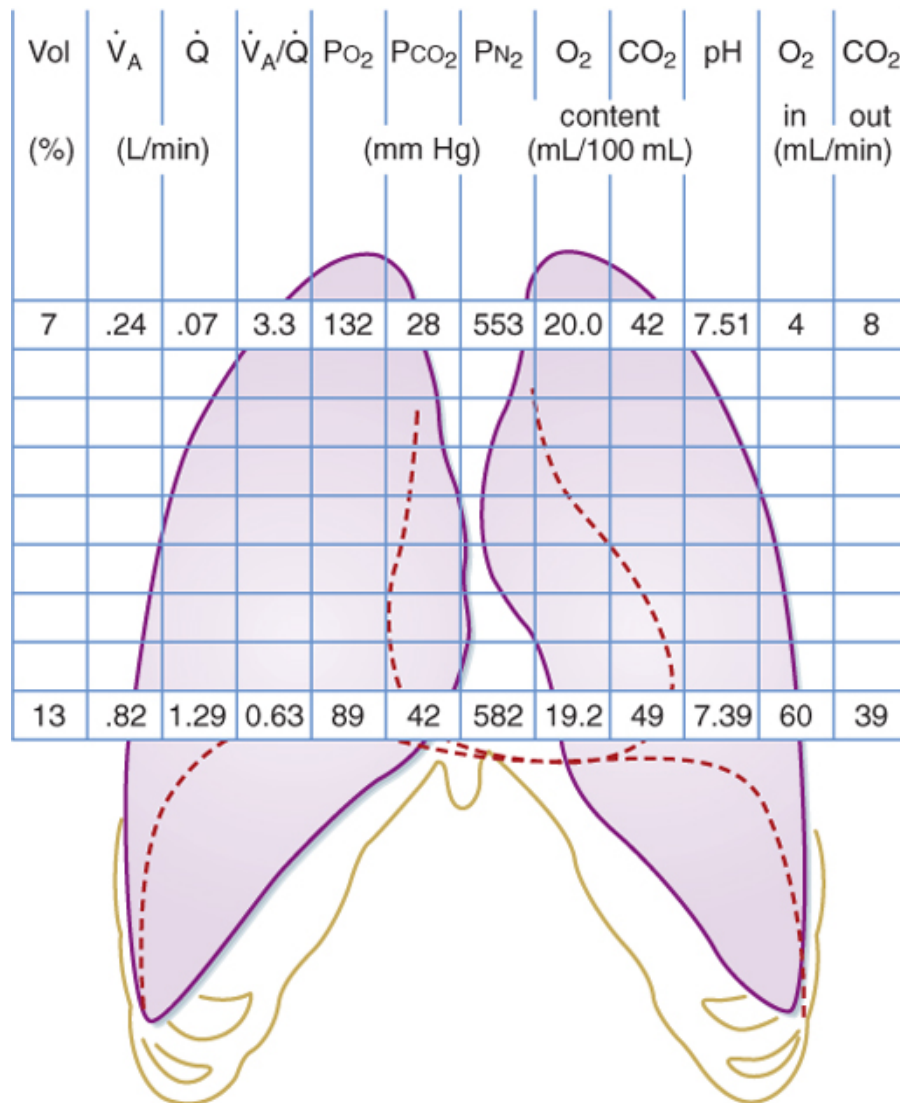


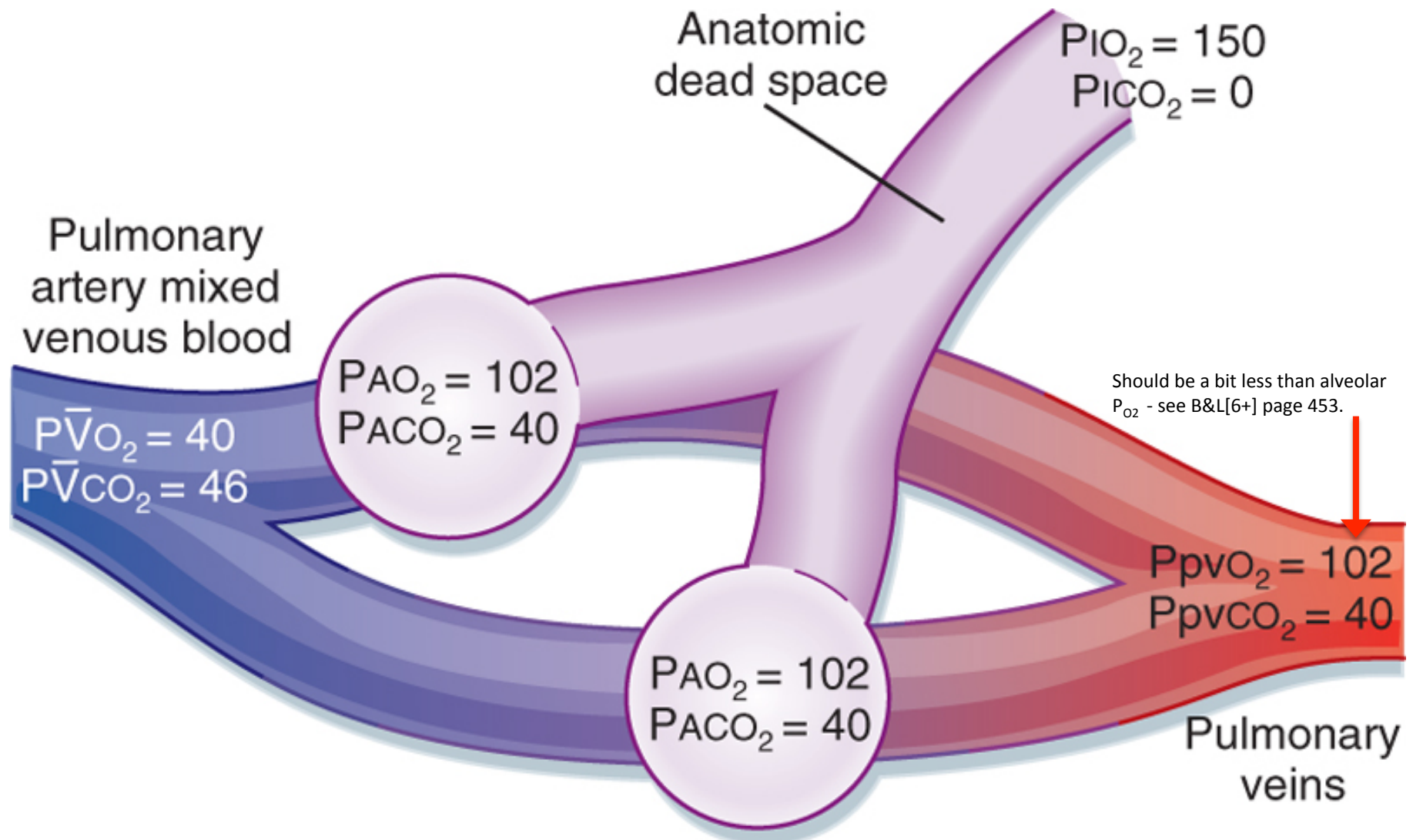
- Normal \dot{V}/\dot{Q} is ≈ 0.8
 - “Normal” \dot{V}/\dot{Q} does NOT mean ventilation and perfusion are “normal”
 - Both can be decreased or increased
- \dot{V}/\dot{Q} varies within the lung
 - Ventilation and perfusion both increase from apex to base
 - Ventilation more slowly than perfusion
 - \dot{V}/\dot{Q} at apex $>$ \dot{V}/\dot{Q} at base
 - \dot{V}/\dot{Q} varies with “defective” capillaries or alveoli

