Inter-Association Task Force: Appropriate Care of the Spine Injured Athlete
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Disclosure
• Michael Kordecki has a financial interest as sole inventor of the Rip-Kord technology and has entered into an exclusive licensing agreement with Riddell Sports.
• Michale Kordecki is a member of the Inter-Association Task Force for appropriate care of the spine injured athlete.

Learning Objectives
• Upon completion of the course, the participant will be able to:
  – Identify changes in protocol when managing an athlete with a suspected cervical spine injury, as dictated by the Inter-Association Task Force (2015).
  – Discuss the uses of the long spine board as it relates to transfers and transportation.
  – Discuss the advantages/disadvantages of on-field equipment removal prior to transport.

Learning Objectives
• Upon completion of the course, the participant will be able to:
  – Identify the challenges of EMT’s and paramedics when managing an equipment laden athlete with a suspected cervical spine injury.
  – Identify the challenges of some protective equipment design as it relates to managing an athlete with a suspected cervical spine injury.

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Background

• Variety of healthcare professionals may be involved in on-field management of suspected head and/or spine injury.

• Important to develop standard guidelines to be used by all providers of prehospital care to ensure safe management.

Objective

• Provide update on
  – New National EMS spine injury standards
  – Inter-Assocation Task Force on Appropriate Care of the Spine Injured Athlete

Questions

• Does a spine board provide better immobilization than a cervical collar and stretcher alone?  
  – No patient outcome studies

• Can spinal immobilization create problems?  
  – Yes

Spinal Immobilization

• Pros:
  – Spinal column injuries will not be aggravated to the point that additional spinal cord injury results

• Cons:
  – Airway compromise (Bauer, Ann Emerg Med, 1988)
  – Aspiration risk
  – Increased intracranial pressure (Stone, Academic Emergency Medicine, 2010)
  – Cutaneous pressure ulcers
  – Iatrogenic pain
  – Increased difficulty in patient handling
  – Combativeness/resistance
  – Increased cost

New National EMS Spine Injury Standards

• The American College of Emergency Physicians believes that current out-of-hospital management practices of patients with potential spinal injury lack evidentiary scientific support.

  – Differentiates between "spinal immobilization" and "spinal motion restriction"

  – Spinal motion restriction procedures may require modification for certain conditions (eg, rescue, vehicle racing, contact or extreme sports) as determined by the EMS medical director.

• Spinal Immobilization Indicated
  – Blunt trauma and altered level of consciousness
  – Spinal pain or tenderness
  – Neurological complaint
    • (e.g. numbness or motor weakness)
  – Anatomic deformity of the spine
  – High-energy MOI

• Spinal Immobilization Not Necessary
  – Normal level of consciousness
  – No spine tenderness or anatomic abnormality
  – No neurologic findings or complaints

  • Patients with penetrating trauma to the head, neck, or torso and no evidence of spinal injury should not be immobilized on a backboard

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New National EMS Spine Injury Standards

Wide Variation in Treatment

The Spine Injured Athlete

• 1998: Inter-Association Task Force for Appropriate Care of Spine Injured Athlete

• 2009: NATA Position Statement on Acute Management of the Cervical Spine Injured Athlete

• 2015: Inter-Association Task Force for Appropriate Care of Spine Injured Athlete
  – 25+ professional associations represented
  – Timeline
    – Jan, 2015: outline
    – May, 2015: 1st draft
    – May, 2015: approved by NATA BOD
    – June, 2015: present at NATA and NSSA; electronic publication
    – June, 2015: JAT submission
    – Aug, 2015: JAT publication

Black & White or Gray?

• Every emergency situation and every patient is different

• Individual circumstances must dictate appropriate actions

• No such thing as “always” and “never”

Enormous Impact Associated With Catastrophic Cervical Spine Injuries

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Enormous Impact Associated With Catastrophic Cervical Spine Injuries

- Physical:
  - pain and suffering
  - permanent disabilities for remainder of life

- Financial:
  - significant medical costs
  - other associated costs (i.e. home and auto modifications, attendants, wheelchair, etc...)
  - loss of income for parents/guardians

- Emotional:
  - mental stress and anguish for student-athlete, family, friends, teammates, coaches

RECOMMENDATIONS FROM THE INTER-ASSOCIATION TASK FORCE REGARDING APPROPRIATE CARE OF THE SPINE INJURED ATHLETE

Appropriate Care of the Spine Injured Athlete

Recommendation 1: EAP

- Each athletic program should have an Emergency Action Plan (EAP) developed in conjunction with local EMS.

Emergency Preparation

- Healthcare providers for athletic competition (MDs, EMTs, ATs) should develop an emergency plan and protocol for dealing with such injuries when they occur and rehearse on regular basis.

