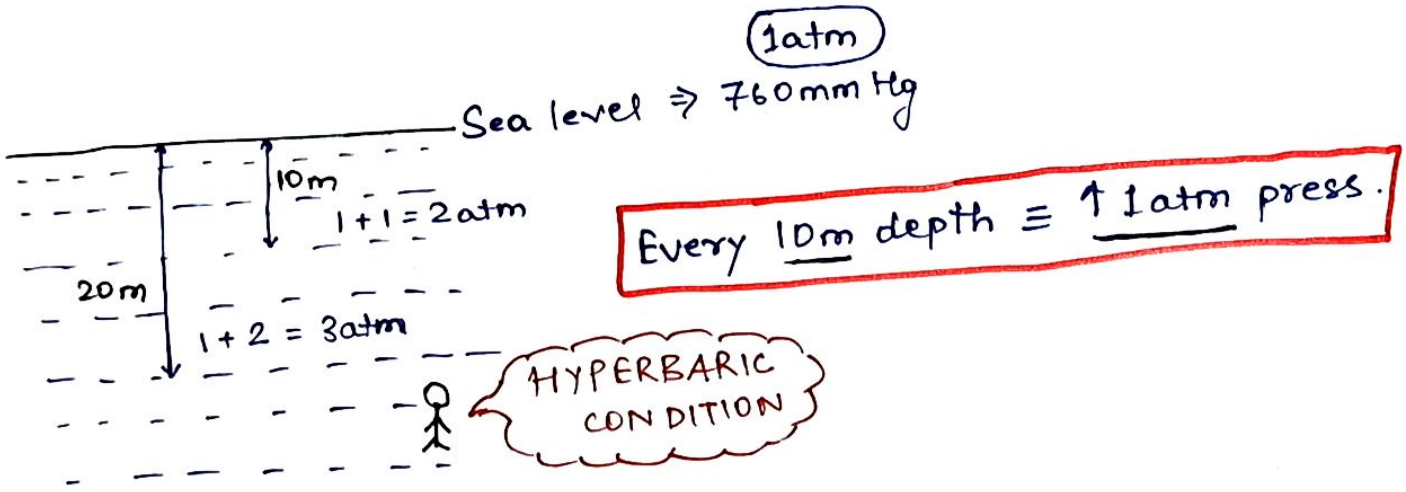
DEEP SEA DIVING



* Effects of Deep-Sea Diving (Hyperbaric)

1. Nitrogen Narcosis
2. Oxygen toxicity
3. CO_2 toxicity

② Oxygen toxicity :-

* ↑ pO_2
* Hyperbaric condition

⇩

- → Seizures
- → Nausea/Vomiting
- → Dizziness
- → Confusion

↓ Severe

- → Respiratory distress
- → Pulmonary edema
- → Death

Mech :-

Normally,

Intracellular oxidation → "Oxidising free Radicals"

↓ Removed by

- catalase
- Oxidase
- Superoxide dismutase

O_2 toxicity,

↑↑ Intracellular oxidation → ↑↑ Oxidising free radicals

↓

Cellular damage (Nervous tissue especially)

⇐ BRAIN DYSFUNCTION

③ CO_2 toxicity

→ Especially d/t rebreathing by divers

→ Respiratory Acidosis develops.

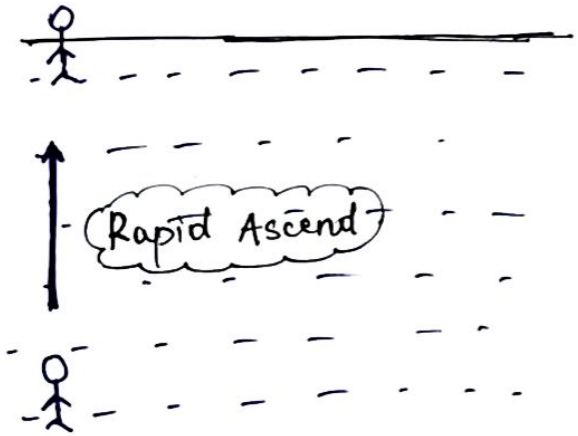
$\uparrow CO_2$ ⊕→ Respiratory center

After 80mm Hg;
↳ Respiratory depress

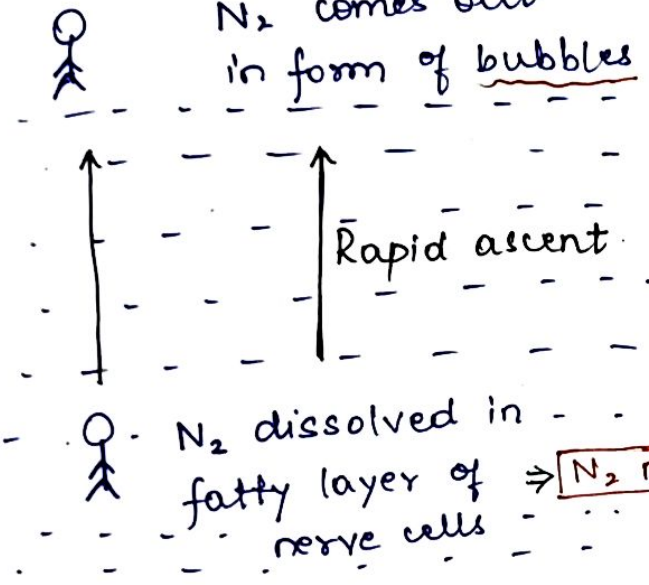
DECOMPRESSION SICKNESS

AKa

* Caisson Disease
* Dysbarism
* Diver's Paralysis
* Bends
* Compressed air sickness



Decompression sickness



- Joint pain :→ BEND's
- Muscle pain
- Shortness of breath :→ CHOKES
- Artery :→ AIR EMBOLISM
- Nervous system
  - Unconsciousness
  - Dizziness
  - Paralysis
  - Motor & sensory disturb.

Prevention of Decompression sickness:-

1. Slow ascent.
2. Compression chamber { Recompression → Slow decompression }
3. SCUBA
4. Helium - Oxygen mixture gases (O_2 + He)

Depth ↑ % O_2 ↓ (to prevent O_2 toxicity)

He → 1/5th narcotic effect of N_2
He → 1/2 solubility of N_2
He → Low density

① Nitrogen narcosis :- After 120 fts

Solubility = K × P Henry's law

Solubility of gases ↑ses ∝ Pressure

⇓

N_2 solubility ↑seş 5x w.r.t. O_2 in fatty substance of neuronal tissue

⇓

* Ionic Conductance of nerve ⇩ 'Martini effect'
* Nerve excitability ⇩

⇓

Symptoms of Alcohol intoxication (AIIMS)
Aka = (Raptures of depth)

→ Confusion
→ Loss of coordination
→ Disoriented
→ Euphoria
→ ↓ motor skill
→ Altered sensory perception
  { visual disturbances
  Auditory "
  Tactile "

Prevent:-
Use Nitrox/Helium gases.