PROCEDURE

Heart transplant

A heart transplant replaces a failing heart with a healthy donor heart.

PURPOSE
Replace a failing heart and improve survival and function

PROCEDURE TYPE
Therapeutic surgery through an opening in the chest

WHERE IT IS DONE
Operating theatre

ANAESTHESIA
General

HOW LONG IT TAKES
About four to six hours

PREPARATION
Assessment, fasting, medication plan, and rapid hospital admission

RECOVERY
Days to weeks in hospital; no driving until cleared

MAIN RISKS
Rejection, infection, bleeding, and donor-heart failure

RESULTS
Heart function assessed immediately and during lifelong follow-up

Overview

A heart transplant is major surgery that replaces a severely damaged or failing heart with a healthy heart from a deceased donor. It is considered when other treatments can no longer control advanced heart disease.

The transplant team removes most of your heart and connects the donor heart to the major blood vessels. The donor heart then takes over pumping blood around your body.

A transplant is not a cure that ends the need for treatment. You will need lifelong medicines to reduce the chance of rejection, which happens when the immune system attacks the donor heart. Regular tests and appointments are also essential.

Why the procedure is performed

Heart transplantation may be considered for advanced heart failure when symptoms remain severe despite appropriate medicines, implanted devices, or previous surgery. Heart failure means the heart cannot pump enough blood to meet the body's needs.

Conditions that can lead to transplantation include:

The goal is to improve survival, physical ability, and quality of life. Because donor hearts are limited and the operation carries major risks, a specialist team first decides whether transplantation is likely to offer more benefit than harm.

- Cardiomyopathy, a disease that weakens or stiffens heart muscle
- Severe coronary artery disease, which reduces blood flow to the heart
- Serious heart valve disease
- Some congenital heart conditions present from birth
- Failure of a previous heart transplant

Who should and should not have it

You may be assessed for transplantation if you have advanced, irreversible heart disease and other treatments are no longer effective. You must also be able to manage lifelong medication, monitoring, and follow-up.

Assessment usually looks at your heart, lungs, kidneys, liver, circulation, nutrition, mental health, and ability to recover from major surgery. The team also discusses practical support, including who can help you after discharge.

Transplantation may be avoided or delayed when its risks are too high. Reasons can include:

These decisions are individual. Age alone does not decide eligibility, but age-related health problems may affect whether transplantation is suitable. Some barriers, such as infection, poor nutrition, or substance use, may be reassessed after treatment.

- An active serious infection
- Active cancer or a high risk of cancer returning
- Severe, irreversible disease in another organ unless combined transplantation is possible
- Major blood vessel disease that makes surgery unsafe
- Severe frailty or another illness likely to limit recovery or survival

- Ongoing substance use that could affect safety or medication use
- Inability to take medicines reliably or attend essential follow-up

How to prepare

Before joining the transplant waiting list, you will have detailed testing. This may include blood tests, heart imaging, lung tests, scans, dental checks, and tests for infections. Blood type, body size, medical urgency, and donor location help determine whether a donor heart may be suitable.

The team will review all medicines, including blood thinners like warfarin or apixaban , supplements, and non-prescription products. Do not stop or change a medicine unless the transplant team tells you to.

While waiting, keep your telephone available and follow the team's advice about travel distance and how quickly you must reach the hospital. Arrange transport, a hospital bag, and support for your recovery in advance.

When a possible donor heart becomes available, the hospital will tell you when to stop eating and drinking. The treating facility's own instructions take priority over general information. Even after you arrive, the operation may be cancelled if final testing shows that the donor heart is unsuitable.

What happens during the procedure

You receive general anaesthesia, so you are unconscious and do not feel the operation. A breathing tube and ventilator support your breathing.

The surgeon opens the chest through the breastbone. A heart-lung bypass machine temporarily pumps blood and adds oxygen while the heart is replaced.

Most of the diseased heart is removed. The surgeon connects the donor heart to the remaining heart tissue and major blood vessels. Blood flow is restored, and the new heart is checked carefully. It may begin beating by itself or need brief electrical pacing or medicines.

The surgeon places drainage tubes around the heart and may insert temporary pacing wires. The breastbone is secured, and the incision is closed. You are then moved to an intensive care unit.

Recovery and what to expect afterward

Pain and soreness are expected around the chest incision and breastbone. Pain medicine is provided, and discomfort should gradually improve. Tell your team if pain suddenly worsens or is not controlled.

You will initially receive fluids and nutrition according to your condition. Eating usually resumes gradually as you wake fully and your digestive system recovers. A dietitian may help you follow food-safety guidance because anti-rejection medicines increase infection risk.

Activity begins in hospital with help sitting, standing, and walking. Cardiac rehabilitation may continue after discharge. Your breastbone needs time to heal, so lifting and upper-body activity will be restricted at first. Follow your transplant team's specific limits.

