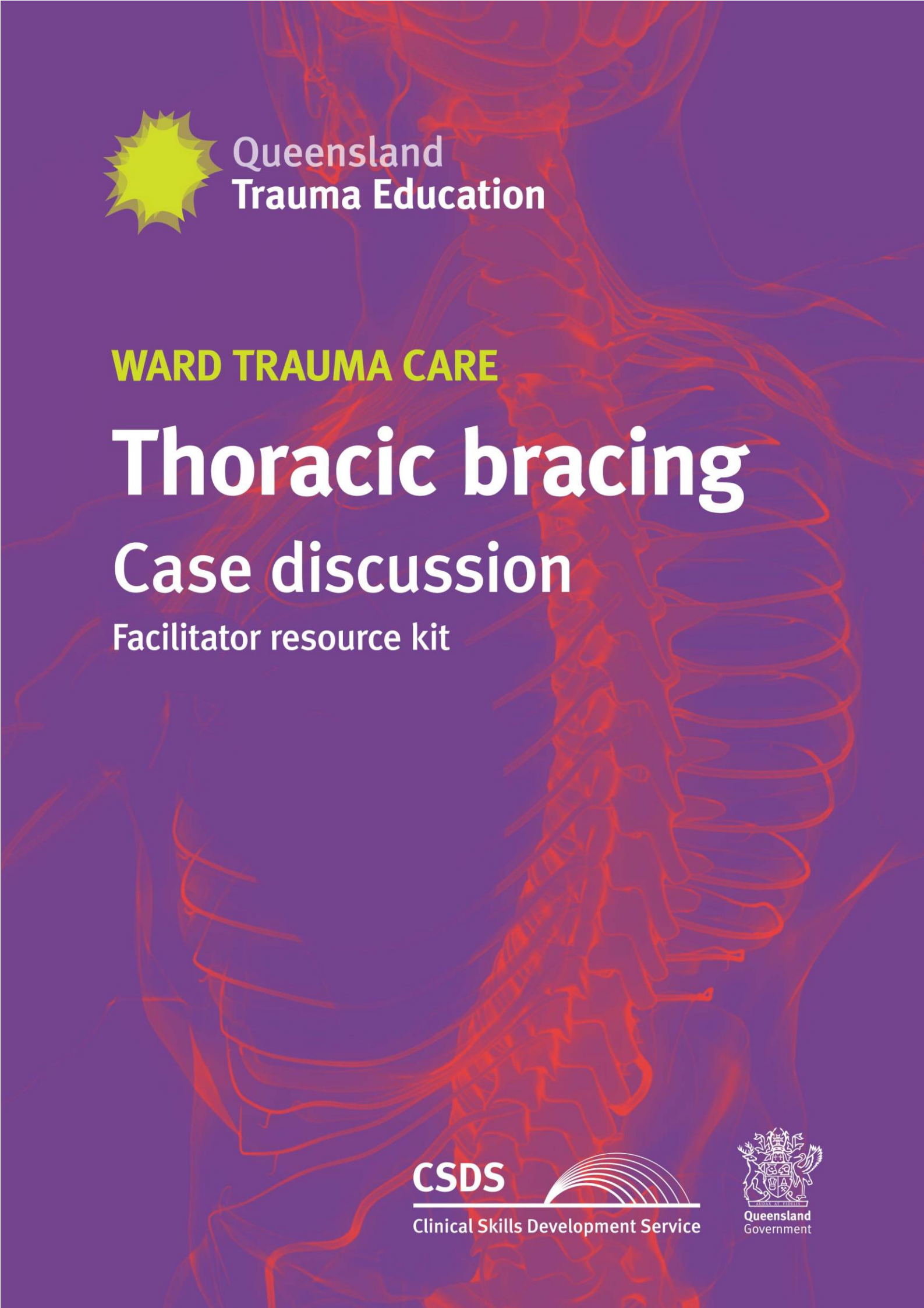

Queensland
Trauma Education

WARD TRAUMA CARE

Thoracic bracing

Case discussion

Facilitator resource kit

CSDS
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Queensland Trauma Education

The resources developed for Queensland Trauma Education are designed for use in any Queensland Health facility that cares for patients who have been injured as a result of trauma. Each resource can be modified by the facilitator and scaled to the learners needs as well as the environment in which the education is being delivered, from tertiary to rural and remote facilities.

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Queensland Trauma Education
Ward trauma care – Thoracic bracing: Case discussion – Facilitator resource kit
Version 2.0

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An electronic version of this document is available via csds.qld.edu.au/qte

About this training resource kit

This resource kit provides the learner with knowledge for the choice and use of thoracic bracing with spinal column injury.

National Safety and Quality Health Service (NSQHS) Standards

Target audience

Ward medical, nursing, and physiotherapy clinicians

Duration

30 minutes

Group size

Suited to small group participation

Learning objectives

By the end of this session the participant will be able to:

- Identify imaging studies used in the diagnosis of thoracic injury
- Describe the importance of clinical examination on management decisions
- Discuss the options for thoracic brace types

Facilitation guide

1. Facilitator to use case discussion to explore thoracic spinal injury imaging and management.
2. Thoracic braces (if available) can be used to demonstrate the features and application on participants.

