

**London Major Trauma  
System**



London  
Operational Delivery Networks

# *London Major Trauma System:* **Management of Paediatric Trauma Guidelines**



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## Abbreviations

### List of abbreviations

#### A

A&E – Accident and Emergency department

AAST - American Association of Trauma Surgeons

APA – Association of Paediatric Anaesthetists

#### B

BM – Blood sugar

BMV – Bag valve mask (self- inflating)

#### C

CATS – Children's Acute Transport Service

CBRN - Chemical Biological Radiological Nuclear

CSL – Compound sodium lactate

CT – Computed Tomography

CVC – Central venous catheter

CVVH - Continuous Veno-Veno Haemofiltration

CXR – Chest X-ray

#### D

DCR – Damage control resuscitation

DCS – Damage control surgery

DAS - Difficult Airway Society

#### E

ED – Emergency department

ETCO<sub>2</sub> – End tidal carbon dioxide



ETT – Endotracheal tube

## **F**

FiO<sub>2</sub> – Inspired oxygen content (%)

FFP – Fresh frozen plasma

## **G**

GCS – Glasgow Coma scale (3-15)

G&S – Group and Save

## **I**

IO – Intraosseous

IM – Intramuscular

IR – Interventional Radiology

IV – Intravenous

## **K**

KPa - kilopascal – measurement of pressure

K<sup>+</sup> - Potassium

## **L**

LAS - London Ambulance Service

LFT – Liver function tests

## **M**

MI – Major incident

MTC - Major Trauma Centres

## **N**

NaCl – Normal Saline (sodium chloride)

NELETN – North East London Essex Trauma network

NAI – Non accidental injury



NCA - Nurse controlled analgesia

## O

ODP – Operating department practitioner

OPSI – Overwhelming post splenectomy infection

## P

PCA - patient controlled analgesia

PEEP – Positive end expiratory pressure

PICU – Paediatric intensive care Unit

## R

RCPCH – Royal college of paediatrics and child health

RCR – Royal College of Radiologists

## S

SpO<sub>2</sub> – Oxygen Saturation

SpR – Specialist registrar

STRS – South Thames retrieval service

## T

TBSA – Total burn surface area

TCA – Traumatic cardiac arrest

TU - Trauma units

TXA – Tranexamic acid

## U

U&E – Urea and electrolytes

## EXECUTIVE SUMMARY

This document provides an overview of paediatric trauma management with gold standards for practice, regardless of location. It is a guide to providing care for the sickest trauma patients so that skills and knowledge are maintained across trauma systems, thus ensuring safe delivery of care. Local policy must always be taken into consideration

### Trauma Systems

Trauma systems provide a continuum of care for all injured patients within a geographical location. This 'inclusive' approach to trauma care involves collaboration between prehospital services, hospitals within the region, community providers and the government.

Within trauma systems, hospitals receiving trauma patients are designated as either Major Trauma Centres (MTCs) or Trauma Units (TUs). MTCs have resources available 24 hours a day to manage severely injured patients, whilst trauma units are responsible for the local management of patients with potentially less severe injuries. However, evidence shows that more seriously injured patients do not always present at major trauma centres. As a consequence, it is important that skills and knowledge are maintained across trauma systems to ensure safe delivery of care. Trauma Units should be capable of performing lifesaving interventions for any major trauma patient that is too unstable for transfer directly to the MTC.

### The Pan London Major Trauma System: Paediatric Trauma

Injury is the leading cause of death in children and adults up to the age of 44 years in England and Wales<sup>1</sup>. Evidence shows that trauma systems improve patient outcomes, yet trauma is the principal cause of morbidity and mortality in the under 18s<sup>2,3,4</sup>. Boys are more likely to be injured than girls, especially during adolescence when they are three times more likely to die from injury than their female counterparts (RCPCH).

Injury occurs at all ages in children and young adults with a bimodal distribution in the under twos and adolescents. Despite the establishment of the London Major Trauma System and sophisticated ambulance triage tools, there is evidence that up to 50% of children with significant trauma still present to trauma units and local emergency departments (EDs) rather than MTCs. Some of these cases bypass the pre-hospital trauma triage systems through self-presentation.