Appropriate Care of the Spine Injured Athlete

Recommendation 2: Pre-Event Time Out

- Sports medicine care teams should conduct a “Time Out” before athletic events to ensure EAPs are reviewed and plan out the options with the personnel and equipment available for that event.

Emergency Preparation

TEAMWORK

- When dealing with a potential life-threatening situation such as a head or cervical spine injury, the scene of the injury is not the time nor the place for healthcare professionals to decide on appropriate treatment on such a controversial area.
Appropriate Care of the Spine Injured Athlete

**Recommendation 3:**

• Ensure proper assessment and management of injury.

Emergency Assessment

• Organized process to quickly obtain information vital to care.
  — Scene size-up
  — Primary survey / resuscitation
  — Secondary survey

Emergency Assessment – Scene Size-up

• Scene/situation safe AND under control
  — Stop play
  — Crowds are controlled
  — Athletes are away
• Gather information
  — MOI/nature of injury
    • C-spine stabilization required
  — Number of patients
  — Additional EMS assistance needed

Emergency Assessment

— Scene size-up
— Primary survey / resuscitation
  • Assess level of consciousness - ABC
  • Provide immediate basic life support measures as needed.
  • Quickly make decision regarding transportation.
— Secondary survey

New National EMS Spine Injury Standards

• **Spinal Immobilization Indicated**
  — Blunt trauma and altered level of consciousness
  — Spinal pain or tenderness
  — Neurological complaint
    • (e.g. numbness or motor weakness)
  — Anatomic deformity of the spine
  — High-energy MOI

• **Spinal Immobilization Not Necessary**
  — Normal level of consciousness
  — No spine tenderness or anatomic abnormality
  — No neurologic findings or complaints
  • Patients with penetrating trauma to the head, neck, or torso and no evidence of spinal injury should not be immobilized on a backboard
Emergency Assessment

- Neurologic assessment should be performed before and after full-body immobilization!
  - Motor
  - Sensation

Emergency Assessment

- Heightened suspicion of potentially catastrophic spine injury:
  - MOI
  - Unconscious or altered level of consciousness
  - Neurological complaints and/or deficits
  - Significant midline spine pain
  - Obvious spinal column deformity

Emergency Assessment

- Heightened suspicion of potentially catastrophic spine injury:
  - Respiratory distress
    - "Tracheal tugging"
    - Accessory respiratory muscles
  - Neurogenic shock
    - Decreased blood pressure
    - Increased pulse

Summary

- Emergency Action Plan
- Pre-event “Time Out”
- Emergency Assessment

Appropriate Care of the Spine Injured Athlete

Recommendation 3:

- Protective athletic equipment may be removed prior to transport to an emergency facility for patients with a suspected CSI.
  - FACILITATES ACCESS TO AIRWAY AND CHEST
  - FACILITATES PACKAGING

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Appropriate Care of the Spine Injured Athlete

Recommendation 3:

• Protective athletic equipment may be removed prior to transport to an emergency facility for patients with a suspected CSI.
  — FACILITATES ED MD EVAL

Inter-Association Task Force for Appropriate Care of Spine Injured Athlete. Jan. 2015. Pensacola, FL

Recommendation 4:

• Equipment removal should be performed by at least 3 rescuers trained and experienced with equipment removal at the earliest possible time.
  — If fewer than 3 people are present, equipment should be removed at the earliest possible time after enough trained individuals arrive.

Inter-Association Task Force for Appropriate Care of Spine Injured Athlete. Jan. 2015. Pensacola, FL

Appropriate Care of the Spine Injured Athlete

Recommendation 4:

• Athletic protective equipment varies by sport and activity and styles of equipment differ within a sport or activity.

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Facemask Removal: Combined Tool Approach

- Facemask removal tools should be readily available.
  - Cordless screwdriver
  - Cutting device
  - Specialty tools for quick release facemask hardware

Facemask Removal

- In the event of respiratory distress or arrest, prior to facemask and/or helmet removal, pocket mask may be positioned through facemask for ventilatory assistance.

Facemask Removal

- Be familiar with all types of equipment utilized by your athletes
- Utilize quick release facemask clips if possible
  - Riddell
  - Schutt

Helmet Removal

- Rescuer 1 maintains C-spine stabilization.
- Rescuer 2 cuts front of jersey using “T technique”.
  - Neck to waist
  - Sleeve to sleeve
  - Rescuer 2 opens front of pads to gain access to C-spine and chest.
  - Cut front of pads
  - Utilize quick release if available
  - Rescuer 2 takes control of C-spine from front: “I have C-spine; you can release”.
  - Rescuer 1 removes helmet.
  - Rescuer 1 resumes C-spine control.

