Academic Issues Following Concussion: Facilitating Return-to-Learn

UK 4th Annual Sports Concussion Summit - Lexington KY

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Concussion can cause academic problems for days, weeks, or months
- Physical and mental over-exertion can aggravate symptoms and complicate recovery
- Academic stress and failure can increase risk of depression and anxiety, which can further hamper recovery

Concussion in the Classroom
- Return-to-Learn (RTL) is just as important as Return-to-Play (RTP)
- Academic supports and accommodations can aid recovery
- School staff may have little understanding of concussion-related academic problems and how to help

What is a concussion?
- Mild traumatic brain injury (mTBI)
- A disruption in normal brain function due to a blow or jolt to the head
- CT or MRI is almost always normal
- 80% of all brain injuries

Concussion in the Classroom
- Striking a balance . . .
  - Medical need for rest and reduced exertion or stimulation
  - Academic need to maintain progress and avoid falling too far behind

Parents, school staff and medical professionals need to work together!

Common Physical Symptoms
- Headache
- Nausea
- Fatigue and lack of energy
- Clumsiness and poor balance
- Dizziness and lightheadedness
- Sleep problems

Neck injury often accompanies head injury
Vision Problems

- Blurred or double vision
- Bothered by bright or fluorescent light
- Eyes tire more easily
- Trouble reading (e.g., words move on the page, skipping words or lines)

*Standard eye exam usually shows normal ocular health and acuity*

Common Emotional Symptoms

- Irritability
- Moodiness
- Easily overwhelmed
- Personality change
- Lack of motivation
- Emotional outbursts

Common Cognitive Symptoms

- Feeling 'dazed' or 'foggy' or 'fuzzy'
- Easily confused
- Slowed processing
- Easily distracted
- Memory problems
- Trouble organizing
- Poor mental stamina

Exertion effects

- Symptoms can be worsened by . . .
  - mental effort
  - environmental stimulation
  - emotional stress
  - physical activity

Invisible Injury

- Student looks normal and *sometimes* feels normal
- Standard medical and neurocognitive testing may not show significant impairment
- Expectation from self and others to 'get over it' and 'get back in the game'

Secondary Problems

- Depression or anxiety can emerge (or increase) due to . . .
  - Medical distress and uncertainty
  - Inability to participate in sports or other usual activities
  - Academic stress
  - Social isolation
Recovery from Concussion

- Full recovery in 7-10 days...in most cases
- Symptoms can last weeks or months
- Symptoms can significantly disrupt academic functioning
- Adolescents seem to take longer to recover

'a miserable minority' experience persistent symptoms

Return-to-Learn: The Evidence Base

- Very little research specifically focused on academic effects of concussion
- Current return-to-learn recommendations are driven primarily by clinical experience
- Growing literature on how to manage return to school, but no consensus yet

Prague 2004 Guidelines

The concept of 'cognitive rest' was introduced with special reference to a child’s need to limit exertion with activities of daily living and to limit scholastic activities while still symptomatic

Related Research

- Multiple injury pathways in mTBI
  - Neurometabolic cascade (Giza & Hovda, 2001)
  - Microstructural axonal injury (Niogi et al., 2008)
  - Altered cerebral blood flow (Maugans et al., 2012)
  - Abnormal fMRI activation (Ptito et al., 2007)
- Early exertion after injury may complicate recovery (McRea et al. 2009)

- Cognitive impairments are common after concussion (Howell et al., 2012; Mathias et al., 2004)
  - Attention
  - Memory
  - Processing speed
  - Executive functioning

- In most group studies, impairments resolve by 3 months (McCrea et al., 2009)

- Persistence of brain abnormalities even after resolution of symptoms
  - Visual memory impairment still present at 3 months (Nieger et al. 2012)
  - Altered cerebral blood flow lasting 14 days for 73% of concussed athletes and at least 30 days for 36% (Maugans et al. 2012)
  - White matter abnormalities still present at 4 months (Mayer et al., 2012)
Concussion in the Classroom

- Tires easily in class and over the course of the day
- Bothered by noise, light, and commotion (hallways, cafeteria)
- Trouble doing more than one thing at a time (e.g., listening to the teacher and taking notes)
- Easily overloaded and ‘shuts down’

- Takes longer and more effort to accomplish the same work
- Concentration aggravates symptoms, especially headache
- Clumsy in hallways or stairwells
- Frequent visits to the nurse’s office
- Late or incomplete homework

Guidelines for Return to School after Concussion

- Out of school at first if necessary, and then gradual re-entry as tolerated
- Avoid re-injury in sports, gym class and crowded hallways or stairwells
- Provide academic accommodations
- Regular communication

Academic Accommodations

- Rest breaks during school in a quiet location (not always the nurse’s office)
- Reduced course and work load
  - If needed, drop unnecessary classes
  - Focus on essential material
  - Decrease homework
- Avoid over-stimulation, (e.g., cafeteria or noisy hallways)

Academic Accommodations

- Extra time and a quiet location for tests
- Provide student with class notes or allow student to audiotape classes
- Allow student to wear sunglasses or a baseball cap to help with light sensitivity
- Preferential seating

Academic Accommodations

- Test formats that minimize memory demands
- Large-print books or books on tape
- Extra help outside regular class-time
- Breaking information and assignments down into manageable chunks
- Assistance with organizing and prioritizing work and assignments
**P.E. Accommodations**

- Avoid re-injury
- Avoid physical and mental over-exertion
- Avoid over-stimulation (noise and light)
- Minimize exertion at first, then increase activity gradually, as tolerated
- In complicated cases, some physical activity may promote recovery
- Don’t substitute mental activity for physical activity!

*Physical education must be adapted to the physical needs of the student*

**Academic Accommodations**

- Consider 504 plan or (rarely) IEP
- Wide variation in how schools respond to requests for accommodations
- Resistance may be due to...
  - Lack of knowledge
  - Concern that student is faking
  - Grades are not that bad
  - Poor communication within school or between school and student/parents

**Return-to-Learn Resources**

**REAP Program** (McAvoy, 2009)

www.rockymountainhospitalforchildren.com

**Upstate Concussion in the Classroom brochure and video**

www.upstate.edu/concussion

**Centers for Disease Control and Prevention**

www.cdc.gov/concussion

**Recommendations for schools**

- Form a concussion team that can be a resource to families and staff
  - Athletic administrator and coach
  - School physician, nurse & athletic trainer
  - Teacher, psychologist & guidance counselor
- Implement an education program for sports, medical, and academic staff
- Develop and implement Return-to-Play & Return-to-Learn policies

**References**


Thanks!

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upstate.edu/concussion