

# APLS Review of Seriously Injured Child 7e 2025

Slide 1



Time needed- 3mins for 1<sup>st</sup> 3 slides  
Review Instructor notes for each slide

50 minutes – interactive session – with whole candidate group

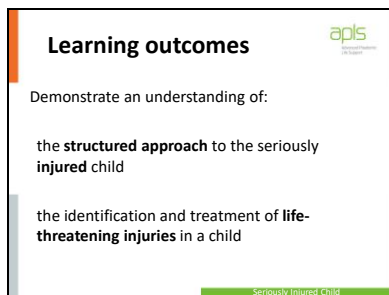
## Requirements

- 4 assistant instructors with appropriate prompting materials needed. One for each group.
- Powerpoint slide set
- Handouts to groups
  - Pencils
  - Activity 1 and 2 on A3
  - Activity 3 on A3

## Environment/Set

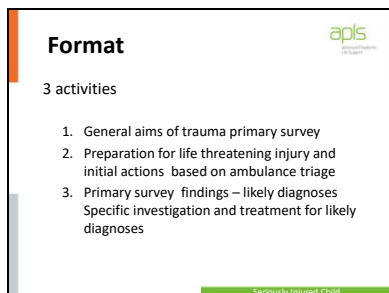
- Allow candidates to get themselves into 4 groups
- One instructor allocated per group

Slide 2



Read as on slide

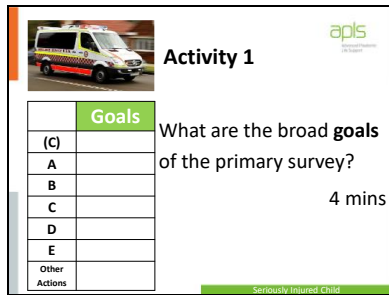
Slide 3



Read as on slide

Time 03mins (Time 03 mins at completion)

Slide 4



**Activity 1**

What are the broad goals of the primary survey?

4 mins

Goals
(C)
A
B
C
D
E
Other
Actions

**Activity 1 – Goals of the Primary Survey**

Time needed 04 mins (Running time 7 mins at completion)

4 min breakout  
Small group activity

**Handout proforma – Activity 1**

**The groups may write on the A3**

Introduce the following

**‘List the goals of each component of the structured approach of the primary survey’**

A facilitator is allocated to assist

**Start the groups at different places. This ensures all areas are covered well. They have to listen though as the area they are allocated next will be different**

They should try and get through all goals but will be responsible for reporting back on the one they started on Allocate 1<sup>st</sup> group start with A, 2<sup>nd</sup> Group B, 3<sup>rd</sup> group C, 4<sup>th</sup> group D/E/Other. **1 facilitator per group with 4 slide handout to keep group on track.**

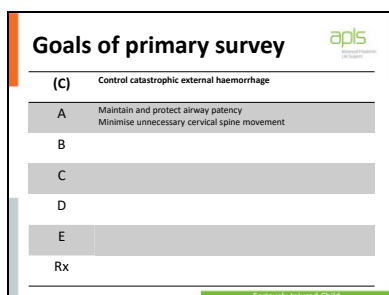
**•Activity 1 – Primary Survey Goals**

**•Review the goals of each component of the structured approach**

**•This section is not about specific diagnoses – but rather the broad physiologic goals**

-Bring groups back together for plenary discussion with the next slide

Slide 5



**Goals of primary survey**

(C)	Control catastrophic external haemorrhage
A	Maintain and protect airway patency Minimise unnecessary cervical spine movement
B	
C	
D	
E	
Rx	

**-Start at 7 min**

-Time needed 5mins to complete this exercise (Running time 12 mins at completion)

-As per slide

-Each group has a representative speak loudly and clearly

-After group has presented display ‘correct response’

# APLS Review of Serious Injured Child 7e 2025

Slide 6

Goals of primary survey	
(C)	Control catastrophic external haemorrhage
A	Maintain and protect airway patency Minimise unnecessary cervical spine movement
B	Maintain oxygenation Maintain ventilation
C	
D	
E	
Rx	

- Time needed 5mins to complete this exercise (Running time 12 mins at completion)
- As per slide
- Each group has a representative speak loudly and clearly
- After group has presented display 'correct response'

