

Concussion

What is a concussion?

A concussion is also known as a mild traumatic brain injury. A concussion affects how the brain works, but can't be seen on X-rays or brain scans.

What causes a concussion?

Any blow or hit to the head, face, neck, or body that causes sudden shaking of the head can cause a concussion. Concussions can happen from falling, during sports like hockey, soccer, or volleyball, or during motor vehicle collisions.

How long does it take to recover after a concussion?

Most patients recover fully from a concussion, but the recovery rate can be variable and unpredictable. Children typically recover in 1-4 weeks, but some children/adolescents will have symptoms at one month and beyond and will need to be monitored and/or seek additional care.

What are symptoms of a concussion?

It is normal after a concussion to have some of the following:

- Mild headache
- Nausea
- Some light/noise sensitivity
- Fatigue
- Mild balance problems
- Feeling foggy or slow
- Difficulty concentrating
- Trouble falling asleep

What are concerning signs or symptoms?

Warning signs of a potentially more serious injury include:

- Severe headache not improving after medication or becoming worse
- Severe neck pain
- Vomiting 2 or more times in an eight hour period of time
- Unusual behavior, increased confusion, restlessness, or agitation
- Drowsiness or inability to wake up
- Slurred speech, weakness, numbness, or decreased coordination
- Convulsions or seizures (shaking or twitching)
- Loss of consciousness (passing out)

If any of the above symptoms develop, call 9-1-1 or seek urgent medical attention in an emergency department.



General Recommendations for the Acute Recovery Period Following a Concussion

A period of physical and cognitive activity restrictions until symptoms have fully resolved is extremely important. This reduces the likelihood of persistent symptoms.

- Return to school (see next page for more details):
 - Do not attend school for the first 2 days following the injury
 - On day 3 return to school for 1 or 2 half days
 - Continue progression to full days as tolerated
- Inform the daycare, school, teachers, and coaches of the concussion and all restrictions and recommendations that are in place.
 - We can provide documentation and letters as well as speak to your school nurse
- No outside recess, gym, sports or any other strenuous activities. The student should not be in the same room as these activities. Do not attend sport practices or games.
- Do not attend music, drama, band or dance classes
- No computer, video games, texting, watching TV and playing musical instruments for the first 2 days as these activities provoke headaches, dizziness and other symptoms. After that please start with short periods of screen time and plenty of rest.
- Short leisurely walks of 10 to 20 minutes are permitted
- Adequate rests and breaks are encouraged as well as staying well hydrated.

Sleep hygiene:

- Have a fixed bedtime routine and maintain the same sleep and wake times during the week and on weekends, if possible.
- Turn off the computer and electronic devices at least 30 minutes before bedtime.
- Make sure you get adequate sleep, and take naps if tired, particularly in the first few days after a concussion. Naps should be limited to once a day, and should take place in bed – not in another room or in front of the TV.
 - During this acute period, the patient should be allowed to sleep as much as needed throughout the day and night. Consult a physician or the ED if not the patient is not easily awoken in the first few hours or days after a concussion.
 - After this acute period, those who have night-time sleep issues should avoid naps to promote night-time sleep and a gradual return-to-activity.

Nutrition and lifestyle:

- Avoid caffeine within 4-6 hours of bedtime
- Avoid energy drinks and alcohol
- Avoid eating heavy meals late in the evening, and avoid sugar 4 hours before bedtime

- Eat a balanced diet; foods such as Goji berries, walnuts, almonds, pineapple, bananas, and oranges all contain substantial amounts of melatonin, a hormone produced in the brain that promotes sleep
- Have an adequate amount of magnesium and zinc in the diet or by supplement. Zinc is known to regulate sleep and magnesium is also directly involved in sleep and relaxation. Magnesium and zinc-rich foods include: dark leafy greens, seeds and nuts (including sunflower and sesame seeds, cashews and almonds), squash, broccoli, and other vegetables, potatoes, legumes, dairy products, meat, and unprocessed whole grains.
- Get some natural light during the day, especially in the morning
- Avoid loud music with a strong beat before bedtime

Additional Recommendations for Teens

- No parties or movies as the excessive noise and light may provoke headaches
 - Avoid driving during the first 24-48 hours after the concussion. You may begin driving when feeling improved, can concentrate sufficiently to feel safe behind the wheel, and when the act of driving does not provoke significant concussion symptoms.
 - Absolutely no energy drinks, alcohol or drugs
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Return to Sports Following a Concussion

If you have sustained a concussion, it is recommended to follow these steps before fully returning to physical activity.

