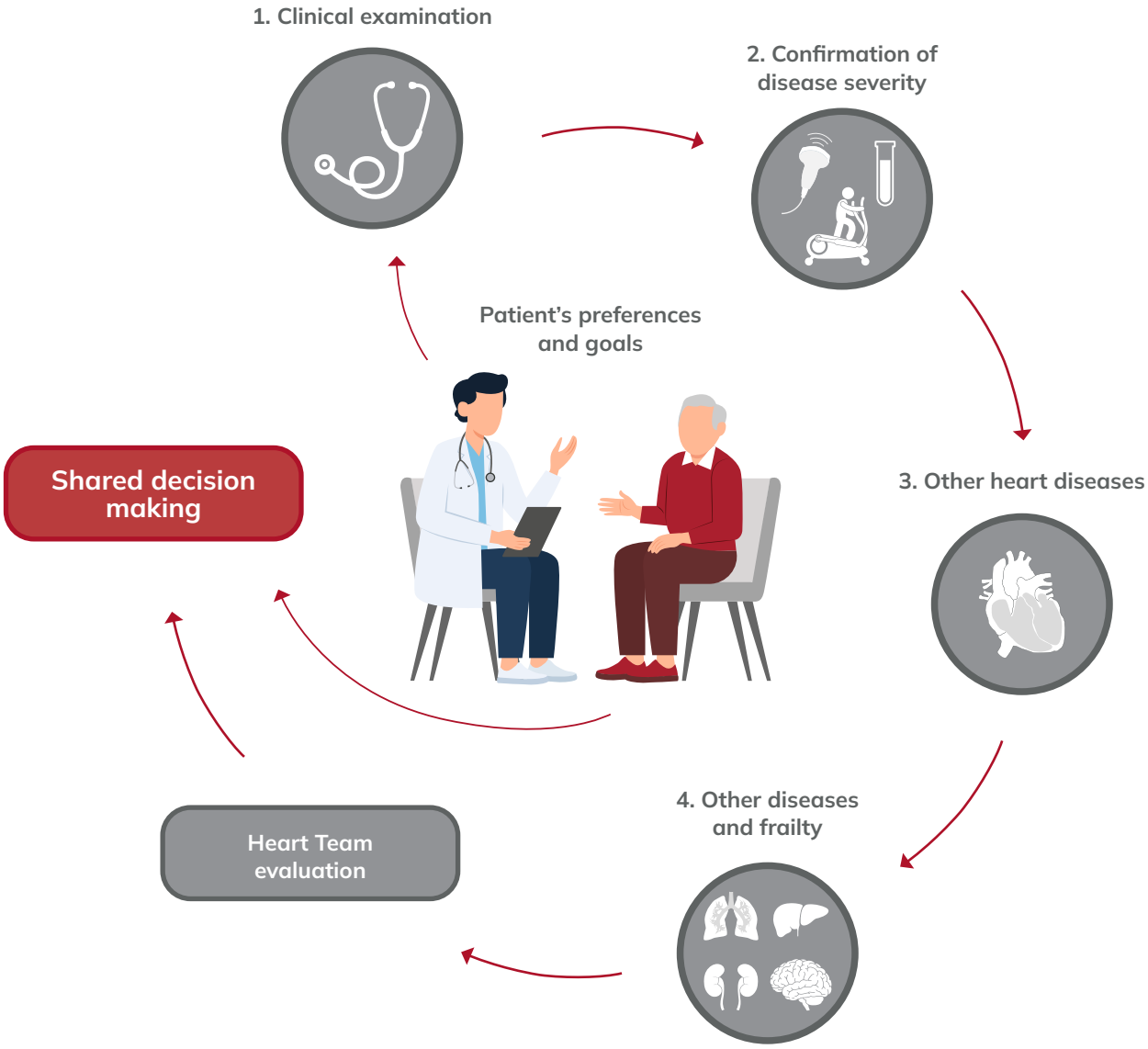
> Imaging plays an important role in the diagnosis of heart valve diseases and helps healthcare professionals to assess the severity of valve damage and to plan for further follow-up or the need of invasive treatment.

In addition to imaging, heart catheterisation may be performed to measure the pressures in the heart chambers and lungs. This involves inserting a thin tube into a vein, which is guided into the right side of the heart.

The Heart Team

If a diagnosis of heart valve disease is confirmed, a group of specialists will be involved with your care. Called the **Heart Team**, this group typically includes cardiologists trained in heart procedures, heart surgeons, cardiologists with imaging expertise and specialist cardiovascular nurses. Other specialist healthcare personnel may also be involved if needed.

Together, they can help weigh the risks and benefits of different treatment options and discuss these with you. With their help, you can make a shared decision about the most suitable treatment.