Slide 7

Goals of primary survey	
(C)	Control catastrophic external haemorrhage
A	Maintain and protect airway patency Minimise unnecessary cervical spine movement
B	Maintain oxygenation Maintain ventilation
C	Assess for shock Seek & control haemorrhage Restore & maintain perfusion
D	
E	
Rx	

- Time needed 5mins to complete this exercise (Running time 12 mins at completion)
- As per slide
- Each group has a representative speak loudly and clearly
- After group has presented display 'correct response'

Slide 8

Goals of primary survey	
(C)	Control catastrophic external haemorrhage
A	Maintain and protect airway patency Minimise unnecessary cervical spine movement
B	Maintain oxygenation Maintain ventilation
C	Assess for shock Seek & control haemorrhage Restore & maintain perfusion
D	Identify neurological injury Prevent secondary insult
E	
Rx	

- Time needed 5mins to complete this exercise (Running time 12 mins at completion)
- As per slide
- Each group has a representative speak loudly and clearly
- After group has presented display 'correct response'

Slide 9

Goals of primary survey	
(C)	Control catastrophic external haemorrhage
A	Maintain and protect airway patency Minimise unnecessary cervical spine movement
B	Maintain oxygenation Maintain ventilation
C	Assess for shock Seek & control haemorrhage Restore & maintain perfusion
D	Identify neurological injury Prevent secondary insult
E	Identify other threats to life & limb Extremities, exposure but maintain temp & euglycaemia
Rx	

- Time needed 5mins to complete this exercise (Running time 12 mins at completion)
- As per slide
- Each group has a representative speak loudly and clearly
- After group has presented display 'correct response'

Slide 10

Goals of primary survey	
(C)	Control catastrophic external haemorrhage
A	Maintain and protect airway patency Minimise unnecessary cervical spine movement
B	Maintain oxygenation Maintain ventilation
C	Assess for shock Seek & control haemorrhage Restore & maintain perfusion
D	Identify neurological injury Prevent secondary insult
E	Identify other threats to life & limb Extremities, exposure but maintain environment & euglycaemia
Rx	Expedite definitive treatment, transfer Limit suffering

- Time needed 5mins to complete this exercise (Running time 12 mins at completion)
- As per slide
- Each group has a representative speak loudly and clearly
- After group has presented display 'correct response'

Slide  
11

**Paul's case**

Paul is a 13 year old boy (40kg) who was climbing a tree in his own garden, which overhung the street.

His mother was out shopping and on her return, she found that he had fallen from the tree, onto a low garden wall, and then onto the pavement.

He could not stand up, and she called an ambulance.



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**Start at 12 min-**

Time needed 2 mins for next 2 slides (Running time 14 mins at completion)

The initial presentation of the case is now relayed to the candidates over the next two slides.

This is your typical prehospital notification which is brief but not comprehensive.

The groups will now think about how they prepare their environment for this patient reception based on the likely injuries to each area of the primary survey

Slide  
12

**Activity 2:  
En route  
Paul 13yo, 40Kg**

In pain, bruised left forehead with left chest and abdominal pain

RR ~38/min, SpO<sub>2</sub> 98%

HR 140/min, BP 140/75

CRT 3 sec, GCS 14, given 1N fentanyl

*What preparation is needed to address his potential injuries?*

6 mins

	Prep
(C)	
A	
B	
C	
D	
E	
Rx	

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Time 2 mins (Running time 14 mins at completion)

Activity 2 – prehospital info preparation

Candidates will work through this case, using a structured approach, discuss in their groups the likely injuries, preparation for these.

Time needed 6 mins for activity (Running time 20 mins at completion)

**Allocate groups different starting points. . This ensures all areas are covered well. They have to listen though as the area they allocated next will be different**

**They should try and get through all goals but will be responsible for reporting back on the one they started on.**

**Works best going anticlockwise or right to left, so that Group 4 get A (had D/E) , Group 1 now get B (had A), group 2 get C (had B), , group 3 get D/E/Other (had C), This way each group is moving down the primary survey rather than backward, and once reaching the end start at the beginning again.**

**That is once they have finished E they'll be dealing with A next.**

**1 facilitator per group with 4 slide handout to keep group on track.**

**Activity 2 – Preparations**

**- groups should list the specific preparations for the likely injury**

Slide  
13

Activity 2 Pre arrival preparation	
(C)	Stop exsanguinating haemorrhage - compression, suture, binder
A	Airway equipment Minimise unnecessary neck movement
B	
C	
D	
E	
Rx	

