REPORTING CARD / ECHOCARDIOGRAPHY

Echocardiography Reference Values

The numbers worth committing to memory, the numbers worth looking up, and the difference between them. Values are for adults and are sex-specific wherever the evidence is. Where a single figure is given, it is the threshold at which a report should say something.

Report discipline, in one box

Index to body surface area wherever an indexed range exists. An absolute left atrial diameter tells the reader almost nothing.

Give the method. A biplane Simpson ejection fraction and a visual estimate are not interchangeable, and the reader cannot tell which one you used unless you say.

Quote the range, not just the value, when the number sits within 5 per cent of a decision threshold. Measurement variability is larger than most reports imply.

Left ventricle

MEASUREMENT	MEN	WOMEN	NOTE
End-diastolic diameter	42.0-58.4 mm	37.8-52.2 mm	Parasternal long axis, at the mitral leaflet tips.
End-diastolic volume, indexed	34-74 mL/m2	29-61 mL/m2	Biplane Simpson. The volume, not the diameter, is what tracks outcome.
End-systolic volume, indexed	11-31 mL/m2	8-24 mL/m2	
Ejection fraction	52-72 per cent	54-74 per cent	Below 52 in men and 54 in women is abnormal. See the 2026 note below before you write a heart failure phenotype into the conclusion.
Septal and posterior wall thickness	6-10 mm	6-9 mm	Over 15 mm without an obvious load raises hypertrophic cardiomyopathy or an infiltrative process.
Mass, indexed	49-115 g/m2	41-95 g/m2	Relative wall thickness above 0.42 with a normal mass is concentric remodelling; with a raised mass it is concentric hypertrophy.
Global longitudinal strain	Around -20 per cent expected	Around -20 per cent expected	ASE 2015 gives an expected healthy value in the region of -20 per cent rather than a formal normal range; -18 per cent is a widely used pragmatic cut-off, not a guideline limit. Vendor-dependent — report the value and the vendor, and follow the patient on one machine.

Right ventricle, atria and the inferior vena cava

MEASUREMENT	NORMAL	NOTE
RV basal diameter	25-41 mm	Apical four chamber, RV-focused view. A non-focused view systematically under-measures it.
RV mid-cavity diameter	19-35 mm	
TAPSE	17 mm or more	Longitudinal function only. Unreliable after cardiac surgery and in significant tricuspid regurgitation.
Tricuspid annular S prime	9.5 cm/s or more	Tissue Doppler.

MEASUREMENT	NORMAL	NOTE
RV fractional area change	35 per cent or more	Falls below this before TAPSE does in many patients.
Left atrial volume, indexed	16-34 mL/m2	Above 34 is the single most useful chronic marker of raised filling pressure. Measure at end-systole, exclude the appendage and veins.
Right atrial area	Under 18 cm2	
IVC diameter and collapse	2.1 cm or less with over 50 per cent collapse	Right atrial pressure 3 mmHg. Over 2.1 cm with under 50 per cent collapse: 15 mmHg. Anything in between: 8 mmHg. Do not apply these to a ventilated patient.
Estimated systolic PA pressure	4 times the square of peak TR velocity, plus right atrial pressure	Peak TR velocity above 2.8 m/s is one of the four criteria for raised filling pressure below.

Diastolic function

In a patient with a normal ejection fraction, four variables are assessed. **One or fewer positive: normal left atrial pressure. Exactly two of four: indeterminate — and the honest report says so. Three or more: elevated.**

VARIABLE	ABNORMAL WHEN	PITFALL
Septal e prime / lateral e prime	Septal under 7 cm/s, or lateral under 10 cm/s	Invalid with significant mitral annular calcification, a prosthetic valve or an annuloplasty ring.
Average E / e prime ratio	Above 14	Use the average of septal and lateral. Unreliable in constrictive physiology and severe mitral regurgitation.
Peak tricuspid regurgitation velocity	Above 2.8 m/s	Needs a complete, well-aligned envelope; an incomplete one under-reads.
Left atrial volume index	Above 34 mL/m2	Raised by atrial fibrillation and by athletic remodelling independently of filling pressure.

