



Characteristics of Selected Cardiac Murmurs

Cause of Murmur	Timing	Characteristics	Location	Radiation	Other Associated Findings
Innocent flow murmur	Midsystolic	Soft	Base	None	None
Aortic stenosis	Systolic	Crescendo-decrescendo	Base	Carotids	Single S ₂ , pulsus parvus, S ₄ , palpable apical impulse
Pulmonic stenosis	Systolic	Crescendo-decrescendo	Base	None	Valve opening click, right-sided S ₄
Hypertrophic obstructive cardiomyopathy	Systolic	Crescendo, late-peaking	Base	Carotids	Brisk or bifid carotid impulse
Mitral regurgitation	Systolic	Holosystolic	Apex	Axilla	Hyperdynamic apical impulse
Mitral valve prolapse with mitral regurgitation	Systolic	Late systolic	Apex	Axilla	Mid-to-late systolic click
Papillary muscle dysfunction with mitral regurgitation	Systolic	Transient, during myocardial ischemia	Apex	Axilla	Setting of an acute coronary syndrome
Ventricular septal defect	Systolic	Holosystolic	LLSB	None	Palpable thrill
Tricuspid regurgitation	Systolic	Holosystolic	LLSB	LRSB	Prominent v waves in neck,

Aortic regurgitation	Diastolic	Decrescendo	LLSB	None	hepatic pulsation Enlarged apical impulse, widened pulse pressure, Austin Flint diastolic rumble, pistol shot sound over peripheral arteries
Pulmonic regurgitation	Diastolic	Mid-diastolic	LLSB	LLSB	Loud S ₂ , prominent neck veins
Mitral stenosis	Diastolic	Low-pitched rumble	Apex	None	Murmur best heard in left lateral decubitus position; opening snap; palpable P ₂ ; if atrial fibrillation, irregular pulse.
Tricuspid stenosis	Diastolic	Low-pitched rumble	LLSB	RUQ	Right ventricular heave
Patent ductus arteriosis	Continuous	Machinery-like	Base	Back	May have widened pulse pressure
Mammary souffle	Continuous	Soft, humming	Between breast/ sternum	None	Usually heard over the breast during pregnancy or postpartum lactation
Coarctation of the aorta	Continuous	Accentuation midsystole, but continuous	Over back	Back	Higher blood pressure in the arms than legs

LLSB = lower left sternal border; LRSB = lower right sternal border; RUQ = right upper quadrant of the abdomen.

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