



Concussion Resources for Medical Professionals





Version 1: November 2018 (Cover photo: S_L / Shutterstock)

The Concussion Awareness Training Tool (CATT) is a series of online educational modules and resources with the goal of standardizing concussion recognition, diagnosis, treatment, and management. Good concussion management may decrease the risk of brain damage and potentially reduce long-term health issues.

Developed by Dr. Shelina Babul, Associate Director/Sports Injury Specialist with the BC Injury Research and Prevention Unit, BC Children's Hospital, CATT is based upon the established principles of the Consensus Statement on Concussion in Sport. The 2017 Berlin Concussion in Sport Group Consensus Statement builds on the principles outlined in previous concussion statements and aims to develop better understanding of sport-related concussion.

Research and evidence on concussions is evolving and the knowledge base is continually changing. As a result, this website is updated on a regular basis to provide current information, tools, and resources to support concussion recognition, diagnosis, treatment, and management.

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Resources for Medical Professionals

British Journal of Sports Medicine – International Consensus Statement on Concussion in Sport (2017)

<https://bjsm.bmj.com/content/bjsports/51/11/838.full.pdf>

Ontario Neurotrauma Foundation – Guideline for Concussion/Mild Traumatic Brain Injury & Persistent Symptoms 3rd Edition (2018)

<http://braininjuryguidelines.org/concussion/>

Parachute – Canadian Guideline on Concussion in Sport (2017)

http://www.parachutecanada.org/downloads/injurytopics/Canadian_Guideline_on_Concussion_in_Sport-Parachute.pdf

Heads Up Clinicians – Acute Concussion Evaluation (ACE) (2006)

https://www.cdc.gov/headsup/pdfs/providers/ace_v2-a.pdf

British Journal of Sports Medicine – The Sport Concussion Assessment Tool 5th Edition (SCAT5) (2017)

<http://bjsm.bmj.com/content/bjsports/51/11/851.full.pdf>

British Journal of Sports Medicine – The Child Sport Concussion Assessment Tool 5th Edition (Child SCAT5) (2017)

<http://bjsm.bmj.com/content/bjsports/51/11/862.full.pdf>

CATT – SCAT5 and Child SCAT5 Online

<https://cattonline.com/scat/>

Rivermead Post-Concussion Questionnaire (1995)

https://drive.google.com/viewerng/viewer?url=http://www.tbi-impact.org/cde/mod_templates/12_F_06_Rivermead.pdf

PECARN Pediatric Head CT Rule (younger than 2 years)

<https://drive.google.com/file/d/0B96hLIM4rbvuMzFVbndLa1hWeTQ/view>

PECARN Pediatric Head CT Rule (2 years or older)

<https://drive.google.com/file/d/0B96hLIM4rbvueVM0OGZSbjJiMHM/view>

Canadian Head CT Rule (2001)

<https://www.mdcalc.com/canadian-ct-head-injury-trauma-rule>

Canadian C-Spine Rule (2001)

<https://www.mdcalc.com/canadian-c-spine-rule>

Concussions Ontario – Referral Indicators (2017)

<http://concussionsontario.org/standards/tools-resources/referral-indicators/>

Canadian Concussion Collaborative – 4 Characteristics of a Good Concussion Clinic