Ventilation-Perfusion Relationships



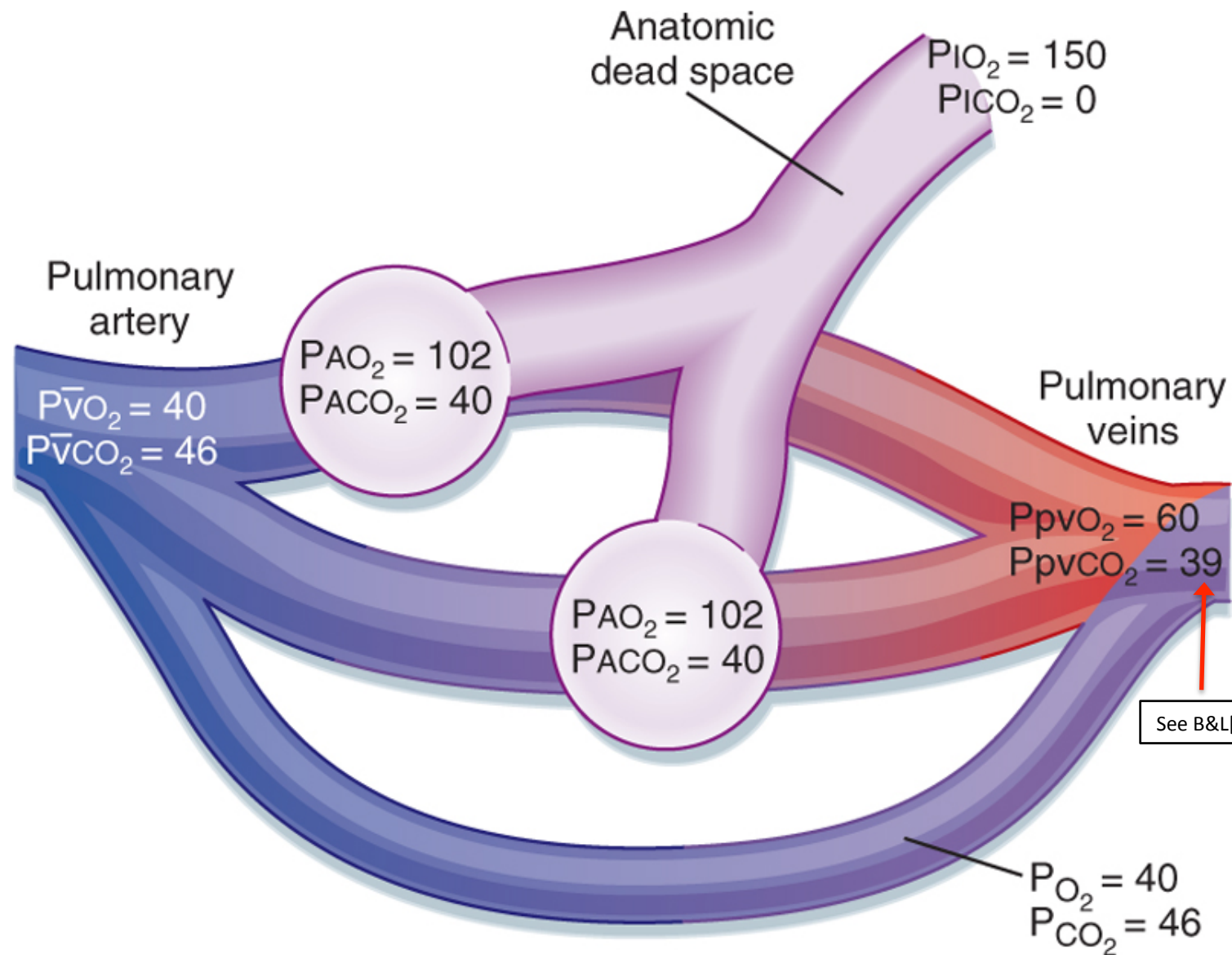
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Figure 22-10 Regional differences in gas exchange in a normal lung. Only the apical and basal values are shown for clarity.