Patient-centred management of heart valve disease

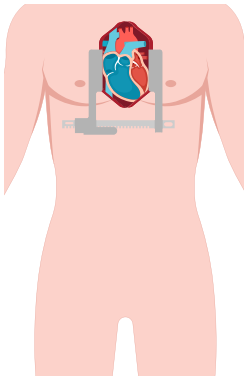
Treatment options

Depending on the type and severity of the valve disease, some patients may not need immediate treatment but they may be monitored at regular intervals.

Other people may require procedures to repair or replace a heart valve. Your team of doctors will discuss with you whether a surgical or a transcatheter approach is best for the type of heart valve disease you have and your characteristics, including your age.

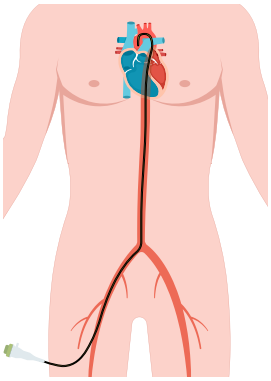
Surgery may be 'open heart surgery' or may involve a smaller opening, called 'minimally invasive surgery.'

In a **transcatheter-based intervention**, a thin tube (called a catheter) is inserted through a blood vessel in the groin, giving access to the heart valve.



Surgery

- More invasive
- Involves a heart-lung machine
- Longer hospital stay
- May provide a longer-lasting result



Transcatheter approach

- Less invasive
- No heart-lung machine
- Faster recovery
- May not be as effective and durable as surgery

Valve repair involves fixing the defective valve. Valve repair usually requires surgery, but transcatheter techniques can also be done in select cases. Surgical valve repair is often preferred to surgical valve replacement. However, valve replacement is generally the only option available when the valve is narrowed or calcium deposits have built up.

Valve replacement involves inserting a new valve (called a prosthetic valve). There are two main types of replacements: mechanical and biological.

Mechanical valves are made of carbon or metal. They are long-lasting, but lifelong blood thinners must be taken to prevent clot formation on the valve (valve thrombosis).

Biological valves are made of animal tissue, or rarely, human tissue. They do not usually require blood thinners but do not last as long as mechanical valves and therefore may need to be replaced again later in life. Biological valves are suitable for people who cannot take blood thinners such as those at high risk of bleeding due to frailty or other diseases, or women considering pregnancy.

Valve replacement can be performed by surgery or using a transcatheter-based intervention. Transcatheter-based interventions are particularly useful for older patients and when surgery is too risky.

The advantages and disadvantages of treatment options should be discussed fully with you, including the chances of success, recovery time, potential complications and possible risks of future procedures. For example, although transcatheter replacement usually involves a shorter hospital stay and recovery time than surgery, the new valve might not last as long, so it may not be suitable for younger patients.

Evidence indicates that the best outcomes occur when valve repair or replacement is performed in Heart Valve Centres that have very experienced staff who perform procedures regularly.

It is not possible to reverse heart valve disease using **medicines** alone, but they may be prescribed to reduce symptoms and to manage other risk factors for heart disease.

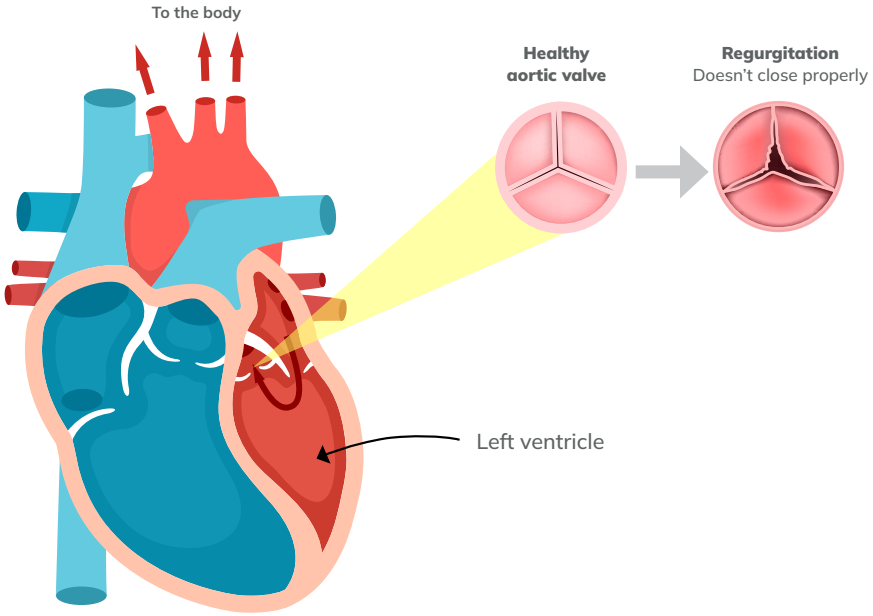
In addition, **lifestyle changes** such as maintaining a healthy weight, stopping smoking and taking light exercise like walking can improve health generally and reduce the strain on the heart.

