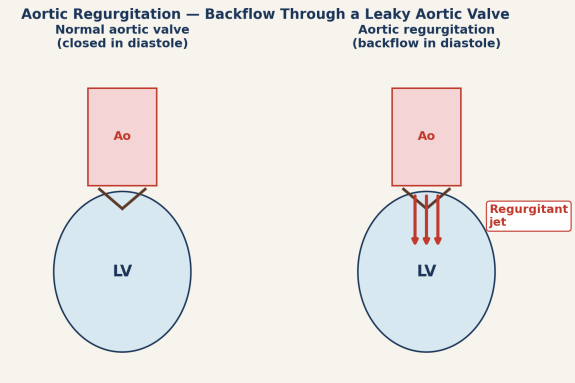
Understanding Aortic Regurgitation

When the aortic valve leaks — what it means and when to fix it

Chronic AR is often silent for years. Severe AR is fixable. Acute AR is a surgical emergency.



Online: https://go.riasalimd.com/ar-guide

Rias KS Ali, MD FACC

Board Certified in Interventional Cardiology & Cardiovascular Disease

4740 Mile Stretch Drive, Holiday FL 34690 | Office: (727) 943-5200 | Fax: (727) 943-5201 | RiasAliMD.com

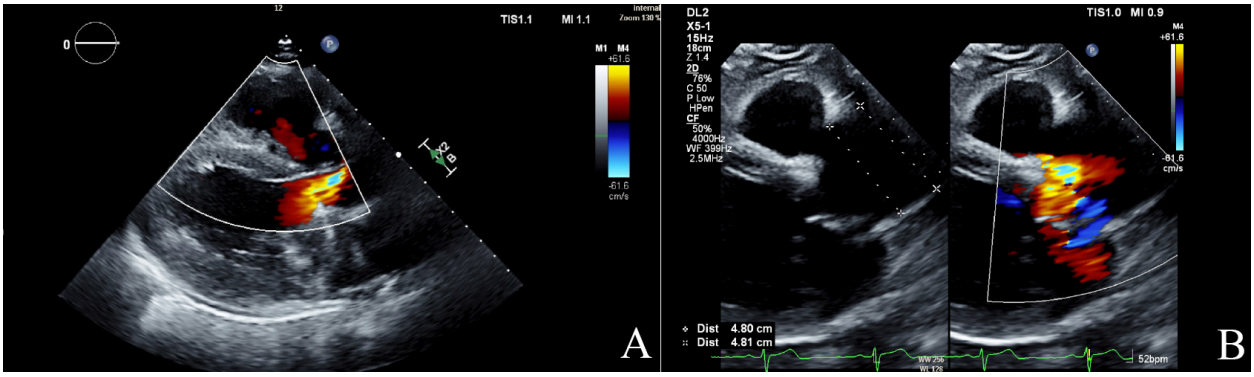
Last Updated: August 2026

Names & Terms You Will Hear

Term	Meaning
AR (aortic regurgitation)	The medical name. The aortic valve does not close fully. Blood leaks BACKWARD into the left ventricle (LV).
AI (aortic insufficiency)	An older name for the same thing. Used interchangeably.
Chronic AR	Develops slowly over years. The LV enlarges to handle extra blood. Often silent until severe.
Acute AR	Develops suddenly from infection, dissection, or trauma. The LV cannot adjust fast enough. This is a surgical emergency.
Primary AR	The valve itself is damaged. Causes include bicuspid valve, rheumatic fever, infection, or calcification.
Secondary AR	The valve is normal but the aortic root is too wide. Causes include Marfan syndrome, aortic aneurysm, and high blood pressure.
Regurgitant volume (RVol)	How much blood leaks backward per heartbeat. Severe AR means more than 60 mL per beat.
Regurgitant fraction (RF)	The share of each heartbeat that goes backward. Severe AR means more than 50%.

What Is Aortic Regurgitation?

