

Concussions: The Injury You Cannot See

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Today's objectives

- Define a concussion
- Discuss short and long term effects of a concussion
- Review common signs and symptoms of a concussion
- Help coaches, referees, and parents understand the importance of appropriate care following a concussion

Concussion facts

- CDC estimates concussions occur in 1.7 million children and adults each year
 - 20% are sports related
- All reported cases of secondary impact syndrome have occurred in athletes <20 years old
- Impacts 3 domains: somatic (physical), emotional/behavioral, and cognitive

What is a concussion?

- “A type of traumatic brain injury (TBI) caused by a bump, blow or jolt to the head or hit to the body that causes the head and brain to move rapidly back and forth” – CDC
- A complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces

Why are children at such a high risk for concussions?

- Smaller structures
 - Brain water content
 - Level of myelination
- Larger ball-to-head ratio
- Weak/undeveloped neck musculature
- Inexperience of a player
- Children continually expected to acquire new information and skills

What happens when a child has a concussion?

- Rapid onset of short-lived impairments of neurological function
 - Begin 1 minute post trauma and persist for 24-48 hours
- Impact initiates a complex cascade of neurochemical and neurometabolic events
- Concussed brain cells undergo a state of vulnerability during which time, if they sustain a second impact to the head, the cells would suffer irreversible cell damage and die
 - Can be vulnerable for up to 30 days

Primary symptoms of concussion

- Decreased: ability to concentrate, processing speed, awareness and memory
- Blurry vision, complaints of dizziness, nausea, vomiting, ears ringing
- Sensitivity to noise and/or light
- Impaired balance and coordination

Secondary symptoms of concussion

- Headache
- Increased fatigue
- Sleep disturbances
- Feelings of depression or anxiety

Second impact syndrome

- A second head injury sustained in the window when cells are still vulnerable, which can continue to compromise the already declining neurological function of a player
- Allowing children to return to contact sports while still symptomatic from initial concussion increases risk for second impact syndrome
- Second impact can be smaller in magnitude and not directly to head

Post Concussion Syndrome

- Characterized by delayed recovery with persistent symptoms 7-28 days post injury
- Presence of three or more lasting symptoms (HA, dizziness, fatigue, irritability, insomnia and decreased memory or concentration)

Putting Things into Perspective

Coaches

- First line of defense
- Witness the event
- Document details

Parents

- Monitor player for changes
- Seek medical attention
- Advocate for best plan

Medical Professional

- Determine plan of care
- Clearance for return to play

Best care and
safe injury
management
for the child

The 5 R's of Concussion Management

- **Recognize** that a concussion may have occurred
- **Remove** player from activity immediately
- **Refer** the individual for medical care
- **Rest** both physically and cognitively
- **Return** to activity only after a full recovery (which is determined by a medical professional)

Massachusetts Concussion Laws

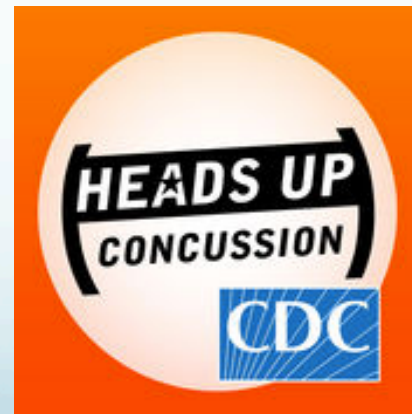
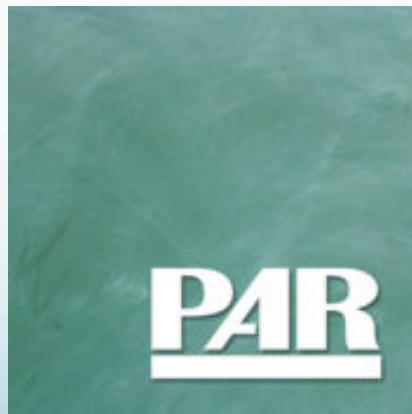
- As of 2011, the state of Massachusetts requires all school districts to have policies and procedures in place for the prevention and management of sport related head injuries
 - Exclusion from Play
 - “(A) Any student, who during a practice or competition, sustains a head injury or suspected concussion, or exhibits signs and symptoms of a concussion, or loses consciousness, even briefly, shall be removed from the practice or competition immediately and may not return to the practice or competition that day.”
 - (B) The student shall not return to practice or competition unless and until the student provides medical clearance and authorization as specified in 105 CMR 201.011.

Example of a Return to Play Protocol

- Gradual resumption of normal activities
 - Light aerobic activity (walking, light jogging)
 - Sport-specific activities and training
 - Noncontact training drills
 - Full contact practice following medical clearance
 - Return to game
- Player needs to be symptom free for 24 hours prior to moving to the next step
- Complete rest >3 days is not as effective as graded exposure

Tools for the Sideline

- To help with the recognition of concussions, the CDC has a free app (Heads UP) that has a list of symptoms that a player may report
- Other screening tools are the PAR and the SCAT2



Training

- In 2016 Mass Youth Soccer mandated that heading repetitions must be monitored and limited for ages 11-13.
 - “For all players between the ages of 11 and 13, heading training will be limited to a maximum of 30mins per week with no more than 15-20 headers per player, per week. No limit of heading in games.” – MYSA
- Education is key
 - Teaching technique is of the utmost importance.
 - Knowing one’s limits, discussing game-like situations, and playing smart

Heading Technique is Key to Success

- Optimal biomechanics of heading a soccer ball
 - Brace/stiffen neck muscles
 - Make contact with your hairline (crown of your head, not the top)
 - Get your whole body behind the ball and moving forward to maximize momentum and decrease the load on the cervical spine

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