

# SPINAL MOTION RESTRICTION

Monique Venter  
BTech EMC, MPhil EM

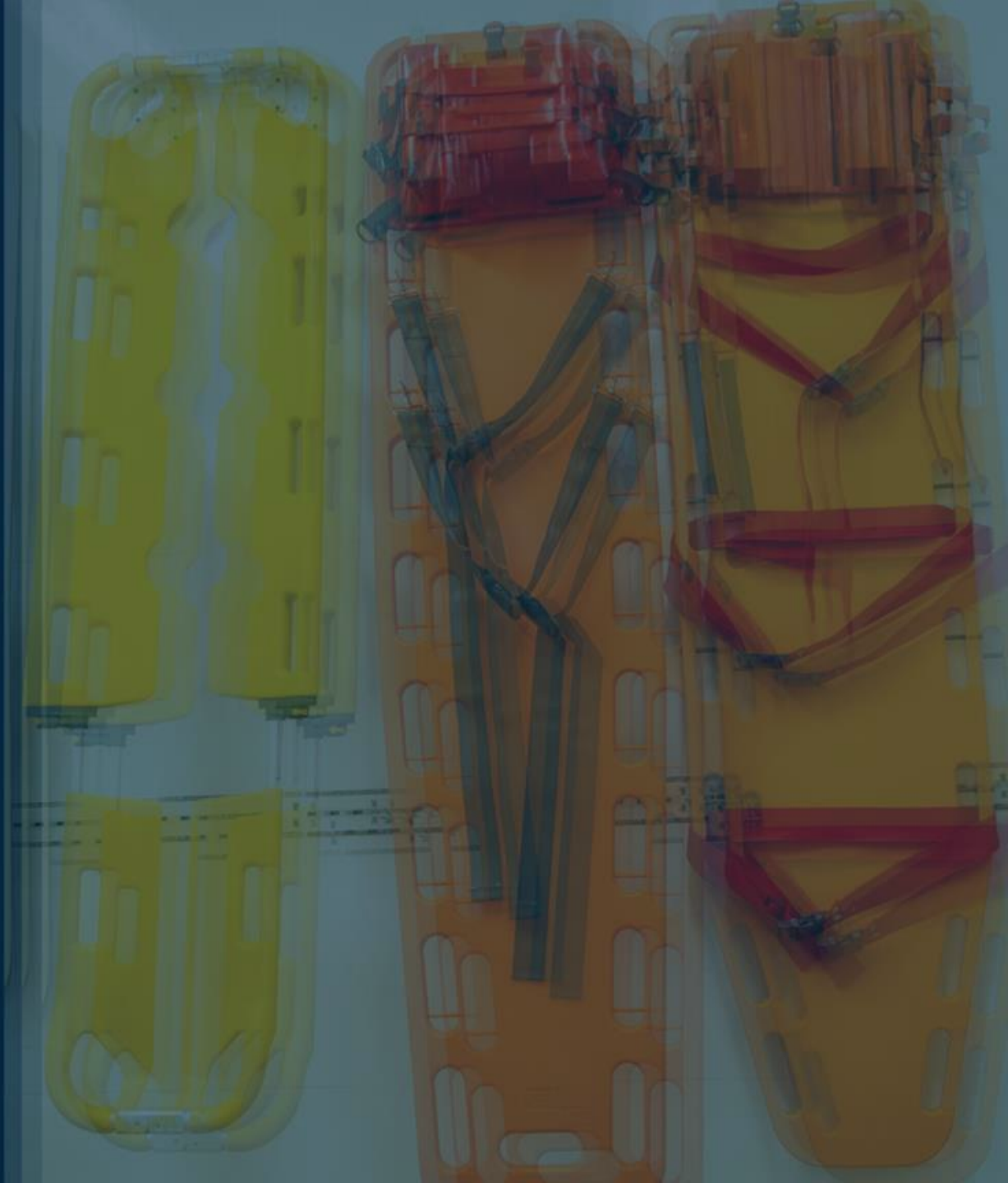


“Global Estimates = Over 15 million People living with SCI”

World Health Organization  
\*Estimation from 2021

# Agenda

- **Causes of Spinal Cord Injury**
- **Who can perform C-Spine clearance (HPCSA CPG)**
- **When to Immobilise**
- **How to Immobilise**



**Causes**

**Motor Vehicle  
Accidents**

**Falls**

**Other**

**Age Group at  
Highest Risk**

**16 – 30 years**

**Most Common  
fracture in PVA**

**T11 – L2**

**Most Common  
Fractures in drivers  
and passengers**

**C3 – C7**

**Stats**

Bennett J, Das JM, Emmady PD. Spinal Cord Injuries. [Updated 2024 Mar 10]. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2024 Jan.

Wu, Y., Zhang, Z., Wang, F. *et al.* Current status of traumatic spinal cord injury caused by traffic accident in Northern China. *Sci Rep* 12, 13892 (2022).

