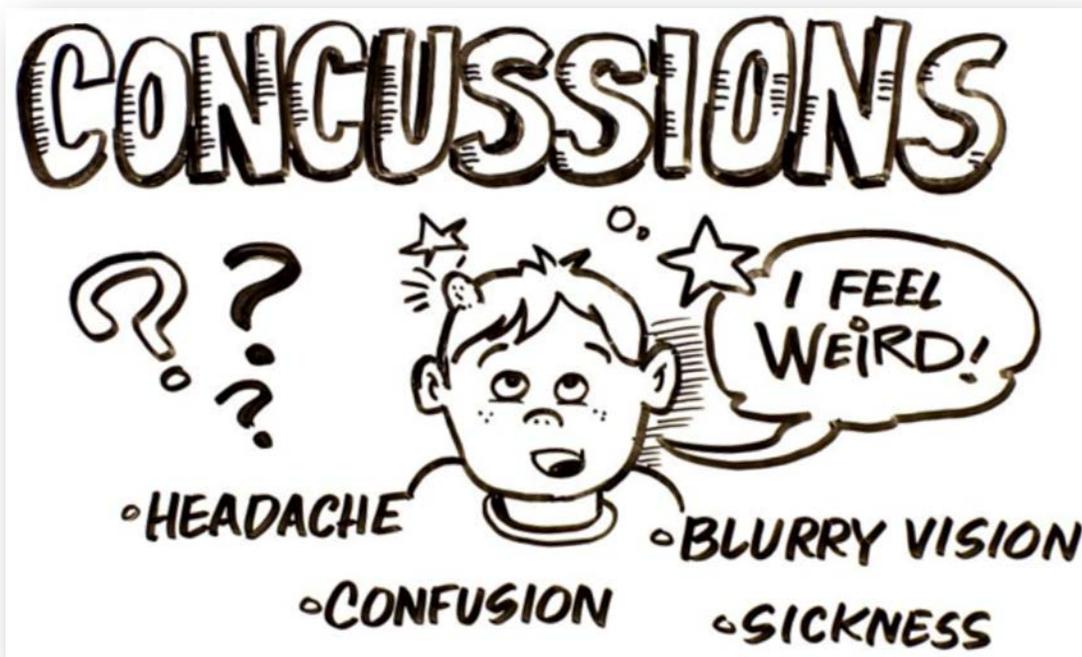


Guidelines for Diagnosing and Managing Pediatric Concussion

First edition, June 2014

Recommendations for Parents and/or Caregivers



Ontario Neurotrauma Foundation
Fondation ontarienne de neurotraumatologie

This document is intended to guide health care professionals in diagnosing and managing pediatric—not adult—concussion. It is not for self-diagnosis or treatment. Parents and/or caregivers may bring it to the attention of their child/adolescent’s health care professionals.

The best knowledge available at the time of publication has informed the recommendations in this document. However, health care professionals should also use their own judgment, the preferences of their patients, and factors such as the availability of resources in their decisions.

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About the Ontario Neurotrauma Foundation

The Ontario Neurotrauma Foundation (ONF) is a health research organization that focuses on the practical application of research to improve the lives of people with an acquired brain injury or spinal cord injury, and the prevention of neurotrauma injuries. Through strategic research funding activity and the building of relationships with numerous partners and stakeholders, the ONF fosters, gathers and applies research knowledge to increase the effectiveness and use of prevention, and to improve the systems of care, outcomes, and quality of life of those who have sustained a neurotrauma injury. The Foundation receives its funding from the Government of Ontario.



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Recommendations for Parents and/or Caregivers

In Advance (before the first activity)

Number		Evidence
<u>0.1</u>	Learn to recognize the symptoms of concussion.	B
<u>0.4</u>	Consider baseline neuro-cognitive testing if the child/adolescent plays high-risk sports—not as a general rule.	B

On Injury (if I suspect the child/adolescent has a concussion)

Number		Evidence
<u>1.1</u>	Remove the child/adolescent from play immediately if you suspect a concussion.	B
<u>1.2</u>	Assess the child/adolescent for symptoms related to concussion.	B
<u>1.3</u>	Watch for possible symptoms of concussion to evolve.	B
<u>1.4</u>	Take a child/adolescent who shows symptoms of concussion to a health care professional.	B

On Discharge from Acute Care (what do we do at home?)

Number		Evidence
<u>3.1j</u>	Follow the written and verbal information your health care professional gives you.	B/C
<u>4.2</u>	Develop a return-to-learn program after acute symptoms have improved.	B/C

On Re-assessment After One Month (what do we do next if the child/adolescent still has symptoms?)

Number		Evidence
<u>5.8</u>	Work with the child/adolescent’s primary care professional, school and/or employer regarding accommodations needed to tasks or schedules.	B

List of Tools

Recommendations by Timeline

In Advance (before the first activity)

O.1: Learn to recognize the symptoms of concussion.

When: Before the child/adolescent engages in any physical activity.

Who: Anyone observing and caring for children/adolescents.

