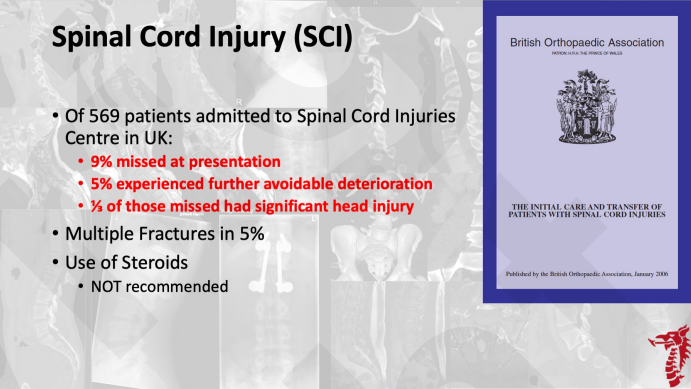


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Management Spinal Injury

- ABCDE / ATLS / ETC Approach (not typical H&Ex)

- Protection - **THINK SPINAL CORD INJURY**

- Maintain airway with spine control
- Always aim to have a team of 6 for transfers (min 4 for log rolls)

- Detection

- Level of injury
- Complete or Incomplete cord injury
- Spinal or Neurogenic shock

- Management

- Conservative or Surgical treatment



Spinal Cord Injury (SCI) - Initial Assessment	Spinal Cord Injury (SCI) - Secondary Assessment	Spinal Cord Injury (SCI) - Tertiary Assessment
- Neck pain/tenderness - Neurological deficit - Loss of consciousness - Head injury - Chest injury - Abdominal injury - Extremity injury - Perineal injury	- Neck pain/tenderness - Neurological deficit - Loss of consciousness - Head injury - Chest injury - Abdominal injury - Extremity injury - Perineal injury	- Neck pain/tenderness - Neurological deficit - Loss of consciousness - Head injury - Chest injury - Abdominal injury - Extremity injury - Perineal injury

Immobilise Entire Spine* - The Old School...



- *Caveats
- Pre existing spinal deformity – ask spond
- Head / Facial Injuries putting patient at risk
- Agitated / Combative patient
- LOCAL / REGIONAL PROTOCOLS



JOURNAL OF HELICOPTER TRAUMA 31 (31-54) (March 15, 2014)
 13, 2014, 13, 2014, 13, 2014
 DOI: 10.1089/hel.2013.004

Prehospital Use of Cervical Collars in Trauma Patients: A Critical Review

Torje Sundstrom^{1,2}, Helge Aabergsen^{1,3}, Samir Habib^{1,4}, Gazi Arne Sund^{1,5,6}, and Knut Westor^{1,3}

European Journal of Trauma and Emergency Surgery
 https://doi.org/10.1007/s00068-020-01779-4

ORIGINAL ARTICLE

Evidence for the use of spinal collars in stabilising spinal injury in the pre-hospital setting in trauma patients: a systematic review

Katherine Hawkridge¹, Ikhlaq Ahmed², Zubair Ahmed^{1,3}

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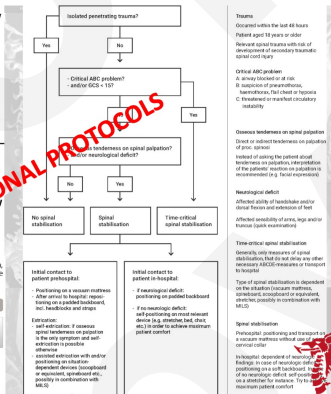
Background: The use of cervical collars in trauma patients is a controversial topic. This systematic review aims to evaluate the evidence for the use of cervical collars in trauma patients.

GUIDELINE

New clinical guidelines on the spinal stabilisation of adult trauma patients – consensus and evidence based

Christian Marchetti^{1,2}, Elisabeth Jørgensen^{3,4}, Monika Alkai Rube^{5,6}, and Charlotte Barfod¹

Review



The Spinal Board

- Transport device
- Remove ASAP
- Regular log rolls

- Risk of pressure sores
- Same goes for some collars...



Assessment - Spine

- History
 - Pain
 - Mechanism
 - Immediate post injury neurology
 - Associated injury
- Examination
 - Log roll
 - Tenderness / Gap / Step
 - Marked spasm
 - Spinal cord function incl PR / DRE
- Imaging

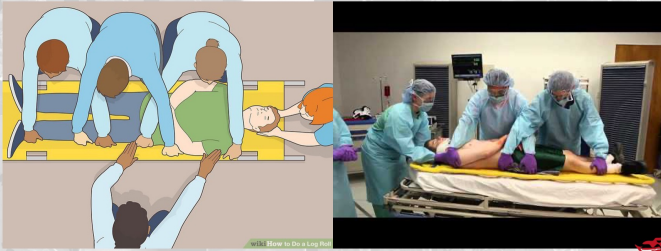
Log Roll - "3 over 3 under" - No Arms Crossing

ACUTE TETRAPLEGIC SPINAL LOGROLL - Method 1

ACUTE TETRAPLEGIC SPINAL LOGROLL - Method 2

The images show two methods of log rolling a patient with a suspected spinal injury. Method 1 involves three people (two on the sides and one at the head) rolling the patient onto their side. Method 2 involves three people (two on the sides and one at the head) rolling the patient onto their side. The images are from the HUNTLEIGH and MASCIIP websites.