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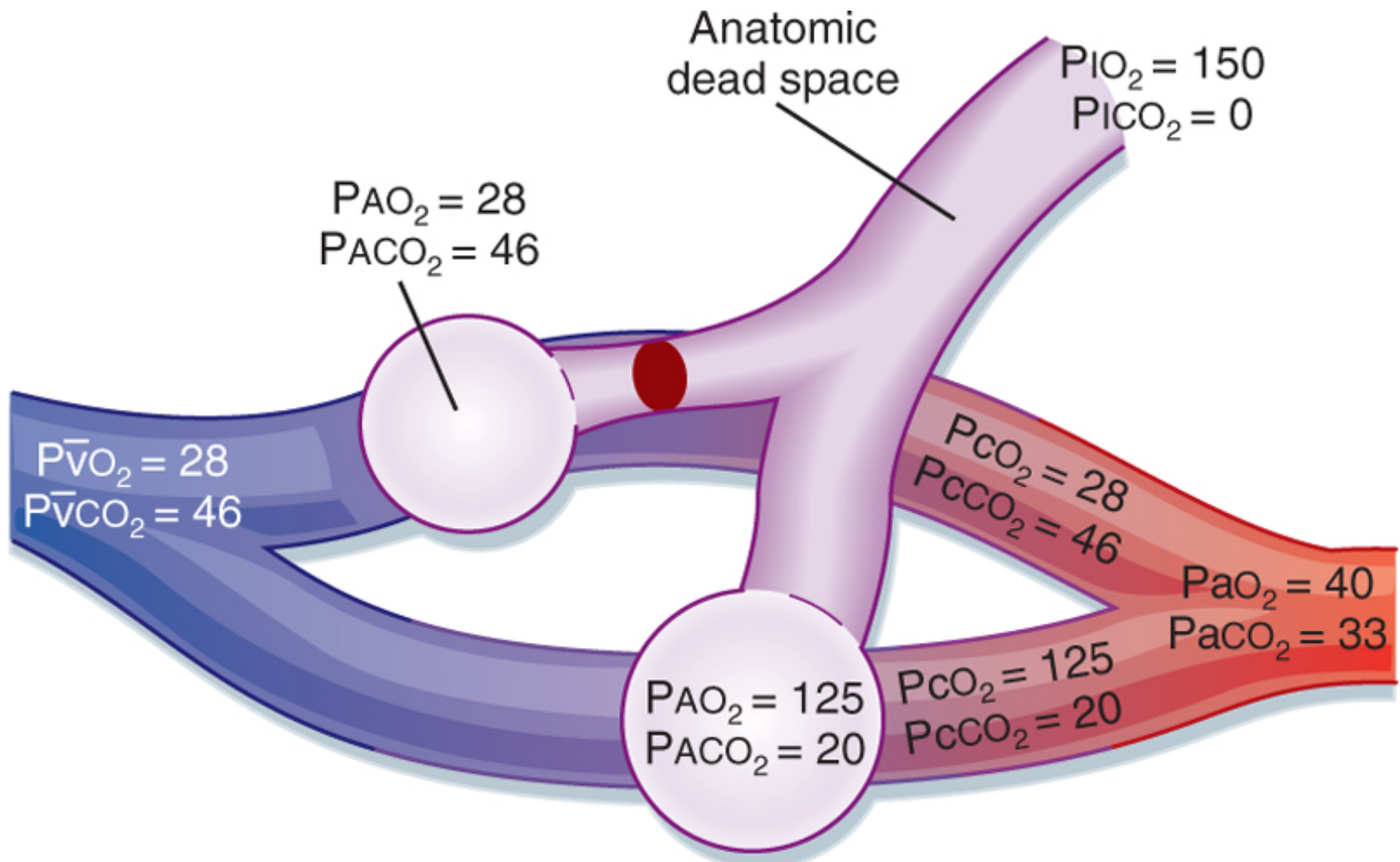
Figure 22-11 Simplified lung model showing two normal parallel lung units. Both units receive equal quantities of fresh air and blood flow for their size. The blood and alveolar gas partial pressures, P , are normal values in a resting person.



