# RETHINKING THE STANDARD OF CARE: GOING BACK TO THE BASICS OF SPINE-BOARDING

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# Disclosures

No conflict of interests and views are my own

Not the views of my colleagues or Temple University

Use your own discretion- this is not legal advice to you!

# BY THE END OF TODAY'S LECTURE, YOU WILL BE ABLE TO:

| | |
|---|---|
| Appraise | Appraise current literature of spinal restriction methods for a spine-injured patient |
| Apply | Apply adaptions from recent spine-boarding consensus statements |
| Generate | Generate a plan to improve practice gaps |

# Let's Reflect

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# BUT I KNOW THIS ALREADY

UNLEARNING

# IMPORTANCE OF CARE

The final outcome of a spinal cord injury depends upon the accuracy, adequacy, and speed of first aid management, diagnosis, and treatment within the first few hours.

- *Tator (1990)*

When an athlete is suspected to have a spine injury, every moment and every movement counts. It is imperative that no matter the level of play, from peewee to professional, there is a health care professional, such as an athletic trainer, that creates venue-specific action plans, leads medical time outs and establishes relationships with allied medical professionals to ensure the best possible outcome for the athlete."

- *Tory Lyndley (2020)*

# SOME STARTLING STATISTICS

Approximately 10% of all Spinal Cord Injuries (SCI) a year from athletics

No statistics on percentage of injuries being present when spine-boarding

85% of sport-related CSI result in tetreplegia

Difficult to know if injury was sustained prior to the spine-boarding or if worsened during the intervention

25% of CSI in children under 15 years old

# MORE THAN JUST A HEADLINE

- Tommy Mallin 2009
- Eric LeGrand 2010
- Kevin Everett 2015

# HIGHEST RISK DATA IN SPORTS (NSCISC)

- Age: 16-30 (67%)
- Sex: Male (89%)
- Racial Groups: Caucasian(88%)
- Hispanic Origin: Not Hispanic (94%)

# TIMELINE OF DOCUMENTS

**2009**

Position Statement

**2015**

Consensus Statement Redacted

Consensus Statement (Pre-Hospital Care of the Spine Injured Athlete)

**2015**

Spine Injury In Sport Group Consensus Statement

**2020**

ATHLETIC TRAINING

# CONSENSUS STATEMENTS

National Athletic Trainers' Association Releases Consensus Recommendations and Best Practices for Emergency Prehospital Care of Spine-Related Injured Athletes in American Football

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# KEY RECOMMENDATION #1

Athletic programs should have an emergency action plan (EAP) developed in conjunction with local emergency medical services agencies specific to pre-hospital spine-injury care. Best practices are for an athlete with a suspected spinal injury to be transported to a designated Level 1 or 2 trauma center as quickly and safely as possible.

# KEY RECOMMENDATION #2

Sports medicine teams should conduct a **pre-event medical time out before each athletic event (practices and competitions)**. Participating in these "time outs" should include medical personnel from both teams, EMS personnel and game officials.

NATIONAL ATHLETIC TRAINERS' ASSOCIATION
HEALTH CARE FOR LIFE & SPORT

**National Athletic Trainers' Association Official Statement on Athletic Health Care Provider "Time Outs" Before Athletic Events**

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# KEY RECOMMENDATION #3

When feasible, those with the highest level of training and experience in removal techniques should participate in equipment removal. Athletic trainers are recognized as the medical professional with the most training and experience in athletic equipment removal.

