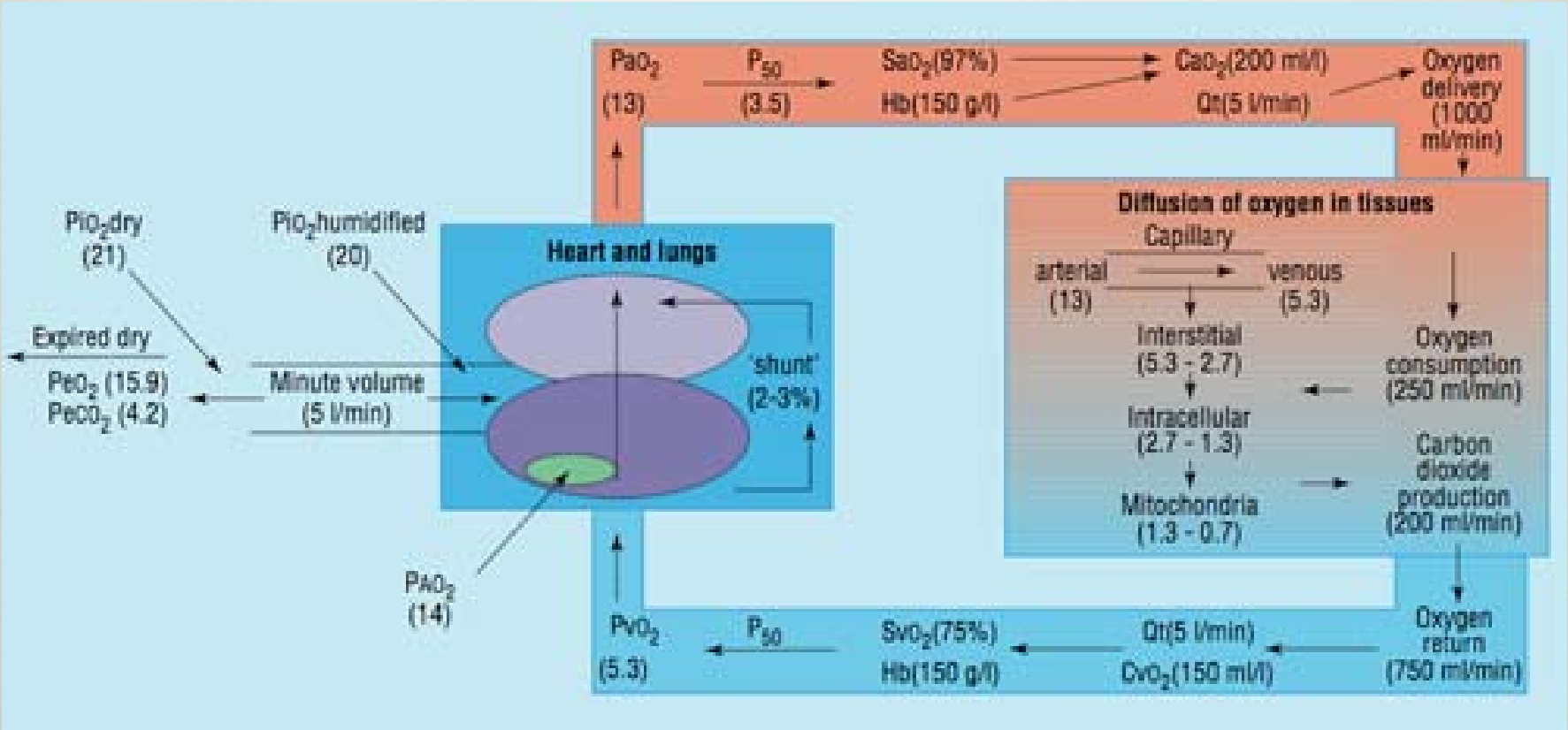
Oxygen Transport
from atmosphere to mitochondria