<http://casem-acmse.org/wp-content/uploads/2018/06/CCES-PUB-CCC-4Qs-E-FINAL.pdf>

Resources for Medical Professionals

Staying Up-to-Date About Concussions

International Consensus Statement on Concussion in Sport

<http://bjsm.bmj.com/content/bjsports/51/11/838.full.pdf>

Concussion Awareness Training Tool

<https://cattonline.com/>

Ontario Neurotrauma Foundation

<http://onf.org/documents>

Parachute

<http://www.parachutecanada.org/injury-topics/item/concussion>

Canadian Concussion Collaborative

<https://casem-acmse.org/resources/canadian-concussion-collaborative/>

Centers for Disease Control and Prevention

<https://www.cdc.gov/headsup/index.html>

AT HOME			AT SCHOOL			
STAGE 1:	STAGE 2:		STAGE 3:	STAGE 4:	STAGE 5:	STAGE 6:
<p>Physical & cognitive rest</p> <ul style="list-style-type: none"> Basic board games, crafts, talk on phone Activities that do not increase heart rate or break a sweat <p>Limit/Avoid:</p> <ul style="list-style-type: none"> Computer, TV, texting, video games, reading <p>No:</p> <ul style="list-style-type: none"> School work Sports Work Driving until cleared by a health care professional 	<p>Start with light cognitive activity:</p> <p>Gradually increase cognitive activity up to 30 min. Take frequent breaks.</p> <p>Prior activities plus:</p> <ul style="list-style-type: none"> Reading, TV, drawing Limited peer contact and social networking <p>Contact school to create Return to School plan.</p>	<p>When light cognitive activity is tolerated:</p> <p>Introduce school work.</p> <p>Prior activities plus:</p> <ul style="list-style-type: none"> School work as per <i>Return to School</i> plan <p>Communicate with school on student's progression.</p>	<p>Back to school part-time</p> <p>Part-time school with maximum accommodations.</p> <p>Prior activities plus:</p> <ul style="list-style-type: none"> School work at school as per <i>Return to School</i> plan <p>No:</p> <ul style="list-style-type: none"> P.E., physical activity at lunch/recess, homework, testing, sports, assemblies, field trips <p>Communicate with school on student's progression.</p>	<p>Part-time school</p> <p>Increase school time with moderate accommodations.</p> <p>Prior activities plus:</p> <ul style="list-style-type: none"> Increase time at school Decrease accommodations Homework – up to 30 min./day Classroom testing with adaptations <p>No:</p> <ul style="list-style-type: none"> P.E., physical activity at lunch/recess, sports, standardized testing <p>Communicate with school on student's progression.</p>	<p>Full-time school</p> <p>Full days at school, minimal accommodations.</p> <p>Prior activities plus:</p> <ul style="list-style-type: none"> Start to eliminate accommodations Increase homework to 60 min./day Limit routine testing to one test per day with adaptations <p>No:</p> <ul style="list-style-type: none"> P.E., physical activity at lunch/recess, sports, standardized testing 	<p>Full-time school</p> <p>Full days at school, no learning accommodations.</p> <ul style="list-style-type: none"> Attend all classes All homework Full extracurricular involvement All testing <p>No:</p> <ul style="list-style-type: none"> full participation in P.E. or sports until <i>Return to Sport</i> protocol completed and written medical clearance provided
	<p>No:</p> <ul style="list-style-type: none"> School attendance Sports Work 					
Rest	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
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:
<p>No sporting activity</p> <p>Physical and cognitive rest until symptoms start to improve OR after resting for 2 days max.</p>	<p>Light aerobic exercise</p> <p>Walking, swimming, stationary cycling.</p> <p>No resistance training.</p> <p>The pace of these activities should be at the point where you are still able to have a conversation.</p>	<p>Sport-specific exercise</p> <p>Skating drills (ice hockey), running drills (soccer).</p> <p>No head-impact activities.</p>	<p>Non-contact drills</p> <p>Progress to complex training drills (e.g. passing drills).</p> <p>May start resistance training.</p>	<p>Full-contact practice</p> <p>Following medical clearance participate in normal training activities.</p>	<p>Back in the game</p> <p>Normal game play</p>
<p>Recovery</p>	<p>Increase heart rate</p>	<p>Add movement</p>	<p>Exercise, coordination, cognitive load</p>	<p>Restore confidence; assess functional skills</p>	
<p>Symptoms improve or 2 days rest max?</p> <p>Yes: Move to stage 2 No: Continue resting</p> <p>Time & Date completed:</p>	<p>No new or worsening symptoms for 24 hours?</p> <p>Yes: Move to stage 3 No: Return to stage 1</p> <p>Time & Date completed:</p>	<p>No new or worsening symptoms for 24 hours?</p> <p>Yes: Move to stage 4 No: Return to stage 2</p> <p>Time & Date completed:</p>	<p>Symptom-free for 24 hours?</p> <p>Yes: Move to stage 5 No: Return to stage 3</p> <p>Time & Date completed:</p>	<p>Symptom-free for 24 hours?</p> <p>Yes: Move to stage 6 No: Return to stage 4</p> <p>Time & Date completed:</p>	<p>Note: Premature return to contact sports (full practice and game play) may cause a significant setback in recovery.</p>
<p>_____</p> <p>_____</p>	<p>_____</p> <p>_____</p>	<p>_____</p> <p>_____</p>	<p>_____</p> <p>_____</p>	<p>_____</p> <p>_____</p>	

