

Topic Overview: Decision Making in Trauma

Module T4

Date of last update: 10th October 2012

The Dangers of Distracting Injuries

Session Objectives

- Discuss some common trauma scenarios and discuss approaches to problem solving
- Explore decision making pathways and clinical guidelines
- Role of teamwork in effective trauma management

Introduction

We will discuss 3 common trauma scenarios today. The value of discussing these scenarios will be that they illustrate the point that everything does not always go according to plan. Even though we follow a structured approach in our assessment and management of trauma patients we must be aware that we have to constantly review the patient and be ready to change approach and/or respond to changing circumstances. Everything does not always follow expected clinical paths, so it is important that one is able to rely on experience, senior advice and common sense to achieve good clinical outcomes.

Having a good and experienced team is vital in these situations. Team members should be able to bounce ideas off each other and to address problems in a systematic manner. They may also be able to raise suggestions or come up with ideas that you had not thought of.

A careful primary survey needs to be performed to exclude life-threatening conditions. Protect the cervical spine with a cervical collar until clinical or radiological clearance is obtained.

An accurate **AMPLE** history is obviously important here. It is important to consider the condition, cause, complications and co-morbidities in any patient presenting to the emergency department.

The primary survey should be followed by the secondary survey, a head to toe assessment of the trauma patient to assess and manage (or at least develop a plan) any injuries or illness identified.

Cervical Spine Clearance

It sometimes can be quite confusing on what is the correct approach when you are trying to clinically clear someone's cervical spine. A good approach is to have consensus in your institution on the standard approach to this, which has been agreed upon by your ED, Trauma and or neurosurgery. The approach will be usually be a combination of the NEXUS and Canadian Cervical Spine Rules.

The National Emergency X-Radiography Utilization Study (**NEXUS**) was the first clinical decision rule applied to cervical spine clearance. The study enrolled 34,069 patients with blunt trauma who were undergoing radiography. They found 818 radiographically documented cervical spine injuries on 3-view c-spine x-rays (AP/Lateral and Peg views). 8 patients were screened negative and were found to have a cervical spine injury. Of these 8 patients, only 2 were deemed to have "clinically significant" injury.

The NEXUS Criteria for Low Probability of Injury are:

1. No midline tenderness
2. No focal neurologic deficit
3. Normal alertness
4. No intoxication (left up to clinician to decide)
5. No painful distracting injury (left up to clinician to decide)

This gave the clinical tool a sensitivity of 99.0-99.6% and a specificity of 12.9%. This tool not only helps us in being able to clinically clear patients from having a significant cervical spine injury, it also reduced the amount of unnecessary radiation exposure and cost to the institution.

The Canadian C-Spine Rule

The Canadian C-Spine rule (figure 1) prompts the user to ask some fundamentally important questions regarding risk of c spine injury:

1. Is there any high risk factor from the ones listed below that requires imaging? If the answer is **YES** to any of the following questions, you should proceed to radiography
 - Age \geq 65
 - Dangerous Mechanism
 - Fall from \geq 1 meter/5 stairs
 - Axial load to head
 - 100km/h, rollover, ejection
 - Motorized recreational vehicles
 - Bicycle collision
 - Paraesthesia in extremities

The next question is to ascertain whether there are any low risk factors that allows for safe range of motion exam of their cervical spine? If answered **NO** to any of the questions below, you should proceed to radiography

- Simple Rear End motor vehicle crashes
- (Not: Pushed into traffic, hit by bus/truck or high-speed vehicle rollover)
- Able to sit in the emergency department
- Ambulatory at any time
- Delayed onset of neck pain
- Absence of midline tenderness

The final question to ask is whether they are able to actively rotate their neck both to the left and right for about 45 degrees? If the patient is **UNABLE** to do so, you should proceed to x-ray examination

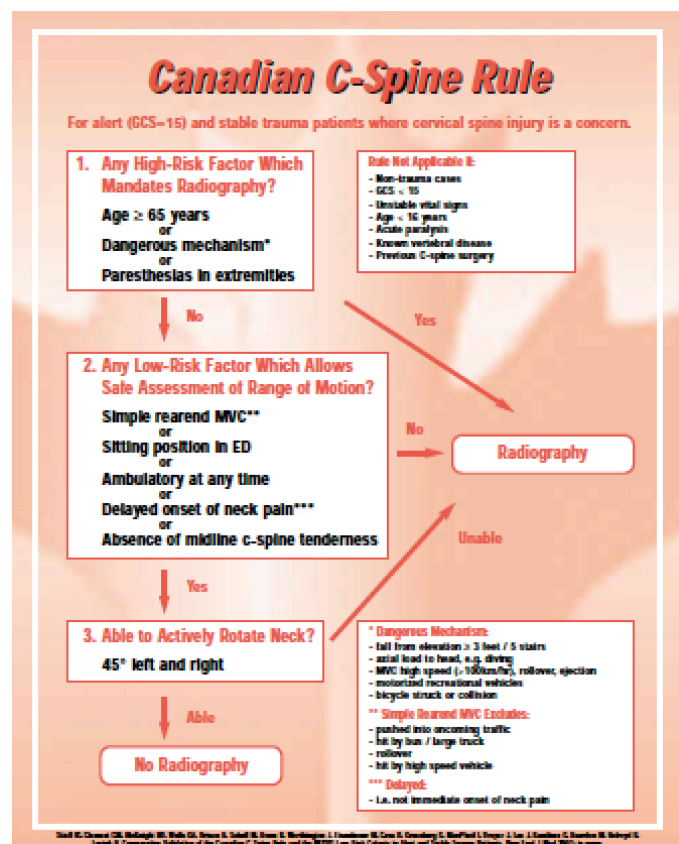


Figure 1: Canadian C-Spine Rule

The Canadian C-Spine rule had a sensitivity of 100% and a specificity of 42.5% (Note in contrast to the NEXUS study, patients who did not get imaging could be enrolled in this study.)

The cervical spine may need CT or MRI scanning to adequately radiologically clear and this should be discussed with senior clinicians if there is any doubt in the ability to clear the cervical spine to avoid spinal cord damage.

Minor Head injuries

Managing head injured patients can be difficult due to the spectrum of presentation and the variability of the approach to management. The approach however should be the same using the trauma primary survey to rule out any life threatening conditions. Once you are satisfied with the patient's clinical status, then the issue of how we can manage the mild head injury can be addressed. The definition of head injury can be problematic and slightly controversial. Most trauma centers agree on the division of head injury into 3 categories: mild, moderate and severe. What you then decide to do with each category is dependent on the clinical indicators. While there are a number of clinical pathways available to help you with this decision it is important to remember to use your good judgment and base it on what is happening with your patient.

We would encourage you to review some of the leading clinical pathways and agree in your institution which one to adopt in consultation with your stakeholders, ie Emergency, neurosurgery, ICU etc.

The NSW Institute of Trauma and Injury Management has reviewed most of the leading literature and has put together some guidelines, which are very useful in aiding your decision-making. The Canadian CT rules for head injured patients are also very well respected and have been referenced for your review.

References

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