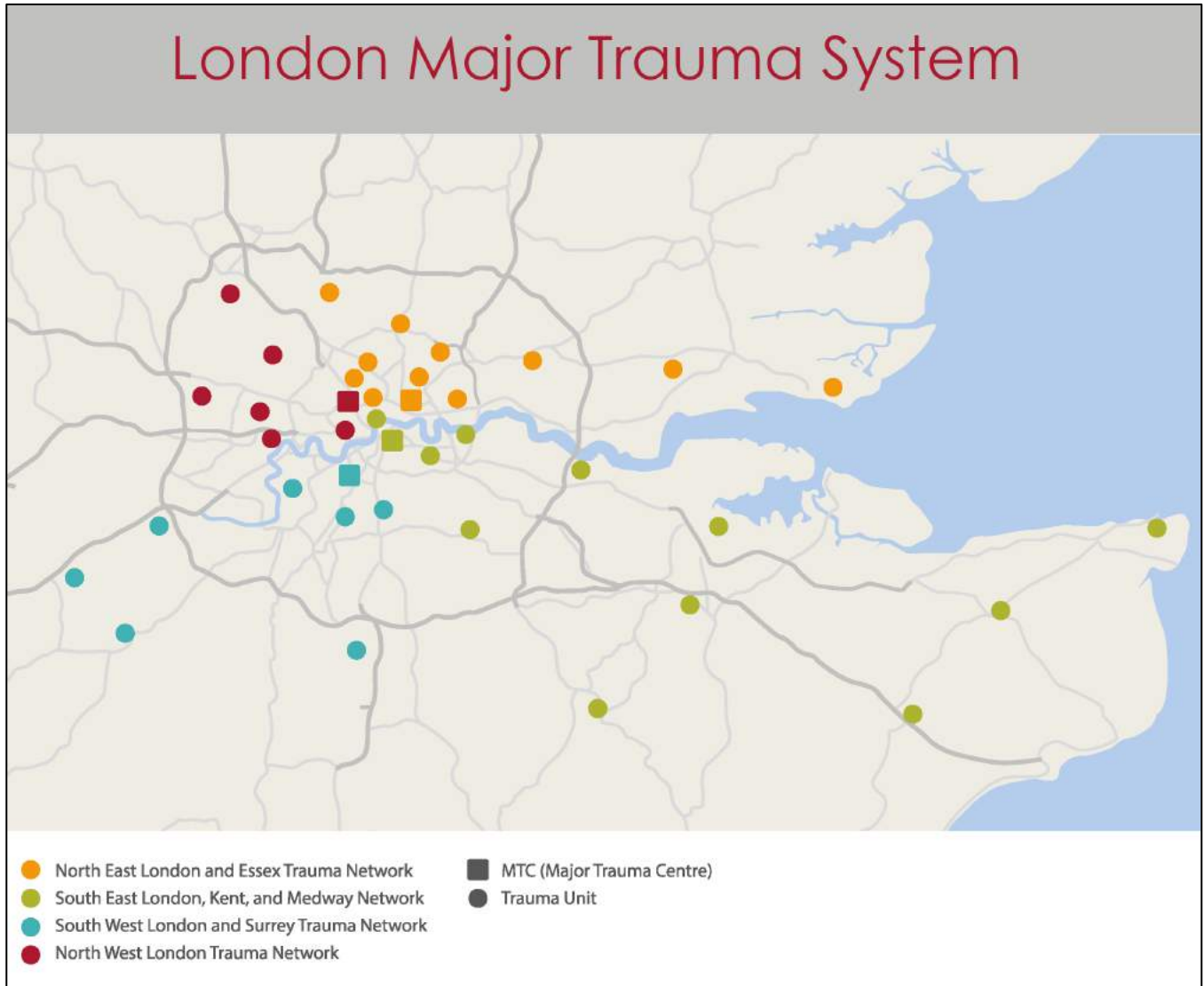




In the under twos, falls or drops from height are the most common mechanism of injury, overtaking road traffic collisions (RTCs), which have declined secondary to health prevention measures; seatbelts, speed limitations, cycle safety schemes, helmets etc.

