North East London & Essex
Trauma Network

Children's Spinal Fracture Automatic Acceptance Pathway V.1.1 (Dec 2020)

According to Prehospital triage tools, the vast majority of children with spinal fractures will be triaged to the Major Trauma Centre. However, this will not prevent children from self-presenting at a Trauma Unit or Local Emergency Hospital. In such scenarios please follow the guidance set out in this document.

Cervical Spine

Key Facts and imaging

- Cervical spine bony injury is uncommon in paediatric patients compared to adults.
- Trauma to the spine in young children can produce spinal cord injury in the absence of bony injury.
- Imaging of the cervical spine is not indicated on the basis of head injury alone: NICE has a separate algorithm extrapolated from adult data. See chart below.
- Plain films may be indicated and if performed should include
  - Lateral c-spine from base of skull to C7/T1 junction
  - AP C-spine from C2-T1
  - Adequate peg views (may be difficult in younger children)
  - 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)
  - interpreting between normal and pathological findings is complex and it may be necessary to seek out specialist radiological input

Thoracolumbar

Key Facts and imaging

- Perform an Xray as the first line investigation for children with suspected spinal column injury without abnormal neurological signs or symptoms in the thoracic or lumbosacral regions (T1-L3).
- Perform CT if the Xray is abnormal or there are clinical signs or symptoms of a spinal column injury.
- If a new spinal column fracture is confirmed, image the rest of the spinal column.
- Use whole body CT in children 16 or over with blunt major trauma and suspected multiple injuries.
- In under 16's use clinical judgement to limit CT to assessment areas.
- Perform an MRI if there is strong suspicion of cervical injury, abnormal neurological signs or both.

Assess

Assess the child for spinal injury, initially taking into account the following factors:

- Any significant distracting injuries
- Under the influence of drugs or alcohol
- confused or uncooperative
- reduced level of consciousness
- any spinal pain
- any hand or foot weakness (motor assessment)
- altered or absent sensation in the hands or feet (sensory assessment)
- any priapism

Carry out full in-line spinal immobilisation if any of these factors are present.

In addition:

- Is there pain in the thoracic or lumbar sacral spine?
- Was a dangerous mechanism of injury?
- Does the child have pre-existing spinal pathology?
- Are there abnormal neuro symptoms, a new deformity or bony midline tenderness?
- If ambulating, is there any pain?
- If a cord injury is suspected complete an ASIA chart ASAP in the ED.

Immobilise:

- Cervical immobilisation should be used in all children with a potential cervical spine injury until such an injury has been ruled out by appropriate clinical assessment and imaging (if indicated).
- The use of a **properly fitting cervical collar**, applied by a competent individual, is an effective tool for the prevention of secondary spinal cord injury. If this is not possible consider the use of blocks and tape.
- Advanced Paediatric Life Support course favours manual in-line stabilisation (MILS) in conscious children +/- blocks and tape to facilitate comfort.
- It is imperative to involve the parents/primary caregivers in the immobilisation stage in order to reduce stress and agitation in the child.
- If attempts at immobilising the cervical spine are causing distress and agitation an assessment of the risks/benefits of continued attempts at immobilisation must be made.
- In unconscious children or when MILS cannot be maintained, immobilisation should be with a properly fitting collar, blocks and tape (3 point immobilisation). **This is also applicable in the case of a poorly fitting collar.**
- Collars should be removed, and MILS maintained prior to intubation attempts MILS should be maintained for intubation attempts if c-spine is not cleared.

