American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN™
Ohio Chapter

Sports Shorts

GUIDELINES FOR PHYSICIANS

Concussions

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Concussion is defined as a complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces. Furthermore, a concussion is a mild traumatic brain injury (TBI), defined by any alteration in consciousness due to a blow or strong force to the head or to the neck and body with an "impulsive" force transmitted to the head. It results in a variety of symptoms and may or may not include memory problems or loss of consciousness.

SIGNS & SYMPTOMS OF A HEAD INJURY

The signs and symptoms of concussion fall into four categories: physical, cognitive, emotional, and sleep.

TYPICAL SYMPTOMS:

- **Physical:** Headache, nausea, vomiting, balance problems, dizziness, visual problems, fatigue, sensitivity to light/noise, numbness/tingling, dazed/stunned
- **Cognitive:** Feeling mentally foggy, feeling slowed down, difficulty concentrating/remembering, forgetful of recent information and conversations, confused about recent events, answers questions slowly, repeats questions
- **Emotional:** Irritable, sadness, more emotional, nervousness
- **Sleep:** Drowsiness, sleep more or less than usual, difficulty falling asleep

The assessment of concussion is challenging because it may involve several or only one of the signs and symptoms listed above. These signs and symptoms alone can be subtle. Concussions in athletes with pre-existing mental health disorders may exacerbate their symptoms and make them more difficult to control. (Halstead 2010)

MANAGING THE CONCUSSION

When concussion symptoms are present:

- Player should be medically evaluated with standard emergency management practices with special attention to excluding cervical spine injury.
- Player should not be left alone and should be monitored.
- **Player should not be allowed to return to play that day.**
- "When in doubt, sit them out." (McCrory et al. 2005)
- Routine imaging using computed tomograpy (CT) or MRI contributes little to concussion evaluation and management.

Use only with suspicion of intracranial structural lesion (prolonged disturbance of consciousness, focal neurological deficit, worsening symptoms) (McCrory et al. 2009)

SIDELINE/ON SITE ASSESSMENT

- **SCAT/SCAT2** (Sports Concussion Assessment Tool)
- **SAC** (Sideline Assessment of Concussion)

OFFICE ASSESSMENT

1) Subjective symptom scale
2) Neurological exam
3) Head and neck exam
4) Balance testing: BESS, Romberg, tandem gait
5) Neuropsychological assessment (computerized testing)
6) Exertional trial once asymptomatic

TREATMENT

Physical and Cognitive Rest:

- Physical – remove from all sports and exertional activities
- Cognitive – remove from loud activities, "screen time" (video games, TV/movies, computers, texting), and even school if unable to tolerate work load and atmosphere

THE FACTS (PART 1)

- For 80% of youth athletes, concussion symptoms usually resolve within 3 weeks (Collins et. al. 2006)
- It is widely accepted that youth athletes tend to take longer to recover and tend to be more symptomatic than adults. (McCrory 2009)
- Evidence indicates that females may be at a greater risk for concussion than their male counterparts possibly due to weaker neck muscles and smaller head mass. (Halstead et al. 2010)

RETURN TO PLAY

Begin to progress the athlete through the following stages **after they become asymptomatic at rest**. Any medication previously used, must be stopped and athlete asymptomatic while off medication (McCrory et al., 2009)

Stage 1: No activity, complete physical and mental rest
Stage 2: Light aerobic exercise (walking or stationary cycling) to increase HR to 70% their maximum. No resistance training
Stage 3: Sport-specific training, no head impact activities
Stage 4: Non-contact training drills (light resistance training)
Stage 5: Full-contact training after medical clearance
Stage 6: Return to play

There should be a minimum of 24 hours for each stage. If symptoms arise, the athlete should return to previous asymptomatic stage once asymptomatic for 24 hrs.

COMPLICATIONS

- **An athlete with first concussion is 4-6 times more likely to have another** (Guskiewicz et al., 2003)
- Second impact syndrome/brain damage/death
- Post-concussion syndrome
- Chronic headache
- Learning disability/cognitive impairment or morbidity
- Chronic depression
- Vestibular/vertigo symptoms
- Migraine syndrome

THE FACTS (PART II)

- In the past 10 years, the number of 8-13 y/o with sport-related concussions has doubled, while the number of 14-19 y/o seeking treatment for head injuries has increased by 200%. (Bakhos et al., 2010)
- The CDC estimates that 1.6-3.8 million sports-related concussions occur annually in the U.S. (Langlois et al. 2006)
- Personal protective equipment has not yet shown a role in concussion reduction (Harmon et al., 2013)

SUMMARY

1) **NEVER LET A SYMPTOMATIC ATHLETE RETURN TO PLAY**
2) Normal CT scan/MRI does not rule in/out concussion
3) Most concussions occur without loss of consciousness
4) Many concussions are not brief/transient – may last weeks, months
5) Neuropsychological/baseline testing best performed preseason
6) Educate all parties involved: coaches, parents, trainers, teachers etc.

