APLS: Trauma Scenario 5

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 5 year old boy ran out in front of a car. It swerved, but still hit him. He was thrown to the ground unconscious and has not woken up since. He was brought to hospital by ambulance.
Estimated weight 20 kg.

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

Unconscious, but initially responding to pain, blood in hair, from right ear, and on right lower leg. Cervical collar in place. Gurgling when breathing. SpO_2 92% in air. HR 130, RR 30, CRT <2, BP 100/65. Pelvic binder in situ.

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

Remains unconscious, when candidate checks the pupils the right is dilated. Movements of the neck result in hypotension and paralysis. The airway remains partially obstructed until suction and insertion of an oropharyngeal airway.
Intubation is necessary to secure the airway and control CO_2 and oxygenation.

INSTRUCTORS INFORMATION

Key Treatment Points ☑

<C>	Assess for and control external bleeding	
Airway & C-spine Breathing	Establish airway patency/suction /OPA	
	Protect cervical spine	
	High flow O2 via face mask commenced early Titrate O2 therapy to SpO2 94-98% when stable	
	Arrange for urgent intubation and ventilation with $ETCO_2$ monitoring	
Circulation	Early IV access with 2 wide-bore cannula	
	Blood for cross-match etc	
General Therapy	Urgent head CT Consideration of other measures to maintain cerebral perfusion Urgent Neurosurgical consultation	

Diagnosis:
Head injury with right parietal skull fracture and extradural haematoma.
Fractured C3/4. Fractured right tibia and fibula

Learning objectives

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

- Apply the structured approach to assessment, management and diagnosis of trauma, head injury and cervical spine injury
- Recall and apply the management of traumatic brain injury in their own practice

Instructor Information

Measures to increase cerebral perfusion and decrease ICP temporarily

7th Ed pp 170

- Nurse in the 20° head-up position and head in midline to help venous drainage
- Ventilation to achieve a *P*aCO_2 of 30–34 mmHg*
- Infusion of intravenous mannitol 0.25–0.5 g/kg
- or 3% hypertonic saline (3 ml/kg)
- Combat hypotension if present with crystalloid/blood infusion and inotropes if necessary
- Note this level is lower than normal because it is a temporary, short-term, urgent intervention.

APLS: Trauma Scenario 6

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 7 year old boy was building a tree house about 3 metres from the ground, when he fell from the tree and impaled himself on a metal stake in the garden. He screamed of excruciating abdominal pain leading his mother to pull the metal stake out of him and call for an ambulance.
Estimated weight 25 kg.

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

On arrival, the boy is screaming and writhing in agony. RR 30, SpO_2 95% in air. HR 135, BP 109/71, Pale and sweaty, CRT 5. Single non-bleeding, penetrating wound left flank. Extremely tender abdomen. Cervical soft collar in place.

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

He then deteriorates with worsening perfusion and increasing tachycardia. He becomes agitated and combative then unresponsive, vomits and aspirates.
His SpO_2 falls – improves with suction, BVM ventilation with 100% O_2.
Perfusion improves with TXA and 3 x 10 ml/kg crystalloid and/or blood. His penetrating wound, tender & distended abdomen and haemodynamics indicate the need for urgent surgical consultation.