> Your healthcare team will discuss appropriate treatment options and lifestyle changes with you. Let them know your preferences and feel free to ask questions.

The next sections describe some common types of heart valve disease and how they may be treated.

Aortic regurgitation

During a normal heartbeat, the left ventricle pumps blood through the aortic valve to the body. **Aortic regurgitation** occurs when the aortic valve does not close properly, resulting in blood leaking back into the left ventricle. This reduces the heart's effectiveness in pumping blood to the body and can cause the left ventricle to enlarge and weaken.

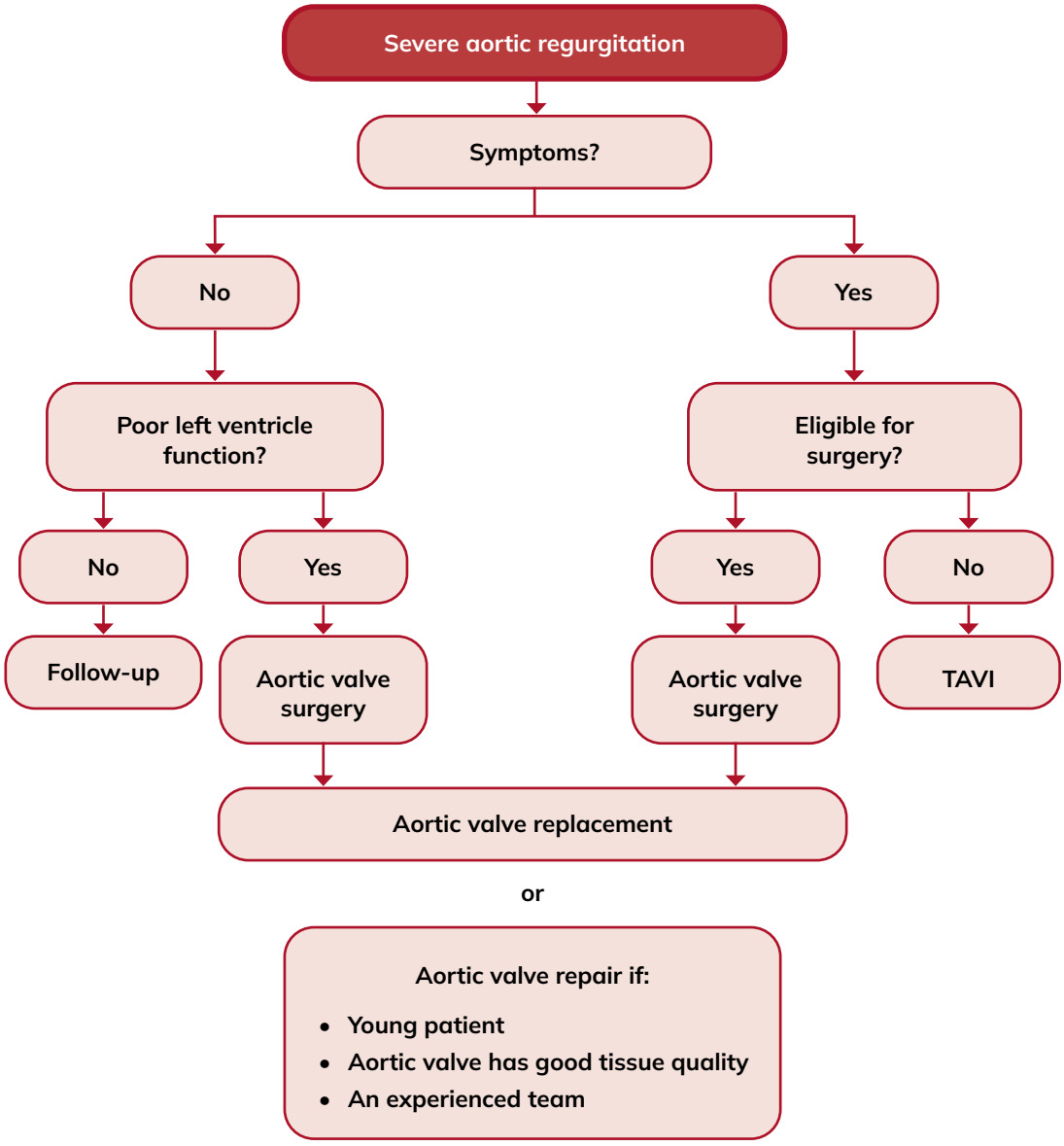


Echocardiography is the first imaging tool used to assess the cause and severity of aortic regurgitation and to look for effects on the left ventricle. In addition, CT or CMR scans may provide useful information on the cause of aortic regurgitation and whether there is left ventricle damage.

Many patients who have aortic regurgitation will not have any symptoms. They will be checked regularly at a Heart Valve Clinic. Patients should report any symptoms to their healthcare provider during these check-ups.