Unit = kPa = *0.01 Bar = *7.5 mmHg

Oxygen Content

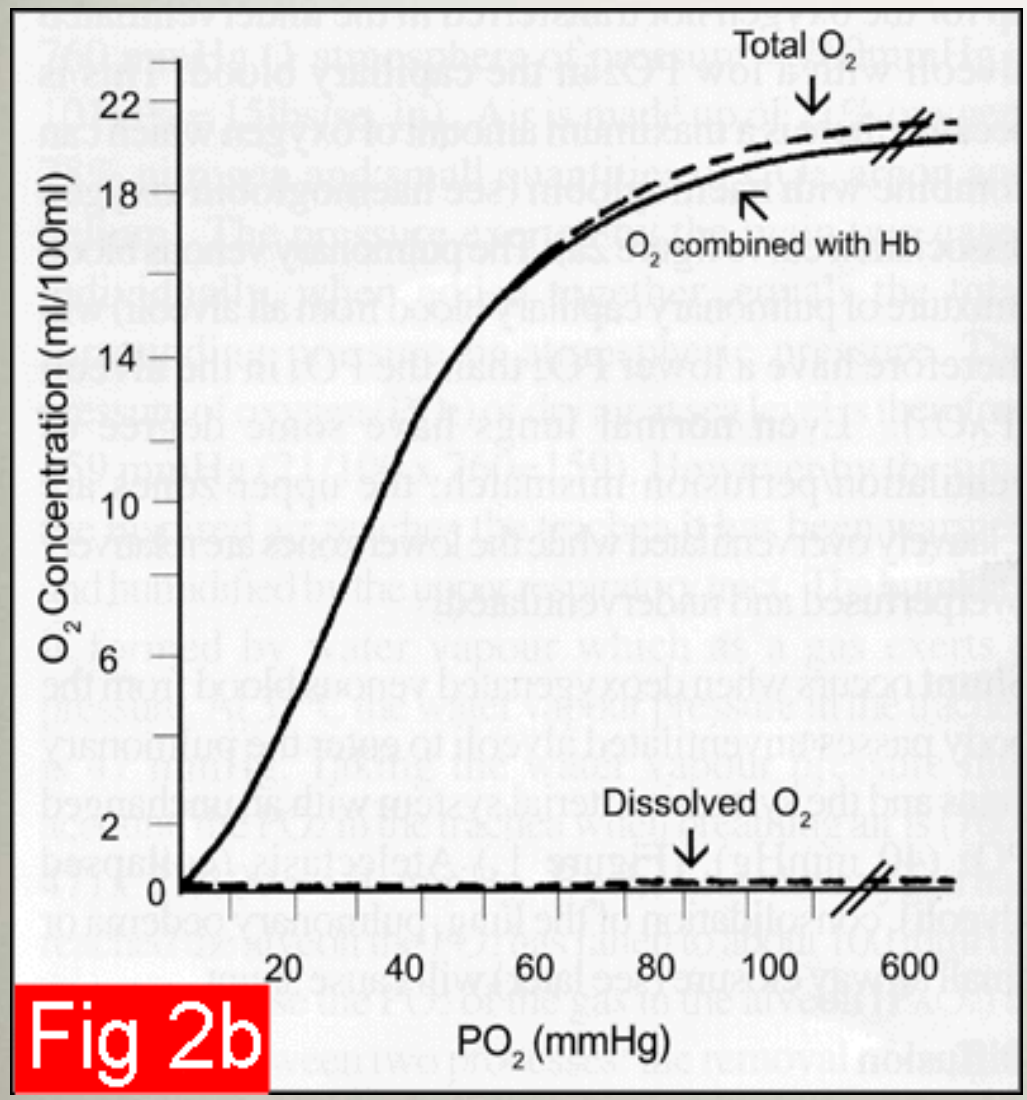
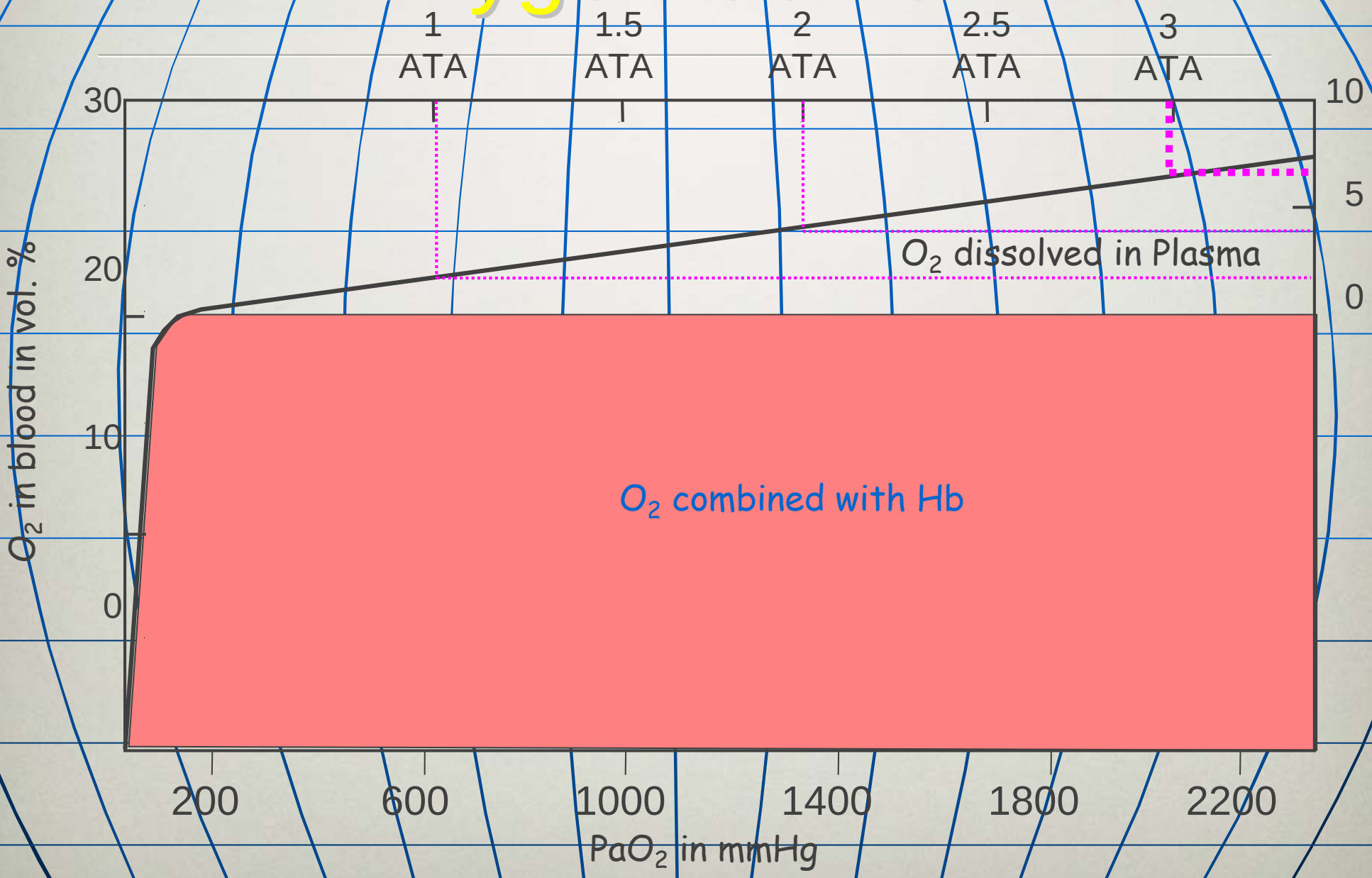