Paediatric patients encompass a group from infancy to adulthood with attendant range of psychosocial factors associated with their injury. A holistic family centred approach to care improves co-operation, experience and overall wellbeing. Clinicians should ensure safeguarding measures are addressed in all age groups with special consideration given to the patients younger than one year.

Historically, blunt trauma has been the most common mechanism of injury in paediatric trauma. However, there has been a significant rise in penetrating trauma in the adolescent group with victims of assault presenting younger with more significant injuries. This has led to an increased presentation of major haemorrhage in children with specific protocols devised to assist in their management.



### [The London Major Trauma System.](#)

The Pan London Major Trauma System was introduced in April 2010, the first area of the UK to provide regional trauma care.<sup>1</sup>

London trauma system operates automatic acceptance policies where the MTC provides care for trauma patients within the network/region as needed. In order to maximise the capacity of the system and ensure flow of patients, effective repatriation of patients from the MTC to their local TU for ongoing rehabilitation is required. The network based system has been shown to significantly improve the quality of care to



major trauma patients, most notably for the critically injured in whom mortality rates have halved. <sup>2,34,35</sup>

### Paediatric Trauma Team: MTC

In the MTC a specialised trauma team is available 24/7, with a Consultant presence to lead or advise the team.

Paediatric trauma within the pan London system is co-located with adult trauma. This supports collaboration between adult and paediatric services, with supporting specialty Consultant presence at advanced, complex calls such as significant neurotrauma or major haemorrhage.

### Paediatric Trauma Team TU's

TUs will have a smaller trauma team response but are mandated to have a team leader ST3 or above with ATLS training (or equivalent) and another clinician trained in APLS<sup>2</sup>.



## Who Do These Guidelines Apply To?

This is a collaborative document open to anyone managing paediatric trauma across greater London.

### Key Principles

- Paediatric patients are a broad group from infancy to adulthood. As such there is a varied psycho-social response to illness and injury. Rapport and co-operation from the patient is vital, so tactics to put the child at ease such as involvement of play therapists, dedicated nurses and distraction help focus on non-medical aspects of management.
- Analgesia appropriate for the child's weight/injury severity should be given early to help aid assessment. In the absence of IV access consider Intranasal/buccal preparations.
- Significant injury can be masked in the "apparently uninjured child." Serious mechanisms of injury should prompt careful consideration for further imaging.
- Safeguarding concerns should be raised for any injured child under 1 or if there is any suspicion of non-accidental injury (NAI) in older children. The paediatric team should be present and lead on safeguarding pathways, ensuring these protocols are followed.
- Children can be managed by trained clinicians, using APLS and ATLS principals.
- Paediatric trauma patients should be reviewed by a Consultant with expertise in paediatrics.
- Network pathways should be followed for MTC consultation as appropriate.
- Attention to detail around fluid balance, warmth and glucose levels is essential.
- The initial compensatory mechanisms in paediatric patients are much better than adults.
- Hypotension and tachycardia are relatively late signs of shock; use clinical judgement in management of injuries.
- Persistent abnormal vital signs suggest serious missed injury.



- In uncontrolled haemorrhage consider Damage Control Surgery/Damage Controlled resuscitation.
- Traumatic Cardiac Arrest: the arrested paediatric patient with an empty heart responds to simple filling better than adult patients. There should not be any delay in administration of haemostatic resuscitation.
- Following the primary survey all patients should have a secondary survey completed in ED. Tertiary survey should be completed prior to discharge.

## CLINICAL GUIDELINES: Admission to a Major Trauma Centre

### Triage Criteria for Ambulance Services<sup>3</sup>

- Ambulance services, guided by triage tools, have become expert at delivering seriously injured children to the correct destination, however many children will still present to TU's either via missed/hidden injuries or via self-presentation.
- Multiple ambulance providers serve the pan-London region and there is variation in their local guidance. There are common triage themes, an illustration of which is available in the attached trauma manual.

### CLINICAL GUIDELINES: Admission to a Trauma Unit

Admission to a Trauma Unit includes trauma that falls outside MTC criteria or isolated injury, such as that sustained to long bones.

Triage Criteria for London Air Ambulance Service works on either immediate or interrogated dispatch criteria as illustrated below (\* local policies may differ). Activation does not necessarily dictate transfer to MTC.