- The aortic valve opens to let blood OUT of the heart. It closes to stop backflow. In aortic regurgitation (AR), it does not close fully. Blood leaks backward into the left ventricle (LV).
- **CHRONIC AR** develops over years. The LV slowly enlarges to handle the extra blood. Symptoms come late. **ACUTE AR** hits suddenly. The LV cannot adjust fast enough. Pressure rises fast and fluid backs up into the lungs.
- Common causes of chronic AR: bicuspid aortic valve (the top congenital cause), age-related valve calcification, prior rheumatic fever, aortic root dilation due to Marfan syndrome or high blood pressure, and prior valve repair.
- Common causes of acute AR: **infective endocarditis** (infection destroys a valve leaflet), **aortic dissection** (a tear extends into the valve), and trauma. Acute AR is a SURGICAL EMERGENCY.
- Severity is graded by echo (echocardiogram): jet width, regurgitant volume (severe > 60 mL), regurgitant fraction (severe > 50%), orifice area (severe > 0.30 cm²), LV size, and Doppler pressure half-time.



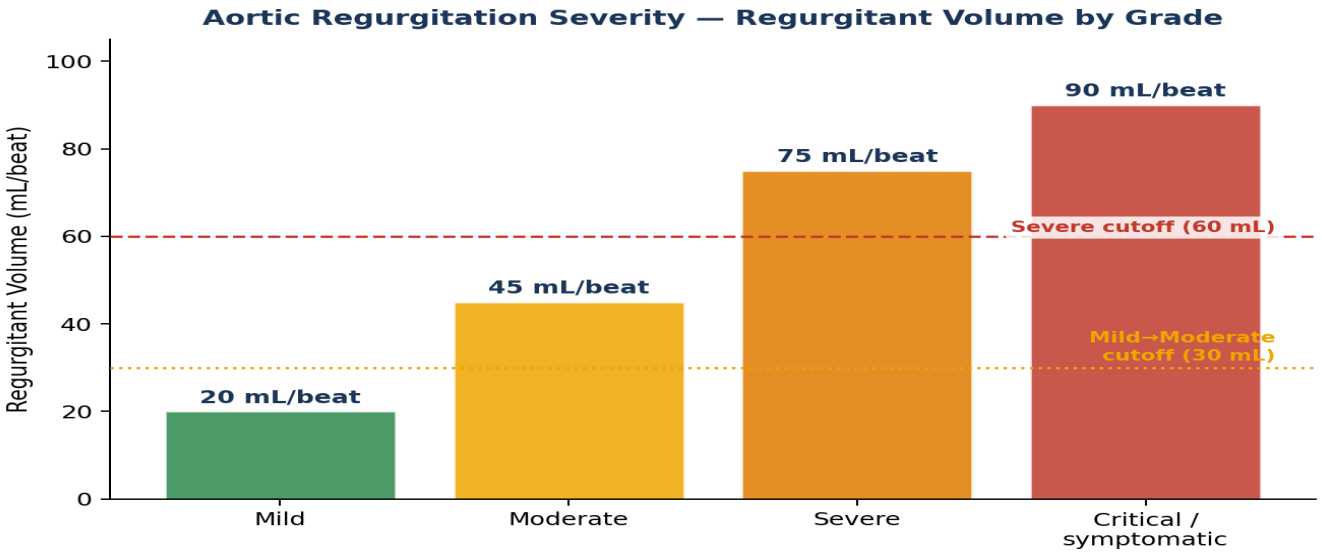
A real echocardiogram with color Doppler. The bright red-yellow-blue 'mosaic' jet is blood leaking backward through the aortic valve into the left ventricle with each heartbeat. Image: Gill et al., Reviews in Cardiovascular Medicine 2025 (CC BY 4.0).

AR Severity — At a Glance

Mild	Moderate	Severe — asymptomatic	Severe — symptomatic
• RVol < 30 mL/beat • RF < 30% • Echo every 2-3 years • Treat BP; no surgery	• RVol 30-59 mL/beat • RF 30-49% • Echo every 1-2 years • Treat BP; surveillance	• RVol at least 60 mL/beat, RF at least 50% • Echo every 6 months • Watch LV size + EF • Surgery if EF < 55% or LVESD > 50 mm	• Any new SOB, fatigue, edema • Class I surgical indication • Mortality 10-20%/yr untreated • Proceed with AVR

Why It Matters

- Severe AR is often silent for years. But once shortness of breath, fatigue, or chest discomfort appears, the LV may already be damaged.
- Untreated severe AR carries 10–20% annual mortality once symptoms appear. Surgery greatly improves survival. We must act before the LV weakens.
- Surgery thresholds (2020 ACC/AHA): severe AR plus symptoms — operate. Severe AR plus LVEF below 55% — operate, even with no symptoms. Severe AR plus LVESD above 50 mm — operate.
- Acute AR from infection or dissection is a surgical emergency. Without urgent valve surgery, the risk of death is very high. Balloon pumps must NOT be used. They make the leak worse.
- Echo follow-up depends on severity: mild AR every 2–3 years; moderate every 1–2 years; severe with no symptoms every 6 months.
- TAVR (transcatheter aortic valve replacement) for AR is now an option for high-risk patients. JenaValve Trilogy was FDA-approved in January 2024.