Seriously Injured Child

### Activity 1B – Prehospital preparation

**Start at 20 min** – Time needed 8 mins for feedback (Running time 28 mins at completion)

A – important to stress that haemoglobin is responsible for 95% oxygen carriage. As trauma patients may be losing haemoglobin, oxygen is imperative to allow dissolved oxygen, PO<sub>2</sub>, to carry oxygen to the tissues in the absence of haemoglobin. Manipulation of the airway, particularly in the obtunded patient, should respect the possibility of an occult or unstable neck injury, and so unnecessary neck movement should be minimised

Slide  
14

Activity 2 Pre arrival preparation	
(C)	Stop exsanguinating haemorrhage - compression, suture, binder
A	Airway equipment Minimise unnecessary neck movement
B	ICC for tension pneumothorax, massive haemothorax, open pneumothorax, ventilation for flail chest/lung contusion, CXR
C	
D	
E	
Rx	

Seriously Injured Child

### Activity 1B – Prehospital preparation

Time needed 8 mins for feedback (Running time 28 mins at completion)

B – with the history of blunt trauma and left chest pain any of these conditions are possible. Preparation for how to clinically detect these conditions, with the aid of chest x-ray, and how to rapidly manage, need to be prepared for.

Slide  
15

Activity 2 Pre arrival preparation	
(C)	Stop exsanguinating haemorrhage - compression, suture, binder
A	Airway equipment Minimise unnecessary neck movement
B	ICC for tension pneumothorax, massive haemothorax, open pneumothorax, ventilation for flail chest/lung contusion, CXR
C	IVC x2, warmed IV crystalloid 10 mL/kg +/- 10 mL/kg O <sub>2</sub> -ve blood, tranexamic acid, massive transfusion protocol, 7FAST, pelvic X-ray
D	
E	
Rx	

Seriously Injured Child

### Activity 1B – Prehospital preparation

Time needed 8 mins for feedback (Running time 28 mins at completion)

C - C – ABC – the focus is on detecting and stopping exsanguinated blood loss. Systematic approach to how to look for areas of declared as well as occult blood loss need to be thought about, as well as the utility of chest x-ray, pelvic x-ray, FAST scan. Areas of active bleeding should be managed with direct compression bandaging, suturing, reduction of fractures, pelvic binding. Large bore IV access is needed. Circulating blood volume should be maintained, with infusion of warmed fluid. The choice of resuscitation fluid is dependent on multiple variables including the presence of shock, estimated starting haemoglobin, the detectable areas of active bleeding and whether there is ongoing bleeding or not, and the response to initial fluid resuscitation. TXA helps decrease clot dissolution which contributes to acute traumatic coagulopathy. MTP is reserved for those requiring large volumes of blood or who are shocked at any stage.

Slide  
16

Activity 2 Pre arrival preparation	
(C)	Stop exsanguinating haemorrhage - compression, suture, binder
A	Airway equipment Minimise unnecessary neck movement
B	ICC for tension pneumothorax, massive haemothorax, open pneumothorax, ventilation for flail chest/lung contusion, CXR
C	IVC x2, warmed IV crystalloid 10 mL/kg +/- 10 mL/kg O-ve blood, tranexamic acid, massive transfusion protocol, 2FAST, pelvic X-ray
D	Rapid neurological assessment, AVPU or GCS, pupils, limb movement, secondary brain and spinal protection – avoid hypotension, hypoxia
E	
Rx	

Seriously Injured Child

### Activity 1B – Prehospital preparation

Time needed 8 mins for feedback (Running time 28 mins at completion)

D- A crude but important neurological assessment is necessary. Progress of neurological status needs to be observed. Factors that aggravate primary brain injury result in secondary brain injury. The major focus is avoiding hypotension and hypoxia. But hypercarbia, hyper/hypoglycaemia, hyperthermia, acidosis, hyponatraemia, seizures all need to be optimised to prevent this occurring.

