

Traumatic Brain Injury

BACKGROUND

The key aim in Traumatic Brain Injury Management is detection of life threatening intracranial bleeding, and to prevent and minimise secondary brain injury from hypoxia, poor cerebral perfusion, cerebral bleeding, hypoglycaemia, seizures and fever.

If Major Trauma – Follow local/ National Major Trauma Guidelines

Mild = GCS 14-15 AVPU

Moderate = GCS 9-13 AVPU

Severe = GCS 3-8 AVPU

SEVERE:

- Stabilise Airway, O₂
- Secure IV Access
- Manage raised ICP
- Call PICU
- Call Neurosurgery

DANGEROUS MECHANISM*

- RTA: High speed >64km/h, rollover or ejection, death of another passenger, pedestrian or cyclist hit without helmet
- Fall from height i.e.
Falls >1m if under 2 years,
Falls >1.5m if above 2 years
- High-speed injury from projectile or object

HISTORY

- Timing and Mechanism
- Loss of consciousness
- Amnesia pre- or post-event
- Seizure
- Vomiting
- Dizziness/unsteady
- Visual disturbance
- Clinical course – improving/ deteriorating
- Cause of head injury – trauma or seizure, arrhythmia, hypoglycaemia, drug overdose
- Child protection concerns
- Risk of bleeding e.g. known coagulopathy or on anti-platelets or anti-coagulants

EXAMINATION

- cABC
- Primary survey
- AVPU, GCS
- Eyes: pupils, fundoscopy, panda eyes, battle sign
- Palpate head, neck, face, teeth
- Check for CSF/blood in nose/ears
- Neuro exam and gait – ataxia
- Other injuries

ADMISSION IF

- Severe head injury – bleed/fracture
- Not returned to normal baseline
- Consider admission for vulnerable children including infants unless clear accidental aetiology or minor head injury- always consider NAI
- Consider admission where known coagulopathy / on anti-coagulants

CT BRAIN INDICATIONS

High Risk

Scan if any risk factor present:

- GCS <14 or <15 in children under 1 year
- GCS <15 at 2 hours post injury or worsening signs/symptoms
- Known coagulopathy or on anti-coagulants
- Suspicion of non-accidental injury
- Post traumatic seizure
- Signs of fracture – open or depressed or base of skull or tense fontanelle
- Focal neurological deficit
- Persistent severe headache or persistent vomiting (>4 hours post injury)

Intermediate risk

Consider CT if risk factors include

- Dangerous mechanism*
- Loss of consciousness ≥5 seconds
- Bruise/swelling/laceration >5cm on the head in child <1 year
- Amnesia > 5 minutes (antegrade or retrograde)

DISCHARGE REQUIREMENTS

- A minor head injury without symptoms or signs can be discharged directly with head injury +/- safety in the home advice
- Observation for 4 hours following symptoms
 - Normal conscious state
 - No further vomiting
 - Tolerating oral fluids
 - Headache not persisting

- Consider social circumstances

Any consideration of NAI should be discussed with senior clinician

DISCHARGE ADVICE:

- Re-present if persistent severe headache or vomiting, seizures, ataxia, confusion, drowsiness, or becomes unconscious, visual disturbance – See CHI parent information leaflet
- See CHI concussion guideline – advice re analgesia, sleep hygiene, rest and graded return to physical activity

REFERENCES:

1. PREDICT 2021 <https://www.predict.org.au/head-injury-guideline/>
2. Head injury: NICE guideline CG176 2014, updated 2019
3. CHI Mild to moderate TBI. 2019. <https://www.olchc.ie/healthcare-professionals/clinical-guidelines/mild-moderate-tbi.pdf>

RESOURCES:

1. CHI parent information leaflet 2019 <https://www.olchc.ie/files-uploaded/clinical-guidelines-companion-documents/head-injury-general-advice-info-leaflet.pdf>
2. CHI concussion guideline 2019 <https://www.olchc.ie/healthcare-professionals/clinical-guidelines/concussion.pdf>