Head Injury

https://www.youtube.com/watch?v=p4dS2V_ccK4&x-yt-ts=1422503916&x-yt-cl=85027636
Head Injury/Clinical/ Mini-neurologic Examination

- GCS/lateralising signs/pupils
- Painful stimulus
- GCS inaccurate within one hour of event
- Descriptions not numbers
- ‘withdrawal’ = spinal reflex
- Wikipedia!, www.glasgowcomascale.org
Head Injury/Clinical/ Monitoring

Monitoring is simple and is key

Non-ventilated patient:
- **Vital signs** (5)
- **Mini-neurologic examination**
  - GCS
  - Lateralising signs
  - Pupils
- **FBC/U&E/LFT/ABG & CT**

Ventilated patient:
- **Vital signs** (5+ET CO₂)
- Ask has the patient been ‘light’?
- **Sedation break to do mini-neurologic examination**
- **ICP monitoring**
- **FBC/U&E/LFT/ABG & CT**
Head Injury/Clinical

- ATLS, resuscitation, ABCDE…other injuries including head/cervical spine
- Mannitol
- Management of seizures
- Intubation (GCS before!)
- Neurosurgery
  - ICP monitor insertion
  - Burrholes
  - Craniotomy
  - Craniectomy
  - Depressed fracture elevation
  - Repair of CSF fistula
Scalp laceration in a HI patient...suturing is part of resus procedure (wound toilet/gloved finger in wound)

BEFORE MOVING to CT

EVEN if patient likely to undergo neurosurgery

(Consider full head shave)
Head Injury/ICP physiology

ICP-Volume Curve

ICP mm Hg

ICP controlled due to compensation

Small ↑ volume → marked ↑ ICP, i.e., decompensation

CPP = MAP – ICP

The CPP should be maintained at 60-70 mmHg
The case for ICP monitoring in head injury is variable

- Talving *et al* (2013)...non-ICP monitored higher mortality
- Shafi *et al* (2008)...ICP monitored higher mortality
- Biersteker *et al* (2012)...ICP monitored not associated with a better outcome at six months
- Haddad *et al* (2011)...not associated with reduced hospital mortality, however, significant increase in mechanical ventilation duration, need for tracheostomy, and ICU LOS
- Melhem *et al* (2014)...RCT...no difference in ICP-managed versus CT/examination-managed
- Su *et al* (2014)...no benefit from ICP monitoring
- Tang *et al* (2014)...non-ICP monitored patients were discharged with higher levels of function, more likely to survive. In the ICP-monitored group, the overall compliance rate to the ICP and cerebral perfusion pressure goals as required by the BTF guidelines was poor.
When to extubate?

- Usually after 48hrs if brain injury
- Neuro-monitoring status
- Respiratory status
- Other injuries & pain management (rib fractures)
- Not being afraid of agitation...mats...maintaining sleep-wake cycle...family involvement
What to say to relatives of a non-minor head injured head injury patient…remember to document.

1. Life-threatening
2. Unpredictable outcome
Head Injury/Clinical/
‘Minor Head Injury (GCS 13-15)’

- GCS 15 in 96.6% and 13-14 in 3.4%.
- Deterioration in only 1.5-4.1%, 87% of deterioration in first 24 hours (i.e., usually in first 24hrs)
- Presence of coagulopathy, anticoagulant drug use, GCS of 13-14 and increased age predicted further deterioration & mortality (Choudry 2013, Seddighi 2013)
- CT head for minor head injury...94% no blood.
  - Contusions (usually frontal) 3%, subdural haematoma 1.5%, 0.5% extradural haematoma, subarachnoid blood 1%. **Warfarin 20% have blood on scan.**
  - Patients with isolated traumatic subarachnoid hemorrhage are at low risk for deterioration (Borczuk 2013)
  - No need for a delayed CT scan Nayak 2013...rely on neuro-assessment (Nayak 2013)
Head Injury/Clinical/ Head Injury Discharge Instructions

**Warning Signs After a Head Injury**
(The first 24 hours)

- Changes in LOC
- Drowsiness
- Confusion
- Difficult to arouse
- Pupils slow to react or unequal
- Seizures
- Bleeding or watery drainage from nose or ears
- Blurred vision
- Loss of sensation to any extremity
- Slurred speech
- Vomiting
35% delayed hematoma evacuation, median of 17 days after head trauma (Kim 2014).

76.8% spontaneous resolution group, 6.8% evacuation between 4 hrs-7 days, 13.6% evacuation 7-28 days, and 2.8% evacuation after one month (Son 2013)

The efficacy of dexamethasone on reduction in the reoperation rate of chronic subdural hematoma - the DRESH study EudraCT 201100354442
Head Injury/Clinical/CSF leak

- Basal skull fracture
- In-hospital rates of meningitis 0.64% and CSF leak 1.75%
- Rates of 90-day meningitis 0.37% and CSF leak 0.40% (McCutcheon 2013)
- No prophylactic antibiotics indicated (Ratilal 2012)
- Vaccination...no evidence
Head Injury/Clinical

Pitfalls:

- Missed injury
- Obs
- CSF leaking wound post-craniotomy
- NGH ITU & Spinal reflexes
- Vertebral artery dissection
Head Injury/Neck Vessel Dissection

The Telegraph

Mother left unable to talk after yobs pelt horse with stones
Lindsey Broomhead has been in hospital for eight months since thugs pelted horse and left her for dead while riding on private track in Rotherham, South Yorkshire
Head Injury/Clinical/Case
Many patients presenting are potentially vulnerable adults...circumstances of assault, pre-morbid background.

