HEAD INJURIES

- United States Army Combatives School
  - Ft. Benning, GA
  - Level III Instructor Course
Head Injuries

Objectives-
- Incidence of Injury
- Mechanisms of Injury
- Signs & Symptoms
- Treatment / First Aid
- Prevention
Head Injuries

- Incidence of Injury:
  - CDC estimates 300,000 sports-related concussions occur per year
  - 100,000 in football alone
  - An estimated 900 sports-related traumatic brain injury deaths per year
Head Injuries

- Mechanisms of Injury:
  - Coup injury
  - Contrecoup injury
  - Rotational injury
  - Repeated subconcussive forces
Head Injuries

- Coup Injury-
  - Stationary skull is hit by an object traveling at a high velocity;
  - Brain injury beneath the point of impact
Head Injuries

- Contrecoup Injury-
  - Skull is moving at a relatively high velocity & strikes a nonmoving object
Contrecoup Injury:
- Fluid w/in skull fails to decrease brain’s momentum
- Brain strikes skull on opposite side of impact
- Maximal brain injury on opposite side of impact
Head Injuries

- Rotational Injury - Angular forces cause a shearing injury
Head Injuries

- Repeated Sub-concussive Forces:
  - Results in higher degree of degenerative changes within the CNS
  - EEG activity is disrupted
  - Neuropsychological impairment results
Head Injuries

- Signs & Symptoms-
  - “High Sensitivity” for mechanisms & presentations of head injuries
  - Term “ding”
  - Assume a head injury with all eye, nose, dental, and/or facial injuries
Head Injuries

- Signs & Symptoms:
  - Headaches
  - Nausea / vomiting
  - Syncopal episodes
  - Lack of awareness of surroundings
Head Injuries

- **Signs & Symptoms**
  - Dizziness / vertigo
  - Tinnitus
  - Hearing loss
  - Diminished taste / smell
  - Speech difficulties
Head Injuries

- Signs & Symptoms-
  - Memory Deficits (Antegrade Amnesia)-
    - Post-traumatic
    - Material / events that have taken place since the injury
    - Learning new material
Head Injuries

- **Signs & Symptoms**-
  - Memory Deficits (Retrograde Amnesia)-
  - Retrieving old material
Head Injuries

- **Signs & Symptoms**-
  - Visual disturbances (the “veil”)
  - Blurred vision
  - Diplopia (double vision)
  - Photophobia (sensitivity to light)
Head Injuries

- **Signs & Symptoms** -
  - Psychological & Somatic Complaints -
    - Anxiety
    - Fatigue / malaise
    - Confusion
    - Attention & concentration deficits
    - Lack of coordination
Head Injuries

- Signs & Symptoms:
  - Psychological & Somatic Complaints:
    - Decreased appetite
    - Sleep disturbances
    - Personality changes
Head Injuries

- Signs & Symptoms-
  - Psychological & Somatic Complaints-
    - Decreased libido ("sex drive")
    - Apathy / depression
    - Disassociation
Head Injuries

- Signs & Symptoms-
  - Altered level of consciousness
  - Impaired attention (vacant stare, delayed responses, inability to focus)
  - Disorientation
  - Lack of awareness of surroundings
  - Gross incoordination
Head Injuries

- Signs & Symptoms:
  - Deformity
  - Muscle spasm
  - External bleeding
  - Battle’s Sign
  - Raccoon Eyes
  - Otorrhea / CSF drainage
Head Injuries

- Signs & Symptoms-
  - Vomiting
  - Syncopal episodes
  - Vertigo
  - Hearing loss
  - Speech difficulties (slurred / incoherent)
**Head Injuries**

- **Signs & Symptoms (Pupils)**:
  - Nystagmus (involuntary eye movements)
  - Anisocoria (unequal pupil size)
  - Unreactive pupils
  - Strabismus (lack of eye control)
Head Injuries

- Signs & Symptoms:
  - Personality changes
  - Emotional reactions out of proportion
Head Injuries

- Signs & Symptoms:
  - Confusion
  - Irritability
  - Anxiety
  - Disorientation / disassociation
Head Injuries

