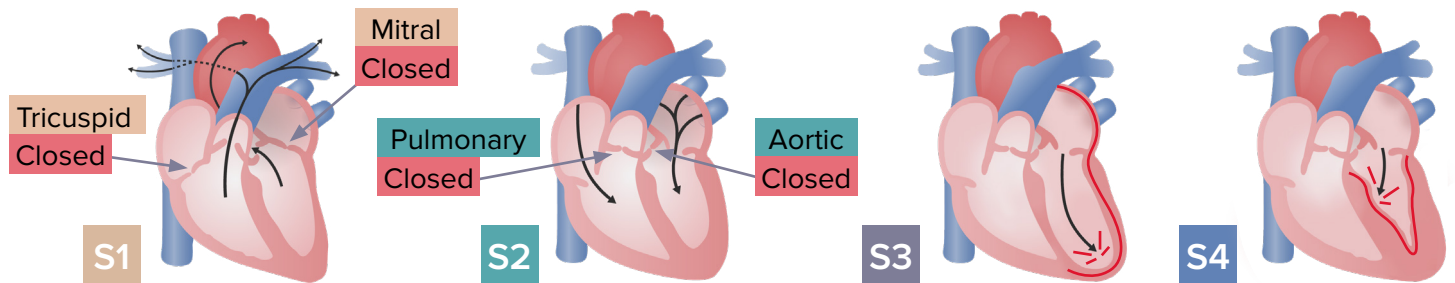


# HEART SOUNDS: NORMAL AND ABNORMAL



Normal heart sounds			
Heart sound	Cardiac cycle phase	Location best heard	Heart sound caused by
S1	Systolic	Cardiac apex	Mitral and tricuspid valves closing
S2	Diastolic	Right upper sternal border	Aortic and pulmonic valves closing
S3	Diastolic	Cardiac apex	Rapid filling of ventricles

Abnormal heart sounds			
Heart sound	Cardiac cycle phase	Location best heard	Heart sound caused by
S4	Diastolic	Cardiac apex	Occurs at or after S1 and ends before or at S2
Systolic murmur	Systolic	Left upper sternal border	Occurs at or after S1 and ends before or at S2
Diastolic murmur	Diastolic	Left midclavicular area	The heart relaxing in between beats after S2 and before S1
Pericardial rub	Systolic and diastolic	Left sternal border	Parietal and visceral pericardial layers rubbing together
Ejection click	Systolic or diastolic	Varies	Maximal opening of the aortic or pulmonary valves

## NOTES

