Clinical Practice Guidelines:
Trauma/Traumatic brain injury

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<th>Date</th>
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<tr>
<td>Purpose</td>
<td>To ensure a consistent approach to the management of a patient with a Traumatic brain injury.</td>
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<td>Scope</td>
<td>Applies to all QAS clinical staff.</td>
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<td>Information security</td>
<td>This document has been security classified using the Queensland Government Information Security Classification Framework (QGISCF) as UNCLASSIFIED and will be managed according to the requirements of the QGISF.</td>
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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 or 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

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 intracranial pressure (ICP)).[5]
- It is important to avoid raised ICP from impaired venous return, by ensuring constricting tapes, ties or 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 is not to be undertaken outside of the setting of rapid sequence induction unless all methods or maintaining a patent airway has failed. Inappropriate endotracheal intubation has been shown to worsen the outcome of this patient cohort.

Consider:
- Basic airway adjuncts
- C-spine support
- Analgesia
- Midazolam
- Hypertonic saline 7.5%
- Antiemetic

Note: Officers are only to perform procedures for which they have received specific training and authorisation by the QAS.

Transport to hospital
Pre-notify as appropriate