

# HEAD INJURIES

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- **United States Army  
Combatives School**
  - Fort. Benning, GA
  - Basic Combatives Instructor Course



# Head Injuries

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

# Head Injuries

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- 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
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# Head Injuries

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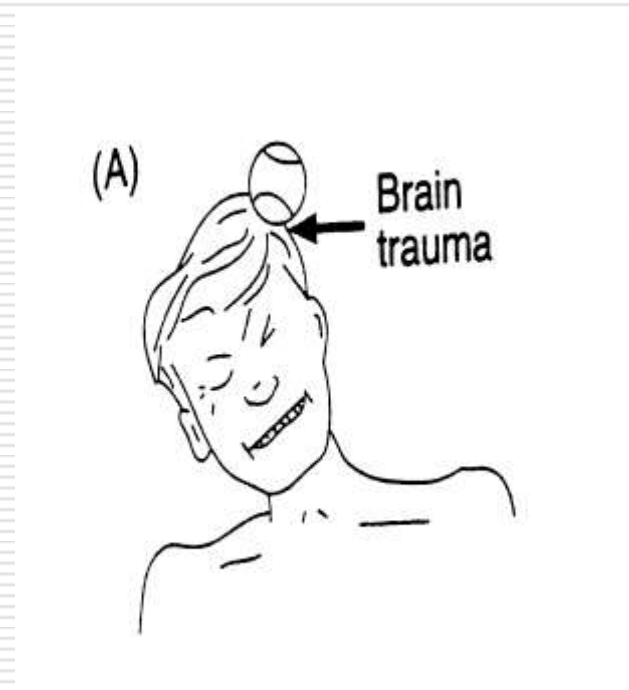


- Mechanisms of Injury-
    - Coup injury
    - Contrecoup injury
    - Rotational injury
    - Repeated subconcussive forces
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# Head Injuries

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



# Head Injuries

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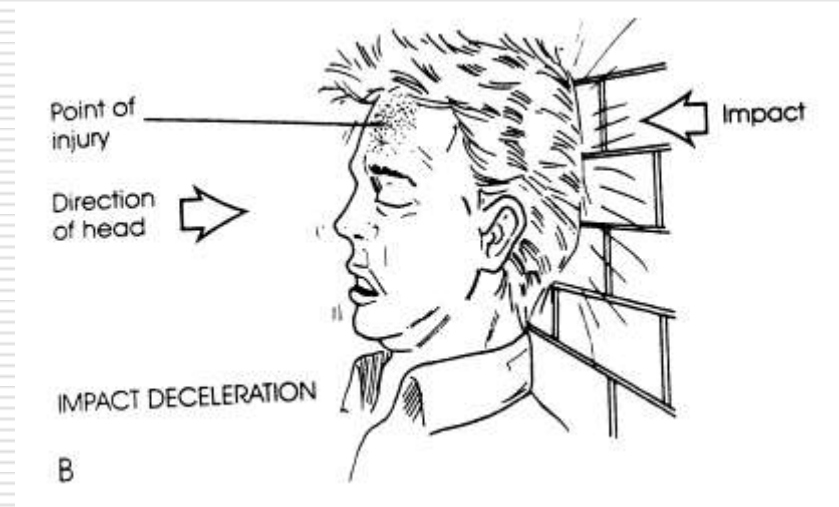
- Contrecoup Injury-
  - Skull is moving at a relatively high velocity & strikes a nonmoving object



# Head Injuries

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- 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

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- Rotational Injury-
  - Angular forces cause a shearing injury





# Head Injuries

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

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- **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

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- **Signs & Symptoms-**
    - Headaches
    - Nausea / vomiting
    - Syncopal episodes
    - Lack of awareness of surroundings
-

# Head Injuries

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

# Head Injuries

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

# Head Injuries

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

# Head Injuries

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- **Signs & Symptoms-**
    - Visual disturbances (the "veil")
      - Blurred vision
      - Diplopia (double vision)
      - Photophobia (sensitivity to light)
-

