Valvular Heart Disease

AS · MR · AR · MS · Grade the lesion, then time the intervention

SYMPTOMS CHANGE EVERYTHING
and so does the EF

AORTIC STENOSIS *the commonest valve lesion you will admit*

Stage	Echo	What to do
Severe (C/D)	**Vmax ≥ 4.0 m/s**, mean gradient **≥ 40 mmHg**, AVA **≤ 1.0 cm²**	**Symptomatic → replace.** Angina, dyspnea, or syncope on exertion is the trigger.
Very severe	Vmax ≥ 5.0 m/s or mean gradient ≥ 60 mmHg	Intervene even if asymptomatic (Class 2a), as are rapid progression, abnormal exercise test, and elevated BNP.
Asymptomatic severe	With **LVEF < 50%**	Replace — a falling EF in severe AS is decompensation, not incidental.
Low-flow, low-gradient	AVA ≤ 1.0 cm² but mean gradient < 40 with **reduced EF**	**Dobutamine stress echo** to separate true severe AS from pseudo-severe. This changes the operation.

TAVR OR SAVR — LARGELY AN AGE AND LIFE-EXPECTANCY DECISION

< 65 y, or life expectancy > 20 y → SAVR preferred (durability). **65–80 y → either**, by shared decision making. **> 80 y, or life expectancy < 10 y → transfemoral TAVR preferred.** SAVR is also favored if vascular anatomy precludes transfemoral access, or when intervening on an asymptomatic patient.

MITRAL REGURGITATION *primary and secondary are different diseases*

PRIMARY (degenerative) — fix the valve

Severe = **EROA ≥ 0.4 cm², regurgitant volume ≥ 60 mL, regurgitant fraction ≥ 50%.** **Operate if symptomatic**, or asymptomatic with **LVEF ≤ 60%** or **LVESD ≥ 40 mm. Repair beats replacement** when feasible. Waiting for a low EF is waiting too long.

SECONDARY (functional) — treat the ventricle

The valve is structurally normal; the **ventricle is the problem. Optimize GDMT first**, plus CRT if indicated. Transcatheter edge-to-edge repair is for persistent severe MR with symptoms **despite maximally tolerated GDMT** and suitable anatomy. Surgery alone does not fix the ventricle.

AORTIC REGURGITATION & MITRAL STENOSIS *the other two*

Lesion	Intervene when	Notes
Chronic severe AR	**Symptomatic**, or asymptomatic with **LVEF ≤ 55%** or **LVESD > 50 mm**	Track LV size and EF on serial echo — AR is a slow, silent dilator. Vasodilators do not delay surgery in asymptomatic disease.
Acute severe AR	**Emergency surgery**	Think **endocarditis or aortic dissection**. Sudden pulmonary edema with a soft murmur and no time to dilate. **Avoid beta-blockade**, which removes the compensatory tachycardia.
Severe MS	**MVA ≤ 1.5 cm²** with symptoms	Almost always **rheumatic**. **Percutaneous balloon commissurotomy** if favorable morphology, **no left atrial thrombus**, and no more than mild MR. Otherwise surgery.

THE MURMUR, AND WHAT ELSE TO DO *bedside first*

LOCALIZE IT

AS: crescendo-decrescendo, right upper sternal border, radiates to carotids, **soft S2 and delayed carotid upstroke = severe**. **MR:** holosystolic, apex, radiates to axilla. **AR:** early diastolic decrescendo, wide pulse pressure. **MS:** opening snap plus diastolic rumble.

ALONGSIDE THE VALVE

Refer to a multidisciplinary heart valve team for severe disease. Treat comorbid HF and atrial fibrillation. **Endocarditis prophylaxis** only for prosthetic valves or prior IE before dental work. Serial echo for asymptomatic severe disease. Prosthetic valve: **warfarin for mechanical valves — DOACs are contraindicated.**

PROSTHETIC VALVES *the questions you will actually be asked on call*

Question	Answer
Mechanical or bioprosthetic?	**Mechanical** lasts longer but requires lifelong warfarin — favored in younger patients. **Bioprosthetic** avoids long-term anticoagulation but structurally degenerates — favored in older patients or when anticoagulation is unsafe.
Which anticoagulant?	**Warfarin only for mechanical valves — DOACs are contraindicated** and were associated with harm. Target INR depends on valve type and position: roughly **2.5–3.5 for mechanical mitral**, **2.0–3.0 for mechanical aortic**. Add low-dose aspirin in selected patients.
Needs a procedure?	Interrupt warfarin for major surgery and **bridge with heparin** for high thrombotic risk (mechanical mitral, older prostheses, prior thromboembolism). Minor dental work often needs no interruption.
Fever with a prosthesis?	**Three sets of blood cultures and a TEE.** Prosthetic valve endocarditis has high mortality and a low threshold for surgery. A new murmur or conduction delay suggests dehiscence or abscess.
New dyspnea years later?	Think **structural valve degeneration**, prosthetic stenosis, pannus, thrombus, or paravalvular leak. Get an echo and compare with the baseline post-operative study.

SURVEILLANCE IN ASYMPTOMATIC DISEASE *how often to re-image*

ECHO INTERVALS

Severe asymptomatic disease: every **6–12 months**. **Moderate**: every **1–2 years**. **Mild**: every **3–5 years**. Re-image sooner for any change in symptoms or exam — the interval is a floor, not a rule.

WHAT PROMPTS EARLIER ACTION

New symptoms on careful questioning — patients self-limit activity and call it ageing, so ask what they have stopped doing. Also a falling EF, rising pulmonary pressures, new atrial fibrillation, or rapid hemodynamic progression.

PEARLS & PITFALLS

- **Nitrates and other vasodilators are dangerous in severe AS.** A fixed obstruction cannot raise output when you drop afterload, so pressure falls and coronary filling suffers.
- **Do not wait for a low EF.** In severe AS or primary MR, an EF that has started to fall means the ventricle is already injured.
- A soft, late-peaking murmur with a delayed carotid upstroke is **more severe**, not less — loudness is unreliable.
- **DOACs are contraindicated with mechanical valves.** Warfarin only.
- Low-gradient AS with a poor EF needs a **dobutamine stress echo** before you conclude the valve is fine.
- In secondary MR, **optimize GDMT before** considering the valve. The problem is the ventricle.

References: 2020 ACC/AHA Guideline for the Management of Patients With Valvular Heart Disease (Circulation / JACC, 2021) · PARTNER and Evolut trial programs.

Educational aid; verify against imaging, local heart-team practice, and patient factors.