Queensland Trauma Education

ABDOMINAL TRAUMA

Management of blunt abdominal trauma – splenic injury

Immersive scenario

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
Abdominal Trauma – Management of blunt abdominal trauma – splenic injury: Immersive scenario – Facilitator resource kit
Version 2.0

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About this training resource kit

This resource kit provides healthcare workers with the knowledge and skills to assess and manage a patient with blunt abdominal trauma.

National Safety and Quality Health Service (NSQHS) Standards

Target audience

Emergency department medical and nursing clinicians.

Duration

45-60 minutes.

Group size

Suited to small group participation (or team composition to local area).

Learning objectives

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

- Demonstrate the effective assessment of a patient with blunt abdominal trauma.
- Recognise and effectively manage a patient with haemodynamic compromise

Facilitation guide

1. Facilitator to discuss the pre-simulation briefing and deliver the immersive scenario on blunt abdominal trauma.
2. Utilise the supporting documents to maximise the learning throughout immersive scenario.
3. Utilise the debriefing guide to evaluate participant performance and provide feedback.

Supporting resources (in Printable Resources)

1. Structured assessment in trauma - infographic poster
2. Pre-simulation briefing poster
3. Statewide MHP
4. EFAST: Splenorenal/LUQ: Positive.

5. EFAST: Pelvis: Negative.
6. EFAST: Subxiphoid/cardiac: Negative.
7. Chest XRAY: NAD.
8. Pelvic XRAY: NAD.
9. ROTEM: Trauma induced coagulopathy (TIC)

Simulation event

This section contains the following:

1. Immersive scenario
2. Resource requirements
3. Handover card
4. Scenario progression
    a. State 1
    b. State 2
    c. State 3
    d. State 4
5. Debriefing guide

Immersive scenario

Type	Immersive scenario
Target audience	Emergency department medical and nursing clinicians
Overview	26-year-old female restrained driver travelling at 60km/hr versus a telegraph pole. Initially encapsulated and transported to ED complaining of diffuse abdominal pain with obvious seatbelt bruising to abdomen. Her haemodynamic state worsens, requiring initiation of fluid resuscitation, activation of MHP and definitive care.
Learning objectives	• Demonstrate the effective assessment of a patient with blunt abdominal trauma. • Recognise and effectively manage a patient who is haemodynamically unstable suffering blunt abdominal injury.
Duration	45 minutes, including debrief.

Resource requirements

Physical resources

Room setup	Resus bay in emergency.
Simulator/s	1 manikin – SimMan 3G/ ALS simulator.
Simulator set up	• Street clothes lying supine. • Cervical collar and pelvic binder insitu. • Moulage: driver seatbelt bruising/abrasion to abdomen. • HM 10L/min insitu.
Clinical equipment	• Standard Precautions PPE. • Resus/trauma bay role identification stickers (if applicable to local area). • Standard Resus bay equipment: Monitors, Resus trolley, Infusion pumps, blood warmers. • Fluids/blood products: N/saline, Hartmanns, Packed Red blood cells/blood components. • Medications: IV analgesia, Tranexamic Acid 1g
Access	2 x PIVC setups. 16G cannula L) ACF with empty N/S 0.9% 250ml bag, No IV sticker attached to R) arm.
Other	ED chart and relevant paperwork.

Human resources

Faculty	2 facilitators (doctor/nurse with debriefing experience) to take on roles of scenario commander and primary debrief.
Simulation coordinators	1 for manikin set up and control of simulator.
Confederates	Junior RN and optional QAS officer for handover.
Other	Trauma team composition - 2 nurses and 3 doctors in room (or team composition applicable to local area).

Handover card

Handover from ambulance officer

This is Anna. Anna is 26 years old and is the driver of a single occupant RTC about 2 hours ago. She states she swerved to avoid a dog at 60km/hr in the street and crashed into a telegraph pole snapping it in half. She was encapsulated until the Fire Service could remove her door. She was wearing a seatbelt and the airbags deployed.