INSTRUCTORS INFORMATION

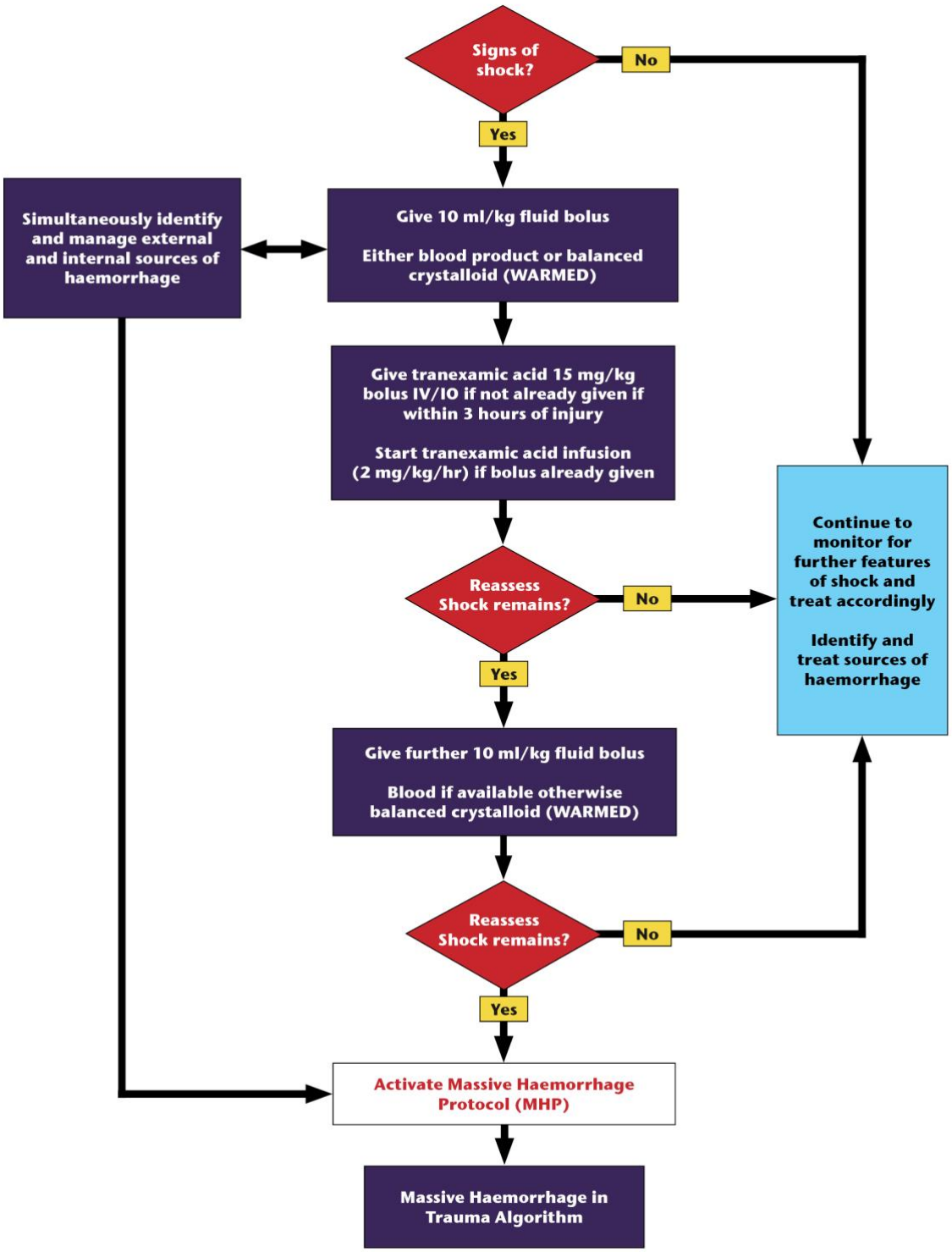
Key Treatment Points ☑

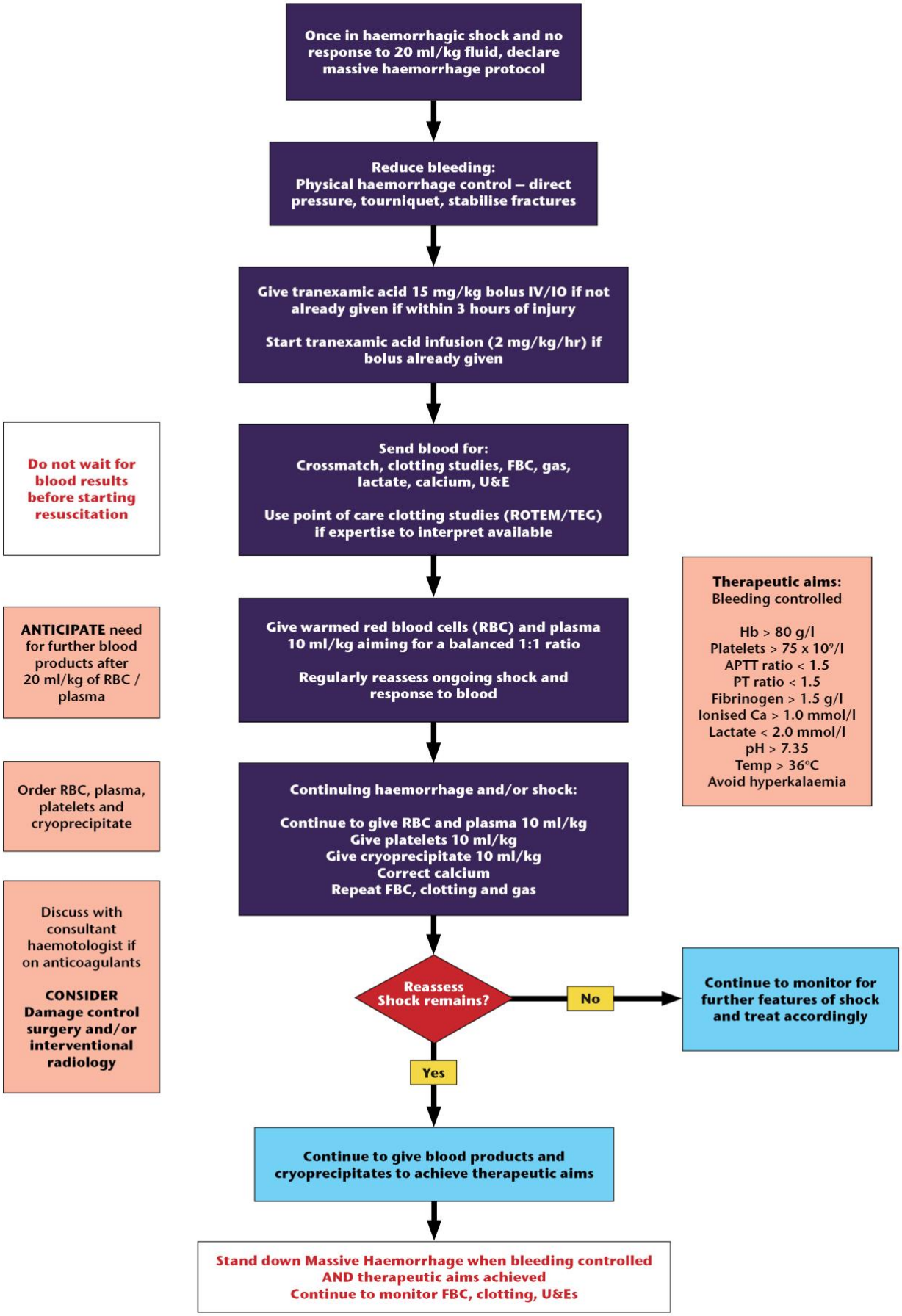
<C>	Assess for and control external bleeding	
Airway & C-spine	Establish airway patency, suction	
Breathing	Protect cervical spine (fall from a height)	
	High flow O2 via face mask commenced early Titrate O2 therapy to SpO2 94-98% when stable	
	BVM ventilation with 100% O2	
	Arrange for intubation and ventilation	
Circulation	Early IV access with wide-bore cannula x 2	
	Blood for cross-match etc	
	Fluid bolus 10 mls/kg x 3 warmed crystalloid/blood, TXA	
	Massive transfusion protocol	
General Therapy	Analgesia and sedation Broad spectrum antibiotics Arrange for urgent surgical assessment ICU / Retrieval service	
Diagnosis; Hypovolemic shock from penetrating injury of left kidney and spleen. Enlarging retroperitoneal haematoma. Laceration of left colon with early peritonitis.		

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 and apply the management of hypovolemic shock and massive transfusion in their own practice




Once in haemorrhagic shock and no response to 20 ml/kg fluid, declare massive haemorrhage protocol
Reduce bleeding:
Physical haemorrhage control – direct pressure, tourniquet, stabilise fractures
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