Immediate dispatch criteria include: -

- Fall from greater than 2 floors (>20 feet)
- 'One under' (fall or jumped in front of a train)
- Ejected from vehicle
- Death of a same vehicle occupant
- Amputation above wrist or ankle
- Trapped under vehicle (not motorcycle)
- Or by request from other emergency services (including the RNLI / coastguard)

Interrogated (call monitoring or via direct communication) dispatch criteria include: -

- Penetrating Trauma (shooting, stabbing, explosions)
- Road Traffic Collisions
- Industrial accidents/incidents or building site accidents
- Hanging
- Drowning
- Entrapments
- Amputations



- Burns/scalds
- Falls from height less than 2 floors
- Impaled on an object

*Further detail available in the linked Paediatric Major Trauma Manual*

## 1. CORE TOPICS: Guidelines for Neurotrauma

### Neurotrauma at the MTC

Certain processes should be followed when a child with significant neurotrauma is expected:

- A pre-alert will have been received and a specialised trauma team assembled
- Neurosurgery team should be contacted
- Theatre teams should be made aware that rapid transfer of the patient to theatre may be required
- PCCU team should be alerted
- Time critical neurotrauma should be performed immediately at the MTC with neuroprotective measures instituted to prevent secondary injury
- A definitive airway should be secured, if required, to facilitate safe scanning
- CT Imaging of the brain should be obtained within 30 minutes of arrival
- Primary/secondary survey should be completed in all patients
- Be prepared for major haemorrhage in conjunction with severe head trauma
- Utilise CATS/STRs for transfer post operatively if no local PCCU available or if ongoing neuro-critical care is not available
- In non "time-critical" neurosurgical injury, teams should liaise with paediatric neurosurgical centres

### Neurotrauma at the Trauma Unit

Principles of management are as above at the MTC. However, there are some special considerations for an unexpected admission or deterioration in an existing patient who presents to a TU and requires neurosurgical assessment/management.

### Key principles

#### Contacts and Pathway

- Call network MTC: TU to MTC Emergency Department time critical trauma transfers are automatically accepted and calls to MTC can be made after transfer initiated.
- Alert ambulance services of a time critical transfer.





- For time critical patients arrange a local transfer. The most senior airway trained person available should do the transfer. A trained assistant should accompany the airway doctor.<sup>16,17</sup>
- Intubation should be carried out by most senior anaesthetist available<sup>16</sup>.
- Discuss local access to scanning versus delay in transfer to MTC, with MTC ED Consultant
- If CT scan is performed at TU it will require Image Transfer to MTC immediately. This needs to be accompanied by a report
- Transfer should not be delayed for arterial line monitoring or central venous access – obtain when able.
- Inotropes if required can be run peripherally. Note recent advice from paediatric transfer services for peripheral adrenaline as first line over dopamin<sup>15</sup>
- Ensure neuroprotective measures are maintained throughout transfer.
- Contact CATS (North Thames transfer service) or STRS (South Thames transfer service) if a non-time critical transfer is required.

#### CATS / STRS TRANSFER SERVICES LINKS

- <http://site.cats.nhs.uk/health-professionals/referrals>
- <https://www.evelinalondon.nhs.uk/our-services/hospital/south-thames-retrieval-service/referrals.aspx>

#### NICE Guidelines for CT Scan in Head Injury.

- <https://www.nice.org.uk/guidance/cg176/resources/imaging-algorithm-pdf-498950893>

*Further detail available in the linked Paediatric Major Trauma Manual*

## 2. CORE TOPICS: Guidelines Thoracic Trauma

### Thoracic Trauma Key Principles

- Chest injury in infants and children range from trivial to immediately life threatening. Assessment, imaging and management should be proportional to injury
- Children have a flexible rib cage therefore significant injury can occur without rib fractures. Significant mechanism of injury should prompt suspicion of underlying chest injury
- If significant chest injury is suspected a CXR should be performed during the primary survey
- If CXR shows significant injury proceed to CT chest <sup>10</sup>
- In Traumatic Arrest manage C-A-B-C simultaneously
- In the TU consider damage control surgery/procedures if peri-arrest, prior to transfer to the MTC
- For time critical patients arrange a rapid local transfer to the MTC. The most senior airway trained person available should do the transfer. A trained assistant should accompany the airway doctor<sup>16,17</sup>
- Intubation should be carried out by most senior anaesthetist available. Be aware decompensation may occur with positive pressure ventilation<sup>16</sup>

