Concussion: A Public Health Responsibility to Our Youth

"No head trauma is good head trauma." Dr. Robert Cantu, MD Clinical Professor of Neurosurgery at Boston University School of Medicine; Chairman Department of Surgery, Chief Neurosurgery Service, Director Service Sports Medicine at Emerson Hospital Researcher, Scientist, Clinician

Concussion is serious.

Concussion is a brain injury.

Concussion is a medical condition.

Concussions and sub-concussive hits are cumulative.

The first concussion leaves the brain more susceptible to future injury.

Current replicable scientific research clearly demonstrates that brain function, metabolism, and matter are altered post-concussion. The white matter of the brain is altered with sub-concussive hits.

There are gaps in knowledge about the identification, diagnosis, management, and support for individuals who have suffered concussion(s).

"We have NO treatment for concussions, we have NO treatment for the accumulative concussion, we have NO treatment for the repetitive concussion." Dr. Charles Tator, PhD, MD

Toronto Neurosurgeon, Researcher, Scientist, Clinician and Founder of Think First Canada.

Medical evidence suggests that young athletes are more vulnerable to concussions and have a longer period of recovery than adults.

Young athletes playing in recreational and school leagues are less likely to go through medical screening prior to participating and often will not benefit from the presence of a team doctor or trainer when concussions occur.

Sports organizations, schools, coaches, (parents) and health care providers have a legal duty of care to protect the health and safety of children participating in sports which raises special issues when young athletes suffer sports-related concussions.

Evidence of the lasting and debilitating effects that these injuries may have on young athletes emphasizes the importance of taking preventative measures to curb the incidence of sports related concussions and adopting effective concussion identification and post-concussion management procedures.

Marie-France Wilson, Young Athletes At Risk: Preventing and Managing Consequences of Sports Concussions in Young Athletes and the Related Legal Issues, 21 Marquette. Sports Law Review 241 (2010)

Available at: http://scholarship.law.marquette.edu/sportslaw/vol21/iss1/8

"Hockey and other contact sports need to be respected as a game, not as a potentially life-anddeath battle that places participants at needless risk for future long-term disability." Dr. Paul Echlin, MD, Board Certified Sports Medicine Specialist Researcher, Clinician, HCEP Primary Investigator, Founder of <u>www.sportconcussionlibrary.com</u> 11 February 2013

The Honourable Brad Wall Premier of Saskatchewan Room 226, Legislative Building Regina, Saskatchewan S4S 0B3

Dear Premier Wall,

On 22 March 2012, I sent former Health Minister Don McMorris a letter along with supporting documentation urging improvements in the current health care approach to identifying, diagnosing, managing care, and supporting individuals with traumatic brain injuries. My letter followed several months of inquiry into what is available in rural Saskatchewan for people who have experienced a traumatic concussive brain injury, often referred to as concussion or mTBI. The revisions in this letter reflect my discoveries since writing the March 2012 letter plus some of the earlier letter content.

BACKGROUND

My personal experience with brain injury occurred after my moving bicycle flipped and my unprotected head smashed down on concrete halfway down a long driveway. It was a traumatic event in more ways than one.

My youngest daughter Jill recalls the accident:

All I see in my mind is you laying on the ground, your eyes rolling back, then blood slowly running out of your head, onto the street. I'm trying to scream, but I can't. Then, people running around me. I'm frozen. I'm in the same spot. You're talking about moving to Boston. Then, a fireman picks me up and moves me out of the way. Then, my mind goes blank. It's later in the day. Grandma and Grandpa come over and thank Eric and Amie for all their help. Nobody says anything to me. I lay in bed that night and think you're going to die during the night.

I was rendered unconscious, suffered a large scalp wound and many abrasions, taken to hospital by ambulance where my head was x-rayed, shaved, and my scalp sutured. I was then observed for four hours in the emergency room before being sent home with my husband. I have little recollection of events post-injury and have no memory of getting on the bicycle or the accident itself. The follow-up care I received in Riverside, California where the accident occurred was minimal, in spite of my repeated visits to the doctor asking for help. The next ten years were spent struggling daily with headaches, fatigue, and a very impaired memory with its very real and frightening cognitive consequences.

One of the greatest problems I encountered post-injury in 1985 was ignorance. My doctor understood little about brain (mal)functions in the context of injury and the range of difficulties that can be attendant with an injured brain, especially when one looks 'normal.` In this vacuum, many errors were made in my follow-up care and support. I was left on my own to sort things out.

Fortunately, research into brain injury has come into focus over the past 10 - 12 years, due in part to military deployments to Iraq and Afghanistan, the return of brain-injured soldiers, and the media coverage of sports-related concussions. There is much more medical research literature and data available today about the how brain injury occurs, how the various parts of the brain may be impacted by injury, the importance of early identification of injury, and the implementation of appropriate protocols immediately following a suspected brain injury.

What is still unknown is how the brain will respond to the injury over time. There is a scarcity of rigorous clinical trial data demonstrating the efficacy of pharmacological protocols for TCBI-related post-concussive symptoms, including depression.

Traumatic concussive brain injury, brain injury-related depression, and other post-concussive syndrome symptoms must all be taken very seriously in the general public and in sports. Because symptoms are injury-based, treatment protocols must also be based upon 1) a good understanding of the brain itself, 2) an understanding of how the injured brain may be either helped or further injured by pharmacological interventions, and 3) ongoing research that demonstrates the appropriateness, safety, and therapeutic value of current practices and establishes evidence-based practice standards.

In rural communities, the combination of 1) unreported concussion, under diagnoses, misdiagnoses, or missed diagnosis and, 2) limited resources, including reduced medical and mental health staffing who may also lack training in the identification, diagnosis, management, and support for those with traumatic concussive brain injury implies that the potential for missed TBI diagnoses resulting in misguided or no treatment is likely even higher in this population.

In 1993, a former high school classmate of my daughters came to see me in the literacy/ESL support office at Lakeland College in Vermilion, AB. During our initial meeting, I asked Aaron if he had ever received a concussion while playing hockey. He had started playing when he was about six years old and continued through Junior B's. Aaron said there had likely been several concussions – all undiagnosed and untreated. He then described the difficulties he encountered going into the seventh grade following a memorable hit during a hockey tournament in late winter of the sixth grade. At school, he was chided for being lazy and disinterested. What he was reading, to understand what was being said, etc. His junior high experience was a frustrating one as he had been a good student in elementary school. When asked about how he got through high school, Aaron said he had to write everything down and study right up to an exam. It was lots of extra work and if he was tired, his brain was like a sieve...the information simply drained through.