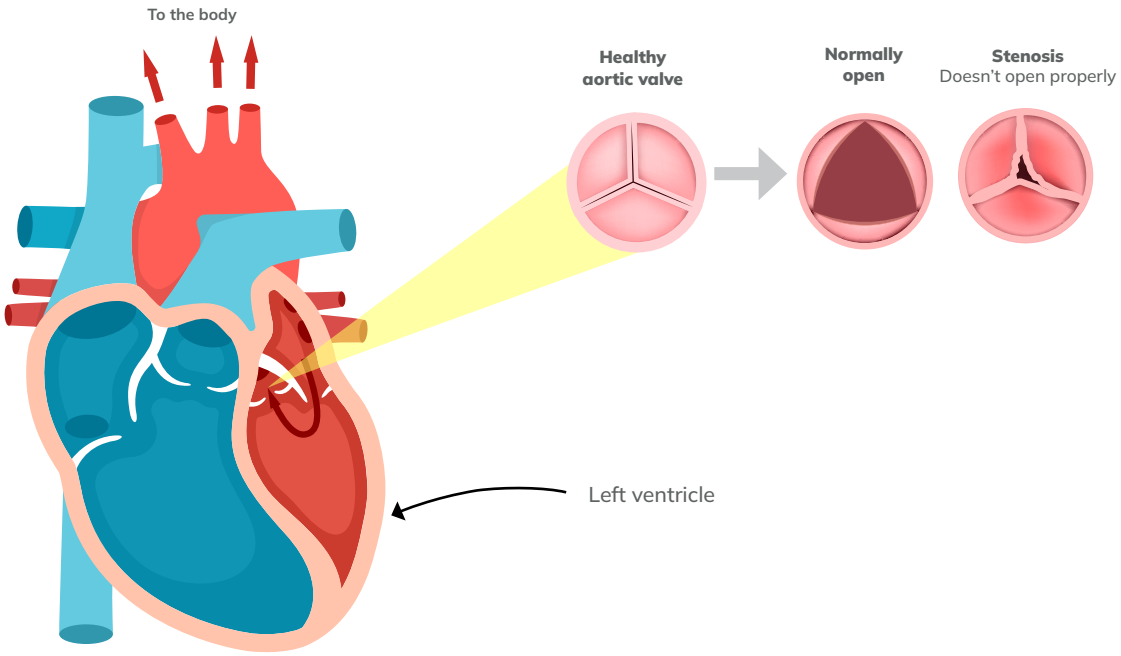
Surgery is recommended in patients with symptoms and severe aortic regurgitation as long as the patient is not at high risk of surgical complications. Surgery is also recommended in patients without symptoms who show progressive enlargement of the left ventricle. Surgical valve replacement is most commonly performed, but valve repair may be suggested for younger patients in centres with expertise. In patients who are not eligible for surgery, transcatheter aortic valve implantation (TAVI) may be recommended.

The figure below shows an example of how patients with severe aortic regurgitation may be treated. However, individual decisions are made for each patient considering different factors and their needs and preferences.



Aortic stenosis

In **aortic stenosis**, the aortic valve becomes narrowed with restricted opening. This means that less blood is able to leave the left ventricle and travel around the body. The most common cause of aortic stenosis is calcium deposits, which build up around the valve as the person ages.



Echocardiography is key to confirming the diagnosis and assessing how narrow the aortic valve has become. An additional CT scan can show how much calcium has built up.

