Baylor Medicine

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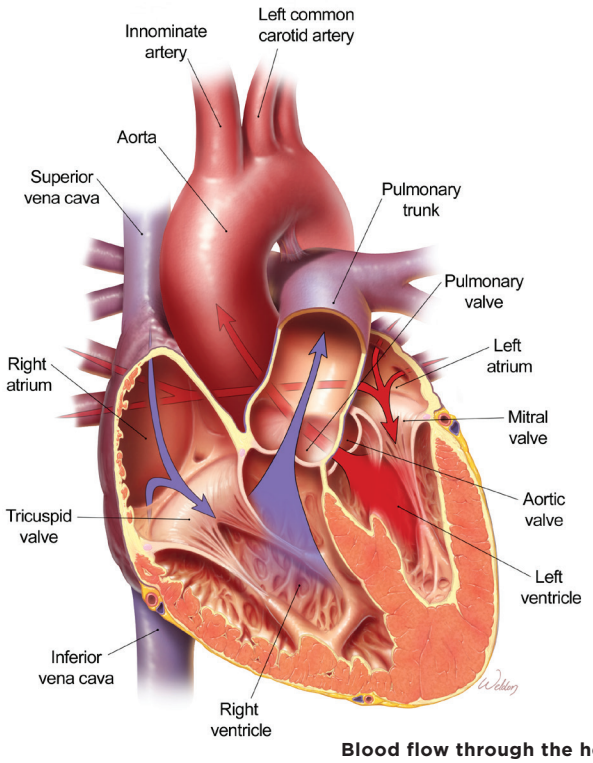
PATIENT EDUCATION

Surgery

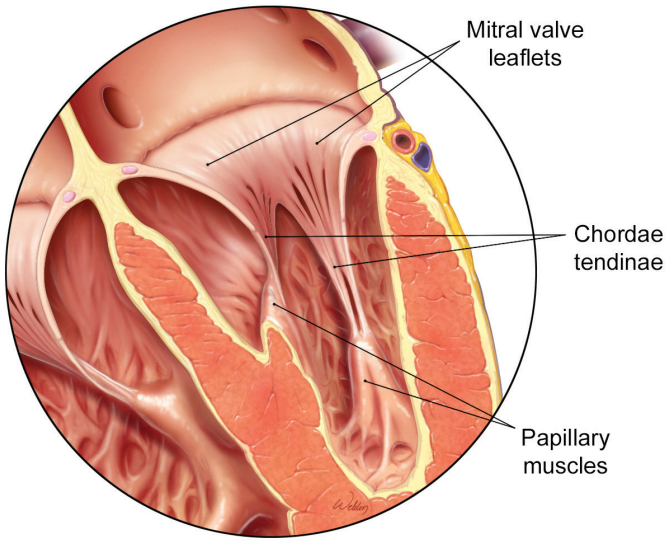
MITRAL VALVE DISEASE & SURGERY

What are Heart Valves?

Valves are one-way gates that keep blood flowing between the four chambers of the heart. There are four valves in the heart and each one has strong flaps called "leaflets" that control blood flow. Leaflets open to let blood move through the heart and out to the rest of the body. They then close to keep blood from leaking back in the wrong direction. The heart's chambers and valves all work together to keep blood flowing in one direction. The mitral valve is the gate between the upper and lower portions of the left heart chambers.



Blood flow through the heart



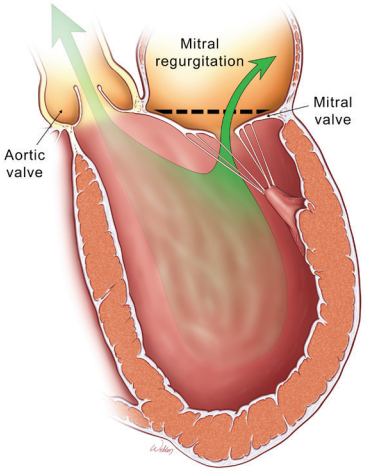
Mitral Valve Disease

Mitral Valve Prolapse

Mitral valve prolapse occurs when one of the mitral valve leaflets or its thin tissue strings ("chordae") that hold these leaflets in place become floppy. If these pieces are floppy, the leaflet segments can float backwards into the upper heart chamber instead of closing up tightly. If it is severe enough, blood may even flow backward or "regurgitate". This can be caused by genetics, connective tissue disorders, or heart damage.

