

Spinal immobilisation and log roll

Key teaching points – cover as much as you can in the allotted time

1. C-spine immobilisation

- Ask students “*what kinds of injuries would prompt you to immobilise someone’s C-spine*”
 - Could they have damaged their head/neck? RTC, fall from height
 - Not all trauma needs C-spine immobilisation - if the patient has been stabbed in the abdomen, they have major trauma, but they don’t need immobilising
- Ask students “*how would you immobilise the C-spine*”
 - **Manual In-Line Stabilisation (MILS)** - place your hands firmly either side of their head, making sure you don’t cover up their ears. You can rest your hands on the sides of their head, or on their shoulders with your forearms holding the head – whichever is more comfortable



- **Gold standard immobilisation** - rigid c-spine collar appropriately sized to the patient PLUS head blocks PLUS tape across the forehead and chin
 - C-spine collar is sized based on measurement from top of the shoulder to angle of the mandible
 - Head blocks placed either side of the head with the holes level with the patient’s ears, so they can still hear you
 - Tape placed across the forehead and chin, stick to something immobile (e.g. the trolley base – not sheets or bed rails). Tape should be stuck to the skin



- Additional considerations
 - There are risks – airway problems, raises ICP, pressure sores on neck/shoulders, can exacerbate pre-existing neck issues
 - Don't try to force a collar on if it won't fit – e.g. obese patients, rugby players with large shoulders
 - Drunk/delirious/confused patients are unlikely to tolerate a collar and become more agitated – blocks/tape only or MILS is sufficient – consider need for sedation

2. The log roll

- How do we safely move a patient with spinal immobilisation?
 - We roll patients to look at their back as part of A-E, or if the patient is about to vomit (it won't end well if they're still laying on their back when it comes up!)
- Talk the students through the log roll procedure and get them to practice
 - Team of at least 5 people:
 - Person One: Head. Team leader.
 - Person Two: Puts one hand on the patient's shoulder. One hand just above their hip.
 - Person Three: Puts one hand on the patient's hip, and one hand under their inner thigh.
 - Person Four: Puts one hand under the knee and one hand under the ankle.
 - Person Five: Examines the back (or holds the vomit bowl).
 - The person holding the head has control, and ultimate responsibility for C-spine alignment.
 - Before rolling, be clear to the team about how far you're going – to examine the back tilting to 45 degrees is enough, if the patient is vomiting they will need to be turned to 90 degrees
 - Don't say "one, two, three, roll" – some people will roll on three, some will roll on roll – instead say "ready, brace, roll"



- Consider which way to roll – if they have a left-sided haemothorax you should roll onto the left (so it doesn't put pressure onto the heart and right

lung) – if they have a left-sided femur fracture, roll onto the left side (because you can't use a broken leg as a lever to turn them)

3. Clearing the C-spine

- The patient needs to have their C-spine assessed to determine if they need any imaging before it is safe to remove the immobilisation
- Based off the Canadian C-Spine rules:
 - Step 1: Over 65, severe neck pain, known vertebral disease, dangerous mechanism (e.g. fall from height, diving injury, bicycle collision), or new paraesthesia = CT scan
 - Step 2: Any of the below “safe factors” = safe to remove immobilisation and assess range of motion. If not → CT scan
 - Simple rear end shunt motor vehicle collision
 - Sitting position in ED
 - Ambulatory at any time
 - Delayed onset of neck pain
 - Absence of midline neck tenderness
 - Step 3: If they can rotate their neck more than 45 degrees they don't need a CT scan. If not → CT scan
- UHL ED has a C-Spine protocol to follow which is based on these guidelines

LRI Emergency Department Suspected cervical spine injury

Competent ED staff to use in all adult blunt trauma patients presenting with

- Neck pain
- New limb weakness
- Indirect feature triad (see boxes 2 and 3)
- Spinal precautions in situ
- GCS <15 with any evidence of trauma above the clavicles

Do NOT use if injury >48h old or if repeat presentation

Disclaimer: Version 77

This is a clinical template; clinicians should always use judgment when managing individual patients

Chair's approval given 01/08/2022, prior to Aug ED guideline.eip. Review date: Feb 2023. Trust Ref: C65/2016

Patient details

Full name
DoB
Unit number

(use sticker if available)

1 Is patient stable?

No, as at least one of the below

- GCS <15
- Respiratory rate <10
- Respiratory rate >24
- Systolic BP <90

Yes, as none of the above

2 Indirect feature triad?

Yes, as ALL THREE of the below

Evidence of trauma above clavicles

record details below

AND not ambulatory since injury
AND 'triad trigger' incident (box 3)

No, as only two or less of the above

3 'Triad trigger' incident?

