

Traumatic Injury

Definition / Supporting Information

Traumatic injury is a term referring to physical injuries of sudden onset / severity which necessitate immediate attention. They are caused by various forces from outside the body, can be either blunt or penetrating, and often include burns, road traffic collision, falls, drowning, violent crime, non-accidental injury and sports injuries.

In the UK, trauma is classified as the most common cause of mortality and morbidity in children over 1 year of age.

Trauma systems have developed in the UK leading to the formation of major trauma centres. The optimal destination for children with major trauma is a major trauma centre; however, children are still seen in the prehospital environment, or a local hospital, where consideration should be given to their particular needs and appropriate care given.

Essential History

Collateral history is often key (from witnesses, carers, prehospital staff or the patient) depending on the circumstances.

Ask about:

- Age
- Sex
- Time of incident
- Mechanism of the injury
- Any treatment given
- Developmental stage of child
- Immunisation history (eg, tetanus status)
- Social history (eg, safeguarding issues)
- Pre-existing conditions
- Drug history (eg, anticoagulants)

'Red Flag' Symptoms and Signs

Assessment should be done using a structured Airway, Breathing, Circulation, Disability, Exposure (ABCDE) approach with some key considerations
[Resuscitation Council UK, Advanced Paediatric Life Support (APLS)]

Ask about:

- Significant mechanism
 - Traumatic death in same passenger compartment
 - Uninterrupted fall over twice the patient's height (not bouncing down stairs)
 - Person trapped under vehicle or large object
 - Bullseye to windscreen / airbag deployed / damage to vehicle caused by impact of individual outside the vehicle
 - Bicycle injury resulting in abdominal and / or groin pain
 - Thrown from or impacted on handle bars
 - Ejection from inside a vehicle (eg, car, van or lorry)
 - Fall from or trampled by large animal
 - Pedestrian or cyclist hit directly by vehicle
 - Known to have a bleeding disorder or on anticoagulants
- How the child has been since the accident (eg, quiet, crying, post-ictal)
- Has their progression been stable or deteriorating

Look for:

- Catastrophic external haemorrhage
 - Maintain airway with cervical spine control
 - Support breathing with ventilatory support as required
 - Maintain circulation with haemorrhage control
 - Prevent disability with prevention of secondary insult
 - Treat exposure with temperature control
- Significant injury
 - Transport immediately to hospital (prehospital) or major trauma centre
 - Ambulance service
 - A trauma call should be placed where the child is seen in a local hospital
 - According to Trust policies
- Assess vital signs and level of consciousness
- Glasgow Coma Score (GCS) of < 13 or below
- Signs (eg, pain or crying) which are not explained by other cause, such as being too quiet or inconsolable
- The following relate to the anatomy of the injury and should indicate a child at risk of loss of life or limb (N.B. letters relate to issues with ABCDE)
 - Significant bruising to chest or abdomen (B / C) Traumatic amputation / mangled proximal to wrist/ankle (E)
 - Penetrating trauma below the head and above the knees (B / C)
 - Suspected open and / or depressed skull fracture (D)
 - Suspected pelvic fracture (C)
 - Significant degloving (soft tissue) injury (E)

- Multiple fractures (long bone) (C)
- Burns / scalds > 20% (C)
- Facial burns with skin loss to lower half of face (B)
- Circumferential burns from flame injury (B / E)

Differential Diagnosis / Conditions

The following are causes and consequences of trauma and further information on how to manage them should be sought:

- Altered conscious level
- Head injury
- Increased intracranial pressure
- Cervical spine injury (see Advanced Paediatric Life Support (APLS) guidelines)
- Chest injury (see APLS guidelines)
- Abdominal injury (see APLS guidelines)
- Drowning
- Burns (see APLS guidelines)
- Extremity injuries (see APLS guidelines)
- Spinal injuries (see APLS guidelines)

Investigations

To be undertaken by non-specialist practitioner (eg, General Practitioner (GP), Emergency Department, Paediatric Teams):

- ABCDE approach
- Investigations are not usually indicated in the prehospital environment unless there is access to urgent pathology or radiology - **transfer to hospital for any significant trauma**
- Minor trauma may be dealt with in urgent care centre / walk in centre / GP practice depending on facilities

To be undertaken by specialist practitioners with knowledge of managing paediatric trauma (eg, Emergency Department, Paediatric, Nurse or Anaesthetic Team(s)):

- ABCDE approach
- Manage life-threatening conditions as they are picked up
- Blood tests
 - Blood gas and lactate
 - Full blood count
 - Urea and electrolytes
 - Liver function
 - Amylase

