

# FACTS ABOUT CONCUSSION



## WHAT IS A CONCUSSION?

A concussion is a mild traumatic brain injury (mTBI) caused by a blow or jolt to the head or body that causes the brain to move abruptly. The movement causes the neurons in the brain to stretch and to temporarily not work normally. Concussions can occur even when a child does not lose consciousness. In fact, only 10 percent of children with concussions report being “knocked out.”

Some of the symptoms of a concussion can appear immediately after the injury, while others may not be noticed for a day or two. Symptoms may last days, weeks or months. Sometimes symptoms may not be obvious.

## HOW IS A CONCUSSION DIAGNOSED?

Your child’s healthcare provider will ask a lot of questions to understand how the injury occurred and what new symptoms your child is experiencing as a result of the injury. Your child will be evaluated by a physical exam, and a healthcare provider will ask questions about the injury itself. Imaging, such as a CT scan or MRI, is generally not useful in diagnosing concussions because these tests do not show the way the brain’s function is affected by the injury.

## WHAT TYPES OF SYMPTOMS COULD MY CHILD HAVE FROM A CONCUSSION?

The symptoms of a concussion are related to how well the neurons in the brain are working together. The most common symptoms are listed in the table below.

Often, symptoms will worsen in the first few days following the injury. Symptoms may also worsen when the brain is doing more work. This may occur with schoolwork, looking at a computer for long periods of time or participating in physical activity.

## PRE-EXISTING CONDITIONS AND CONCUSSION SYMPTOMS

For children with certain pre-existing conditions, concussion symptoms may sometimes be more severe or prolonged. These conditions include: migraine headaches, learning disabilities, attention deficit disorder/attention deficit hyperactivity disorder (ADD/ADHD), visual disorders, and emotional and mental health conditions. A concussion may temporarily make these conditions more challenging to control.

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## COMMON CONCUSSION SYMPTOMS

<b>PHYSICAL</b>	Headache	Nausea and vomiting	Slowed reaction time	Sensitivity to light	Sensitivity to sound
<b>VISION/ BALANCE</b>	Balance problems	Dizziness	Eye strain/ symptoms with eye movement	Fuzzy or blurry vision	Motion sensitivity
<b>THINKING/ REMEMBERING</b>	Difficulty concentrating	Difficulty remembering	Confusion	Feeling “mentally foggy”	Feeling slowed down
<b>SLEEP</b>	Sleeping more than usual	Sleeping less than usual	Trouble falling asleep	Trouble staying asleep	Feeling fatigued or drowsy
<b>MOOD DISRUPTIONS</b>	More emotional	Irritable	Sad	Nervous/Anxious	Depressed

## HOW DO I TREAT MY CHILD'S CONCUSSION?

Initial treatment for a concussion is REST – both mental and physical. This gives the brain a chance to recover. Too much activity early in the recovery can provoke severe symptoms; however, resting for too long can also make it harder to return to activities.

If you suspect your child has a concussion, see a healthcare provider as soon as possible. It is important to closely monitor your child, pay attention to their specific symptoms and contact a healthcare provider with any concerns.

If your child has acute concussion symptoms, they should not participate in risky activities until evaluated by a healthcare provider.

### Avoid:

- Activities that could cause another head injury (such as sports, gym class, riding a bike, etc.)

### Based on symptoms, limit:

- Other physical activities that make their symptoms worse (i.e. running or lifting heavy items, etc.)
- Cognitive activities that require a lot of concentration (i.e. attending school, doing homework, playing video games, texting, social media, etc.)

With guidance from your child's healthcare provider, your child can slowly return to activities that require concentration and physical effort as they begin to feel better.

As parents, you should be on the lookout for signs that your child is in immediate danger as a result of their injury.

### Call 911 if your child has any of the following symptoms:

- Seizures (twitching or jerking movement of parts of the body; may look stiff)
- Weakness or tingling in the arms or legs
- Cannot recognize people or places
- Confused, restless or agitated
- Impaired consciousness
- Difficult to arouse or unable to awaken
- Repeated vomiting
- Slurred speech
- Bloody or clear fluid from the nose or ears

## ADDITIONAL RESOURCES

**Brain Injury Association of Pennsylvania**  
www.biapa.org  
800-444-6443

**Brain Injury Alliance of New Jersey**  
www.bianj.org  
732-783-6172

**Brain Injury Association of Delaware**  
www.biaofde.com  
800-411-0505

**BrainSTEPS: Brain Injury School Re-Entry Program**  
www.brainsteps.net  
724-944-6542

**The U.S. Centers for Disease Control and Prevention – Concussion and Mild Traumatic Brain Injury**  
www.cdc.gov/headsup

### QUESTIONS ABOUT YOUR CHILD'S INJURY?

If you have questions about your child's injury, please call your child's primary care provider who can discuss concussion symptoms and help create a recovery plan for your child.

If you have additional questions after seeing your child's primary care provider, please call CHOP's Sports Medicine and Performance Center at **215-590-1527** or the Trauma Center at **215-590-5932**.

