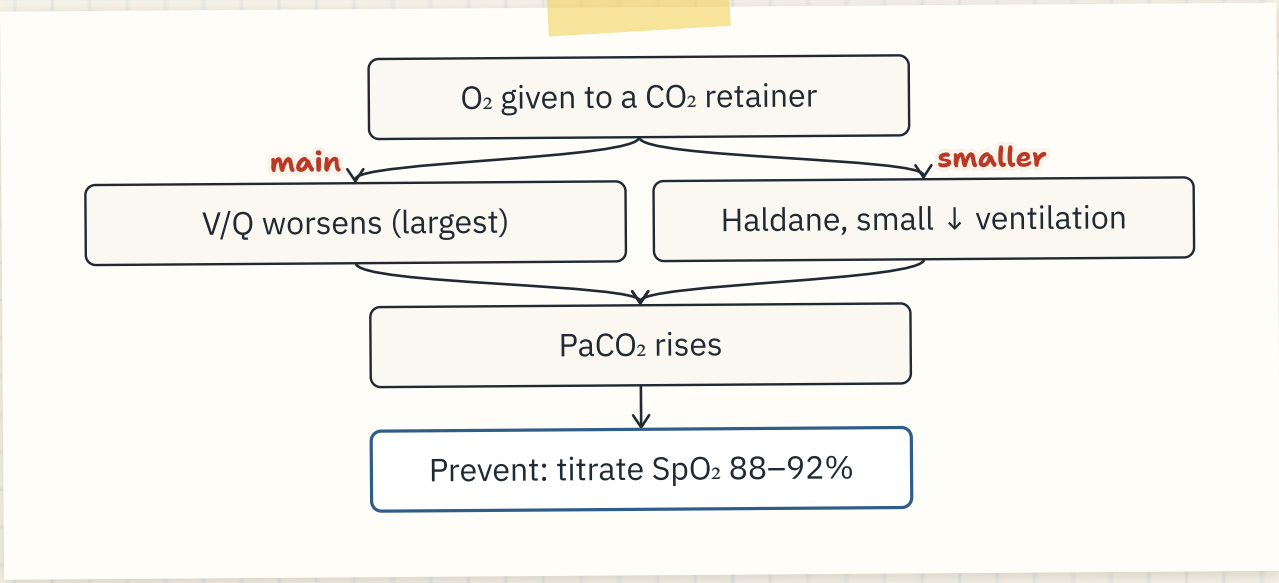
Chemoreceptors and O_2 in COPD

Who senses what, and why oxygen can raise CO_2



Step by step

1. Central: CO_2 crosses the blood–brain barrier, H^+ drives ventilation.
2. Peripheral: dissolved PO_2 about 60 mmHg or below drives ventilation steeply.
3. Oxygen in a CO_2 retainer: V/Q worsens (largest), Haldane and small fall in ventilation add less.
4. Do not withhold O_2; titrate to SpO_2 88–92%.

	Central	Peripheral
Where	Ventral medulla	Carotid and aortic bodies
Senses	H^+ from CO_2	Low PO_2, high PCO_2, low pH
O_2 detail	Not applicable	Dissolved O_2; steep rise at about 60 mmHg or below

Central vs peripheral chemoreceptors

Three things to keep

Central = H^+, peripheral = low PO_2

Several causes; V/Q usually largest

Never withhold O_2; aim 88–92%

Exam traps

- Blaming a large loss of hypoxic drive: ventilation falls only modestly.
- Peripheral receptors sense dissolved O_2, not O_2 on haemoglobin.
- Withholding oxygen from a hypoxaemic patient.

Central vs peripheral chemoreceptors and oxygen-induced hypercapnia

Video, written lesson, practice question and sources: medservatory.com/usmle-step-1/respiratory-physiology/chemoreceptors-oxygen-copd-hypercapnia

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