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GUIDELINES FOR PARENTS & ATHLETES

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WHAT IS A CONCUSSION?

A concussion is a brain injury that affects normal brain activities such as thinking, memory, problem solving, vision, balance, and many others. A concussion is a traumatic brain injury (TBI) defined by any alteration in consciousness due to a blow or strong force to the head or to the neck and body with an "impulsive" force transmitted to the head described as "whiplash" or "head snapping back."

JUST THE FACTS

- In the past 10 years, the number of 8-13 year-old children with sports related concussions has doubled while the number of 14-19 year-olds seeking treatment for head injuries has increased by 200%. (Bakhos et al., 2010)
- Between 1.6 to 3.8 million sports-related concussions occur each year in the United States. (Langlois et al., 2006)
- It has been documented that only 20% of athletes report their concussion symptoms. (Kaut et al., 2003)
- Loss of consciousness (passing out) only occurs in around 10% (1/10) of concussions. When loss of consciousness occurs, the medical personnel will likely assume there is a neck injury and take extra care.
- Young people who have a first concussion have a 4-6 times greater risk of having a second concussion. (Guskiewicz et al., 2003)
- A normal MRI or CT scan does not rule out a concussion. These tests are only used to rule out a structural injury or brain bleed.
- The majority of concussions occurring in organized sports in the U.S. are sustained in football, girls' soccer, wrestling, boys' soccer and girls' basketball.

SIGNS OBSERVED BY COACHES

- Appears dazed or stunned
- Confused about assignment or position
- Forgets sports plays
- Unsure of game score or opponent
- Moves clumsily
- Answers questions slowly
- Shows behavior or personality changes
- Can't recall events prior to or after the hit/fall

SYMPTOMS OBSERVED BY PARENTS

- Headache
- Feeling slowed down or mentally "foggy"
- Sensitivity to light or noise
- Dizziness or balance problems
- Memory problems
- Tired, easily fatigued, or difficulty sleeping
- Sleeping more or less than usual
- Emotional – argues or laughs excessively, cries easily
- Irritability and/or anxiety
- Double or blurry vision
- Nausea or vomiting

Your child may have many or only one of the above signs and symptoms to be considered to have a concussion.

LONG TERM MEDICAL PROBLEMS FROM RECURRENT CONCUSSIONS

- Learning problems
- Concentration issues/attention deficit and hyperactivity disorder
- Increased incidence of depression
- Problems with frequent headaches
- Rarely – permanent brain damage or death from Second Impact Syndrome
- Post-concussion syndrome

EVALUATION

- Any young athlete who suffers a concussion or possible concussion should be evaluated by their pediatrician, primary care doctor, or a sports medicine professional.
- The evaluation may include a computerized test that is another useful objective tool in evaluating concussion.
  - This test evaluates memory, problem solving, reaction time, and other functions of the brain.

TREATMENT

The treatment of concussion consists of relative physical and cognitive/mental rest. (Moser et al., 2012)

- Physical rest = rest from all sports and exertional activities
- Mental rest = rest from loud activities (headphones, parties, dances), video games, computers, cell phones, bright light/sunlight, driving, alcohol, drugs, and even school if unable to tolerate work load and atmosphere.

An athlete should NOT engage in physical or cognitive activities that result in an increase in symptoms. (Harmon et al, 2013)

TAKE HOME POINTS

1. **A player with any symptom should NEVER be permitted to return to play**.
2. Follow up with your **pediatrician or sports medicine professional** is necessary for any suspicion of head injury or concussion.
3. Good quality helmets are essential for biking, snow sports, many contact sports, and inline skating to prevent skull lacerations and skull fractures. No helmet or other protective equipment has been proven to prevent or reduce a concussion.
4. When athletes have died or suffered serious complications from repeated concussions, almost all of the athletes did not report their continued concussion symptoms to their parents, athletic trainers, or doctors. **It is imperative that athletes be honest about their symptoms at all times**.
5. Coaches, parents, students and teachers should **be aware of the signs and the symptoms of concussion** to help recognize this condition early.
6. There is a variety of concussion education material available through governmental, educational, and private companies.

Concussion education websites

NCAA Concussion programme NCAA.org/concussion
CDC Concussion Education/Head Up http://www.cdc.gov/cocussion/sports
NFL Health and Safety NFLhealthand safety.com

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This information is available on the Ohio AAP website www.ohioaap.org