Slide  
17

Activity 2 Pre arrival preparation	
(C)	Stop exsanguinating haemorrhage - compression, suture, binder
A	Airway equipment Minimise unnecessary neck movement
B	ICC for tension pneumothorax, massive haemothorax, open pneumothorax, ventilation for flail chest/lung contusion, CXR
C	IVC x2, warmed IV crystalloid 10 mL/kg +/- 10 mL/kg O-ve blood, tranexamic acid, massive transfusion protocol, 2FAST, pelvic X-ray
D	Rapid neurological assessment, AVPU or GCS, pupils, limb movement, secondary brain and spinal protection – avoid hypotension, hypoxia
E	Extremity review, exposure – log roll to assess posterior and thoracolumbar spine Environment – keep warm & check BGL
Rx	

Seriously Injured Child

### Activity 1B – Prehospital preparation

Time needed 8 mins for feedback (Running time 28 mins at completion)

E – exposure and a thorough examination of the posterior aspect and extremities of the patient is critical to not missing injuries. Remembering that heat loss needs to be minimised.

Slide  
18

Activity 2 Pre arrival preparation	
(C)	Stop exsanguinating haemorrhage - compression, suture, binder
A	Airway equipment Minimise unnecessary neck movement
B	ICC for tension pneumothorax, massive haemothorax, open pneumothorax, ventilation for flail chest/lung contusion, CXR
C	IVC x2, warmed IV crystalloid 10 mL/kg +/- 10 mL/kg O-ve blood, tranexamic acid, massive transfusion protocol, 2FAST, pelvic X-ray
D	Rapid neurological assessment, AVPU or GCS, pupils, limb movement, secondary brain and spinal protection – avoid hypotension, hypoxia
E	Extremity review, exposure – log roll to assess posterior and thoracolumbar spine Environment – keep warm & check BGL
Rx	Trauma page, blood, trauma imaging, consider analgesia, O-ve blood, Notify surgeon, anaesthetist, telemedicine, inter-facility transfer?

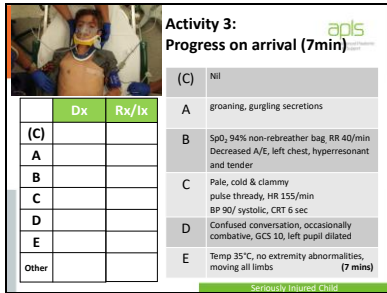
Seriously Injured Child

### Activity 1B – Prehospital preparation

Time needed 8 mins for feedback (Running time 28 mins at completion)

Rx - Other actions – the patient’s mechanism of injury and initial descriptions of injuries and vital signs would recommend the presence of trauma team on arrival. As well as this notification of relevant complimentary services such as radiology, Blood Bank, surgical team, anaesthetic and intensive care team would be appropriate depending on the facility.

Slide  
19



**Activity 3:**  
Progress on arrival (7min)

	Dx	Rx/ix
(C)		
A		
B		
C		
D		
E		
Other		

(C) Nil  
 A groaning, gurgling secretions  
 B SpO<sub>2</sub> 94% non-rebreather bag, RR 40/min  
 Decreased A/E, left chest, hyperresonant and tender  
 C Pale, cold & clammy  
 pulse thready, HR 155/min  
 BP 90/ systolic, CRT 6 sec  
 D Confused conversation, occasionally combative, GCS 10, left pupil dilated  
 E Temp 35°C, no extremity abnormalities, moving all limbs (7 mins)

Seriously Injured Child

### Activity 3 – Diagnoses & further Actions

Time needed 2 mins for this slide (Running time 30 mins at completion)

#### Start at 28 min-

Time needed 2 mins for this slide (Running time 30 mins at completion)

#### Read the following

**‘Pt now arrives. A number of features of his primary survey have progressed.**

**Utilise the next seven minutes to consider his latest primary survey injury status and the associated treatment or intervention required.**

**Both areas of activity 3 need to be filled out on the A3 forms for this exercise. You have 7 minutes’**

Time 7 mins (Time 37 mins at completion)

Time needed 7 mins for activity (Running time 37 mins at completion)

**Start the groups at different places. This ensures all areas are covered well.**

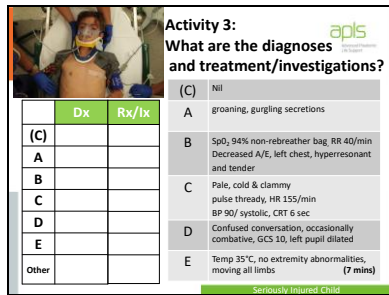
**They should try and get through all goals but will be responsible for reporting back on the one they started on.**

