

assessment of head injury

general

patients with head injuries can be divided into those with high-risk indicators and those with minor head injuries. Clinical rules exist to help determine which patients with minor head injuries require CT scans

definite indications for imaging

High risk factors that clearly necessitate imaging include:

1. loss of consciousness for more than 5 minutes
2. depressed or decreasing level of consciousness
3. focal neurological findings
4. seizure
5. failure of mental status to improve over time in an alcohol-intoxicated patient
6. penetrating skull injuries
7. signs of a basal or depressed skull fracture

what constitutes a minor head injury?

- there is no precise definition of what constitutes a minor head injury
- normal neurological examination has been used by some experts to define a minor head injury even with brief LOC and post-traumatic amnesia
- GCS of 15 at time of assessment used by others
- GCS of 13 or higher has also been used as definition (although 40% with a GCS of 13 have an abnormal CT)

New Orleans Criteria for CTB after minor head injury:

1. headache
2. vomiting
3. age over 60 years
4. drug or alcohol intoxication
5. deficits in short-term memory
6. evidence of trauma above the clavicles

Canadian CT head rules:

- defines minor head injury as 'defined witnessed LOC, definite amnesia or witnessed disorientation in patients with a GCS of 13-15'

- the rules are:

1. GCS of less than 15 2 hours after the injury
2. suspected open or depressed skull fracture
3. more than two episodes of vomiting
4. physical evidence of basal skull fracture
5. age >65 years

- in addition there were two 'medium-risk' factors for predicting brain injury on CT:

1. amnesia for events that happened more than 30 minutes prior to injury
 2. dangerous mechanism:
 - (i) pedestrian struck by motor vehicle
 - (ii) occupant ejected from motor vehicle
 - (iii) fall from higher than 3 feet or 5 stairs
- the five 'high risk' criteria were 100% sensitive in a study of over 3000 patients

other indications for CT brain

alcohol-intoxicated patients:

- alcohol intoxicated patients have a prevalence of intracerebral injury on CT scans of 2.4-8.4%

patients with coagulopathies:

- patients taking warfarin should be worked up aggressively perhaps with overnight observation and repeat scanning (abnormal clotting predicts delayed brain injury on CT)

patients with shunt-treated hydrocephalus:

- aggressive diagnostic work-up is indicated

Infants & children:

- infants have been reported to develop intracranial haematomas despite normal initial examinations and CT scans; symptoms such as vomiting and seizures have poor specificity and sensitivity
- a number of studies show that 0.4-1.5% of children with minor head injuries require neurosurgical intervention
- no single set of clinical criteria to detect all pediatric patients with radiographic lesions has been identified and liberal use of CT scanning may be advisable despite associated risks
- risk for asymptomatic brain injury is higher in children under 6 months
- age less than 2 years is an independent risk factor for significant head injury

Age greater than 60 years is also an independent risk factor for intracranial injury