Aaron returned to my office after receiving the results of an assessment administered by an Edmonton area psychologist contracted by Career Development. The results were stunning. Stated clearly in the psychologist's detailed report - and shared with the several people gathered together by Career Development staff - was the psychologist's determination that Aaron was of low average intelligence and therefore, unable to enter the journeyman carpentry program at the college. The Aaron described in the eight page assessment that lay on the desk in front of me was not consistent with the Aaron I knew. He gave me written permission to speak with his former high school teachers and guidance counsellor. Not one of these individuals concurred with the psychologist's findings.

Dr. Ed Inglis, a physician I had worked for and respected, met with Aaron and arranged for a second assessment with a brain injury specialist at the Glenrose Hospital in Edmonton. It seemed criminal to



think that a three hour assessment – with no medical/personal history requested prior to the testing could potentially destroy this young man's future employment opportunities. A year later, the much awaited second assessment was administered. Aaron was asked to return to the Glenrose for the results where he was told, "Never let anyone question your intelligence again. You have an injured brain."

Aaron completed the journeyman's program with help from the Learning Assistance Centre and later started his own construction business. But life hasn't been easy. Aaron still suffers from headaches, mood swings, fatigue, and memory/concentration/focus problems. Learning new information takes additional time and effort. He strives to be a good father to three teenagers and a soon-to-be three year old. He also teaches Safe Hockey to the kids he coaches – skating skills, stick and puck handling, sportsmanship, team building, discipline. Aaron doesn't wish to see any one of them get hurt or hurt others. He knows firsthand what it is like to have to battle the affects of brain injury each and every day. Aaron has given permission to share his story and is willing to talk with you personally.

My interest in concussion was rekindled after meeting and spending time talking with a former hockey player in Davidson in early fall of 2011. These talks led me on a search to determine what is available in Saskatchewan in the way of support for individuals with traumatic brain injury, especially concussion. My next step was to search for a self-help model that could be replicated in communities to support people who have suffered concussions.

As a relative newcomer to Saskatchewan, my first contacts were made to the Saskatchewan Brain Injury Association. There I learned that there are but a handful of SBIA sponsored support groups meeting in Saskatoon, Regina, Moose Jaw, Yorkton, and Prince Albert and these exist primarily for the more severely injured and their caregivers.

According to the 2010 Saskatchewan Acquired Brain Injury Partnership evaluation report, people with a 'mild' brain injury **are not** served by ABIP even though up to 20% may experience more complicated post-concussive symptoms following brain injury. According to concussion management experts, difficulties with cognitive and executive functioning may result in job instability and increased reliability on family members or significant others. In a recent conversation with an Acquired Brain Injury Education & Prevention Coordinator, I learned that individuals with a diagnosis of concussion can meet with the coordinator in their region for one-time concussion information and prevention strategies visit.

Having learned that depression is also a common symptom post-concussion, and that thinking about suicide can be present during depressive episodes, I remain puzzled by the exclusion of this cohort of individuals living with brain injury from receiving additional support services. Having lost both my youngest brother Randy and my mother to suicide, my family knows firsthand the impact of these most unexpected and unwelcome deaths.

My journey into learning more about best practices in traumatic concussive brain injury identification, diagnoses, management, support and prevention has proven to be somewhat disconcerting. Journey with me and you might just understand why.

In North America, we have been groomed to make emotional decisions rather than critically assessing the veracity of product claims or statements of "fact". It is common practice in a market driven society for corporations to employ behavioural psychologists as advisors when developing and launching advertising campaigns. These campaigns are leveraged to engage consumers on an emotional rather than a reasoning level.

During the Saskatchewan Brain Injury Association's Brain Blitz Roundtable Discussion in Regina, April 2012, Toronto Maple Leaf president Ken Dryden deftly steered away from discussing fighting in hockey by asserting that "people either like fighting or they don't." I had the sense that Mr. Dryden was purposely redirecting the dialogue to prevent audience members from questioning him about the impact on hockey players who engage in fighting and the potential for brain or other injury. It also seemed an odd tactic to employ during a discussion about contact sports and brain injury.

Noticeably absent from this roundtable discussion were older concussed athletes who were no longer able or willing to play the game. The athletes being interviewed were just starting into their adult years and had not lived with brain injury for an extended period of time. One 18 year old had made the decision to quit playing post-injury and was, understandably, emotional after spending years of his life pursuing the goal of playing major league hockey some day. If this same young man develops anger management or depression issues in the future or experiences lasting cognitive difficulties, will his symptom management continue to reflect earlier brain injury - if there is care to be found - or might he be fast-tracked under the mental health umbrella and treated as mentally ill?

Dryden's refusal to discuss fighting in hockey may have its roots in earlier medical ignorance about concussion. In their study **Concussion and Football: Failures to Respond by the NFL and the Medical Profession,** researchers David Orentlicher, MD, JD and William S. David, MD, PhD point out:

- 1) While medical experts have come to a better understanding of concussion in recent years, there still is much more to learn about concussion.
- 2) In reviewing the response of the National Football League (NFL) to concussion, one can easily think that the league was too slow to worry about the medical consequences of head trauma.
- 3) Physicians also did not worry very much about the medical consequences of concussions. For some time, neurologic experts disagreed as to whether concussions could cause permanent injury, with many attributing patient symptoms to psychological issues or to the incentives created by compensation programs for people with disabling conditions.
- 4) Indeed for decades, concussions were viewed as a benign phenomenon without any structural damage to the brain and whose symptoms resolved fully within a short period of time.

We know better in 2013. Recent scientifically conducted brain research has demonstrated that brain injury can have anything but blissful outcomes for the injured and their loved ones. Claiming ignorance, downplaying the significance of injury, or refusing to seriously engage in injury prevention policy discussions is no longer acceptable.

Children and youth should have the best safety procedures available to prevent concussion because research has demonstrated that this cohort may be more adversely affected by traumatic concussive brain injury and take longer to heal from their injuries.

In 2010, the NFL put up posters in players' locker rooms stating, "Concussions can change your life and your family's life forever." With the 2011 deaths of hockey players Wade Belak, Rick Rypien, and Derek Boogaard – a Saskatchewan boy, we should all be paying closer attention to what is going on in court rooms and corporate insurance company boardrooms. According to trending reports discussed in early 2012 - and which continue to be watched closely by the sports entertainment complex - insurance companies are considering in earnest whether or not they will continue to provide concussion coverage for hockey players and athletes in other contact sports. *http://www.sportsbusinessnews.com/content/year-sports-%E2%80%93-concussions-order-day-business-sports*

Given the recent trend of such (sports-related) lawsuits in the United States...it is important for all interested parties in Canada to take a more pro-active role in facing these issues and to craft appropriate rules, regulations and guidelines before such lawsuits become a quagmire and cripple the culture and business of sport.

... with appropriate laws and regulations in place as well as an informed community, the occurrence and consequences of concussions can, at the very least, be significantly reduced. Head-related injuries have important implications not just for players but for community organizations, athletic associations at the local and provincial level, school boards, coaches, parents, and medical trainers alike. Thus, comprehensively developing this area of the law will serve to better communities, the sports industry and the lives of athletes as a whole.

