



# PHYSICAL ACTIVITY AND SPORT-RELATED **CONCUSSION**

## **CONCUSSION DEFINITION**

A concussion is a brain injury that occurs when the brain makes contact with the inside of the skull causing changes in how the brain cells function. This injury leads to symptoms that can be physical (e.g. headache, dizziness), cognitive (e.g. memory problems, decreased concentration), or emotional (e.g. feeling depressed). The brain injury cannot be seen on X-rays or CT scans. A concussion can occur even if there has been no loss of consciousness; in fact most concussions occur without a loss of consciousness. A concussion can occur from a direct blow to the head but may also occur from a major physical trauma to other parts of the body (e.g. a sideways check to the body that causes a whiplash effect on the head and neck).<sup>1</sup>

## **SECOND IMPACT SYNDROME**

Recent research indicates that “second impact syndrome” may occur when a participant is concussed and suffers a second concussion while he/she still has symptoms from the previous concussion. The second injury may initially appear to be very minor, but can progress to serious consequences and can be fatal. It is therefore essential to appropriately identify, track and manage all concussions.<sup>2</sup>

## **CONCUSSION IDENTIFICATIONS – COMMON SIGNS AND SYMPTOMS:**

A participant may be reluctant to report symptoms of concussion because of a fear that they will be removed from the physical activity, that it may jeopardize their status on a team or in a game, or that it will impact their academics. However, it is important to consider the permanent repercussions of a concussion. If concussions are not identified and properly managed they can result in permanent brain damage and even death.

A participant may experience many different signs and symptoms. A symptom is something the participant will feel, whereas a sign is something that will be observed by a parent/guardian, Program Leader, coach, supervisor, teacher, friend, etc. Signs and symptoms of concussion can appear right after the injury, or may appear later. No concussion is the same and so the signs and symptoms may be a little different for everyone.

1. Adapted from ThinkFirst Position Statement on Concussion.

2. Adapted from “Identification and management of children with sport-related concussion”, Paediatrics & Child Health 2006; 11(7):420-428.



CONCUSSION SHOULD BE SUSPECTED IN THE PRESENCE OF ANY ONE OR MORE OF THE FOLLOWING SYMPTOMS AND SIGNS:

### SIGNS OBSERVED

#### Physical

- ▶ Vomiting
- ▶ Slurred speech
- ▶ Slowed reaction time
- ▶ Poor coordination or balance
- ▶ Blank stare/glassy eyed
- ▶ Decreased playing ability
- ▶ Loss of consciousness

#### Cognitive

- ▶ Difficulty concentrating
- ▶ Easily distracted
- ▶ General confusion
- ▶ Cannot remember things that happened before and after the injury
- ▶ Does not know time, date, place, type of activity in which he/she was participating
- ▶ Slow to answer questions or follow directions

#### Emotional

- ▶ Strange or inappropriate emotions (e.g. laughing, crying, getting mad easily)

#### Sleep

- ▶ Drowsiness

### SYMPTOMS REPORTED

#### Physical

- ▶ Headache
- ▶ Neck pain
- ▶ Feeling off or not right
- ▶ Ringing in the ears
- ▶ Seeing double or blurry/loss of vision
- ▶ Seeing stars, flashing lights
- ▶ Pain at physical site of injury
- ▶ Nausea/stomach ache/pain
- ▶ Balance problems or dizziness
- ▶ Fatigue or feeling tired
- ▶ Sensitivity to light or noise

#### Cognitive

- ▶ Having difficulty concentrating or remembering
- ▶ Feeling slowed down, fatigue or low energy
- ▶ Feeling dazed or in a fog

#### Emotional

- ▶ Irritable, sad, more emotional than usual
- ▶ Nervous, anxious, depressed

#### Sleep

- ▶ Drowsiness
- ▶ Sleeps more/less than usual
- ▶ Has trouble falling asleep

**NOTE:** ALL PARTICIPANTS NEED TO CONSULT A PHYSICIAN AFTER A SUSPECTED CONCUSSION.

Participants (under the age of 10), those with special needs or participants for whom English/French is not their first language, will have the same signs and symptoms of a concussion as listed above, but it may be more difficult for them to communicate how they are feeling. The signs of a concussion for younger participants (under the age of 10) may not be as obvious as older participants.

### MANAGEMENT PROCEDURES FOR A SUSPECTED CONCUSSION

#### 1. INITIAL RESPONSE

##### A. UNCONSCIOUS PARTICIPANT:

For a participant who is unconscious or there is/was a loss of consciousness, concussion should be assumed and medical attention must be sought:

PG 2



- ▶ Initiate Emergency Action Plan and call 911.
- ▶ Assume there is a possible neck injury and, only if the Program Leader has been trained, immobilize the participant before the arrival of the ambulance attendants and subsequent transportation to hospital.
- ▶ Do not remove athletic equipment (e.g. helmet) unless there is difficulty breathing.
- ▶ If the participant regains consciousness, encourage him/her to remain calm and to lie still. Do not administer medication.
- ▶ Even if the participant regains consciousness, he/she must be taken to the hospital for examination.

OR

#### B. CONSCIOUS PARTICIPANT:

If there is no loss of consciousness, but a concussion is suspected due to a direct blow to the head or a major physical trauma to other parts of the body (causing a whiplash effect to the head and neck):

- ▶ Remove the participant from the current activity or game immediately.
- ▶ Conduct an initial assessment of the participant (i.e. check signs and symptoms).
- ▶ Do not leave the participant alone. Continue to monitor signs and symptoms.
- ▶ Do not administer medication.
- ▶ Do not allow the participant to return to play in the activity, game or practice that day even if the participant states that he/she is feeling better. (If in doubt, sit them out).
- ▶ The participant must not leave the premises without parent/guardian (or emergency contact) supervision.