For more information, visit  
[www.chop.edu/concussion](http://www.chop.edu/concussion)

# COPING AFTER A CONCUSSION



## WHAT IS THE TREATMENT FOR A CONCUSSION?

Initial treatment for a head injury or concussion is REST, both mental and physical for the first few days after the injury. It is important to give the brain a chance to recover. Your child may need to sleep more than usual.

- **Physical rest:** Initially, no activity that makes symptoms worse or could result in head trauma.
- **Brain rest:** In the first few days following injury, your child may need to stay home from school until their symptoms are significantly improved. They may return to activity slowly as they feel better. Your child's healthcare provider can help you through this gradual process.

## WHEN CAN MY CHILD RETURN TO SCHOOL?

It will depend on your child. Every child's injury and recovery is different and requires careful observation from parents and healthcare providers. You can promote recovery and prevent ongoing symptoms by following a "return to learn" plan like the one below. Your healthcare provider may customize this plan based on your child's recovery, and your child will move through the plan at their own pace.

### RETURN TO LEARN PLAN

**Step 1:** Immediately after a concussion, brain rest for a few days is recommended.

- This may mean no school, no homework, no computer, no texting, no video games and maybe even no television if it makes your child's symptoms worse.
- As symptoms improve, allow your child to try short periods of watching television, listening to audio books, drawing, cooking or small amounts of reading/homework if these activities do not cause a severe increase in symptoms. If symptoms do develop, encourage the child to take a break while the symptoms are still mild.

**Step 2:** Light thinking activity can restart once your child has had a significant improvement in symptoms at rest.

- Your child may do activities that do not cause symptoms to get much worse.
- Initially, your child may tolerate only 5 to 15 minutes of work at a time. Stop the activity when mild to moderate symptoms develop.
- Your child may increase the length of thinking activity as long as symptoms do not worsen significantly and as long as symptoms improve with less than a 30-minute break.

**Step 3:** Increase school-specific activities gradually.

- When your child is feeling better, they should try to do some schoolwork at home, increasing the amount and duration as tolerated.
- Your child should continue to participate in school-specific activities in short bursts of time (up to 30 minutes) as tolerated and work up to longer time periods.

**Step 4:** Once your child is able to perform thinking activity for short periods of time, consider having them return to school. They can start attending half-day, then return to full days of school as symptoms allow. Coordinate a plan with the school nurse or other school staff.

- If symptoms develop at school, encourage your child to take a break in a quiet, supervised area until symptoms improve (they may not completely resolve, but that is OK), then they can return to class. If symptoms are severe, your child may consider going home for the day, but if your child paces themselves and takes breaks when mild symptoms develop, those symptoms will be more likely to resolve with a break and they will be able to last longer in school.
- It's normal for children and teens with concussions to have minor "bumps in the road" during recovery where symptoms may worsen with increasing levels of activity. It's better to have short periods of rest when symptoms increase a little, rather than try to plow through the day without breaks and end up with severe symptoms which take longer to improve with a break.
- The goal for your child is regular, daily attendance in school.

## WHEN CAN MY CHILD RETURN TO PHYSICAL ACTIVITY (CONTACT SPORTS AND PLAY)?

It will depend on your child. You can promote recovery and prevent ongoing symptoms by following a “return to play” plan like the one at right. Your child’s healthcare provider may customize this plan based on your child’s needs, and your child will move through the plan at their own pace.

### Call 911 if your child has any of the following symptoms:

- Seizures (twitching or jerking movement of parts of the body; may look stiff)
- Weakness or tingling in the arms or legs
- Cannot recognize people or places
- Confused, restless or agitated
- Impaired consciousness
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## RETURN TO PLAY PLAN

**Step 1:** Physical rest for a few days is helpful as symptoms improve. Bed rest is not necessary and your child is allowed to do light daily activities and take short walks as tolerated (generally about 15 minutes to start). They should avoid any physical activities that cause severe symptoms to develop.

**Step 2:** Your child may then participate in more light aerobic exercise (brisk walking, stationary cycling, etc.) as long as severe symptoms do not return during or after the activity. We don't recommend weight training at this time. Your child should take a break or stop if symptoms develop. Your child should be able to advance to a full day of school as symptoms improve.

**Step 3:** Once your child is able to tolerate light aerobic exercise, they may advance to sport-specific exercise including moderate jogging/brief running, moderate-intensity stationary biking, or having a catch with an adult. No head impact activities are permitted.

**Step 4:** Once your child is able to tolerate moderate intensity aerobic exercise, they may advance to noncontact training drills and heavy noncontact physical exertion, including sprinting/running, high-intensity stationary biking, noncontact sport-specific drills and begin some weightlifting (start with lighter weights and more repetitions, then work up to heavier weights and fewer reps).

**Step 5:** At this point, ask your child's healthcare provider if your child is ready to advance to full contact play. For interscholastic sports, formal clearance by a medical provider is required.