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

www.cattonline.com

 CONCUSSION AWARENESS TRAINING TOOL

BC INJURY research and prevention unit
www.injuryresearch.bc.ca

Return to Activity

This tool is a guideline for managing an individual's return to activity 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:
<p>Initial rest</p> <ul style="list-style-type: none"> Stay home in a quiet and calm environment Limit your screen time (computer, television, and smartphone use) Keep any social visits brief Sleep as much as your body needs while trying to maintain a regular night sleeping schedule <p>Note: The goal for each stage is to find the 'sweet spot' between doing too much and too little.</p>	<p>Prepare to return to activity</p> <ul style="list-style-type: none"> Test your readiness by trying some simple, familiar tasks such as reading, using the computer, or shopping for groceries Keep the time on each activity brief (e.g., less than 30 minutes) and take regular rest breaks Go for walks or try other light physical activity (e.g., swimming, stationary bike), without becoming short of breath Keep bed rest during the day to a minimum. It is unlikely to help your recovery 	<p>Increase your activity</p> <ul style="list-style-type: none"> Gradually return to usual activities and decrease rest breaks Start with less demanding activities before harder ones Physical activity might include jogging, lifting light weights, or non-contact sport drills, gardening, dancing <p>Note: You could start returning to school or work on a part-time basis (e.g., a few hours per day).</p>	<p>Gradually resume daily activities</p> <p>Resuming daily activities can be challenging because your energy and capacity for activities may be variable, but should improve day-to-day or week-to-week.</p> <p>Students and workers may require accommodations, such as reduced hours, reduced workload, extra time for assignments, or access to a quiet distraction-free work environment.</p>	<p>Full return to activity</p> <ul style="list-style-type: none"> Full class schedule, with no rest breaks or accommodations Full work schedule with usual expectations for productivity Student athletes should not return to sport competition until they have fully returned to school <p>Only return to contact sports or dangerous job duties (e.g., operating heavy equipment, working from heights) when cleared by your doctor.</p>
Rest	Get ready to return	Start your return	Continue your return	
When symptoms start to improve OR after resting for 2 days max, BEGIN STAGE 2	Tolerates simple, familiar tasks, BEGIN STAGE 3	Tolerates further increase in level of activity, BEGIN STAGE 4	Tolerates partial return to usual activities, BEGIN STAGE 5	

Adapted from Noah D. Silverberg, PhD

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.

Each person will progress at his/her own pace. It is best not to "push" through symptoms. If you do too much, your symptoms may worsen. Decrease your activity level and your symptoms should settle. Then continue to gradually increase your activity in smaller increments.

Medical Assessment Letter

Date: _____ Athlete's Name: _____

To whom it may concern,

Athletes who sustain a suspected concussion should be managed according to the *Canadian Guideline on Concussion in Sport*. Accordingly, I have personally completed a Medical Assessment on this patient.

Results of Medical Assessment

- This patient has not been diagnosed with a concussion and can resume full participation in school, work, and sport activities without restriction.
- This patient has not been diagnosed with a concussion but the assessment led to the following diagnosis and recommendations:

- This patient has been diagnosed with a concussion.

The goal of concussion management is to allow complete recovery of the patient's concussion by promoting a safe and gradual return to school and sport activities. The patient has been instructed to avoid all recreational and organized sports or activities that could potentially place them at risk of another concussion or head injury. Starting on _____ (date), I would ask that the patient be allowed to participate in school and low-risk physical activities as tolerated and only at a level that does not bring on or worsen their concussion symptoms. The above patient should not return to any full contact practices or games until the coach has been provided with a *Medical Clearance Letter* provided by a medical doctor or nurse practitioner in accordance with the *Canadian Guideline on Concussion in Sport*.