<https://doi.org/10.1038/s41598-022-16930-9>

Who can perform C-Spine  
Clearance



# Cervical spinal clearance

**BAA AEA ECT ECA ANT ECP**

X

X

X

X

X

Practice needs to align to scope of practice

All registrations can perform spinal motion restriction

# When do we consider *not* performing **SMR**?



## The Evidence

### **NEXUS** - National Emergency X-Radiography Utilization Study

#### Trauma patients who do not require SMR:

- alert and stable
- no focal neurologic deficit
- no altered level of consciousness
- not intoxicated
- no midline spinal tenderness
- no distracting injury

#### Pneumonic **NSAID**

- **N**eurological deficit
- **S**pinal tenderness
- **A**ltered mental status
- **I**ntoxication
- **D**istracting injury

\*The NEXUS criteria may not be reliable with patient >65 years of age, however

# When do we need to consider performing **SMR**?



## The Evidence

### Canadian C-Spine Rules -High Risk Factors

- Fall From  $\geq 1$  Meter/5 Stairs
- Axial Load to Head, eg, Diving
- MVC High Speed ( $>100$  km/hr), Rollover, Ejection
- Motorized Recreational Vehicles
- Bicycle Collision

#### <sup>†</sup> Simple Rear-end MVC Excludes:

- Pushed Into Oncoming Traffic
- Hit by Bus/Large Truck
- Rollover
- Hit by High-Speed Vehicle

#### <sup>‡</sup> Delayed:

- Not Immediate Onset of Neck Pain

\*Patient must be awake and alert

# Canadian C-Spine Rules

Any High-Risk Factor That Mandates Radiography

- Fall From  $\geq 1$  Meter/5 Stairs
- Axial Load to Head, eg, Diving
- MVC High Speed ( $>100$  km/hr), Rollover, Ejection
- Motorized Recreational Vehicles
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<sup>†</sup> Simple Rear-end MVC Excludes:

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<sup>‡</sup> Delayed:

- Not Immediate Onset of Neck Pain



Any Low-Risk Factors That Allows Safe Assessment of Range of Motion

Simple Rear-end MVC<sup>†</sup>  
or  
Sitting Position in ED  
or  
Ambulatory at Any Time  
or  
Delayed Onset of Neck Pain<sup>‡</sup>  
or  
Absence of Midline C-Spine Tenderness



Able To Actively Rotate Neck



# The South African Context



## The Evidence

### Ref Exerts from the HPCSA CPG

“It has been postulated that between 3% to 25% of spinal cord injuries occur after the initial traumatic injury, either during transit or early in the course of management (Theodore et al., 2013).”

“Cardiac Arrest patient: When multisystem trauma is present, or trauma involves the head and neck, excluding penetrating trauma, the cervical spine must be stabilized. A jaw thrust should be used instead of a head tilt– chin lift to establish a patent airway.”

“Spinal immobilization in patients with penetrating trauma is not recommended because of increased mortality from delayed resuscitation. (Theodore et al., 2013)”

# The South Africa Context



## The Evidence

### Ref Exerts from local studies

“This scoping review found limited, often inconsistent literature available investigating the effectiveness and safety of the CCSR or the NEXUS rule as a spinal clearance tool in the prehospital setting, especially in poorly resourced settings.”\*

“These NEXUS-based decision tools also present with their challenges to EMS personnel due to some of the **subjective** nature of the criteria.”\*

\*Geduld C, Muller H, Saunders CJ. Factors which affect the application and implementation of a spinal motion restriction protocol by prehospital providers in a low resource setting: A scoping review. Afr J Emerg Med. 2022 Dec;12(4):393-405. doi: 10.1016/j.afjem.2022.08.005. Epub 2022 Sep 15. PMID: 36187075; PMCID: PMC9489745.

# The South African Context



## The Evidence

### Ref Exerts from local studies

**“Selection of devices for the transport of motion restricted patients should be in the following descending order of**

- Vacuum mattress
- Scoop stretcher
- Patients can also be motion restricted on a normal ambulance stretcher
- Patients can be coached to remain still if they are awake.
- Head blocks can be attached to the ambulance stretcher for unresponsive patients.”

“There is little value in a standing take-down. It is recommended that patients walking around on scene can walk to and lie themselves down on the ambulance stretcher”

“Transport of a patient on a trauma board is strongly not recommended. While it is a valuable tool for moving patients, there is no benefit to transporting a patient on this device.”

Stanton D, Hardcastle T, Muhlbauer D, van Zyl D. Cervical collars and immobilisation: A South African best practice recommendation. Afr J Emerg Med. 2017 Mar;7(1):4-8. doi: 10.1016/j.afjem.2017.01.007. Epub 2017 Jan 28. PMID: 30456099; PMCID: PMC6234176.



***Any* Questions?**