

Addressing the need for standardized concussion care in Canada

Concussion Awareness Training Tool

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There are few health issues as complex as concussions. Sport associations, media, parents, coaches, scientists, and health practitioners, among many others, share a common goal of increased awareness and understanding. However, to date, even with this collective aim, there remains a prevalent sense of disconnect among all parties. This is in part owing to the ambiguous nature of the injury and potentially high variation in recovery experiences between and within individuals. For this reason, establishing a comprehensive and inclusive concussion protocol has been a global goal, with the development of the first Consensus Statement on Concussion in Sport by the Concussion in Sport Group in 2001, and subsequent reviews in 2004, 2008, and 2012.¹⁻⁴ Its development was considered a pinnacle achievement in the field, as clearly defined consensus recommendations were established to assist in maintaining a high standard of care in sport-related concussion around the world.

Knowledge translation for concussion care

Stoller et al sought to gauge knowledge translation for the established consensus statements and protocols.⁵ Two hundred seventy FPs, emergency department physicians (EDPs), and pediatricians in community teaching hospitals in Ontario were invited by their department chiefs to participate in a 19-question multiple-choice survey. The response rate was 43.7%; more than half of respondents were FPs. The authors frequently found inconsistencies and large knowledge gaps among the aforementioned physicians. Specifically, 49% of FP, 52% of EDP, and 27% of pediatrician respondents reported not knowing of any consensus statements on concussion in sport. Further, when respondents were probed about one of the principal tools revised in the consensus

statements, the Sport Concussion Assessment Tool, version 2 (SCAT2), 54% of FPs, 86% of EDPs, and 78% of pediatricians reported never using it in the clinical setting. However, most telling is that even though cognitive rest is considered part of the criterion standard of concussion recovery, only 49% of FPs, 57% of EDPs, and 36% of pediatricians consistently recommended it.

Not only are current concussion management knowledge translation strategies inadequate, but patients with concussions are receiving inconsistent messages from their health care providers, which could lead to poor health outcomes. Stoller et al highlighted Parachute (formerly ThinkFirst Canada) as one of the groups leading concussion knowledge translation—delivering current and comprehensive concussion treatment strategies to Canadian physicians. However, in their study 68% of respondents reported the usefulness of the ThinkFirst website as “not applicable.”⁵ Perhaps one can infer that some respondents were not even aware of its existence. The authors went further and stated that all organizations producing and disseminating concussion tools and materials needed to evaluate the outcomes of their initiatives to address problem areas and target specific groups.

Burden of concussion

In British Columbia, concussion accounted for 9.7% of 4151 head injury hospitalizations from 2001 to 2010.⁶ Of these, 1619 were among children and youth 0 to 19 years of age.⁷ Within this population, rates were highest among youth aged 10 to 14 years at 19.8 concussion hospitalizations per 100 000 population. Within the lower mainland of British Columbia, there were an estimated 16 888 emergency department visits for concussion in 2011, with children and youth accounting for 39.5%.⁶ In 2010, the cost of concussion hospitalization in British Columbia was \$2.4 million, excluding concussion resulting from intentional assault or self-harm.⁸

In 2012, with this growing recognition of the burden of concussion, British Columbia recognized the need for comprehensive, accessible, and up-to-date concussion resources. Concussion resources did exist, such as the Centers for Disease Control and Prevention's HEADS UP and the ThinkFirst materials (now Parachute). However, at the time the tools that existed were not Canadian-based, had a cost attached to them,



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This article has been peer reviewed.
Can Fam Physician 2015;61:660-2

La traduction en français de cet article se trouve à www.cfp.ca dans la table des matières du numéro d'août 2015 à la page e347.

or were not up-to-date. Since that time, many of these resources have now been updated and expanded, and the pool of concussion resources continues to grow (physicians.cattonline.com/resources); examples are presented in **Box 1**.⁹ Free online tools are also available for specific needs, such as the SCAT3, the Balance Error Scoring System for evaluating static postural stability, the Abbreviated Westmead Post Traumatic Amnesia Scale, and many others.