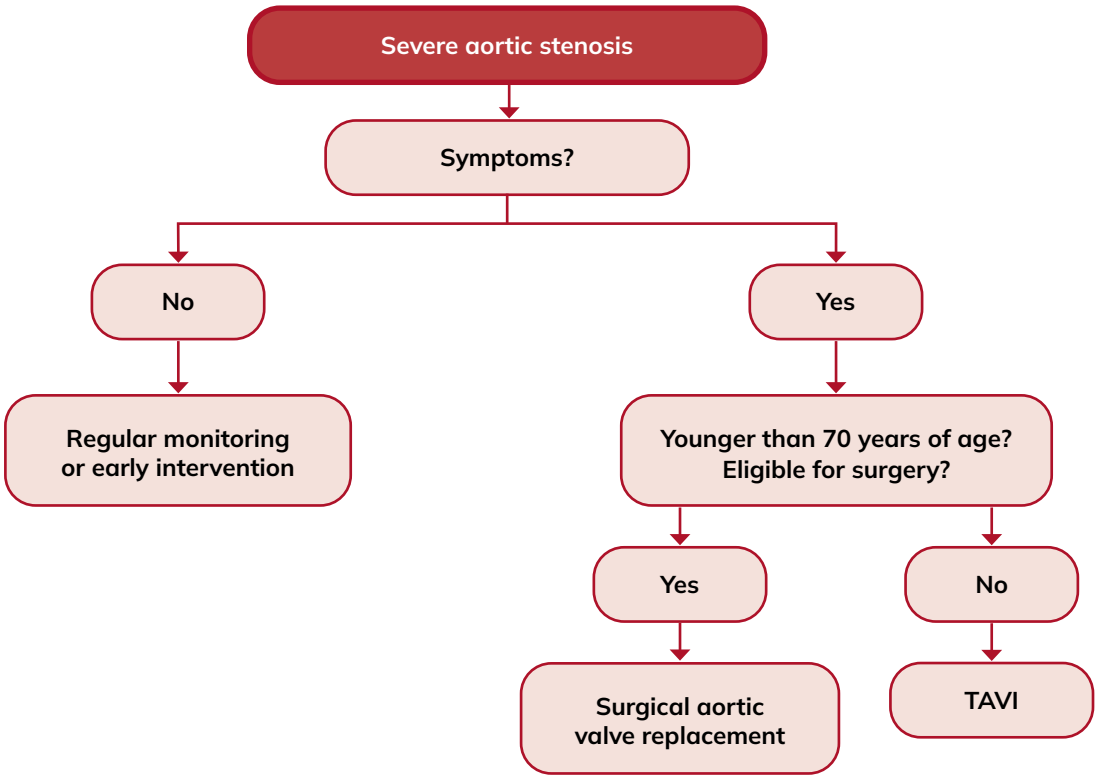
Mild aortic stenosis often does not cause any symptoms and does not require immediate treatment.

If you have severe aortic stenosis but no symptoms, your doctor will talk with you about the possible benefits and risks of having your valve treated early. Depending on the risk of the procedure, and your personal preferences, you may decide together to have the valve replaced or to wait and have regular check-ups ('watchful waiting'). During watchful waiting, you will be checked at least every 6 months to allow detection of early symptoms or signs of worsening It is important that you report any new symptoms to your healthcare provider during this time period.

For patients with severe aortic stenosis and symptoms, valve replacement is recommended. Whether the valve is replaced using surgery or a transcatheter intervention (TAVI) depends on many factors, but the patient's age is particularly important. Older age is associated with higher risk of complications during surgery and TAVI is most suitable for patients aged 70 years or older. Surgery may be best for younger patients or for those patients with an estimated long life expectancy, as there is a chance that the valve inserted with TAVI may need to be replaced later in life, which carries risks.

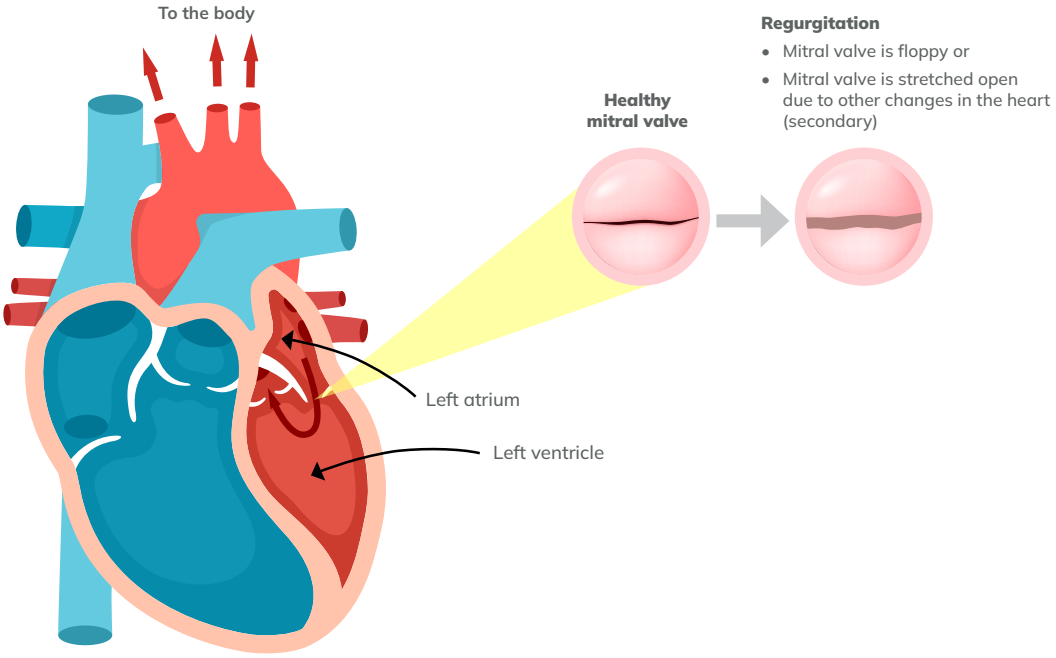
Other factors such as valve shape, valve size, the degree of calcification and any other existing diseases are also part of the decision-making process. The Heart Team will consider the risks and benefits and discuss the available options with the patient.

