CLINICAL CLEARANCE OF THE CERVICAL SPINE

OVERVIEW

Many stable young trauma patients with normal mental status and previously normal cervical spines can have their cervical spines “clinically cleared” without requiring medical imaging. If in doubt consult a senior clinician. There are 4 key steps in clearing the cervical spine all of which require some degree of clinical judgment.

(i) Initial clinical examination
(ii) Historical risk factor assessment
(iii) Range of movement assessment
(iv) Functional assessment

STEP 1 – INITIAL CLINICAL EXAMINATION

Does the patient meet all the following criteria?

- Alert, conscious, cooperative
- No clinical evidence of drug or alcohol intoxication
- No clinical evidence of painful distracting injury (nb multi-trauma)
- Neurologically normal on history and examination
- No midline bony tenderness on palpation

→ If does not meet all criteria then consult senior clinician and patient likely to require c-spine imaging
→ If yes to all, then proceed to step 2

STEP 2 – HISTORICAL RISK FACTOR ASSESSMENT

High risk factors favouring imaging?

- Dangerous mechanism – high impact MVA +/- rollover or ejection
- Dangerous mechanism – high impact MBA or cyclist/pedestrian hit by car
- Dangerous mechanism – dive into surf/pool or fall from height/stairs/horse/bicycle
- Immediate onset severe neck pain
- Abnormal c-spine (surgery/prior injury/congenital deformity/rheumatoid/ankylosing spondylitis)
- Age > 65 (osteoporosis/degenerative △)

Low risk factors favouring clinical clearance?

- Low impact mechanism eg simple rear end MVA shunt
- Mobilised at scene or since injury
- Delayed onset mild neck pain
- Healthy young adult

→ If high risk factors present then consult senior clinician and patient likely to require c-spine imaging
→ If unsure then consult senior clinician (clinical judgment required if dangerous mechanism the only risk factor in young adult who has mobilized)
→ If no high risk factors identified and particularly if low risk factors also present, then proceed to step 3

Note that steps 1 and 2 are performed to allow safe testing of range of movement. Patients who have mobilised since their accident without significant pain have in effect already had a trial of neck movement.
STEP 3 – RANGE OF MOVEMENT ASSESSMENT

Can the patient move their neck without any significant bony pain or restriction?

- Able to rotate neck 45° to left and right
- No midline bony pain on neck rotation 45° to left and right
- No midline bony pain on neck flexion and extension

→ If significant midline bony pain on movement or restriction of movement then consult senior clinician and patient likely to require c-spine imaging
→ If no significant pain on movement or restriction of movement then remove cervical spine collar and proceed to step 4

*Increased midline bony pain on movement or restriction of movement are the most clinically useful indicators of significant bony cervical spine injury.*

STEP 4 – FUNCTIONAL ASSESSMENT

Once cervical spine collar has been removed allow patient to sit up and if not already done provide simple analgesics (paracetamol/ibuprofen). Reassure patient and reassess in 30 minutes. Patient should feel better and be moving neck without significant pain especially when distracted by friends and relatives. A mild amount of paravertebral soft tissue soreness is often present.

→ If patient complaining of persistent significant pain consult senior clinician
→ If patient improved then cervical spine now clinically cleared. Patient can be discharged with whiplash advice.

PEARLS & PITFALLS

* Alertness/alcohol/distracting injury – the key question is whether the patient can focus on your examination sufficiently to tell you whether they have pain in their cervical spine on palpation and movement. Potential pitfalls include dementia, language barriers, confusion, pre-hospital analgesia, drug or alcohol ingestion and painful distracting injuries (nb multi-trauma). Bedside clinical judgment is required. Pre-hospital analgesia may mask clinical symptoms in patients and should always be considered. Where potential doubt exists decision making should be documented eg, patient X has a fractured femur but following femoral nerve block and splinting is pain free and not a distracting injury or patient Y has ingested one beer but is not intoxicated.

* Transient parasthesiae/tingling (<5 min) – brief transient parasthesiae/tingling in limbs is common following trauma and usually not predictive of serious neck injury unless it persists. Any persistent parasthesiae or tingling (>5 min) should be treated with concern, particularly if present when assessed by Ambulance Officers or on arrival at hospital, and medical imaging should be performed.

* Age >65 is the most significant historical risk factor. Elderly patients are more likely to have abnormal cervical spines and require less force to cause injury. Dementia and stoicism are also common. Beware elderly patients with simple falls and bruised faces.

* Dangerous mechanisms in young patients involve focal forceful impact to the cervical spine. Classical mechanisms include falls onto the head or down stairs, diving into shallow water and ejection from a car.

* Most cervical spine fractures will produce focal midline bony tenderness that is worse on movement or restricts movement in stable alert young patients. Diffuse non midline bony pain that is not worse on movement in a stable alert young patient is unlikely to be clinically significant. Assessment of pain or restriction on movement is probably the best clinical discriminator.


Dr D Reed Director of Trauma Gosford Hospital revised May 11, 2011
FLOWCHART FOR THE CLINICAL CLEARANCE OF SUSPECTED CERVICAL SPINE INJURY

Alert conscious co-operative?

YES

NO → C spine imaging

Absence of any drug or alcohol intoxication?

YES

NO → C spine imaging

Absence of painful distracting injury?  
(nb beware effect of analgesia)

YES

NO → C spine imaging

Neurologically normal on history and examination?  
(nb includes absence of parasthesia)

YES

NO → C spine imaging

Absence of midline bony tenderness on palpation?

YES

NO → C spine imaging

Clinical risk factors favour clinical clearance?

YES

Low risk factors favouring clinical clearance

Low impact mechanism eg simple rear end MVA  
Mobilised since injury  
Delayed onset mild neck pain  
Healthy child or young adult

NO → C spine imaging

YES

Clinically safe to assess neck movement. Able to rotate (at least 45°), flex and extend neck without restriction or significant midline bony pain?

YES

NO → C spine imaging

Clinically low risk of C spine injury:  
Remove spinal precautions, sit-up and give simple analgesics  
Re-assess after approx 30 mins (usually feel better)

NO NEW CLINICAL CONCERNS

CERVICAL SPINE CLINICALLY CLEARED WITHOUT IMAGING

High risk factors favouring imaging

High impact MVA +/- rollover or ejection  
High impact MBA or cyclist/pedestrian hit by car  
Dive into surf/pool or fall from height/stairs/horse/cycle  
Immediate onset severe neck pain  
Abnormal c-spine (surgery/prior injury/deformity/rheumatoid)  
Age > 65 (osteoporosis/degenerative)

NO → C spine imaging

NOTIFY SENIOR ED STAFF EARLY IF CONCERNED / UNSURE OR IF C SPINE IMAGING REQUIRED