Queensland Trauma Education

TRAUMA TEAMS

Trauma triage

Case discussion

Facilitator resource kit

Clinical Excellence Queensland
JAMIESON TRAUMA INSTITUTE
CSDS Clinical Skills Development Service
Queensland Government

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.

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Queensland Trauma Education
Trauma Teams – Trauma triage: Case discussion – Facilitator resource kit
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About this training resource kit

This resource kit provides a training opportunity to discuss common trauma triage challenges.

National Safety and Quality Health Service (NSQHS) Standards

Target audience

Emergency department nursing clinicians.

Duration

30 minutes.

Group size

Suited to small group participation.

Learning objectives

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

- Understand the elements of triage for trauma patients.
- Discuss the importance of understanding the mechanism of injury on triage decisions.
- Recognise the variations in special populations.

Facilitation guide

1. Use the clinical scenarios to highlight the learning objectives
2. Facilitators to adapt scenarios to local context

Supporting documents (in Printable resources)

The following supporting documents are provided for this case discussion:

1. ATMIST handover tool
2. Cardiac box diagram
3. Ballistic wound in gel

Case discussion

Case 1

A call is received at triage from the paramedic team caring for a 28-year-old male who has crashed his E-scooter. The patient is confused, has a HR 90, BP 120/80, sats 82% RA improved to 97% 15LNRB. They will be at the hospital in 10 minutes.

Case 2

A 56-year-old man self presents to triage stating he was in a car crash 4 hours prior. He was travelling on the motorway at 100km/hr when he lost control and ran into a barrier. There was significant damage to the front of his car, with no damage to the drivers capsule, and he was wearing a seatbelt. The police and ambulance were on scene and the patient declined assessment or transport. After going home he has had increasing abdominal pain where the seatbelt was.

Case 3

An 18-year-old female is brought to the ED by paramedics after being assaulted at a nightclub. She has no medical history. She has significant facial swelling and bruising around the L orbit, has blood in her mouth but is GCS 15 and able to speak normally. Her vital signs are normal with the paramedics. She has received 10mg IV morphine for pain.

Case 4

A 78-year-old man is brought to ED after a fall at home. He is on warfarin for AF. He has a haematoma to his occiput with a small laceration which is not currently bleeding. He is GCS 15, independently mobilising and does not have a headache.

Case 5

A 23-year-old man is brought to ED by the retrieval team after a tractor rolled on him at a worksite. He has been intubated and ventilated pre-hospital, his initial GCS was 8 (E1V2M5). His current vital signs are HR 120, BP 100/80mmHg, sats 100% FiO1 1.0. He has a haematoma to his L forehead, bruising across his abdomen and pelvis and an open L tibial #.

Question and answer guide

1. What factors contribute to triage decisions in trauma?

Trauma triage, like all Emergency Department triage processes, aims to identify patients that require treatment in order of priority.

Understanding the impact of injury mechanism, physiological response and predictable outcomes in trauma will guide decision making.

Additionally, some patient specific factors may change the triage categorisation due to risk of deterioration, e.g. anticoagulation in suspected traumatic brain injury.

2. What role does patient vital signs impact triage decisions?

Consistent with general triage principles, abnormal vital signs will dictate resource allocation required for the patient.

In addition to haemodynamic parameters- HR and BP, any administration of pre-hospital blood and blood products, history of traumatic cardiac arrest or penetrating injury should prompt a trauma team response.

3. Why is mechanism important?

Understanding the trauma mechanism is important as it will help identify and risk stratify the patient allowing for early detection and management of injuries. Trauma results from the transfer of kinetic energy into the patient and certain mechanisms will result in predictable patterns of injury.

Mechanism of injury is initially divided into blunt and penetrating. Blunt encompasses the majority of trauma in Australia and result primarily from falls, vehicle crashes, pedestrian vs vehicle collisions and animal related trauma. Penetrating trauma is less common and results from stabbings and gunshot wounds.

Blunt trauma occurs due to compression forces, with acceleration and deceleration forces applied to the body. This results in stretching and shearing of tissues, often between fixed and mobile structures. This can result in injury to organs, blood vessels and nerves and tissues.

