Victorian State Trauma System

Traumatic Brain Injury Guideline

RAUMA VICTORIA

Make early contact with ARV for advice and to initiate retrieval.

- GCS <8
- Impending herniation
- Hypotension

Early Activation

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

Primary Survey

AIRWAY / C SPINE:
- Protect Airway
- Early intubation for GCS < 8
- Secure the airway using any available means
- Maintain full spinal precautions

BREATHING:
- Apply oxygen
- Ventilate as necessary
- SpO_2 monitoring
- $ETCO_2$ monitoring

CIRCULATION:
- Insert x 2 large bore IV cannulas
- Assess HR/BP:
- Take bloods

DISABILITY:
- Assess level of consciousness
- Check pupils
- Check BSL

EXPOSURE / ENVIRONMENT:
- Fully expose patient
- Ensure normothermia

ADJUNCTS:
- FAST scan
- X rays: Lat c spine, Chest, Pelvis
- 12 lead ECG

Prevention of secondary brain injury is best achieved by avoiding hypotension and hypoxaemia.

Does patient meet the Inter-hospital major trauma transfer criteria?

Y Yes
N No

N
- Perform secondary survey
- Monitor closely
- Observe in facility for at least 2 hours
- Provide required care, discharge and follow up as necessary

Y

Notify ARV to conduct case assessment

Transfer required?

N
- Perform complete trauma evaluation
- Monitor closely
- Observe in facility
- Take advice from ARV coordinators regarding treatment options
- Provide required care
- Contact ARV if any deterioration in patient's condition occurs

Y
- Take a history using AMPLE
- Perform any interventions as necessary to stabilise patient prior to transfer:
  - Airway Management
  - Fluid resuscitation
  - Splint limbs
  - Analgesia
- Continuously monitor patient
- Complete patient documentation
- Commence secondary survey if time allows
- Communicate with ARV any new clinical developments or significant deterioration
- Prepare patient for retrieval (see Prep'n for Retrieval Guideline)

Early Management

Prevention of secondary brain injury. Aim for:
- SpO_2 > 90%
- $ETCO_2$ 35 - 40mmHg
- Sys BP > 90mmHg

Anticonvulsants
- Indicated in the early stages following moderate to severe TBI in order to reduce the incidence of seizures.

Sedation
- Drowsy, confused or agitated TBI patients should not be sedated in the initial resuscitation unless for intubation.
- In a ventilated patient, paralysis and sedation are essential to management. Appropriate sedation may lower ICP by reducing metabolic demand.

The intoxicated patient
- Should be observed until they are **clinically** not intoxicated. Do not assume that an altered conscious state is due only to intoxication.

Anticoagulation and head trauma
- Where intracranial haemorrhage is present, patients on anticoagulation medication may deteriorate due to extension of their bleed. Consultation with ARV should take place regarding administration of reversal agents.

Signs of Deterioration

Early signs:
- Confusion
- Vomiting
- Agitation
- Severe headache
- Drowsiness

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

Rapid deterioration:

If there are clinical or CT findings of raised Intra cranial pressure / mass effect, contact ARV to speak with a trauma service and neurosurgical specialist for advice regarding when to initiate the following:
- Hyperventilate at 20 breaths / min. Aim for an $ETCO_2$ of 30 mmHg. Monitor the response with $ETCO_2$ readings or ABG.
- Consider osmotherapy such as Mannitol 20% / hypertonic saline.
- Emergency burr hole craniectomy may be necessary where time to definitive care is prolonged (ONLY WITH CONSULTATION).

Adult Retrieval Victoria
ARV
Coordinators of Critical Care Services

1300 36 86 61 Statewide 24 hours

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AMBULANCE VICTORIA