

## Paediatric Trauma Cervical Spine Guidelines UHW

Traumatic injuries of the cervical spine (C-spine) are uncommon in children. However, it is safer to assume there is a cervical spine injury until examination and/or radiological investigation demonstrate otherwise. It is often challenging to assess and immobilize children when a C-spine injury is suspected.

- Frequent reassurance is required to help keep the child still and reduce their anxiety levels.
- If the child is anxious or uncooperative and a thorough examination is not possible, try to maintain in-line C-spine immobilisation.
- Early provision of simple analgesia (paracetamol / ibuprofen) and early review by a senior clinician who is experienced in the management of paediatric C-spine assessment may avoid prolonged periods in C-spine collars.

### Indications for cervical spine immobilisation: -

1. All patients with altered level of consciousness post trauma
2. Patients in whom the mechanism of the injury could have resulted in injury to the spine: -  
Severe force (e.g., motor vehicle crash or fall)
  - Diving-related injuries
  - Acceleration-Deceleration injuries
  - Sports injuries (particularly hockey, football and horseback riding)
3. All patients with signs and symptoms consistent with spinal cord injury:
  - History of transient paraesthesia, dysaesthesia, shooting pains or subjective extremity paralysis
  - Complaints of neck pain or discomfort, or presence of muscle spasm
  - Limited range of motion or tenderness over the spine
  - Presence of sensory-motor deficits

**Note: Cervical spine in an unconscious patient can only be confidently cleared after the patient regains consciousness. In doubtful situations it is mandatory to continue with cervical spine immobilisation, expert consultation is available preferably after negative radiology and normal clinical examination. If a child has had a negative MRI, then there is no injury.**

### Immobilisation Technique

- Vacu-Mattress with torso and extremity restraints
- Blocks or sandbags with tape (rigid collars are no longer recommended in paediatric trauma)
- Where above not available manual in-line stabilisation (MILS) must be used

### Assessment of Cervical Spine

**If abnormal neurology-contact spinal team / on call orthopaedic registrar immediately**

To be able to adequately assess the patient, they must be:

- Conscious
- Co-operative
- Not be affected by alcohol or recreational drugs
- Be developmentally able to engage in the assessment process

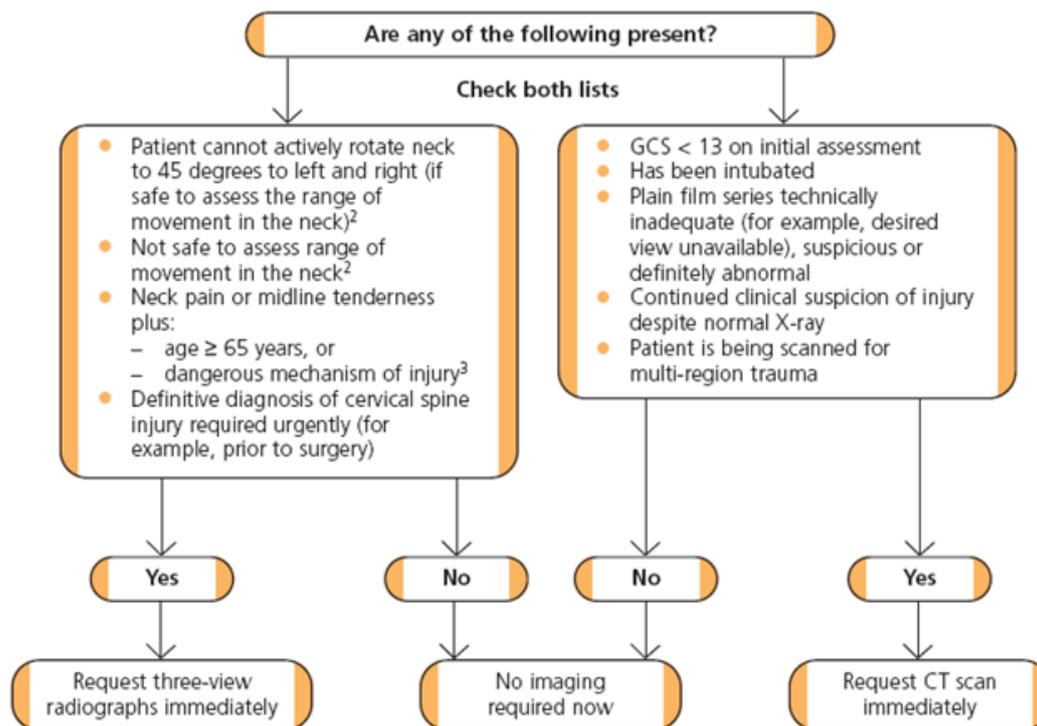
C-spine assessment, clearance and x-ray interpretation should be conducted in consultation with a senior clinician,

