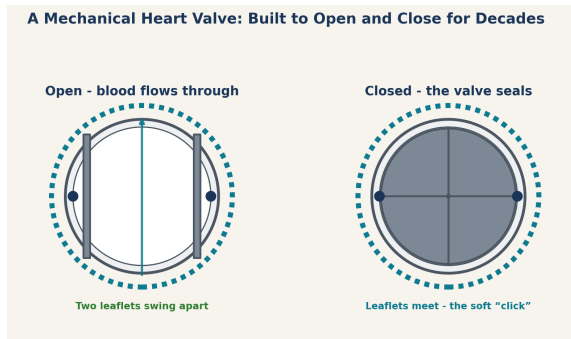


Mechanical Heart Valves

Living with a durable, man-made valve - and the lifelong warfarin it requires

Built to last decades - but only if warfarin, not a DOAC, protects it every day.



Online: <https://go.riasalimd.com/mech-valve-guide>

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Names & Terms You Will Hear

Term	Meaning
Mechanical heart valve	A replacement heart valve made entirely of durable man-made materials - usually metal alloy and pyrolytic carbon - not tissue.
Bileaflet valve	The most common mechanical valve design today: two semicircular leaflets that pivot open and shut, like a pair of small doors. On-X and St. Jude Medical are common brands.
Occluder / leaflet	The moving part of the valve that swings open to let blood through and swings shut to stop it flowing backward.
Sewing cuff / sewing ring	The fabric-covered ring around the valve that the surgeon stitches to your own heart tissue to anchor the valve in place.
INR (international normalized ratio)	The blood test that measures how thin your blood is on warfarin. Your target INR range depends on where your valve is and its design.
Warfarin	The only blood thinner proven safe for a mechanical valve. It is a vitamin K antagonist and needs regular INR blood tests to find the right dose for you.
DOAC (direct oral anticoagulant)	Newer blood thinner pills. They work well for some heart conditions. But they are NOT safe with a mechanical heart valve.
Bridging anticoagulation	A short switch to a fast shot-based blood thinner around a surgery. It keeps your valve safe while warfarin is paused.
Valve thrombosis	A blood clot that forms on or around a mechanical valve, most often because anticoagulation was too light or was stopped. It is a medical emergency.
Home INR self-testing	Checking your own INR with a small fingerstick meter at home, similar to how a diabetic checks blood sugar, instead of (or between) lab draws.



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Never stop warfarin. Never switch to a newer blood thinner on your own. A mechanical valve needs warfarin every day, for life. Newer pill blood thinners are **not a safe substitute**. A major trial testing one of them was stopped early. It caused more strokes and more bleeding than warfarin. If you need surgery, your team will plan a safe bridge. Do not stop warfarin on your own.



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Mechanical Heart Valves?

- A mechanical heart valve is a small, durable device that takes over for a heart valve that no longer works - most often replacing the aortic or mitral valve.
- The most common design today is bileaflet: two semicircular leaflets, made of pyrolytic carbon over a metal alloy frame, pivot open to let blood flow forward and swing shut to stop it flowing backward.
- Its biggest advantage is durability. Unlike a tissue valve, a well-functioning mechanical valve typically lasts decades - often a lifetime - without wearing out.
- That durability comes with one firm requirement: blood tends to clot on man-made surfaces, so a mechanical valve needs a blood thinner every single day, for life.
- The only blood thinner proven safe for a mechanical valve is warfarin. Newer blood thinners (DOACs) are NOT a substitute - they were tested and found unsafe in this setting.
- Many patients feel or hear a soft, rhythmic “click” from the valve opening and closing. This is normal and simply means the valve is doing its job.
- Because it is chosen for its long life, a mechanical valve is most often recommended for younger patients who can safely manage lifelong warfarin.