Immediate Management if suspected SCI

Airway

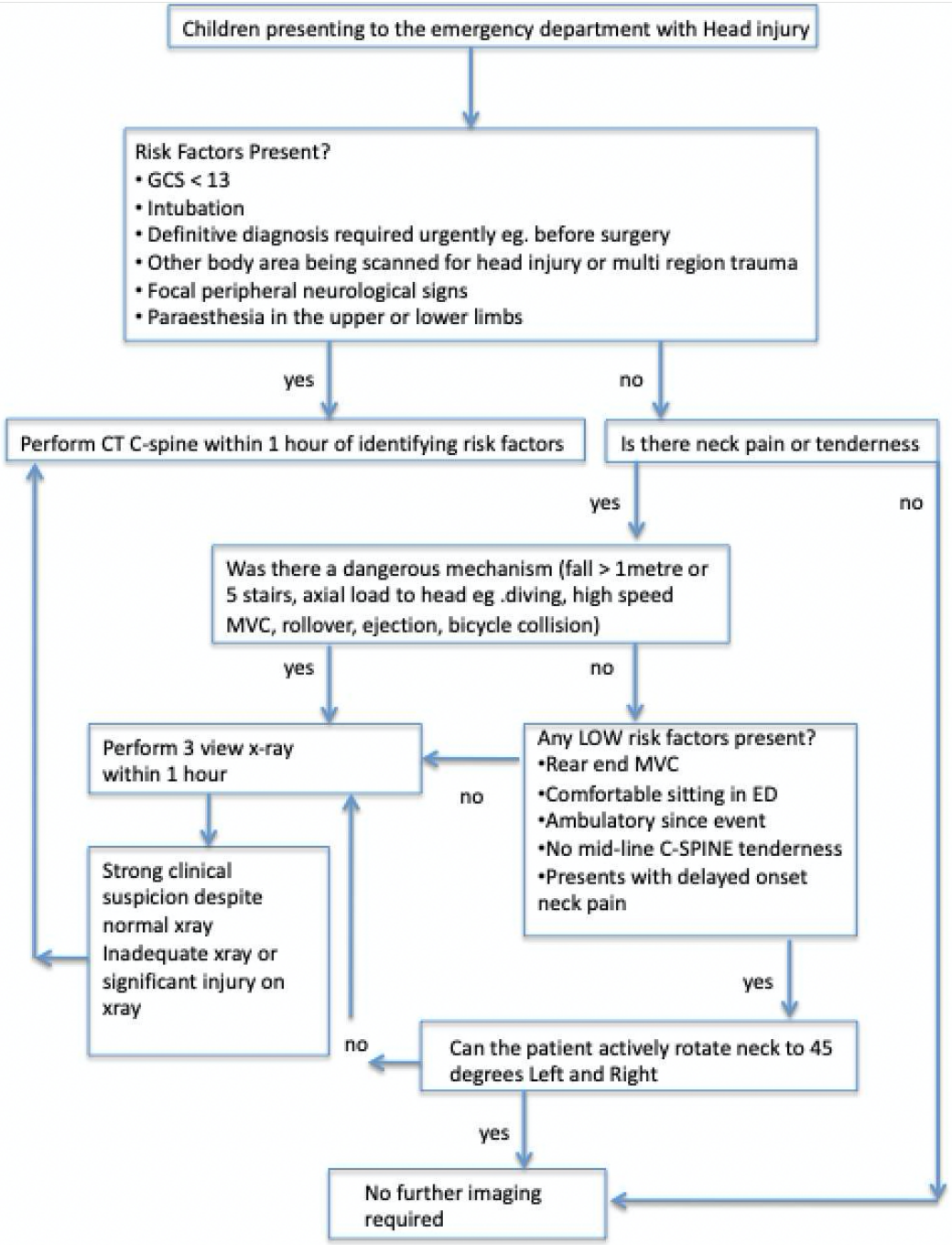
- Maintain mean arterial pressure
- Anticipate bradycardia and hypotension if intubating or suctioning
- Avoid Succinylcholine
- Maintain temperature

Breathing

- Nurse flat, max of 15 degrees if ventilated.
- Minimum hourly obs for signs of respiratory distress or fatigue.
- Humidify O2, consider bronchodilators.

Circulation

- SCI may result in bradyarrhythmias or asystole which can be exacerbated by log rolling, repositioning or tracheal stimulation
- Prescribe Atropine for emergency treatment of bradycardia
    - 20mcg/kg (min 100mcg, max 600mcg)
    - Repeated after 5 minutes if required
    - Max 1mg in a child or 2mg in an adolescent
    - If prolonged bradycardia, consider glycopyrrolate
- Observe for neurogenic shock. Consider vasopressors e.g. noradrenaline.
- Maintenance fluid should be titrated to urine output (not BP).
- Beware of autonomic dysreflexia. Identify stimuli and treat. Monitor continuously until resolution.



Refer:

- Refer the patient to The Royal London Hospital MTC via the Major Trauma Workstream on Referapatient.org (see network handbook for further details)
- Do NOT refer directly to neurosurgery or spinal surgery
- IEP the images to The Royal London on blue light
- If appropriate transfer the child to a safe clinical area whilst arrangements are made
- Plan for transfer including:
  - Appropriate clinical accompaniment
  - Appropriate immobilisation
  - Essential drugs and equipment

Once transfer agreed:

- For intubated patients liaise with CATS urgently - info can be found online at https://cats.nhs.uk/emergency-tools
- For non-intubated patients enact local policy. Safe transfer tool (STOPP) available at http://site.cats.nhs.uk/wp-content/uploads/stopp_tool.pdf
- Ensure spinal alignment is maintained at all times throughout transfer
- Confirm appropriate monitoring equipment is available
- The child should have appropriate analgesia prior to transfer
- Ensure an appropriate accompanying clinical team, along with the child's parent or caregiver where possible
- Ensure appropriate transfer documentation maintained

Communication is vital throughout the whole process. Keep in touch with the MTC team via 0203 594 5722. All transfers MUST have a Referapatient referral in place, even if it needs to be completed after the patient has left.