Other comments:

Thank-you very much in advance for your understanding.

Yours Sincerely,

Signature/print _____ M.D. / N.P. (circle appropriate designation)*

**In rural or northern regions, the Medical Assessment Letter may be completed by a nurse with pre-arranged access to a medical doctor or nurse practitioner. Forms completed by other licensed healthcare professionals should not otherwise be accepted.*

We recommend that this document be provided to the athlete without charge.

Return-to-School Strategy¹

The following is an outline of the *Return-to-School Strategy* that should be used to help student-athletes, parents, and teachers to partner in allowing the athlete to make a gradual return to school activities. Depending on the severity and type of the symptoms present, student-athletes will progress through the following stages at different rates. If the student-athlete experiences new symptoms or worsening symptoms at any stage, they should go back to the previous stage.

Stage	Aim	Activity	Goal of each step
1	Daily activities at home that do not give the student-athlete symptoms	Typical activities during the day as long as they do not increase symptoms (i.e. reading, texting, screen time). Start at 5-15 minutes at a time and gradually build up.	Gradual return to typical activities.
2	School activities	Homework, reading or other cognitive activities outside of the classroom.	Increase tolerance to cognitive work.
3	Return to school part-time	Gradual introduction of schoolwork. May need to start with a partial school day or with increased breaks during the day.	Increase academic activities.
4	Return to school full-time	Gradually progress.	Return to full academic activities and catch up on missed school work.

Sport-Specific Return-to-Sport Strategy¹

The following is an outline of the *Return-to-Sport Strategy* that should be used to help athletes, coaches, trainers, and medical professionals to partner in allowing the athlete to make a gradual return to sport activities. Activities should be tailored to create a sport-specific strategy that helps the athlete return to their respective sport.

An initial period of 24-48 hours of rest is recommended before starting their *Sport-Specific Return-to-Sport Strategy*. If the athlete experiences new symptoms or worsening symptoms at any stage, they should go back to the previous stage. It is important that youth and adult student-athletes return to full-time school activities before progressing to stage 5 and 6 of the *Sport-Specific Return-to-Sport Strategy*. It is also important that all athletes provide their coach with a *Medical Clearance Letter* prior to returning to full contact sport activities.

Stage	Aim	Activity	Goal of each step
1	Symptom-limiting activity	Daily activities that do not provoke symptoms.	Gradual re-introduction of work/school activities.
2	Light aerobic activity	Walking or stationary cycling at slow to medium pace. No resistance training.	Increase heart rate.
3	Sport-specific exercise	Running or skating drills. No head impact activities.	Add movement.
4	Non-contact training drills	Harder training drills, e.g. passing drills. May start progressive resistance training.	Exercise, coordination and increased thinking.
5	Full contact practice	Following medical clearance and complete return to school.	Restore confidence and assess functional skills by coaching staff.
6	Return to sport	Normal game play.	

¹Source: McCrory et al. (2017). Consensus statement on concussion in sport – the 5th international conference on concussion in sport held in Berlin, October 2016. *British Journal of Sports Medicine*, 51(11), 838-847. <http://dx.doi.org/10.1136/bjsports-2017->

Medical Clearance Letter

Date: _____ Athlete's Name: _____

To whom it may concern,

Athletes who are diagnosed with a concussion should be managed according to the *Canadian Guideline on Concussion in Sport* including the *Return-to-School* and *Return-to-Sport Strategies* (see page 2 of this letter). Accordingly, the above athlete has been medically cleared to participate in the following activities as tolerated effective the date stated above (please check all that apply):

- Symptom-limiting activity (cognitive and physical activities that don't provoke symptoms)**
- Light aerobic activity (Walking or stationary cycling at slow to medium pace. No resistance training)**
- Sport-specific exercise (Running or skating drills. No head impact activities)**
- Non-contact practice (Harder training drills, e.g. passing drills. May start progressive resistance training. Including gym class activities without a risk of contact, e.g. tennis, running, swimming)**
- Full-contact practice (Including gym class activities with risk of contact and head impact, e.g. soccer, dodgeball, basketball)**
- Full game play**

What if symptoms recur? Any athlete who has been cleared for physical activities, gym class or non-contact practice, and who has a recurrence of symptoms, should immediately remove himself or herself from the activity and inform the teacher or coach. If the symptoms subside, the athlete may continue to participate in these activities as tolerated.