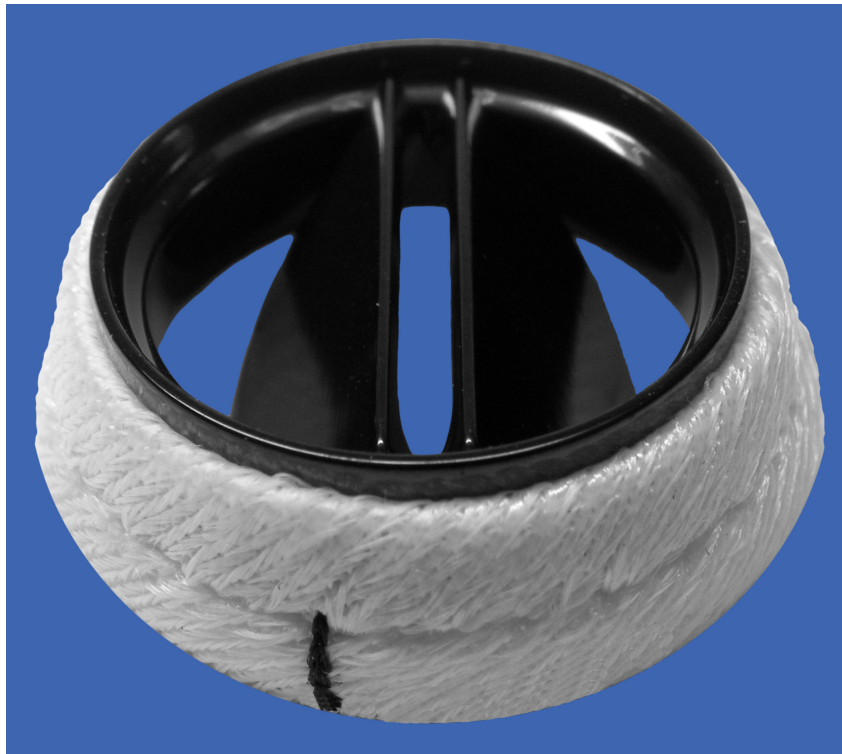


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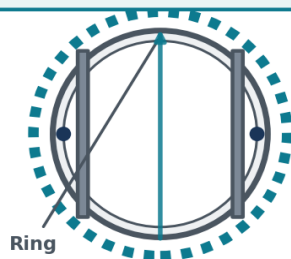
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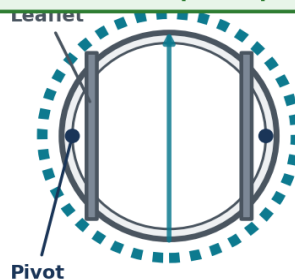
A real bileaflet mechanical heart valve (Karboniks-1, aortic position), photographed with its sewing ring and two carbon leaflets in the closed position. Mechanical valves last a lifetime but need lifelong blood thinning. Image credit: Stif Komar, Wikimedia Commons (CC BY-SA 3.0).

Bileaflet Mechanical Valve Design (On-X / St. Jude Style)

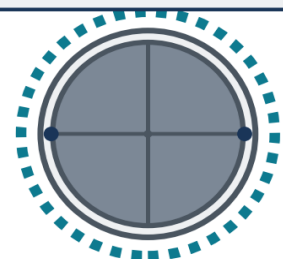
Sewing ring anchors it in place



Two leaflets pivot open



Leaflets seal - normal "click"



A bileaflet mechanical valve: a sewing ring anchors it to your heart, and two leaflets pivot on small posts to open for forward flow and seal shut with a soft click.



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Why It Matters

- A mechanical valve's durability means most patients avoid a second valve operation later in life - a major advantage for someone in their 30s, 40s, or 50s.
- That same durability only holds if the daily warfarin routine is followed precisely - skipping doses or switching to a DOAC on your own puts the valve, and your life, at risk.
- Understanding your target INR range, and why it differs by valve position, helps you and your care team catch a dose that has drifted too high or too low before it causes harm.
- Knowing how to handle warfarin around a dental visit, a colonoscopy, or a surgery - through bridging, not simply stopping the pill - prevents both clot and bleeding emergencies.
- If you are or may become pregnant, warfarin crosses the placenta and can harm a developing baby - this needs a specialized plan made well before conception, not after a positive test.
- Recognizing the warning signs of valve thrombosis (a stuck leaflet) and major bleeding early, and knowing to call immediately, can be lifesaving.