*Further detail available in the linked Paediatric Major Trauma Manual*

### 3. CORE TOPICS: Guidelines Abdominal/Pelvic Trauma

#### Abdominal/Pelvic Trauma: Key Principles

- The majority of blunt abdominal trauma in children may be safely managed conservatively
- Abdominal Injuries may be to the solid (liver, spleen, kidneys) or hollow organs (bowel, bladder) or may involve the great vessels the retro-peritoneal space
- Free fluid within the peritoneum in the absence of identified injury should raise suspicion of covert injury and be closely observed
- Increasingly interventional radiology and embolisation can be employed if there is evidence of active bleeding in a child who is not haemodynamically unstable
- Children with a history of high impact trauma or associated with trauma where others have sustained significant injury should be admitted for observation, even in the absence of positive examination findings
- In the severely injured child, damage-control surgery and resuscitation should be implemented to decontaminate, control bleeding and resuscitate
- In the event of considerable liver and pancreatic trauma advice can be sought for ongoing management via specialist liver centre. This should not delay resuscitation in the haemodynamically unstable child
  
- Pelvic splints should be applied when there is a significant mechanism of injury
- Plain films for pelvic injury are not routine in pre-teens but should be performed where the mechanism and/or assessment suggest possible injury
- Movement should be minimised at all times through use of scoops and limited log rolling, to prevent disruption of clot
  
- If a child with suspected abdominal or pelvic injury presents to the TU, discussion should occur between the TU and MTC emergency department leads. This should include benefits of imaging at TU v MTC
- If scanned at the TU, images should be transferred without delay to the MTC, accompanied by a report



### Interventional Radiology

Interventional radiological (I.R) procedures can be considered for abdominal and/or pelvic injury, in centres where teams are experienced in this style of management. This can be utilised in situations where active bleeding is demonstrated by contrast blush on CT. This requires full trauma team support the detail of which is available within the linked Paediatric Major Trauma manual.

## 4. CORE TOPICS: Guidelines Major Haemorrhage

### Paediatric Major Haemorrhage

Major haemorrhage can be defined as severe, ongoing, often non compressible bleeding requiring immediate blood product resuscitation. This may be accompanied by signs of shock or acute coagulopathy. Children have excellent compensatory mechanisms so clinical signs of shock may present late.

### Product Dosing in Children

- PRBC: 10-20mls/kg
- FFP: 10-20mls/kg in aliquots (Octaplas if available)
- Cryoprecipitate: 10mls/kg
- Platelets: administer after every 30ml/kg of PRBC & FFP
- Tranexamic Acid 15mg/kg (Max 1g)

Blood product administration should be guided by clinical response and ideally through use of near side testing such as ROTEM.

Management of electrolytes, specifically potassium and calcium should be part of any major haemorrhage protocol.

As always hypothermia and acidosis should be avoided.

*Full detail of major haemorrhage protocols of management can be accessed in the linked Paediatric Major Trauma Manual*

## 5. CORE TOPICS: Guidelines for Extremity and Spinal Trauma

### Factors for Consideration in Paediatric Trauma

- Children with orthopaedic injuries should have shared paediatric care for ongoing medical and safeguarding needs
- Child safeguarding should be considered in all cases
- Supracondylar fracture of the humerus is the most common injury associated with neurovascular compromise in children. The “pink but pulseless upper limb” in this context should undergo emergency reduction with either appropriate procedural analgesia and sedation or general anaesthetic in theatre
- Advice should be sought early if vascular support is required
- Similar urgency should be applied with neurovascular compromise of any traumatic limb injury
- BOAST guideline for open fractures should be followed details of which can be found in the linked *Paediatric Trauma Manual*. <sup>6,7,8</sup>