# EQUIPMENT REMOVAL



- Initially thought to facemask only
- Consider removing all equipment
- C-A-B Importance

# KNOWING YOUR EQUIPMENT

- Helmet Types
  - Tools needed for removal
- Additional Equipment Challenges and Knowledge

# TIPS OF THE TRADE

Preceptors or those with multiple ATs, consider the method below:

- Assign a number & a duty
    1. You/Lead AT - Head
    2. R Shoulder – Equipment Removal
    3. L Shoulder – Equipment Removal
    4. R Middle – Derm/Myo
    5. L Middle – Severe Injury Kit
    6. R Foot- Initial Scene Control
    7. L Foot- AED
    8. Board – Grab Spine Board

# KEY RECOMMENDATION #4

- Removal of the helmet and shoulder pads can occur in the emergency room or on the field. There are potential advantages to on-field removal prior to transport to the hospital, such as improved airway management, access to the chest for CPR, and expedited care of the athlete. The decision to remove equipment before transport should be based on a variety of factors, such as the medical status of the injured athlete, type of equipment worn, number of onsite rescuers and training and experience of on-the-field and emergency room rescuers in equipment removal.

- Blunt trauma and altered level of consciousness
- Spinal pain or tenderness
- Loss of cervical range of motion
- Neurologic complaint or findings (eg, numbness or motor weakness in more than 1 limb)
- Anatomic deformity of the spine

**Spinal-motion restriction is not necessary when the athlete has a normal level of consciousness, no spine tenderness or anatomic abnormality, and no neurologic findings or complains**

# SPINAL NEUTRAL ALIGNMENT

- Contraindications for SMR:
  - Pain increases
  - Neurologic signs or symptoms deteriorate
  - Resistance to movement is present.

# Fill the Void

- Challenges the "All-or-Nothing" Recommendation
- Place towel or like object under the head to fill the space left from the helmet without removing the shoulder pads.

# Lift Techniques

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# SPINAL RESTRICTION TECHNIQUES

- Log Roll
- Scoop Stretcher
- Motorized Spine-Board
- Prone Log Roll Push
- Prone Log Roll Pull
- Multi-Person Lift

# EVIDENCE BASED PRACTICE

- (Multi-person) Lift minimizes extent of motion in unstable cervical spine
  - DelRossi et al 2008
- Prone Log Roll PUSH had significantly less motion than Prone Log Roll PULL in thoracolumbar spine
  - Conrad et al 2012
- Prone Log Roll PUSH had significantly less lateral-bending and anteroposterior motion than Prone Log Roll PULL
  - Conrad et al 2013
- Call for removal of log roll
  - Conrad 2012

# EVIDENCE BASED PRACTICE

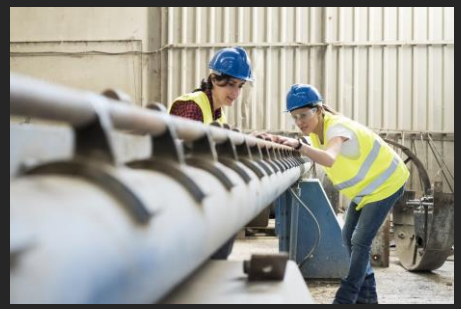
- The 8-person lift technique resulted in the least amount of angular and linear motion for all planes tested as compared with the lift-and-slide and log-roll techniques.
  - Prasarn et al 2015
- The lift-and-slide technique was significantly more effective at reducing motion than the log roll for axial rotation and lateral bending.
  - Prasarn et al 2015

# EVIDENCE BASED PRACTICE

- Rigid Board vs Vaccuum mattress splint
  - *Similar results <250 lbs*
  - *Need rigid board >250 lbs*
    - Etier et al 2017
- Head Squeeze vs Trap Squeeze
  - TS better for confused patients
    - Patrick et all 2011

# SPECIAL CONSIDERATIONS

- Pole Vault
- Gymnastics
- Industrial Setting and Machinery
- Ice
- Weather Conditions



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# TIPS OF THE TRADE

- Do not lift on a count- use WORDS
  - *"1,2,3 LIFT"*
  - *"1,2,3 LOWER"*
- Schedule consistent times to practice
- Helicopter pick-ups
- Prone Hand Positions
  1. *Tap the ground with where you want your hands to land*
  2. *Place your hands on the patient's head*

# KEY RECOMMENDATION #5

- If a spine board is used in the care of an athlete with a suspected cervical spine injury, non-athlete data recommends that time on the board be minimized, however, the board is left in place for transport to the hospital.