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Mechanical vs Tissue Valve - Why the Choice Is Made

Feature	Mechanical valve	Tissue valve
What it is made of	Metal alloy and pyrolytic carbon	Treated cow, pig, or human tissue
How long it lasts	Decades - often a lifetime	About 10-20 years
Long-term blood thinner	Yes - lifelong warfarin, with INR tests	Usually none long-term
DOACs (dabigatran, apixaban, etc.)	NOT safe - contraindicated (RE-ALIGN trial)	Not usually needed for the valve itself
Main trade-off	Needs a daily blood thinner for life	Wears out and may need a future procedure
Often best for	Younger patients who can manage warfarin reliably	Older patients, high bleeding risk, or a planned pregnancy



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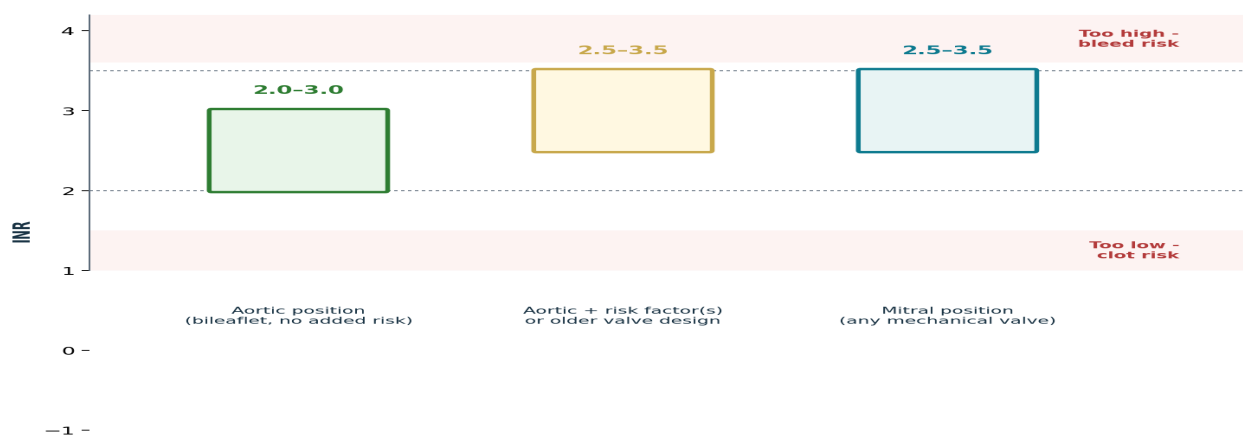
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Risk Factors

Some patients are more likely to develop this condition. Knowing your risk helps your care team take extra precautions.

Risk Factor	Why It Increases Risk
Mitral or tricuspid valve position	Blood moves more slowly through these chambers. This raises clot risk. Guidelines set a higher INR target here than for most aortic valves.
Older mechanical valve designs	Older valve styles create more turbulent flow than modern designs. They usually need a higher INR target.
Atrial fibrillation	An irregular heartbeat lets blood pool in the heart's upper chambers. This adds clot risk on top of the valve itself.
Prior stroke or blood clot	A past clot or stroke means a higher risk profile. This usually means a higher INR target and closer monitoring.
Reduced heart-pumping function	A weaker heart moves blood more slowly. This can encourage a clot to form around the valve.
Missed INR checks or uneven dosing	Diet, illness, and other medicines can shift warfarin's effect. Skipped checks let the INR drift too low or too high without anyone noticing.

INR Target Range Depends on Valve Position



Your INR target range depends on where your valve sits and its design - mitral valves and higher-risk profiles need a higher target than a standard aortic bileaflet valve.



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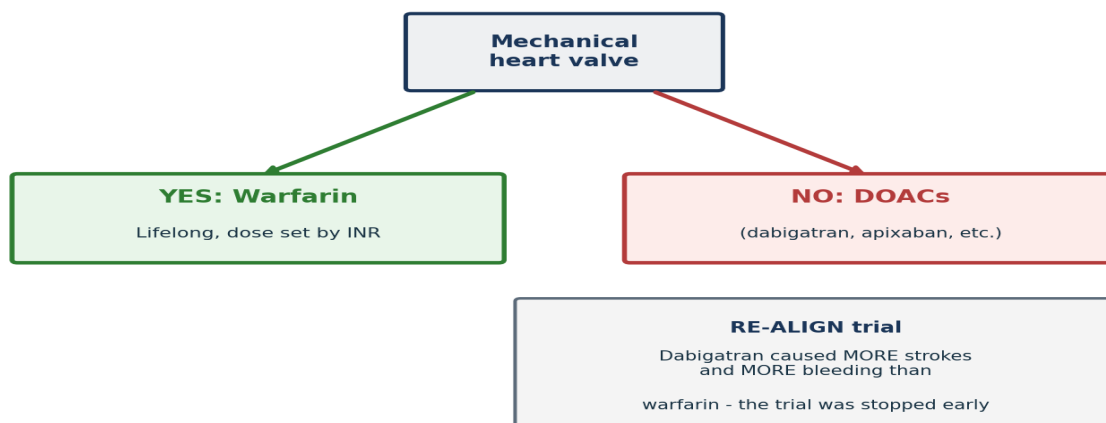