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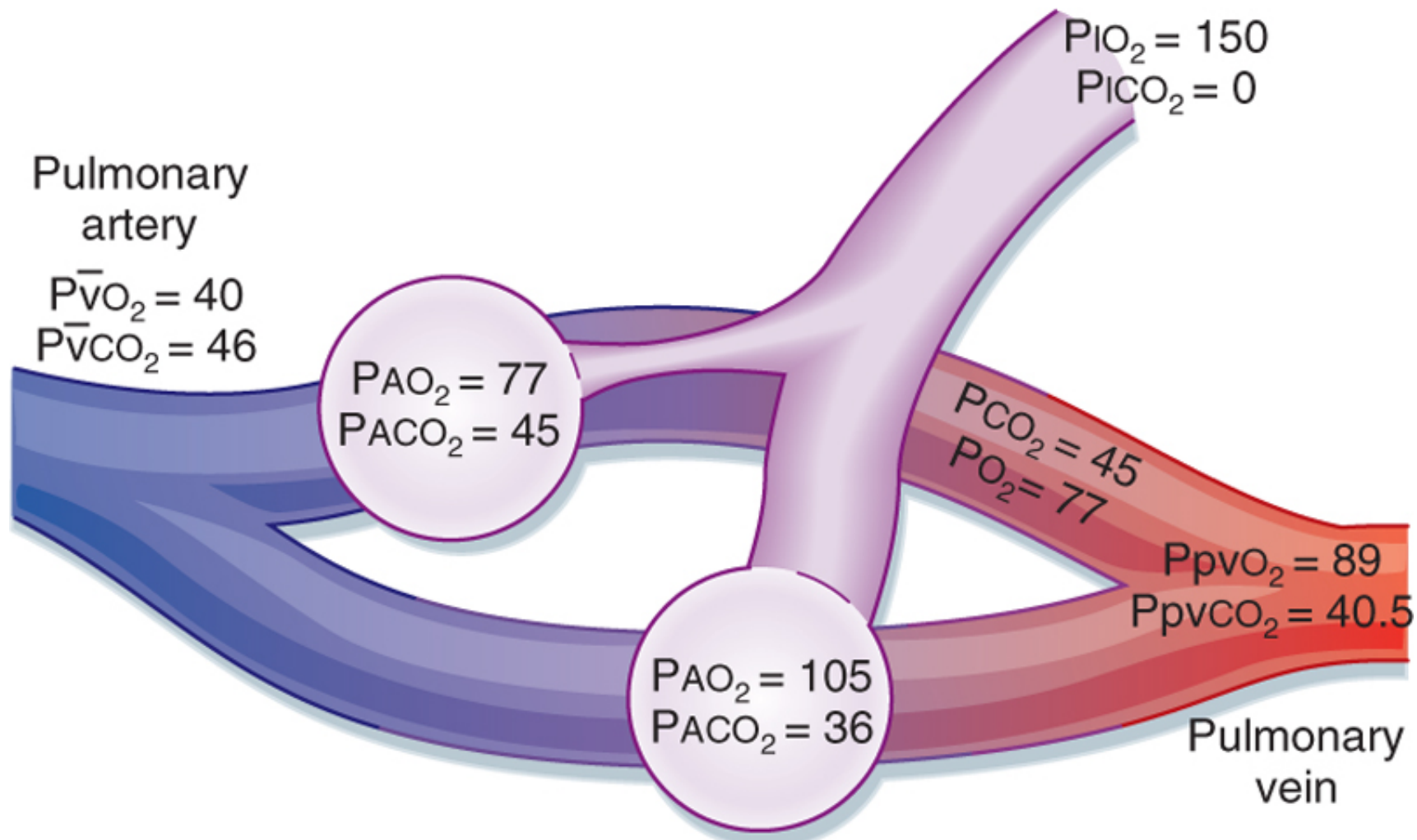
anatomic

Figure 22-12 **Right-to-left shunt**. Alveolar ventilation is normal, but a portion of the cardiac output bypasses the lung and mixes with oxygenated blood. P_{aO_2} will vary depending on the size of the shunt.