Box 1. Concussion resources

Comprehensive, accessible, up-to-date resources include the following:

- *Parachute's Concussion Toolkit* (parachutecanada.org/active-and-safe)
- *Ontario Neurotrauma Foundation Guidelines for Diagnosing and Managing Pediatric Concussion* (<http://onf.org/documents/guidelines-for-pediatric-concussion>)⁹
- *Montreal Children's Hospital Trauma Concussion Kit, available in both English and French* (www.thechildren.com/health-info/trauma/mch-trauma-concussion-kit)
- *Centers for Disease Control and Prevention's HEADS UP: Concussion in Youth Sports, available in both English and Spanish* (www.cdc.gov/headsup/youthsports)

Concussion Awareness Training Toolkit

The growing recognition of the burden of concussion also led to the development of the Concussion Awareness Training Toolkit (CATT; www.cattonline.com). To inform the instructional design of the CATT courses, a front-end learning analysis was done, looking at learner characteristics, cognitive styles, previous learning, and more. Informal focus groups were conducted among physicians, coaches, parents, and educators. These individuals were asked what learning style they preferred as well as how they perceived their peers' preferences in learning. This provided insight into similarities and differences in learning styles when engaging in activities such as reading, listening, and watching. These 3 learning aspects are all incorporated into the CATT learning tool. The CATT was extensively reviewed by various committees involved in concussion research and education, and was disseminated provincially, nationally, and internationally with the goal of providing information to physicians, nurses, physiotherapists, parents, coaches, athletes, educators, and others in a user-friendly, easy-to-understand, and easy-to-navigate format. The tool is available 24 hours a day, 7 days a week, free of charge, and is updated every other week to incorporate new evidence-based research and resources. Unlike more structured resources, it allows flexibility to navigate freely and to review the course content over more than 1 session. Further, there are plans to enhance the suite of tools in the CATT based on

feedback received by users, including optimization for mobile devices, translation into different languages, and the development of a mobile device application. A province-wide social marketing campaign to further knowledge translation is also planned once all 3 tools are complete.


Phase 1 of the CATT involved developing a tool to standardize care in British Columbia and throughout Canada among medical professionals (CATT MP). Funded by the BC Children's Hospital Foundation and Child Health BC, the CATT was developed in collaboration with Doctors of BC (formerly the BC Medical Association) by a team of injury prevention researchers and EDPs. The aim of the CATT is to use established international principles (fourth Consensus Statement on Concussion in Sport⁴) to standardize concussion recognition, diagnosis, treatment, and management. The CATT features a learner-directed online training module (approximately 40 minutes in length and eligible for Mainpro-M2 credits), supplemented with diagnostic tools (both the adult and the child SCAT3, electronic-based and printable) and links to clinical resources, printable patient handouts, journal articles, related websites, concussion videos, and case studies. Evaluation of the CATT MP demonstrated a statistically significant positive change in concussion practices among both physicians ($P=.001$) and nurses ($P=.005$). Improved concussion knowledge was detected among physicians who reported seeing more than 10 concussion cases per year ($P=.039$), while nurses demonstrated statistically significant positive change in attitudes about concussion as a health issue ($P=.035$). The CATT MP was rolled out on April 15, 2013, and to date has received more than 42 000 hits from around the world.

Phase 2 of the CATT is tailored to parents, players, and coaches (CATT PPC). Parents are central to the management of their child's concussion recovery. They are responsible for monitoring their child on a day-to-day basis, seeking medical attention, and ensuring their child follows the recommended treatment. The players themselves—children, youth, and adolescents at risk of concussion—also need to understand what a concussion is and how it occurs, what the symptoms are, and the importance of acknowledging a potential concussion. And finally, coaches, including community volunteer coaches, need to understand the principles of concussion management to support players in high-risk activities, compiling preparticipation information and taking appropriate action when a player sustains an injury that could be a concussion. The CATT PPC was launched on June 15, 2014, and has received more than 12 000 hits. Its evaluation found a significant positive change in concussion knowledge among parents ($P=.002$).