She has always been GCS 15, alert and complaining of pain in her abdomen. Her heart rate was initially within normal limits, but during the trip to hospital she became more tachycardic and her vital signs are now: HR 120, BP 110/80, sats 100% 10L/min HM and respiratory rate 22. She is afebrile and her BSL is 7.

We have placed a 16G cannula in her L ACF and given her 10mg IV morphine in total, 8mg IV ondansetron and 250mls N/Saline IV. She has a cervical collar for mechanism but had no neurological deficits or neck pain.

She has no known past medical history and no known allergies.

Thank you for continuing her care.

Scenario progression

<table>
<tr><th colspan="4">STATE 1: INITIAL ASSESSMENT</th></tr>
<tr><th colspan="2">Vital signs</th><th>Script</th><th>Details</th><th>Expected actions</th></tr>
<tr><td>ECG</td><td>ST</td><td rowspan="9">Anna
Can I have more pain relief? My belly hurts.</td><td rowspan="9">Primary survey results

A intact, maintaining own

B equal breath sounds, no chest wall tenderness/crepitus or subcutaneous emphysema.

C cool peripherally, pink, equal radial pulses.

D GCS 15, PEARL 3mm, nil neurological deficits.

E temp and BSL NAD</td><td rowspan="9">Commence Primary Survey
❑ Recognise the abnormality in circulation.
❑ Gain further IV access.
❑ Call for help – identify available resources relevant to local area.

Management
❑ Provide analgesia.</td></tr>
<tr><td>HR</td><td>120</td></tr>
<tr><td>SpO_2</td><td>100%
10L/min
HM</td></tr>
<tr><td>BP/ART</td><td>110/80</td></tr>
<tr><td>RR</td><td>22</td></tr>
<tr><td>Temp</td><td>36.5</td></tr>
<tr><td>BGL</td><td>7</td></tr>
<tr><td>GCS</td><td>15</td></tr>
<tr><td></td><td></td></tr>
</table>

<table>
<tr><th colspan="4">STATE 2</th></tr>
<tr><th colspan="2">Vital signs</th><th>Script</th><th>Details</th><th>Expected actions</th></tr>
<tr><td>ECG</td><td>ST</td><td rowspan="9">Anna
Ongoing c/o pain to abdo, distressed by pain.
Moaning.

Confederate
Point out seatbelt bruising to abdo.</td><td rowspan="9">• Worsening distress from pain if no
• analgesia given.
• Increase tachycardia and hypotension if no recognition of circulatory compromise.

Secondary survey results

Abdomen – diffusely tender, seatbelt abrasion across abdomen, no wounds.

Pelvis – non-tender, bony margins aligned.

Long bones – no deformity, non-tender.

Log roll – nil bony midline tenderness, no bruising/wounds, perianal sensation normal.</td><td rowspan="9">Secondary survey
❑ Recognition of abdominal injury.
Initiate investigations
❑ Blood tests: FBE, chem20, lipase, coags, blood group and hold/XMatch, ROTEM/TEG (if applicable).
❑ Point of care tests: Hemocue, iStat CG4 (if applicable).
❑ Bedside tests: UA, ECG, VBG, BHCG.
❑ Imaging: CXR, pelvis Xray and EFAST.
Management
❑ Commence fluid resuscitation.
• Initiate crystalloid bolus.
❑ Discuss minimising crystalloid – plan for haemostatic resuscitation.</td></tr>
<tr><td>HR</td><td>120</td></tr>
<tr><td>SpO₂</td><td>99%
10L/min
HM</td></tr>
<tr><td>BP/ART</td><td>90/60</td></tr>
<tr><td>RR</td><td>24</td></tr>
<tr><td>Temp</td><td>36.5</td></tr>
<tr><td>BGL</td><td>7</td></tr>
<tr><td>GCS</td><td>15</td></tr>
<tr><td></td><td></td></tr>
</table>