Mitral Valve Regurgitation

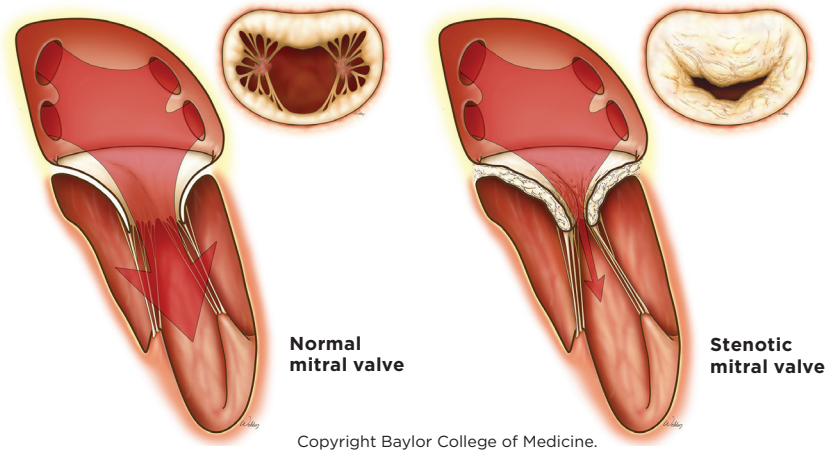
Regurgitation is leakage of the heart valve. When a valve leaks, the leaflets do not close completely. Some blood leaks backwards instead of flowing all



in one direction. Valve leakage most often happens because the valve simply wears out as we age. But other things, such as a defective valve at birth, mitral valve prolapse, rheumatic fever or infection, can also cause leakage.

Mitral Valve Stenosis

Stenosis is the narrowing of the valve area causing obstruction of the left ventricle inflow. The most common cause of mitral valve stenosis is rheumatic heart disease, which causes the leaflets or chordae to thicken or become hard. When a healthy mitral valve is open, it is about as big as a half-dollar coin. But in stenosis, the mitral valve opening becomes more narrow.



Symptoms of Mitral Valve Disease

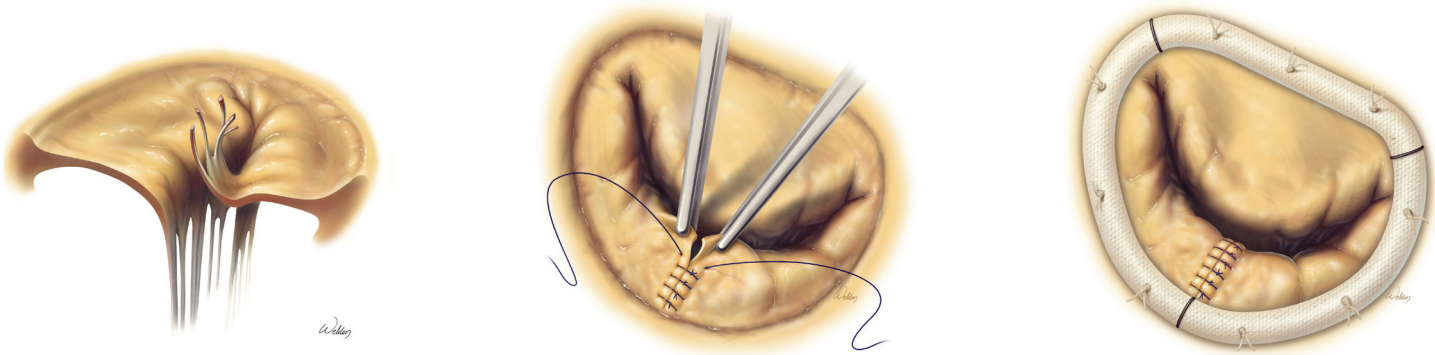
You can have either valve stenosis, prolapse, or regurgitation and not know anything is wrong. However, if your condition becomes more severe you may begin to experience symptoms such as chest pain, fatigue, lightheadedness or dizziness, shortness of breath, and swelling in your lower extremities especially with exercising.

Mitral Valve Surgery

The goal of mitral valve surgery is to repair or replace the valve.

Mitral Valve Repair

During surgery to repair the mitral valve, the surgeon performs "plastic surgery" on your own heart valve so that you do not need to replace it with an artificial valve. As seen in the pictures below, the surgeon will surgeon will remove the loose, floppy section of the valve, then sew the strong parts of the valve together. A special ring made of cloth and metal is then stitched around the repaired valve to compress the leaflets together, adding strength and stability to the repair.



Mitral valve repair

Mitral Valve Replacement

If you have rheumatic or thick and stiff (fibrotic) mitral valve, you may need the mitral valve replaced entirely.

Selecting a Valve

You will have a conversation with your surgeon to decide which type of valve is right for you. If you're having a valve replaced, several factors need to be considered when deciding on the type of replacement valve used:

- your age
- personal preference
- other medical conditions

Tissue valves

Tissue valves are often made up of a cloth sewing ring attached to tissue from either a pig or a cow. Some tissue valves are made from the heart valve of a pig (porcine) and others are made from leaflets that are fashioned out of tissue from around a cow's heart (bovine). Because tissue valves aren't as durable as mechanical valves, they tend to wear out over time. The life of a tissue valve varies from person to person but is typically 10–20 years. When a tissue valve wears out, another procedure may be needed to replace the valve again; options include both open-heart and transcatheter procedures.