# KEY RECOMMENDATION #6

- If feasible, spine-injured athletes should be transported to a medical facility that can deliver immediate and definitive care in the event the athlete has a significant cervical spine injury. This includes: an emergency department with certified emergency medicine physicians; personnel trained in equipment removal; advanced imaging services; spine surgeon consultation in house or readily available; 24/7 operating access; and critical care monitoring and rehabilitation services.

# TIPS OF THE TRADE

Know where your closest Level 1 Trauma center is

Importance of Children's Hospitals

Care for a patient with a helicopter pick up

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# How Do I Start QI in Medical Documentation?

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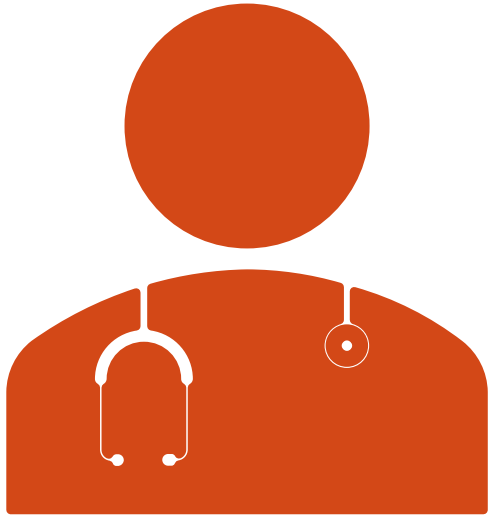
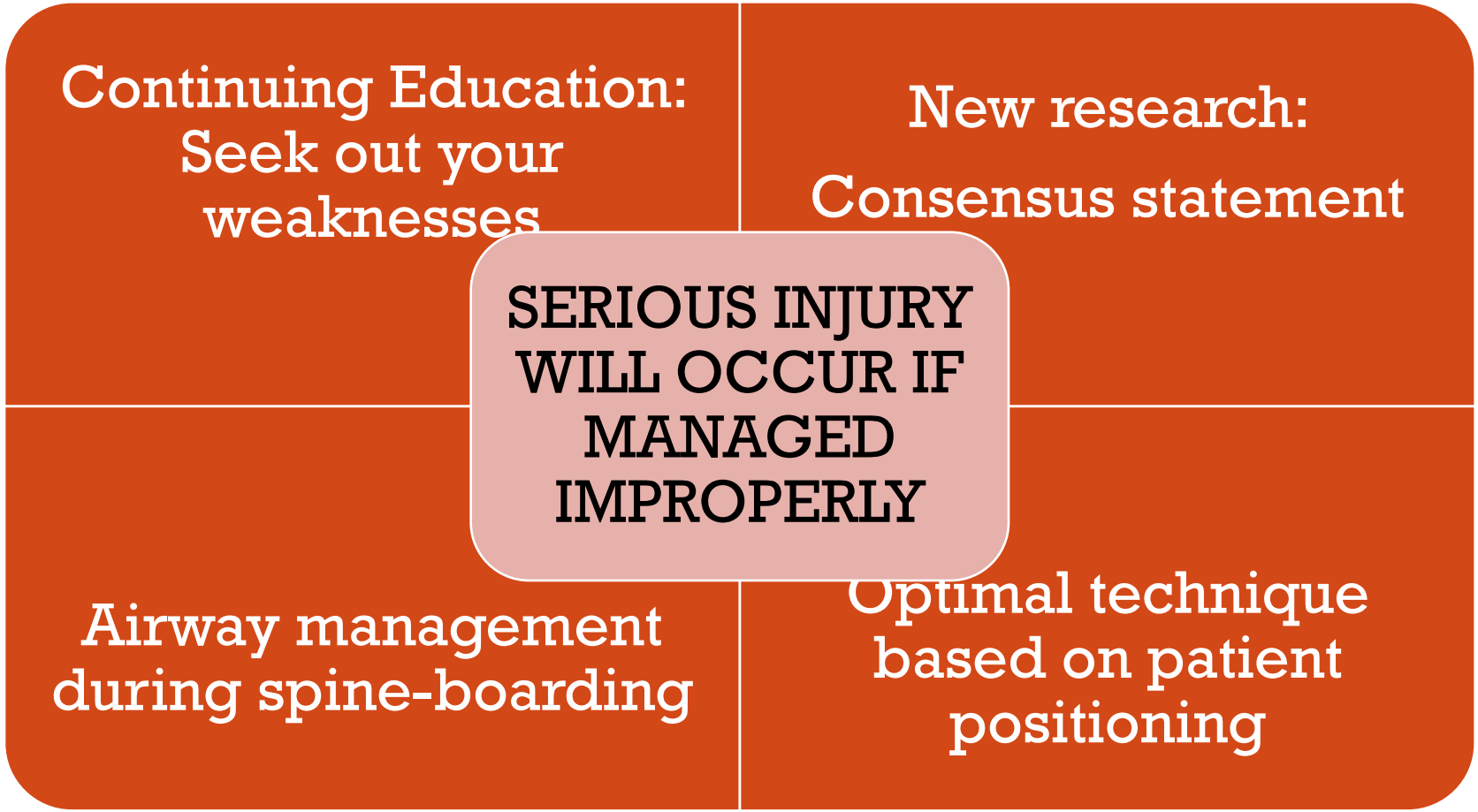


