

What is a Concussion?

A concussion is a type of traumatic brain injury (TBI) caused by a bump, blow, or jolt to the head or by a hit to the body that causes the head and brain to move rapidly back and forth. This rapid movement alters the shape of brain tissue, stretching and damaging brain cells.

These cellular damages can lead to chemical and metabolic changes within the brain, making it more difficult for cells to function and communicate. Given that the brain serves as the body's central command center, the effects of a concussion can be extensive and lead to a range of physical, emotional, and cognitive changes.

How are concussions diagnosed?

Concussions are not always easy to detect, and the signs and symptoms may vary from person to person. Some people may experience immediate symptoms, while others may take days before showing any signs.

Diagnosing a concussion typically involves

- Evaluating a patient's medical history
- Conducting a physical examination
- Neurological tests.

Medical professionals may also use imaging tests such as a CT or an MRI to check for damage to brain structures or a bleed, which can be lethal if untreated. However, there is no objective test, like drawing blood or saliva, that can determine if a patient has a concussion, and a concussion will not show up on any scan.

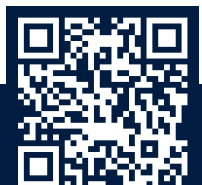
A doctor makes a concussion diagnosis based on the results of a comprehensive examination, which includes observing signs of concussion and patient's reporting symptoms of concussion appearing after an impact to the head or body.



While concussions are usually not life-threatening, it is essential to take them seriously. Ignoring the signs and symptoms of a concussion or failing to seek appropriate treatment can lead to a more serious brain injury, which may result in long-term consequences.



Concussions don't always have obvious signs, which can make them hard to recognize. It's important to seek medical attention if one is suspected, even if symptoms seem mild.



Concussion

Signs & Symptoms

Concussion signs and symptoms are the brain's way of showing it is injured and not functioning normally. Signs are what someone could observe to determine if you have a concussion, ranging from obvious to more nuanced. However, even one sign after a hit to the head should be reported to a medical professional.

Symptoms are what someone who is concussed will tell you they are experiencing, though a child may not be able to clearly communicate them due to age-limited vocabulary and the injury itself. Most symptoms fall into four categories: physical, cognitive, sleep, and emotional.

A brain injury can cause changes in behaviour or personality, and while these aren't diagnostic, it's normal for someone to seem "different" or "off." Every concussion is unique, and symptoms may not appear immediately. Because symptoms aren't always visible, coaches, parents, teachers, and caregivers should be aware of the signs and seek medical attention when needed.

Signs of a concussion

- Balance problems
- A glazed look in the eyes
- Amnesia
- Delayed response to questions
- Forgetting an instruction, confusion about an assignment or position, or confusion about the game, score, or opponent
- Inappropriate crying
- Inappropriate laughter
- Vomiting
- Loss of consciousness



Physical

- Headache
- Light-headedness
- Dizziness
- Nausea
- Sensitivity to light and/or noise
- Ringing in the ears (tinnitus)
- Blurred or double vision
- Loss of coordination or balance



Cognitive

- Difficulty with attention
- Memory problems
- Loss of focus
- Difficulty multitasking
- Difficulty completing mental tasks



Emotional

- Anxiety/panic attacks
- Depression
- Anger/aggression



Sleep

- Sleeping more than usual
- Sleeping less than usual
- Having trouble falling asleep



Concussion danger signs

CLF follows CDC guidance on concussion danger signs. According to the CDC, in rare cases, a dangerous collection of blood (hematoma) may form on the brain after a bump, blow, or jolt to the head or body that may squeeze the brain against the skull. Call 911 right away, or take the patient to the emergency department if they have one or more of the following danger signs after a bump, blow, or jolt to the head or body.

Canada

Dangerous Signs and Symptoms of a Concussion

- One pupil larger than the other
- Drowsiness or inability to wake up
- A headache that gets worse and does not go away
- Slurred speech, weakness, numbness, or decreased coordination
- Repeated vomiting or nausea, convulsions or seizures (shaking or twitching)
- Unusual behaviour, increased confusion, restlessness, or agitation
- Loss of consciousness (passed out/knocked out); even a brief loss of consciousness should be taken seriously

Concussions: A common injury

A variety of factors, such as accidents, abuse, exposure to blasts, and falls can cause concussions. Depending on the circumstances, these injuries can affect people of all ages, from young children to older adults.

