CLEARING THE C-SPINE

Unrecognised cervical injury can produce serious morbidity and disability.

Among some clinicians, fear of failing to diagnose such injuries has led to a very liberal use of imaging in blunt trauma. US figures from the past decade estimate that 800,000 people undergo C-spine imaging at a cost of $180 million – with a 2% yield for positive scans.¹

With this in mind clinical decision rules were formulated in an attempt to rationalise radiological imaging.

Care needs to be taken in the application of decision rules however. They are not a substitute for clinical judgment.

NEXUS

NEXUS was a multicentre, prospective, observational study. All comers with blunt trauma who received C-spine plain films were included. In total 34069 patients (including paediatric patients) were studied.

The decision instrument required patients to meet 5 criteria to be classified as having low probability of injury.

- The absence of posterior midline cervical tenderness
- No evidence of intoxication
- No focal neurology
- Normal level of alertness
- No distracting injury

2.4% of the study population had radiographically documented C-spine injury. The sensitivity of the decision rule was 99%. The conclusion being that those people with a low probability of injury can forego imaging. In this study 13% of participants were low probability of serious injury and would have avoided imaging if NEXUS was applied.

Canadian C-Spine Rule

This was a prospective cohort Canadian study published in 2001². 8924 adult patients were enrolled with blunt trauma to the head or neck. They all had normal vital signs and a GCS of 15.

In this population, clinically important C-spine injury (fracture, dislocation or ligamentous injury) occurred in 1.7% patients. From this data a clinical decision rule was derived with 100% sensitivity for clinically important C-Spine injury.
The potential radiology ordering rate using the Canadian C-spine Rule in this study was 58.2% of patients presenting with blunt trauma to head or neck.

There is an article published in the NEJM comparing the two algorithms which suggests the Canadian approach is superior to its American counterpart. The paper
quotes 99.4% vs 90.7% sensitivity and lower radiology ordering rates with the Canadian C-spine Rule. This paper however was written by the same people who created the Canadian rule and the conclusions are less convincing if you look at the paper critically. Both decision tools have similar ordering rates – roughly 60% - if the results were presented differently. The Canadian Rule has a significantly lower inter-rater reliability – in keeping with it being a more complex algorithm. And somewhat surprisingly in 10% of cases physicians didn’t apply the Canadian C-spine Rules correctly – omitting the 3rd step and testing neck ROM.

When do you proceed to CT?

- When C-spine plain films are abnormal or inadequate
  An American study4 demonstrated that only rarely will plain imaging fail to detect clinically significant injuries. The NEXUS investigators in a sample of 34,069 patients with blunt trauma found plain imaging missed 2.81% of injuries. Their imaging protocol included 3 views - AP, lateral and odontoid.

- When the patient has significant pain or limited ROM even with normal plain imaging – this is more clinical gestalt

- The intubated multi-trauma patient should have their C-spine imaged via CT in the first instance

When do you proceed to MRI in the ED?

- All patients with suspected cord injury in the setting of trauma – without adequate delineation on CT - should have MRI imaging of their spine

REFERENCES