Favours SURGICAL valve replacement	**Favours TRANSCATHETER valve replacement (TAVI)**
• Younger than 70 years • Other heart diseases needing treatment • Complex coronary artery disease • Certain valve features (e.g. severe calcification or a bicuspid valve [valve has two flaps instead of three])	• 70 years or older • Previous heart surgery • Heart condition or other disease that increases surgical risk • Frailty • Leg artery allows access to the heart



Mitral regurgitation

The mitral valve directs blood from the left atrium to the left ventricle. **Mitral regurgitation** occurs when the mitral valve does not close properly. Blood leaks back into the left atrium, which becomes enlarged while the left ventricle progressively weakens.



When the mitral valve is damaged or abnormal, this is called **primary mitral regurgitation**. A common cause is age-related degeneration, which can result in a floppy valve (a 'mitral prolapse') that won't close completely. In other cases, the valve has been damaged by an infection (endocarditis) or the patient has been born with an abnormal valve.

Other patients have a normal valve but changes in the dimensions of the left heart pull the valve flaps apart. This is called **secondary (or functional) mitral regurgitation** and it can happen following a heart attack and in patients with heart failure or long-term atrial fibrillation.

Echocardiography is the method of choice to assess the severity of mitral regurgitation and the cause – primary or secondary – as this will determine the best treatment.

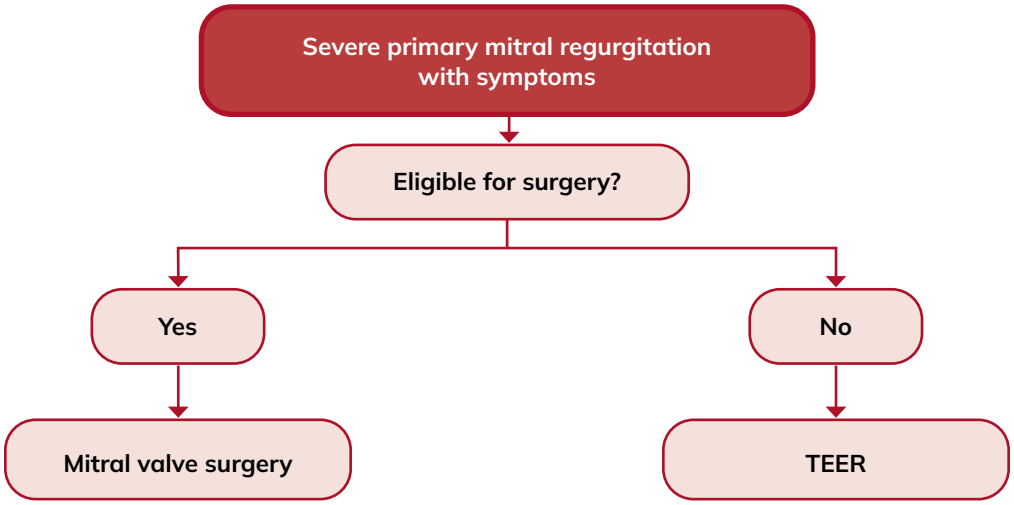
Primary mitral regurgitation

Patients with severe primary mitral regurgitation who have no symptoms and no marked problems with their left ventricle or heart rhythm should be assessed twice per year, ideally in a Heart Valve Clinic. This is called 'watchful waiting'. Enlargement of the left heart chambers, weakening of the heart's pumping function or high pressure in the blood vessels of the lung may indicate the need for surgery.

In patients with severe mitral regurgitation who have symptoms, mitral valve surgery is recommended, preferably with mitral valve repair.

If surgery is considered too high risk, the patient may be considered for transcatheter edge-to-edge repair (TEER). This does not involve opening the chest – instead the heart valve is accessed by passing a tube and a clip up a blood vessel from the groin. The clip is inserted into the mitral valve and helps hold the flaps together to reduce leakage when the valve closes.

Not all mitral valves are suitable for TEER and your healthcare provider may discuss other transcatheter procedures with you or using medications only to reduce symptoms.



Secondary mitral regurgitation

Treatment of secondary mitral regurgitation first focuses on improving the underlying heart problem that has caused the mitral valve to leak. This usually means adjusting medications for heart failure and treating heart rhythm problems if they are present.

If the leakage remains severe despite these treatments, the Heart Team will discuss a procedure to treat the valve. Depending on the cause of the leak and the structure of your valve, this may be done either with TEER or with surgery. In general, TEER is more often considered when the heart muscle is weakened, whereas surgery may be preferred when the leak is mainly due to enlargement of the left atrium.

Mitral stenosis

Mitral stenosis occurs when the mitral valve does not open properly and less blood flows into the left ventricle.

