

Initial Approach to Dive Injury

1st Principles

- DCI
 - Trapped gas -> POS, AGE
 - Evolved gas -> DCS
- Not all diving casualties are dysbaric
 - Thermal (hyper/hypothermia)
 - Near drowning, IPE
 - Environment (blast injuries, tools, mechanical dangers, marine life)
 - Previous med conditions (MI, Sz)
- Not all dysbaric casualties have DCS
 - POS, AGE
 - Other barotraumas
- Dead/VSA
 - At surface vs. depth
 - Witnessed/unwitnessed
 - AGE, MI, drowning due to blackout/medical condition
- Blackout
 - Gas issue (too much, not enough, wrong gas), seizure
- Vertigo and other ENT symptoms
 - Vestibular DCS, inner ear BT (pure or combined with vestib DCS), alternobaric vertigo, Meniere's/BPPV
- Chest pain/SOB
 - Chokes, pneumothorax, immersion pulm edema, ACS/CHF
- Headache
 - CO2 toxicity, DCS (?type?), migraine, plain H/A

Initial Approach

- Approach
 - Onset
 - Evolution
 - Presentation
 - Gas burden – dive profile
 - Evidence of barotrauma
- Mod – High risk = Manage as DCI
- Low Risk – consider other causes
 - 1) Non-DCI dysbaric (i.e. BT)
 - 2) Non-dysbaric diving-related (i.e. marine life)
 - 3) Non-diving-related CLASSICAL (ie. MI)
- Diver Hx
 - Dive Profile
 - Depth, time - estimate of N2 stress
 - ?repet dives – how many, when was last dive
 - Dive equipment & gas used
 - Mechanism of injury
 - When did problems start
 - Descent, at depth, ascent, at surface
 - What happened during dive
 - Uneventful; strong current; aborted; emergency ascent

Initial Actions Dysbaric Casualty

- **ABCDE**
- Vitals
- 100% Oxygen
 - Accelerate inert gas elimination & improve O₂ delivery to hypoxic tissue
 - BMV, demand valve, rebreather
- IV Fluids – IL bolus, then titrate (~100-175ml/hr)
 - Avoid dextrose (can increase ICP)
 - PO fluids unlikely to benefit
 - Increase tissue perfusion = increase inert gas washout
- DDX
- Emergency (Red) – immediate, life-saving
 - Severe sx, rapid onset <1hr, progressive, neuro deficits, clearly ill
- Urgent (Yellow) – disability preventing
 - Pain only, stable or progressing, overall stable, without sx of severe DCS
- Timely (Green) – elective
 - Unclear/ambiguous sx, long delay from when sx 1st appeared (not when 1st reported)

Time to Tx – DAN workshop 2004

- Consensus Statements

1. Mild s/sx = limb pain, constitutional sx, some cutaneous sensory changes, rash; where these manifestations are static or remitting, and associated objective neuro dysfx has been excluded by medical exam
2. Untreated mild s/sx due to DCI are unlikely to progress after 24hrs from end of diving (unless further deco or ascent to altitude)
3. Level B epi evidence indicates that a delay prior to recompression for a patient with mild DCI is unlikely to be associated with any worsening of long-term outcome

4. Some patients with mild s/sx after diving can be treated adequately without recompression. For those with DCI recovery may be slower in the absence of recompression.

5. Some divers with mild s/sx after diving may be evacuated by commercial airliner to obtain treatment after a surface interval of at least 24hrs, and this is unlikely to be associated with worsening outcomes

- NB Mild s/sx – need monitoring

General Approach RTD

- Impairment
 - Loss of use or derangement of body part/organ system or fx
- Disability
 - Inability to meet demand/need based on an impairment
- 5 key questions:
 - Diver or patient?
 - Disqualifying meds
 - Consider both med & indication
 - Ability to do job
 - Exercise tolerance, cognitive fx, roles (buddy, rescue diver, dive sup, boat driver, EOD disposal), stressors (pressure, gas toxicities, thermal, disorientation etc.)
 - Quantification of impairment
 - Immune function
 - Assessment of job - ?tailored diving
- Key Considerations:
 - Dive safety (individual & team)
 - Job/mission completion
 - Conserve trained resources
- CAF RTD after DCI
 - Type I DCS completely resolved
 - No fly 3d, no diving 7d
 - Type II DCS completely resolved after 1 TT
 - No flying 7d, no diving 30d
 - Type II DCS residual sx or repeated tx
 - No fly 10d, no diving until reviewed by CDSM
 - AGE completely resolved after 1 TT
 - No fly x 7d, no diving until reviewed by CDSM
 - AGE residual sx or repeated tx
 - No fly x 10d, no diving until reviewed by CDSM