## QUESTIONS ABOUT YOUR CHILD'S INJURY?

If you have questions about your child's injury, please call your child's primary care provider who can discuss concussion symptoms and help create a recovery plan for your child.

If you have additional questions after seeing your child's primary care provider, please call CHOP's Sports Medicine and Performance Center at 215-590-1527 or the Trauma Center at 215-590-5932.

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# RETURNING TO LEARN AFTER SUMMER VACATION



When a child suffers a concussion during summer vacation or a break from school, parents often wonder if their child will be ready to return when school starts again. Every child's injury and recovery is unique and requires careful observation from parents and healthcare providers. You can promote recovery and prevent ongoing symptoms by following a "return to learn during a break" plan like the one below. Your child's doctor will adjust this plan to meet your child's needs, and your child will move through the plan at their own pace.

**STEP 1:** Immediately after a concussion, your child should take a break from thinking activities for a few days.

At first this may mean avoiding texting and computers, not playing video games and possibly even avoiding television, if it makes symptoms worse. It may also mean staying away from "busy" activities such as swimming, large get-togethers with friends or family, or even summer camp. Your child may participate in activities with low thinking demands, such as drawing, cooking, and card or board games.

**STEP 2:** When you start to see your child's symptoms improve during rest, allow them to slowly start light thinking activities. These include things like texting, easy reading, and puzzles such as word search or crossword puzzles. If your child's symptoms return, stop these activities.

At first, your child may only tolerate 5 to 15 minutes of thinking activity at a time. Stop the activity if symptoms increase a lot. Allow your child's brain to rest, then return to activities when symptoms improve.

Your child may continue to increase time with thinking activities as long as symptoms do not get worse, or symptoms improve within 30 minutes of taking a break.

**STEP 3:** Slowly advance to higher levels of thinking activity.

When your child is feeling better, they should try to do some type of higher-level thinking activity. Even though school is not in session, it's a good idea to work on activities that would mimic schoolwork at home, increasing the amount of time as tolerated. This type of thinking activity could include summer reading (especially reading activity books where you can answer questions about what you read) or SAT prep questions.

Your child should continue to participate in these activities in short bursts of time (up to 30 minutes) as tolerated and then work up to longer periods of time.

Your child should participate in daily thinking activities until they return to school. Do not try to cram summer reading into the final weeks before school. This plan will help make a smooth transition back to school after concussion.

## QUESTIONS?

Please contact the Minds Matter Concussion Program at 215-590-6919.

# RETURNING TO RECREATIONAL ACTIVITY AFTER A CONCUSSION



When a child suffers a concussion, parents often wonder when their child can return to physical activity. The timing for your child’s return to recreational physical activity will depend on their specific needs. You can promote recovery and prevent ongoing symptoms by following a “return to play” plan like the one below. Your child’s doctor will adjust this plan to best meet your child’s needs, and your child will move through the plan at their own pace.

## RETURN TO PHYSICAL ACTIVITY PLAN

**STEP 1:** Your child may participate in light physical activities that have a low risk for head injury, including light walking and usual daily activities that don’t make symptoms significantly worse. This does not include any type of sports training.

**STEP 2:** If light physical activity does not significantly increase symptoms, your child can advance to moderate aerobic activity as tolerated. Once your child can participate in their usual daily activities with only mild symptoms, they can start some moderate aerobic exercises, including brisk walking, light jogging, stationary biking or playing in the yard or park. These activities should not make symptoms significantly worse.

**STEP 3:** If moderate aerobic activity does not significantly increase symptoms, your child can advance to heavier levels of aerobic activity. This includes exercises such as moderate jogging/running, moderate-intensity stationary biking, playing catch and kicking a soccer ball with an adult. Your child may not participate in activities that may have a high risk of head impact.

**STEP 4:** When your child is symptom-free, your doctor will discuss the process for fully returning to sports activities. This is called the Return to Play Protocol. When your child tolerates heavier levels of physical activity, they may advance to high-intensity non-contact physical exertion, including sprinting/running, stationary biking, light weightlifting and non-contact play. However, your child should not participate in head impact activities.

**STEP 5:** If your child is symptom-free on the Return to Play Protocol, ask the doctor if your child is ready to advance to full gym class and other contact and collision sports. Contact your child’s doctor with questions or concerns.

### LIGHT ACTIVITY

- Light walking
- Usual daily activities such as household chores

### MODERATE ACTIVITY

- Brisk walking
- Light jogging
- Light-intensity stationary biking
- Playing in the yard or park

### HEAVY ACTIVITY

- Jogging/running
- Moderate-intensity stationary biking
- Playing catch with a baseball and kicking a soccer ball with an adult

### HIGH INTENSITY

- Sprinting/running
- High-intensity stationary biking
- Light weightlifting
- Non-contact play

### QUESTIONS?

Please contact the Minds Matter Concussion Program at 215-590-6919 or visit [www.chop.edu/concussion](http://www.chop.edu/concussion).