Youth Concussion in Sports: How is law put into practice?

Jessica Brown, Ph.D., CCC-SLP
Assistant Professor
Speech-Language-Hearing Sciences

Toben Nelson, ScD
Associate Professor
School of Public Health

Moira Novak, M.S., ATC
Director of Athletic Medicine

Francis Shen, J.D., Ph.D.
Associate Professor
Law School
University Grand Challenges

“Aim is to elevate the University’s interdisciplinary research strengths for greater impact on the critical societal issues facing our state and the world.”
Grand Challenge Awards

Exploratory research proposals will identify exciting opportunities to foster new interdisciplinary collaborations, spur creative interdisciplinary approaches, integrate research across disciplines and colleges, and strengthen productive research interactions within and beyond the university.
• In 2011, Governor Dayton signed into law a new set of protocols to govern the treatment of concussions experienced by youth athletes in Minnesota
• All 50 states have now enacted statutes related to brain injury in youth sports.
• Most statutes are comparable in wording and policy prescription.
• Following this “first wave” of concussion legislation, however, states are now beginning to revisit the issues to determine what works, what does not, and what additional reforms are needed.
Establish a campus-wide working group on TBI

Conduct a pilot study(s) on implementation of concussion law

Host a statewide summit to disseminate best practices and identify statewide needs

Develop grant proposals to secure future funding
Lingering Questions

• What is the quality of information provided to student-athletes?
• What is the effectiveness of treatment provided to student-athletes?
• What disparities of treatment exist across ages, sports, or regions?
• Beyond care for Return to Play – are students receiving services to help them succeed in the classroom and beyond? If so, what do these services look like and how can they be improved?
Injury Characteristics and Outcomes

Functional Supports and Independence

Deficit Assessment
Concussion Etiologies and Outcomes
Injury Characteristics and Outcomes

Challenges:

• Difficult to predict who will experience long term consequences following BI and who will recover without complication
  • Every injury and person is unique
  • Presence/absence of specific acute symptoms has little prognostic value
  • Medical professionals tend to minimize the potential for negative outcomes to alleviate undue concern
<table>
<thead>
<tr>
<th>Physiological complaints</th>
<th>Cognitive complaints</th>
<th>Socio-emotional complaints</th>
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<tbody>
<tr>
<td>• Trouble sleeping</td>
<td>• Memory problems</td>
<td>• Irritability/anger/emotional outbursts/mood swings</td>
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<tr>
<td>• Dizziness</td>
<td>• Planning/organization problems</td>
<td>• Depression</td>
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<tr>
<td>• Headaches</td>
<td>• Slow thinking or speed of processing</td>
<td>• Apathy or loss of interest in previously enjoyed activities</td>
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<tr>
<td>• Sensitivity to light or sound</td>
<td>• Difficulty learning new information</td>
<td>• Difficulty with relationships</td>
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<tr>
<td>• Problems focusing eyes</td>
<td>• Attention problems</td>
<td>• Flashbacks</td>
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<tr>
<td>• Balance/coordination problems</td>
<td>• Concentration problems</td>
<td>• Panic attacks</td>
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<tr>
<td>• Reduced mobility</td>
<td>• Difficulty keeping track of multiple activities at one time</td>
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<tr>
<td>• Excessive fatigue</td>
<td>• Problems starting or finishing tasks</td>
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<tr>
<td>• Pain</td>
<td>• Difficulty solving problems</td>
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</tbody>
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Students with histories of possible BIs report significantly higher numbers of health complaints than young adults without BIs, $t = -4.264, p < 0.0001$
Conditional Probability of People Experiencing Symptoms

- High symptomology (n=13)
- Moderate symptomology (n=58)
- Negligible symptomology (n=47)

- Memory
- Organization
- Slow thinking
- Concentration
- Multitasking
- Finishing tasks
- Solving problems
- Sleep
- Dizziness
- Headaches
- Sensitivity to light
- Problems focusing
- Eyes
- Balance
- Mobility
- Fatigue
- Pain
- Anger
- Depression
- Apathy
- Relationships
- Flashbacks
- Panic attacks
What is the law?
How does it work?
It’s a No-Brainer!