Log Roll - "5 vs 4" - Arms Crossing



Assessment - Spinal Cord

- Complete / Incomplete SCI
 - Sensory level
 - Sensory modality
 - Motor level
 - Sphincter tone
 - Bulbocavernosus reflex
- **SCI in the Unconscious Patient**
 - Flaccid areflexia
 - Diaphragmatic breathing
 - Pain response above clavicle
 - Bradycardia / Hypotension
 - Priapism



"Shock"

- Refers to a state of inadequate organ perfusion and tissue oxygenation
- Hypovolaemic – Haemorrhagic or fluid loss
- Tension Pneumothorax
- Cardiac Tamponade
- Cardiogenic
- **Neurogenic**
- Septic
- Anaphylactic

Pump Failure (incl Obstructive)
Circulatory Failure

Spinal "Shock"

- Refers to the flaccid paralysis, areflexia and lack of sensation secondary to physiologic spinal cord "shut down" in response to injury
- Usually resolves within 24 hours when reflex arcs caudal to injury return
- Lowest that can be tested clinically
 - bulbocavernosus reflex
- **Importance of spinal shock**
 - determining whether a patient has a complete or incomplete spinal cord injury

Neurogenic Shock

- State of inadequate tissue perfusion and oxygenation due to:
- Reduced sympathetic outflow (T1-L2) with resultant unopposed vagal tone
- **Hypotension** due to loss of blood vessel tone with resultant venous pooling
- **Bradycardia** due to reduced cardiac stimulation
 - distinguishes neurogenic shock from other types of shock (e.g. hypovolaemic, cardiac, anaphylactic) - caveat - end stage / catastrophic hypovolaemic shock

Spinal Cord Injury

- Primary (at the time of injury)
- Secondary (occurring after the injury)
- **Complete spinal cord injury**
 - no sensation or voluntary motor function below the level of the injury
- It can only be confirmed after the resolution of spinal shock when reflex activity has returned
- The level of the injury is defined as the first with useful partial neurological function $\geq 3/5$
- The overall prognosis for recovery of neurological function in complete lesions is poor

Spinal Cord Injury

- **Incomplete spinal cord injury means that there is some function caudal to the injury**
- In general, the greater the function the faster the recovery and better the prognosis
- Cord syndromes are forms of Incomplete SCI
 - Central Cord Syndrome, Anterior, Posterior and Brown Sequard
- Sacral sparing after spinal cord injury
 - the presence of sacral sensation, voluntary rectal tone and great toe movement
 - indicates intact long tract neurones and the potential for recovery
- Prognostic for predicting recovery except in lesions involving the conus medullaris or cauda equina

Spinal Cord Injury Versus Spinal Column Injury

1. You can break your spine and not have a spinal cord injury
2. You can have a spinal cord injury and not have broken your spine

Stable Versus Unstable Spinal Column Injury

1. You can have a spinal cord injury with a stable spine
2. You are more likely to have a spinal cord injury with an unstable spine

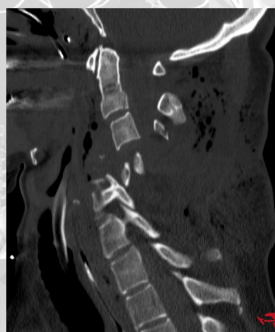
Spinal Injury Screening

- Mr Brooks will go through this later this morning...



Acute Consequences SCI

- (Paralysed...)
- Inadequate ventilation
- Hypotension
- Abdominal evaluation compromised
- Occult compartment syndrome



Management Hypotension

- In Major Trauma:
- Haemorrhagic shock until proven otherwise
- Consider neurogenic shock
- Monitor urine output

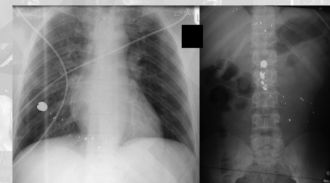


Hypotensive Bradycardic...

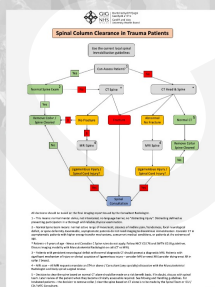


Initial Management Spinal Cord Injury

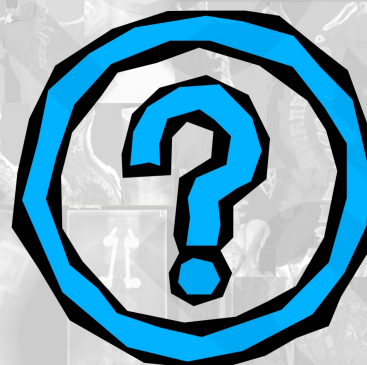
- Treat life threatening injuries first – ABCDE / ATLS etc.
- Ventilation and Oxygenation
 - Involve ICU early
- Maintain blood pressure
 - IVI / MAP / Drugs / ICU
- Maintain spinal cord perfusion
 - O₂ and MAP
 - Lie flat
 - Catheterise (monitor end organ perfusion)
 - **Immobilisation / Reduction / Decompression / Stabilisation**



Local Guidelines – Clearance / Handling / Collars & Braces



Spinal Column Clearance	Spinal Column Handling	Spinal Column Collars & Braces
- Spinal Column Clearance - Spinal Column Handling - Spinal Column Collars & Braces	- Spinal Column Handling - Spinal Column Collars & Braces	Spinal Column Collars & Braces



Thank you

