
Concussion in Sport, Leisure, and Occupational Settings

See also [Background to Concussion in Sport, Leisure, and Occupational Settings](#)

Context:

Concussions and head injuries are a common occurrence in sport and leisure activities, and frequently occur in occupational settings as well. While the majority of individuals who suffer from a concussion will recover with time, others may be at risk for serious and lasting complications. These include (1) children; (2) previous history of head injury or concussion; (3) prior mental health symptoms; and (4) missed diagnosis and management.¹

This aim of this advocacy and policy document is to improve safety during activity by raising awareness of concussions, and by working to improve the detection and safe management of concussions when they occur. It is not a clinical practice guideline. It should not be perceived as a plea to avoid sports or leisure activities, but rather as a call for safer sporting, leisure, and occupational practices. The documented health benefits that result from establishing an active lifestyle in youth and maintaining it throughout life cannot be overstated.

Achieving balance of safe play in sport, leisure and occupational activities while promoting greater physical activity levels for Canadians would have the effect of reducing health care costs in Canada, while promoting a healthier concussion recovery culture for all Canadians.

Therefore, to promote better concussion and head trauma awareness and prevention, as well as better management/treatment practices, the following policy recommendations for key target audiences across all levels of sport, leisure, and occupational activity are made.^a

a All the policy recommendations made in this document are not meant to be interpreted as clinical practice guidelines. Any individual who suspects they may have sustained a concussion should promptly consult a physician.

Key Concussion & Head Injury Principles:

- a) The detection of concussions and head injury should be a shared responsibility and any stakeholder/observer to such an injury should verbally raise their concerns that a concussion may have occurred.²
 - i. It is important to understand that individuals with a possible concussion, or head injury, may not be able to recognize that they are suffering from a concussion;
 - ii. It is important to recognize that engrained within popular culture are dangerous notions (e.g., to minimize, ignore, downplay, or play through the pain, etc.) that cause individuals/observers to ignore the real, often hidden, dangers of such injuries.
- b) Broadly speaking, access to the latest edition of the internationally recognized Concussion Recognition Tool (CRT)³ should be promoted/available to help identify the signs and symptoms of a possible concussion;
- c) Any individual who sustains more than a minor head injury should be immediately removed from play, activity, or occupation, and not permitted to return on the same day³ (regardless of whether a concussion is later suspected).
 - i. These individuals should be the subject of observation for developing/evolving concussion symptoms or emergency warning signs (especially within the first 4 hours post-injury, but also up to 48 hours when red-flag symptoms are present).⁴
- d) Following first aid principles, where an individual displays signs of a serious head or spinal injury, that individual should lie still (not moving their head or neck) until a qualified individual has performed an evaluation; to determine whether emergency evacuation for medical assessment is necessary.⁵
- e) Any individual with a suspected concussion (especially where red-flag symptoms are present), or more severe traumatic brain injury, should be promptly evaluated by a physician to:
 - i. Either rule-out or confirm a diagnosis via an appropriate medical assessment; and
 - ii. Institute the provision of an age-appropriate follow-up care plan (including progressive return to school, work, and play protocols) if such an injury is confirmed.¹
- f) Ideally, a physician knowledgeable in concussion management determines when, and how, a concussed individual should progressively return to both cognitive (school or work) and physical activities.
- g) Following a suspected, or diagnosed concussion, an individual should not return to play, or resume any activity associated with a heightened risk of head trauma, until cleared by a physician to do so.¹

Recommendations For:

1. Physicians:

Should:

- a) Where possible, encourage safe play practices in sports, and where appropriate, educate patients about the risks of head injuries (associated with high-risk behavior in sports, leisure and occupational activities).
- b) Gain/maintain, through relevant continuous medical education, competencies related to the assessment, diagnosis and management of concussion according to most current clinical practice recommendations (e.g., latest edition of the CRT, SCAT, Child SCAT, Acute Concussion Evaluation Tool, etc.).
- c) Be aware that clinical practice guidelines and assessment tools exist to assist in assessing and treating concussed individuals (e.g., Ontario Neurotrauma Foundation, Parachute Canada, etc.).
- d) When assessing a patient with a potential concussion:
 - i. Rule out the presence of more severe traumatic brain and musculoskeletal injury;
 - ii. Assess for any previous concussion history, risk factors and newly arising complications;
 - iii. Educate and instruct parents, athletes and any individual that sustains a concussion about what to do, and what to expect, in the post concussive phase. (This should be based on the most current age-appropriate concussion management guidelines);⁴
 - iv. Provide individualized recommendations on how to optimally apply the progressive return-to-school, work, and play strategies with consideration for the specificities of the patient's usual activities and responsibilities;⁴
 - v. Work to provide concussed patients timely access for medical reassessment in the event of worsening or persistent symptoms (including mental health); and
 - vi. In the presence of persistent or worsening symptoms (including mental health), consider what external, evidence based, concussion resources may be necessary as well as referral.

2. Medical Colleges & Faculties:

Should:

- a) Promote/support medical education regarding; awareness, detection/diagnosis; and the appropriate management of concussions, throughout the continuum of medical education (undergraduate, post-graduate, and continuing medical education).
- b) Support research in concussion prevention, detection, and treatment or management.

3. Athletes in Contact/Collision Sports:

Should:

- a) (Prior to the commencement of the sporting season) be given age-appropriate instruction² to understand:
 - i. How to identify the signs and symptoms of a possible concussion using the latest edition of the internationally recognized CRT (e.g. Concussion Recognition Tool, or Concussion Awareness Training Tool (CATT));
 - ii. The risks associated with concussion (including long term and mental health); especially, the risks of potentially life-threatening complications associated with continued sport participation, while presenting with signs or symptoms of a possible concussion;
 - iii. What to do/expect if a concussion is ever suspected (including for teammates), and the expected role of the athlete and team members;
 - iv. Removal and progressive returns to school, work and play policies/procedures, and the expected role of the athlete in the recovery process; and
 - v. How to foster a healthy sporting culture (that promotes: safe play practices; fosters concussion/injury prevention and reporting; peer-to-peer support; and combat injury stigmatization).
- b) Have such instruction reinforced periodically throughout the sporting season as needed.
- c) Be aware of, and seek treatment for, potentially serious mental health issues that may arise post-concussive injury.

4. Parents with Minors in Contact/Collision Sports:

Should:

- a) Prior to the commencement of a sporting season, request and be open to receiving instruction² on:
 - i. How to identify the signs and symptoms of a possible concussion using the latest edition of the internationally recognized CRT (e.g. Concussion Recognition Tool, or Concussion Awareness Training Tool (CATT));
 - ii. The risks associated with concussion; especially, the risks of potentially life-threatening complications associated with continued sport participation, while presenting with signs or symptoms of a possible concussion;
 - iii. What to do/expect if a concussion is ever suspected for an athlete;
 - iv. Removal and progressive returns to school, work and play policies/procedures, and the expected role of the parent(s) in the recovery process; and
 - v. How to foster a healthy sporting culture that promotes: safe play practices; fosters concussion/injury prevention and reporting; peer-to-peer support; and combats injury stigmatization.

- b) Have such instruction reinforced periodically throughout the sporting season as needed.
- c) Be prepared to address potentially serious mental health issues that may arise post-concussive injury.

5. Individuals Who Sustain a Head Injury Outside of Organized Sports:

Should:

- a) Be aware of possible signs and symptoms of a possible concussion, and immediately withdraw from activity and seek medical assessment a possible concussion is suspected.¹
 - i. Refer to the latest addition of the internationally recognized CRT (Concussion Recognition Tool) for further guidance on signs and symptoms.³
- b) Understand the risks associated with concussion; including the risks of potentially life-threatening complications associated with repeated head injury if signs or symptoms of a possible concussion are present.
- c) In the event of a diagnosis of concussion, judiciously implement the medical recommendations received regarding their gradual return to cognitive and physical activity (including the need for medical reassessment in the presence of persistent symptoms).
- d) Openly communicate their recovery needs and work with any group or individual who might support them in their recovery process (e.g., employers, family members, school, etc.).
- e) Be aware of, and seek treatment for, potentially serious mental health issues that may arise post-concussive injury.