David A. Bertschi, Bertschi Orth Smith LLP, Stéphanie Drisdelle, Bertschi Orth Smith LLP, Özlem Eskicioğlu, Student-at-Law, Bertschi Orth Smith LLP. Sport-Related Concussions: A Canadian Legal Perspective. Available at: <u>http://www.thefederation.org/documents/10.Sports%20Related%20Concussions.pdf</u>

Concussion: Definition

World Health Concussion definition: <u>http://www.concussionsontario.org/faq/#Definition</u>

- 1. Concussion may be caused either by a direct blow to the head, face, neck or elsewhere on the body with an "impulsive" force transmitted to the head.
- 2. Concussion typically results in the rapid onset of short-lived impairment of neurologic function that resolves spontaneously.
- 3. Concussion may result in neuropathological changes, but the acute clinical symptoms largely reflect a functional disturbance rather than a structural injury.
- 4. Concussion results in a graded set of clinical symptoms that may or may not involve loss of consciousness. Resolution of the clinical and cognitive symptoms typically follows a sequential course. However, it is important to note that in a small percentage of cases, post-concussive symptoms may be prolonged.
- 5. No abnormality on standard structural neuroimaging studies is seen in concussion.

1 in **26** Canadians are living with an acquired brain injury. Many are unaware. **80 – 100%** of those with a brain injury will have some sort of communication disorder. Brain injuries are the **#1** killer and disabler **of people under 44**. **1** in **5** sports-related injuries are head injuries.

~ Ontario Brain Injury Association <u>http://www.obia.ca/index.php/education</u>

Quick fact: Only one in 20 people with traumatic brain injury receive the rehabilitation they require. *Understanding Brain Injury in Adolescence: A guide for parents, coaches, educators and those that work with youth.* The Sun Life Financial Chair in Adolescent Mental Health, Dalhousie University: 2012 Available at: <u>www.teenmentalhealth.org</u>

Concussion: Depression

IN THE GENERAL POPULATION

In a Vanderbilt University news release concerning a 2011 study, *Traumatic Brain Injury and Depression, Comparative Effectiveness Review No. 25,* funded by the Agency for Healthcare Research and Quality (AHRQ), Dr. Oscar Guillamondegui, assistant professor in Vanderbilt's Division of Trauma and Surgical Critical Care in Nashville, TN, states:

<u>Any</u> patient who has a traumatic brain injury is at a real risk for developing depression, short and long term. It doesn't matter where on the timeline that you check the patient population – six months, 12 months, two years, five years – the prevalence is always around 30 percent across the board. In the general population, about 9 percent to 10 percent of people have depression.

Practitioners should ask about history of TBI and follow-up when they hear symptoms such as irritability, restlessness, anxiety and sleeplessness.

Guillamondegui et al concluded their study with this statement:

We find a concerning lack of high-quality evidence to inform clinical decision-making for the 1 to 2 million individuals in the United States who experience traumatic brain injury each year. Lack of treatment studies focused on this population is especially remarkable. Given how common, concerning, and debilitating the combination of TBI and depression can be, a priority on promoting high-quality research in the United States is imperative.

Dr. Guillamondegui`s co-researcher, Dr. Melissa McPheeters, a healthcare epidemiologist and codirector of Vanderbilt's Evidence-based Practice Center, cautions that:

TBI is also likely under-reported due to the high prevalence of mild injury where patients might not go to the emergency department. Patients and their families need to know about this. They need to know what to look for because they are the ones who will see the changes first.

IN SPORTS

Andrew King, a former youth hockey player in B.C., suffered seven concussions (four diagnosed, three unreported) in two years playing at the junior level. Now a free-lance journalist based in Brussels, he writes in the 28 November 2011 edition of the *Montreal Gazette*:

The seriousness of concussion and depression in the game of hockey is getting worse. Making lifelasting sacrifices before the end of puberty in the name of hockey is wrong. Hockey culture must change, along with the macho mentality that dominates in the dressing room. The teenage years are hard to get through, harder still when you realize the price of your hockey dream has been constant headache and depression.

In his guest post 15 February 2011 on the hockey blog, *All We Do is Puck*, Vinod Venugopalan, a medical researcher and clinician from the Montreal Neurological Institute and Hospital at McGill University also raises concerns about hockey players' brain health.

I suspect that a great percentage of players come to the NHL with unreported head injuries. Part of the responsibility lies with the player who is reluctant to tell the trainer he's hurt for of fear of losing ice-time, his job, draftability, or just simply appearing weak. In a game whose very ethos is defined by resilience and toughness, admitting weakness is career suicide.

Canadian neuropsychologist Dr. Alain Ptito, Director of the Department of Psychology of the McGill University Health Centre, reports that his team's research on concussed elite athletes suffering from post-concussive syndrome demonstrates functional abnormalities in the frontal lobes of the brain using *f*MRI imaging.

CONCLUSIONS: The results suggest that depressed mood following a concussion may reflect an underlying pathophysiology consistent with a limbic-frontal model of depression. Given that depression is associated with considerable functional disability, this finding has important clinical implications for the management of individuals with a cerebral concussion.

Depression is one of a number of *persisting* symptoms experienced by athletes following sports concussions and can reach an astounding 40%.

In a Herald Sun (Australia) interview published 01 March 2012, Dr. Ptito reiterated that there is a strong link between TBI and depression.

"There is little doubt at this point that depression and traumatic brain injury are related," Dr. Ptito told the *Herald Sun*.

"Also, the diagnosis of depression increases the more traumatic brain injuries one has suffered. You can see this in the huge number of depression cases in American football players who usually suffer multiple concussions in their lifetime."

Concussion: Depression and Suicide

A 2011 report, AHRQ *Traumatic Brain Injury and Depression*, Comparative Effectiveness Review #25: April 2011 reveals that <u>major depressive disorder (MDD) may be the most common and challenging mental health condition that patients encounter following a TBI—53.1% of TBI patients in the study experienced MDD at least once in the first year after their injury. Another study showed that suicidal thoughts and attempts are also common reactions to TBI - 23% of the participants had thoughts of suicide, while 17% actually attempted suicide after their injury. These higher rates of suicidal behaviors may also be connected to MDD following TBI.</u>

Available at: http://www.traumaticbraininjury.net/depression-suicide-tbi/

Concussion: Depression Treatment

In their collaborative study entitled *Depression and Cognitive Complaints Following Mild Traumatic Brain Injury* (Department of Psychiatry, New York University; Dartmouth Medical School, Lebanon, ME; the Brain Injury Rehabilitation Unit, Health-ONR Spalding Rehabilitation Hospital, Aurora, CO; and the Neuro-Behavioral Disorders Program, Department of Psychiatry, University of Colorado Denver School of Medicine) published in the American Journal of Psychiatry 2009 166: 653-661, researchers concluded:

Although depression occurs most often in the first year after TBI, the risk of developing depression remains elevated <u>for decades</u> thereafter.