### Peripheral Nerve Blockade

- Peripheral nerve blockade (PNB) should be considered in addition to other modes of analgesia
- Successful peripheral nerve blockade can provide effective, safe analgesia and minimise opiate requirements until surgical fixation
- Painful long bone fractures such as femoral fracture with associated traction can respond effectively to PNB such as Fascia Iliaca Block. Further detail within linked *Paediatric Trauma Manual*
- Before proceeding to peripheral nerve blockade, routine safety checks must be adhered to. “Stop Before You Block”<sup>44</sup>
- Patients should be continuously monitored throughout block as per AAGBI guidelines

### Factors for Consideration in Paediatric Spinal Trauma

- Trauma to the spine in young children can produce neural damage in the absence of bony injury.
- Spinal fracture is uncommon in paediatric patients compared to adults.
- Imaging of the cervical spine is not indicated on the basis of head injury alone: NICE has a separate algorithm extrapolated from adult data.



- In the presence of neurological findings suggestive of cervical spine injury, MRI scan is the investigation of choice, due to the risk of spinal cord injury without radiologic abnormality (SCIWORA)

#### C-spine immobilisation

- The Royal College of Emergency Medicine (RCEM) recognises that in some trauma systems there has been a move away from the use of 'hard' cervical collars for immobilisation of the cervical spine and that such collars often do not fit, particularly young children, appropriately <sup>31</sup>
- Cervical spine immobilisation should be used in all children with a potential cervical spine injury (when able) until such an injury has been ruled out by appropriate clinical assessment and imaging (if indicated)

- 

#### Suspected thoracic or lumbosacral column injury

- It is well recognised that assessment of the child for potential thoraco-lumbar injury is difficult and often dependent on both developmental age and distracting circumstances

*NICE guidelines for suspected Cervical and Thoracolumbar Spinal injury. See linked Paediatric Major Trauma Manual*

## 6. CORE TOPICS: Guidelines for Burn Management

Burn care is organised using a tiered model of care whereby the most severely injured are cared for in services recognised as "Specialist Burns Centres" and those requiring less intensive clinical support being cared for in a "Burns Unit."

### London Referrals

#### Specialist Burns Centre/ICU

- Children > 6 months/6kg are accepted at St Andrew's Centre for Plastics Surgery and Burns (Broomfield Hospital).
- Contact: 01245 516037
- Infants < 6months/6kg will be referred to Birmingham, Bristol or Manchester

#### Burns Units



- Chelsea and Westminster Hospital
- Queen Victoria Hospital East Grinstead

#### Absolute Criteria for referral to a Paediatric Specialist Burns Centre:

- Burn  $\geq$  30% TBSA
- Burn  $\geq$  20% TBSA Full thickness
- Burn  $\geq$  15% TBSA in  $<1$  year old
- Burn + inhalation injury or need to ventilate
- Burn + Major trauma
- Burn + requirement for inotropic support
- Burn + requirement for renal support
- Burn + base deficit  $>6$  and deteriorating
- Burn + O<sub>2</sub> Requirement  $>FiO_2$  of 50%

#### Factors for Consideration in Burn Referral

- To assist discussion and referral, clinical photographs of the burn should be taken, and images uploaded to <http://trips.nhs.uk>
- Link to London & South East Burns Network (LSEBN): <http://www.lsebn.nhs.uk><sup>9</sup>
- Transfers out of network may occur due to bed availability for burns. Be aware you may need to discuss with neighbouring networks
- Always consider safeguarding

*Clinical management of burns: see linked Paediatric Major Trauma Manual*





## 7. CORE TOPICS: Guidelines for Paediatric Radiology

Children should be individually assessed on the basis of mechanism of injury and clinical findings, before exposure to X Rays. They should not be automatically exposed to CT scanning as occurs with polytrauma in the adult population

Injuries regarded as common and serious in the adult population such as spinal or pelvic injury are rare in pre-adolescent children

Historically blunt trauma has been a more common mechanism of injury in children, with a more conservative approach to injury management. However, penetrating trauma is on the increase

The cancer risk of computed tomography (CT) in childhood is significant and is higher in younger ages. Careful clinical evaluation, judicious use of plain radiographs and targeted use of CT is recommended to guide decision making regarding radiation risk versus risks of missed injuries

Link to Royal College of Radiologists decision making algorithm:

<https://www.rcr.ac.uk/publication/paediatric-trauma-protocols>

*Clinical decision making in radiology: see linked Paediatric Major Trauma Manual*