Understanding the forces applied to the body will aid in diagnostic focus- for example:

a. Lateral compressive forces following a T-bone motor vehicle crash. This will result in forces applied to one side of the body and result in ipsilateral pelvic fractures, soft tissue haematomas, rib fractures and haemo-pneumothorax.
b. Frontal impact from a head-on motor vehicle crash are more likely to result in bowel injury, splenic bleeding, and external bruising in seatbelt pattern.

Some additional associations are recognised in blunt injury:

a. Lateral impact collisions whilst uncommon are associated with increased risk of aortic injury
b. Unbelted occupants of a vehicle have a higher risk of severe injury with increased contact with the windshield and dashboard
c. Motor bike collisions are associated with open book pelvic injury and high falls with vertical shear pelvic injuries

Penetrating injury can be categorised into ballistic (gunshot) and non-ballistic (knife) wounds. Damage is related to the wounding instrument, the velocity and the tissue in which it passes though. For example- the damage created by a ballistic injury will create a cavity and shock waves through the tissues from pressure waves. The pressure expansion stretch and rupture nearby tissues and blood vessels. The cavity created may be 10-15 times that of the bullet with fragments that break off creating further damage by rotating through the tissues.

Knife wounds do not have the same crushing force to tissues, however predicting the tract can be difficult, with depth assessment unreliable. Of concern are penetrating injuries to the 'box' – with significant harm from injury to heart, great vessels, lung and abdominal injuries possible. In penetrating trauma patients should have a focussed examination in high-risk areas- groin, axilla, neck and back.

4. What are high risk injury mechanisms?

Patients who sustain high velocity transfer of force are at higher risk of significant injury. Examples include:

Vehicle crash >60km/hr, Ejection from a vehicle, Fall > 3 metres, large animal related injury.

Other mechanism of injury that may lead to deterioration include:

- Burns >20% or explosion, near drowning, attempted hanging, crush/entrapment.
- Penetrating trauma to the 'box', junctional areas and the neck.

5. How do trauma activation protocols add to triage decisions?

In many hospitals trauma activation protocols add to the triage decision. Your hospital may have a single- or two-tier activation process.

In a two-tier protocol, the risk delineation is often related to mechanism criteria vs physiological abnormalities. The higher trauma activation being reserved for abnormality of physiological parameters in the patient.

In the higher activation process- often called ‘Trauma Respond/Trauma Attend’- the activation will engage ‘outside’ services in addition to the normal Emergency Department staff. This may include surgeons, anaesthetists, intensive care, theatres, blood bank and radiology. The composition of the team will vary at each institution.

6. What format is used in trauma handover?

An ATMIST handover is used in trauma care. This will cover important information to help guide triage decisions. Additional information may be sought as required, including past medical history and allergies.

7. What about special populations - older, paediatrics, obstetrics?

Yes! Age and normal physiological changes with pregnancy should be considered when assessing the trauma patient.

Older patients are more at risk of injury with seemingly minor trauma. In addition, they often have co-morbidities which lead to reduced reserve when injured and may be taking multiple medications which alter their response to injury or complicate management. In many trauma activation protocols patients are included with lower mechanism injury of they are older than 65 years or frail.

Children, whilst less likely to sustain severe trauma, have different patterns of injury due to their body size and proportions, with additional challenges relating to size-based equipment and medications.

Pregnant patients have the additional challenge of two patients to consider. It is recognised that for best foetal outcomes, maternal care should be optimised. Obstetric criteria generally apply to gestations >20 weeks/fundus above umbilicus, as at this stage the foetal size may compromise maternal resuscitation due to pressure on the IVC and maternal physiological changes.

Acronyms and abbreviations

Term	Definition
ETEK	Emergency Triage Education Kit
ED	Emergency Department
NRB	Nonrebreather mask

References

1. ETEK - Emergency Triage Education Kit. https://www.health.gov.au/resources/collections/emergency-triage-education-kit
2. Triage, ACEM. Australasian College for Emergency Medicine. https://acem.org.au/Content-Sources/Advancing-Emergency-Medicine/Better-Outcomes-for-Patients/Triage

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