AR severity is graded by regurgitant volume per beat. Mild: less than 30 mL. Moderate: 30–59 mL. Severe: 60 mL or more. Echo also uses regurgitant fraction, vena contracta width, and LV size. Thresholds per 2020 ACC/AHA valve guideline.

Acute AR is a surgical EMERGENCY.
It can be caused by valve infection, aortic dissection, or trauma. It overwhelms the left ventricle in hours to days. The main sign is sudden severe shortness of breath. Intra-aortic balloon pumps must NOT be used. They make the leak worse. The only treatment is urgent valve surgery. If you have AR and get sudden severe breathlessness or chest or back pain — call 911.

Treatment Options

- **Mild to moderate AR:** No surgery needed. Keep blood pressure below 130 systolic. Check the aortic root size. Get echo on schedule.
- **Severe AR with no symptoms, normal LVEF, and normal LV size:** Watch and wait. Echo every 6 months. Act when surgery criteria are met.
- **Severe AR plus symptoms:** Aortic valve replacement (AVR). Surgery is preferred for most patients.
- **Severe AR plus LVEF below 55% or LVESD above 50 mm:** AVR even with no symptoms. Operating early prevents lasting LV damage.
- **AR plus ascending aortic dilation above 4.5–5.0 cm:** Combined valve and root surgery. Options include the Bentall procedure or valve-sparing root repair.
- **TAVR for AR (newer option):** JenaValve Trilogy was FDA-approved January 2024. It is for native AR in patients too sick for open surgery. Long-term data are still growing.
- **Acute severe AR:** Emergency surgical valve replacement. No medicine bridges this safely.

Intervention Thresholds — When to Replace the Valve

Scenario	Action	Class
Severe AR + ANY symptoms	AVR — proceed	I
Severe AR + LVEF < 55%	AVR even if asymptomatic	I
Severe AR + LVESD > 50 mm (or > 25 mm/m²)	AVR even if asymptomatic + EF normal	I
Severe AR + ascending aorta > 5.0 cm	Combined AVR + root replacement	I
Severe AR + undergoing other cardiac surgery	AVR at same operation	I
Acute severe AR (endocarditis, dissection)	EMERGENCY surgical AVR	I

Chronic vs Acute AR — A Key Difference

- **Chronic AR** develops over years. The LV slowly grows bigger to handle the extra blood. Many patients feel well even with severe AR. Symptoms come late. The risk is LV damage before symptoms appear. That is why regular echo follow-up matters.
- **Acute AR** works differently. The LV has no time to adjust. Pressure on the left side of the heart rises fast. Patients get sudden shortness of breath, low blood pressure, and rapid heart rate within hours to days. Causes include valve infection, aortic dissection, and trauma.
- **Why this matters for treatment:** chronic AR allows planned surgery. Acute AR needs the OR right away. Even a short delay raises the risk of death. Water pills and blood pressure drugs can ease symptoms briefly but do not replace urgent surgery.
- **If you have AR and get sudden severe symptoms:** go to the ER — do not wait for an office visit.

TAVR for Aortic Regurgitation — The Newer Option

- **Why this is newer:** standard TAVR valves grip calcified tissue. Native AR valves usually are NOT calcified. So standard TAVR devices could shift or leak. Until recently, AR was not a TAVR option.
- **JenaValve Trilogy:** FDA-approved January 2024. It is for severe AR with symptoms in patients too sick for open surgery. It uses 'locator' arms to grip the leaflets. This works in non-calcified valves.
- **Who qualifies:** patients with severe AR plus symptoms whose risk for open AVR is too high. The aortic root and leaflet shape must be suitable.
- **Outcomes:** early results from registries are good. Long-term data are still being collected. Leak rates around the valve have improved with newer devices.
- **Practical tip:** if open surgery is too risky, ask about TAVR-for-AR at a high-volume center. Few US centers implant the Trilogy now. Access is growing.