Supporting documents (in Printable resources)

1. Anatomical spinal drawing
2. Xray thoracic spine and CT thoracic spine demonstrating level
3. Xray demonstrating crush fracture and MRI demonstrating cord injury
4. ASIA grading scale
5. RBWH Spine Orthosis Selection guide
6. Jewitts TLSO

Case discussion

Case study

A 26-year-old female is admitted to the ward with a thoracic spine fracture after falling from her horse. She has no other identified injuries.

Question and answer guide

1. What is meant by ‘spinal injury’?

Spinal injury can be defined as bony trauma or injury that involves the spinal cord. The initial clinical examination is important to delineate the likelihood of spinal cord injury in addition to bony fractures.

2. What imaging studies are used to identify spinal injuries?

For each patient, the most appropriate imaging studies will be chosen depending on the mechanism of injury, the clinical examination findings, the urgency of the investigations and availability. Each imaging study has different uses, indications and will deliver varied information.

- **Plain film / X-ray** is often used in low velocity trauma, including falls from standing. It may miss injury unless significant as subtle fractures are often hard to identify.
- **CT (Computed Tomography)** is the modality of choice for high velocity trauma and will delineate the injury profile including associated injuries. CT can provide basic information on disc pathology and arterial contrast is used in setting of potential vascular injury.
- **MRI (Magnetic Resonance Imaging)** is used to define ligamentous, disc and spinal cord injury. Whilst the most accurate imaging study, it takes time to acquire and is not used in acute multi-system trauma due to acquisition challenges.

3. What constitutes the ‘thoracic’ spine?

The thoracic spine is between the cervical and lumbar vertebrae. There are 12 thoracic vertebrae (T1-12).
Each thoracic vertebrae (t-spine) articulates with a rib at a costal facet. Vertebral body size increases from T1-T12.
The thoracic spine allows some rotation but minimal flexion and extension.

4. What mechanism of injury is likely to result in a thoracic spine fracture?

Burst fractures typically occur with axial load and flexion, most often occurring at T10-L2. Road traffic crashes and falls from height contribute around 65% of injuries (1).

5. What concurrent injury are common with thoracic fractures? [(1)]

Thoracic fractures are associated with other fractures of the spine in approximately 20% of cases and a high index of suspicion should prompt further imaging if identified.
Concurrent abdominal and chest trauma is most common with spinal injuries involving the cord and should prompt careful assessment if present. Burst fractures from road traffic crashes with lap belts are associated with abdominal visceral injury.
Additional long bone fractures are important to identify as they may impact on mobility and rehabilitation processes.

A thorough examination is undertaken to identify the investigations required to exclude other injury.

6. How are thoracic fractures managed?

Management decisions are determined by several factors including:

- Associated injuries
- Level of injury
- Neurological deficits
- Stability of fracture segments

Management can operative or non-operative. Often the decision is determined by the clinical examination (level of injury, identification of complete/incomplete injury, associated injury profile and co-morbid factors).

Non operative management is used when the fracture segment is determined to be stable and there are no neurological deficits. Mechanical stability occurs when the posterior ligament complex is intact. In this scenario bracing is used for comfort to allow mobilisation, as prolonged bed rest is associated with complications including pneumonia and DVT (Deep Vein Thrombosis). Neurological deficits are documented using the ASIA grading scale with an assessment of motor, sensory and perianal function.

Operative management involves instrumentation with or without decompression of fracture segments. Unstable fractures, as defined with posterior ligamentous complex disruption, or patients with significant multisystem trauma will be considered for operative management. Operative fixation with decompression is used in patients with spinal cord compression as demonstrated by neurological dysfunction.

Complications from operative management include entrapment or injury to nerves, pain, or infection.

7. What are the options for bracing when nonoperative management is utilised?

Thoracic bracing may be used independently or in conjunction with cervical spine bracing. Orthosis for isolated thoracic spine fractures is termed *Thoracic Lumbar Sacral Orthosis* (TLSO) and commonly stabilise the T7-L5 region. Examples include the Cash TLSO brace, Jewett TLSO and Bi-valved TLSO. These braces aim to reduce movement with trunk flexion and encourage extension of the spine. The brace type will be determined by the spinal team, by considering the fracture type, patient body habitus and past medical history.

Acronyms and abbreviations

Term	Definition
TLSO	Thoracic lumbar sacral orthosis
CT	Computed tomography
MRI	Magnetic resonance imaging

References

1. Rajasekaran, S., Kanna, R. M., & Shetty, A. P. (2015). *Management of thoracolumbar spine trauma: An overview*. Indian journal of orthopaedics, 49(1), 72–82. https://bit.ly/3RBg1L0

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