Trauma Scenario 3 Refresher Course

This is a Teaching Scenario. Some flexibility in how it progresses is possible according to individual learner needs

History {initial candidate briefing prior to arrival of child}

A 10-year-old girl is shot in the left chest in a drive-by drug related shooting.
Found at side of road and brought in by ambulance.
Estimated weight 30 kg

Initial impression {provide information as candidate assesses child and applies monitoring}

RR 34. HR 120. BP 100/65. SpO_2 96% in air. She is agitated, crying, calling for her mother. GCS 15 (E 4, M 5, V 4).

Clinical Course {to be given to candidate as they progress}

The child initially is stable with oxygen. She has a small sucking chest wound on the left side of her chest. Decreased A/E. No tamponade. Epigastric tenderness. No exit wounds on log roll.

Subsequently RR rises and SaO_2 falls and there is decreased AE on the left side as a pneumothorax enlarges. Perfusion deteriorates and HR rises. BP starts to drop.
DDx – hemo-pneumothorax, tamponade, haemorrhagic shock, spinal shock. FAST -ve.
Haematemesis occurs.

INSTRUCTORS INFORMATION

Key Treatment Points ☑

<C>	Assess for and control external bleeding	
Airway & C spine	Establish airway patency	
	Protect cervical spine	
	High flow O2 via face mask commenced early Titrate O2 therapy to SpO2 94-98% when stable	
Breathing	3 sided or ported occlusive dressing followed by ICC	
Circulation	Early IV access X 2 wide-bore cannula	
	Blood for cross-match etc	
	Urgent surgical consult for penetrating injury mx. Focus is urgent surgery.	
	Fluid bolus 10 mls/kg x 2 warmed crystalloid/blood TXA	
	Massive transfusion protocol	
General Therapy	Analgesia	
	Arrange CXR and AXR to ascertain bullet passage and likely organ injury. Pelvic x-ray not appropriate in penetrating injury.	

Diagnosis; Left pulmonary contusion with open pneumothorax. Hypovolemic shock.
Stomach laceration.

Learning objectives

At the end of this session participants should be able to:

- Apply the structured approach to assessment, management and diagnosis of penetrating trauma and shock
- Recall, classify and apply the differential diagnosis of hypotension in penetrating trauma
- Recall the management of open chest wounds
- Recall and apply the management of hypovolemic shock and massive transfusion in their own practice

Potential Issues to be Discussed

- Principles of resuscitation in penetrating trauma and shock
- Penetrating trauma, shock and the role of urgent surgery
- Massive transfusion
- DDx of hypotension in penetrating trauma including hypovolemia, tension pneumothorax, tamponade, spinal shock
- Management of open chest wound