Athletes who have been cleared for full contact practice or game play must be able to participate in full-time school (or normal cognitive activity) as well as high intensity resistance and endurance exercise (including non-contact practice) without symptom recurrence. Any athlete who has been cleared for full-contact practice or full game play and has a recurrence of symptoms, should immediately remove himself or herself from play, inform their teacher or coach, and undergo medical assessment by a medical doctor or nurse practitioner before returning to full-contact practice or games.

Any athlete who returns to practices or games and sustains a new suspected concussion should be managed according to the *Canadian Guideline on Concussion in Sport*.

Other comments:

Thank-you very much in advance for your understanding.

Yours Sincerely,

Signature/print _____ M.D. / N.P. (circle appropriate designation)*

**In rural or northern regions, the Medical Clearance Letter may be completed by a nurse with pre-arranged access to a medical doctor or nurse practitioner. Forms completed by other licensed healthcare professionals should not otherwise be accepted.*

We recommend that this document be provided to the athlete without charge.

Return-to-School Strategy¹

The following is an outline of the *Return-to-School Strategy* that should be used to help student-athletes, parents, and teachers to partner in allowing the athlete to make a gradual return to school activities. Depending on the severity and type of the symptoms present, student-athletes will progress through the following stages at different rates. If the student-athlete experiences new symptoms or worsening symptoms at any stage, they should go back to the previous stage.

Stage	Aim	Activity	Goal of each step
1	Daily activities at home that do not give the student-athlete symptoms	Typical activities during the day as long as they do not increase symptoms (i.e. reading, texting, screen time). Start at 5-15 minutes at a time and gradually build up.	Gradual return to typical activities.
2	School activities	Homework, reading or other cognitive activities outside of the classroom.	Increase tolerance to cognitive work.
3	Return to school part-time	Gradual introduction of schoolwork. May need to start with a partial school day or with increased breaks during the day.	Increase academic activities.
4	Return to school full-time	Gradually progress.	Return to full academic activities and catch up on missed school work.

Sport-Specific Return-to-Sport Strategy¹

The following is an outline of the *Return-to-Sport Strategy* that should be used to help athletes, coaches, trainers, and medical professionals to partner in allowing the athlete to make a gradual return to sport activities. Activities should be tailored to create a sport-specific strategy that helps the athlete return to their respective sport.

An initial period of 24-48 hours of rest is recommended before starting their *Sport-Specific Return-to-Sport Strategy*. If the athlete experiences new symptoms or worsening symptoms at any stage, they should go back to the previous stage. It is important that youth and adult student-athletes return to full-time school activities before progressing to stage 5 and 6 of the *Sport-Specific Return-to-Sport Strategy*. It is also important that all athletes provide their coach with a *Medical Clearance Letter* prior to returning to full contact sport activities.

Stage	Aim	Activity	Goal of each step
1	Symptom-limiting activity	Daily activities that do not provoke symptoms.	Gradual re-introduction of work/school activities.
2	Light aerobic activity	Walking or stationary cycling at slow to medium pace. No resistance training.	Increase heart rate.
3	Sport-specific exercise	Running or skating drills. No head impact activities.	Add movement.
4	Non-contact training drills	Harder training drills, e.g. passing drills. May start progressive resistance training.	Exercise, coordination and increased thinking.
5	Full contact practice	Following medical clearance and complete return to school.	Restore confidence and assess functional skills by coaching staff.
6	Return to sport	Normal game play.	

¹Source: McCrory et al. (2017). Consensus statement on concussion in sport – the 5th international conference on concussion in sport held in Berlin, October 2016. *British Journal of Sports Medicine*, 51(11), 838-847. <http://dx.doi.org/10.1136/bjsports-2017->