

# Initial Management of Adult Mild Closed Head Injury

## Initial GCS 14-15 on arrival following blunt head trauma

Stabilise ABCDEs and assess clinical risk factors.

Commence minimum of hourly clinical observations of vital signs, GCS, pupils, PTA and clinical symptoms

### Low risk mild head injury

No indication for CT scan if all of...

- GCS 15 at 2 hours post injury.
- No focal neurological deficit.
- No clinical suspicion of skull fracture.
- No vomiting
- No known coagulopathy or bleeding disorder.
- Age <65 years.
- No seizure
- Brief loss of consciousness (<5 mins).
- Brief post traumatic amnesia (<30 mins)
- No severe headache.
- No large scalp haematoma or laceration
- Isolated head injury
- No dangerous mechanism.
- No known neurosurgery / neurological impairment.
- No delayed presentation or representation

#### NOTE:

Mild acute clinical symptoms such as lethargy, nausea, dizziness, mild headache, mild behavioural change, amnesia for event and mild disorientation are common and are not associated with increased risk of intracranial injury. These clinical symptoms usually start to improve within 2 to 4 hours of time of injury.

Continue minimum of hourly clinical observations until at least four hours post time of injury.

Clinically deteriorates or clinical symptoms not improving during observation period

Normal CT scan

Clinical symptoms IMPROVING or remain normal during period of observation.

Clinical symptoms IMPROVING at 4-6 hours post time of injury.

Clinical symptoms NOT IMPROVING at 4-6 hours post time of injury.

Clinically safe for discharge for home observation if:

- GCS 15/15
- No persistent post traumatic amnesia (nb A-WPTAS 18/18)
- Alertness / behaviour / cognition returning to normal
- Clinically improving after observation.
- Normal CT scan or no indication for CT scan.
- Clinical judgment required regarding discharge and follow up of elderly patients or patients with known coagulopathy or bleeding disorder due to increased risk of delayed subdural haematoma.

Clinically safe for discharge for home observation if:

- Responsible person available to take home and observe.
- Able to return if deteriorates.
- Discharge advice is understood.

Discharge for home observation if above criteria met:

- Provide written patient advice sheet
- Provide discharge summary for GP
- All patients should be advised to see their GP for follow up if they are not feeling back to normal within 2 days
- Any patients who have minor CT abnormalities, who suffered significant clinical symptoms or who had prolonged post traumatic amnesia should be routinely referred to their GP for follow up due to an increased risk of post concussion symptoms.

### High risk mild head injury

Strong indication for CT scan if...

- GCS <15 at 2 hours post injury. #1
- Deterioration in GCS.
- Focal neurological deficit.
- Clinical suspicion of skull fracture #2
- Vomiting (especially if recurrent) #3
- Known coagulopathy or bleeding disorder #4
- Age >65 years. #5
- Seizure #6
- Prolonged loss of consciousness (>5 mins).
- Persistent post traumatic amnesia (A-WPTAS <18/18 at 4hrs post injury) #7
- Persistent abnormal alertness / behaviour / cognition #8
- Persistent severe headache.

Relative indication for CT scan if...

- Large scalp haematoma or laceration #9
- Multi-system trauma. #10
- Dangerous mechanism. #11
- Known neurosurgery / neurological impairment. #12
- Delayed presentation or representation. #13

#### Note

The presence of multiple risk factors is more concerning than a single isolated risk factor. In most uncomplicated mild head injury patients clinical symptoms start to improve by 2 hours post injury and are returning to normal by 4 hours post injury. Clinical symptoms that are deteriorating or not improving by 4 hours post injury on serial observation such as abnormal alertness / behaviour / cognition, PTA, vomiting or severe headache are very concerning.

Indication for CT scan. Continue clinical observations.

Abnormal CT scan

CT scan unavailable

Consider transfer for CT scanning particularly if:

- Persistent GCS <15.
- Deterioration in GCS.
- Focal neurological deficit.
- Clinical suspicion of skull fracture
- Known coagulopathy (esp if INR>4)
- Persistent abnormal alertness, behaviour, cognition, PTA, vomiting or severe headache at 4 hours post injury

Consult senior clinician and network neurosurgical service regarding further management and disposition. Continue clinical observations in hospital.

### Explanatory notes for risk factors

1. Using GCS<15 at 2 hours post injury allows clinical judgement for patients who present soon after injury or who have drug or alcohol intoxication. Drug or alcohol intoxication has not been shown to be an independent risk factor for intracranial injury but persistent GCS<15 is a major risk factor and mandates CT.
2. Clinical suspicion of skull fracture includes history of focal blunt assault or injury; palpable skull fracture; large scalp haematoma or laceration; signs of base of skull fracture – haemotympanum / CSF leak / raccoon eyes / Battles sign.
3. Recurrent vomiting more concerning than isolated vomiting but both are indications.
4. Known coagulopathy is both a strong indication for early CT scan and to check the INR. Early reversal of anticoagulation if abnormal CT scan and consider reversal if initially normal CT scan with high INR (>4) depending on clinical situation.
5. Elderly patients have increasing risk of intracranial injury with increasing age; routine CT scanning indicated unless totally asymptomatic patient with no other risk factors.
6. Brief generalised seizures immediately following head injury are not significant risk factors. Prolonged, focal or delayed seizures are risk factors for intracranial injury.
7. Post traumatic amnesia may manifest as repetitive questioning or short term memory deficits and can be objectively tested using the A-WPTAS. PTA > 30 mins is a minor risk factor and PTA > 4 hours a major risk factor for intracranial injury.
8. Abnormal alertness/behaviour/cognition detects subtle brain injury better than GCS and should be part of the bedside assessment. Family may help establish what is normal.
9. Multi-system trauma – beware patient with unstable vital signs or distracting injuries or who receive analgesia or anaesthesia, as significant head injury is easily missed.
10. Clinical judgement required as to what is a large scalp haematoma or laceration.
11. Dangerous – MVA ejection / rollover; pedestrians / cyclists hit by vehicle; falls >own height or five stairs; falls from horses / cycles etc; focal blunt trauma, eg bat / ball / club.
12. Known neurosurgery/neurological impairment – conditions such as hydrocephalus with shunt or AVM or tumour or cognitive impairment such as dementia make clinical assessment less reliable and may increase risk of intracranial injury.
13. Delayed presentation should be considered as failure to clinically improve during observation. For representation consider both intracranial injury and post concussion symptoms and have a low threshold for CT scanning if not done initially.