- Example: teachers, coaches, parents, peers.

How: Bring the following tools to sports sessions (practice or match), events and activities.

- [Tool 0.1](#): Pocket Concussion Recognition Tool for children, adolescents and adults.
- [Tool 0.3](#): Parachute Concussion Guidelines for Parents & Caregivers.

Why: So that you are ready and able to provide the best immediate support and appropriate action to any child, in case it is needed.

Level of evidence: B.

O.4: Consider baseline neuro-cognitive testing if the child/adolescent plays high-risk sports—not as a general rule.

When: Before the child/adolescent plays a practice or match.

Who:

- Parents and/or caregivers.
- Health care professionals.
 - Example: family physicians, pediatricians, nurse-practitioners.
- School boards, community sports organizations/centres.

How: Contact a health care professional for referral to a qualified professional for a neuro-cognitive assessment.

Why:

- To provide baseline information on children/adolescents who play high-risk sports in case they sustain a concussion.
- To assist with return-to-play decisions.

Level of evidence: B.

On Injury (if I suspect the child/adolescent has a concussion)

1.1: Remove the child/adolescent from play immediately if you suspect a concussion.

When: On injury, on site.

Who: Anyone observing and caring for children/adolescents.

- Example: teachers, coaches, parents, peers, health care professionals.

How: Do not let the child/adolescent return to play or practice that day. “If in doubt, sit them out.”

- [Recommendation 0.1](#): Learn to recognize symptoms of concussion.
- Use the evidence in the following tools written by experts.
 - Teachers, coaches, parents, peers and others
 - [Tool 0.1](#): Pocket Concussion Recognition Tool for children, adolescents and adults.
 - [Tool 0.3](#): Parachute Concussion Guidelines for Parents & Caregivers.

Why:

- To assess the child/adolescent as soon as possible.
- To avoid another blow that would:
 - complicate the injury further;
 - have a longer recovery time due to the higher risk of persistent symptoms;
 - potentially put the child/adolescent’s life at risk (second impact syndrome).

Level of evidence: B (ages 13+).

1.2: Assess the child/adolescent for symptoms related to concussion.

When: On injury, on site if possible.

Who: Onsite health care professional and/or responsible adult.

- Example: Team physician, coach, trainer.

How:

- Assess the injury (responsible adult).
 - [Tool 0.1](#): Pocket Concussion Recognition Tool for children, adolescents and adults
- Do not leave the child/adolescent alone.

Why:

- Monitoring will help detect any worsening conditions and promote recovery.
- Symptoms may only appear several hours after a concussion.
- Concussion is an evolving injury; symptoms may change over time.

Level of evidence: B (ages 13+).

1.3: Watch for possible symptoms of concussion to evolve.

When: For (1-2 days) after injury.

Chapter: Recommendations—On Injury
Guidelines for Diagnosing and Managing Pediatric Concussion

Who: Anyone observing and caring for children/adolescents.

- Example: teachers, coaches, parents, peers.

How: Monitor for symptoms or changes in behaviour.

- [Tool 0.1](#): Pocket Concussion Recognition Tool for children, adolescents and adults.

Why:

- Symptoms may only appear several hours after a concussion.
- Concussion is an evolving injury; symptoms may change over time.
- Awareness of the signs and symptoms that could indicate a concussion or more serious brain injury will help ensure that the child/adolescent receives the necessary diagnosis and treatment to promote recovery.

Level of evidence: B.

1.4: Take a child/adolescent who shows symptoms of concussion to a health care professional.

When: On injury or as soon as possible after symptoms appear.

Who: Anyone observing and caring for children/adolescents.

- Example: Teachers, coaches, parents, peers.

How:

- Take the child/adolescent to a family physician, primary care sport medicine physician, nurse practitioner or to the nearest Emergency Department.
- Arrange an ambulance service for children/adolescents with any of the “red flag” symptoms in the following tool:
 - [Tool 0.1](#): Pocket Concussion Recognition Tool for children, adolescents and adults.

Why: To confirm the diagnosis of concussion, and to rule out other potentially serious injuries that may require medical intervention.

Level of evidence: B.

On Discharge from Acute Care (what do we do at home?)

3.1j: Follow the written and verbal information your health care professional gives you.

When: On discharge, interim evaluation, on re-evaluation.

Who: Parents and/or caregivers.

How:

- Make sure the health care professional gives you information and tools on the following, as needed:
 - Return to school/play/activity;
 - Variable recovery rate and timeline;
 - Second impact syndrome;
 - Sleep hygiene;
 - Headaches;
 - Fatigue;
 - Alcohol, recreational drugs and driving;
 - Social networks;
 - Daily informal monitoring of symptoms;
 - Follow-ups.
- Use the following tools and instructions:
 - Make sure the child/adolescent gets physical and cognitive rest.
 - Watch for possible symptoms of concussion to evolve. ([Recommendation 1.3](#)).
 - Make sure your child/adolescent attends follow-up appointments.
 - [Recommendation 4.2](#): Develop a return-to-learn program after acute symptoms have improved.

