Trauma Service Guidelines

Title:	**Thoracolumbar Spine Guideline**
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Created:	**Version 1.0 February 2005**
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Revised:	**Version 4.0 December 2019, V3.0 June 2015, V2.0 June 2012**

Overview

The aim of the thoracolumbar spine (TLS) guideline is to assist in the decision making, assessment and identification of TLS injuries and prevention or minimisation of harm, to ensure appropriate and timely referral.

The incidence of TL injuries is 4-5%. [1-4] The incidence in severely injured patients (major trauma) over the last 10 years at RMH is 29%. [5] The TLS is the most rigid and strong of all the vertebrae and to disrupt the column at this level requires great force. Therefore injuries are most commonly the result of high velocity deceleration mechanisms such as motor vehicle crashes, high falls, pedestrians stuck by motor vehicles and motorcyclists. [1, 3] Compression and burst fractures are the most common TLS fractures, accounting for 35% of all TLS injuries.[6] At RMH the most common TLS spine fracture is to the vertebral body fractures 41% followed by transverse processes 35%.[5]

The reported incidence of neurological deficit in patients with TLS fractures is 19-50%, [2, 7] however, only 2% of RMH patients with a thoracolumbar spine fracture are diagnosed with neurological deficit. [5]

Delayed or missed injuries result in an eight fold increase in neurological deficits and lead to complications related to patient positioning and immobilisation in addition to long term pain and diminished quality of life. [2-4]

Clearance of the Thoracolumbar Spine

CT scanning gives clinicians the ability to assess bony damage including loss of height segmental kyphosis and be able to assist in predicting instability. CT scanning is the 'gold standard' in imaging with sensitivity of up to 100% in identifying bony injuries. [1-4] With spinal reformats from abdominal and chest CT's in trauma have been shown to have a better sensitivity, specificity and negative predictive values than plain x-rays of the TLS [1, 2] Spinal reformats can also result in faster spinal clearance times, equivalent overall costs and improved detection of TLS fractures when used as a screening tool compared with plain films. [1 4] CT scans however are limited in their ability to differentiate between healed and non-healed fractures. [8]

There are a number of clinical signs and high risk mechanisms and that correlate strongly to the presence of TL injuries

<u>High risk clinical signs include:</u> [1-3, 6, 9]

- Altered mental status
  - Intoxicated patients: defined as loss of control of faculties and/ or behaviour
  - Patients intubated: at the scene or in emergency prior to any clinical examination
  - Confused and/ or, repetitive speech
  - Unconscious/ obtunded GCS < 13
  - Seizure activity
- TL pain, tenderness, bruising, deformity, palpable step
- Multiple or painful distracting injuries
- New neurological deficits
- Known cervical spine fractures or any other region of the spine
- > 65 years of age

<u>High risk mechanisms include</u>: . [1, 2, 10]

- High speed motor vehicle crash > 100km/hr
- Fall from greater ≥ 3 metres
- Ejection from a motor vehicle or vehicle roll over
- Motor bike crash > 30km/hr
- Pedestrian hit by car ≥ 60 km/hr

All patients with abnormal clinical signs or high risk mechanism should be kept in spinal precautions and require a complete radiological assessment, to identify injuries and assess their severity and plan appropriate management. The patient will require an either reformats of the chest and pelvis CT scan or a dedicated CT of the TLS.

If there is no evidence of clinical signs or high risk mechanism, the TLS can be cleared clinically with no radiology required [2, 11]. This should be documented on the spinal management chart or in the medical record and TLS precautions can be ceased.

Role of MRI scan in TLS

Neurological status is the best indicator of the severity of a TLS injury. MRI may be helpful in determining the age of fractures and evaluating injuries to soft tissues, including ligaments, discs and spinal cord. It can also diagnose haematoma within the spinal canal, contusion within the cord and assess for canal stenosis. MRI is used in conjunction with CT but does not contribute additional ionizing radiation. [8] [2]

The indication for MRI should be considered in consultation with spinal team and include: [2, 12, 13]

- Abnormal neurology +/- normal CT scan (these patients should also have a complete neurological assessment using the ASIA Chart Assessment)
- No neurology but abnormal CT findings needing assessment of the posterior ligament complex (stability)

Who can clinically clear a thoracolumbar spine?

A qualified clinician can deem the TLS injury free after assessing the patient.

A qualified clinician is anyone of the following:

- Trauma consultant or accredited registrar
- ED consultant or accredited senior registrar
- Neurosurgery consultant or accredited registrar
- Orthopaedic consultant or accredited registrar
- Intensive care consultant or accredited registrar

Who can radiologically clear the thoracolumbar spine?

A Radiologist or an accredited registrar or a senior credentialed clinician can deem the thoracolumbar spine radiologically injury free. Documentation of clearance will be by the reporting radiologist/ fellow or accredited registrar completing the report in synapse. Accredited registrars will have a disclaimer in their signature stating their level and ability to clear spines.

