

Concussion (Traumatic Head Injury)

Hilliard Pediatrics, Inc. - Dr. Tim Teller, MD

Introduction

A **concussion** is a type of brain injury. The injury can occur if something hits the head (another head, a ball, something else) or if the head moves rapidly causing the brain to hit the inside of the skull bones that surround the brain. This can cause bruising of the brain, damage to blood vessels, and injury to nerves. Common causes of concussion include falls (skiing, skating, biking, climbing), being hit in the head (baseball, another helmet, hockey puck), and car crashes. Young brains are at higher risk for concussions.

It is not possible to cover all the bases with concussion with a brief handout, so do not hesitate to call us with questions or concerns about your child after their head injury.

Signs and Symptoms

There are four main categories of the signs and symptoms.

1. **Physical:** Headache (by far the most common symptom), nausea and vomiting, problems with balance, vision problems, and tiredness.
2. **Cognitive:** A feeling of mental “fogginess” or feeling slowed down are common. With a significant concussion, you may have a memory loss for the event or that day (example: if you hit your head while skate boarding and get knocked out, you might forget the actual event and parts of the day). If you have memory loss past that first day (example: your child cannot recall in the future seeing their grandparents three days after the concussion), a more serious injury may have occurred.
3. **Emotional:** It is not uncommon to have sadness, irritability, and nervousness.
4. **Sleep:** Sometimes a concussion will cause someone to be drowsy and sleep more while their symptoms linger. Other times a concussion will cause someone to have difficulty falling asleep and they will sleep less than usual. Note that although often people are taught to check someone’s pupils after a head injury, we have never seen someone who’s “only sign that something was terribly wrong” was a change in their pupils when everything else looked reassuring.

What to Do When it occurs

- **Call 911** if there is a car crash with ejection from the car; a car rollover; a pedestrian or bicyclist without a helmet struck by a motor vehicle; falls from a height more than the child’s own height and not acting normally; seizure; or head injury by a high impact object.
- **Go to the Nationwide Children’s Hospital immediately** if loss of consciousness; vomits more than once after a head injury; altered mental status (agitated, sleepiness, slow to respond, or repetitive questioning); severe headache; or amnesia.

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- **Immediately stop your activity and rest** if there are any of the above concussion symptoms, including headache, nausea or vomiting, dizziness, feeling “foggy”. It is fine to take acetaminophen (Tylenol®) by mouth for the headaches pain. Ice can be applied to the area where it is sore. Many children will find that “**mental rest**” is also required for a few days or longer. These children find that their concussion symptoms are worse if they read, do homework, watch TV, and play video games.
- **Who needs a CT scan?** A concussion is not diagnosed with a CT scan or MRI – it is diagnosed based on the history and physical. An imaging study of the brain tells us if something more than a concussion occurred: a bleed (hemorrhage) on or in the brain. It can also confirm a more serious skull injury, such as a skull fracture. The physician seeing someone at the emergency department will discuss with you whether a child needs an imaging study after a head injury.
- **Who needs to be seen at Concussion Clinic at Nationwide Children’s Hospital?** If told by the emergency department to follow-up with the Concussion Clinic, we would recommend your child be seen there in follow-up. Also, sometimes symptoms will linger for longer than expected, change from how they started, or we will have other questions we will want answered by the specialist. In that case, we will refer you to the Concussion Clinic. The concussion clinic is a team of sports medicine, physical medicine and rehabilitation specialists, and other specialists. They can do computer-based assessments that can be helpful in judging someone’s recovery or comparing to their baseline (if that is available). You can call and set-up the appointment with Concussion Clinic at 614-722-6200. If your insurance needs a referral, let our office know once you have set-up the appointment.
- **Who needs to be woken up over night to be checked-on?** Although this is frequently discussed as an important thing to do after a concussion, we only recommend doing this if specifically instructed by a physician after your child has been evaluated in the office or in the emergency department. If so, the goal is to make sure your child has not worsened and can still respond to you appropriately. So if someone vomits again, does not respond to you normally (responding normally might include them angrily telling you they want to go back to sleep) appropriately, or if you have great difficulty waking them up, they should be evaluated immediately at the emergency department at Nationwide Children’s Hospital.
- **Multiple concussions.** There is a very frightening issue called Second Impact Syndrome where someone not fully recovered from a concussion has another traumatic head injury soon after the first and the injury causes brain swelling that can lead to death. This is one of many reasons to wait until fully recovered to return to normal activities. There are times when a less severe concussion will follow a previous concussion. We have seen many cases where this causes longer lasting, lingering symptoms – sometimes for months.

Return to Play Protocol

Rules:

1. **No** return to play the **same day** as a concussion.

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2. Your child should be **without any concussion symptoms** to return to play.
3. A minimum of 24 hours (one day) should be spent on the following stages. Many children will take longer than 24 hours.

Do not move onto the next stage if you have a return of your concussion symptoms.