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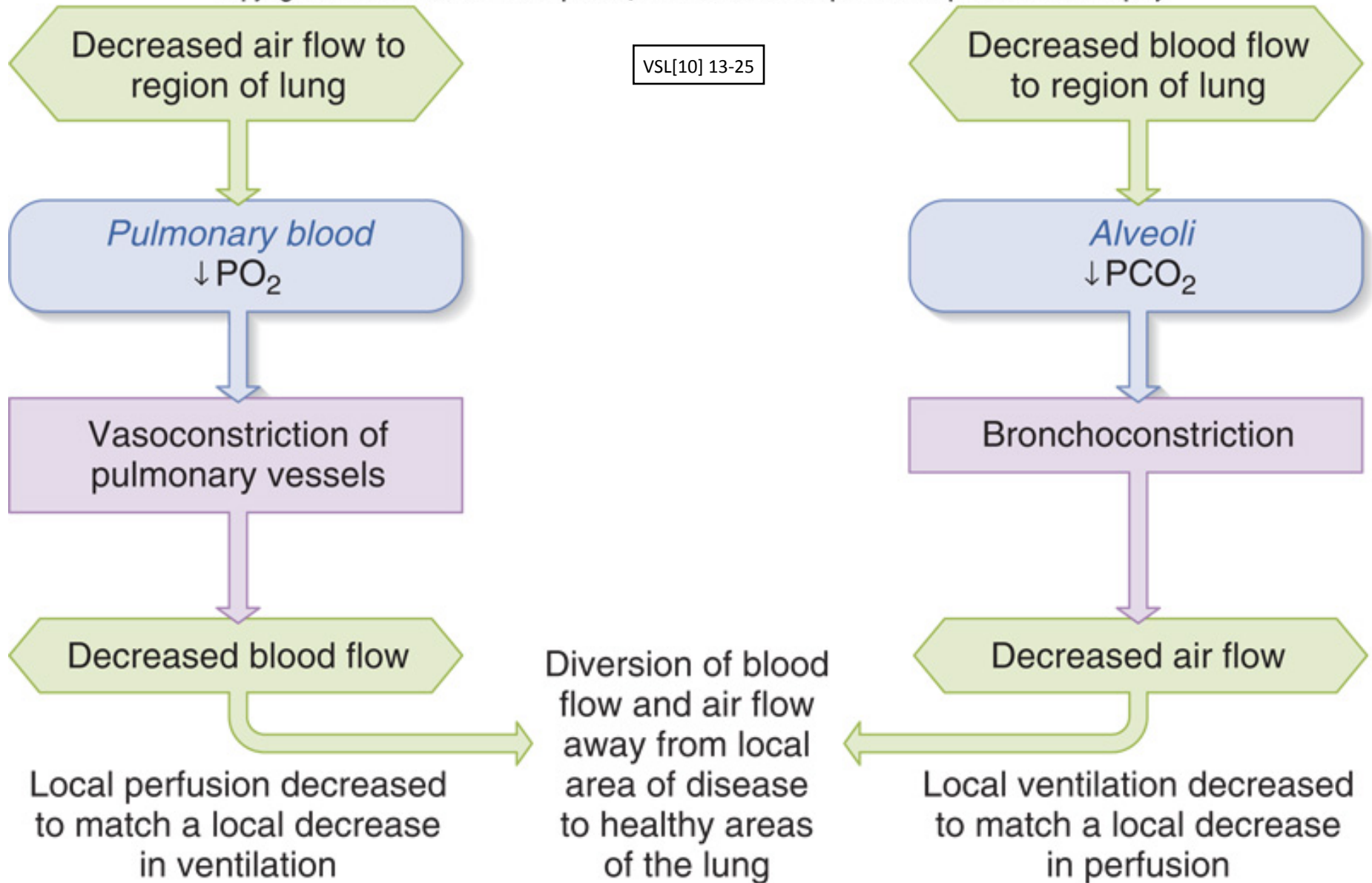
Figure 22-13 Schema of a physiological shunt (venous admixture). Notice the marked decrease in arterial Po_2 in comparison to Pco_2 . The AaDo_2 is 85 mm Hg.