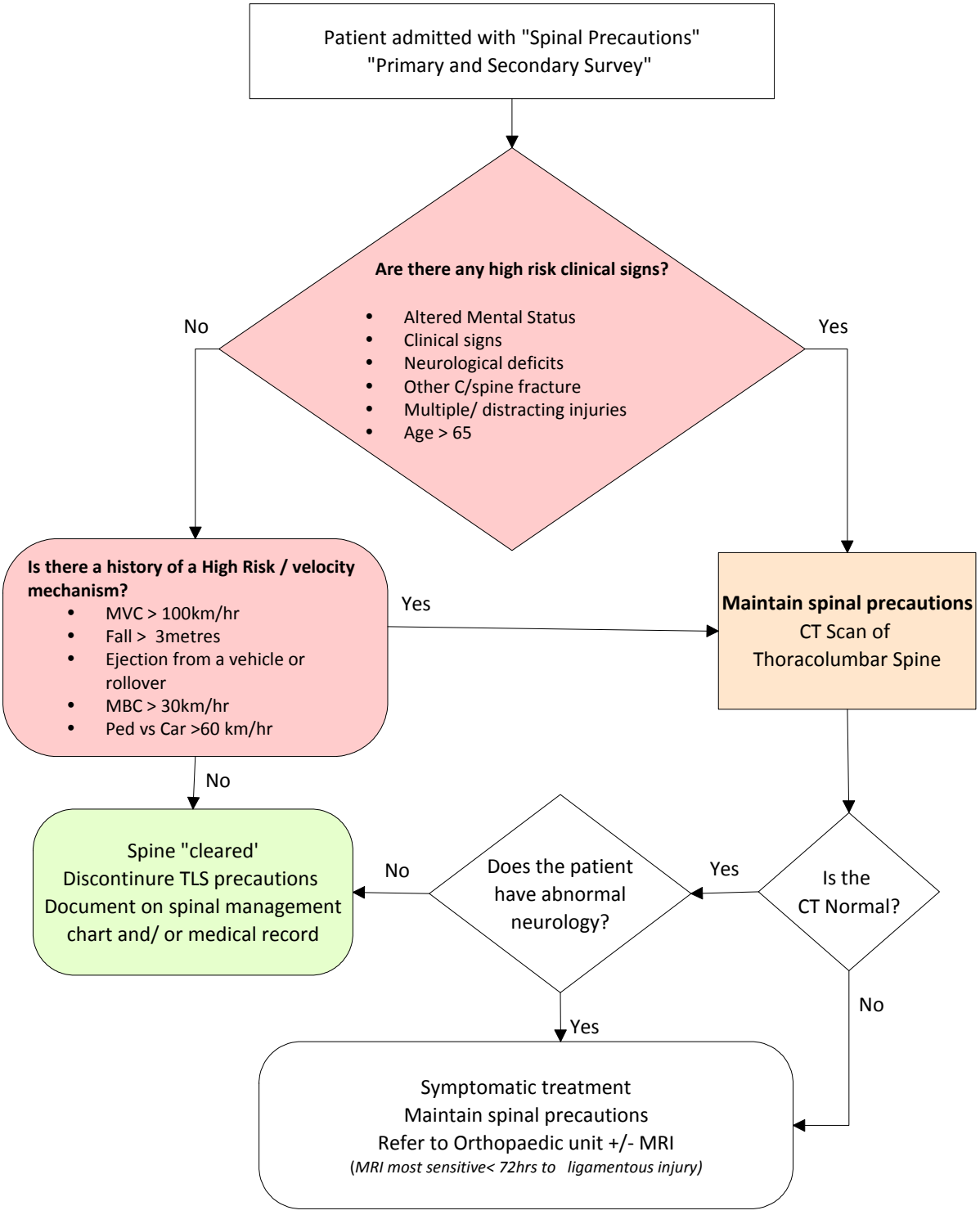
Documentation of Spinal Management/ Clearance

When a spinal management plan or spinal clearance is ascertained there should be clear documentation by the treating team in the patient's progress notes and/or on the spinal management chart.

Position restrictions

The consensus opinion of the ACT committee and amongst the orthopaedic spinal surgeons is that trauma patients awaiting a spinal management plan are to be nursed with spinal precautions i.e. immobilised on a flat surface in a neutral position. If they need to have head elevation this should be achieved by tilting the bed. There is to be no hip flexion unless specified by the managing unit and documented on the spinal management chart and/or in the patients' medical record. (Refer to the Management of the patient with Spinal Precautions)

	**If any doubt exists as to the mechanism or the clinical assessment of the patient leave spinal precautions insitu and refer to the orthopeadic unit for ongoing management**


Patient admitted with "Spinal Precautions"
"Primary and Secondary Survey"
Are there any high risk clinical signs?
Altered Mental Status
Clinical signs
Neurological deficits
Other C/spine fracture
Multiple/ distracting injuries
Age > 65
No
Yes
Is there a history of a High Risk / velocity mechanism?
MVC > 100km/hr
Fall > 3metres
Ejection from a vehicle or rollover
MBC > 30km/hr
Ped vs Car >60 km/hr
Yes
Maintain spinal precautions
CT Scan of Thoracolumbar Spine
No
Spine "cleared'
Discontinure TLS precautions
Document on spinal management chart and/ or medical record
No
Does the patient have abnormal neurology?
Yes
Is the CT Normal?
Yes
No
Symptomatic treatment
Maintain spinal precautions
Refer to Orthopaedic unit +/- MRI
(MRI most sensitive< 72hrs to ligamentous injury)

References

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