- Clotting
- Blood glucose
- Imaging may include plain X-rays or computerised tomography (CT) scans of:
 - Head
 - Spine
 - Chest Abdomen
 - Pelvis

Treatment Approach

To be undertaken by non-specialist practitioner (eg, General Practitioner (GP), Emergency Department, Paediatric Teams):

- Basic Life Support (BLS) should be provided using an ABC approach
 - Ensure the neck is immobilised if:
 - The mechanism of trauma could have caused a neck injury
 - Or the child is unconscious
 - In the prehospital environment this can be done by using a rolled up blanket, or coat/jacket
- First aid should be provided in the prehospital environment, depending on the injury
 - Ensure the child does not get cold
 - Run cold water on a superficial or partial thickness burn for up to 10 minutes to reduce heat damage, then ensure the child is wrapped and kept warm
 - Apply compression to any obvious bleeding
 - Consider a tourniquet for major catastrophic external bleeding
 - Administer pain relief, if required
- Transfer immediately to hospital
- If already in hospital then request assistance of a more senior clinician who has training in managing paediatric trauma

To be undertaken by specialist practitioners with knowledge of managing paediatric trauma (eg, Emergency Department, Paediatric, Nurse or Anaesthetic Team(s)):

- Manage trauma according to ABCDE
- Obvious exsanguinating haemorrhage must be identified and managed immediately
- Treat life-threatening conditions as they are suspected before moving to the next system
- Airway obstruction should be managed as an emergency
- Stabilisation of the cervical spine [[Royal College of Emergency Medicine position statement](#)]
 - The cervical spine must, wherever possible, be stabilised until a cervical spine injury is ruled out

- If attempts at immobilising the cervical spine are causing distress and agitation, assess the risks and benefits of continued attempts
- In conscious children, use manual in-line stabilisation (MILS) whenever possible
- In unconscious children or when MILS cannot be maintained, immobilisation should be with a properly fitting collar, blocks and tape
- If no properly fitting collar is available, blankets etc should be used to improvise an immobilisation device
- Assessment of the chest for emergencies including pneumothorax and / or haemothorax
- Shock should be managed according to paediatric trauma guidelines
- Identify and treat hypoglycaemia
- Definitive care must be delivered as soon as possible, and it may be necessary to transfer to the appropriate facility

When to Refer

Escalate care to major trauma centre if:

- Specialist care (eg, neurosurgery, surgical input) is required
- Intensive care is required

‘Safety Netting’ Advice

- If children are sent home after trauma, advice should be given specific to the injury (eg, head injury advice)
- Written advice should be given where possible

Patient / Carer Information

****Please note: whilst these resources have been developed to a high standard they may not be specific to children.***

- [Brain injury](#) (Web page), The Brain Injury Association
- [Paediatric Trauma Care](#) (Web page), After Trauma

Resources

National Clinical Guidance

[Major trauma: assessment and initial management](#) (Web page), NICE guideline NG39, National Institute for Health and Care Excellence

[Major trauma: service delivery](#) (Web page), NICE guideline NG40, National Institute for Health and Care Excellence

[Paediatric trauma protocols](#) (PDF), RCR guideline BFCR (14)8, Royal College of Radiology

Medical Decision Support

Advanced Life Support Group. [Advanced Paediatric Life Support: The Practical Approach \(APLS\)](#), 5th ed. John Wiley & Sons (Wiley-Blackwell), 2011

[Advanced Trauma Life Support \(ATLS®\)](#), 9th ed (Book), 2013

[Getting to know the European Trauma Course](#) (Web page), European Training Course

[Glasgow Coma Score](#) (Web page), Headway

[Paediatric Trauma Protocol](#) (PDF), Royal College of Radiologists

[Position Statement Paediatric Trauma - Stabilisation of the Cervical Spine](#) (PDF), Royal College of Emergency Medicine

Resuscitation Council. [European Paediatric Life Support \(EPLS\)](#). 4th ed, 2016

Teasdale G, Jennett B. Assessment of coma and impaired consciousness. A practical scale. *Lancet* 1974;13(2):81–84 [[PubMed](#)]

Suggested Resources

[Concussion – Headcase](#) (Web page), England Rugby

[Health Care Professionals General Information](#) (Web page), England Rugby

****Please note: these resources include links to external websites. These resources may not have national accreditation and therefore PCO UK cannot guarantee the accuracy of the content.***

[What is trauma?](#) (Web page), After Trauma

[Paediatric Thoracic Trauma](#) (Web page – log-in required), Medscape

[Paediatric Head Trauma](#) (Web page – log-in required), Medscape

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