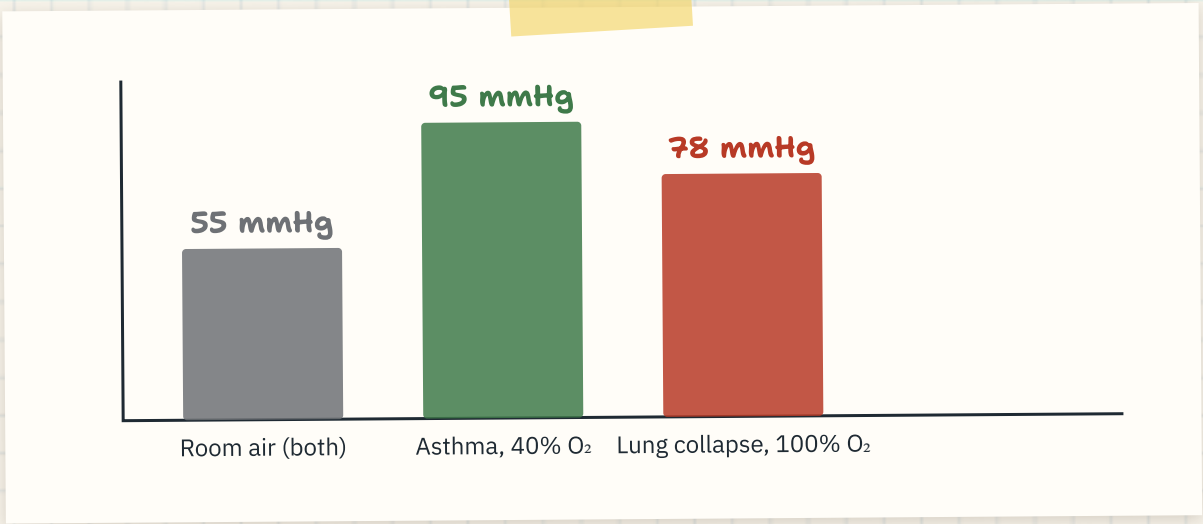
V/Q mismatch and the oxygen test

Tell shunt from dead space and low V/Q



Step by step

1. Is the unit perfused but not ventilated? Shunt.
2. Is it ventilated but not perfused? Dead space.
3. Is ventilation reduced but not absent? Low V/Q.
4. Give oxygen and watch the PaO_2.

V/Q RATIO

V/Q = ventilation ÷ perfusion, per region

healthy lung averages about 0.8 (some texts say close to 1); shunt = 0; dead space → ∞

Pattern	V/Q	On oxygen
Shunt	0	Barely improves
Dead space	→ ∞	Hypoxaemia, if any, improves
Low V/Q	Reduced	Improves

Response to oxygen

Rule of thumb

Shunt: perfused, not ventilated

Dead space: ventilated, not perfused

Only shunt barely improves on oxygen

Exam traps

- Dead space mainly impairs CO_2 removal; any hypoxaemia is mainly low V/Q elsewhere.
- Hypoventilation and diffusion limitation also respond to oxygen.
- Shunt barely improves; it does not literally stay unchanged.

V/Q mismatch: shunt, dead space and the oxygen test

Video, written lesson, practice question and sources: medservatory.com/usmle-step-1/respiratory-physiology/vq-mismatch-shunt-dead-space

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