# DEBRIEF: CARING FOR THE CARE GIVER

# TAKE HOME MESSAGE



# THANK YOU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# REFERENCES


- 1. http://www.mayoclinic.org/diseases-conditions/spinal-cord-injury/basics/definition/con-20023837
- 2. Center NSCIS. Facts and figures at a glance. *Birmingham, AL: University of Alabama at Birmingham* March 2013
- .3. Horodyski M, Conrad BP, Del Rossi G, Dipaola CP, Rechtine GR, 2nd. Removing a patient from the spine board: is the lift and slide safer than the log roll? *J Trauma.* 2011;70(5):1282-1285.
- 4. http://espn.go.com/high-school/lacrosse/story/_/id/7344390/athlete-advocates-safety-field
- 5. Zahir, U., & Ludwig, S. C. (2010, December). Sports-related cervical spine injuries: on-field assessment and management. In *Seminars in Spine Surgery*(Vol. 22, No. 4, pp. 173-180). WB Saunders. *Surgery*(Vol. 22, No. 4, pp. 173-180). WB Saunders.
- 6. http://www.aolnews.com/2010/10/21/eric-legrand-injury-shines-light-on-ncaa-rules-and-enforcement
- 7. 8. Swartz EE, Boden BP, Courson RW, et al. National Athletic Trainers' Association Position Statement: Acute Management of the Cervical Spine–Injured Athlete. *Journal of athletic training.* 2009;44(3):306.
- 9. NATA Consensus Statement
- 10. EMT- paramedic national standard curriculum. 1998.
- 11. Del Rossi G, Horodyski M, Powers ME. A comparison of spine-board transfer techniques and the effect of training on performance. J Athl Training. 2003;38(3):204.
- 12. Bailes JE, Petschauer M, Guskiewicz KM, Marano G. Management of cervical spine injuries in athletes. *J Athl Training.* 2007;42(1):126.
- 13. Conrad BP, Marchese DL, Rechtine GR, Horodyski M. Motion in the unstable thoracolumbar spine when spine boarding a prone patient. *J Spinal Cord Med.* 2012;35(1):53-57.
- 14. Conrad BP, Del Rossi G, Horodyski MB, Prasarn ML, Alemi Y, Rechtine GR. Eliminating log rolling as a spine trauma order. *Surg Neurol Intl.* 2012;3(Suppl 3):S188
- 15. Jacobson B, Cendoma M, Gdovin J, Cooney K, Bruening D. Cervical spine motion furing football equipment-removal protocols: a challenge to the all-or-nothing endeavor. *J Athl Training.* 201
- 3.