Why: To monitor progress and promote recovery.

Level of evidence: B for need for rest; C for ideal duration of rest.

On Interim Assessment (when can the child/adolescent return to learn/play?) and On Return to School (what do we monitor in the longer term?)

4.2: Develop a return-to-learn program after acute symptoms have improved.

When: On interim evaluation, on re-evaluation.

Who:

- Health care professionals.
 - Example: Family physicians, pediatricians, nurse-practitioners, occupational and physical therapists, neuropsychologists.
- Qualified school-based professionals.
 - Example: teachers.
- Parents and/or caregivers.

How:

- Create a schedule (health care professionals, schools, and parents and/or caregivers together) to gradually reintroduce cognitive activities mixed with rest periods. Examples of activities include family engagement (lunch or dinner with family), general home activities (making a sandwich, walking the dog), 10-15 minutes of texting, 30 minutes TV show, 20 minutes of homework.
- Check to see if symptoms get worse when activity increases.
- Note that there is evidence stating the need for physical and cognitive rest, but no clear answer as to the ideal duration. Extreme prolonged rest may delay recovery. Therefore, we offer tools for two approaches. Tools followed by “a” reflect a standard approach, those followed by “b” reflect a more conservative approach. Use clinical judgment (health care professionals).
 - [Tool 0.5a](#): ACE Post-Concussion Gradual Return to School.
 - [Tool 0.5b](#): CanChild Return to School Guidelines for Children and Youth.
 - [Tool 4.3](#): Academic Accommodations for Concussed Students.
 - [Tool 4.2](#): Template Letter of Accommodation from School to Parents/Caregivers.
 - [Tool 4.4](#): Returning to School-based Activities After Concussion Care Plan.
- Prioritize return-to-learn before return-to-work. For older teens who work, refer to the “*Guidelines for Concussion/ Mild Traumatic Brain Injury and Persistent Symptoms Second Edition For Adults (18+ years of age)*.”
 - http://onf.org/system/attachments/201/original/ONF_mTBI_Guidelines_2nd_Edition_MODULE_12.pdf.

Why:

- Parents and/or caregivers need to know that most patients recover fully from concussion even though the recovery rate is variable and unpredictable.

Chapter: **Recommendations—On Interim Evaluation**

Guidelines for Diagnosing and Managing Pediatric Concussion

- The key to the initial management of concussion is physical and cognitive rest, which allow symptoms to resolve.

Level of evidence: B for need for rest; C for ideal duration of rest.

On Re-assessment After One Month (what do we do next if the child/adolescent still has symptoms?)

5.8: Work with the child/adolescent's primary care professional, school and/or employer regarding accommodations needed to tasks or schedules.

When: At home, in between evaluations.

Who:

- Parents and/or caregivers.
- Health care professionals.
 - Example: Family physicians, pediatricians, nurse-practitioners, occupational and physical therapists, neuropsychologists.
- Qualified school-based professionals.
 - Example: teachers, coaches.

How:

- Discuss additional assessment and accommodations if symptoms fail to improve and managing cognitive impairments with your primary care professional.
- Use the following tools, as appropriate.
 - [Tool 4.2](#): Template Letter of Accommodation from School to Parents/Caregivers.
 - [Tool 4.3](#): Academic Accommodations for Concussed Students.
 - [Tool 4.4](#): Returning to School-based Activities After Concussion Care Plan.
 - [Tool 4.5](#): Return-to-school Information and Strategies.

Why: To promote recovery and avoid the development of persistent symptoms.

Level of evidence: B.

List of Tools

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Tool 01: Pocket Concussion Recognition Tool for children, adolescents and adults

Guidelines for Diagnosing and Managing Pediatric Concussion

Tool 0.1: Pocket Concussion Recognition Tool for children, adolescents and adults

Pocket CONCUSSION RECOGNITION TOOL™

To help identify concussion in children, youth and adults

RECOGNIZE & REMOVE

Concussion should be suspected **if one or more** of the following visible clues, signs, symptoms or errors in memory questions are present.

1. Visible clues of suspected concussion

Any one or more of the following visual clues can indicate a possible concussion:

- Loss of consciousness or responsiveness
- Lying motionless on ground/Slow to get up
- Unsteady on feet / Balance problems or falling over/Incoordination
- Grabbing/Clutching of head
- Dazed, blank or vacant look
- Confused/Not aware of plays or events

2. Signs and symptoms of suspected concussion

Presence of any one or more of the following signs & symptoms may suggest a concussion:

<ul style="list-style-type: none"> - Loss of consciousness - Seizure or convulsion - Balance problems - Nausea or vomiting - Drowsiness - More emotional - Irritability - Sadness - Fatigue or low energy - Nervous or anxious - "Don't feel right" - Difficulty remembering 	<ul style="list-style-type: none"> - Headache - Dizziness - Confusion - Feeling slowed down - "Pressure in head" - Blurred vision - Sensitivity to light - Amnesia - Feeling like "in a fog" - Neck Pain - Sensitivity to noise - Difficulty concentrating
--	--

3. Memory function

Failure to answer any of these questions correctly may suggest a concussion.