The impact of their head injury will likely make them vulnerable adults.

Their subsequent post-discharge status may make them vulnerable adults.

Safeguarding any children within a family.

http://nww.sth.nhs.uk/NHS/SafeguardingPatients/
Consent, emergency treatment, urgent treatment, significant decisions re care or withdrawing care, & involvement of IMCA

Unknown male

In care and with paid carer

Those with family, family involvement & documentation of their involvement
Deprivation of Liberty Safeguards (DOLS)

- Mental Capacity Act 2005/Mental Health Act 2007
  - 19th March 2014, the Supreme Court handed down the judgement in the joint cases of *P v Cheshire West and Chester Council* and another; *P and Q v Surrey County Council*
  - A deprivation of liberty occurs when 'the person is under continuous supervision and control and is not free to leave, and the person lacks capacity to consent to these arrangements'
  - Urgent Authorisation – can be put into immediate effect by the Consultant/SpR (on behalf of the Trust) in charge of the care for up to 7 days
  - Standard Authorisation – which can be approved by the PCT for up to 12 months.
Head Injury/Adult Safeguarding

- Head injury = Adult Safeguarding
- Playing the safeguarding card…
Head Injury/Legal 1

- Coroner
- Criminal investigation
- CICA
- Litigation
- Adult Safeguarding
- DVLA
- Managing the affairs of the patient

Appropriate patient record:
- Admission notes, nursing notes, operation notes
- Obs charts (many Trusts have guidance on back of charts)
- Date/time/clear identifier
- Photo/drawings/measurements
- IT system audit trails
- Coroner
  - Reporting a death/certification
  - Brain death & organ donation
  - Coroner’s Inquest
Head Injury/Legal 3

• **Criminal Case** (assault, GBH, manslaughter, murder)
  • Police Statement
  • Professional witness
  • Chain of Evidence (piece of wood)

• Scrutiny of medical/nursing care (notes & timelines)
...accused defence team
Head Injury/Legal 4

- **Forensics**
  - Discrimination of falls vs blows (Guyomarc’h 2010):
    - more than three lacerations
    - laceration length of 7 cm or more
    - comminuted or depressed calvarial fractures,
    - lacerations or fractures located above the HBL,
    - left-side lateralization of lacerations or fractures
    - more than four facial contusions or lacerations
    - presence of ear lacerations, presence of facial fractures

**IMPORTANCE OF YOUR DOCUMENTATION**
• CICA
  • https://www.gov.uk/government/organisations/criminal-injuries-compensation-authority
  • ‘We deal with compensation claims from people who have been physically or mentally injured because they were the blameless victim of a violent crime in England, Scotland or Wales’
  • (CICA is an executive agency, sponsored by the Ministry of Justice)
Head Injury/Legal 6

- DVLA, including vocational license (nature of injury, surgery, seizures, visual function)

- Mental Capacity/Deputy/Court of Protection/Office of the Public Guardian/Emergency Order

- Litigation/RTA/injury at work (also medical)
Head Injury/Rehabilitation 1

- Post-concussion syndrome
- Frontal executive dysfunction
- Personality change...up to 50%
- Epilepsy
- Permanent deficit
- Mood & Adjustment disorders
Head Injury/Rehabilitation 2

- Importance of family in outcome
  - GET THEM INVOLVED
  - FORGET ABOUT VISITING TIMES
  - SET THEM REHABILITATION TASKS

- ‘For persons with complicated mild/moderate injury, better family functioning was associated with greater home integration, and less caregiver distress was associated with better social integration’

- ‘For persons with severe injuries, greater caregiver perceived social support was associated with better outcomes in productivity and social integration’ (Sady 2010)
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<td>- Social worker &amp; OT</td>
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<td>- Social care issues</td>
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<td>- Alcohol dependence</td>
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<td>- NHS-provided aids (bed, mobility aids)</td>
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| VAT relief, blue badge, carer's allowance, personality independence payment  |
No neurosurgery social worker

OT provision re Osborne 4

Medicalised ward rounds

No structured AHP/nursing/family approach

Reduction in AHP resource, frequency limited

DGH transfer including from N-ITU

Rehab prescription for patients ‘constrained to bedside’

'Patients with stroke should be offered a minimum of 45 minutes of each appropriate therapy that is required, for a minimum of 5 days per week, as a level that enables the patient to meet their rehabilitation goals for as long as they are continuing to benefit from the therapy and are able to tolerate it'

For psychiatric inpatients undergoing rehabilitation, there should be 'a minimum of 25 hours of planned activities per week. These may take place either on or off the unit'

Daily sessions of 60 minutes six out of seven days a week for four weeks (Bartolo 2012)
Head Injury/Rehabilitation 5

- Starts from admission or if ventilated initially, immediately post-extubation
- Key step is being able to independently ‘weight bear for transfer’...gradated outings
- Rehab prescription for ‘constrained to bedside’
  - 4 domains...hand/leg/cognitive/communication
  - 4 components...passive/active/compensatory/equipment
- AHP provision
- Involvement of family
- Rehab in the community is rubbish...whole industry in assessments
Head Injury/Changing epidemiology

- 50% of HI are from RTAs…Glass/safety belts/vehicle standards, road legislation/maintenance/education
- Also guns, alcohol & drugs, employment legislation,

How we choose to have our society impacts on head injury