## 8. CORE TOPICS: Guidelines for Paediatric Analgesia

### Analgesia in the Injured Child: Factors for Consideration

- Pain can hinder assessment and diagnosis in children, causing agitation, tachycardia and distress. Alleviating pain early can exclude cardiovascular instability as a cause of altered signs and assist clinicians in their trauma assessment. It has the added benefit of also reducing patient and parental anxiety
- Consideration should be given to different routes of administration whether that be oral, intranasal (IN), rectal, intramuscular (IM), intravenous (IV) or use of regional/peripheral nerve blocks as an adjunct for analgesia
- For IV access consider the use of local anesthetic creams or cold spray if time allows, to minimise distress
- Ongoing analgesia needs must be considered in the form of patient controlled analgesia (PCA) or nurse controlled analgesia (NCA), depending on the age and cognition of the patient.
- Epidural analgesia has a role in paediatric trauma and has a particular benefit in children where opiate side effects should be avoided. Staff experienced in managing paediatric epidurals should be available for patient review 24/7
- For opiate based analgesia rescue doses of naloxone for both respiratory depression and pruritus should be prescribed. A range of anti-emetics should also be prescribed.

*Further detail available in the linked Paediatric Major Trauma Manual*

## 9. CORE TOPICS: Paediatric Rehabilitation

### Definitions:

**Rehabilitation** is a process of assessment, treatment and management with ongoing evaluation by which the individual (and their family/carers) are supported to achieve their maximum potential for physical, cognitive, social and psychological function, participation in society and quality of living.

**Specialist rehabilitation** is the total active care of patients with complex disabilities by a multiprofessional team who have undergone recognised specialist training in rehabilitation; led/ supported by a consultant trained and accredited in rehabilitation medicine.

(Ref: Specialist neuro-rehabilitation services: providing for patients with complex rehabilitation needs. London: British Society of Rehabilitation Medicine. 2010.)

- Major trauma can cause complex and long-lasting effects including physical, cognitive, emotional, social and behavioural problems
- All patients are required to have a rehabilitation prescription completed by a recognised practitioner, usually a rehabilitation consultant or an allied specialist therapist. This is a requirement for best practice tariff in England
- British Society Rehabilitation Medicine: Core Standard document

Essential data collection using standardised data collection tools for audit and commissioning (ref: <https://www.bsm.org.uk/downloads/bsrm-core-standards-for-major-trauma-24-10-13-version1.4newlogo-forpublication-finalforweb-checked1-12-14.pdf>)

### Neuro Rehabilitation: Key Principles

- Children and young people can experience a wide range of symptoms following trauma; physical, cognitive and psychosocial
- Discharge planning should involve the patient and family in consultation with all available community services, including the child's general practitioner
- Families should be signposted to supportive groups such as the Child Brain Injury Trust (CBIT) and Headway



- Trauma can have a serious effect on the wellbeing of babies and toddlers. It can disrupt important aspects of child development that occur before the age of three years. These may include bonding with parents, as well as foundational development in the areas of language, mobility, physical and social skills and managing emotions
- Adolescents particularly teenagers are a socially sensitive group. They engage in risk taking behavior, they may wish to be autonomous and exclude parents/primary care givers as they strive to become independent
- For patients approaching adulthood it can be helpful to promote shared decision making and help them to set their own goals for recovery within the framework of clinical guidance. Social media and online forums can also feel less threatening to children in need.
- CBIT offers clinical screening, advice, education and onward referral for children and young people following an acquired brain injury.  
(<https://childbraininjurytrust.org.uk>)
- Headway is a UK-wide charity that works to improve support and provide services after brain injury for patients of all ages and their primary caregivers.  
(<https://www.headway.org.uk>)

*Additional paediatric rehabilitation in linked Paediatric Major Trauma manual*

## 10.CORE TOPICS: Safeguarding/Non-Accidental Injury (NAI)

### Definition of Maltreatment

- The World Health Organization distinguishes four types of child maltreatment: physical abuse, sexual abuse, emotional and psychological abuse and neglect.