#### 2. ALL PARTICIPANTS WITH A SUSPECTED CONCUSSION, EVEN IF THERE WAS NO LOSS OF CONSCIOUSNESS, NEED TO BE EVALUATED BY A PHYSICIAN AS SOON AS POSSIBLE.

#### 3. PARENTS/GUARDIANS MUST BE INFORMED OF:

- ▶ the injury;
- ▶ the importance of monitoring their child during the initial hours following a suspected concussion;
- ▶ the importance of the head injury being evaluated by a physician as soon as reasonably possible.

4. Provide parents/guardians with a return to participation form (refer to the [www.thinkfirst.ca](http://www.thinkfirst.ca) website).

5. Following a medical examination, the participant must be monitored by a responsible adult for the next 24-48 hours for signs of deterioration. If any signs of deterioration occur, the participant needs to be immediately re-evaluated by a physician.

#### WHEN CAN A PARTICIPANT WITH A CONCUSSION RETURN TO PHYSICAL ACTIVITY?

##### PHYSICIAN VISIT #1

If **NO CONCUSSION** is determined by a doctor:

Using a return to participation form (refer to the [www.thinkfirst.ca](http://www.thinkfirst.ca) website):

- ▶ Doctor checks the box "No Concussion – participant may return to:" and the other appropriate activity boxes, and signs and dates the form.
- ▶ This form must be returned to the Program Supervisor who will inform all relevant personnel (i.e. Program Leaders) that the participant can participate in all physical activities with no restrictions.

If **CONCUSSION** is determined by a doctor:



Using a return to participation form (refer to the [www.thinkfirst.ca](http://www.thinkfirst.ca) website):

- ▶ Doctor checks the box “Concussion – no physical activity until symptoms and signs have gone”, and signs and dates the form.
- ▶ The participant/parent/guardian must return this form to the Program Supervisor who will inform all relevant personnel (i.e. Program Leaders) that the participant is NOT to participate in physical activities until further notice.

#### HOW LONG DOES IT TAKE TO GET BETTER?

The signs and symptoms of a concussion often last for 7 – 10 days, but may last much longer. The exact length of this period is unclear, but the brain temporarily does not function normally, and, during this time, it is more vulnerable to a second brain injury. In some cases, participants may take many weeks or months to heal. Significant cognitive symptoms may result from concussion, including; poor attention and concentration, reduced speed of information-processing and impaired memory and learning.

Return-to-physical activity following a concussion must only occur after medical clearance (in writing) by a physician stating that the participant is free of all signs and symptoms (refer to the [www.thinkfirst.ca](http://www.thinkfirst.ca) website).

#### CONCUSSIONS - MINIMIZING THE RISK:

Any time a participant is involved in physical activity, there is a chance of sustaining a concussion.

Program Leaders hold responsibility to minimize the risk of concussion. Following these procedures can help to minimize the risk of concussions:

- ▶ Teach the correct activity techniques in proper progression.
- ▶ Enforce the rules of the activity.
- ▶ Emphasize that there is NO intentional body contact for all activities.
- ▶ Do not allow a participant suspected of a concussion to participate in any physical activities.
- ▶ Do not allow a participant suspected of a concussion to be alone.
- ▶ Stress the importance of a suspected concussion being evaluated by a medical doctor and not permitting the participant to participate in activities until written clearance has been received from a physician.
- ▶ Check that protective equipment is approved by a recognized Equipment Standards Association (e.g. CSA, NOCSAE), is visually inspected prior to the activity, and well maintained.
- ▶ Instruct participants absent from previously taught safety skills prior to the next activity session.
- ▶ Document safety lessons (e.g. date, time, brief content, participant attendance).
- ▶ Learn as much as possible about concussion. Many resources are available at [www.thinkfirst.ca](http://www.thinkfirst.ca) including videos and concussion cards.

Program Leaders are to meet with participants to go over the following concussion information:

- ▶ Definition and causes of a concussion.
- ▶ Signs and symptoms.
- ▶ Dangers of participating in an activity while experiencing signs and symptoms of a concussion.
- ▶ The importance of immediately informing the Program Leader of any signs or symptoms of a concussion and removing themselves from the activity.
- ▶ The risks of sustaining a concussion associated with the activity and how to minimize those risks.
- ▶ The importance of wearing protective equipment (e.g. a helmet) that is properly fitted (e.g. with chin strap done up)



according to the one finger rule [only one finger should fit between the strap and chin]).

- ▶ Where helmets are worn, inform participants that there is no such thing as a concussion proof helmet. Helmets were designed to prevent skull fractures and injuries to the head. Although wearing a helmet reduces the risk of a brain injury it does not protect you from a concussion.
- ▶ The importance of respecting the rules of the activity (e.g. no body contact).

#### CONCUSSION RESOURCES:

A participant's safe return to physical activity after a concussion is enabled when the participant and the parents/guardians are familiar with the signs, symptoms and treatment. Summaries (appropriate hand-outs) of this information are available on the ThinkFirst Canada website:

- ▶ Parent/Guardian Information: <http://www.thinkfirst.ca/downloads/concussion/concussion-parent.pdf>
- ▶ Athlete Information: <http://www.thinkfirst.ca/downloads/concussion/concussion-information-athletes.pdf>
- ▶ General Information: <http://www.thinkfirst.ca/downloads/concussion/Concussion%20Handout%20for%20Families%20and%20Caregivers.pdf>

An excellent video "Concussions 101, a Primer for Kids and Parents" by Dr. Mike Evans is available on YouTube.