"What venue are we at today?"

"Which half is it now?"

"Who scored last in this game?"

"What team did you play last week/game?"

"Did your team win the last game?"

Any athlete with a suspected concussion should be IMMEDIATELY REMOVED FROM PLAY, and should not be returned to activity until they are assessed medically. Athletes with a suspected concussion should not be left alone and should not drive a motor vehicle.

It is recommended that, in all cases of suspected concussion, the player is referred to a medical professional for diagnosis and guidance as well as return to play decisions, even if the symptoms resolve.

RED FLAGS

If ANY of the following are reported then the player should be safely and immediately removed from the field. If no qualified medical professional is available, consider transporting by ambulance for urgent medical assessment:

<ul style="list-style-type: none"> - Athlete complains of neck pain - Increasing confusion or irritability - Repeated vomiting - Seizure or convulsion - Weakness or tingling/burning in arms or legs 	<ul style="list-style-type: none"> - Deteriorating conscious state - Severe or increasing headache - Unusual behaviour change - Double vision
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Remember:

- In all cases, the basic principles of first aid (danger, response, airway, breathing, circulation) should be followed.
- Do not attempt to move the player (other than required for airway support) unless trained to do so
- Do not remove helmet (if present) unless trained to do so.

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Tool 0.3: Parachute Concussion Guidelines for Parents & Caregivers
Guidelines for Diagnosing and Managing Pediatric Concussion

Tool 0.3: Parachute Concussion Guidelines for Parents & Caregivers



WHAT IS A CONCUSSION?

A concussion is a brain injury that cannot be seen on routine x-rays, CT scans, or MRIs. It affects the way a child may think and remember things, and can cause a variety of symptoms.

WHAT ARE THE SYMPTOMS AND SIGNS OF CONCUSSION?

A CHILD DOES NOT NEED TO BE KNOCKED OUT (LOSE CONSCIOUSNESS) TO HAVE HAD A CONCUSSION.

THINKING PROBLEMS	CHILD'S COMPLAINTS	OTHER PROBLEMS
<ul style="list-style-type: none"> • Does not know time, date, place, period of game, opposing team, score of game • General confusion • Cannot remember things that happened before and after the injury • Knocked out 	<ul style="list-style-type: none"> • Headache • Dizziness • Feels dazed • Feels "dinged" or stunned; "having my bell rung" • Sees stars, flashing lights • Ringing in the ears • Sleepiness • Loss of vision • Sees double or blurry • Stomachache, stomach pain, nausea 	<ul style="list-style-type: none"> • Poor coordination or balance • Blank stare/glassy eyed • Vomiting • Slurred speech • Slow to answer questions or follow directions • Easily distracted • Poor concentration • Strange or inappropriate emotions (ie. laughing, crying, getting mad easily) • Not playing as well

WHAT CAUSES A CONCUSSION?

Any blow to the head, face or neck, or a blow to the body which causes a sudden jarring of the head may cause a concussion (ie. a ball to the head, being checked into the boards in hockey).

WHAT SHOULD YOU DO IF YOUR CHILD GETS A CONCUSSION?

Your child should stop playing the sport right away. They should not be left alone and should be seen by a doctor as soon as possible that day. If your child is knocked out, call an ambulance to take him/her to the hospital immediately. Do not move your child or remove any equipment such as helmet, in case of a cervical spine injury. Wait for paramedics to arrive.


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 Parachute is bringing attention to preventable injury and helping Canadians reduce their risk of injury and enjoy long lives lived to the fullest.

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CONCUSSION GUIDELINES FOR PARENTS & CAREGIVERS



HOW LONG WILL IT TAKE FOR MY CHILD TO GET BETTER?

The signs and symptoms of a concussion often last for 7-10 days but may last much longer. In some cases, children may take many weeks or months to heal. Having had previous concussions may increase the chance that a person may take longer to heal.

HOW IS A CONCUSSION TREATED?

THE MOST IMPORTANT TREATMENT FOR A CONCUSSION IS REST.

The child should not exercise, go to school or do any activities that may make them worse, like riding a bike, play wrestling, reading, working on the computer or playing video games. If your child goes back to activities before they are completely better, they are more likely to get worse, and to have symptoms longer. Even though it is very hard for an active child to rest, this is the most important step.

Once your child is completely better at rest (all symptoms have resolved), they can start a step-wise increase in activities. It is important that your child is seen by a doctor before he/she begins the steps needed to return to activity, to make sure he/she is completely better. If possible, your child should be seen by a doctor with experience in treating concussions.

WHEN CAN MY CHILD RETURN TO SCHOOL?

Sometimes children who have a concussion may find it hard to concentrate in school and may get a worse headache or feel sick to their stomach if they are in school. Children should stay home from school if their symptoms get worse while they are in class. Once they feel better, they can try going back to school part time to start (eg. for half days initially) and if they are okay with that, then they can go back full time.