- Prior to palpation ask if the patient has any neck pain, weakness, paralysis or parasthesia-if any present contact spinal team
- If patients have a high mechanism of injury, obtain a c-spine prior to examination.
  - Fall from height > 1 m or 5 stairs
  - Axial load to the head
  - High speed motor vehicle collision
  - Rollover motor accident
  - Accident involving motorised recreational vehicles
  - Bicycle collision
  
- To examine, maintaining in-line immobilisation, gently palpate the posterior midline of the neck-feeling from the nuchal ridge to the 1<sup>st</sup> thoracic vertebrae. Repeat process lateral to the midline
- If there is no midline tenderness assess for active range of movement by asking the patient to slowly rotate to 45 degrees and lift head off the bed. Stopping if there is any pain or abnormal sensations in the arms
- If patient is able to move neck without any pain-c-spine can be cleared
- If midline pain – three view cervical spine x-rays
- If normal x-rays and pain resolved- clear the c-spine
- If x-rays abnormal or ongoing pain – discuss with Trauma and Orthopaedic SpR on call (further imaging, CT, MRI, Erect x-rays)

**If patient is unable to be assessed immobilisation should be maintained**

## Imaging

### Selection of Adults and Children $\geq 10$ years for imaging of the C-spine ( in the context of associated Head Injury)



<sup>2</sup> Safe assessment can be carried out if patient: was involved in a simple rear-end motor vehicle collision; is comfortable in a sitting position in the emergency department; has been ambulatory at any time since injury and there is no midline cervical spine tenderness; or if the patient presents with delayed onset of neck pain.

<sup>3</sup> Dangerous mechanism of injury: fall from > 1 m or 5 stairs; axial load to head – for example, diving; high-speed motor vehicle collision; rollover motor accident; ejection from a motor vehicle; accident involving motorized recreational vehicles; bicycle collision.

### Children < 10 years old

- Use anterior/posterior and lateral radiographs without an anterior/posterior view
- Use CT imaging to clarify abnormalities and uncertainties