- You must complete your recommended period of activity restriction.
- You should be symptom-free for a few days and fully returned to cognitive and academic activities; or have been advised by a doctor or a concussion specialist before you are ready to start the step-by-step process of returning to sports.
- See the last page of this handout for a 6-stage outline for returning to sports.
- There should be approximately 24 hours or longer in between each step. If any symptoms return at any time, stop working out. Rest until you are symptom-free for 24 hours, then return to the previous step. If symptoms do not resolve or get worse, seek the expertise of a doctor or a concussion specialist.

For patients with symptoms that last longer than 4 weeks, you may be referred to a sports medicine concussion specialist.

Return to School Following a Concussion

In order to minimize post-concussive symptoms, the following academic recommendations have been implemented to reduce cognitive load. These recommendations will help the student participate in academic activities throughout the recovery period. Accommodations may vary per course as well as according to the individual needs of the student.

The student and parent(s) are encouraged to discuss and determine accommodations with both the school administration, school nurse and teachers in order to ensure consistency. The return to school process should be coordinated by the school's concussion management team and/or a point person in the school (e.g. guidance counselor, principal / vice principal, teacher, etc.).

Attendance restrictions and accommodations:

It is reasonable for a child or adolescent to miss some school after a concussion, but it is also important not to allow or encourage the child to “settle into the habit” of missing school. The school setting provides beneficial contact with peers and social support. A gradual return-to-school and activity is the best way to make sure that the child or adolescent remains symptom-free when he or she fully engages in school and related activities.

The timeframes below may be used as a general guide, but will vary on a case-by-case basis:

- No school for 2 days
- Then progress to 1 or 2 half-days, and finally full days as tolerated
- Allow for late arrival or early departure
- For the first 1-2 weeks allow for rest time in the nurse's office
- Provide a second set of books for the first week in order to avoid heavy lifting
- Allow use of the elevator for the first week
- Avoid gym, band, outdoor recess, or sports while symptomatic

Testing:

Students who have sustained a concussion can experience an increase in memory and attention problems. Highly demanding activities such as testing can significantly increase these symptoms and cause headaches and fatigue subsequently making testing more difficult. While the student is symptomatic, it is recommended that he/she have:

- No exams, tests or quizzes
- No oral presentations

When the student has been symptom-free for a few days, initiate a gradual approach to testing:

- Additional time to complete tests
- Testing in a quiet environment

- Allow testing across multiple sessions
- Reduced length of tests
- Open book/take home tests when possible
- Allow 1-2 days between tests
- Reformat from free response to multiple choice

Workload reduction:

A concussed student may require more time to complete assignments due to an increase in memory problems and decreased speed of processing. It is therefore recommended to reduce the cognitive load, which may include reducing homework during the first week, and allocating additional time for projects and assignments.

Note taking:

As a result of impaired multitasking abilities and increased symptoms, taking notes may become a difficult task. Provide the student with lecture notes/outlines ahead of time in order to assist with organization and reduce multi-tasking demands. If this is not possible, permit the student to photocopy notes from another student.

Breaks:

If headaches worsen during class time, allow the student to be excused from class in order to seek a quiet area to rest until symptoms have decreased.

- Allow breaks as needed in order to control symptom levels
- Allow the student to leave class early to avoid hallway noise.
- Allow the student to eat lunch away from the cafeteria.
- The student should not participate in, or observe extracurricular activities.

Other accommodations and restrictions:

- Limit reading, computers, and looking at smart boards while the student is very symptomatic
- Allow the use of audio books if the student is very symptomatic while reading.
- No music, drama and physical education. The student should not be in the same room during these activities.
- Allow the student to bring a water bottle to class and wear sunglasses if light-sensitive.
- Students may have been advised to take analgesics for headache management, please allow them to do so if consent has been given.

Note: Most students will require these accommodations for 2-4 weeks. Those who require accommodations for longer periods of time should continue to follow up with a concussion specialist.

Return to School

This tool is a guideline for managing a student's return to school following a concussion and does not replace medical advice. Timelines and activities may vary by direction of a health care professional.