**Works best going anticlockwise or right to left, so that Group 4 get B (had A) , Group 1 now get C (had B), group 2 get D/E/Other (had C), group 3 get A (had D/E/Other), This way each group is moving down the primary survey rather than backward, and once reaching the end start at the beginning again.**

**That is once they have finished E they’ll be dealing with A next.**

**1 facilitator per group with 4 slide handout to keep group on track.**

Slide  
20



**Activity 3:**  
What are the diagnoses and treatment/investigations?

	Dx	Rx/Ix
(C)		
A		
B		
C		
D		
E		
Other		

(C) Nil  
 A groaning, gurgling secretions  
 B SpO<sub>2</sub> 94% non-rebreather bag, RR 40/min  
 Decreased A/E, left chest, hyperresonant and tender  
 C Pale, cold & clammy  
 pulse thready, HR 155/min  
 BP 90/ systolic, CRT 6 sec  
 D Confused conversation, occasionally combative, GCS 10, left pupil dilated  
 E Temp 35°C, no extremity abnormalities, moving all limbs (7 mins)

**Activity 3 – Diagnoses & further Actions**

Time needed 2 mins for this slide (Running time 30 mins at completion)

**Start at 28 min-**

Time needed 2 mins for this slide (Running time 30 mins at completion)

**Read the following**

**‘Pt now arrives. A number of features of his primary survey have progressed.**

**Utilise the next seven minutes to consider his latest primary survey injury status and the associated treatment or intervention required.**

**Both areas of activity 3 need to be filled out on the A3 forms for this exercise. You have 7 minutes’**

Time 7 mins (Time 37 mins at completion)

Time needed 7 mins for activity (Running time 37 mins at completion)

**Start the groups at different places. This ensures all areas are covered well.**

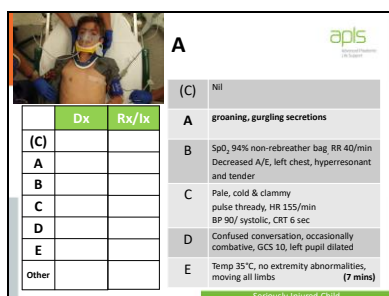
**They should try and get through all goals but will be responsible for reporting back on the one they started on.**

**Works best going anticlockwise or right to left, so that Group 4 get B (had A) , Group 1 now get C (had B), group 2 get D/E/Other (had C), group 3 get A (had D/E/Other), This way each group is moving down the primary survey rather than backward, and once reaching the end start at the beginning again.**

**That is once they have finished E they’ll be dealing with A next.**

**1 facilitator per group with 4 slide handout to keep group on track.**

Slide  
21



**Activity 3:**  
What are the diagnoses and treatment/investigations?

	Dx	Rx/Ix
(C)		
A		
B		
C		
D		
E		
Other		

(C) Nil  
 A groaning, gurgling secretions  
 B SpO<sub>2</sub> 94% non-rebreather bag, RR 40/min  
 Decreased A/E, left chest, hyperresonant and tender  
 C Pale, cold & clammy  
 pulse thready, HR 155/min  
 BP 90/ systolic, CRT 6 sec  
 D Confused conversation, occasionally combative, GCS 10, left pupil dilated  
 E Temp 35°C, no extremity abnormalities, moving all limbs (7 mins)

**Activity 3 – Diagnoses & further Actions ‘Lets start with A’**

-

Refresher whilst group give answers over next 2 slides

Let them give answer before showing answer

Time needed 2 mins for this and next 2 slides (Running time 39 mins at completion)



Slide 22

**Re-assessment - Possible diagnoses**

(C)	
A	Airway threatened, may become obstructed secondary to diminished LOC (closed head injury, opiates, shock)
B	
C	
D	
E	

**A – likely issues**

Slide 23

**Treatment and investigation**

(C)	
A	HFO NRB, suction, OPA ? NPA maintain cspine immobilization – BVM, prepare for RSI
B	
C	
D	
E	

**A – likely intervention. Talk about MILS with intubation. Avoidance of NPA with facial fractures but not if no evidence of such.**