WHEN CAN MY CHILD RETURN TO SPORT?

It is very important that your child not go back to sports if he/she has any concussion symptoms or signs. Return to sport and activity must follow a step-wise approach:

STEP 1) No activity, complete rest. Once back to normal and cleared by a doctor, go to step 2.

STEP 2) Light exercise such as walking or stationary cycling, for 10-15 minutes.

STEP 3) Sport specific aerobic activity (ie. skating in hockey, running in soccer), for 20-30 minutes. **NO CONTACT.**

STEP 4) "On field" practice such as ball drills, shooting drills, and other activities with **NO CONTACT** (ie. no checking, no heading the ball, etc.).

STEP 5) "On field" practice with body contact, once cleared by a doctor.

STEP 6) Game play.

Note: **Each step must take a minimum of one day.** If your child has any symptoms of a concussion (e.g. headache, feeling sick to his/her stomach) that come back either during activity, or later that day, your child should stop the activity immediately and rest until symptoms resolve, for a minimum of 24 hours. Your child should be seen by a doctor and cleared again before starting the step wise protocol again.

When should I take my child to the doctor?

Every child who gets a head injury should be seen by a doctor as soon as possible. Your child should go back to the doctor **IMMEDIATELY** if, after being told he/she has a concussion, he/she has worsening of symptoms such as:

1. being more confused
2. headache that is getting worse
3. vomiting more than twice
4. strange behaviour
5. not waking up
6. having any trouble walking
7. having a seizure

Problems caused by a head injury can get worse later that day or night. The child should not be left alone and should be checked throughout the night. If you have any concerns about the child's breathing or how they are sleeping, wake them up. Otherwise, let them sleep. If they seem to be getting worse, you should see your doctor immediately. **NO CHILD SHOULD GO BACK TO SPORT UNTIL THEY HAVE BEEN CLEARED TO DO SO BY A DOCTOR.**

Tool 0.5a: ACE Post-Concussion Gradual Return to School
Guidelines for Diagnosing and Managing Pediatric Concussion

Tool 0.5a: ACE Post-Concussion Gradual Return to School



ACE Post-Concussion Gradual Return to School



Stage	Description	Activity Level	Criteria to Move to Next Stage	Date Criteria Met
0	No return, at home	Day 1 - Maintain low level cognitive and physical activity. No prolonged concentration. Cognitive Readiness Challenge: As symptoms improve, try reading or math challenge task for 10-30 minutes; assess for symptom increase.	To Move To Stage 1: (1) Student can sustain concentration for 30 minutes before significant symptom exacerbation, AND (2) Symptoms reduce or disappear with cognitive rest breaks* allowing return to activity.	
1	Return to School, Partial Day (1-3 hours)	Attend 1-3 classes, intersperse rest breaks. No tests or homework. Minimal expectations for productivity.	To Move To Stage 2: Symptom status improving, tolerates 4-5 hours of activity; 2-3 cognitive rest breaks built into school day.	
2	Full Day, Maximal Supports (required throughout day)	Attend most classes, with 2-3 rest breaks (20-30'), no tests. Minimal HW ($\leq 60'$). Minimal-moderate expectations for productivity.	To Move To Stage 3: Symptom number & severity improving, needs 1-2 cognitive rest breaks built into school day.	
3	Return to Full Day, Moderate Supports (provided in response to symptoms during day)	Attend all classes with 1-2 rest breaks (20-30'); begin quizzes. Moderate HW (60-90') Moderate expectations for productivity. Design schedule for make-up work.	To Move To Stage 4: Continued symptom improvement, needs no more than 1 cognitive rest break per day	
4	Return to Full Day, Minimal Supports (Monitor final recovery)	Attend all classes with 0-1 rest breaks (20-30'); begin modified tests (breaks, extra time). HW (90+) Moderate- maximum expectations for productivity.	To Move To Stage 5: No active symptoms, no exertional effects across the full school day.	
5	Full Return, No Supports Needed	Full class schedule, no rest breaks. Max. expectations for productivity. Begin to address make-up work.	N/A	

*Cognitive rest break: a period during which the student refrains from academic or other cognitively demanding activities, including schoolwork, reading, TV/games, conversation. May involve a short nap or relaxation with eyes closed in a quiet setting.

G. Gioia (v1.2014)

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Tool 0.5b: CanChild Return to School Guidelines for Children and Youth
Guidelines for Diagnosing and Managing Pediatric Concussion

Tool 0.5b: CanChild Return to School Guidelines for Children and Youth

**CONCUSSION
MANAGEMENT**

**Return to School
Guidelines for
Children & Youth**

A concussion is a
brain injury and must
be taken seriously!

 **canChild**
Centre for Childhood Disability Research

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 **McMaster
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Tool 0.5b: CanChild Return to School Guidelines for Children and Youth
Guidelines for Diagnosing and Managing Pediatric Concussion

Return to School Guidelines

These stages are designed to strike a balance between the importance of returning to school and brain recovery. Work with your school to put these recommendations into place.