Risks, Benefits, and Alternatives

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

Option	Risks	Benefits	Alternatives
Surgical AVR (mechanical or bioprosthetic valve)	Open-chest surgery (1-3% mortality in good-risk patients). Risks: bleeding, stroke. Warfarin needed with mechanical valves.	Gold standard. Durable. Restores normal valve function. Strong long-term survival data.	TAVR for AR (high-risk), valve repair (selected cases), medical watch (mild-moderate AR).
Valve-sparing root surgery (David or Yacoub for AR plus root dilation)	Complex surgery. Higher early risk than isolated AVR. Long-term results are good in expert centers.	No prosthetic valve or blood thinner needed. Keeps native leaflets. Best for young patients with bicuspid valve and root dilation.	Bentall procedure, separate AVR plus root repair.
TAVR for native AR (JenaValve Trilogy or off-label TAVR)	Newer option. Long-term durability and leak rates still being studied. Anatomy must fit.	Less invasive than open surgery. Faster recovery. Option for patients too sick for open surgery.	Surgical AVR (standard for most), observation if no symptoms and LV is preserved.
Medical watch only	Risk of LV damage if surgery thresholds are missed.	Right for mild-moderate AR and severe AR with no symptoms and preserved LV function.	AVR when criteria are met. Strict blood pressure control is required.
Heart failure medicine while waiting for surgery	Does NOT replace surgery in severe AR with symptoms. Gives only modest symptom relief.	ACE inhibitor or ARB plus a water pill to ease symptoms before surgery.	Surgical AVR (the cure).

Common Misconceptions

Myth	Reality
A leaky valve is no big deal — I can live with it.	Mild AR is often well-tolerated for years. But severe AR is a different disease. Once symptoms appear, the risk of death is 10–20% per year without treatment. Severe AR can be silent until the LV fails.
My echo showed mild AR — do I need surgery?	No. Mild AR is common and rarely needs more than follow-up and blood pressure control. Most mild AR never becomes severe.
Acute AR can wait for an office visit.	No. Acute AR from infection, dissection, or trauma is a SURGICAL EMERGENCY. It overwhelms the LV in hours to days. Sudden severe shortness of breath with risk factors means go to the ER now.
I should wait for bad symptoms before having surgery.	WRONG — and dangerous. The 2020 ACC/AHA guideline says to operate before symptoms if LVEF falls below 55% or LV size grows above 50 mm. Waiting for symptoms may mean lasting LV damage.
AR only happens to older people.	Not true. Bicuspid aortic valve affects 1–2% of people. Many develop AR in their 30s or 40s. Marfan syndrome, endocarditis, and trauma also cause AR in young patients.
TAVR does not work for AR — only for stenosis.	That was true until recently. JenaValve Trilogy was FDA-approved January 2024 for native AR in patients too sick for open surgery. Other devices are in trials.
If my LV is enlarged on echo, I have waited too long.	Not always. LV enlargement can improve after AVR if the EF is still preserved. Earlier surgery gives the best chance of full LV recovery.

Possible Complications

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

Where / What	What Can Happen
Left ventricular dysfunction	Years of extra blood slowly enlarges and weakens the LV. Once LVEF falls below 55% or LVESD exceeds 50 mm, surgery is needed — even without symptoms.
Heart failure	Severe AR can cause fluid in the lungs, leg swelling, and breathlessness. Water pills and ACE inhibitors help short-term. Valve surgery is the cure.
Aortic dissection (bicuspid valve plus dilated aortic root)	Bicuspid AR raises the risk of aortic wall damage. Annual echo or CT checks root size. Surgery is often done at about 5.0–5.5 cm, based on risk factors.
Infective endocarditis	Any damaged valve has a higher risk of valve infection. Ask us if you need antibiotics before dental work or invasive procedures.
Atrial fibrillation	The left atrium grows with chronic AR. This raises the risk of AFib. AFib often gets better after valve surgery. Blood thinners may still be needed.
Sudden cardiac death	This is rare but possible with severe AR and symptoms. It is one more reason to act before the LV weakens too far.

Points to Know

If you remember nothing else, remember these key points.