When pharmacotherapy is initiated, a <u>start low and go slow</u> approach is recommended. Given the <u>absence</u> of compelling evidence that medication hastens recovery in mild TBI, we recommend that the decision to initiate pharmacotherapy be decided in partnership with the patient and his or her family.

Common clinical experience, as well as a limited body of literature, suggests that persons with TBI may be more susceptible to the side effects of many psychotropic medications, suggesting a heightened need for vigilance for such effects when prescribing psychotropic agents in this context.

Additionally, no medications have been approved by the U.S. Food and Drug Administration specifically for the treatment of post-TBI depression, or for any other posttraumatic neuropsychiatric problem. The use of these agents is therefore "off-label" and will in each case be a matter of empiric trial.

Education regarding TBI and recovery expectations, reassurance, and frequent support are associated with better outcomes during the first year after the injury was sustained.

Peer support programs for persons with TBI and their families increase their knowledge about TBI, improve general outlook, enhance their ability to cope with depression, and improve quality of life after TBI.

Concussion: Evaluation and Diagnostic Concerns

IN THE GENERAL PUBLIC

Drs. Silver, McAllister, and Arciniegas in the aforementioned study make the following caveats regarding the evaluation of concussion in their research:

First, because of the retrospective nature of evaluating a TBI—days, weeks, or months after the event—the potential for misreporting the event and its immediate neuropsychiatric manifestations is significant.

Second, it is difficult to gauge accurately the mechanics, severity, and effects of an injury after the fact. In many cases, an informed but subjective clinical judgment will be required to confirm or rule out the diagnosis of TBI.

Third, patients (and some clinicians) frequently misinterpret the immediate sequelae of TBI and their diagnostic implications. For example, a patient unable to recall portions of the event may misinterpret impaired recall due to posttraumatic amnesia as loss of consciousness.

Fourth, the absence of evidence supporting a TBI in the medical record does not constitute evidence of absence of a TBI. Many patients with mild TBI do not go to a hospital at the time of injury. Moreover, a recent study demonstrated that for those who did present to a hospital, emergency room records failed to document TBI in 56% of cases that study personnel identified as meeting the Centers for Disease Control and Prevention case definition for mild TBI.

Fifth, the patient who states that he or she was "dazed," "confused," or "saw stars" may be reporting phenomena consistent with a mild TBI, an acute stress reaction, cerebral dysfunction produced by other injury-related physiologic disturbances (e.g., hypotension, hypoxia, toxin/gas inhalation), or some combination of these.

Sixth, conventional clinical neuroimaging of the brain, including MRI, is often interpreted as "normal" in persons with mild TBI. A normal MRI of the brain after mild TBI does not suggest the absence of injury but instead indicates that any changes in the brain caused by the TBI are below the threshold of conventional MRI.

The tendency of medical personnel to miss or misunderstand mild TBI and its consequences is shared by the general public. Such misconceptions raise suspicion and doubt about the veracity of TBI survivors` clinical complaints, fueled, in part, by portrayals in cartoons and movies as `head` injuries` or `concussions` that produce little immediate impairment and from which unrealistically rapid and complete recoveries are made.

Researchers Miranda Boggild and Charles Tator make the following recommendations in their study, *Concussion knowledge among medical students and neurology/neurosurgery residents*, Canadian Journal of Neurological Science, 2012 May; 39(3):361-8:

A significant number of medical students and residents have incomplete knowledge about concussion diagnosis and management. This should be addressed by targeting this population <u>during undergraduate medical education</u>.

If this incomplete knowledge is of concern among medical students and residents preparing to become neurology specialists, it should be of even greater concern among already graduated health care practitioners in general, including those in mental health.

Concussions Ontario @<u>www.concussionsontario.org/whats-the-problem-raa/</u> identifies the following concerns regarding concussion/mTBI based upon their assessments, evaluations, or surveys of Ontario **1**. paramedic standards; **2**. nursing program standards; **3**. medical school concussion/mTBI curricula; **4**. 4th year medical students and neurology and neurosurgery residents concussion knowledge; **5**. school board concussion/mTBI guidelines awareness; **6**. school-based coaches' concussion/mTBI knowledge; **7**. first aid training and concussion knowledge of coaches who are not school-based.

There is a lack of recognition and awareness of concussion/mTBI by the public, health care providers, school staff, employers, coaches, players, and regulatory bodies. There is also a need to enhance recognition and awareness that concussion is a brain injury and symptoms may persist.

Specifically:

- Health care providers (e.g. paramedics, nurses, and emergency department and family physicians) who encounter individuals with concussion may not be fully knowledgeable about concussion
- School staff (e.g. teachers and coaches) may not be knowledgeable about concussion particularly in regards to the identification of concussion and steps to take for appropriate management
- Employers may not be knowledgeable about concussion management when it occurs
- Concussion screening tools are not widely used in schools, workplaces, and sports
- There is no mandatory reporting of concussion in most sports
- There is no mandatory concussion education/training/credentialing/certification in most sports
- Return to play guidelines are not always followed in sports

Overall, when tools are used to identify/assess a concussion, they are not necessarily evidencebased. There is also no standardized use of such tools so there is a lack of consistent practice.

IN SPORTS

In their study, *Traumatic Brain Injury in Sports: a Review*, Rehabilitation Research and Practice, vol. 2012, Article ID 659652, 10 pages, 2012. doi:10.1155/2012/659652, researchers Christopher S. Sahler and Brian D. Greenwald state:

As important as having a physician conduct the appropriate brain injury evaluation of an athlete is <u>ensuring the appropriate training of that medical professional conducting the examination</u>. Many studies have concluded that most physicians have little to no knowledge on the accurate diagnosis or management of patients with TBI.

Powel et al. found in their study that over 50 percent of patients who presented to the emergency department with TBIs were not accurately identified by ED physicians. Surveys to determine the knowledge of TBI guidelines in primary care physicians found that less than half were up to date with current medical management. Of patients admitted to the hospital for TBI, 9% were allowed to Return To Play (RTP) too quickly and 60% were given no advice in regards to RTP. In a survey of the members of the American Society of Sports Medicine, only 30% of physicians treated their patients per the current established guidelines.

As the incidence of brain injuries continue to increase, there must also be a concurrent increase and improvement of physician knowledge and training regarding assessment and management of TBI in sports.

The 2011 Canadian Medical Association (CMA) Policy – Head Injury and Sport reads, in part:

Concussion, which is the most frequent form of Traumatic Brain Injury (TBI), is a disturbance in brain function caused by a direct or indirect force to the head. Professional and amateur sports that involve contact or collision - such as hockey, soccer, football, rugby and basketball - are among the most common sports in which concussion occurs. However, it is important to note that a concussion can occur in any activity where a blow to the head, face or jaw, or other force to the head occurs.