STAGE 1: Brain Rest - NO SCHOOL

- No school for at least one week
- Lots of cognitive rest (NO TV, video games, texting, reading)
- When symptom free, move to **STAGE 2**
"If symptoms persist past 2 weeks, move to STAGE 2"

STAGE 2: Getting Ready to Go Back

- Begin gentle activity guided by symptoms (walking, 15 minutes of screen time twice daily, begin reading).
- When symptom free, move to **STAGE 3**
"If symptoms persist, stay in this stage for a maximum of 2 weeks and discuss moving to STAGE 3 with your physician or brain injury clinician"

STAGE 3: Back to School/Modified Academics

- This stage may last for days or months depending on rate of recovery
- Go to bed early and get lots of sleep. Have a quiet retreat space in school
- Academic Modifications:
 - Timetable/attendance: Start by going for one hour, half days or every other day
 - Curriculum: Attend less stressful classes, no tests, homework in 15 minute blocks up to a maximum of 45 minutes daily
 - Environment: Preferential seating, **avoid** music class, gym class, cafeteria, taking the bus, carrying heavy books
 - Activities: Limit screen/TV time into 15 minute blocks for up to 1 hour daily
- When symptom free, move to **STAGE 4**
"If symptoms persist past 4 weeks → A recovery Individualized Education Plan (IEP) may be needed"

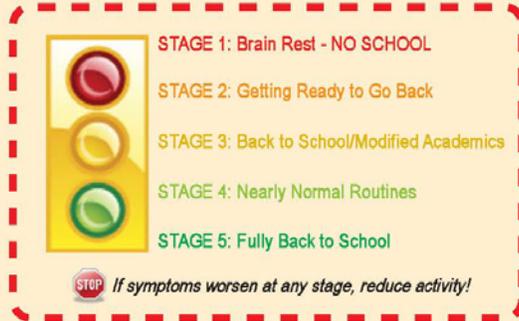
STAGE 4: Nearly Normal Routines

- Back to full days of school, but can do less than 5 days a week if needed
- Complete as much homework as possible and a maximum of 1 test per week
- When symptom free, move to **STAGE 5**

STAGE 5: Fully Back to School

- Gradual return to normal routines including attendance, homework, tests and extracurricular activities

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Important Notes

- **Anxiety** can be high after a brain injury. Many children worry about school failure and need reassurance about the temporary accommodations.
- **Depression** is common during recovery from a brain injury, especially when the child is unable to be active. This may make symptoms worse or prolong recovery.

Talk with the child about these issues and offer encouragement and support.

Also see the McMaster Return to Activity Guidelines

Concussion Facts

The biggest risk is going back to play before the brain heals and getting another concussion!

Higher risk of prolonged recovery with:

- Multiple concussions
- History of learning or behaviour problems
- History of migraines
- Symptoms of amnesia, foginess or dizziness

Percentage of children who are symptom free in:

- 15 days=25%
- 26 days=50%
- 45 days=75%
- 92 days=90%



**WHEN IN DOUBT
SIT THEM OUT**

**WHEN THEY'RE OKAY
RETURN TO PLAY**



For more information, please visit www.canchild.ca



CONCUSSION

A concussion, also known as a mild traumatic brain injury (MTBI), changes the way the brain functions. An MTBI can be caused by a direct or indirect hit, blow or force to the head or body.

SYMPTOMS OF CONCUSSION

- Sleep disturbances or drowsiness
- Headache
- Nausea and vomiting
- Poor balance or coordination
- Dizziness
- Visual problems
- Sensitivity to light or noise
- Mentally foggy
- Difficulty concentrating/ remembering
- Irritability
- Sadness
- Nervousness

Symptoms should be evaluated daily to show healing and recovery

RED FLAG SYMPTOMS

If any of the following symptoms develop, go to the emergency department/seek further investigation immediately.

- Increased drowsiness or cannot be awakened
- Headaches worsen or neck pain
- Persistent vomiting
- Pupils are unequal in size
- Seizures
- Confusion or short-term memory loss
- Blurred/double vision, slurred speech or loss of motor function
- Change in behaviour (irritability, agitation or aggression)

Tool 4.2: Template Letter of Accommodation from School to Parents/Caregivers

Guidelines for Diagnosing and Managing Pediatric Concussion

Tool 4.2: Template Letter of Accommodation from School to Parents/Caregivers

Dear (parents' names)

We are happy to hear that your child is feeling well enough to start to the return-to-learn process after his/her concussion. To make sure teachers and staff are prepared, we would like your insight on the following symptoms. Please check the answers that best fit your child.

Fatigue

My child tires easily has the normal amount of energy.

My child has the most energy in the morning afternoon evening.

Behaviour

My child is easily frustrated isn't easily frustrated.

My child has been acting the same different compared to before concussion.

Memory

My child's memory seems fine impaired.

Cognition

My child seems to be able to understand complex thoughts and ideas. Yes No

My child is able to read for less than ½ hour ½ to 1 hour more than 1 hour.