ASSUME CERVICAL SPINE INJURY UNTIL RULED OUT!!
Head Injuries

- Treatment:
  - Remove from Activity
  - Airway, Breathing, & Circulation
  - Monitor vital signs
  - Physician / EMS referral
Head Injuries

- Treatment

- Communication
  - Platoon / Squad Leader
  - Platoon Mates
  - Spouse / Family
Head Injuries

- Treatment (OTC drugs)-
  - No aspirin or ibuprofen
  - ??? Acetaminophen / Tylenol (check w/MD)
Head Injuries

Dear Student:

You may have suffered a head injury. Head injuries vary in severity from mild to severe concussions to skull fractures. Though most severe head injuries can be recognized at the time of the injury, the signs and symptoms of others may not develop until a later time. Therefore, it is imperative that any Soldier who may have sustained even a minor head injury to take prudent precautions.

We suggest the following:

1. Eat a light diet.
2. Do not take any sedatives or consume any alcoholic beverages.
3. Immediately go to the emergency room and call the cadre if any of the following occur:
   - Sever or progressively worsening headache
   - Nausea and/or vomiting
   - Unusual drowsiness
   - Blood or other fluids draining from ears nose or mouth
   - Convulsions and/or seizures
   - Confusion and/or inability to concentrate
   - Blurred vision and/or double vision
   - Ringing in the ears
   - Balance difficulties
   - Dilated and/or unequal pupil size
   - Temperature above 100.5 with or without neck stiffness
4. Do not take more than two(2) Extra-Strength Tylenol (Acetaminophen) or three (3) regular strength for headaches. Do not take aspirin or Ibuprofen!! Do not take any other pain medications.

If any symptoms occur, report them to the cadre before your next class.
Head Injuries

ANY DETERIORATION IN SIGNS / SYMPTOMS AFTER INITIAL TRAUMA WARRANTS IMMEDIATE REFERRAL TO ER!!
Head Injuries

- Related Pathologies-
  - Post-Concussion Syndrome
  - 2nd Impact Syndrome
  - Intercranial Hematoma (Fig. 18-13)
  - Skull Fractures
Head Injuries

- Post-Concussion Syndrome-
  - Cognitive impairments may linger
  - Decreased attention, trouble concentrating
  - Irritability
  - Fatigue, headaches, dizziness, tinnitus, etc.
Head Injuries

- 2nd Impact Syndrome-
  - 50% mortality rate
  - Cumulative damage
  - Brain swelling after 2nd concussion
  - 2nd impact is usually minor
Head Injuries

- 2nd Impact Syndrome-
  - Occurs w/in **2 minutes** after 2nd injury
  - Athlete quickly collapses into semi-comatose state
  - Dilating pupils (rapid), pupils unresponsive, respiratory distress
Head Injuries

- Epidural Hematoma-
  - Arterial bleeding (middle meningeal artery)
  - Rapid onset of symptoms (15-30 min)
  - Severe headache that increases
  - Deterioration in LOC & vitals
Head Injuries

- **Subdural Hematoma**
  - Most common cause of death in athletics
  - 30-40% mortality rate
  - Venous / slow bleeding
  - "lucid interval" - can be hours, days, weeks
  - Headaches, cognitive impairments
Head Injuries

- Related Pathologies (Skull Fracture):
  - Linear - blunt impact
  - Comminuted - skull fragments
  - Depressed - obvious indentation
Head Injuries

- Skull Fractures-
  - Laceration
  - Raccoon eyes
  - Battle’s sign
  - Crepitus
  - Loss of contour
Head Injuries

- Prevention -
  - “High Sensitivity” for mechanisms & presentations of head injuries
  - Communication
Head Injuries

- Prevention -
  - AVOID BLOWS TO THE HEAD
Head Injuries

- Prevention:
  - Headgear
  - Mouthpieces
  - Gloves
Conclusion

- Boxing is the most Dangerous part of the Combatives Program
  - Contrary to common wisdom
  - Highest amount of potential Head Trauma

- Protective Equipment creates the illusion of safety
  - Eliminate mostly superficial wounds
  - False “safety measures” allow for more activity
QUESTIONS?