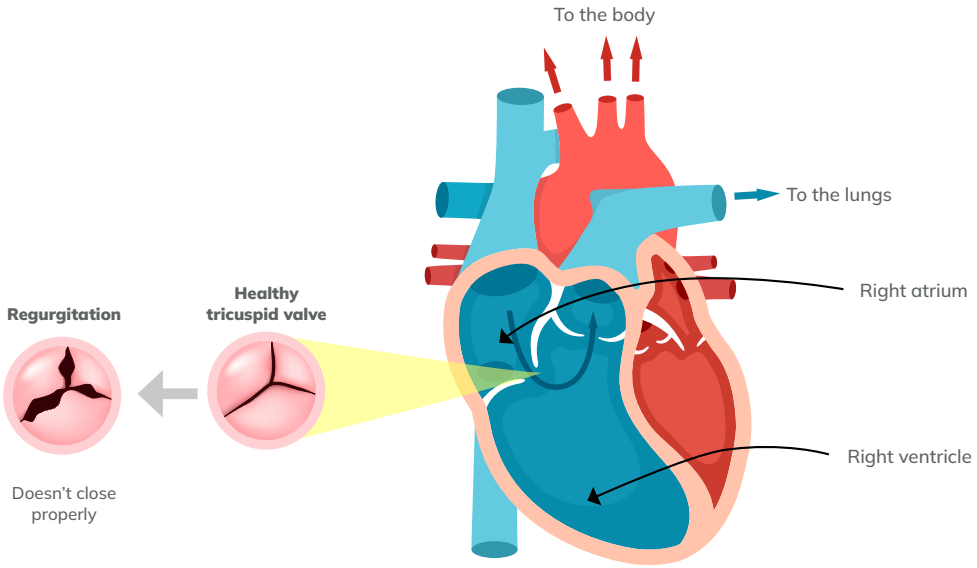
One of the main causes of mitral stenosis is rheumatic fever, which is now uncommon in high- and middle-income countries. Age-related degeneration of the mitral valve can also occur where calcium builds up over time.

Most people with mitral stenosis will not need any treatment but will require regular monitoring of their condition.

Patient with symptoms may be given medications. If symptoms persist, the Heart Team may consider surgery or a transcatheter intervention called ‘percutaneous mitral commissurotomy’ where a balloon is inflated inside the valve to improve opening. When the valve stenosis is not limited to the valve flaps but involves the whole valve apparatus, surgery is preferred. In selected patients, a transcatheter mitral valve replacement can be an option.

Tricuspid regurgitation

The tricuspid valve directs blood from the right atrium to the right ventricle where it travels to the lungs to gain oxygen. In **tricuspid regurgitation**, the tricuspid valve does not close properly and blood leaks back into the right atrium.