# SOME EXTRA INFORMATION

# PERSONELL REQUIREMENTS

| ue | Athlete Position | No. of Rescuers Needed | Comments |
|---|---|---|---|
| og roll | Supine | Minimum of 5 | In some instances, the log roll may be completed with fewer re |
| g-roll-push | Prone | Minimum of 5 | If available, additional rescuers positioned on both sides may u prone log-roll push-pull technique. |
| g-roll-pull | Prone | Minimum of 4 | Advantageous in confined spaces |
| son lift (field) | Supine | Minimum of 8 | |
| son lift (ED) | Supine | Minimum of 7 | May not require rescuer for spine board in ED |
| tretcher | Supine | Minimum of 3 | |
| access techniques | | | |
| mask removal | Supine | Minimum of 2 | Combined-tool approach |
| et removal | Supine | Minimum of 2 | |
| s to airway must be obtained before transport regardless of respiratory status. | | | |
| removal techniques | | | |
| or-posterior stabilization | Supine | Minimum of 2 | |
| l-lateral stabilization | Supine | Minimum of 2 | May require helmet cheek-pad removal |
| r pad-removal techniques | | | |
| erson lift (field) | Supine | Minimum of 9 | Additional rescuer positioned near head and trunk removes the pads once the athlete is elevated. |
| erson lift (hospital) | Supine | Minimum of 8 | May not require rescuer for spine board in ED |
| ted torso or tilt | Supine | Minimum of 3 | Should not be used with suspected concomitant injury to the th lumbar spine |
| rso | Supine | Minimum of 2 | |
| e log roll | Supine | Minimum of 5 | In some instances, the log roll may be executed with fewer res |
| the head | Supine | Minimum of 4 | May be used when it is not possible to cut shoulder pads in fro not be used with suspected concomitant thoracic or lumbar i |
| elmet should be removed first, followed by the shoulder pads. | | | |

ation: ED, emergency department.

umber of people and transfer technique selected to move a spine-injured athlete should be determined by the medical pro
e at the scene and the resources available. Note that variations exist in transfer techniques (eg, verbal commands, han
angles, centering techniques).

# INJURY STATISTICS

**Table 1. Combined High School and College Catastrophic Injury Data in Select Sports Derived From the National Center for Catastrophic Sport Injury Research, Fall 1982 Through Spring 2007[3,a]**

| Sport | Setting | Direct Catastrophic Injuries | Direct Injury Incidence Rates (Nonfatal[b]) per 100 000 Population | |
|---|---|---|---|---|
| | | | Males | Females |
| American football (males) | High school | 603 | 0.75 | NA |
| | College | 133 | 1.89 | |
| Gymnastics | High school | 13 | 2.08 | 0.97 |
| | College | 6 | 20.07 | 5.35 |
| Ice hockey | High school | 19 | 1.02 | 0.00 |
| | College | 12 | 4.18 | 0.00 |
| Track and field | High school | 59 | 0.12 | 0.01 |
| | College | 10 | 0.34 | 0.15 |
| Lacrosse | High school | 9 | 0.52 | 0.00 |
| | College | 11 | 2.11 | 2.01 |
| Wrestling (males) | High school | 58 | 0.60 | NA |
| | College | 1 | 0.00 | NA |
| Cheerleading | High school | 46 | ... | ... |
| | College | 23 | ... | ... |

Abbreviations: NA, not applicable; ..., data not available.
[a] Data reprinted with permission of the National Center for Catastrophic Sport Injury Research.
[b] Nonfatal indicates permanent severe disability.