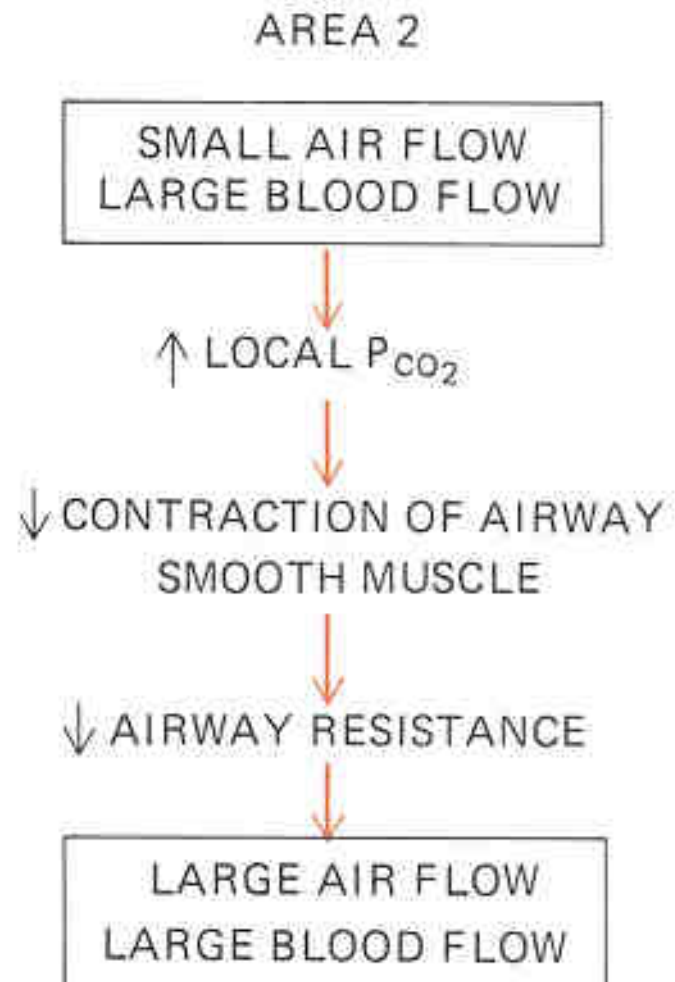
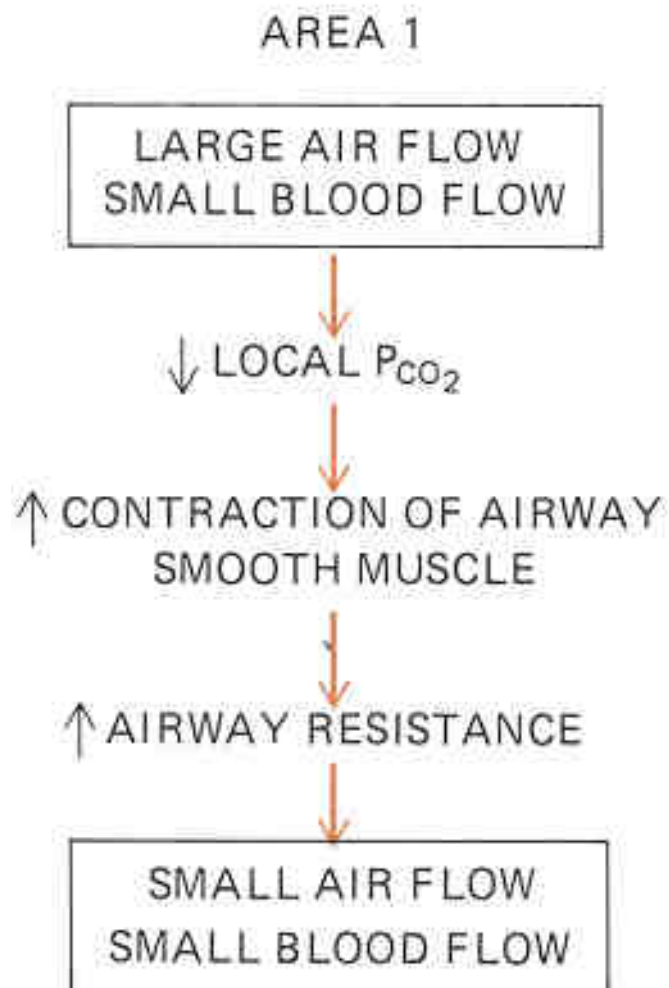


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Figure 22-14 Effects of ventilation-perfusion mismatching on gas exchange. The decrease in ventilation to the one lung unit could be due to mucus obstruction, airway edema, bronchospasm, a foreign body, or a tumor.

VSL[10] 13-25





VSL[3] 12-12

AREA 1

LARGE AIR FLOW
SMALL BLOOD FLOW

↑ LOCAL P_{O_2}
↓ LOCAL $[H^+]$

↓ CONTRACTION OF
PULMONARY VESSEL
SMOOTH MUSCLE

↓ VASCULAR RESISTANCE

LARGE AIR FLOW
LARGE BLOOD FLOW

AREA 2

SMALL AIR FLOW
LARGE BLOOD FLOW

↓ LOCAL P_{O_2}
↑ LOCAL $[H^+]$

↑ CONTRACTION OF
PULMONARY VESSEL
SMOOTH MUSCLE

↑ VASCULAR RESISTANCE

SMALL AIR FLOW
SMALL BLOOD FLOW

VSL[3] 12-13

END

Video 3, Module 12