

## TREATMENT AND CARE OF THE PATIENT WITH COMPLEX NEUROLOGICAL DISORDERS: CRANIOCEREBRAL TRAUMA

## TBI FACTS

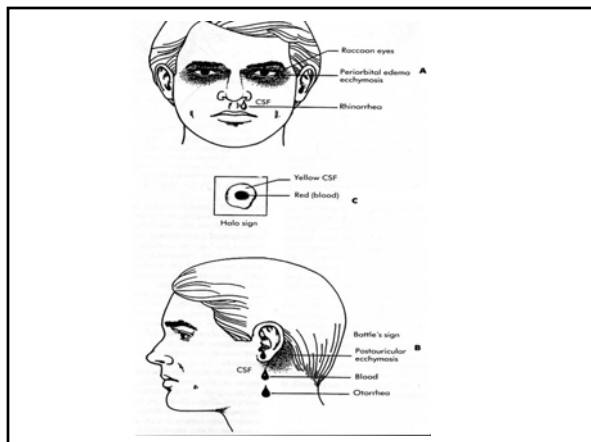
- 1.5 million sustain TBI every year
- 50,000 deaths; 80,000 with disability
- Peak occurrences 15 –24 years & >75 years
- Leading causes transportation & falls in elderly
- Cost \$48.3 billion annually

## TERMINOLOGY

- Direct head injury
- Open & closed head injuries
- Coup & Contrecoup injury
- Missile injury

## BASAL SKULL FRACTURES

- No nasal suctioning
- NG through mouth
- No Valsalva or vigorous coughing
- Sterile dressing for CSF drainage
- “Halo sign”
- PC: meningitis



## PRIMARY BRAIN INJURY

- Occurs at time of impact
- Direct traumatic forces that injure & kill brain cells
- Concussion, contusion, skull fractures, hemorrhage

## SECONDARY INJURY

- Damage & death of brain cells that initially survived traumatic event
- Depends upon severity of primary injury
- IICP, cerebral edema, hematoma, infection, brain herniation
- Results in increased mortality

## CONCUSSION

- Traumatically induced alteration in mental status
- Less than 10% result in LOC
- After a concussion 4 – 6X more likely to sustain 2<sup>nd</sup> concussion

## CONCUSSION

- Cumulative effect with repeat concussion
- Second Impact Syndrome
- AAN Guidelines



## CONTUSION

- Trauma to brain tissue
- Often occurs with laceration
- Cerebral edema – more pronounced 3 – 4 days after injury
- Contrecoup injuries

## DAI & BRAIN STEM INJURY

- Diffuse axonal injury or shearing
- Associated with prolonged comatose state
- Acceleration – deceleration & high velocity injuries
- Brain stem injury can be immediate primary injury or develop later with secondary injury

## HEMORRHAGE

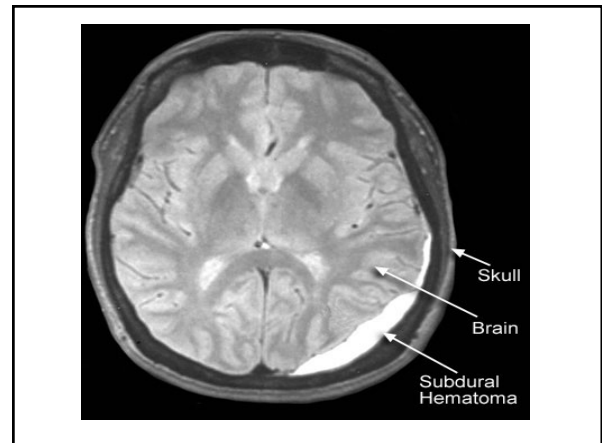
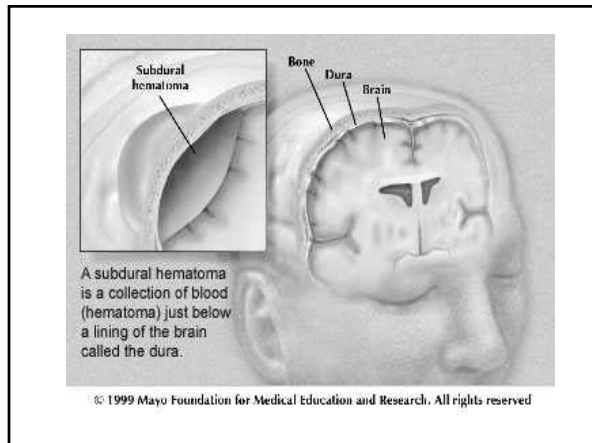
- Epidural
- Subdural
- Intracerebral

## EPIDURAL HEMATOMA

- Arterial bleeding between skull & dura
- Fracture of temporal bone with damage to middle meningeal artery
- “Talk & die;” initial lucid interval

## SUBDURAL HEMATOMA

- Venous bleeding between dura and arachnoid
- Highest incidence of hematomas – 24% pts with severe head injury
- Elderly & alcoholic more at risk
- Acute, subacute & chronic



## INTRACEREBRAL HEMATOMA

- Bleeding within brain tissue
- Accompanies serious contusions & lacerations
- DTICH – delayed traumatic intracerebral hematoma

## PREDICTING OUTCOME IN SEVERE HEAD INJURY

- Hypotension & hypoxia critical
- Hypotension with or without hypoxia doubles mortality rate
- B/P < 90, ICP > 20 mm Hg
- Age > 20

## SEQUELAE AFTER SEVERE HEAD INJURY

- Post – traumatic epilepsy
- Post – concussion syndrome
- Hydrocephalus

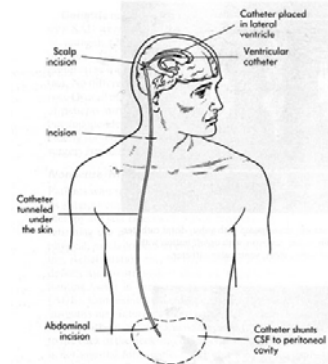
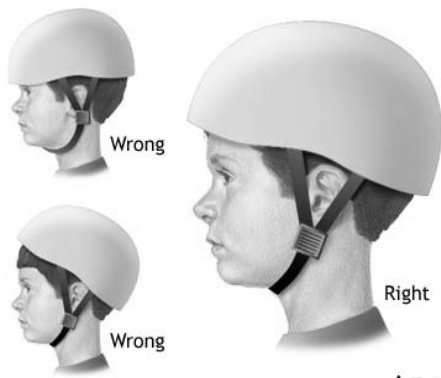


Fig. 10-17. Patient with ventriculoperitoneal (VP) shunt.



## PREVENTION

- Seat Belts
- Helmet use
- Drinking & driving
- Decrease violence
- Safe playgrounds
- National Head Injury Foundation