6. Coaches, Trainers, Referees, & First Responders:

Should:

- a) Receive certified emergency first aid training.
- b) Receive periodic education (ideally annually) on national standards regarding the signs and symptoms, potential long-term consequences, appropriate steps for initial intervention, and immediate management (including: athlete removal-from-play; observation; determining when medical assessment is necessary; and progressive return to school, work and play procedures).
- c) Be trained in the use of the latest edition of the internationally recognized CRT (Concussion Recognition Tool) – to detect whether an injured individual is suffering from a concussion.²
- d) Be knowledgeable and responsible to ensure safety and safe play practices are applied throughout the sporting season.
- e) Be responsible for fostering a healthy sporting culture (promote safe play practices, foster concussion/injury prevention and reporting, peer-to-peer support and combat injury stigmatization).
- f) Be prepared to address potentially serious mental health issues that may arise post-concussive injury.

7. Licensed Health Care Providers Involved as Therapists in Sport Environments:

Should:

- a) Be fully licensed in their professional field and pursue continuing professional development to maintain competencies related to concussion and head injuries.
- b) Promote the implementation of properly adapted concussion management protocols (that comply with the most current clinical recommendations, based on consideration for the specificities of each sport environment and available resources).
- c) Work with qualified physicians to initiate/implement tailored medically supervised concussion management protocols that define:
 - i. Mutual and shared health professional responsibilities to optimize the quality, and safety of patient care (within one's scope of practice); and
 - ii. The optimal corridors for timely access to medical (re)assessment with due consideration for available resources.
- d) Be prepared to address potentially serious mental health issues that may arise post-concussive injury.

8. Educational Institutions & Sports Organizations:

Should:

- a) (Especially in the cases involving minors) implement, and keep updated, prevention strategies to include:
 - i. Safety standards that include safe play policies; and
 - ii. Mandatory safety gear/equipment (tailored to individual sport settings).
- b) Mandatory concussion and head injury protocols that work to:
 - i. Reduce the occurrence of concussions and head injury by promoting: safe play practices; fostering concussion/injury prevention and reporting; peer-to-peer support, and combatting injury stigmatization;
 - ii. Ensure the prompt detection, and standardized early management of concussion and head injuries, by informing all potential stakeholders (in the preseason phase) about the nature/risks of concussion and head injury, and how any such occurrence will be dealt with should they occur;
 - iii. Enshrine into practice removal-from-play, and post-injury observation of athletes;
 - iv. Progressively reintegrate students back into symptom guided educational and physical activities based on the most current recommendations;²
 - v. Reintegrate injured athletes back into unrestricted training activities and sport once medical clearance has been obtained; and
 - vi. Foster better lines of communication for injury management/recovery between: parents, athletes, coaches, school personnel, therapists and physicians.

- vii. Address potentially serious mental health issues that may arise post-concussive injury.

9. Employers (Occupational Considerations)

Should:

- a) Comply with workplace safety laws and implement safety standards to reduce the incidence of head injuries in the work environment.
- b) Integrate considerations for concussion and head injury in health and safety protocols that work to:
 - i. Reduce the occurrence of concussions and head injury by promoting: safe practices; concussion/injury prevention and reporting; peer-to-peer support, and combats injury stigmatization;
 - ii. Ensure prompt detection and standardized early management of concussion and head injuries by informing potential stakeholders about the nature/risks of concussion and head injury, and how occurrences will be dealt with should they occur;
 - iii. Enshrine into practice/ workplace culture the removal-from-work, and post-injury observation of workers;
 - iv. Progressively reintegrate workers back into symptom guided cognitive and physical activities based on the most current recommendations;
 - v. Reintegrate injured workers with a confirmed diagnosis of concussion, progressively back into work activities only once medical clearance has been obtained; and
 - vi. Foster better lines of communication, and support for, injury management between: employees, employers, medical professionals and insurances.
 - vii. Address the potentially serious mental health issues that may arise post-concussive injury.