Finally, the third and final phase of CATT will address the issue for school professionals (CATT SP). Schools,

specifically teachers and administrators, play an important role in the management of students with concussions. Educators need to be aware of the physical, cognitive, academic, behavioural, and emotional outcomes of concussions and need to make accommodations for students in their classrooms. The Canadian Paediatric Society recommends that anyone working with children be educated about the signs and symptoms of concussion and the appropriate management of a child with a concussion. Return-to-learn protocols for students have received increasing attention following the development of return-to-play guidelines for athletes as part of a concussion care plan.¹⁰ The CATT SP is currently in development and is anticipated to be released in the summer of 2015.

Conclusion

As reported in the study by Stoller et al³ and countless online media articles that are being published and disseminated, there is now concrete evidence of a substantial disconnect among physicians with regard to concussion awareness and treatment methods. The field of concussion research has grown into a comprehensive and multidisciplinary network that has implications and includes audiences such as health practitioners, researchers, sport governing bodies, non-governmental organizations, and governments. Concerted efforts must be directed toward the exchange of knowledge and information among these audiences. The CATT addresses the need for standardizing clinical practice by using a novel and comprehensive platform. 

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Competing interests

Dr Babul is responsible for the idea, development, and oversight of the Concussion Awareness Training Toolkit (CATT) project in its entirety; she also holds the copyright for the CATT. However, there is no monetary benefit whatsoever from the release of the CATT.

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The opinions expressed in commentaries are those of the authors. Publication does not imply endorsement by the College of Family Physicians of Canada.

References

1. Aubry M, Cantu R, Dvorak J, Graf-Baumann T, Johnston K, Kelly J, et al. Summary and agreement statement of the First International Conference on Concussion in Sport, Vienna 2001. Recommendations for the improvement of safety and health of athletes who may suffer concussive injuries. *Br J Sports Med* 2002;36(1):6-10.
2. McCrory P, Johnston K, Meeuwisse W, Aubry M, Cantu R, Dvorak J, et al. Summary and agreement statement of the 2nd International Conference on Concussion in Sport, Prague 2004. *Br J Sports Med* 2005;39(4):196-204.
3. McCrory P, Meeuwisse W, Johnston K, Dvorak J, Aubry M, Molloy M, et al. Consensus statement on concussion in sport: the 3rd International Conference on Concussion in Sport held in Zurich, November 2008. *J Athl Train* 2009;44(4):434-48.
4. McCrory P, Meeuwisse WH, Aubry M, Cantu B, Dvorák J, Echemendia RJ, et al. Consensus statement on concussion in sport: the 4th International Conference on Concussion in Sport held in Zurich, November 2012. *Br J Sports Med* 2013;47(5):250-8.
5. Stoller J, Carson JD, Garel A, Libfeld P, Snow CL, Law M, et al. Do family physicians, emergency department physicians, and pediatricians give consistent sport-related concussion management advice? *Can Fam Physician* 2014;60:548-52.
6. Rajabali F, Ibrahimova A, Turcotte K, Babul S. *The burden of concussion in British Columbia*. Vancouver, BC: BC Injury Research and Prevention Unit, Child Health BC; 2012. Available from: http://childhealthbc.ca/?drawer=Concussion*Report. Accessed 2015 Feb 23.
7. Rajabali F, Ibrahimova A, Turcotte K, Babul S. *Concussion among children and youth in British Columbia*. Vancouver, BC: BC Injury Research and Prevention Unit, Child Health BC; 2013. Available from: http://childhealthbc.ca/?drawer=Concussion*Report. Accessed 2015 Feb 23.
8. *Injury Data Online Tool*. Vancouver, BC: BC Injury Research and Prevention Unit; 2013. Available from: www.injuryresearch.bc.ca. Accessed 2015 Jun 18.
9. Ontario Neurotrauma Foundation. *Guidelines for diagnosing and managing pediatric concussion*. 1st ed. Toronto, ON: Ontario Neurotrauma Foundation; 2014. Available from: <http://onf.org/documents/guidelines-for-pediatric-concussion>. Accessed 2015 Jun 19.
10. Master CL, Gioia GA, Leddy JJ, Grady MF. Importance of 'return-to-learn' in pediatric and adolescent concussion. *Pediatr Ann* 2012;41(9):e180-5.