# Head Injuries

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



# Head Injuries

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- ❑ **Signs & Symptoms-**
    - Psychological & Somatic Complaints-
      - ❑ Decreased appetite
      - ❑ Sleep disturbances
      - ❑ Personality changes
-

# Head Injuries

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

# Head Injuries

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- **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

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## □ Signs & Symptoms-

- Deformity
  - Muscle spasm
  - External bleeding
  - Battle's Sign
  - Raccoon Eyes
  - Otorrhea / CSF drainage
-

# Head Injuries

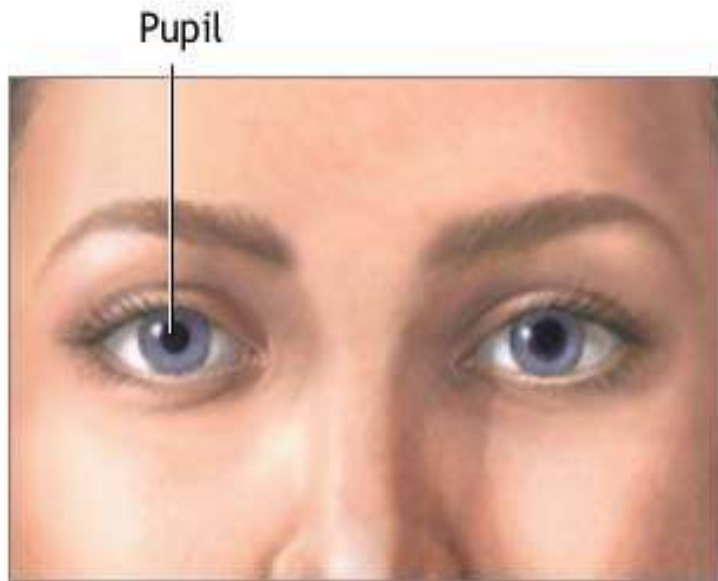
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- **Signs & Symptoms-**
    - Vomiting
    - Syncopal episodes
    - Vertigo
    - Hearing loss
    - Speech difficulties (slurred / incoherent)
-

# Head Injuries

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## □ Signs & Symptoms (Pupils)-

- Nystagmus (involuntary eye movements)
- Anisocoria (unequal pupil size)
- Unreactive pupils
- Strabismus (lack of eye control)

# Head Injuries

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- **Signs & Symptoms-**
  - Personality changes
  - Emotional reactions out of proportion

# Head Injuries

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## □ Signs & Symptoms-

- Confusion
  - Irritability
  - Anxiety
  - Disorientation / disassociation
-



# Head Injuries

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**ASSUME CERVICAL SPINE  
INJURY UNTIL RULED OUT!!**

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# Head Injuries

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## □ Treatment-

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

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## Treatment-

### Communication-

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

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

# Head Injuries

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## Head Injury Warning

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.**

## □ Treatment-

- Post Sparing Instructions
- Read and Given to Students

# Head Injuries

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

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# Head Injuries

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- Related Pathologies-
    - Post-Concussion Syndrome
    - 2<sup>nd</sup> Impact Syndrome
    - Intercranial Hematoma (Fig. 18-13)
    - Skull Fractures
-