Recent research suggests **1.6% of Canadians aged 12 or older reported sustaining one or more concussions** in 2019, equating to approximately 400,000 concussions annually. Though this likely underrepresents the true number, as only a fraction are recognized and treated by medical professionals. Studies suggest 50% to 90% of sports concussions go unreported.

Youth are especially vulnerable to concussions. Findings from the **2018 Health Behaviour of School-aged Children (HBSC) Study** demonstrated that 11% of students in grade 6 to 10 reported having a diagnosed concussion.

Acquired brain injuries and severe TBIs (i.e. massive structural damage requiring intensive care) are just out of the scope of our focus here at CLF and the CLF HelpLine.

We routinely refer out to organizations that deal with more severe brain injuries or have resources for disability services.



How to respond when you suspect a concussion

When someone experiences a blow to the head or body and is exhibiting signs of a concussion, it's important to respond quickly and appropriately.

When a concussion is suspected, the recommended course of action is to remove the individual from play or activity immediately and monitor them for signs and symptoms of a concussion. This includes keeping a close eye on the Concussion Danger Signs listed above.

If the individual is showing any of these danger signs, such as repeated vomiting or loss of consciousness, it's important to seek medical attention immediately. Ignoring these signs can have serious and potentially life-threatening consequences.

For a more comprehensive guide how to respond to a concussion, including specific guidelines for different age groups and scenarios, visit our [Concussion Response](#) page.



What you should know about Post-Concussion Syndrome during recovery

When recovering from a concussion, brain cells must restore normal function by rebalancing chemicals like sodium and calcium, a process that requires significant energy. This makes it critical to prioritize sleep, nutrition, and rest in the first 24–48 hours, while minimizing physical and mental exertion to support healing.

When properly managed, most concussion symptoms resolve within one month; however, over-exertion during recovery can lead to symptoms lasting months or longer. Approximately 20% of patients experience persistent post-concussion symptoms (PPCS), previously known as Post-Concussion Syndrome (PCS).

To improve recovery and minimize the risk of developing PPCS, after a minimum of 48 hours of rest, studies show that subthreshold aerobic activity initiated under a doctor's guidance 2-10 days after concussion reduces the [chances of PPCS](#). In addition, athletes should follow a [six-step plan](#) that takes a minimum of a week before returning to play.

For additional resources, reach out to the [CLF HelpLine](#).

To help individuals dealing with PPCS, our [Resource Centre](#) provides valuable information, coping advice, and treatment options. Explore our comprehensive resources to deepen your understanding and find the support you need.



Understanding the dangers of Second Impact Syndrome

Second Impact Syndrome (SIS) is a severe and potentially fatal condition that can occur when an individual suffers a head impact before fully recovering from a concussion. This dangerous situation, although extremely rare, can occur when the brain has not fully healed from the initial injury, leaving it more vulnerable to subsequent impacts.



Rowan Stringer, a 17-year-old Canadian high school rugby player, tragically lost her life to SIS in 2013. Her death prompted the creation of

Rowan's Law is the first concussion legislation in Canada, which aims to raise awareness and improve safety protocols for managing concussions in youth sports.

Educating parents and athletes about the potential complications, symptoms, and expected recovery time of a concussion is crucial. This includes discussing the risks of returning to play too soon, such as prolonged concussion recovery, persistent symptoms, and the possibility of Second Impact Syndrome.

Concussions and traumatic brain injuries are preventable

The good news is that we can stop many concussions before they happen.

There are many opportunities to reduce concussions through smart policy decisions. Research has shown that more than half of all head impacts and concussions in football occur during practice. In middle school soccer players, there are 100,000 concussions caused by heading every three years.

The Concussion Legacy Foundation Canada has led the movement to reduce unnecessary hits to the head in youth contact and collision sports. There is still a lot of work to do to make sports safer for all athletes, and the Concussion Legacy Foundation Canada will continue to be at the forefront of research and education.

Head to our [Stop Hitting Kids in the Head](#) page to learn more about our efforts on that front.