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Treatment Options

- Take warfarin exactly as prescribed, every day, for the rest of your life - never stop it or skip doses without talking to your care team first.
- Get your INR checked as often as your team recommends, and know your personal target range for your specific valve position and design.
- Never take a DOAC (dabigatran, apixaban, rivaroxaban, edoxaban) in place of warfarin - it is not an option with a mechanical valve.
- Ask about home INR self-testing if frequent lab visits are a burden - many patients successfully manage their own weekly checks with a fingerstick meter.
- Before any surgery, dental extraction, or invasive procedure, tell every provider you have a mechanical valve and plan bridging anticoagulation with your cardiologist well in advance - do not simply stop the warfarin on your own.
- Take endocarditis prevention seriously: keep up routine dental care and, when your dentist or care team advises it, take antibiotics before certain dental procedures.
- If you are of childbearing age, discuss pregnancy planning before you try to conceive - the anticoagulation plan changes and needs specialized, early input.

Mechanical Valve = Warfarin, Never a DOAC



Mechanical valve means warfarin, not a DOAC. The RE-ALIGN trial was stopped early because dabigatran caused more strokes and more bleeding than warfarin in mechanical-valve patients.



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Life on Warfarin - What Daily Anticoagulation Looks Like

- Take warfarin at the same time each day, exactly as prescribed. Never double up on a missed dose without asking your team first.
- Your target INR range is personal to your valve. Know your number. Keep it written down - a card, a phone note, or a log.
- Diet does not need to avoid vitamin K. It needs to be steady. Big swings in leafy greens week to week are what throw off your dose.
- Alcohol, illness, and many common medicines can shift your INR. Tell your team about any change.
- Report unusual bruising, nosebleeds, bleeding gums, or dark stool right away. These can be early signs your INR is too high.
- Carry a medical-alert card or bracelet listing your valve type and target INR. It speeds safe care anywhere, including an emergency room.



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Home INR Self-Testing

- Home INR testing uses a small fingerstick meter. It works much like a diabetic glucose meter, checking your INR without a lab visit.
- Many patients on lifelong warfarin are good candidates. It often means more frequent checks with far less disruption to daily life.
- Ask your cardiologist if you qualify. You will get trained on the meter, the testing schedule, and how to report results.
- You will still need periodic office or lab checks. This confirms your home meter stays accurate.
- Keep a simple log of every result and dose. It helps your team spot a trend before it becomes a problem.
- Our companion [Warfarin and INR Monitoring guide](#) covers the testing routine in more depth.



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Bridging Anticoagulation for Surgery or Procedures

- Never stop warfarin on your own before surgery or dental work. Call your cardiologist 1 to 2 weeks ahead to plan.
- For most mechanical valve patients, the plan is a bridge. Warfarin is paused, and a fast shot-based blood thinner covers the gap.
- Bridging keeps your valve safe from clotting during the short window when warfarin's effect is too low for the procedure.
- Some low-risk procedures, like certain dental work, may not need warfarin stopped at all. Your team decides based on your case.
- After the procedure, warfarin restarts. The bridge stops once your INR is back in your target range.
- See our [Anticoagulation Bridging guide](#) for the full step-by-step process.



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Comfort Measures at Home (No Medication Needed)

These simple steps support healing and ease symptoms. Use them alongside any medication your doctor prescribes.

- Carry a card or wear a medical-alert bracelet listing your valve brand, model, size, and target INR range - it speeds care in any emergency.
- Keep a simple INR log (paper or app) with each result and dose - patterns are easier for your team to spot than isolated numbers.
- Eat a consistent amount of vitamin-K-rich food (leafy greens) day to day rather than avoiding it - big swings, not the food itself, throw off warfarin.
- Limit alcohol and tell your team about any new medication, supplement, or antibiotic - many interact with warfarin and shift your INR.
- Use a soft toothbrush and an electric razor, and be extra careful with sharp tools, to reduce minor bleeding and bruising while anticoagulated.
- Stay active as your team allows - most people with a well-functioning mechanical valve live full, physically active lives.



