Return to Learn after Concussion: 
Emerging Science for Educational Settings

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• Katy O’Brien is a paid employee of the University of Georgia and as part of that work, conducts the research presented here.
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Concussion and mTBI

What is concussion?

“trauma-induced alteration in mental status that may or may not involve loss of consciousness.”

2016 Berlin Definition Sport–Related Concussion (McCrory et al 2017)

- Sport related concussion is a traumatic brain injury induced by biomechanical forces.
- May be caused either by a direct blow to the head, face, neck or elsewhere on the body with an impulsive force transmitted to the head.
- Typically results in the rapid onset of short-lived impairment of neurological function that resolves spontaneously. However, in some cases, signs and symptoms evolve over a number of minutes to hours.
- May result in neuropathological changes, but the acute clinical signs and symptoms largely reflect a functional disturbance rather than a structural injury and, as such, no abnormality is seen on standard structural neuroimaging studies.
- Results in a range of clinical signs and symptoms that may or may not involve loss of consciousness. Resolution of the clinical and cognitive features typically follows a sequential course. However, in some cases symptoms may be prolonged.
- Cannot be accounted for by other circumstances.

What is concussion?

- Rarely loss of consciousness (~10%)
- Rarely identifiable on neuroimaging
- Impaired function rather than structural changes

Structural versus Functional

Neurometabolic Cascade

- Neurometabolic Cascade Following Cerebral Concussion/mTBI
- Neuronal network dysfunction
- Neurochemical changes
- Cognitive impairment
Physical Effects Over Time

Cognitive and Emotional Effects Over Time

Academic Recovery

“Cocooning”
Downsides to Cocooning

• Mood dysregulation (Wells et al., 2015)
• Increased Depression and Anxiety/Nocebo Effect (DiFazio et al., 2015)
• Physical deconditioning (Silverberg & Iverson, 2013)

Progressive Return to Activity

Rest Recommendations (McCrory et al., 2017)

- 24-48 hours of rest
- Return to moderate activity
- Reassess symptoms
Variations in State Laws
Governing School Reintegration
Following Concussion

Entities Responsible for RTL
Required RTL Education of School Personnel
Required RTL Policy
Specified Standards for RTL Protocol
Other Actions Related to RTL Mandated by Law
Does the Statute Apply to All Students?

Results: RTL laws were uncommon, present in only 8 states. Most (75%) of these laws held schools responsible for RTL management but mandated RTL education for school personnel was less frequent, present in only one quarter of the laws. None of the RTL laws provided guidance on support of students with persistent postconcussive symptoms, and only 1 recommended an evidence-based standard for RTL guidelines.
Academic Implications of Concussion

Students report...
- Leaving school early
- Decrease in grades
- Desiring to return to school
- Using academic adjustments

(Iadecola et al., 2015; McGrath, 2010; Baker et al., 2015)

Current Concussion Management


Methods

High School students (within 5 years)
History of concussion during high school
Returned to school after injury
Online recruitment through social media and team sports
Demographics

- N = 58 (37 female, 21 male)
- 253 total responses, 195 removed
- Mean age 17.7 (SD 2.5)
- Mean TPO 2.5 years
- 24/58 (40%) sustained multiple concussions
"I just felt like I wasn’t there like I was trying to think through a thick fog."
"I did not have a return to learn process. I got my concussion at an away game so our AT was not there and did not know about it. No one knew I had passed out so I was allowed to go back in and play. I wish I had had a return to learn process because it could have helped me adjust back into school."
Medical care postinjury
Extended recovery time
Academic effects
Return to school while recovering
Many students report using AA

Limitations
- Preliminary results
- Mostly descriptive
- Small sample size
- Multiple concussions

Future Directions
- Collecting control data now on students without injuries and students with orthopedic injuries
- Injury characteristics predicting academic problems
- Relationship between RTL and academics

Preliminary Conclusions

Discussion
Concussions in College

Returning to Learn Post-Concussion: Invisible Struggles of an Invisible Injury
*A Phenomenological Investigation of College Student Experiences*

**The Issue: Academic Challenges**
- Symptoms
- Initial steps
- Self-advocacy
- Resource awareness
- Symptom management - no protocol
- ADA Constraints

**The Current Study**
**Research Aims**
- Student experiences
- Student care pathways
- Possible avenues of improvement

**Qualitative Design**
- Phenomenology
- Emergent hypothesis
- Holistic description of phenomena
- Commonalities among participants
Data Collection and Sample

**Participants**
- Purposefully selected
- 1 male, 11 females
- Colvin et al., 2009
- Harmon et al., 2016
- Various academic levels
- Recruitment

**Data Collection**
- Academic dysfunction survey (Wasserman et al., 2017)
- Learning and Study Strategies Inventory (LASSI; Weinstein et al., 2016)
- Semi-structured interviews
- Audio recorded

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**Aim 1: To Describe College Student Experiences of Concussion**

- Physical effects
  - 7 students
  - 38 statements
- Cognitive effects
  - 11 students
  - 49 statements
- Sleep effects
- Emotional effects
- Social effects

**Aim 2: To Describe Student Care Pathways Following Concussion**
**Interaction Effect**

- Interaction of factors & impact on RTL
- Contributions to experience + student reaction

**Aim 3: To Identify Avenues to Improvement of Care for Students with Concussion on Campus**

**Recommendations**

- Improved concussion & resource knowledge
- Improved communication among resources
- Short-term accommodations
- Improved academic outcomes and long-term effects
Conclusions and Implications

Return to School, Recovery, and Academic Adjustments

Role of the Speech Language Pathologist
SLP Scope of Practice

**Service Delivery Areas**
- Cognition
- Attention
- Memory
- Problem solving
- Executive functioning

**Etiologies**
- Neurological disease/dysfunction (e.g., traumatic brain injury, cerebral palsy, cerebrovascular accident, dementia, Parkinson’s disease, and amyotrophic lateral sclerosis)

**Prevention & Wellness**
- Concussion/traumatic brain injury awareness: Educate parents of children involved in contact sports about the risk of concussion.

**Barriers**
- Personal
  - Knowledge
  - Self-Efficacy
- Vocational
  - Caseloads
  - Productivity
- Attitudes
  - SLP Roles
  - Collaboration

**CDC HEADS UP**
[Link to CDC HEADS UP page]

https://www.cdc.gov/headsup/youthsports/index.html
System Approaches and Advocacy

CDC Pediatric mTBI Guidelines

Key Recommendations from the CDC Pediatric mTBI Guidelines:
1. Do not label patients as having PTSD.
2. Use validated, age-appropriate symptom scales to diagnose PTSD.
3. Ask whether a child has experienced a traumatic event.
4. Provide patients with instructions on how to adjust to their new normal.
5. Counsel patients to return gradually to non-contact activities after more than 2-3 days of rest.
Finding our Footing

Training
- Cognition
- Attention
- Memory
- Problem solving
- Executive functioning

Population Access
- Concussion, traumatic brain injury awareness. Educate parents of children involved in contact sports about the risk of concussion.

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