Physicians have a critical role in advocating for the prevention of head injuries. The Canadian Medical Association (CMA) and many other medical organizations have taken positions that support advocacy; calling for the mandatory use of facial protection and helmets in hockey, and the use of protective headgear for cyclists, equestrians, downhill skiers and snowboarders. *The CMA has also strongly advocated the ban of sports in which the main objective is to injure opponents.*

It is important to note that while the use of protective gear such as helmets and mouth guards may decrease the risk of head injuries such as lacerations or fracture, their efficacy in concussion prevention should not be overestimated. *More research is needed in this area*.

The February 2012 College of Family Physicians of Canada (CFPC) Position Statement: The Role of Family Physicians in the Management of Concussions states:

Concussion is an increasing concern in the sports world, the health care community, and the general public and has recently been the subject of increased media coverage. The recent focus on Sidney Crosby has brought the issue of concussions to light for most parents of young athletes competing in sport, and *the need for knowledge and education in the area is paramount*. Sport concussions have been noted by the Canadian Institute for Health Information to be the third leading cause of traumatic brain injury admissions in Canada. *The potential implications of missed or poorly managed concussions make proper management essential*.

There is still much to learn about concussions in the medical field. The Sport and Exercise Medicine Program Committee of The College of Family Physicians of Canada (CFPC) recommends that family physicians be aware of and use both the Zurich 2008 Consensus Statement on Concussion in Sport and the Canadian Medical Association's Policy on Head Injury and Sport to help guide them in caring for their head injured patients. These documents are key sources of information on the management of concussions by all physicians. The SCAT2 document is also provided in the Consensus Statement and is integral to immediate management and return-to-play guidelines.

An excerpt from the *Consensus Statement on Concussion in Sport,* 3rd International Conference in Zurich, November 2008 states:

The panel unanimously agreed that all athletes regardless of level of participation should be managed using the same treatment and return to play paradigm. ... Although formal baseline Neuropsychological screening may be beyond the resources of many sports or individuals, it is recommended that in *all organised high risk sports* consideration be given to having this cognitive evaluation regardless of the age or level of performance.

Dr. Paul Echlin, a board certified sports medicine specialist in both Canada and the USA and the primary investigator of the Hockey Concussion Education Project, launched the Sports Concussion Library *www.sportsconcussion.org* in December 2011.

This is a public service ... It's not about commercialized sport. It's about the health of our children. Parents are key to this. They can be proactive and empowered because I think in the past, the parents haven't been empowered and they felt at the mercy of sports people. So it's about them determining what's best for their children.

Dr. Echlin et al's study, *Return to play after an initial or recurrent concussion in a prospective study of physician-observed junior ice hockey concussions: implications for return to play after a concussion, published in the Journal of Neurosurgery: Neurosurgical Focus, Volume 29, Issue 5: November 2010 found that* **24%** of the concussions that were identified among the 67 fourth-tier players aged 16 -21

were directly related to fighting. Rates of concussion were <u>seven times higher</u> than reported in any previous research. During the season followed by researchers, **25%** of the players received one concussion during play. More than **7%** suffered two concussions.

In Dr. Echlin et al's most recently published research, *"A prospective study of physician observed concussion during a varsity university ice hockey season,"* in the *Journal of Neurosurgery: Neurosurgical Focus*, Volume 33: December 2012, the SCAT2 assessment and MRS of players demonstrated cognitive, metabolic, and white matter changes in two teams of hockey players –one female, one male – over the course of a playing season.

Of particular concern were the significant metabolic changes observed in the <u>absence of a diagnosed</u> <u>traumatic concussive brain injury</u> in the female athletes and "a reproducible and significantly higher incidence of concussion among both men and woman ice hockey players, when compared with nonphysician-observed games, suggesting a significant underestimation of sports concussion in the scientific literature. "

The following is a summary of observations made by Dr. Echlin "about the roles of different people around young athletes as they make their health care decisions."

THE COACHES

The young athlete is often caught between competing demands of the adults around them. Young athletes sometimes make decisions based on the adult whom they perceive to have the most influence on their success, and also whom they wish most to please for a variety of reasons. In many cases, the coach is perceived to be the adult with the most influence on the success of the athlete. The coach determines the amount of time the athlete will play during a specific game or season. To improve concussion prevention and care, the coach is central to potential social change.

THE PHYSICIANS

The team physician's first duty is to protect the patient/athlete by providing independent medical care focused solely on their short- and long-term health. Ideally the player's medical management should be devoid of environmental pressures to remain in play regardless of sustaining an injury. The struggle with team-related bias occurs in the relationships that develop between the physician, players/trainers/coaches, and team administration.

Physicians inexperienced in evaluating concussions can have difficulty under the current identification and diagnostic protocol. The team physician often experiences both bias and cultural resistance when determining diagnosis and return-to-play decisions. A senior physician (a team physician for 20 years) admitted after observing his first game from an elevated position strictly looking at head contact under HCEP protocol, that he "felt guilty" that he really had not been paying attention to possible concussion incidence in the past. Often the observed explanation for non-adherence to the protocol by the physician or trainer was made to appease the player and coach, despite knowledge of the purpose of the protocol and medical responsibilities.

THE ATHLETE

The reluctance of athletes to self-report a possible concussion and their observed inclination to mask concussion symptoms is a major obstacle to concussion identification. This reluctance to report is often a result of their fear of losing playing time during the recovery process.

While it is difficult to quantify the inclination of athletes to not report injury in order to keep playing, physician observers in this study did consistently report resistances by athletes to reveal possible concussions.

THE TRAINER/FIRST RESPONDER

Conflicts arose during the study that disrupted the relationship of trust between the trainer and the team. In 1 (one) case, a player was identified with a concussion by the physician and the trainer. The player was examined the next day by the physician and the trainer. The player admitted to symptoms, but said that they existed prior to the hit, including "migraine" symptoms that had not been previously discussed.

The trainer later admitted to the HCEP PI that he *"talked the physician involved into returning the player to play because the player denied symptoms and the team needed him on the upcoming road trip."* This same player was diagnosed with a concussion 2 weeks later by a neurologist, and *the same trainer returned the player to play, overriding the decision by the neurologist.* ATHLETIC ADMINISTRATION AND MEDICAL RESEARCHERS

Prior to the initiation of the 2011–2012 HCEP, multiple institutions were invited to participate in this fully funded multisite study. Remarkably few institutions demonstrated interest. The telling reason given by 3 of the prominent institutions was that they did not believe the coaching staff would accept the direct monitoring and independent medical decision-making concerning their players.

