Concussion Guidelines for Pediatricians

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 tomography (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

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
• Learning disability/cognitive impairment or morbidity
• Chronic depression
• Vestibular/vertigo symptoms
• Migraine syndrome
• Chronic headache

THE FACTS
• 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. (McCready 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)
• 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 (Harman et al., 2013)
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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.

**OHIO’S CONCUSSION/RETURN-TO-PLAY LAW FREQUENTLY ASKED QUESTIONS**

1. **Who can clear an athlete to return-to-play?**
   Under Ohio law (R.C. 3313.539 and R.C. 3707.511), a physician must provide **WRITTEN** clearance for an athlete to return to play. A school district or youth sports organization may also authorize a licensed health care provider who is not a physician to make an assessment or grant clearance to return to play if the provider is acting in accordance with one of the following, as applicable to the provider’s authority to practice in Ohio:
   1. In consultation with a physician;
   2. Pursuant to the referral of a physician;
   3. In collaboration with a physician;
   4. Under the supervision of a physician.

   It is important to review your school or youth sports organization’s policy regarding what health care providers are authorized to clear an athlete to return-to-play.

2. **Can a child return to play on the same day if he/she is cleared to return by a physician or other authorized health care provider?**
   No. Ohio law prohibits a child to return to play (practice or competition) on the same day that he/she is removed on suspicion of having sustained a concussion, regardless of whether he/she has been cleared by a physician or other authorized health care provider. He/she may return the following day if cleared in writing by a physician (MD or DO) or other authorized health care provider that they did not sustain a concussion. If they sustained a concussion, then they should complete the recommended 5 Phase Exercise Progression before returning.

3. **What schools must comply with Ohio’s return-to-play law?**
   The prohibitions and requirements for interscholastic athletics apply to public schools, including schools operated by school districts, community schools, and science, technology, engineering, and math (STEM) schools. They also apply to all private schools, including both chartered and non-chartered non-public schools. (ORC 3313.539, ORC 3314.03, ORC 3326.27.)

4. **Is physician defined under the law?**
   “Physician” means a person authorized under Chapter 4731 of the Revised Code to practice medicine and surgery (MD) or osteopathic medicine and surgery (DO).

5. **Is there a form that health care providers must sign to permit an athlete to return to practice or play after they are removed?**
   For school sports that are members of the Ohio High School Athletic Association, there is an OHSAA sanctioned form available here: [http://ohsaa.org/medicine/AuthorizationToReenter.pdf](http://ohsaa.org/medicine/AuthorizationToReenter.pdf)

   The law only requires that the athlete must present evidence in writing by a physician (MD or DO) or other authorized health care provider that they have been cleared to return.

   This document is intended to serve as guidance for Ohio’s “Return to Play” Law and should not be construed as legal advice or legal opinion on specific facts or circumstances. You should consult an attorney with respect to any particular issue or concern.

**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, teacher, etc.

**SELECT REGIONAL REFERRAL SITES**

(A full list of more than 90 sites statewide is available at [www.ohioaap.org/concussions](http://www.ohioaap.org/concussions))

- **Akron Children’s Hospital**
  Sports Medicine Center - Concussion Clinic
  330.543.8260

- **Cincinnati Children’s Hospital Medical Center**
  513.636.4366

- **UH Rainbow Babies & Children’s Hospital**
  Sports Concussion Program
  216.844.3595

- **Nationwide Children’s Hospital**
  Physical Medicine and Rehabilitation Concussion Clinic
  614.722.6200

- **ProMedica Toledo Children’s**
  Sports Care
  419.578.7590

- **Dayton Children’s Hospital**
  Neurosurgery
  937.641.3461