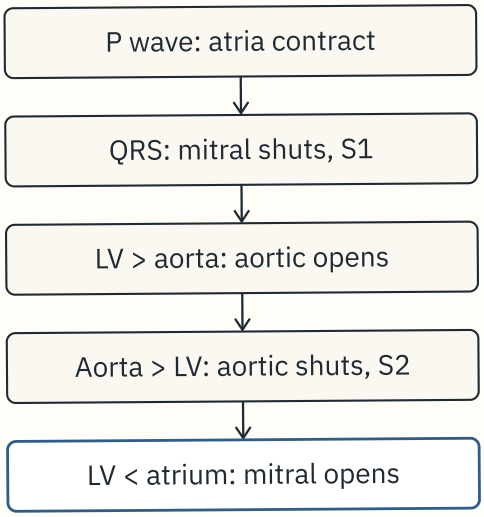
The cardiac cycle on a Wiggers diagram

Valves, sounds and ECG in order



Step by step

1. Atrial contraction tops up the ventricle while the mitral valve is open.
2. S1: the mitral valve closes and isovolumetric contraction starts, every valve shut.
3. The aortic valve opens and ejection runs until S2 closes it.
4. Isovolumetric relaxation follows, then the mitral valve opens and filling starts.

Phase	Valves	Marker
1 Atrial contraction	Mitral open	P wave
2 Isovolumetric contraction	All closed	S1 starts it
3 Rapid ejection	Aortic open	Silent opening
4 Reduced ejection	Aortic open	Ends with S2
5 Isovolumetric relaxation	All closed	S2 starts it
6 Rapid filling	Mitral open	S3 may come early

Phases 1–6 of one cycle

MODEL STROKE VOLUME

$$SV = EDV - ESV = 120 - 50 = 70\ mL$$

Round model numbers, not a clinical normal.

Rule of thumb

- Valves obey pressure gradients
- S1 starts isovolumetric contraction
- S2 starts isovolumetric relaxation
- Ejection follows aortic opening; filling follows mitral opening

Exam traps

- Both isovolumetric phases have every valve closed and flat volume.
- Healthy valves open silently: only closures make S1 and S2.
- Pressure can rise with no flow while the aortic valve is shut.

Wiggers diagram explained: the cardiac cycle step by step

Video, written lesson, practice question and sources: medservatory.com/usmle-step-1/cardiovascular/wiggers-diagram-cardiac-cycle

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