

Spinal Immobilization Techniques and Decision Making

Returning to Common Sense
Approaches to Patient Care
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Presentation Objectives

- Present scenarios for immobilization devices and techniques
- Discuss strategies for patients with needs for immobilization and spinal motion restriction
- Differentiate risks and immobilization strategies for patients with cervical, thoracic, lumbar, or multiple-level spinal injuries
- Review management strategies for integrated approaches in this patient group

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Emergency Care Principle: First, Do No Harm

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Changing Approaches

Backboard (LBB) Immobilization is Uncomfortable

LBB Can Result in Airway Loss, Breathing Problems, and Pulmonary Edema

LBB Can Harm Patients Skin, Causing Lengthy Complications

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Appropriate Use of LBB

- Moving a Patient Safely across a horizontal set of surfaces
- Assist in moving a patient vertically
- As a platform for safe restraint
- As the platform for lumbar spine and pelvic motion restriction
- For entire body packaging and SMR

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Restraining vs. Packaging

Restraining

- Restraints are used for Safety and for Medical Needs
- Security Restraining to Protect the Crew and the Patient
- Law Enforcement Restraining – Under Arrest in Control of Police
- Chemical Restraints used in Selected Impaired Patients

Packaging

- Medical Packaging – Based on Medical Need
 - ◆ Hypoglycemia
 - ◆ Dementia
 - ◆ Excited Delirium
 - ◆ Hypoxia
- Trauma Packaging – Patients having:
 - ◆ Spinal Trauma
 - ◆ Multiple Trauma
 - ◆ Severe Extremity Trauma

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Restraining

- Use of Devices for Security and Safety
- Security Packaging – Not in Custody - Protect the Crew and the Patient – for Mental Health Impaired Patients
- Law Enforcement Packaging – In Custody - Under Arrest in Control of Police. Use Law Enforcement Restraints in Presence of a Law Enforcement Officer

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Priority Setting

- Protect Patient's Life
- Protect Limbs
- Protect Crew
- Restraint for Medical Indication
- Restraint for Mental Health
- Restraint as part of Law Enforcement Control of Patient

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Medical Restraint

- Packaging by Restraining Hands, Torso (Dementia, Hypoglycemia, Excited Delirium)
- Packaging on LBB whole spine, arms
- Selective Spinal Restriction for Trauma – Entire Spine
- Selective Immobilizing Cervical, Thoracic, or Lumbar Spine, based on mechanism and patient complaint

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Selective Immobilization

- Entire Spine – Mechanism of Whole Body Trauma
- Cervical for Head, Whiplash, Neck Trauma
- Thoracic for blunt or penetrating mechanism to torso
- Lumbar Spine for low back, pelvis, and lower extremity trauma

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Cervical Spinal Motion Restriction

- Mechanisms of Head, Whiplash, or Neck Trauma
- Protect Airway
- Don't Worsen any Injuries
- Options
 - ◆ One Piece Collar
 - ◆ Two Piece Collar
 - ◆ Tall Collar – "X Collar"
 - ◆ Short backboard – solid or flexible

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Thoracic Spinal Motion Restriction

- Mechanism of blunt or penetrating trauma to torso
- Options
 - ◆ Short backboard
 - ◆ Long backboard – solid or flexible

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Controversy – Immobilizing in Penetrating Torso Trauma

- Trauma literature says poor outcomes from use of long backboard in penetrating trauma to torso
- Unless neuro deficit at the scene
- Likely due to:
 - ◆ Longer time on scene
 - ◆ Patient struggling against restraint increases blood loss
 - ◆ Failure to continue to re-assess for life threats like tension pneumo

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Teaching – Immobilizing in Penetrating Torso Trauma

- Use of long backboard in penetrating trauma to torso restricted to:
- Patient with obvious spinal column injury
- Patient with neuro deficit at the scene
- To assist in moving patient onto stretcher, then remove
- Penetrating plus blunt trauma with high risk of spinal column injury (e.g., shot and then fell a distance)

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Lumbar Spinal Motion Restriction

- Mechanism of low back, pelvis, and lower extremity trauma
- Options
 - ◆ Long backboard – solid or flexible

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Patient Self-Direction

- What position they feel best in?
- Let them advise you of threats
- Suction in the patient's hands
- Oxygen therapy based on Pulse Ox and Pt comfort

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Trauma Transport

- Patient still Ambulatory
- Sitting Upright, Airway OK
- Supine or Prone
- Packaged to a Hard Board



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Maintain The Airway

- Use gravity to help
- Spine is important, but.....
- Airway is absolute life threat
- Flat strapped on a backboard is a life threat

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Airway Management Options

- Elevate
- Roll to have "sunny side up"
- Flip upside down
- Have patient guide you
- Spinal Motion Restriction as possible

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Pediatric

Packaging for safe transport is critical
Use safety seats
Collars difficult to fit
Very uncooperative on LBB

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Chest Trauma

Blunt or penetrating
Near midline

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Multiple Penetrating Wounds, Uncooperative Patient

Multiple Wounds
May have law enforcement
Implications
Package Safely, LBB may be
good platform, may not need
cervical immobilization
Preserve Airway

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Torso Crush

Uncomfortable when laying
down
Potential for eye injury

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Motorcycle Accident

Full packaging
appropriate
Multiple spinal
column injuries a
significant risk
Similar in pedestrian
vs vehicle

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Positioning Other Systems

- Intentionally elevate (an extremity)
- Make dependent (a gravid uterus)
- Don't make problem worse (an injured eye)
- Listen to the patient

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Pregnant Trauma

Selective
Immobilization of Spine
Cannot safely lie
supine
Airway is in danger

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Restrain for Vertical Movement

Release when arrive at
stretcher

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Selective Spinal Motion Restriction

- Based on Mechanism, Complaints, and Exam Findings
- LBB- Fixed or Flexible
- Short backboard – solid or flexible
- Cervical
 - ◆ One Piece Collar
 - ◆ Two Piece Collar
 - ◆ Tall Collar – “X Collar”

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Documenting: Packaging

- Based on History and Mechanism
- Packaging for Security or Safety
- Medical Packaging Based on Medical Need
- Security Packaging – Restraint to Protect the Crew and the Patient
- Law Enforcement Packaging
- Any complaints or findings that changed?

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Documenting: Selective Spinal Motion Restriction

- Based on Mechanism
- Patient Complaints
- Physical Exam Findings
- Use of transfer tools
- Patient comfort during and after use of SMR
- Any complaints or findings that changed?

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In the Emergency Department: Spinal Motion Restriction

- Based on History from EMS
- Any complaints or findings that changed?
- Literature-based rules for Continuing Immobilization, and then Imaging the Spine
 - ◆ NEXUS
 - ◆ Canadian C-spine Rule

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Position the Patient

- Do No Harm
- Protect Spine and Airway and other Critical Functions
- LBB as a Movement Tool
- Safety for the Patient
- Selective Spinal Immobilization

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