My child can handle different technologies (example: TV, computers). Yes No

My child can complete some homework. Yes No

Stamina

My child makes it through a day without a period of rest. Yes No

Social

My child is becoming isolated or has different friends than before the concussion. Yes No

My child can handle noisy/busy environments. Yes No

Awareness

My child feels like there is nothing wrong with him/her after the concussion. Yes No

My child understands that there have been changes and would like help. Yes No

Please elaborate on any other changes you've noticed in your child. We want to be ready to support your child's return-to-learn process and make accommodations to ensure success.

Sincerely,

(school contact person's name)

Telephone/email _____

Reproduced with permission from Vermont's Student Athletes and Concussion: Return to Learn and Return to Play Toolkit, www.biavt.org.

Tool 4.3: Academic Accommodations for Concussed Students

Guidelines for Diagnosing and Managing Pediatric Concussion

Tool 4.3: Academic Accommodations for Concussed Students

<i>Persistent Symptom</i>	<i>Effect of attending school</i>	<i>Accommodation</i>
Headache	Difficulty concentrating	Frequent breaks, quiet area, hydration
Fatigue	Decreased attention, concentration	Frequent breaks, shortened day, only certain classes
Photophobia/ phonophobia	Worsening symptoms (headache)	Sunglasses, ear plugs or headphones, avoid noisy areas (cafeterias, assemblies, sport events, music class), limit computer work
Anxiety	Decreased attention or concentration, overexertion to avoid falling behind	Reassurance and support from teachers about accommodations, reduced workload
Difficulty concentrating	Limited focus on school work	Shorter assignments, decreased workload, frequent breaks, having someone read aloud, more time to complete assignments and tests, quiet area to complete work
Difficulty remembering	Difficulty retaining new information, remembering instructions, accessing learned information	Written instructions, smaller amounts to learn, repetition

Adapted with permission from the author: Laura K Purcell; Canadian Paediatric Society, Healthy Active Living and Sports Medicine Committee. "Sport-related concussion: Evaluation and management". Paediatr Child Health 2014;19(3):153-8.

Tool 5.15: Post-concussion Symptom Inventory Self-assessment, ages 13-18

Guidelines for Diagnosing and Managing Pediatric Concussion

Tool 4.4: Returning to School-based Activities After Concussion Care Plan

Holland Bloorview

Kids Rehabilitation Hospital

Client Name: _____
Health Record No: _____
Date of Birth: _____

General Care Plan:

- Orange:** Preparing to return to school – gentle activity at home (e.g., light walking, begin reading, minimal screen time of 15 minutes twice per day etc.)
- Yellow:** Back to school with modified schedule – gradual progression of time spent at school (e.g., 1 hour of class time to start and progress to half day/every other day; attend less stressful classes etc.)
- Green:** Back to school with full schedule – attend all classes every day

Additional School Support Recommendations:

- Contact person at school who can be responsible for relaying information between student/student's family and teachers, and who can assist in scaling back/modifying school supports as needed
- Extra check-in meetings provided with teachers/guidance counselors in order to monitor progress and determine the need for more/less supports and modifications
- No homework
- Overall class work/homework load reduced with gradual resumption as per the student's ability to handle increased demands and extra time provided (homework and class work load be prioritized collaboratively between the student and school personnel)
- No testing
- Testing completed in a quiet, distraction free environment with extra time provided in order to allow for cognitive rest breaks; no more than one test per day
- Student not asked to do all missed work, and extra help given to get student caught back up
- Excused from class for 'rest breaks' in a quiet room to avoid physical and cognitive exertion and to manage increased symptoms (regularly scheduled and/or when symptoms increase)
- Preferential seating provided to allow for decreased distractions and closer teacher monitoring (e.g. closer to teacher/board, away from window, away from door, away from disruptive classmates etc.)
- Access to a model peer's or teacher's notes allowed and/or access to pre-printed class notes to help with planning and attention
- Avoid attending and participating in physical education and band/music activities (these classes can be used as rest breaks)
- Eat lunch in a quiet, distraction free area with 2-3 friends
- Avoid carrying heavy textbooks. To avoid extraneous physical exertion, have an extra copy of class textbooks in classes to limit need to carry books to and from school/classes

All recommended supports/accommodations are **to be used on an as needed basis and can be modified as per the student's ability to better handle the cognitive and physical demands of the school environment (improved post-concussion symptoms). Continued communication between the school, the student and the student's family is encouraged to best meet the needs of the student and to develop a plan for successful return to school-based activities.

Other comments: _____

Completed by: _____ Date: _____

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Tool 4.5: Return-to-school Information and Strategies

Guidelines for Diagnosing and Managing Pediatric Concussion

Tool 4.5: Return-to-school Information and Strategies

Holland Bloorview

Kids Rehabilitation Hospital

- Concussion (also known as mild traumatic brain injury) and related symptoms can result in difficulties returning to school for many students.
- Trying to complete school work and learn before the brain has recovered from a concussion “overuses” the brain at a time when it needs all its energy to recover. The brain needs proper rest to recover from a concussion.
- Limiting exertion (physical and mental) until post-concussive symptoms have resolved and then gradually increasing activity as tolerated (no symptoms reappear) is highly recommended.
- Most students will have difficulty with concentration, memory and processing speed – all can negatively affect how one learns and perform at school.
- When returning to school, modifications can be made in order to limit physical and mental exertion and allow the student to best return to full school activities and performance.