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Risks, Benefits, and Alternatives

Every choice has trade-offs. Use this table to start the shared decision conversation.

Option	Risks	Benefits	Alternatives
Choosing a mechanical valve	Needs lifelong warfarin. Regular blood tests. Some bleeding risk. Careful planning for surgery or pregnancy.	Built to last. Often decades or a lifetime. Usually avoids a second valve operation. This matters most for younger patients.	A tissue valve. It skips the lifelong blood thinner. But it wears out sooner, often in 10 to 20 years.
Warfarin at your target INR	Needs regular blood tests. Too much thinning can cause bleeding. Too little can cause a clot.	The only blood thinner proven safe for a mechanical valve. Keeps the valve working the way it should.	None. Newer blood thinners are not safe here. This is not optional with a mechanical valve.
Home INR self-testing	Needs training on the meter. Needs discipline with logging results. Not the right fit for everyone.	More frequent checks. Less disruption to your day. Many patients find it easier to stay in range.	Lab-based INR draws through your doctor's office or an anticoagulation clinic.
Heparin bridging around a procedure	Adds a period of shots. Adds extra monitoring. Timing must be planned closely with your care team.	Keeps the valve safe from clotting while warfarin is paused for surgery.	Stopping warfarin with no bridge. Not recommended for most mechanical valve patients.



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Common Misconceptions

Myth	Reality
Newer blood thinners don't need blood tests, so I can switch from warfarin to one of those.	Newer pill blood thinners are dangerous with a mechanical valve. A major trial testing one was stopped early. It caused more strokes and more bleeding than warfarin.
If my INR checks have all been in range, I can occasionally skip a dose.	Warfarin's effect does not carry over evenly. One skipped dose can drop your INR out of the safe range. Your clot risk can rise within days.
I should just stop my warfarin a few days before any surgery or dental work.	Stopping warfarin on your own can leave your valve unprotected. A short bridge with a shot-based blood thinner, planned by your cardiologist, is the safe approach for most patients.
The clicking sound from my valve means something is wrong.	A soft, steady click is the normal sound of the valve opening and closing. Many patients find it reassuring. A new or muffled sound is what needs a call.
A mechanical valve is always better than a tissue valve.	Neither is simply better. A mechanical valve lasts longer but needs lifelong warfarin. A tissue valve usually skips the blood thinner but wears out sooner. The right choice depends on your age, bleeding risk, and life plans.
I can't get pregnant with a mechanical valve.	Pregnancy is possible with careful, early planning. Warfarin can harm a developing baby, most in the first three months. Talk to your cardiologist before you try to conceive, not after.
Once my INR is in range, I don't need to worry about diet or other medications.	Diet, alcohol, illness, and many common medicines can shift your INR. Staying steady and talking with your team still matters.



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Possible Complications

Knowing what can go wrong helps you spot problems early. Most complications are uncommon, especially with treatment.

Where / What	What Can Happen
Valve thrombosis (a stuck or clotted leaflet)	A clot can form on the valve. This often happens when the blood thinner dose was too light or a dose was missed. A leaflet may stop moving. This is an emergency.
Stroke or systemic embolism	A clot on the valve can break free. It can travel to the brain, causing a stroke. It can also block an artery elsewhere in the body.
Major bleeding	Warfarin thins the blood. If the level runs too high, or after an injury, this can cause serious bleeding, including inside the head or gut.
Warfarin embryopathy in pregnancy	Warfarin can cross into a developing baby. Exposure in the first three months carries the most risk to bone growth. This is why pregnancy needs a plan made in advance.
Valve infection (endocarditis)	Germ, often from the mouth, can settle on the valve. This causes a serious infection. Good dental care lowers this risk. So do antibiotics before certain dental work, when advised.
Hemolysis (mild red blood cell breakdown)	The valve's motion can gently wear down some red blood cells. This is usually mild and has no symptoms. Blood tests check for it now and then.



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Planning a Pregnancy With a Mechanical Valve

- Pregnancy with a mechanical valve is possible. It is high-risk and needs a specialized team well before conception.
- Warfarin can cross into a developing baby. The first three months carry the highest risk to bone growth.
- The blood-thinner plan often changes by trimester. Your cardiologist and obstetric team decide this together, with you.
- Stopping the blood thinner during pregnancy is not safe. It leaves the valve unprotected and raises stroke risk for the mother.
- If you could become pregnant, talk about birth control and pregnancy planning at your routine visits, not only after a positive test.
- Delivery is planned in advance too - timing, anesthesia, and the blood-thinner plan around labor, together across your care team.



