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Encouraging Concussion Reporting

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ENCOURAGING CONCUSSION REPORTING

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Evergreen Sports Medicine, Williston, VT

October – November 2024

Mentor: Dr. Scott Paluska

Problem Identification

- 50% of concussions are not reported
- Leads to increased risk of insufficient or incorrect treatment and worse outcomes
 - If a second concussion is sustained while the patient is still recovering from the first, there is risk of Second Impact Syndrome
 - In the past, prolonged full cognitive rest was recommended after concussion, but this has more recently been shown to contribute to persistent symptoms

AHEC Focus Areas addressed: Interprofessional Education, Connecting Communities & Supporting Health Professionals/Community Health Workers, and Current and Emerging Health Issues

Second Impact Syndrome

Second impact syndrome (SIS) is a condition that occurs when a concussed individual sustains a second impact upon their head before fully recovering from the first blow.

Symptoms

- Loss of consciousness
- Headache
- Vomiting
- Dilated pupils or vision loss
- Seizure

Common Misdiagnoses

- * Stroke
- * Cardiovascular emergency
- * Seizure

Highest Risk Groups

- Young people ages 13-24
- Males
- Athletes in high contact sports, such as American football, hockey, and boxing

THE BEST WAY TO PREVENT SIS IS TO ENSURE PROPER REST AND RECOVERY FOLLOWING AN INITIAL CONCUSSION!

MAC
Mid-Atlantic Concussion Alliance

Rainey, R. (2023, August 31). *Second impact syndrome (SIS): What athletes, coaches and trainers need to know*. Mid-Atlantic Concussion Alliance. <https://macconcussion.com/second-impact-syndrome-sis-what-athletes-coaches-and-trainers-need-to-know/>

Public Health Cost

Graves et al., 2015

- Methods: Retrospective cohort, 2007 – 2010
- Subjects: Children with mild TBI
- Findings, for first three months after injury:
 - Cost per concussion – \$1004
 - Population-level cost – \$695 million

Yengo-Kahn et al., 2020

- Methods: Retrospective cohort study, Nov 2017 – March 2020, Southeast US
- Subjects: 141 male American high school football players with concussion
- Findings:
 - Cost per concussion – \$800
 - Increased cost of care was associated with a greater initial symptom burden, presenting to the ED, and a diagnosis of post-concussion syndrome

Community Perspective

Cameron Stultz – Student at Essex High School

- Soccer goalie, got a concussion fall of 2024
- Did not receive sideline assessment
- Did not report to the AT because his coach said he would be kept from playing for 10 days
- “Students don’t want to be out for 10 days if they might feel better in 3”
- Some students may think they can manage symptoms on their own

Leo Labonte – Head Certified Athletic Trainer at Essex High School

- Trainers assess students soon after head injury is observed, or concussion is reported, using the Sport Concussion Assessment Tool 6 (SCAT6)
- There isn’t a certain number of days athletes are out
- Return to play is symptom-based and stepwise
- Coaches complete an annual online training on concussion
- Concerned about athletes at schools in VT that don’t have athletic trainers

Matt Lunser, DO – Team Physician at the University of Vermont

- Current practice includes immediate sideline assessment after head injury using the C3 Logix system (includes the SCAT6)
- 24 hours of rest are required after which it is proven safe to start sub symptom threshold activity and progress through a stepwise return to play protocol
- There is no set amount of time athletes are kept out of sport other than the first 24 hours

Intervention and Methodology

Deliverable:

A document explaining updated concussion management as is relevant to the motivations of students, parents, and coaches involved in sports at the middle and high school levels

Distribution plan:

Document will be added to resources for providers at Evergreen Family Health, Evergreen Sports Medicine, and Alder Brook Family Health and can be provided to patients and families as applicable

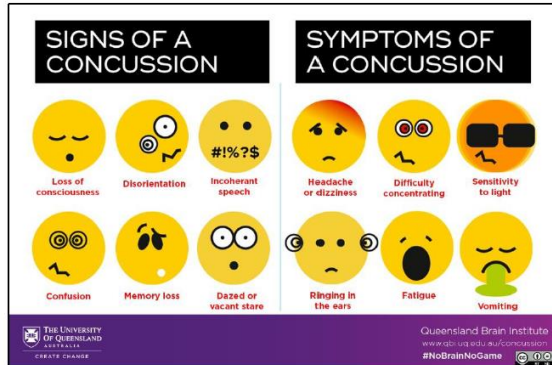
Goals of deliverable:

Accurately inform students, coaches, and parents on current concussion management

Increase reporting of concussions to athletic trainers or primary care providers

Decrease negative outcomes from untreated or incorrectly treated concussions

Updated Concussion Guidelines



Signs and symptoms of concussion. Queensland Brain Institute - University of Queensland. (2024, May 3). <https://qbi.uq.edu.au/concussion/signs-and-symptoms-concussion>

There is no longer a certain number of days that an athlete must be kept out of play after a concussion – so please report!

The athlete should be monitored closely after the injury, especially within the first 24 hours, to identify any delayed onset signs and symptoms.

Please report concussion to your school's athletic trainers to ensure proper treatment protocols are followed to minimize risks of future injury and the development of long-term symptoms.

Many symptoms from concussion resolve in 3-10 days, but some can persist for weeks, months, and even years.

Risk Factors for Persistent Concussion Symptoms

- Pre-existing mental health conditions including anxiety and depression
- History of migraine headaches
- History of prior concussions
- Prolonged recovery from concussion in the past

Always report concussion to your school's athletic trainer or to your primary care provider to minimize risks of future injury and the development of long-term symptoms that can be difficult to treat. If your symptoms last longer than 21 days, please contact Evergreen Sports Medicine.

Adapted from UVM Athletic Medicine's *Concussion Assessment & Management Guidelines*
Created by a student at the Larner College of Medicine in 2024

For students, coaches, and parents in sports at the middle and high school levels

Initial Evaluation

If concussion is suspected, the student should be immediately removed from sports participation and should not be allowed to return to play for the rest of the day.

After the first 24 hours, athletes can begin the return to play protocol at the direction of their athletic trainer or provider. Concussions are now treated according to symptom severity on a day-by-day basis. Treatment is individualized.

SEVERAL WARNING SIGNS SHOULD PROMPT AN EMERGENCY DEPARTMENT REFERRAL WHEN EXAMINING AN ATHLETE WITH SUSPECTED HEAD TRAUMA:

- » tingling or numbness in the arms or legs
- » a severe or worsening headache
- » loss of consciousness or a decline in the level of consciousness
- » recurrent vomiting episodes
- » aggressive mood
- » seizures or convulsions

AMN, B. (2024, February 8). Sports-related concussions in Pediatrics • AMN • Academy for Multidisciplinary Neurotraumatology. <https://brain-ann.org/sports-related-concussions-in-pediatrics/>

RESULTS

Evaluation of Effectiveness and Limitations

Assessment of intervention:

Survey students, coaches, and parents of athletes on concussion management knowledge before and after receipt of educational handout

Record number of concussions reported before and after implementation of intervention

Compare rates of more severe or persistent concussion symptoms before and after intervention reaches large percent of target population

Limitations:

Method of distribution may not reach a large enough percent of the target population

Updated information may not influence enough change in reporting to make an impact on more meaningful goals

Inconsistency and variability in data on concussion and persistent concussion symptoms makes assessment and interpretation difficult

Future Interventions

- Consider how to more broadly distribute updated concussion guidelines to target population
 - Ex. Reaching out to the VPA to improve or update concussion training materials for coaches
 - Ex. Identify schools in Vermont without athletic training departments and consider how to provide education
- Compile resources for clinic on where to refer for treatment of persistent concussion symptoms
- Investigate C3 Logix system and whether it can be expanded to be used at high schools for baseline testing for athletes and more immediate sideline assessment
- Create a deliverable explaining the current return to play stepwise protocol directed at athletes in case they still don't want to report

References

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<https://pmc.ncbi.nlm.nih.gov/articles/PMC4874376/#:~:text=Athletes%20who%20do%20not%20immediately,are%20immediately%20removed%20from%20activity>
2. Graves, J. M., Rivara, F. P., & Vavilala, M. S. (2015). Health Care Costs 1 Year After Pediatric Traumatic Brain Injury. *American Journal of Public Health*, 105(10), e35–e41.
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