Slide 24

**Activity 3 – Diagnoses & further Actions. ‘Lets talk about B’**

	<b>Dx</b>	<b>Rx/lx</b>
(C)		
A		
B		
C		
D		
E		
Other		

**B**

(C)	Nil
A	groaning, gurgling secretions
B	SpO <sub>2</sub> 94% non-rebreather bag, RR 40/min Decreased A/E, left chest, hyperresonant and tender
C	Pale, cold & clammy pulse thready, HR 155/min BP 90/ systolic, CRT 6 sec
D	Confused conversation, occasionally combative, GCS 10, left pupil dilated
E	Temp 35°C, no extremity abnormalities, moving all limbs (7 mins)

**Activity 3 – Diagnoses & further Actions. ‘Lets talk about B’**  
 Refresher whilst group give answers over next 2 slides  
 Let them give answer before showing answer  
 Time needed 2 mins for this and next 2 slides (Running time 41 mins at completion)

Slide 25

**Re-assessment - Possible diagnoses**

(C)	
A	Airway threatened, may become obstructed secondary to diminished LOC (CHI, opiates, shock)
B	<b>Tension pneumothorax</b> Massive haemothorax Flail chest & pulmonary contusions ? Diaphragmatic hernia
C	
D	
E	

**B – likely DDx for decreased A/E**

Slide 26

Treatment and investigation	
(C)	
A	HFO NRB, suction, OPA ? NPA maintain C-spine immobilisation – BVM, prepare for RSI
B	Left ICC – before or after RSI? CXR before/after?
C	
D	
E	

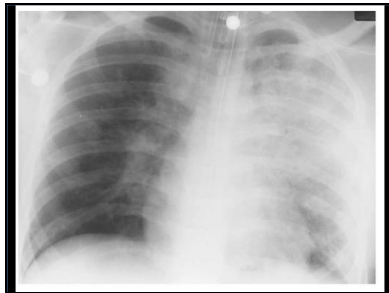
**B – indications for ICC. CXR before if sats > 90% and not shocked or tension Ptx. CXR may reveal contusion or traumatic diaphragmatic hernia that doesn't need ICC. If A needs intubation, what is timing for ICC ? Before or after intubation. With preparation for tension Ptx, better to do once intubated.**

Slide 27



CXR DDx for decreased air entry – not all need ICC  
Pneumothorax

Slide 28



CXR DDx for decreased air entry – not all need ICC  
Lung contusion

Slide 29



CXR DDx for decreased air entry – not all need ICC  
Traumatic diaphragmatic hernia

Slide 30

C	
(C)	Nil
A	groaning, gurgling secretions
B	SpO <sub>2</sub> 94% non-rebreather bag RR 40/min Decreased A/E, left chest, hyperresonant and tender
C	Pale, cold & clammy pulse thready, HR 155/min BP 90/ systolic, CRT 6 sec
D	Confused conversation, occasionally combative, GCS 10, left pupil dilated
E	Temp 35°C, no extremity abnormalities, moving all limbs (7 mins)

**Start at 41 mins**

**Activity 3 – Diagnoses & further Actions. ‘Lets talk about C’**

Refresher whilst group give answers over next 2 slides

Let them give answer before showing answer

Time needed 2 mins for this and next 2 slides (Running time 43 mins at completion)

Slide 31

Re-assessment - Possible diagnoses	
(C)	
A	Airway threatened, may become obstructed secondary to diminished LOC (closed head injury, opiates, shock)
B	Tension pneumothorax Massive haemothorax Flail chest & pulmonary contusions ? Diaphragmatic hernia
C	Intra peritoneal haemorrhage – ruptured spleen Retro-peritoneal haemorrhage – pelvis +/- kidney Cardiac tamponade/contusion, BP 90 systolic = large blood loss
D	
E	

**C – likely Dx if tachycardia = bleeding. If BP low = significant bleeding. Need to search for blood loss.**

Slide 32

Treatment and investigation	
(C)	
A	HFO NRB, suction, OPA ? NPA maintain C-spine immobilization – BVM, prepare for RSI
B	Left ICC – before or after RSI? CXR before/after?
C	Pelvic binder + Xray, FAST. 10mL/kg warmed blood, 10mL/kg crystalloid until available. Tranexamic acid. Surgeon needed
D	
E	

**C – Note output from ICC. Bind pelvis and Xray to ensure no fracture or position with binder satisfactory. CXR and Pelvic Xray if NAD helpful for excluding these areas as sources for significant blood loss. FAST scan in accredited hands detects blood in abdomen – if blood present then – need surgeon NOW – resus with blood, TXA and consider MTP, – pt needs advanced imaging (CT abdo).**