Valve disease — the severe thresholds

LESION	SEVERE WHEN	SUPPORTING
Aortic stenosis	Peak velocity 4.0 m/s or more, mean gradient 40 mmHg or more, valve area 1.0 cm2 or less, indexed area 0.6 cm2/m2 or less	Discordant grading is common. Check the stroke volume index (under 35 mL/m2 is low flow), then consider CT calcium scoring — the sex-specific thresholds supporting severe AS are above 2000 AU in men and above 1200 AU in women. The 2025 ESC/EACTS guideline gives calcium scoring a defined role in discordant cases and endorses sex-specific stroke volume thresholds.
Aortic regurgitation	Vena contracta over 0.6 cm, regurgitant volume 60 mL or more, effective orifice 0.30 cm2 or more	Holodiastolic flow reversal in the descending aorta, and a pressure half-time under 200 ms, both support severe.
Mitral stenosis	Valve area 1.5 cm2 or less (very severe at 1.0 cm2 or less)	This is the ACC/AHA staging convention; several European texts reserve severe for under 1.0 cm2, so name your source in the report. Planimetry is the reference. Pressure half-time is unreliable after valvuloplasty and in aortic regurgitation.
Mitral regurgitation, primary	Effective orifice 0.40 cm2 or more, regurgitant volume 60 mL or more, vena contracta 0.7 cm or more	Systolic flow reversal in the pulmonary veins is strong supporting evidence. Since Zoghbi et al (2017) the *same* thresholds apply to secondary MR — the older, lower secondary cut-offs are no longer current, though the measurement remains harder in that setting.

LESION	SEVERE WHEN	SUPPORTING
Tricuspid regurgitation	Effective orifice 0.40 cm2 or more, regurgitant volume 45 mL or more, vena contracta 0.7 cm or more	Systolic hepatic vein flow reversal supports severe. Grading beyond severe (massive, torrential) now guides intervention decisions.

What changed in 2026 — this affects the conclusion line of your reports

The 2026 ESC heart failure guidelines removed the mildly reduced ejection fraction category entirely. There are now two phenotypes either side of a single cut-off: **HFrEF is an ejection fraction below 50 per cent**, and **HFpEF is 50 per cent or above**.

The rationale is that patients formerly labelled HFmrEF behave, and respond to treatment, more like the reduced group than the preserved group. The guidelines also introduce a staging approach running from patients at risk through to advanced disease.

Practical consequence for the reporting room: an ejection fraction of 44 per cent in a symptomatic patient is now reported into the HFrEF phenotype rather than an intermediate category. Reporting templates, teaching slides and structured report dropdowns that still carry HFmrEF need updating.

The 2025 ESC/EACTS valvular heart disease guidelines separately introduced a class IIa recommendation for intervention in carefully selected patients with genuinely asymptomatic severe aortic stenosis, which raises the stakes on accurate severity grading.

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Scope. Written for qualified clinicians and clinicians in training performing or reporting transthoracic echocardiography in adults. Reference ranges vary between guideline bodies, laboratories and vendors; where your laboratory has validated its own ranges, use those. Not applicable to paediatric or congenital echocardiography. Educational material, not a substitute for individual clinical judgement or the full source documents.

Principal sources. Recommendations for Cardiac Chamber Quantification by Echocardiography in Adults, American Society of Echocardiography and European Association of Cardiovascular Imaging (Lang et al, 2015). Recommendations for the Evaluation of Left Ventricular Diastolic Function by Echocardiography, ASE/EACVI (Nagueh et al, 2016). Recommendations for Noninvasive Evaluation of Native Valvular Regurgitation, ASE (Zoghbi et al, 2017). Recommendations on the Echocardiographic Assessment of Aortic Valve Stenosis, EACVI/ASE (Baumgartner et al). 2025 ESC/EACTS Guidelines for the management of valvular heart disease. 2026 ESC Guidelines for the management of heart failure.