Do not drive until the transplant team clears you. Pain, weakness, medicines, and breastbone healing can all affect safe driving. You will need someone else to take you home.

Returning to work often takes weeks to months. Timing is based on your recovery, job demands, test results, and medication effects. People with physically demanding jobs may need more time or altered duties.

Hospital recovery commonly lasts days to several weeks. Full recovery takes longer and involves frequent appointments, blood tests, scans, and medication changes.

Risks and possible complications

Heart transplantation has significant risks, although the team takes steps to prevent and treat them. Early complications can include:

Anti-rejection medicines suppress the immune system. This helps protect the donor heart but makes infections more likely. These medicines can also contribute to kidney problems, high blood pressure, diabetes, high cholesterol, and certain cancers.

Over time, some people develop cardiac allograft vasculopathy. This is a narrowing of the donor heart's blood vessels and may not cause typical chest pain because nerves to the donor heart were cut during surgery.

Severe complications can require further procedures, mechanical heart support, or another transplant. Death is also a possible outcome of the operation or its complications.

- Bleeding or blood clots
- Infection
- Stroke or injury to other organs

- Abnormal heart rhythms
- Primary graft dysfunction, when the donor heart does not pump effectively
- Rejection of the donor heart

Results and follow up

The team checks the donor heart's function during surgery and closely monitors it in intensive care. Echocardiograms, which use sound waves to show the heart pumping, help assess early function.

You will take several anti-rejection medicines every day. Missing doses can increase the risk of rejection, even if you feel well.

Follow-up is especially frequent during the first months. It may include blood tests, electrocardiograms, echocardiograms, and heart biopsies. During a biopsy, a thin tube is passed through a vein to remove tiny samples of heart tissue for signs of rejection.

Some rejection episodes cause no clear symptoms and are found through routine testing. Others can be treated by adjusting medication. Lifelong monitoring also checks for infection, medicine side effects, blood vessel narrowing, and cancer.

Alternatives

The alternatives depend on your heart condition and treatment goals. They may include:

- Optimised medical treatment: Heart medicines and implanted devices can reduce symptoms and hospital admissions, but may no longer be enough in advanced heart failure.
- Left ventricular assist device: An implanted mechanical pump can support the heart while you await transplantation or as long-term treatment. It avoids the need for a donor heart but requires surgery, a power source, and ongoing care, with risks such as bleeding, infection, and stroke.
- Temporary mechanical support: Devices may stabilise someone with sudden severe heart failure, but they are usually a short-term bridge to recovery or another treatment.
- Other heart surgery: Valve repair, bypass surgery, or congenital heart surgery may help selected conditions but cannot restore heart muscle that is too severely damaged.

- Combined-organ transplantation: A heart may be transplanted with another organ when both have irreversible disease. This is more complex and uses more donor organs.
- Supportive or palliative care: This focuses on comfort, symptoms, and personal goals. It can be provided alongside active treatment or when transplantation is not wanted or suitable.

When to call your healthcare team

After discharge, contact the transplant team promptly for fever or chills, new cough, vomiting or diarrhoea, worsening breathlessness, swelling, rapid weight gain, palpitations, reduced urine, or redness, drainage, or opening of the incision. Also call if you miss or cannot keep down an anti-rejection medicine.

Attend routine appointments even when you feel well. Use these visits to discuss medication effects, sleep, mood, rehabilitation, vaccination, work, travel, and sexual activity.

Call emergency services for severe difficulty breathing, fainting, uncontrolled bleeding, sudden severe chest pain, or signs of stroke such as facial drooping, arm weakness, or trouble speaking.

Common questions

Will I be asleep?

Yes. Heart transplantation is performed under general anaesthesia. You remain unconscious throughout the operation and initially have a breathing tube.

Can I drive home?

No. Someone else must take you home. Do not drive again until the transplant team confirms that your breastbone, strength, and medicine effects allow it.

How painful is a heart transplant?

You will not feel the surgery. Chest and breastbone pain are expected afterward, especially with movement or coughing. Pain medicine and gradual activity usually make this manageable.

When will I know if the transplant worked?

The team can assess the donor heart's pumping immediately. Long-term success cannot be decided at once because rejection, infection, and blood vessel changes require ongoing monitoring.

How long will the donor heart last?

There is no fixed lifespan for a transplanted heart. Outcomes are influenced by rejection, infection, blood vessel disease, other health conditions, and consistent use of anti-rejection medicines.

Will I need anti-rejection medicine forever?

Yes. Lifelong immune-suppressing treatment is normally required. Never reduce or stop these medicines without instructions from your transplant team.

Sources

- Heart transplant , National Heart, Lung, and Blood Institute
- Heart transplant , Mayo Clinic
- Heart transplant , NHS
- International Society for Heart and Lung Transplantation. ISHLT Guidelines for the Evaluation and Care of Cardiac Transplant Candidates , 2024
- Heart transplant , American Heart Association