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Planning a pregnancy matters as much as planning surgery. Warfarin can harm a developing baby. The risk is highest in the first three months. If you could become pregnant, talk with your cardiologist first. Do this **before** you try to conceive. A safe plan can then be ready from day one.



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Points to Know

If you remember nothing else, remember these key points.

- A mechanical valve is chosen for its durability - it can last decades or a lifetime - but it requires warfarin every day, for life.
- Never switch to a newer pill blood thinner. A major trial showed these cause more strokes and more bleeding with a mechanical valve.
- Know your personal INR target range - it depends on your valve's position and design, not a single number for everyone.
- Never stop warfarin on your own before a procedure - a short bridge, planned with your cardiologist, keeps the valve protected.
- Home INR self-testing can make staying in range easier for many patients - ask your team if it is right for you.
- A soft, rhythmic click from the valve is normal. A new, muffled, or missing click, or sudden shortness of breath, is not - call immediately.
- If you are of childbearing age, plan pregnancy anticoagulation with your cardiologist BEFORE you try to conceive - warfarin can harm a developing baby.
- Keep up dental care and take antibiotics before certain dental procedures if your team advises it, to help prevent a valve infection.



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When to Call Us - and When to Call 911

If you are not sure, call. We would rather hear from you twice than miss a real problem.

- Sudden shortness of breath, chest pain, or a new, muffled, or missing valve click - call 911. This can mean the valve is not opening or closing normally (valve thrombosis).
- Signs of a stroke - sudden weakness, slurred speech, facial drooping, or vision change - call 911 immediately.
- Major bleeding - blood in vomit or stool, coughing up blood, a head injury, or bleeding that won't stop after 10 minutes of pressure - call 911.
- Unusual bruising, nosebleeds that won't stop, pink or dark urine, or blood in your stool - call us the same day; your INR may be too high.
- Fever, chills, or feeling unwell for more than a day or two - call us; this can be a sign of valve infection (endocarditis).
- Any planned surgery, dental extraction, or invasive procedure - call us at least 1-2 weeks ahead to arrange your anticoagulation plan.
- You are pregnant or planning to become pregnant - call us before you try to conceive, not after a positive test.
- You missed more than one dose of warfarin, or you are unsure of your last INR result - call us for guidance rather than guessing.

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Trusted Resources

The links below are the trusted resources Dr. Ali used to write this guide and that he recommends you visit for more information. Each is a clickable link in the digital version and a Short.io tracked URL on the printed version.

- [Cleveland Clinic - Mechanical Heart Valve](#) - Overview of mechanical valve design, durability, and the lifelong anticoagulation requirement.
- [Mayo Clinic - Heart Valve Disease](#) - Patient-facing overview of prosthetic valve options and warning signs of valve dysfunction.
- [American Heart Association - Options for Heart Valve Replacement](#) - Plain-language comparison of mechanical and tissue valves.
- [MedlinePlus - Pregnancy and Heart Disease](#) - US National Library of Medicine overview of managing high-risk cardiac conditions, including anticoagulation, during pregnancy.
- [Dr. Ali - Living With a Prosthetic Valve Guide](#) - Our companion guide on daily life with a tissue or mechanical valve.
- [Dr. Ali - Warfarin and INR Monitoring Guide](#) - Our companion guide on how warfarin works, INR testing, and staying in range.



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Sources Used to Build This Guide

Every recommendation in this guide is grounded in one or more of the studies, guidelines, or trusted resources below. Short links are tracked so Dr. Ali can see which references patients are reading; nothing personally identifying is captured.