At another level, the culture of resistance was revealed in the following letter from a grant evaluator:

It is very unclear how a physician sitting in the stands (not affiliated with the team) will go to the bench area after identifying a player with a "suspected" concussion, perform an evaluation on an athlete, and then determine whether they would return to play. This is absurd and I cannot envision any varsity hockey team program permitting this during competition. It would be useful to have letters of support from the athletic director, coach, current team physician, and athletic trainer.

There is an apparent lack of independent, cooperative, public health initiatives to confront the issue of directly defining concussion incidence and enacting effective prevention-based solutions. One of the primary obstacles may be the fact that the sports that have the highest incidence of concussion also have the most significant public resistance to getting rid of violence.

PARENTS OF THE ATHLETE

The parent has a primary role in the development of young athletes' attitudes toward competition, excellence, and health. Parents of young athletes face multiple responsibilities. One responsibility is to support their child's athletic success through giving time and financial assistance. Another responsibility is to protect the long-term mental and physical health of their child. The priority to protect their child's long-term health can sometimes be overlooked as parents weigh the developmental values associated with sport and their children's accomplishments and achievements. Parents invest time, money, energy, and good intentions in their children's extracurricular sports. Often, a family's leisure time revolves around amateur sports schedules. When there is injury that requires treatment and rest, the rhythm of family relationships and the activities during family time are affected.

This chilling statement was made by the father of one of the athletes from the 2009–2010 HCEP study:

One answer is simple: that we put our desire of being able to brag about our children's accomplishments ahead of their welfare. The children just want to please us and they see the response they get from getting a goal, or laying on the best "hit" of the game. So we reinforce this aggressive behavior and over time it becomes natural for our kids to go out and nail the opponent in order to get the applause and praise from us, the coaches, and spectators (and they get more ice time as a reward, which is like a drug—they have to have it).

Because of this misaligned thinking, our son is now no longer able to play the sport he grew up with and loves. And we have to live with the fact that we pushed him to be aggressive and to hit and be hit so that we could feel proud and have others tell us how great he was. We had the choice and we made the wrong decision. We loved our time at the rink and our time with him, but we now question whether we could have enjoyed the time with our son without putting him in danger.

I should have been smarter, somehow (his voice thickening with emotion). So yeah, I have total guilt and I will for the rest of my life on this one.

AUTHOR OPINION STATEMENT (excerpt)

The pressure to win the next period, game, or series is an important and overriding factor that blinds many of those who are responsible for protecting the health of our young athletes. Hockey and other contact sports need to be respected as a game, not as a potentially life-and-death battle that places participants at needless risk for future long-term disability.2

The win-at-all-costs philosophy is dangerous when it filters down to the minor hockey player who emulates his/her hero by not admitting to a concussion, or complies with their coaches or other adult leaders who resist reporting concussion for fear of having to take that player off the playing surface.

The social resistance to change concerning concussion identification and treatment is evident in the fact that despite significant efforts to educate teams and improve their care, in the third-to-last game of their season a player and coach in this study still sought to return to play immediately after a concussion.

Education is vital to decrease the incidence of concussion and improve treatment. *Education* and *positive action* are everyone's responsibility. To overcome cultural inertia concerning the growing knowledge about concussion, and the too-frequent inaction by supervising adults, we must look primarily toward educating the next generation of coaches and parents.

The priority must be placed on the short- and long term health of each individual athlete over the outcome of any particular game or practice. Specific responsibility must be placed on the medical professionals working with the team coaches, administrators, and trainers to provide unbiased, independent, and prioritized care of the athlete.

Until there is a breakthrough in our understanding of all aspects of concussion, each concussion should be treated very conservatively by trained medical specialists. We can no longer afford to treat this serious brain injury with the cavalier attitude that has been demonstrated in the past.

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The games that we play and want our children to play must evolve with the advancement of medical knowledge concerning concussion. This "silent epidemic" is significantly affecting the future of our youth, and at what price: to entertain us, or to win the next game? <u>http://thejns.org/doi/abs/10.3171/2012.9.FOCUS12287</u>

University of Regina researcher Dr. J. Patrick Neary, PhD et al also demonstrated that the concussed brain suffers from brain blood flow abnormalities not seen in healthy athletes in their study "Cerebrovascular Reactivity Impairment after Sport-Induced Concussion," published in *Medicine & Science in Sports & Exercise*, November 2012. This study also advocates that another level of testing be implemented to determine an athlete's physiological fitness before returning to play.

The 2011 American College of Sports Medicine revised team physician statement on concussion cautions that neuropsychological testing alone should not be relied upon to diagnose or manage concussions or to make return-to-play decisions.

Dr. Calvin Gutkin, MD CFPC (EM) poses some thought-provoking questions in his editorial, *A head-injured society*? in the Vital Signs column of the *Canadian Family Physician*, Vol. 57: August 2011.

The good news is that today it is possible to prevent many of these injuries (concussions). The notso-good news is that it is not clear whether we, as a society, really want to prevent them. Many recommended preventive approaches are often rejected or, if implemented, simply seem to raise the challenge threshold for those striving to go where no human has gone before. People today are spurred on by death-defying virtual games or "reality" shows, and they celebrate truly violent "sports" like the Ultimate Fighting Championship. For some people, life has become an ongoing contest to see if they can overcome any risk, defeat any foe, and defy the laws of nature.

Is this inability to do what we can and should do to prevent concussions in sports a sign that we are all part of a chronically dazed and confused society? Are those resistant to change themselves victims of unrecognized head injuries? Why else are rules that could be changed to make some sports safer left alone or just tweaked? Why are face masks or mouth guards not accepted? Why do the rock-hard elbow and shoulder pads, which are intended to protect players from personal injuries, remain the standard equipment when they convert players into high-powered missiles sure to render opponents unconscious if struck in the head? Why are players who are willing to take greater risks or deliver harder hits rewarded? Will the efforts to bring about dramatic and meaningful change in the violent and potentially life-threatening elements of many sports ever be able to overpower the human trait that needs, desires, seeks, promotes, sells, and cheers man challenging both fellow man and nature by risking life, limbs, and mental capacity? Will this world always have gladiators and Romans to cheer them on?

Family physicians can play an important role in helping to interrupt the wave of concussions sweeping our society. In keeping with the principles of family medicine, family doctors should not only be fulfilling their roles as expert clinicians by diagnosing and treating patients who have suffered sports-related injuries, but should also be acting as resources for the individuals and populations they serve—educating them about how to prevent and recognize concussions and advocating for the changes needed in sports that could help bring an end to the current epidemic of head injuries.

In her petition to remove body checking from all levels of Pee Wee & Bantam hockey in Canada <u>http://www.change.org/petitions/hockey-canada-remove-body-checking-from-all-levels-of-pee-wee-bantam-hockey-in-canada</u>, businesswoman and hockey mom, Andrea Winarski, reminds us:

Given the mounting medical evidence that injuries, specifically concussions, can be substantially reduced if body checking is removed from minor hockey, and given the recent findings on the long term consequences of concussions, we maintain that Hockey Canada knowingly provides an unsafe sporting environment for Canadian children.

