



Queensland
Trauma Education

TRAUMATIC BRAIN INJURY

Closed head injury

Immersive scenario

Participant resource kit



Developed by

Dr Frances Williamson
Emergency Staff Specialist - Metro North Hospital and Health Service

Tracey McLean
Simulation Educator - Clinical Skills Development Service

Reviewed by

Kimberly Ballinger
Simulation Educator - Clinical Skills Development Service

Education Working Group, Statewide Trauma Clinical Network - Clinical Excellence Queensland

Designed by

Rebecca Launder
Product Designer - Clinical Skills Development Service

Queensland Trauma Education**Traumatic brain injury - Closed head injury: Immersive scenario - Participant resource kit
Version 1.0**

Published by the Clinical Skills Development Service

Herston, Queensland, Australia

csds.qld.edu.au/qte

Phone +61 7 3646 6500

Email CSDS-Courses@health.qld.gov.au

© Metro North Hospital and Health Service through the Clinical Skills Development Service (CSDS) 2003 - 2021.
All rights reserved.

Disclaimer: The content presented in this publication is distributed by the Queensland Government as an information source only. The State of Queensland makes no statements, representations or warranties about the accuracy, completeness or reliability of any information contained in this publication. The State of Queensland disclaims all responsibility and all liability (including without limitation for liability in negligence) for all expenses, losses, damages and costs you might incur as a result of the information being inaccurate or incomplete in any way, and for any reason reliance was placed on such information.

Queensland Trauma Education

The resources developed for Queensland Trauma Education are designed for use in any Queensland Health facility that cares for patients who have been injured as a result of trauma. Each resource can be modified by the facilitator and scaled to the learners needs as well as the environment in which the education is being delivered, from tertiary to rural and remote facilities.

National Safety and Quality Health Service (NSQHS) Standards



About this training resource kit

This resource kit provides healthcare workers with the knowledge and skills on how to assess and manage a closed head injury following traumatic incident.

Learning objectives

By the end of this session the participant will be able to:

- Perform the assessment of a trauma patient with a closed head injury.
- Identify the need for neuroprotective measures in traumatic brain injury.
- Perform required neuroprotective treatment.
- Demonstrate early definitive management.

Supporting resources

- Clinical and radiological features of closed head injury - infographic poster.

Overview of traumatic brain injury

Traumatic brain injury (TBI) is responsible for 50% of trauma deaths and 70% of all road crash deaths.¹

Further reading

Current assessment and management guidelines:

Clinical Pathway - Closed Head Injury (Adult)

<https://qheps.health.qld.gov.au/caru/clinical-pathways/head-injury>

Neurosurgical Society of Australasia - The Management of Acute Neurotrauma in Rural and Remote Locations - A set of guidelines for the care of head and spinal injuries (page 7 - 13)

<https://pubmed.ncbi.nlm.nih.gov/10833574/>

Primary Clinical Care Manual - 10th Edition (page 175 - 180)

<https://www.publications.qld.gov.au/dataset/primary-clinical-care-manual-10th-edition/resource/9ee849ab-ba4a-49d8-a582-dfa30f1d8a96>

Criteria for early notification of trauma for interfacility transfer

<https://www.publications.qld.gov.au/dataset/f26b0c15-8dbb-40f6-9513-dc79207ed9de/resource/5f15fdf6-d2ce-439d-abaa-aff3cdfa8c5a/download/pccm-10th-edition-criteria-early-notification-trauma.pdf>

Adult Trauma Clinical Practice Guidelines: Initial Management of Closed Head Injury in Adults

- 2nd Edition https://www.aci.health.nsw.gov.au/_data/assets/pdf_file/0003/195150/Closed_Head_Injury_CPG_2nd_Ed_Full_document.pdf

Mannitol or hypertonic saline in the setting of traumatic brain injury: What have we learned?

Myles Dustin Boone, Achikam Oren-Grinberg, Timothy Matthew Robinson, Clark C. Chen, Ekkehard M.

