PROCEDURE

Aortic valve surgery - open

Open aortic valve surgery repairs or replaces the heart valve controlling blood flow into the aorta.

PURPOSE
Restore one-way blood flow through the aortic valve

PROCEDURE TYPE
Therapeutic surgical heart operation

WHERE IT IS DONE
Operating theatre

ANAESTHESIA
General

HOW LONG IT TAKES
2 to 5 hours

PREPARATION
Fasting, medication review, blood-thinner plan, skin washing

RECOVERY
Several hospital days; no driving until surgical clearance

MAIN RISKS
Bleeding, infection, stroke, abnormal heart rhythm

RESULTS
Valve function assessed during surgery and before discharge

Overview

Open aortic valve surgery repairs or, more often, replaces the aortic valve. This valve sits between the heart's main pumping chamber and the aorta, the large artery carrying blood to the body.

The surgeon reaches the heart through an incision in the chest. Most operations use a heart-lung machine, which temporarily pumps and adds oxygen to the blood.

A replacement valve may be:

Repair is possible in selected cases, but replacement is more common.

- Mechanical: made from durable manufactured materials. It usually requires lifelong blood-thinning treatment to prevent clots.

- Biological, or tissue: made from animal or donated human tissue. It may eventually wear out and require another procedure.

Why the procedure is performed

Surgery may be offered when the valve is severely narrowed or does not close properly. A narrowed valve is called aortic stenosis ; a leaking valve is called aortic regurgitation . Both can make the heart work harder and eventually weaken it.

Open surgery may be recommended to:

The decision considers your symptoms, heart scans, anatomy, general health, age, priorities and expected benefits and risks.

- Relieve symptoms caused by severe valve disease
- Protect a heart that is becoming enlarged or weaker
- Replace an infected or damaged valve
- Treat the valve during another heart operation
- Repair part of the nearby aorta at the same time

Who should and should not have it

Open surgery may be appropriate for severe aortic valve disease, especially if you also need coronary bypass surgery, aortic surgery or treatment of another valve. It may also be chosen when catheter-based valve replacement is unsuitable or unlikely to provide the expected result.

Surgery may be delayed if you have an active infection, untreated dental infection, recent serious illness or another condition requiring stabilisation. Medicines may also need adjustment.

Open surgery may not be suitable when its risks exceed the likely benefits, such as with severe frailty, advanced disease affecting several organs or little chance of meaningful recovery. A less invasive procedure or symptom-focused care may then be considered.

Valve choice is individual. Your age, ability to take long-term blood thinners like warfarin or apixaban , future pregnancy plans and possible need for another procedure all matter.

How to prepare

Follow your treating facility's instructions, as preparation varies.

You may need blood tests, an electrocardiogram, chest imaging, an echocardiogram and tests of the coronary arteries.

Tell your team about every medicine, supplement and non-prescription product you use. Blood thinners, diabetes medicines and other drugs may require a special plan. Do not stop prescribed medicine unless your surgical team tells you to.

Follow the facility's exact fasting instructions. You may also need to shower with a special cleanser and remove jewellery, nail products or body piercings.

Arrange help for your return home and early recovery. You cannot drive yourself home.

What happens during the procedure

You receive a general anaesthetic and remain unconscious. A breathing tube and monitoring lines are placed.

The surgeon usually makes an incision down the centre of the chest and separates the breastbone. Some operations use a smaller incision but still require surgical access to the heart.

A heart-lung machine temporarily supports circulation. The heart is usually stopped with a protective solution while the surgeon removes the damaged valve and inserts a replacement, or repairs the existing valve.

The heart is restarted and the valve is checked. The machine is disconnected, and temporary pacing wires and chest drains may be placed before the chest is closed. Combined procedures generally take longer.

Recovery and what to expect afterward

Chest and incision pain are expected, especially when coughing or moving. Pain medicine should allow you to breathe deeply, walk and sleep. Tell staff if your pain is not controlled.

You will gradually return to normal food and activity. Staff will help you sit, stand and walk. At home, take regular short walks, but avoid heavy lifting and strenuous activity while the breastbone heals. Cardiac rehabilitation can provide supervised exercise and support.

Do not drive home. Driving usually remains restricted for several weeks and until your surgical team confirms that you can move comfortably, steer and brake suddenly without impairment

from medicines.

Returning to work often takes several weeks, depending on your recovery and job demands. Tiredness, poor sleep and emotional ups and downs can occur but should gradually improve.

Risks and possible complications

Open aortic valve surgery is a major operation. Your team should explain your personal risk before you consent.

Possible complications include:

Mechanical valves can form clots without effective blood-thinning treatment, while blood thinners increase bleeding risk. Tissue valves can wear out and require another procedure.

- Bleeding requiring transfusion or another operation
- Infection of the incision, breastbone, lungs or valve
- Stroke, heart attack or injury to another organ
- Abnormal heart rhythms, sometimes requiring a pacemaker
- Blood clots or valve malfunction
- Kidney or breathing problems
- Anaesthetic reactions
- Death

Results and follow up

The surgeon usually explains the immediate result after the operation. An echocardiogram may be performed during surgery or before discharge to assess blood flow through the valve.

Follow-up includes an incision check, medicine review and assessment of recovery. Further echocardiograms monitor the valve and heart function.

If you have a mechanical valve, you need regular blood tests to keep your blood thinner within its target range. Some people with tissue valves also need temporary blood-thinning treatment.

Tell dentists and other healthcare professionals about your valve surgery. Your team will explain whether you need antibiotics like amoxicillin or doxycycline before particular dental procedures.

Alternatives

Alternatives depend on your valve problem, anatomy and overall health.

- Transcatheter aortic valve implantation or replacement: A valve is passed to the heart through a blood vessel, usually from the groin. Recovery is generally faster, but the procedure may not suit your anatomy or address other heart problems.
- Monitoring: Appointments and heart scans may be appropriate before severe disease requires intervention.
- Medicines: These may manage fluid buildup, blood pressure or symptoms but cannot permanently correct severe valve disease.
- Balloon valvuloplasty: A balloon widens a narrowed valve. Improvement is often temporary in adults.
- Symptom-focused care: If intervention is unlikely to offer meaningful benefit, care can prioritise comfort, function and personal goals.

When to call your healthcare team

Contact your surgical or cardiology team if pain is not improving, your appetite remains poor, you have medication side effects or you need advice about activity, work or follow-up.

Seek prompt medical advice for increasing incision redness, drainage, wound separation, fever, worsening ankle swelling, new palpitations or breathlessness that is worsening rather than improving.

Call emergency services for:

Do not drive yourself for emergency assessment.

- Severe or sudden chest pain
- Severe trouble breathing
- Fainting or inability to wake normally
- Sudden facial drooping, arm weakness or trouble speaking
- Heavy bleeding that does not stop

Common questions

Will I be asleep?

Yes. General anaesthesia keeps you unconscious throughout the operation.

Can I drive home?

No. Someone must take you home. Do not resume driving until your surgical team clears you.

How painful is it?

Chest soreness is expected, particularly with coughing, movement and deep breathing. Pain medicine and chest support can help.

When will I know if it worked?

The surgeon assesses the valve during the operation. You will receive an early explanation afterward, and an echocardiogram helps confirm the result.

How long will the new valve last?

Mechanical valves are designed for long-term durability but usually require lifelong blood thinners. Tissue valves can wear out and may need another procedure.

Sources

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