Helmet Removal

- Rescuer 1 maintains C-spine stabilization.
- Rescuer 2 cuts front of jersey using “T technique”.
- Rescuer 2 opens front of pads to gain access to C-spine and chest.
  - Cut front of pads
  - Utilize quick release if available
  - Remove helmet chin strap
  - Rescuer 2 takes control of C-spine from front: “I have C-spine; you can release”.
  - Rescuer 1 removes helmet.
  - Rescuer 1 resumes C-spine control.
Helmet Removal

- Rescuer 1 maintains C-spine stabilization.
- Rescuer 2 cuts front of jersey using “T-technique”.
  - Neck to waist
  - Sleeve to sleeve
- Rescuer 2 opens front of pads to gain access to C-spine and chest.
  - Cut front of pads
  - Utilize quick release if available
- Rescuer 2 takes control of C-spine from front: “I have C-spine: you can release”.
- Rescuer 1 removes helmet.
- Rescuer 1 resumes C-spine control.

Helmet Removal Question:
If the helmet is removed on-site prior to transport, does the facemask need to be removed?

It depends upon the type of helmet/facemask.

Some facemasks may be very difficult to remove

- Some loop straps are NOT accessible to a standard cutting tool (eg FM extractor) in its placement as it relates to the facemask in order to remove the entire facemask.
- Some loop straps located on the nose bumper are not flush, rather they are recessed into the bumper and do not allow access to a standard cutting tool in the event the screw and t-nut fail to disengage in order to remove the entire facemask.

Shoulder Pad Removal

- 8 person lift
- Rip-Kord shoulder pads
- Elevated torso technique
- Flat torso technique
- May incorporate jersey and pad cutting into log roll or 8-person lift procedures

Shoulder Pad Removal

- 8 person lift
  - Cut pads in front and pull off from back when athlete elevated.
  - Rescuer 9: “Pads clear”.
- Bi-valve pads
- Elevated torso technique
- Flat torso technique

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Shoulder Pad Removal

• 8 person lift
  — Cut pads in front and pull off from back when athlete elevated.
  — Rescuer 9: “pads clear”
• Rip-Kord shoulder pads
  — Cut and/or release pads in front and back.
• Elevated torso technique
  — Contraindicated if suspect thoracic or lumbar injury.
• Flat torso technique

Shoulder Pad Removal

• Bi-valve pads
  — RIP-KORD system: cut pads in front and release in back

Shoulder Pad Removal

• 8 person lift
• Bi-valve pads
• Elevated torso technique
  — Side lift technique:
    • Rescuer 1 stabilizes c-spine.
    • Rescuers 2 and 3 elevate torso.
    • Rescuer 4 removes pads.
  — Contraindicated if suspect thoracic or lumbar injury.
• Flat torso technique

Shoulder Pad Removal

• 8 person lift
• Bi-valve pads
• Elevated torso technique
  — Straddle technique:
    • Rescuer 1 stabilizes c-spine.
    • Rescuer 2 elevates torso.
    • Rescuer 3 removes pads.
  — Contraindicated if suspect thoracic or lumbar injury.
• Flat torso technique

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Shoulder Pad Removal

• Other considerations:
  – Cervical collar
  – Rib pads
  – Back pad
  – Difficulty or inability to cut pads due to materials involved

Shoulder Pad Removal

• Other considerations:
  – Cervical collar
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Shoulder Pad Removal

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Shoulder Pad Removal

• Other considerations:
  – Cervical collar
  – Rib pads
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  – Difficulty or inability to cut pads due to materials involved

Appropriate Care of the Spine Injured Athlete

Recommendation 5:

• A rigid cervical stabilization device should be applied to the spine injured athlete prior to transport.
  – Properly fitted: rescuer(s) should be trained in fitting.
  – Relative immobilization in the process to aid in minimizing motion.

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Appropriate Care of the Spine Injured Athlete

Recommendation 6:

- Spine injured athletes should be transported using a rigid immobilization device.
  - Concept of spinal immobilization vs. spinal restriction

Types of Rigid Immobilization Devices

- Standard spine board
- Oversize spine board
- Scoop stretcher
- Full body vacuum mattress
- Vacuum pad
- Kendrick Extrication Device (KED)

Rigid Immobilization Device: Accessories

- Spinal immobilization kit:
  - CID
  - HID
  - Body immobilization
    - i.e., speed clips, spider straps,
    - Facemask removal tools
    - Cordless screwdriver, cutting tools
  - Wrist straps
  - Tape
  - Padding

Head Immobilization Device (HID)

- Variety of designs to secure head to spine board; be skilled in use of design you select.
  - Always secure head last to spine board.