Yes - one of the below

- Fall ≥3 feet or ≥5 steps
- Diving injury
- Contact sport with axial load to head
- Motor vehicle (incl. motorcycle) collision
- Pedestrian hit by motor vehicle
- Bicycle collision

No - none of the above

4 Dangerous mechanism?

Yes - one of the below

- Fall ≥3 feet or 5 steps
- Axial load to head, e.g. diving
- Crash with motorized recreational vehicle (e.g. quad bike)
- Motor vehicle collision at ≥65mph, rollover or ejection
- Bicycle collision

No - none of the above

5 Known c-spine problem?

Yes - one or more of the below

- Rheumatoid arthritis
- Ankylosing spondylitis
- Cervical spinal stenosis
- Previous c-spine surgery

No - none of the above

6 Is ROM-testing safe?

Yes, as one or more of the below

- Ambulatory at any time after injury
- Sitting position in the ED
- Onset of pain not immediate
- Simple rear-end MVC (see box 7)
- No midline c-spine tenderness

No, as none of the above

7 Simple rear-end MVC?

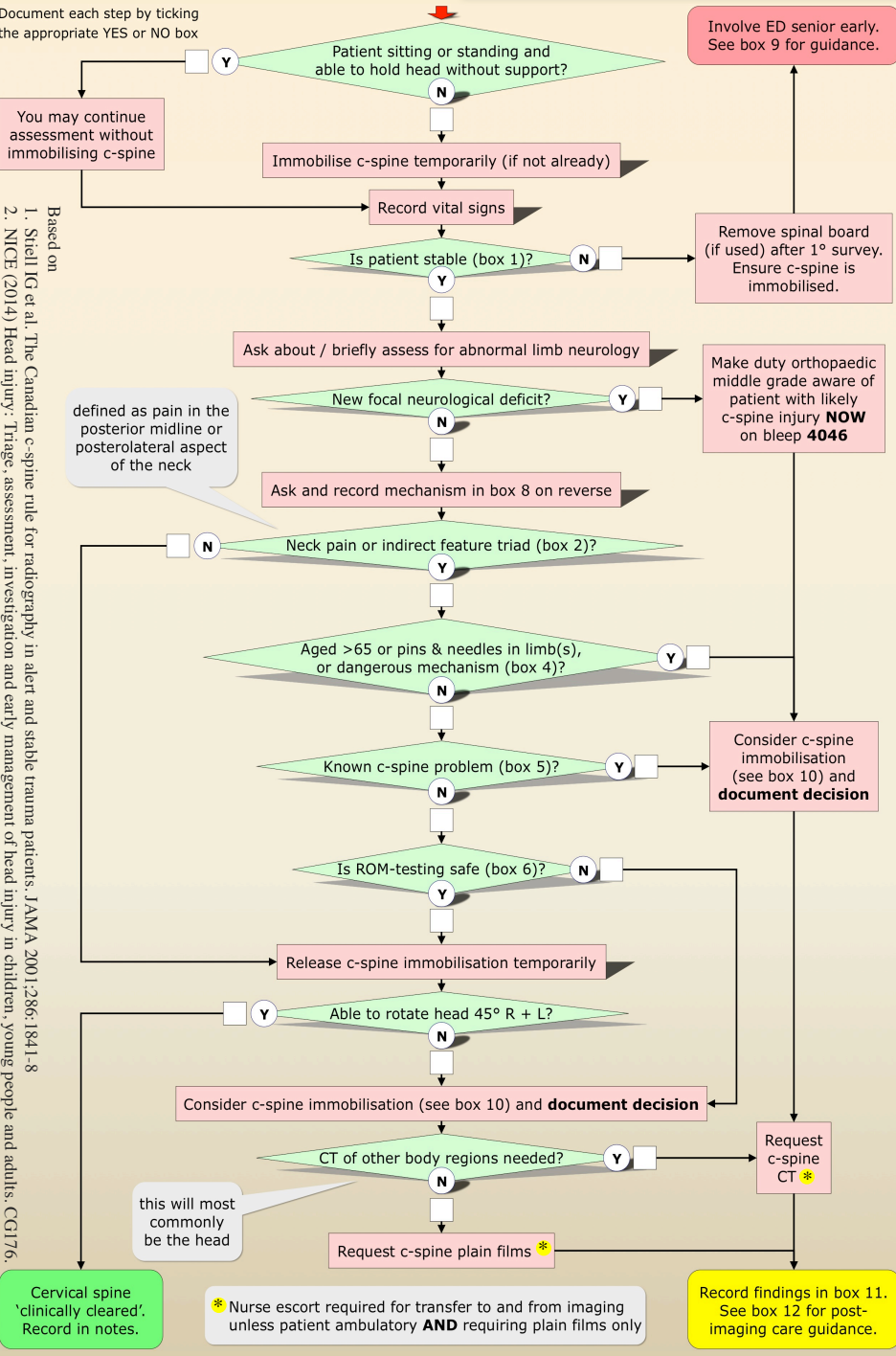
No, as at least one of the below

- Pushed into oncoming traffic
- Hit by high speed vehicle
- Rollover
- Hit by bus or large truck