STAGE, EXERCISE, and GOAL

1. **No activity**
 - Exercise - Complete rest
 - Goal - Recovery
2. **Light exercise**
 - Exercise - Walking, swimming, stationary bike. No weight training.
 - Goal - Increase heart rate.
3. **Sports-specific exercise**
 - Exercise - Jogging, running, or skating.
 - Goal - Add movement to the activity.
4. **Non-contact training**
 - Exercise - No activities with possibility of head impact. Kicking or throwing the ball, batting and passing drills. Light weight training.
 - Goal - To test how someone functions when progressing to more complex training.
5. **Full contact practice**
 - Exercise - Normal activities without restriction.
 - Goal - Help with athlete's confidence and coach's ability to assess how athlete is doing in their recovery.
6. **Return to play**
 - Exercise - Normal game play

Ohio's Concussion Law

The State of Ohio has a law concerning youth and sports that went into effect April 26th, 2013. The new law states that an athlete must be removed from practice or play if showing signs or symptoms of a concussion and not return the day of the injury. To return to practice or play, the athlete must provide written clearance (usually on a prescription) from a medical professional (MD or DO) that it is safe to return to practice and competition. The law applies to all participants in youth and school sports in Ohio. There is much more information available here:

<http://www.nationwidechildrens.org/concussion-law>

So if no worrisome symptoms are occurring (see above) and your child is recovering, the ideal time to come in for an appointment to discuss if your child may return to practice and competition

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is **when they now are free of any symptoms**. Otherwise, we cannot clear them to return. One of the difficulties in dealing with concussions makes this clearance quite tricky: children and adults lie about their symptoms in order to return sooner than is safe. Since there is nothing we would find on physical exam to tell us that a child is still having headaches or dizziness or a foggy feeling, we cannot detect those children that should rest a longer period of time. We have to rely on what we are told as physicians. Please remember that clearance means being cleared to follow the Return to Play protocol, which does not mean they can go to play as usual that day. We realize this is very frustrating for many athletes and families. But it is the safest thing to do.

Call us during regular office hours to discuss when to schedule concussion follow-up appointments in the office. Realize the best time to come in to discuss clearing your child to return to play is when they are free of any concussion symptoms. Therefore, it may be that you will need to reschedule an appointment if they have not yet recovered.

What to Do When

- If your child has an injury with signs or symptoms (headache, nausea or vomiting, dizziness, drowsiness, or feeling “foggy”) of a concussion => **stop activities immediately**. Whether your child is practicing an activity, playing a sport, or simply playing, it is important to then have your child rest. It is now law in the State of Ohio that children in youth and school sports be removed from their sport and not return that day.
- If your child’s injury involved a car crash with ejection from the car, a car rollover, a pedestrian or bicyclist without a helmet struck by a motor vehicle, falls from a height more than the child’s own height and not acting normally, seizure, or head injury by a high impact object => **call 911**. Your child needs to be evaluated at Nationwide Children’s Hospital Emergency Department.
- If your child has loss of consciousness, vomits more than once after a head injury, has altered mental status (agitated, sleepiness, slow to respond, or repetitive questioning), severe headache, or amnesia => your child needs to be evaluated at Nationwide Children’s Hospital **Emergency Department**. They will likely need more of an evaluation than can be done at the doctor’s office or the urgent care.
- If your child has an injury and with rest is recovering well => **call during regular office hours** to arrange for follow-up **to be cleared** to follow the Return to Play protocol. In order to be cleared, your child should be **free of symptoms** of the concussion – no headache without medicine, no dizziness, no drowsiness, no fogginess, and no nausea.
- If your child has been cleared to follow the Return to Protocol, can they skip the days needed to follow the **Return to Play protocol**? => No. The Return to Play protocol is designed to safely allow someone to get back to his or her normal activities. If concussion symptoms linger for longer than expected, change from how they started, or we will have other questions => we will refer your child to the **Nationwide Children’s Hospital Concussion Clinic**.

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- If your child had a concussion, was having no symptoms later, was cleared to follow the Return to Play protocol, and along the way has symptoms return (headache, foginess, dizziness, drowsiness, nausea, hard to focus) => **stop, rest, and start from the beginning** of the protocol once the symptoms are gone. For instance, if your child rested (and was doing well), was cleared, is walking (without problems), and then the next day they develop headache and a foggy feeling after running, they need to stop and rest again. Once they are symptom free for a day, try the first step (walking) the next day. If at any point along the Return to Play steps they develop symptoms again, stop and rest. Once free of symptoms for at least one day, return to the Return to Play steps.
- If your child feels fine when they are resting, but even TV, video games, or reading is bothering them => **stop TV, video games, or reading** until feeling better. Some children will find they will be unable to enjoy these activities or even attend school while they recover from their concussion. Call during routine hours to discuss this if you have questions. We can provide a school excuse if needed.

Resources

Nationwide Children's Hospital Sports Medicine

Concussion Clinic is available at the Dublin and Westerville Close To Home Centers Center, downtown at the hospital's main campus, and other locations. 614-722-6200 (press option #3 then option #4). The Concussion Clinic is available a number of days throughout the week. Their website is: <http://www.nationwidechildrens.org/concussions>

Helpful websites

- <https://www.cdc.gov/traumaticbraininjury/>
- <http://www.healthychildren.org/English/health-issues/injuries-emergencies/sports-injuries/pages/Concussions.aspx>