Slide 33



Xray with pelvic binder in place

Slide 34

**7<sup>th</sup> Ed. Fluid resuscitation in trauma**

- Tranexamic acid
- 10mL/kg blood
- 10mL/kg blood
- Massive transfusion protocol (MTP)
- Crystalloid if blood not available

Figure 8.2 Page 136

1 minute for these 2 fluid resus slides – remind them re early use of blood, activate MTP when 20 mls/kg fluid and ongoing shock/bleeding  
Now Advocating Tourniquets, direct pressure and early tranexamic acid

Minimal Volume resuscitation

Slide 35

**Massive haemorrhage in trauma**

- Shock and no response to 20 ml/kg fluid - declare massive haemorrhage protocol
- Give warmed RBC and plasma 10 ml/kg aiming for a balanced 1:1 ratio
- Continuing shock/blood loss – give RBC and FFP 10 ml/kg Platelets 10 ml/kg Cryoprecipitate 10 ml/kg
- Use local guidelines

Figure 8.3 Page 139

Slide 36

	Dx	Rx/Ix
(C)		
A		
B		
C		
D		
E		
Other		

**D**

- (C) Nil
- A groaning, gurgling secretions
- B SpO<sub>2</sub> 94% non-rebreather bag, RR 40/min  
Decreased A/E, left chest, hyperresonant and tender
- C Pale, cold & clammy  
pulse thready, HR 155/min  
BP 90/ systolic, CRT 6 sec
- D Confused conversation, occasionally combative, GCS 10, left pupil dilated
- E Temp 35°C, no extremity abnormalities, moving all limbs (7 mins)

**Activity 3 – Diagnoses & further Actions. ‘Lets talk about D’**  
 Refresher whilst group give answers over next 2 slides  
 Time needed 2 mins for this and next 2 slides (Running time 46 mins at completion)

Slide 37

**Re-assessment - Possible diagnoses**

- (C)
- A Airway threatened, may become obstructed secondary to diminished LOC (closed head injury, opiates, shock)
- B Tension pneumothorax  
Massive haemothorax  
Flail chest & pulmonary contusions  
? Diaphragmatic hernia
- C Intra peritoneal haemorrhage – ruptured spleen  
Retro-peritoneal haemorrhage – pelvis +/- kidney  
Cardiac tamponade/contusion: BP 90 – large blood loss
- D Progressive head injury – raised ICP, lateralising signs.  
Progressive spinal injury needs consideration
- E

**D – Decreased GCS and signs raised ICP – severe head injury**

Slide 38

**Treatment and investigation**

- (C)
- A HFO NRB, suction, OPA ? NPA maintain C-spine immobilization – BVM, prepare for RSI
- B Left ICC – before or after RSI? CXR before/after?
- C Pelvic binder + Xray. FAST. 10 mL/kg warmed blood, 10mL/kg crystalloid until available. Tranexamic acid. Surgeon
- D A UPU – likely intracranial haemorrhage – secondary brain protection  
Avoid hypotension or hypoxia. Hyperventilate (pCO<sub>2</sub> 35-40)  
Mannitol/hypertonic saline?
- E

•D – management – secondary brain protection principles. Best outcome for D is to ensure A, B and particularly C stable. Safe intubation, hyperventilation to PCO<sub>2</sub> 30-35 is most HD stable way to decrease raised ICP – rapid effect within mins. HTS also better if trying to avoid hypotension and diuresis, but takes 20-30 mins to have effect.

Slide 39

	Dx	Rx/Ix
(C)		
A		
B		
C		
D		
E		
Other		

**E to end**

- (C) Nil
- A groaning, gurgling secretions
- B SpO<sub>2</sub> 94% non-rebreather bag, RR 40/min  
Decreased A/E, left chest, hyperresonant and tender
- C Pale, cold & clammy  
pulse thready, HR 155/min  
BP 90/ systolic, CRT 6 sec
- D Confused conversation, occasionally combative, GCS 10, left pupil dilated
- E Temp 35°C, no extremity abnormalities, moving all limbs (7 mins)

**Activity 3 – Diagnoses & further Actions. ‘Lets talk about E and Rx’**  
 Refresher whilst group give answers over next 2 slides  
 Time needed 2 mins for this and next 2 slides (Running time 48 mins at completion)