Yes, as none of the above

Document each step by ticking the appropriate YES or NO box



Based on
1. Stiell IG et al. The Canadian c-spine rule for radiography in alert and stable trauma patients. JAMA 2001;286:1841-8
2. NICE (2014) Head Injury: Triage, assessment, investigation and early management of head injury in children, young people and adults. CG176.



Assessed by
Print name Signature Job role Date Time completed

8 Mechanism of injury

Fall

- down stairs
distance in steps: 
- from height
distance in feet: 
 - on level ground
 - riding incident

Motor vehicle collision (MVC)

- Seatbelt worn Yes No
- Did vehicle roll over Yes No
- Was patient ejected Yes No


Patient vehicle type (*please circle*)



Other 

Object of collision (*please circle*)

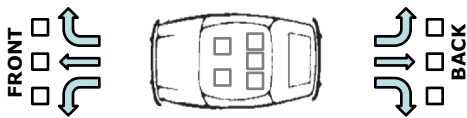



Other vehicle type or object 

None


Collision schematic


- Indicate patient's position in vehicle
- Tick direction of travel
- Draw an arrow to indicate point & direction of impact with object



Patient vehicle speed (*mph*) 

Colliding vehicle speed (*mph, if applicable*) 

Combined speed (*mph; if frontal impact with other vehicle*) 

- Pedestrian hit by motor vehicle
- Bicycle crash
- Diving injury
- Contact sport + axial load to head
- Other 

9 C-spine assessment in unstable patients

Arrange CT if

- GCS less than 13 on arrival in ED
- Intubated
- Meets criteria for CT head
- Other body areas require CT
- Focal peripheral neurological deficit
- Presence or absence of cervical spine integrity needs to be established urgently (e.g. before surgery)

If none of the above AND alert but abnormal vital signs

→ Reassess patient after aggressive resuscitation

- Stabilized patients - continue down flowchart on reverse
- Persistent instability - CT body regions of concern **AND** c-spine

If none of the above AND stable vital signs but GCS 13 or 14

→ Use clinical judgment; select from the following options


- Immobilization and reassessment at 2h from injury (if GCS then 15 continue down flowchart on reverse; CT if not)
- Early CT c-spine (**AND** head) if immobilization poorly tolerated

10 C-spine immobilisation needs

- Spinal boards help extrication but cause pressure damage and do not add value once patient is placed on ED trolley. Remove ASAP.
- Standard immobilisation requires hard cervical collar, head blocks and tape but can be provided manually during initial assessment
- Immobilisation is mandatory if patient altered or unstable, or new peripheral neurological deficit or radiological abnormality found
- Walking, alert and stable patients do not need to be immobilised unless peripheral neurological deficit or paraesthesia are present
- In alert and stable but non-walking patients without neurological signs, **senior clinicians** may rarely relax immobilisation (e.g. if pre-existing fixed c-spine deformity or immobilisation refused). Document rationale on request form and inform radiographers.


11 C-spine imaging results

Plain films

- Normal
- Abnormal 
- Inadequate

NB: Request CT if films are suspicious or abnormal (radiographers will arrange CT themselves if films merely technically inadequate)

CT

- Normal
- Abnormal 

NB: Consider CT or MR angiography of the neck vessels if injuries seen on CT (fractures involving foramina transversaria or lateral processes, or vertebral misalignment) raises suspicion of vascular injury or if patient has features of a posterior circulation stroke.

12 Post-imaging care guidance

- Acute CT abnormality or new focal neurological deficit**
→ Keep immobilised and refer to orthopaedic team. **NB:** If focal peripheral neurological deficit despite normal CT, MRI can show spinal cord injury without radiological abnormality ('SCIWORA').
- Neither of the above but patient intubated and ventilated**
→ Keep immobilised. If reassessment not possible after 24h the options are MRI or mobilisation, signed off by two consultants.
- All other patients can be declared 'radiologically cleared'**
→ Remove c-spine precautions and record outcome in the notes