Safeguarding children is defined in [Working Together To Safeguard Children](#) as:

- protecting children from maltreatment
- preventing impairment of children's health or development
- ensuring that children are growing up in circumstances consistent with the provision of safe and effective care
- taking action to enable all children to have the best outcomes <sup>13</sup>



Non-accidental injury is a major cause of trauma in children and must be considered in all cases. It is particularly prevalent cause of injury in children under the age of one year. These children are often under 6 months of age with high injury severity scores, particularly from severe head injuries. They have associated high mortality rates.

For further information please refer to the linked *Paediatric Major Trauma Manual*

### Duties of the Trauma Team

- To be aware of the local child protection mechanisms
- To contact the named paediatrician or safeguarding nurse for advice on all cases (on call paediatrician or named/designated Doctor/Nurse)  
\*see local guidelines
- To act in the best interests of the child and the child's rights to be protected
- To respect the rights of the child in terms of confidentiality
- To be aware of the rights of those with parental responsibility

All staff with clinical responsibility for paediatric patients should be trained in safeguarding children

*Further detail available in the linked Paediatric Major Trauma Manual*

### Violence Reduction

#### Principles of violence reduction

- Traditional safeguarding processes do not always offer an adequate safety net for these patients on discharge from the hospital setting
- Identification of risk can protect young people from future episodes of violence.

#### Violence reduction: a team-based approach

An approach taken by a growing number of hospitals is to deploy a team of independent caseworkers, usually through a third party or local authority. The caseworkers are generally from neighbouring communities or will have grown up with exposure to many of the problems that these young patients experience. This peer led support provides a sense of authenticity and trustworthiness to the young person, not always possible from clinical staff.



Teams of this nature include the St Giles SOS Project, Oasis Youth Support, the Glasgow Navigator project, and Redthread.

#### Key points for clinicians in order to promote violence reduction

- Good practice is to ensure that a medically fit patient is also safe to be discharged from hospital.
- If the patient is under 18, they should additionally be referred to children's safeguarding services. If there are siblings or other children at home, a safeguarding referral should be actioned for them also.

*Further detail available in the linked Paediatric Major Trauma Manual*

## 11. MAJOR INCIDENT AND MASS CASUALTY

A major incident is any occurrence that presents serious threat to the health of the community and requires implementation of special arrangements. It can result in a surge in patient numbers that is beyond the scope of “normal business operations”.

Mass casualty events are typically events with casualties in the 100s where the normal major incident response must be augmented with extraordinary measures.

Recent events have reiterated the need for well coordinated plans to include children's services.

Every hospital should have an updated major incident plan that includes children. Once a Major Incident is declared this plan should roll into action.

### Major Incident Summary: Key Considerations:

- Be aware of your institution's major incident plan. Ensure that this is up to date for paediatric care
- Ensure up to date major incident telephone call list
- Command, control, and communication are essential components of management in a major incident: practice the major incident plan via tabletop exercises and simulation
- An in-hospital triage area led by a senior clinician, often an Emergency Medicine Consultant, should be available to allow rapid assessment of injury severity, with allocation of a triage priority
- Set up command centres in key areas to coordinate admission and flow between ED, theatres, PICU and wards
- A central command should coordinate additional equipment as required
- Allocate roles in advance of MI to all staff. Ensure staff are familiar with their role in a MI via action cards)
- Allocate staff to next shift planning during the initial phase
- Consider how your department would manage on going care of mass casualties, after the initial wave





- Time should be allocated for debrief of clinical and non clinical staff involved. Staff may also require physical, social, and psychological support after a major incident
- Consider cohorting care where adults (parents) have been injured with their children
- All patients should undergo secondary and tertiary trauma surveys to identify missed injuries. Patients will also need ongoing psychological support
- Consider prophylaxis for retroviral disease

#### Chemical Biological Radiological Nuclear

- The Public Health England document on “**CRBN; Clinical management and health protection**” gives clear guidance for these services, including medical management for multiple different incidents and can be found below.  
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/712888/Chemical\\_biological\\_radiological\\_and\\_nuclear\\_incidents\\_clinical\\_management\\_and\\_health\\_protection.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/712888/Chemical_biological_radiological_and_nuclear_incidents_clinical_management_and_health_protection.pdf)

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**Please note that references apply to above document and more detailed Paediatric Trauma Manual**

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