Let’s tackle sports concussions in Minnesota.
Additional supporters include: Dr. Rosemary Krawczyk, PhD; Kyle Farrell BSc; Lynn Duncan PT; Pam Otterbein; Christine Egan; Jordan Krieg
Return to Play Practices
NCAA Concussion Policy and Legislation

• Mandates:
  • Annual education for Student-Athletes, Coaches and Medical Providers

  • Process that ensures a student-athlete who exhibits signs, symptoms or behaviors consistent with a concussion is removed from sport and evaluated by trained medical professional

  • Process that ensures no return to play on same day as concussion

  • Policy that required medical clearance following concussion dx by a physician or their designee.
Concussion Safety Protocol

- Annual May 1 submission of individual institution’s Concussion Safety Protocol that is consistent with Inter-association Consensus Guidelines:
  - Baseline Testing
  - Procedure to reduce exposure to head injuries
  - Education
  - Return to Learn policy
  - Procedure to ensure proper management of concussion
  - Written certificate of compliance signed by Director of Athletics
Outcomes and Lessons Learned

- Audit on baseline testing measures – ImPACT and SCAT3

- May 2016 - Reviewed all individual concussions – for compliance with institutional protocol

- July 2016 - Instituted QA process for greater accountability on following the protocol
A Public Health Approach to Brain Injury in Youth Sport
What do we mean by a *Public Health* approach?

- Defining what is “unacceptable”
- Informed by theory
- Informed by data
- Broad
- Upstream causes (prevention)
  - Policy
- Goal is to prevent injury and death (not to assess blame)
What is Public Health?

Distinctions between Medicine and Public Health

**Medicine**
- Emphasis on disease diagnosis, treatment, and care for the individual patient
- Medical paradigm places predominant emphasis on medical care

**Public Health**
- Emphasis on disease prevention and health promotion for the whole community
- Public health paradigm employs a spectrum of interventions aimed at the environment, human behavior and lifestyle, and medical care

Source: H Fineberg - http://www.hsph.harvard.edu/about/public-health-medicine/
Language matters

- Concussion is a vague term
- Few outward signs/symptoms
- Re-define as Brain Injury
- Causes can be identified
- Preventive actions can alter their effect
Prevention

Promoting health by not getting sick in the first place

3 types

• **Primary** – Avoiding “risks”; For completely well people

• **Secondary** – Identifying and intervening on “risks”; For people with risks for illness/disease but not yet developed

• **Tertiary** – Slowing disease progression; For people with developed disease

Kaplan, Sallis & Patterson (1993)
Injury
Public Health Definition

Bodily trauma or damage caused by transfer of energy

• Mechanical or kinetic
• Chemical
• Thermal
• Radiant
• Electrical
Epidemiologic Model of Injury

- **Host** - individual
- **Agent** - energy transferred
- **Vector** - means of transmission
- **Environment** - circumstances
Advancing a Public Health approach to Brain Injury in Sports

• Get good data
• Have good theory/frameworks
• Accountability of all parties
  • Players
  • Coaches
  • Athletic training/Sports medicine
  • Officials
  • League administrators
  • Equipment manufacturers
We need data systems

- Need better diagnostics and definition of brain injury
- Broad data collection
- Includes healthy/normal people and events
- Includes:
  - Brain scans
  - Mechanism of injury
  - Medical reports
  - Field conditions
  - Social conditions
Common Beliefs / Impediments to Injury Prevention

• Optimism
  • “It will never happen to me”

• Fatalism
  • “Accidents happen – there was nothing I could do”

• Moralism
  • “How about accepting personal responsibility?”

Hemenway, 2013
Arguments Against Injury Prevention Policy

• Futility
  • The policy will have no effect

• Perversity
  • The policy will have the opposite of intended effect (make it worse)

• Jeopardy
  • The policy will have a chilling effect on other fundamental values (e.g., freedom, liberty)
Next Steps...

Collaborations with school districts

State fair data collection

Focus group completion (school nurses, special educators, SLPs, service coordinators, athletic trainers, physicians, etc.

Stakeholder Meeting
May 24th
University of Minnesota
Thank You