Hockey Canada is failing players in the instance when they most need to be protected. This is a serious breach of responsibility and accountability. This is NOT an issue of being for or against body checking- this is a more serious issue of behavior and outcomes by the stewards of minors.

It is my opinion that Hockey Canada's **Rule 6.5**, which deals only with bodychecking, allows for too much referee discretion, and is duplicitous regarding player safety. The omission of <u>fighting</u> negates their "Fairness and Respect" statements.

Rule 6.5 – Head Contact

(b) In minor hockey and female hockey, a double minor penalty or a major and a game misconduct penalty, <u>at the discretion of the referee and based on the degree of violence of impact</u> shall be assessed to any player who intentionally contacts an opponent in the head, face or neck with her stick or any part of the player's body or equipment.

(c) In junior hockey and senior hockey, a minor and a misconduct penalty, or a major and a game misconduct penalty, <u>at the discretion of the referee based on the degree of violence of impact</u>, shall be assessed to any player who checks an opponent in the head in any manner.

"Referees *should* be aware of the tragic consequences of head injuries and concussions and strictly enforce the rule" is a watered down version of the *Consensus Statement on Concussion in Sport*, 3rd International Conference in Zurich, November 2008 (see preceding page) which clearly states:

As the ability to treat or reduce the effects of concussive injury after the event is minimal, education of athletes, colleagues and the general public is a mainstay of progress in this field. Athletes, <u>Referees</u>, Administrators, Parents, Coaches and Health Care providers *must be educated* regarding the detection of concussion, its clinical features, assessment techniques and principles of safe return to play.

The 2000 Pascall Report, *Eliminating Violence in Hockey*, written by Bernie Pascall states:

The <u>violence is part of the game</u> social conditioning is somewhat unique to hockey. For the most part, particularly in the sport of hockey, aggression and violence is learned behaviour - cultivated and nurtured by a number of influences not the least of which are the very role models that young players are exposed to—parents, coaches, other players and professional athletes. It is a self-fulfilling prophecy."

Dr. Charles Tator, neurosurgeon and founder of ThinkFirst Canada, during a hockey fights panel discussion at the Hockey Hall of Fame in Toronto as reported in the Globe & Mail, 03 May 2012:

Eliminating <u>fighting and head shots</u> from hockey is simply a matter of common sense. We have NO treatment for concussions, we have NO treatment for the accumulative concussion, we have NO treatment for the repetitive concussion. *Emphasis mine.*

Repetitive concussions also make individuals at risk for **Chronic Traumatic Encephalopathy** (CTE) which may manifest itself through depression, early dementia, behavioural, and personality changes.

Excerpt from: A Conversation with the Honourable R. Roy McMurtry: A Forty Year Perspective on Hockey Violence:

We are dealing with a league (NHL) that is very badly run, even from a standpoint of protecting their players. I recently received an essay from a mature law student at York University in Toronto. This student had been in the construction industry, and his essay focused upon the relationship between the workplace safety legislation and professional sport violence. He made a good case for the fact that the Province has a legal responsibility to protect players, because the owners are employers and are permitting this nonsense. He argued that sport violence and the related injuries are a breach of current legislation. I'm not sure that any government has the guts to take on the hockey establishment, and this is what worries me.

I would add that the sports entertainment machine in its entirety exerts enormous influence across North America. There are many feeding at the proverbial trough who are willing to bend rules or dismiss medical evidence in order to satisfy personal appetites rather than ensuring the safety of the players.

The legal ramifications of not providing legal duty of care in regard to concussion in professional sports are now being argued before the courts. It is imperative that our corporate legal duty of care in sports programs for children and youth be upheld because their futures are at risk. Action is required.

For their part, coaches, managers, and others must recognize, in a clear and transparent manner, that sports-related concussions are serious and potentially-life threatening injuries. They must take assertive steps to prevent the incidence of concussions, starting with the conduct of their practices and training routines. As important, they must be vigilant and attentive in the course of games to the possible occurrence of concussions and take prudent action in response. Stated simply, the attitude that the incidence of concussions is a regular part of the game - that the player has just had his or her "bell rung"- and that it is not a problem is unacceptable conduct.

Marie-France Wilson, Young Athletes At Risk: Preventing and Managing Consequences of Sports Concussions in Young Athletes and the Related Legal Issues, 21 Marquette. Sports Law Review 253 (2010)

Available at: http://scholarship.law.marquette.edu/sportslaw/vol21/iss1/8

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Concussion: Cognitive Challenges

Dr. Claudia Osborn eloquently expresses her desire to both inform and be understood in her personal account detailed in *Over My Head: A Doctor's Own Story of Head Injury (from the Inside Looking Out),* Andrews McMeel Publishing.

It is a daunting task for me to make my thoughts clear. My difficulty in telling (my) story was compounded by my memory, language, and organizational skills. This book is, of necessity, about the grief accompanying the loss of one's self. It is the process of rehabilitation and the building of a new life. It is also an attempt to provide insight into what happens when neural pathways are damaged and the most sophisticated computer in the universe goes awry. I hope to show the effect head injury has on behaviour and personality and how thinking and problem-solving can be so altered that the simplest actions require extraordinary conscious effort.

Not addressing a traumatic brain injury is a missed opportunity that will impact that person's future. It spells the difference between just getting by and living a happy, productive life. They do not make the connection between injury and their worsened performance. People say, 'I got knocked out, but no damage was done. I'm fine.' How would they know? It is the brain that gives us our information. If the brain is injured, it cannot be a reliable reporter.

GiveBack: A community based cognitive self- help support group model

Dr. Larry Schutz, PhD, ABPP (<u>http://www.larryschutzphd.com/?page_id=151</u>), California-based neuropsychologist, founder/CEO of the GiveBack Foundation, and author of Head *Injury Recovery in Real Life* and *Rehabilitation of the Shaken Soldier Syndrome* notes,

At the present time, with tens of millions of living survivors and almost as many pages of published scientific research on TBI, it is still hard to make sense of the recovery of a single survivor. In the present era, all too often, the real needs of the individual with TBI are lost in the name of *cost containment*.

The number and scope of problems associated with brain injuries in long-term status are both vastly under-identified. Most people assume that permanent brain damage is easily recognized and physically as well as intellectually disabling; but chronic brain injury is a "SILENT" problem virtually invisible to most people and often difficult for professionals to detect.

Injury that affects behaviour is not a psychiatric disorder and needs to be handled as a neuropsychological problem. The American and Canadian medical systems have attempted to handle long-term needs for care by transferring responsibility to mental health providers, but this approach has proven to be highly counterproductive and should not even be a last resort.