Hancock™ II Valve
Image courtesy of Medtronic

Mechanical valves

Like your native heart valves, mechanical valves have flaps that open and close. They are made of a strong carbon-based material and a cloth ring. Mechanical valves are designed to last for the rest of your life. The downside of mechanical valves is that blood clots can form on the valve. If a clot breaks off, it can enter the bloodstream and possibly cause a stroke, pulmonary embolism, or other serious condition. To prevent clots from forming, a blood-thinning medication called warfarin must be taken.

Medtronic Open Pivot
Image courtesy of
St. Jude Medical

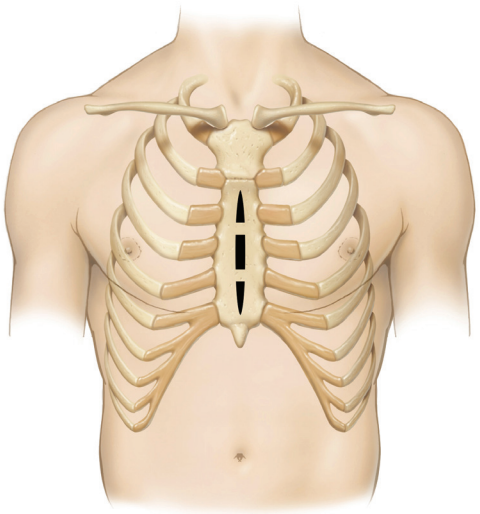
Blood-Thinning Medications

If you choose a mechanical valve, you will have to take a medication every day to prevent blood clots. You will have to take this medication for as long as you have the mechanical valve, which could be the rest of your life. This medication needs to be carefully monitored with blood testing to make sure the levels are correct. Blood clots are not as common in tissue valves so, if you choose a tissue valve, you can probably avoid taking long-term blood thinners. However, you may have to take blood thinning medications for the first few months after your surgery until your body is used to the new valve.

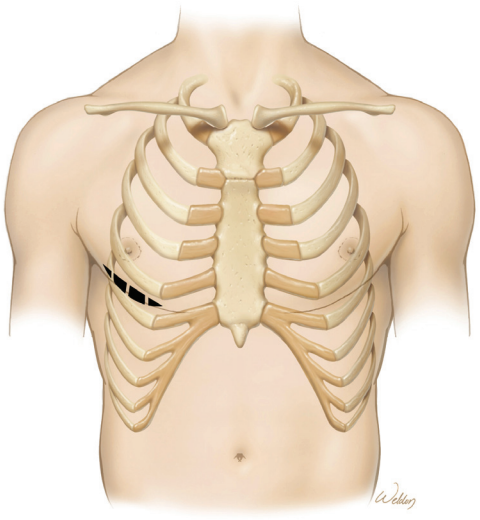
Your Mitral Valve Surgery

During this operation, the surgeon will make an incision, either through your breastbone (median sternotomy) or between your ribs (minimally invasive).

The surgeon will repair or replace the defective valve. If the valve is removed, the surgeon will replace it with either a tissue valve or a mechanical valve, as discussed. During most open-heart surgeries, including valve surgery, your heart will be stopped and you will be placed on a heart-lung bypass machine. This machine takes over the work of the heart, putting oxygen in your blood and circulating it throughout the body. Your heart will be restarted once the procedure is complete.



Median sternotomy incision



Minimally invasive incision

During Surgery

- You will be given general anesthesia, so you will be asleep and pain-free
- Through an IV, you will be receiving fluids and other medicines like antibiotics during the surgery
- After you are completely asleep, a breathing tube will be put into your windpipe through your mouth to help you breathe
- Another IV that measures the pressure in your heart may be placed through a vein in your neck.
- You will also have tube placed in your bladder to drain your urine. This will be removed once you are awake and moving around comfortably
- The surgeon will make a modest incision either down your chest or between your ribs
- The surgery team will connect you to a heart-lung machine. This machine takes over the pumping action of the heart, allowing the surgeon to work on the still heart
- The surgeon opens up the left upper chamber of the heart to see the mitral valve
- For a mitral valve repair, the surgeon will remove the loose, floppy section of valve, then sew the strong parts of the valve together. A special ring made of cloth and metal is then stitched around the repaired valve to compress the leaflets together, adding strength and stability to the repair
- In a replacement, the damaged or diseased mitral valve is removed. A new valve (tissue or mechanical) is sewn into place
- The heart is carefully closed, and its function is tested to ensure the new valve is working correctly.
- You are weaned off the heart-lung machine
- The incision is closed using wire or strong sutures.

Minimally Invasive Surgery

During minimally invasive heart surgery, the surgeon makes one or more small incisions between the ribs. This allows the surgeon to clearly see and access the internal areas. Your surgeon will discuss the option with you, if he or she believes this type of surgical approach may be best for you.

Recovery

It will take you approximately two to three months to fully recover from undergoing your cardiothoracic procedure. You should plan to be away from work, getting your full strength back, for approximately 6 to 12 weeks. You will be given a separate handout that provides you with everything you need to know about your hospital stay and recovery.