## **Reassessment**

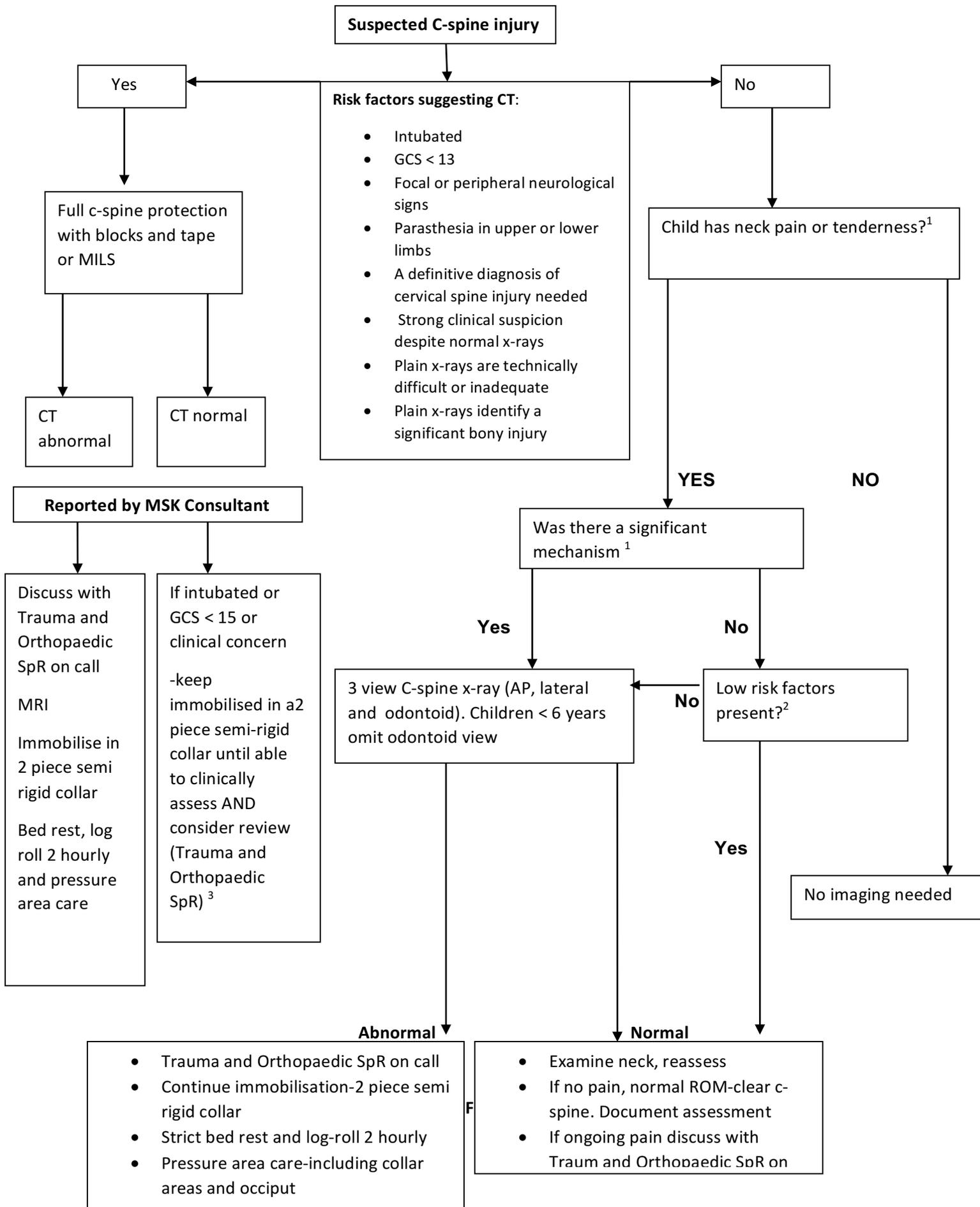
Patient with normal x-rays should be re-assessed for:

- Posterior midline tenderness
- Range of motion of cervical spine
  - Flexion/extension
  - Lateral Flexion (left and left)
  - Lateral rotation (left and right)

**If no tenderness and normal x-rays can be cleared**

**Ongoing MIDLINE pain and normal x-rays, discuss with Trauma and Orthopaedic SpR on call (further imaging, CT, MRI, erect XRs)**

## Summary: Management of C-spine injuries



1. If dangerous mechanism get x-ray BEFORE assessing range of movement
  - Fall from height > 1 m or 5 stairs
  - Axial load to the head
  - High speed motor vehicle collision
  - Rollover motor accident
  - Accident involving motorised recreational vehicles
  - Bicycle collision
  
2. Low risk factors present:
  - Involved in a simple rear end collision
  - Has been ambulatory
  - Is comfortable in the sitting position
  - Has no midline c-spine tenderness
  - Has a delayed onset of neck pain
  
3. Continue immobilisation until child is awake and can be assessed clinically. If child is intubated then collar to remain on during extubation process unless risk to airway control.