



Clinical Practice Guidelines: Trauma/Traumatic brain injury

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Date	February, 2021
Purpose	To ensure a consistent approach to the management of a patient with a traumatic brain injury.
Scope	Applies to Queensland Ambulance Service (QAS) clinical staff.
Health care setting	Pre-hospital assessment and treatment.
Population	Applies to all ages unless stated otherwise.
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Traumatic brain injury

February, 2021

Traumatic brain injury (TBI) is a significant cause of morbidity and mortality in Australia, with over 22,000 people admitted to hospital per annum. The most common causes of TBI are falls, motor vehicle accidents and assault.^[1]

The goal of pre-hospital care is to reduce secondary brain injury due to hypoxia, abnormal carbon dioxide levels and hypotension.

In areas where it is available, pre-hospital rapid sequence intubation using muscle relaxants may be beneficial.^[2] Intubation of patients without muscle relaxants, except in arrest, is harmful to TBI patients, and is not indicated.^[3]

Clinical features



- External evidence of head injury:
 - scalp abrasion, laceration, haematoma, complaining of headache
 - obvious depressed skull fracture/open head injury
 - blood from ears or nose (suggestive of base of skull injury)
 - brain matter on view is an extremely poor prognostic sign
- ALOC/focal neurology
 - reduced GCS (patients may be agitated and appear intoxicated)
 - unilateral weakness, seizure, unequal/unreactive /dilated pupils



Clinical features (cont.)

- Abnormal vital signs
 - Bradycardia and hypertension (Cushing's reflex) is a sign of raised Intracranial Pressure (ICP) and suggests imminent brain herniation.^[4]
 - Hypoxia or hypotension have important prognostic implications and receiving facilities should be informed of this.^[3]
 - Excluding hypoglycaemia is essential.

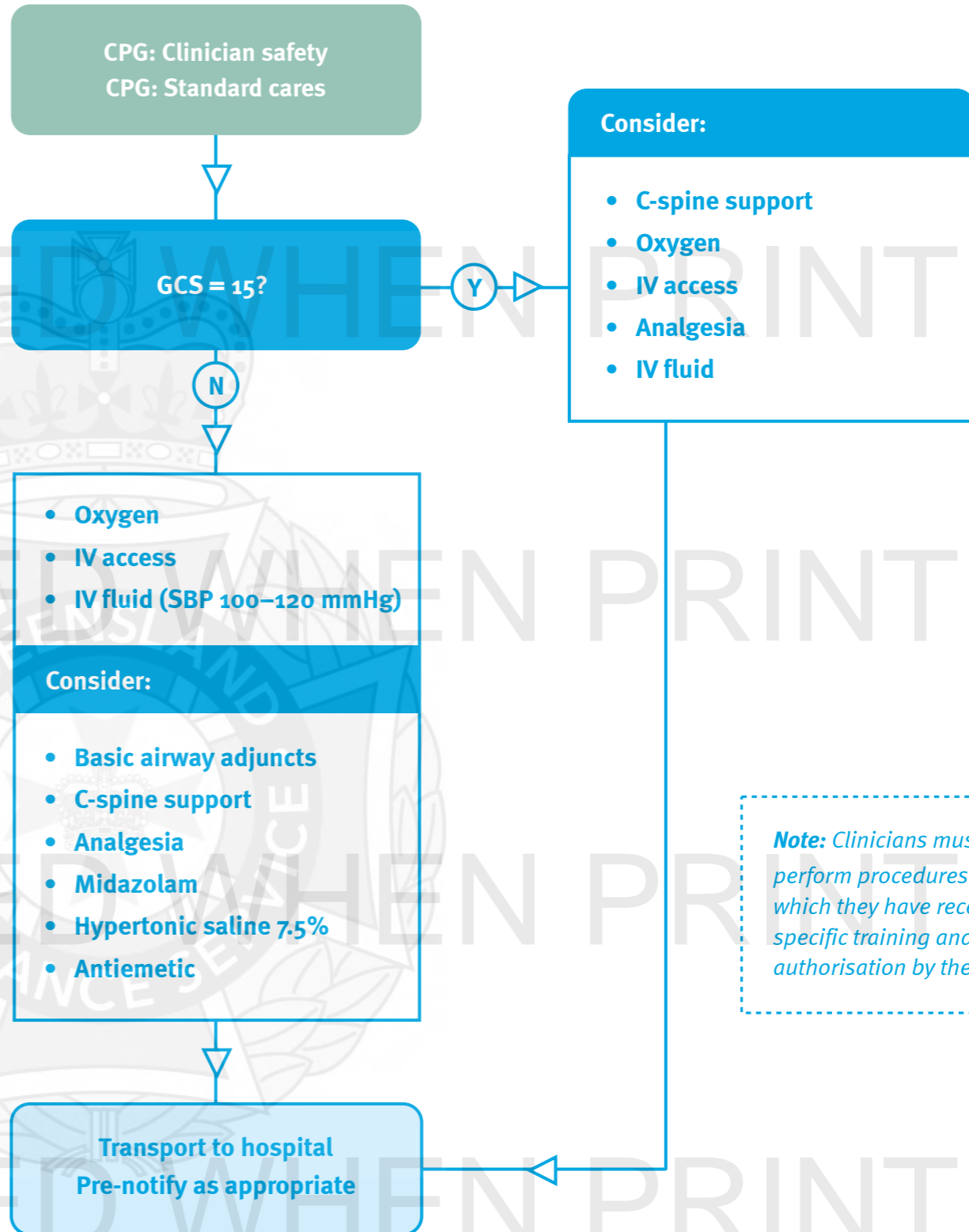


Risk assessment

- Patients receiving anti-coagulant and/or anti-platelet therapy will have an increased risk of haemorrhage.
- Any episode of hypoxia or hypotension in the setting of TBI will significantly increase morbidity and mortality.^[3]
- Hyper or hypoventilation of patients causing abnormal CO₂ levels will also impair brain perfusion (hyperventilation causes hypocapnoeic vasoconstriction; hypoventilation causes hypercapnoeic vasodilatation and raised ICP).^[5]
- It is important to avoid raised ICP from impaired venous return, by ensuring constricting tapes, ties and collars are loosened from around the neck and the patient is positioned head-up to 30 degrees if possible.^[6]

Additional information

- Support oxygenation and ventilation to prevent hypoxia and maintain normal CO₂ levels.
- Some areas may participate in trials assessing the impact of hypothermia in TBI. Except in these situations, the goal is to achieve normothermia.
- Endotracheal intubation of severely head injured patients must not be undertaken outside of the setting of rapid sequence induction unless all methods for maintaining a patent airway have failed. Inappropriate endotracheal intubation has been shown to worsen the outcome of this patient cohort.



Note: Clinicians must only perform procedures for which they have received specific training and authorisation by the QAS.