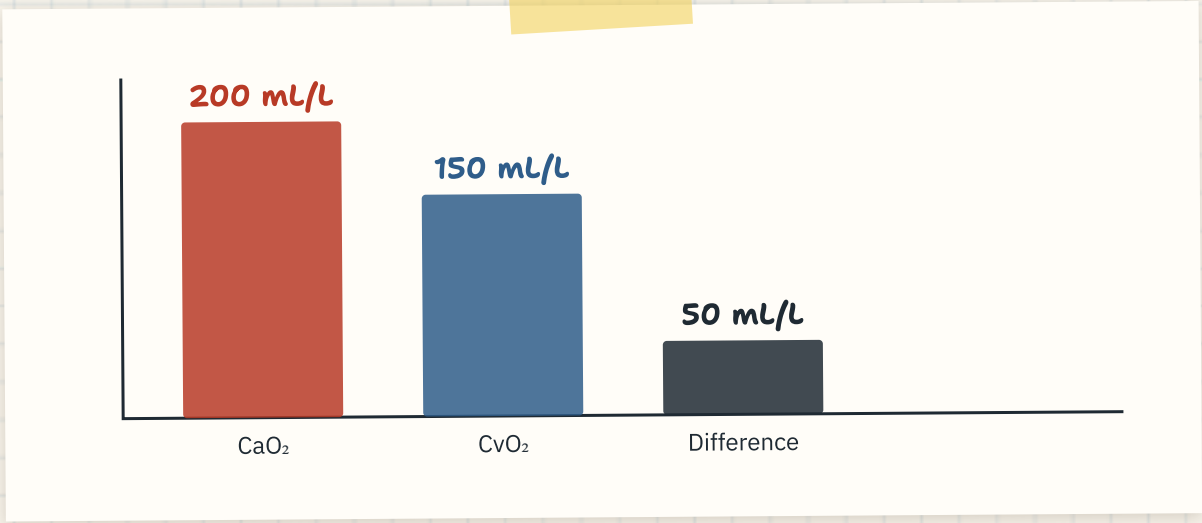
Fick principle in 3 lines

Cardiac output from oxygen



Step by step

1. Take VO_2 (mL/min)
2. Subtract mixed venous from arterial content
3. Convert mL/dL to mL/L (× 10)
4. Divide VO_2 by the difference

FICK PRINCIPLE

$$CO = VO_2 / (CaO_2 - CvO_2)$$

VO_2 about 250 mL/min at rest; content in mL/L

AV difference	Cardiac output
Wide	Low
Narrow	High

AV difference and output (constant VO_2)

Rule of thumb

Lungs load, tissues unload

Venous blood from the pulmonary artery

Constant VO_2: wide difference, low output

Exam traps

- Dividing by one content alone instead of the difference.
- Forgetting to convert mL/dL to mL/L (× 10).
- Sampling one peripheral vein instead of the pulmonary artery.
- Indirect Fick assumes VO_2 and can be inaccurate.

Fick principle: how to calculate cardiac output

Video, written lesson, practice question and sources: medservatory.com/usmle-step-1/cardiovascular/cardiac-output-fick-principle

For exam study only, not medical advice. Follow local guidelines and your lab's ranges.
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