STATE 3				
Vital signs		**Script**	**Details**	**Expected actions**
ECG	ST	**Anna** What's going on… I am in so much pain, can you help me? *Moaning.*	Progression of hypotension and circulatory collapse despite fluid and haemostatic resuscitation. **Results** EFAST: positive free fluid in splenorenal angle.	**Assessment** ❑ Worsening circulatory collapse SBP<90. **Investigations** ❑ Positive EFAST for free fluid. **Management** ❑ Commence Haemostatic resuscitation. • Commence PRBC. • Administer Tranexamic Acid 1g. ❑ Activate massive haemorrhage protocol or give blood products as per local guidelines. **Referral for surgical management or consult RSQ for retrieval.**
HR	120			
SpO_2	99% 10L/min HM			
BP/ART	70/40			
RR	28			
Temp	36.5			
BGL	7			
GCS	14			

STATE 4				
Vital signs		**Script**	**Details**	**Expected actions**
ECG	ST	**Phone call from surgeon to trauma bay:** *"We won't be able to take this patient to OT, we've got someone open on the table and no anaesthetist backup. You will have to keep this patient in your department."*	**Discussion with surgeon for operative management.** Senior participants: • push back from surgical team for OT >30minutes to table • interpretation of ROTEM/TEG	**Management** ❑ Use of TEG/ROTEM for guided haemostatic resuscitation.
HR	120			
SpO_2	99%			
BP/ART	70/40			
RR	28			
Temp	36.5			
BGL	7			
GCS	14			

Debriefing guide

Scenario objectives

- Demonstrate the effective assessment of a patient with blunt abdominal trauma.
- Recognise and effectively manage a patient who is hemodynamically unstable suffering blunt abdominal injury.

Example questions

Exploring diagnosis

- What role does an EFAST play in the assessment of blunt trauma?
- When should an EFAST be performed?
- What is a ‘positive’ EFAST?
- Have you seen a Diagnostic Peritoneal Aspirate/Diagnostic Peritoneal Lavage performed?
- Do you always need a CT scan to confirm the injury profile?
- What blood tests are useful for diagnosis of injury in blunt trauma cases?
- What constitutes a Massive Haemorrhage Protocol (MHP)?
- How do you activate a Massive Heamorrhage Protocol in your facility?
- What end points do you use to determine the massive transfusion?
- What is a ROTEM/TEG?
- How do you interpret the ROTEM/TEG?

Discussing management

- How would you approach this scenario in your department?
- Are there any protocols or guidelines to seek urgent help?
- What are your strategies if you encounter a difference of opinion from the surgical team?

Key moments

- Recognition and response to hypotension in trauma.
- Utilisation of bedside investigations to identify bleeding source.
- Early referral to surgical team or retrievals/tertiary facility for definitive care.
- Use of adjunct investigations to provide haemostatic resuscitation for critically bleeding trauma patient.

Acronyms and abbreviations

Term	Definition
MHP	Massive haemorrhage protocol
PRBC	Packed red blood cells
OT	Operating theatre
EFAST	Extended focussed assessment with sonography in trauma
VBG	Venous blood gas
UA	Urinalysis
ECG	Electrocardiogram
CXR	Chest Xray
FBE	Full blood examination
NAD	Nil abnormalities detected
BHCG	Beta-human chorionic gonadotropin

References

1. Australian Trauma Quality Improvement (AusTQIP) Collaboration (2019*). Australia New Zealand Trauma Registry, Management of the Severely Injured, 1 July 2017 to 30 June 2018.* Alfred Health. https://static1.squarespace.com/static/5b761ed3f93fd491065f7839/t/5f5ede7f02b4ba0be6129464/1600052899945/ATR_Annual+Report_18-19_FINALAUGUST_web.pdf
2. Diercks, D. B. & Clarke, S. O. (2016). *Blunt abdominal trauma in adults: initial evaluation and management.* Up To Date. http://www.uptodate.com/contents/initial-evaluation-and-management-of-blunt-abdominal-trauma-inadults

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