Appropriate Care of the Spine Injured Athlete

Recommendation 6:

- Techniques employed to move the spine injured athlete from the field to the transportation vehicle should minimize spine motion.

Spinal Immobilization Techniques

- Log Roll vs. Eight Person Lift (formerly known as lift and slide)
  - Research compared techniques to assess movement in healthy individuals and destabilized C-spines of cadavers.
**Spinal Immobilization Research**

- Both techniques created movement; more with log roll.

**Neutral Alignment**

- Current recommendations for the acute treatment of the cervical-spine injured athlete are to *immobilize the head and neck in neutral alignment* prior to transfer to an emergency facility and to minimize the motion that occurs throughout this process.

**Neutral Alignment**

- Current recommendations for the acute treatment of the C-spine injured athlete are to *immobilize the head and neck in neutral alignment* prior to transfer to an emergency facility and to minimize the motion that occurs throughout this process.

**Supine Log Roll**

- In-line C-spine stabilization
- Thumbs toward face
- If C-spine not in neutral, gently correct unless resistance met.

**Prone Log Roll**

- In-line C-spine stabilization
- Thumbs toward face
- If C-spine not in neutral, gently correct unless resistance met.

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Centering on Spine Board

- Various techniques
  - Lateral slide
  - Angled centering
    - Position top of board ~8-10 inches above head to allow for further centering movement when positioned on board.
    - Athlete may be moved from sides or straddled by rescuers and clothing gripped to facilitate centering.

Eight Person Lift (formerly known as lift and slide)

- Requires multiple rescuers:
  - Rescuer 1 maintains C-spine stabilization.
  - Rescuer 2 positions spine board.
  - Rescuers 3-8 position kneeling 3 to each side.
  - "On my command, lift the athlete 12": 1, 2, 3, lift"
  - 9th rescuer may be utilized for shoulder pad removal.

Eight Person Lift to Gurney

- Rescuer position should be uniform.
  - All kneeling

- Rescuer with spine board should ensure there is adequate room to lift board in beneath patient.

Scoop Stretcher

- Rescuer position should be uniform.

- Rescuer with gurney should ensure there is adequate room to roll gurney in beneath patient.
Scoop Stretcher

Kendrick Extrication Device (KED)

Vacuum Mattress

Vacuum Pad

• Placed on top of rigid spine board with 8 person lift.
• May be molded around head in place of HID.
• Form fits to athlete to decrease pressure on bony prominences.
• Knees may be flexed (optional) to flatten spine.

Straps & Strapping Technique

• Traditional 3 strap technique
  – Chest
  – Pelvis
  – High

Straps & Strapping Technique

• Pin and speed clip system
  – Requires customized spine board.
  – Allows for multiple strapping techniques.
  – Rapid fixation to spine board.

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Straps & Strapping Technique

- Velcro
- “Spider Straps”

Securing to Spine Board

- “X-strap” technique from top of shoulder under opposite axilla.
  - Minimizes translation on spine board.
  - Important with acceleration and deceleration of ambulance.

Securing to Spine Board

- Head should be last body segment secured to spine board.
- Two points of contact on head.
  - Use circumferential taping technique for top of head.
  - Eyebrows as landmark if no helmet.
  - Secure chin.
- Secure wrists together.
  - Keep arms outside of spine board straps.

Straps & Strapping Technique

Appropriate Care of the Spine Injured Athlete

Recommendation 7:

- A transportation plan must be developed prior to the start of any athletic practice or competition.
Appropriate Care of the Spine Injured Athlete

Recommendation 7:
• Spine injured athletes should be transported to a hospital that can deliver immediate, definitive care for these types of injuries.

Special Situations
• CPR
• Combative athlete
• Confined space
• Unstable or uneven surfaces
• Extrication
• Water Rescue

Special Situations
• CPR
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Special Situations

- CPR
- Combative athlete
- Confined space
- Unstable or uneven surfaces
- Extrication
- Water Rescue

Water Rescue

Rescue from pool should be performed by lifeguards.

Water Rescue

Once out of pool, transition of care from lifeguards to athletic trainers.

Water Rescue

Poolside, transition of care from athletic trainers to EMS.

Conclusion

- Important to develop standard guidelines.
- Carefully weigh all factors and make educated decision on what fits best into individual situation.
- Proper planning and preparation: "scenario based training".
- Sports medicine team concept.
- Further research and training needed in spinal immobilization and equipment removal techniques.
Acknowledgements

- Ron Courson, ATC, PT, NREMT-I, CSCS
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  – University of Georgia
  – Athens, GA

- National Athletic Trainers’ Association

References


Questions?

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