Victorian State Trauma System Guideline

Traumatic Brain Injury



Make early contact with ARV for advice from the major trauma services and to initiate retrieval.

- A patient with a decreased level of consciousness (GCS≤8) is unable to protect their airway.
- Prevention of 2° brain injury is vital in early management.
- Signs of deterioration may indicate impending herniation.

Early Activation

- · Gather vital information
- Activate Trauma Team
- Designate roles
- Set up to receive patient
- Ensure safety using PPE

Primary Survey



AIRWAY / C-SPINE

- Assess airway stability & protect as needed
- Early intubation for GCS ≤8
- Maintain full spinal precautions if susppected injury



BREATHING

- Identify & treat life threats
- Assess RR, work of breathing, SpO₂ and symmetry
- Oxygen therapy to maintain SpO₂ 94 - 98%
- Aim for ETCO₂ 35-40mmHg if intubated



CIRCULATION

- Identify & control any bleeding
- Insert x 2 large bore IV cannulas
- Assess HR/Cap Refill/BP & aim for SBP ≥110mmHg:
- Initial management of hypovolaemia - crystalloid fluids, 20mL/kg



DISABILITY

- Assess level of consciousness **AVPU**
- Check pupils
- Check **BSL** - Avoid hypoglycaemia



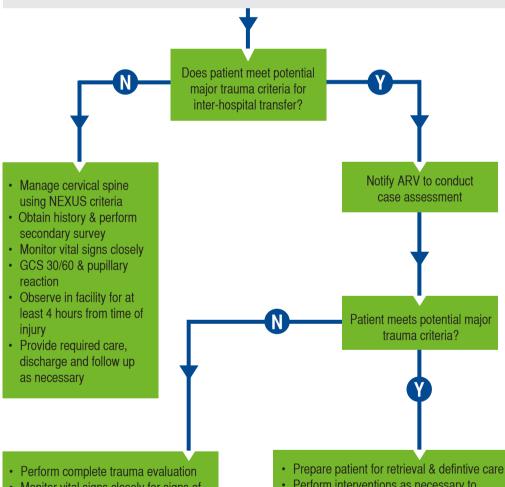
EXPOSURE / **ENVIRONMENT**

- Fully expose patient
- Ensure normothermia
- Log roll



ADJUNCTS

- FAST scan
- X rays: Chest, Pelvis
- 12 lead ECG
- Analgesia
- Bloods FBE, X-match, U&E, Lacatate, ABG
- Orogastric tube if intubated
- **AMPLE** mnemonic



- Monitor vital signs closely for signs of deterioration
- Frequently reasess ABCD
- Imaging as required
- Seek advice from ARV coordinators regarding treatment options
- Make early contact if any deterioration in patient's condition occurs
- Perform interventions as necessary to stabilise patient prior to transfer:
- Administer anticonvulsants
- Closely monitor vital signs, GCS and pupillary reaction
- Ensure clear, accurate and concise documentation
- If intubated, ensure adequate paralysis &
- Imaging as required if time and safety allows
- Communicate with ARV any new clinical developments or significant deterioration
- Communicate with & support family and

Key Points

Prevention of secondary brain injury.

It is essential to prevent secondary brain injury by maintaining oxygenation & cerebral perfusion.

Aim for:

- SpO₂ 94 98%
- ETCO₂ 35 40mmHg
- Sys BP > 110mmHg

Early Intubation

 A decreased level of consciousness puts the patient at risk of airway compromise, early intubation is recommended by a skilled practitioner. In a ventilated patient, paralysis and sedation are essential to management as it may lower ICP by reducing metabolic demand.

Signs of deterioration

Early:

- Confusion
 - Severe headache
 - Vomiting **Drowsiness**
- Agitation

Late

- Dilated pupils Seizure activity
- Decrease in GCS by 2 or more.
- Cushing's response (bradycardia and hypertension).

Management Considerations

Rapid deterioration:

If there are clinical signs of deterioration & impending herniation, contact ARV for advice regarding when to initiate the

- Hyperventilate, aiming for an ETCO₂ of 30 mmHg. Monitor the response with ETCO_a readings and/ or ABG.
- Consider osmotherapy such as Mannitol 20% / hypertonic saline.
- Emergency burr hole craniectomy may be necessary where time to definitive care is prolonged.

Anticoagulation and head trauma

- Patients on anticoagulation medication may deteriorate rapidly due to extension of their bleed. Reversal agents should be considered early.
- Contact haematologist via ARV.

Anticonvulsants

Phenytoin or Levetiracetam is indicated in the early stages following moderate to severe TBI to reduce the incidence of seizures.



1300 36 86 61 Statewide 24 hours