Fig 2b

- CaO_2 = O_2 carried by Hgb + O_2 dissolved in Plasma
- O_2 carried by Hgb = (grams of Hb X 1.31 ml O_2 X %O_2 Hb)
- O_2 dissolved in Plasma = (0.003 X mm PO_2)

Oxygen Content



Arterial O_2 Contents in Plasma

Pressure	Breathing Air (Vol.%)	Breathing 100%O_2 (Vol.%)
1 ATA (760 mmHg)	0.32	2.09
2 ATA (1520 mmHg)	0.81	4.44
2.5 ATA (1900 mmHg)	1.06	5.62
3 ATA (2280 mmHg)	1.31	6.8

5.8 vol.% of O_2 is extracted by tissue

O_2 Diffusion

- Augments pathogen killing
- Accelerate inert gas elimination
- Treat conditions of reduced HBO
- Oxygenates marginally perfused tissues

Reactive Oxygen Species (ROS)

- Edema reduction
- Acute inflammation reduction
- Stem cell mobilization, Angiogenesis
- Mitochondrial biogenesis and cell proliferation

Rational of HBO

General	•Reverse hypoxia by hyperoxygenation •Oxygenation by dissolved oxygen and increase oxygen diffusion
Decompression Illness	•Reduced bubble size by pressure effect •Acceleration inert gas elimination •Reduced edema •Amelioration of I/R injury
Gas embolism	•Reduced bubble size by pressure effect •Acceleration gas elimination in bubble •Amelioration of I/R injury
Exceptional Blood Loss Anemia	•Increased oxygen content in plasma •Supply adequate oxygen in the absence of hemoglobin
CO poisoning	•Increased oxygen content in plasma •Enhanced dissociation of CO from tissue, hb •Inhibit lipid peroxidation, I/R injury