Diving Accidents & Barotrauma

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Barotrauma

• The physical damage to the bodies tissues caused by the difference in pressure between a gas filled space inside, or in contact with the body, and the surrounding fluids.
  – During Decent:
    • External or middle ear squeeze, inner ear barotrauma, sinus squeeze, lung squeeze, gastric squeeze, tooth squeeze.
  – During Accent:
    • Reverse middle ear or sinus squeeze in divers with colds or URI’s.
    • Pulmonary barotrauma can lead to burst/ruptured lung parenchyma.
    • Air embolism- gas bubbles entering circulatory system through ruptured veins. Bubbles expand (Boyles Law) & obstruct arteries of brain/heart. **Most Serious & Feared Consequence of Diving.**
Decompression Sickness
“The Bends”

• Involves gases (usually nitrogen) diffusing into the tissues and gets trapped there (gas bubbles in places where there should be none).
  – Henry’s Law- more gas will dissolve in a liquid when a gas is pressurized.
  – Different body parts affected depending on bubble location.
Decompression Sickness
“The Bends”

• **Signs & Symptoms**
  
  – **Pulmonary Barotrauma**: Hoarseness, neck fullness, chest pain, SOB, painful swallowing.
  
  – **Air Embolus**: Sudden loss of consciousness within 10 minutes of surfacing to stroke symptoms.
  
  – **Body**: Rash, itching, bubbles under skin, joint pain, paralysis, sensory disturbances, bladder problems (unable to urinate), chest pain, cough, SOB.

  • Symptoms usually appear within 1 hour of surfacing but can be delayed up to 6 hours.
Treatment

• Transport to nearest Hyperbaric Chamber
• Active re-warming.
• Supplemental 100% oxygen via NRB, treat LOC with intubation as appropriate then FIO2 100% via ventilator.
• Air Embolism suspected- transport head down left lateral decubitus to prevent additional gas emboli.
Treatment

• IV fluids initiated briskly for rehydration
• High dose steroids early in resuscitative effort
  – Solu Medrol
    • Adult 125 mg
    • Pediatric 5mg/kg

• DAN (Divers Alert Network) recommends flight transport if required 800 feet or less.
• Aeromed Protocol: Air transport at 1000 feet or less.
Recompression Chambers

Florida Hospital Orlando (Orange)

St. Mary’s Medical Center (Palm Beach)

Mercy Hospital (Miami-Dade)

Capital Regional Medical Center (Leon)

Mariners Hospital (Monroe)