Common Post-concussive Symptoms

Physical	Thinking (Cognitive)	Behavioural or Emotional
<ul style="list-style-type: none"> • Headaches • Sick to stomach or vomiting • Dizziness or balance problems • Low energy or being run down • Trouble with vision/seeing • Bothered by light or noise • Sleeping problems 	<ul style="list-style-type: none"> • Slowed thinking • Trouble paying attention • Difficulty remembering • Acting like "in a fog" • Easily confused • School performance worsens 	<ul style="list-style-type: none"> • Irritability or grouchiness • Easily upset or frustrated • Nervousness • Sadness • Acting without thinking • Any other personality change

Modified from: http://www.thechildrenshospital.org/conditions/rehab/concussion/school_staff.aspx

What can be done to help with the return-to-school process?

Before returning to school

- The student should not return to school until post-concussive symptoms have cleared (e.g. headaches, nausea etc.) or they begin to tolerate extended periods of thinking and activity.
- Students should limit reading, using computers, playing video games and texting, if these activities worsen symptoms.
- Students should not exercise or take part in sports or gym class until a health care professional has evaluated and cleared them.
- Walking or taking the bus to school (avoid noise, busy environments and exercise)—have parents drive the student to school if possible.
- Once symptoms have cleared/improved, students can begin brief periods of reading or studying. If symptoms return, they should stop the activity and rest. They can return to school for gradually increasing periods of time when they can tolerate a couple of hours of thinking.

Tool 4.5: Return-to-school Information and Strategies

Guidelines for Diagnosing and Managing Pediatric Concussion

On returning to school

- It is important that the student has a contact person at the school who can relay information from the student, student’s family and the student’s health care team related to the student’s injury (e.g. severity, necessary accommodations etc.) to the student’s course teachers. This can be a school guidance counsellor or nurse (if available). Students should check in with this contact person at the school daily in order to scale back or change school modifications as required.
- If students experience post-concussive symptoms (e.g. headache, nausea, dizziness etc.) while in the classroom, they should go to the nurses office to rest and skip the next period of class. If symptoms occur again in the next period, after resting, they should return home.
- If a student can only handle attending classes part-time, an effort should be made to attend core classes over non-core classes and to avoid missing the same classes repeatedly.

Test Taking

- If a student attempts to write a test while suffering from post-concussive symptoms, there symptoms may worsen, recovery may be extended and their performance on the test will not be a true measure of what they know.
- Strategies:
 - If possible, tests may be delayed until the student is no longer experiencing post-concussive symptoms
 - Test taking should be spaced out and limited to no more than one test per day to avoid over exertion of the brain and reduce cognitively demanding tasks
 - Students can be provided extra time to complete the test
 - Tests can be written in a separate room free of distraction

Assignments and Homework

- If possible, due dates for assignments and homework can be flexible, where extra time to complete tasks may be provided
- Pre-printed copies of class notes can help the student who has difficulty planning or paying attention after their concussion
- Access to a model peer’s notes or teacher’s note can be helpful
- Some students may benefit from peer support, tutoring or private meetings with the classroom teacher for help with school work, organization and test preparation

Physical Activity/Gym Class

- All physical activity should be avoided initially
- Student are to complete a medically supervised gradual return-to-play protocol and obtain medical clearance from their primary provider prior to returning to physical activity

Summary of General and Specific Return-to-School Supports

Possible General Support	Possible Specific Classroom-based Supports
• Re-integration into school occurs	• Tests put off until recovery complete

Tool 4.5: Return-to-school Information and Strategies

Guidelines for Diagnosing and Managing Pediatric Concussion

<p>gradually (e.g., student returns part-time before building up to a full schedule)</p> <ul style="list-style-type: none">• Student not asked to do all missed work, and extra help given to get student caught back up• Extra check-in meetings provided with teacher• Rest time or breaks provided during the day• Overall homework and class work load reduced• Cognitively demanding in-school tasks reduced (e.g., no more than one test each day)	<ul style="list-style-type: none">• Extra time given to complete tests• Flexibility allowed for assignment due dates• Preferential seating provided to allow for closer teacher monitoring and decreased distractions• Access to a model peer's or teacher's notes allowed
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Modified from: http://www.thechildrenshospital.org/conditions/rehab/concussion/school_staff.aspx

References:

1. Lee MA, Perriello VA. Adolescent concussions--management guidelines for schools. *Conn Med.* 2009;73(3):171-173.
2. Kirkwood MW, Yeates KO, Wilson PE. Pediatric sport-related concussion: a review of the clinical management of an oft-neglected population. *Pediatrics.* 2006;117(4):1359-1371.

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