10. Governments & Professional Regulatory Bodies:

Should:

- a) Implement comprehensive public health strategies for the Canadian population to:
 - i. Increase awareness that concussions can be sustained in accidents, sports, leisure and occupational contexts;
 - ii. Inform head injuries should be taken seriously; and
 - iii. Explain how and why concussions should be prevented and promptly assessed by a physician where they are suspected to have occurred.
- b) Define appropriate scopes of practice for all health professionals involved in the field of concussion detection, management, and treatment.

- c) Work with key stakeholders to develop compensation structures to support physicians to allocate the time necessary to: (1) conduct appropriate assessments to rule out concussions, (2) provide ongoing concussion management, and (3) develop detailed medical clearance plans.
- d) Work with key stakeholders to develop standardized educational tools for physicians to provide to patients with concussions.
 - i. Ideally this would include contextualized tools for sports teams, schools, and employers.
- e) Adopt legislation or regulation for educational institutions and community-based sport associations to establish clear expectations/obligations regarding concussion awareness and management for youth in sports (e.g., Ontario's Rowan's law).
 - i. To have meaningful impact, such initiatives must also be accompanied by: implementation funding to support the development and implementation of sport specific concussion management protocols; and monitoring/compliance programs.
- f) Establish a national concussion and sports injury surveillance system (with standardized metrics) to collect detailed head and sport injury related information. Thus, providing the ability to research such injuries in an ongoing and timely manner.
- g) Provide research opportunities/funding on concussions. Specific examples of research areas to prioritize include:
 - i. Effective prevention strategies for both adults and children in a range of sport, leisure, or occupational environments;
 - ii. The incidence and impact of concussions in children, and how to reduce their occurrence (inside and outside of sport);
 - iii. Address knowledge gaps for concussion identification, management, and medical clearance for physicians not specialized in concussion care;
 - iv. Explore all health professionals' participation in concussion management providing for respective: competency, expertise, interdisciplinary collaboration, and appropriate roles;
 - v. Evaluate how emerging point of care diagnostics and biomarker testing will be incorporated into sport, leisure and work environments;
 - vi. Continued development of effective, user-friendly, and age appropriate management strategies/tools for physicians regarding concussion identification, management, and medical clearances; and
 - vii. Develop a harmonized understanding of "concussion" and "mild traumatic brain injury" (MTBI) constructs/concepts, so that adults with concussion signs or symptoms, who do not meet the more restrictive MTBI criteria, are properly managed.

¹ McCrory P, Meeuwisse W, Dvorak J, et al. Consensus Statement on Concussion in Sport - the 5th International Conference on Concussion in Sport Held in Berlin. *Br J Sports Med* 2017, 51: 838-847.

² Parachute Canada. Canadian Guideline on Concussion in Sport. 2017. Available: <http://www.parachutecanada.org/injury-topics/item/canadian-guideline-on-concussion-in-sport> (accessed 2018 Jul 31).

³ Concussion in Sport Group. Concussion Recognition Tool 5. *Br J Sports Med* 2017 51: 872. Available: <https://bjsm.bmj.com/content/bjsports/early/2017/04/26/bjsports-2017-097508CRT5.full.pdf> (accessed 2018 July 31st). (accessed 2018 Jul 31).

⁴ Ontario Neurotrauma Foundation. *Guidelines for Concussion/Mild Traumatic Brain Injury & Persistent Symptoms. Health Care Professional Version. 3rd Ed, Adults (18 + years of age)*. Toronto: Ontario Neurotrauma Foundation; 2018. Available: <http://braininjuryguidelines.org/concussion/fileadmin/media/adult-concussion-guidelines-3rd-edition.pdf> (accessed 2018 Jul 31).

⁵ Concussion in Sport Group. *Sport Concussion Assessment Tool – 5th Ed*. *Br J Sports Med* 2017, 0:1-8. Available: <https://bjsm.bmj.com/content/bjsports/early/2017/04/26/bjsports-2017-097508CRT5.full.pdf> (accessed 2018 July 31).