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Open pneumothorax

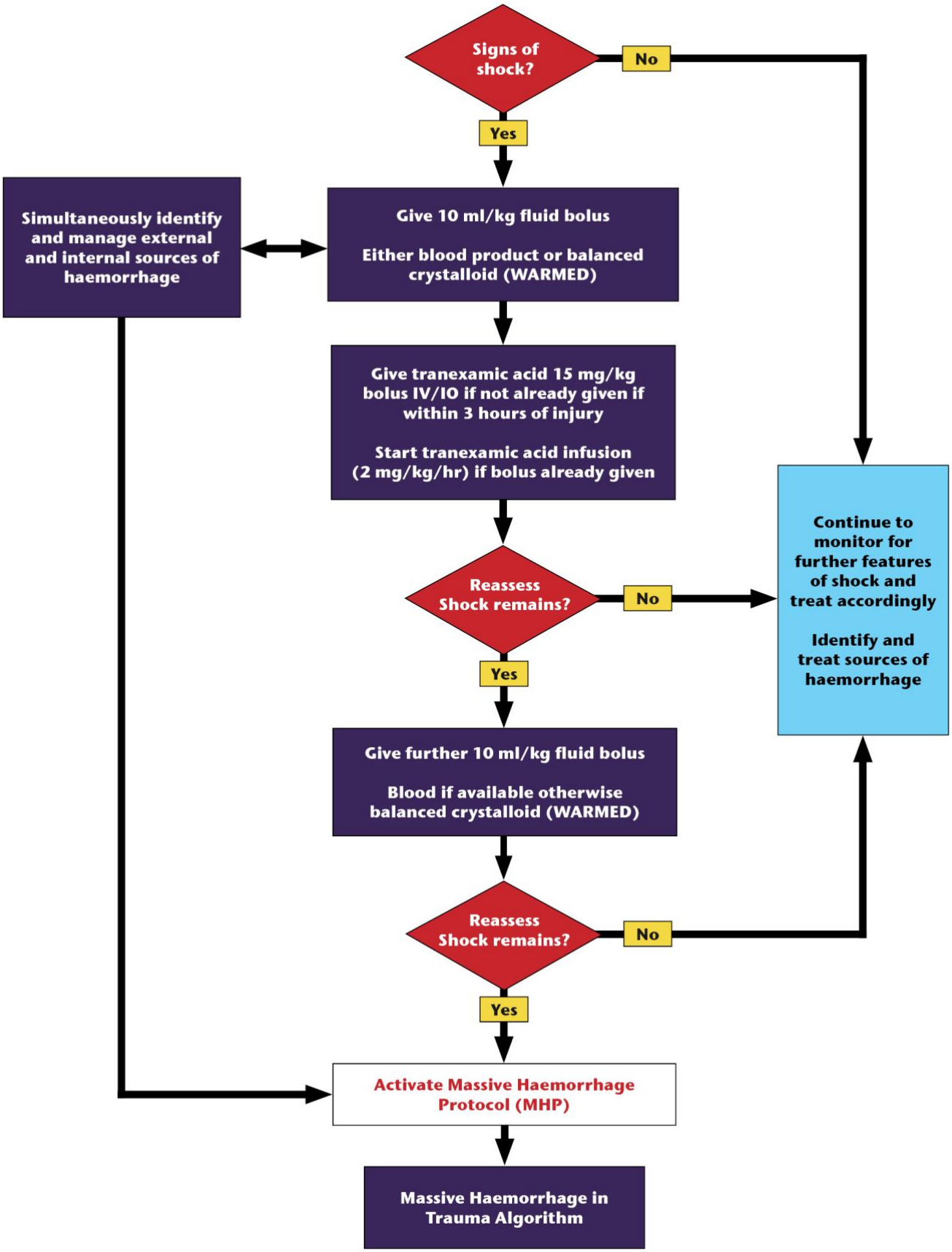
In this situation there is a penetrating wound in the chest wall with associated pneumothorax. The wound may be obvious, but if it is on the child's back it will not be seen unless actively looked for. If the diameter of the defect is greater than about one-third of the diameter of the trachea, air will preferentially enter the pleural space via the defect rather than be drawn into the lungs via the trachea when the child takes a breath. It is then referred to as a sucking chest wound.

Signs

Air may be heard sucking and blowing through the wound
The other signs of pneumothorax will be present
There may be an associated haemothorax (i.e. a haemopneumothorax)
POCUS of the chest may be useful

Resuscitation

High-flow oxygen should be given through a reservoir mask
The immediate treatment for a sucking wound is to occlude the wound site by using a ported chest seal, provided that the defect is not larger than the base of this device (Figures 9.4 and 9.5). If a ported seal is unavailable, use a three-sided occulsive dressing (Figure 9.4)
A chest drain will be required as part of emergency treatment. It should not be inserted through the defect itself, as this may spread contamination and restart bleeding


Signs of shock?
No
Yes
Simultaneously identify and manage external and internal sources of haemorrhage
Give 10 ml/kg fluid bolus
Either blood product or balanced crystalloid (WARMED)
Give tranexamic acid 15 mg/kg bolus IV/IO if not already given if within 3 hours of injury
Start tranexamic acid infusion (2 mg/kg/hr) if bolus already given
Reassess Shock remains?
No
Yes
Continue to monitor for further features of shock and treat accordingly
Identify and treat sources of haemorrhage
Give further 10 ml/kg fluid bolus
Blood if available otherwise balanced crystalloid (WARMED)
Reassess Shock remains?
No
Yes
Activate Massive Haemorrhage Protocol (MHP)
Massive Haemorrhage in Trauma Algorithm