Slide 40

**Re-assessment - Possible diagnoses**

- (C)
- A Airway threatened, may become obstructed secondary to diminished LOC (closed head injury, opiates, shock)
- B Tension pneumothorax,  
Massive haemothorax  
Flail chest & pulmonary contusions  
? Diaphragmatic hernia
- C Intra peritoneal haemorrhage – ruptured spleen  
Retro-peritoneal haemorrhage – pelvis +/- kidney  
Cardiac tamponade/contusion: BP 90 – large blood loss
- D Progressive head injury – raised ICP, lateralising signs.  
Progressive spinal injury needs consideration
- E Hypothermia, hypoglycaemia, hidden injuries

**E – keep warm, check BSL, log roll for occult injury.**

Slide  
41

Treatment and investigation	
(C)	
A	HFO NRB, suction, OPA ? NPA maintain C-spine immobilisation – BVM, prepare for RSI
B	Left ICC – before or after RSI? CXR before/after?
C	Pelvic binder + X-ray, FAST, 10 mL/kg warmed blood, 10mL/kg crystalloid until available. Transosmic acid. Surgeon
D	A <sub>1</sub> PU – likely ICH – secondary brain protection Avoid hypotension, hypoxia. Hyperventilate. Mannitol/hypertonic saline?
E	Exposure, look for injuries, keep warm, euglycaemia
Ix, Meds	?Whole body CT (WBCT) - or CT cervical spine, brain, abdo, +/- chest? Consider radiation dose with WBCT CXR, pelvic X-ray Surgical and neurosurgical review

Pt needs CT Abdo, CTB, CT Cx spine  
Concerns re radiation dose with WBCT  
Need surgical and Neurosurgical attendance

Slide  
42

Diagnoses & Specific therapy	
Diagnoses	<p>CT C-spine – NAD CXR – L) ICC – resolved pneumothorax, # ribs Pelvic X-ray – left pubic bone # CT abdomen – ruptured spleen Multiple lacerated left kidney CTB – left SDH, midline shift</p>
Specific therapy options	<p>Conservative ? Operative ? Interventional radiology ? Telemedicine ? Interfacility transfer required ?</p>

**Start at 48 min** Time 4 mins (Time 52 mins at completion of next 4 slides)

Eventual findings

Review the treatment options – but do not dwell upon these

The important point of all management options is that emergent paediatric trauma surgery should be available.

Text 5e Section 15.4 Page 172

What are the pre-requisite conditions for conservative management?

- Frequent monitoring
- Blood bank service including coagulation factors
- Accurate fluid management
- Emergent paediatric surgery immediately available

What are the indications for immediate laparotomy?

- Perforated viscous
- Penetrating injuries
- Refractory shock with clinical suspicion of intra-abdominal haemorrhage

Slide  
43

Paediatric traumatic cardiac arrest – principles of management?	
<p>The emphasis and priorities are to manage the reversible causes specific to TCA, including:</p> <p>&lt;C&gt; – manage catastrophic external bleeding</p> <p>Airway/Breathing – oxygenation and ventilation, exclude/treat tension pneumothorax</p> <p>Circulation – fluid resuscitation with early use of blood, exclude/treat pericardial tamponade</p>	

Briefly review the important principles of managing a traumatic cardiac arrest

Slide  
44







Slide  
45

**A structured approach ...**

- <C> - control external bleeding
- Airway - oxygen, C-spine control
- Breathing - ventilatory support
- Circulation - haemorrhage control
- Disability - prevent secondary insult
- Exposure - temperature control

Slide  
46



Airway & C-spine 	Imaging 
Circulation/ MTP/TXA 	Blunt vs penetrating 

A prompting slide to remind the candidates of the *differences* in resuscitation of the traumatic patient v the ill patient

- control of catastrophic haemorrhage, care of the cervical spine, need for x 2 lvs, early blood products in major haemorrhage, analgesia...

Slide  
47

**Prep for Thoracic Skills**

Landmarks (5 mins) SCAN ME  <a href="https://flowcode.com/p/OZPhIaK087fc0">https://flowcode.com/p/OZPhIaK087fc0</a>	Chest Tube Insertion (7 mins) SCAN ME  <a href="https://flowcode.com/p/OZPhIaCv7f6">https://flowcode.com/p/OZPhIaCv7f6</a>
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