Send blood for:
Crossmatch, clotting studies, FBC, gas, lactate, calcium, U&E
Use point of care clotting studies (ROTEM/TEG) if expertise to interpret available
Do not wait for blood results before starting resuscitation
Give warmed red blood cells (RBC) and plasma 10 ml/kg aiming for a balanced 1:1 ratio
Regularly reassess ongoing shock and response to blood
ANTICIPATE need for further blood products after 20 ml/kg of RBC / plasma
Therapeutic aims:
Bleeding controlled
Hb > 80 g/l
Platelets > 75 x 10⁹/l
APTT ratio < 1.5
PT ratio < 1.5
Fibrinogen > 1.5 g/l
Ionised Ca > 1.0 mmol/l
Lactate < 2.0 mmol/l
pH > 7.35
Temp > 36°C
Avoid hyperkalaemia
Continuing haemorrhage and/or shock:
Continue to give RBC and plasma 10 ml/kg
Give platelets 10 ml/kg
Give cryoprecipitate 10 ml/kg
Correct calcium
Repeat FBC, clotting and gas
Order RBC, plasma, platelets and cryoprecipitate
Reassess
Shock remains?
No
Continue to monitor for further features of shock and treat accordingly
Yes
Discuss with consultant haemotologist if on anticoagulants
CONSIDER
Damage control surgery and/or interventional radiology
Continue to give blood products and cryoprecipitates to achieve therapeutic aims
Stand down Massive Haemorrhage when bleeding controlled
AND therapeutic aims achieved
Continue to monitor FBC, clotting, U&Es