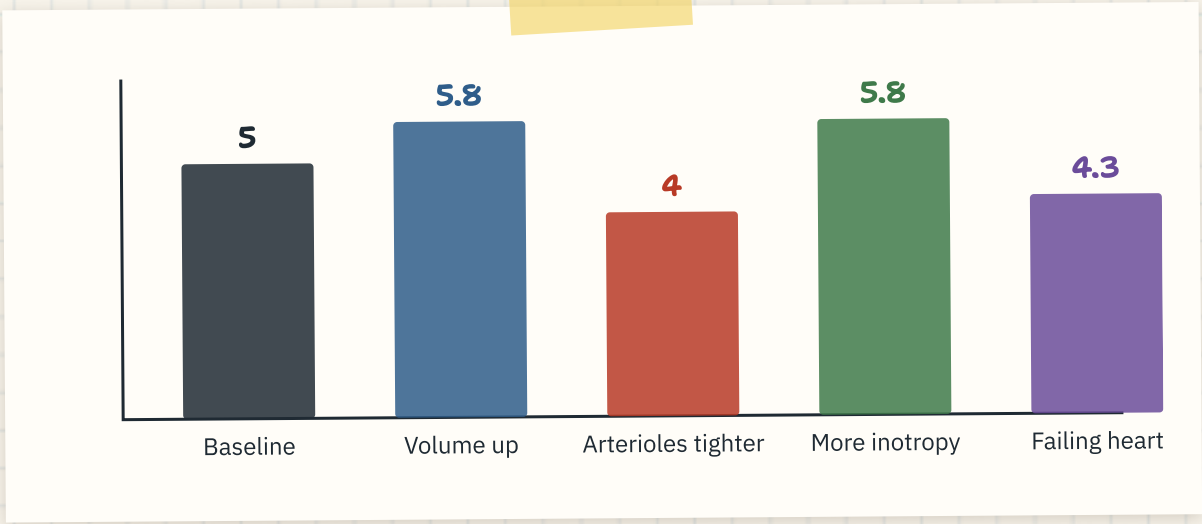
Venous return and cardiac function curves

Read the crossing point



Step by step

1. Plot both curves against right atrial pressure
2. Cross = steady state: sets CO and RAP
3. Veins slide the venous return curve
4. Arterioles tilt it
5. Heart moves the cardiac curve

Change	Curve and move
Volume up, venoconstriction	Venous return, right
Volume loss, venodilation	Venous return, left
Arteriolar constriction	Venous return, slope falls
More inotropy	Cardiac, up
Failing heart	Cardiac, down

Which curve each change moves

VENOUS RETURN

(Pmc − RAP) / resistance to venous return

Pmc about 8 mm Hg = zero-flow point of the curve; steady state: venous return = cardiac output

Rule of thumb

Veins slide, arterioles tilt, heart moves the cardiac curve

Venous return curve change: CO and RAP move the same way

Cardiac curve change: CO and RAP move opposite ways

Exam traps

- Right atrial pressure is read off the crossing point, not set on its own.
- A rise in cardiac output can come with a rise or a fall in RAP.
- Arteriolar effects assume the heart is held constant.

Venous return and cardiac function curves: where they cross

Video, written lesson, practice question and sources: medservatory.com/usmle-step-1/cardiovascular/venous-return-cardiac-function-curve

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