AT HOME			AT SCHOOL			
STAGE 1:	STAGE 2:		STAGE 3:	STAGE 4:	STAGE 5:	STAGE 6:
Physical & cognitive rest - Basic board games, crafts, talk on phone - Activities that do not increase heart rate or break a sweat Limit/Avoid: - Computer, TV, texting, video games, reading No: - School work - Sports - Work - Driving until cleared by a health care professional	Start with light cognitive activity: Gradually increase cognitive activity up to 30 min. Take frequent breaks. Prior activities plus: - Reading, TV, drawing - Limited peer contact and social networking Contact school to create <i>Return to School</i> plan.	When light cognitive activity is tolerated: Introduce school work. Prior activities plus: School work as per <i>Return to School</i> plan Communicate with school on student's progression.	Back to school part-time Part-time school with maximum accommodations. Prior activities plus: - School work at school as per <i>Return to School</i> plan No: - P.E., physical activity at lunch/recess, homework, testing, sports, assemblies, field trips Communicate with school on student's progression.	Part-time school Increase school time with moderate accommodations. Prior activities plus: - Increase time at school - Decrease accommodations - Homework – up to 30 min./day - Classroom testing with adaptations No: - P.E., physical activity at lunch/recess, sports, standardized testing Communicate with school on student's progression.	Full-time school Full days at school, minimal accommodations. Prior activities plus: - Start to eliminate accommodations - Increase homework to 60 min./day - Limit routine testing to one test per day with adaptations No: - P.E., physical activity at lunch/recess, sports, standardized testing	Full-time school Full days at school, no learning accommodations. - Attend all classes - All homework - Full extracurricular involvement - All testing No: - full participation in P.E. or sports until <i>Return to Sport</i> protocol completed and written medical clearance provided
	Gradually add cognitive activity including school work at home		School work only at school	Increase school work, introduce homework, decrease learning accommodations	Work up to full days at school, minimal learning accommodations	Full academic load
Rest						
When symptoms start to improve OR after resting for 2 days max, BEGIN STAGE 2	Tolerates 30 min. of cognitive activity, introduce school work at home	Tolerates 60 min. of school work in two 30 min. intervals, BEGIN STAGE 3	Tolerates 120 min. of cognitive activity in 30-45 min. intervals, BEGIN STAGE 4	Tolerates 240 min. of cognitive activity in 45-60 min. intervals, BEGIN STAGE 5	Tolerates school full-time with no learning accommodations BEGIN STAGE 6	<i>Return to School</i> protocol completed; focus on RETURN TO SPORT

Note: A student is tolerating an activity if symptoms are not exacerbated.

Adapted from the Return to Learn protocol by G.F. Strong School Program (Vancouver School Board), Adolescent and Young Adult Program, G.F. Strong Rehabilitation Centre.

Return to Sport

This tool is a guideline for managing an individual's return to sport following a concussion and does not replace medical advice. Timelines and activities may vary by direction of a health care professional.

STAGE 1:	STAGE 2:	STAGE 3:	STAGE 4:	STAGE 5:	STAGE 6:
No sporting activity Physical and cognitive rest until symptoms start to improve OR after resting for 2 days max.	Light aerobic exercise Walking, swimming, stationary cycling. No resistance training. The pace of these activities should be at the point where you are still able to have a conversation.	Sport-specific exercise Skating drills (ice hockey), running drills (soccer). No head-impact activities.	Non-contact drills Progress to complex training drills (e.g. passing drills). May start resistance training.	Full-contact practice Following medical clearance participate in normal training activities.	Back in the game Normal game play
Recovery	Increase heart rate	Add movement	Exercise, coordination, cognitive load	Restore confidence; assess functional skills	
Symptoms improve or 2 days rest max? Yes: Move to stage 2 No: Continue resting Time & Date completed: _____ _____	No new or worsening symptoms for 24 hours? Yes: Move to stage 3 No: Return to stage 1 Time & Date completed: _____ _____	No new or worsening symptoms for 24 hours? Yes: Move to stage 4 No: Return to stage 2 Time & Date completed: _____ _____	Symptom-free for 24 hours? Yes: Move to stage 5 No: Return to stage 3 Time & Date completed: _____ _____	Symptom-free for 24 hours? Yes: Move to stage 6 No: Return to stage 4 Time & Date completed: _____ _____	Note: Premature return to contact sports (full practice and game play) may cause a significant setback in recovery.

If new or worsening symptoms are experienced at any stage, go back to the previous stage for at least 24 hours. You may need to move back a stage more than once during the recovery process.

Medical clearance required before moving to stage 5

BOTH TOOLS CAN BE USED IN PARALLEL; HOWEVER, RETURN TO SCHOOL SHOULD BE COMPLETED BEFORE RETURN TO SPORT IS COMPLETED