Kasper (2015) *Surgical Neurology International* <https://www.nejm.org/doi/pdf/10.1056/NEJMra1208708>

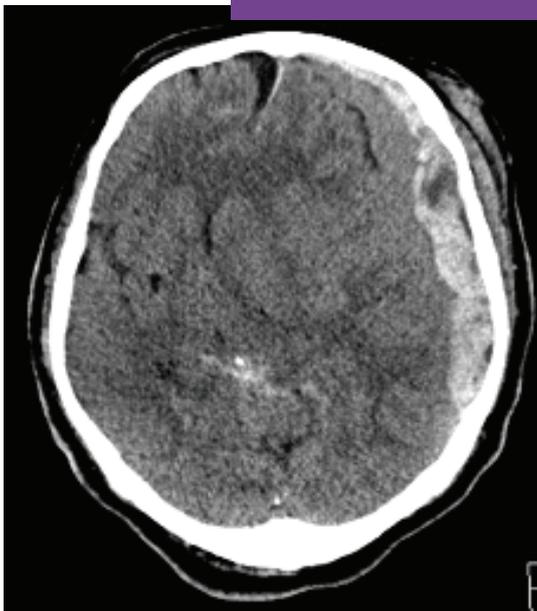
Traumatic Intracranial Hypertension. Nino Stocchetti, M.D., and Andrew I.R. Maas, M.D., Ph.D (2014) *The*

New England Journal of Medicine <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4665128/pdf/SNI-6-177.pdf>

TRAUMATIC BRAIN INJURY

Clinical and radiological features of closed head injury

Subdural haemorrhage



Clinical features

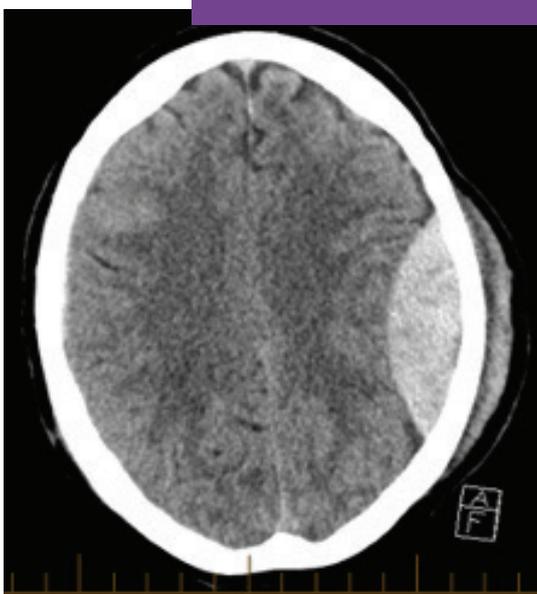
- Associated with trauma - younger patients high velocity, older patients low velocity.
- Confusion/vague neurological symptoms.
- Slower development of symptoms.
- History of anticoagulation use.

Radiological features

- Crescent shaped peripheral collection.
- Not limited by sutures.
- Fills dural reflections (falx cerebri/tentorium).
- Density can be varied (anticoagulants, acute bleed, mixed with CSF).

<https://radiopaedia.org/articles/subdural-haemorrhage-summary>

Extradural haemorrhage



Clinical features

- Associated with high energy trauma - younger patients.
- Arterial bleed - middle meningeal artery.
- Headache.
- Localising signs.
- Rapid loss of consciousness.

Radiological features

- Associated skull fracture.
- Hyperdense biconvex extra-axial collection.
- Lens (lentiform) or egg-shaped collection.
- Clearly demarcated area between brain and skull.

<https://radiopaedia.org/articles/extradural-haemorrhage-summary>

Acronyms and abbreviations

GCS	Glasgow Coma Scale
NAD	nil abnormalities
CXR	chest Xray

References

1. Neurosurgical Society of Australasia. The Management of Acute Neurotrauma in Rural and Remote Locations. A set of guidelines for the care of head and spinal injuries. Third Edition: 2009 Published by: *Neurosurgical Society of Australasia*, Tenancy 5, Level 1 550 Lonsdale Street MELBOURNE VIC 3000 © Neurosurgical Society of Australasia. <https://pubmed.ncbi.nlm.nih.gov/10833574/>
2. Subdural haemorrhage. Dr Ayla Al Kabbani and Assoc Prof Frank Gaillard. *Radiopaedia*. <https://radiopaedia.org/articles/subdural-haemorrhage?lang=us>
3. Extradural haemorrhage. Dr Ayla Al Kabbani and Assoc Prof Frank Gaillard. *Radiopaedia*. <https://radiopaedia.org/articles/extradural-haemorrhage?lang=us>

Share your feedback

Please complete our survey to help make Queensland Trauma Education better.

The survey should take no more than 5 minutes to complete.

Scan the QR code or visit this link:

<https://www.surveymonkey.com/r/3FWL3ZD>



Queensland Trauma Education
Traumatic brain injury - Closed head injury: Immersive scenario - Participant resource kit

Published by the Clinical Skills Development Service
Herston, Queensland, Australia
csds.qld.edu.au/qte
Phone +61 7 3646 6500
Email CSDS-Courses@health.qld.gov.au