- Chronic AR is often silent for years. Severity matters more than the diagnosis alone.
- Severe AR has clear surgery thresholds: symptoms, OR EF below 55%, OR LV end-systolic size above 50 mm.
- Acute AR (from infection or dissection) is a surgical EMERGENCY. It is life-threatening within days.
- Keep blood pressure below 130 systolic. This is the key medical step for all chronic AR.
- Bicuspid aortic valve is the top congenital cause. First-degree family members should be screened.
- Echo follow-up interval scales with severity: mild every 2–3 years; severe with no symptoms every 6 months.
- TAVR for AR is now available for high-risk patients (JenaValve Trilogy, FDA January 2024).
- If you have AR plus aortic root dilation, both may need repair in the same operation.

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 severe shortness of breath — especially at rest or lying flat — call 911.
- New chest pain, fever, and a heart murmur — call us today. Infection of the valve must be ruled out.
- Tearing chest or back pain — call 911. This may be aortic dissection.
- Shortness of breath that is getting worse over weeks or months — call us this week.
- New or worsening leg swelling, weight gain, or fatigue — call us this week.
- Fainting or near-fainting — call us today.
- New or irregular heartbeat — call us this week.
- You have AR and need dental work or any procedure — call us first to confirm if you need antibiotics.

Office: (727) 943-5200

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 — Aortic Valve Regurgitation - Easy-to-read guide on AR causes, symptoms, and treatment.
- Mayo Clinic — Aortic Valve Regurgitation - Full patient guide on AR diagnosis and treatment.
- AHA — Aortic Regurgitation - AHA patient page on aortic regurgitation.
- MedlinePlus — Aortic Insufficiency - NIH plain-language reference.
- BAV Foundation — Bicuspid Aortic Valve - Patient education and family screening for bicuspid aortic valve, the top congenital cause of AR.

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 (Otto et al.) *[Guideline]*
  Primary US guideline framework for AR severity grading, intervention thresholds, and surgical timing.
- 2021 ESC/EACTS Guidelines for the Management of Valvular Heart Disease (Vahanian et al.) *[Guideline]*
  European framework for AR intervention; complements ACC/AHA and informs international practice.
- Aortic regurgitation: pathophysiology, diagnosis, and management (Enriquez-Sarano et al., NEJM) *[Review]*
  Definitive NEJM clinical review of chronic and acute AR, severity grading, and treatment decisions.
- Long-term outcomes of aortic valve replacement for chronic AR (Bonow et al., Circulation) *[Clinical Trial]*
  Landmark long-term outcomes data showing improved survival with timely AVR in severe AR.
- JenaValve Trilogy — FDA approval for transcatheter AR (FDA 2024) *[Guideline]*
  FDA approval (January 2024) of the first TAVR device specifically indicated for native AR in high-surgical-risk patients.
- ALIGN-AR Trial — JenaValve Trilogy in symptomatic AR (Vahl et al., JACC 2024) *[Clinical Trial]*
  Pivotal trial supporting FDA approval of the JenaValve Trilogy for native AR; 30-day + 1-year outcomes.
- Cleveland Clinic — Aortic Valve Regurgitation *[Clinical]*
  Patient-friendly overview of AR causes, diagnosis, and treatment.
- Mayo Clinic — Aortic Valve Regurgitation *[Clinical]*
  Comprehensive Mayo patient guide.
- American Heart Association — Aortic Valve Regurgitation *[Clinical]*
  AHA patient-facing summary.
- MedlinePlus — Aortic Insufficiency *[Clinical]*
  NIH/NLM plain-language reference.

About This Guide

Rias KS Ali, MD FACC | Board Certified in Interventional Cardiology & Cardiovascular Disease

4740 Mile Stretch Drive, Holiday FL 34690 | Office: (727) 943-5200 | Fax: (727) 943-5201 | RiasAliMD.com

Version: 2026-08-16

Reviewer note: Reviewed Cleveland Clinic, Mayo Clinic, AHA, and Bonow outcomes data. This guide adds severity visuals, clear surgery thresholds, and TAVR for AR (JenaValve Trilogy, FDA-approved 2024).

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.

Take This Guide With You

Scan or visit: https://go.riasalimd.com/ar-guide

Online: https://go.riasalimd.com/ar-guide

Office: (727) 943-5200

4740 Mile Stretch Drive, Holiday FL 34690 | Office: (727) 943-5200 | Fax: (727) 943-5201 | RiasAliMD.com