# Head Injuries

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



# Head Injuries

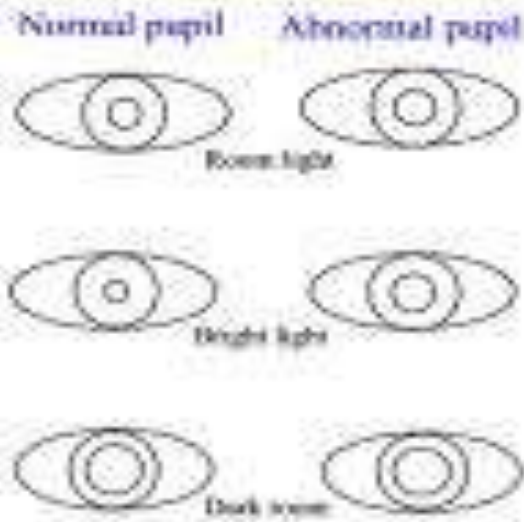
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- 2<sup>nd</sup> Impact Syndrome-
    - **50% mortality rate**
    - Cumulative damage
    - Brain swelling after 2<sup>nd</sup> concussion
    - **2<sup>nd</sup> impact is usually minor**
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# Head Injuries

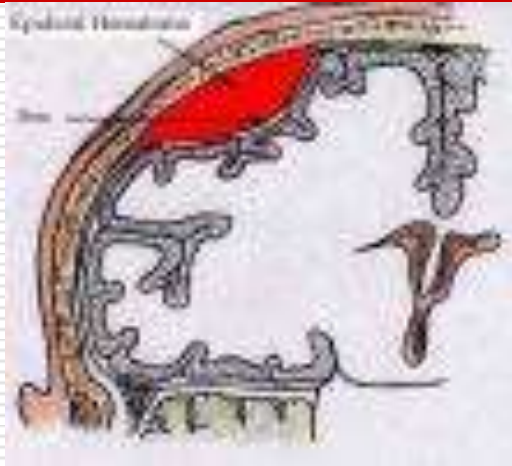
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- **2<sup>nd</sup> Impact Syndrome-**
  - Occurs w/in **2 minutes** after 2<sup>nd</sup> injury
  - Athlete quickly collapses into semi-comatose state
  - Dilating pupils (rapid), pupils unresponsive, respiratory distress

# Head Injuries

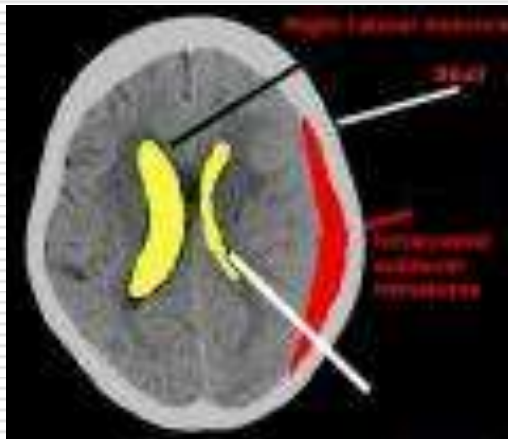
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- **Epidural Hematoma-**
    - Arterial bleeding (middle meningeal artery)
    - Rapid onset of symptoms (15-30 min)
    - Severe headache that increases
    - Deterioration in LOC & vitals
-

# Head Injuries

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- **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
-

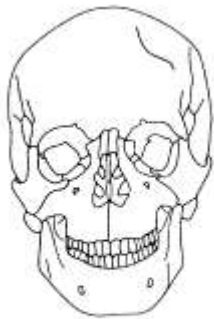
# Head Injuries

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

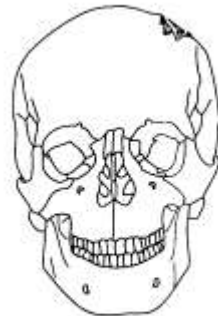
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Linear  
fracture



Depressed  
fracture



Comminuted  
fracture

- Skull Fractures-
  - Laceration
  - Raccoon eyes
  - Battle's sign
  - Crepitus
  - Loss of contour

# Head Injuries

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- Prevention-
    - ***"High Sensitivity"*** for mechanisms & presentations of head injuries
    - **Communication**
-

# Head Injuries

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- Prevention-
  - ***AVOID BLOWS TO THE HEAD***





# Head Injuries

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- Prevention-
  - Headgear
  - Mouthpieces
  - Gloves



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# Conclusion

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- 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
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# QUESTIONS?

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