

## CCI Notes

- **History**
  - 1- Time and Type of trauma
  - 2- Hx of convulsions, LOC (lucid interval), PTA, retrograde amnesia
  - 3- Headache, vomiting, epileptic attacks
- **Physical**
  - 1- Patency of airways, BP, LOC (GCS and Trauma scale score)  
Note: Shock is rare; except in children
  - 2- Scalp examination: wounds, hematomas, Battle's sign or Raccoon eyes
  - 3- Neuro exam
  - 4- Examination of other systems (muscle weakness or plegia)
  - 5- Pupillary size, oculocephalic reflex
- **Closed head injury Management**
  - 1- Resuscitation
  - 2- Full neuro and general examination
  - 3- Patent airways
  - 4- IV line
  - 5- **Skull and cervical spine XR:** impaired LOC, apparent severe injury, nasal/ear fluid leak, positive clinical exam, penetrating injury
  - 6- **Non-enhanced CT with bone window, if:** GCS <14, fractures, disturbed consciousness, neuro deficit, epilepsy, CSF leak, amnesia >5min, drug and alcohol, extreme ages
  - 7- **Admission if:** Same as CT + patients with comorbidities
- **Scalp Injury Management**
  - 1- First aid by compression bandage
  - 2- Shave hair
  - 3- Clean wound (antiseptics) and debridement (lacerations)
  - 4- Inspect wound and remove fractures
  - 5- Suture 2 layers
  - 6- Dressing
  - 7- Antibiotics / tetanus
- **Linear and Basal Skull Fractures Management:**
  - No specific management for linear skull fractures. Just observation and do CT scan to rule out hematomas.
  - Basal skull fractures should be covered with antibiotics and the nose and ear should be observed for CSF leak
- **Depressed Skull Fractures Management:**

**They need operation when:**

  - Depression is more than skull thickness
  - CSF leak
  - Seizures
  - Over an imp. area
  - Compound

**The operation could be:**

  - Simple elevation (one piece)
  - Craniectomy then cranioplasty (delayed after 6months; open / immediate; closed)
- **Brain Injury Management:**
  - Primary:
    - **Concussion** = 24hr observation
    - **Contusion & Laceration** = steroids, diuretics, anticonvulsants and may need ICP monitoring or excision
    - **DAI** = As above + ventilation
  - Secondary:
    - Hypovolemia and Hypoxia
    - **Brain edema** = steroids, Mannitol, hyperventilate, ICP monitoring and anticonvulsants
- **Management of mild brain injury GCS ≥ 13:**
  - Usually from concussions
  - No Tx, analgesia or NSAIDs
- **Management of moderate brain injury GCS 9-12:**
  - Usually from contusions and lacerations
  - Non-contrast CT
  - Admission to intermediate care ICU
  - IV line
  - Foley's catheter
  - Head elevation (unless: hypovolemia or cervical injury)
  - Codeine phosphate, Mannitol
- **Management of severe brain injury GCS ≤ 8:**
  - Usually from DAI
  - Same as mild
  - Admission to ICU
  - Ventilation
  - Intracranial monitor for ICP
  
  - Hematoma = craniotomy and evacuation
  - Contused parts = excision
  - Craniotomy to relieve pressure

- **Ant. Cranial Fossa fracture presents with:**
    - Raccoon eyes, subconjunctival hemorrhage, rhinorrhea (dura), CN deficit
  - **Middle Cranial Fossa fracture presents with**
    - Battle's sign (petrous temporal), hemotympanum, Otorrhea (dura)
- 

- **Secondary events:**
    - Continued diffuse axonal damage = phosphate cascade
    - Vasogenic edema = disrupted BBB
    - Cytotoxic edema = failure of Na/K pump (poisoning, cardiac arrest, ischemia)
    - Osmotic edema = decreased osmolality
    - Interstitial edema = CSF brain barrier disruption (around ventricles)
    - Brain edema management: dexamethasone, mannitol, IPPV, or craniectomy
- 

- **CSF fluid:** Beta 2 transferrin
  - **CSF leak management** = Abs for 2 weeks > surgery
- **Chronic subdural hematoma** = in old people, taking anticoagulants, alcoholics
  - **Management** = evacuation through burr holes. If it has a rigid membrane > craniotomy and evacuation. If re-accumulated > subduro-peritoneal shunt
- **Hyponatremia:** trauma causes ADH secretion.
  - **Manifestations** = Confusion, lethargy, weakness, NV.  
<120 = seizure / Loss OC      <105 = status epilepticus
  - **Management** = Saline infusion 5 mmol/l. Rapid infusion causes pontine myelinolysis
- **Extradural management:**
  - Asymp. + thin = observe & steroids
  - Symp. / children / thick = craniotomy and evacuation
- **Subdural management** = Craniotomy and evacuation
- **Hemorrhagic contusion management** = removed with contused brain and evacuation