- [2020 ACC/AHA Guideline for the Management of Patients With Valvular Heart Disease](#) [Guideline]
Authoritative basis for lifelong warfarin (not DOACs) after mechanical valve replacement, INR targets by valve position and thrombogenicity, bridging strategy for procedures, and mechanical-vs-tissue valve-choice counseling.
- [2021 ESC/EACTS Guidelines for the Management of Valvular Heart Disease](#) [Guideline]
European guideline concordant on lifelong vitamin K antagonist therapy for mechanical prostheses, INR target ranges by position and thrombogenicity risk, and explicit contraindication of DOACs in mechanical valves.
- [Eikelboom JW et al. Dabigatran versus Warfarin in Patients with Mechanical Heart Valves \(RE-ALIGN trial\), N Engl J Med 2013](#) [Trial]
The pivotal trial (PMID 23991661) stopped early because dabigatran caused MORE strokes and MORE bleeding than warfarin in mechanical-valve patients — the direct evidence basis for 'NO DOACs with a mechanical valve,' cited per PubMed.
- [Jung B, Vahanian A. Lessons from the RE-ALIGN Trial. Archives of Cardiovascular Diseases 2014](#) [Review]
Editorial synthesis (PMID 24709283) explaining why direct thrombin inhibition fails on mechanical valve surfaces, reinforcing the class-wide DOAC contraindication for mechanical prostheses, cited per PubMed.
- [Puskas J et al. Reduced Anticoagulation After Mechanical Aortic Valve Replacement — PROACT trial. J Thorac Cardiovasc Surg 2014](#) [Trial]
Randomized FDA IDE trial (PMID 24512654) of the On-X bileaflet mechanical aortic valve showing a lower INR target (1.5-2.0) plus aspirin cut major and minor bleeding versus standard-dose warfarin (2.0-3.0) with no increase in thromboembolism — basis for the On-X low-dose-INR discussion, cited per PubMed.
- [Yanagawa B et al. Reduced Anticoagulation Is Safe in High-Risk Patients With the On-X Mechanical Aortic Valve. Curr Opin Cardiol 2015](#) [Review]
5-year PROACT follow-up data (PMID 29504958) confirming lower major bleeding with low-dose warfarin and no significant difference in thromboembolic events for the On-X aortic valve, cited per PubMed.
- [Ruel M et al. Midterm Survival, Clinical, and Hemodynamic Outcomes of the On-X Mechanical Mitral Valve — PROACT Mitral. J Thorac Cardiovasc Surg 2024](#) [Trial]
PROACT Mitral randomized data (PMID 39617318) on the On-X mechanical mitral valve showing durable survival (92.4% at 5 years) and stable hemodynamics, supporting the durability argument for choosing a mechanical valve, cited per PubMed.
- [Cleveland Clinic — Mechanical Heart Valve](#) [Patient Education]
Plain-language patient framing of bileaflet mechanical valve design, the audible 'click,' and lifelong warfarin requirement.
- [Mayo Clinic — Heart Valve Disease \(Symptoms & Causes\)](#) [Patient Education]
Patient-facing overview of prosthetic valve options and warning signs of valve dysfunction (breathlessness, swelling, palpitations) used to frame the when-to-call section.
- [American Heart Association — Options for Heart Valve Replacement](#) [Patient Education]
Frames the mechanical-vs-tissue valve trade-off (durability vs anticoagulation burden) in plain language for the RBA and comparison-table sections.



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- [ACC/AHA Anticoagulation Bridging Guidance for Mechanical Heart Valves \(2020 VHD Guideline, Section 10\)](#) *[Guideline]*
Basis for peri-procedural bridging strategy (heparin bridge for high-thrombotic-risk mechanical valves undergoing invasive procedures) rather than simply holding warfarin.
- [MedlinePlus — Pregnancy and Heart Disease](#) *[Patient Education]*
US National Library of Medicine consumer-health resource on managing high-risk cardiac conditions, including anticoagulation, during pregnancy — supports the pregnancy-planning subsection and trusted resources list.



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About This Guide

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Reviewer note: Reviewed against the Cleveland Clinic mechanical-heart-valve page, the Mayo Clinic heart-valve-disease pages, and the AHA valve-replacement options page. Ours adds: an open/closed bileaflet schematic, an INR-target ladder by valve position, a warfarin-vs-DOAC decision figure grounded in the RE-ALIGN trial, a tinted mechanical-vs-tissue trade-off table, dedicated subsections on home INR self-testing, peri-procedure bridging, and pregnancy planning - and direct cross-links to our living-with-a-prosthetic-valve, warfarin/INR monitoring, and bridging guides.

Disclaimer

This guide is for educational purposes only and does not replace medical advice from your physician. Recommendations may not apply to every patient. Always follow the specific instructions of Dr. Ali and your care team. In an emergency call 911 or go to the nearest emergency department.



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