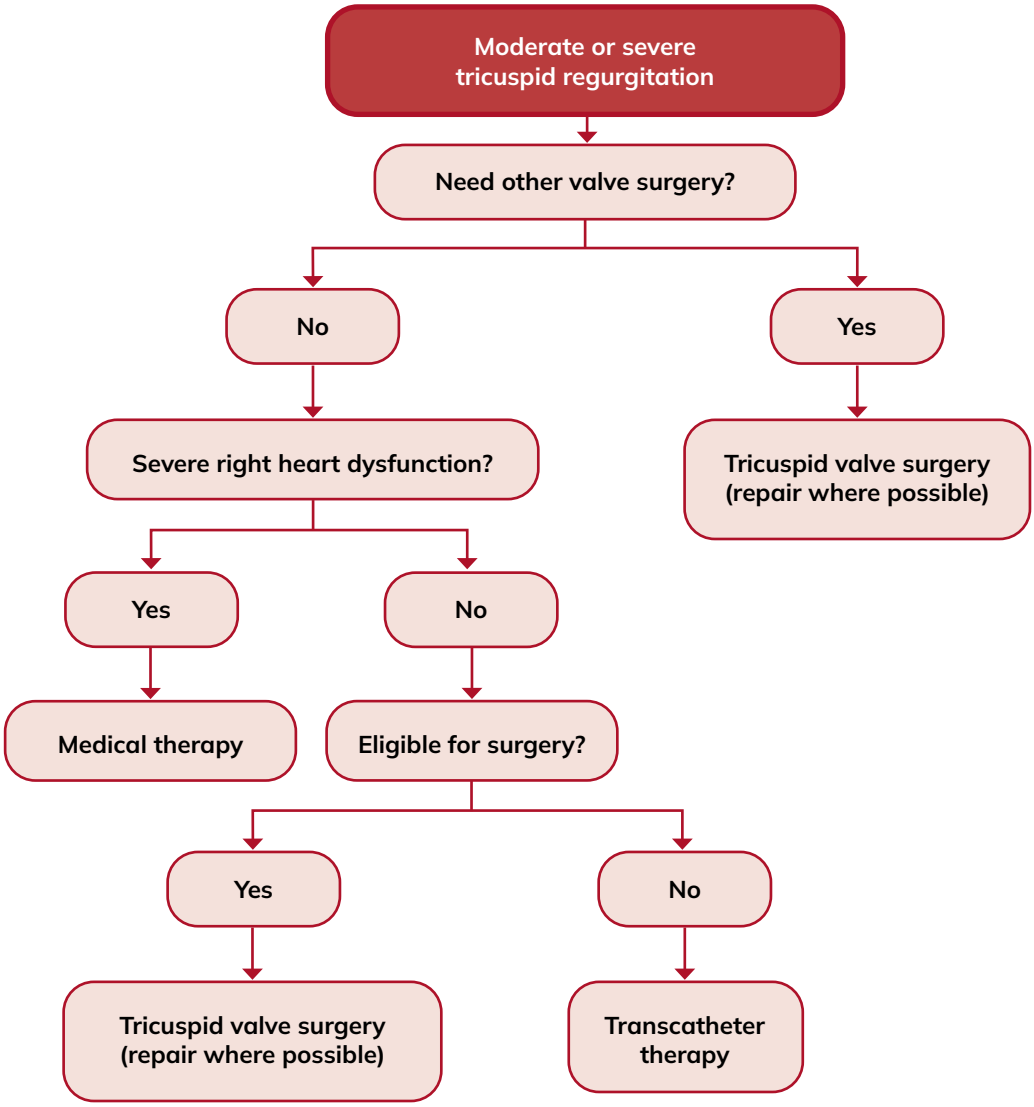


Isolated mild tricuspid regurgitation is very common and requires no treatment. Moderate tricuspid regurgitation is also common and is often due to age-related changes. Severe tricuspid regurgitation is most often caused by changes in the right atrium or right ventricle that stretch the tricuspid valve open.

Echocardiography is used to assess the severity and the cause of the tricuspid regurgitation. If needed, right heart catheterisation may be performed where a tube is inserted into a blood vessel to measure the pressure in the vessels of the lung and the right side of heart.

Patients with tricuspid regurgitation are given medicines to treat the underlying cause. These may include heart failure drugs or medications to treat high blood pressure in the lungs or abnormal heart rhythms.

Currently, it is unusual for patients to have a procedure on their tricuspid valve alone. Most often, the tricuspid valve is repaired at the same time as another valve is operated on. Transcatheter interventions are becoming more widely used in certain patients with severe tricuspid regurgitation who are ineligible for surgery.



Tricuspid stenosis – where the valve doesn't open properly – is relatively rare. Surgical tricuspid valve replacement may be performed if medications do not improve symptoms.

Follow-up of patients after surgical or interventional valve procedures

Patients who have had a valve repaired will usually require check-ups every 2–3 years.

After valve replacement, follow-up visits every year are recommended. Over time, replacement valves inserted surgically or in transcatheter-based interventions may deteriorate. This is more common with biological valves than mechanical valves. Monitoring helps to check that your valve is still working properly.

> It is important that you tell your healthcare provider if you experience any new symptoms in between check-ups.

Patients with a mechanical heart valve will receive lifelong blood thinners called anticoagulation therapy to reduce the chance of a clot forming on the new valve (valve thrombosis). The effectiveness of the blood thinners will be checked regularly with international normalised ratio (INR) testing. It is recommended that patients test INR levels themselves. Patients should receive education about INR testing and how important effective anticoagulation is to their heart health.

The risk of clotting is lower with biological heart valves but patients may need to receive blood thinners for other reasons or they may be prescribed aspirin for 3 months or longer.

Antibiotics are recommended when patients with a replaced or repaired valve have dental extractions, oral surgery or other type of invasive interventions. This is to prevent endocarditis (infection of the repaired or replaced valve).

Cardiac rehabilitation

You may be offered an individualised programme of exercise, education and support called cardiac rehabilitation. Programmes differ – they may be in person or online – but they are designed to support your physical and mental wellbeing. Cardiac rehabilitation can help you:

- Recover after a valve procedure
- Reduce the risk of further heart problems
- Understand your condition and medications you are prescribed
- Make lifestyle changes to improve your heart health, such as eating healthily, stopping smoking and reducing alcohol intake
- Improve mental wellbeing with discussions and resources

> Remember that your healthcare team are here to help you. Speak to them if you have any questions about your care or worries about your condition.
>
> **Seek urgent medical attention if you develop:**
>
> - **Sudden severe shortness of breath**
> - **Fainting**
> - **Chest pain**
> - **Rapid worsening of symptoms**

This guide for patients is a simplified version of the 2025 ESC/EACTS Guidelines for the management of valvular heart disease.

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Disclaimer

This material was adapted from the ESC/EACTS Guidelines for the management of valvular heart disease (European Heart Journal 2025 - doi.org/10.1093/eurheartj/ehaf194) as published on 29 August 2025.

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