Mental health therapy is based on assumptions that are incorrect for the brain injury population, and such misguided efforts can even do harm if they are pursued vigorously. The lesson of a century of clinical experience is that the only effective treatment is rehabilitative, an entirely specialized form of rehabilitation. It is difficult to access, as very few professionals have been trained in fully developed, fully specialized neurorehabilitation methodology.

Because most people are not offered the treatment they need to help them realize their full recovery potential, rehabilitation experts should at least share their knowledge of the principles of recovery with the untreated survivors, families, and community-based providers who are willing to

help them.* Most survivors and their families are people from ordinary backgrounds, with very little accurate knowledge about TBI.

They (TBI survivors, families, and community based providers) do not understand what long-term symptoms are like, and they fail to recognize those symptoms when they occur. They have no idea how to cope with those symptoms, and most efforts to recover are misguided and unsuccessful. Patients who make good recoveries through advanced rehabilitation receive a great deal of education to use in their daily lives after they leave therapy. People who have head injuries, and those who care for the survivors, have an absolute need for the specialized knowledge that is currently available only to TBI experts and discharged patients.

* To this end, Dr. Schutz and a long time colleague from the University of California, Davis campus are collaborating on a book about how to set up an advanced rehab program in a community setting that have no local experts available. ``It will be the most complete documentation of how to perform an advanced neurorehabilitation program thus far written.``

Dr. Schutz' 30+ years of experience in neurorehabilitation has taught him that <u>ordinary people can be</u> taught to work toward recovery. He has taught most survivors how to do the *t*herapy on themselves and strongly believes that community-based programs to assist individuals with TBI in the recovery of cognitive abilities is both do-able and desirable. His experience with GiveBack since 2004 has demonstrated that <u>when survivors are educated in self-help methods</u>, they can learn to make themselves <u>more consistent</u>.

His mission is to assist communities in filling this gap so that everyone has real access to recovery. We are planning to launch a GiveBack chapter in Davidson, and Dr. Schutz will endeavour to provide as much substantive support as possible.

GiveBack, Inc. is a self-help community dedicated to educating, encouraging and inspiring survivors of head injuries to commit to using compensation strategies so that they can regain control of their lives and build new futures. Those who succeed are asked to give back by reaching out to survivors still finding their way.

GiveBack was created to fill the gap between the end of healthcare treatment for the injury and the long-term challenges of recovery. It brings to those who have never received them the recovery strategies needed to reduce disability, in the form of self-help techniques. We remind one another that the recovery is each person's own responsibility; it is the job of the survivor because no one else can or will do it.

Meredith and I are planning the opening of a GiveBack chapter in her community and if we can arrange for a consultation visit, I would also be available to consult with local professionals and officials about developing a brain injury program for the region. I believe that our efforts can benefit not only her community, but other regions within Canada that share the problem of limited recovery resources.

Surely we can field community-based programs by teaching paraprofessional and volunteer staff what to do. The cost of a local brain injury resource center, with active therapy programs, would be less than the cost of a community mental health center. I set up my own program with an equipment budget of two hundred dollars and a staff of two. The only practical obstacles are the staff salaries and the cost of about 700 square feet of office space. We are willing to supply the necessary expertise, and to help her community to secure the funding.

Participation in the program is free of charge and all written materials are provided at no cost on the GiveBackLA website. <u>www.givebackla.com</u>

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Conclusion and Recommendations

There is sufficient evidence demonstrating a <u>significant knowledge gap</u> in how to properly identify, diagnose, manage, and support individuals who incur traumatic concussive brain injury. It is, therefore, imperative that this issue be taken seriously and acted upon quickly. Protecting our most valuable asset – our brains – is essential, and ensuring player safety must be the top priority in sanctioned sports. This means a cultural shift at both governmental and sports levels.

Being informed and not acting makes both government officials and the sports industry complicit in their failure to protect. Choosing to remain ignorant about *concussion in general* is unwise. We, the adults, must consider our children and grandchildren's safety and futures and balance current understanding about brain injury and its consequences with their desire to participate in sports activities. Being better informed and not acting to reduce brain injury amounts to *corporate* failure. Making policy without being informed is madness. We can do better. We must do better.

As the government of Saskatchewan has stated that *health solutions are a priority*, I strongly urge that it take proactive measures to identify, diagnose, manage care, and support <u>all</u> persons with traumatic brain injury and continue to be a partner in the prevention of traumatic brain injury.

- 1. Educate to ensure that physicians and community health/mental health care providers are able to properly identify, diagnose, manage care, and support individuals who incur traumatic concussive brain injury aka concussion.
 - a. Ensure that all Saskatchewan healthcare professionals and community health/mental health care providers are aware of current CMA and CCFP policies regarding concussion through vigorous awareness and prevention campaigns
 - b. Ensure that all Saskatchewan healthcare professionals and community health/mental health care providers "receive nationally standardized and certified education about the signs and symptoms, potential long-term consequences, and appropriate steps for managing sport related concussions "
 - i. mdBriefCase Inc: A CMA approved physician continuing education program "Sports-Related Concussions: When Medicine and Sport Meet Head On"is available to all healthcare professionals through <u>www.mdBriefCase.com</u>, <u>www.rxBriefCase.com</u>, and <u>www.AdvancingIn.com</u> and was developed by Dr. Charles Tator Professor of Neurosurgery at the University of Toronto and Founder of ThinkFirst Canada, and Dr Michael Clarfield, Director of Sports Medicine Specialists in Toronto and former Head Team Physician of the Toronto Maple Leafs (1989-2004).
 - Require that physicians use a CMA or CCFP recognized assessment tool such as SCAT
 2 or ACE to identify and develop an appropriate concussion management plan for or to rule out concussion in individuals presenting with symptoms of traumatic concussive brain injury i.e., headache, amnesia, confusion, irritability, anxiety, restlessness, and sleeplessness, etc.
 - iii. Promote on-line learning to all health/mental health care professionals through reliable on-line tools to enhance patient care through increased knowledge and skill sets (free from pharmaceutical company influence)
 - 1. Saskatchewan CMA members have free access to two on-line clinical tools:

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- a. DynaMed, an evidence-based database designed for quick pointof-care reference
- b. Access Medicine, a vast resource that provides access to 60 essential textbooks, a differential diagnosis tool, case files for students and daily updates.
- 2. All Saskatchewan physicians, health and mental health care professionals, and researchers and the general public have free access to all resources at the <u>www.sportconcussionlibrary.com/</u>, <u>www.concussionsontario.org/</u>

2. Implement a user-friendly, provincial brain injury registry database to record and track all brain injuries that occur in the province, including concussion

- a. Include a separate category for sports related brain injuries, including concussion
- b. Require that all findings of all traumatic brain injury, including concussion, be reported to the registry
- c. Use data to inform policy

3. Educate athletes, parents, teachers, school administrators, coaches, referees, athletic trainers and therapists about traumatic concussive brain injuries, injury prevention, and Return to Play protocols before athletes are allowed to participate in local, regional, or provincially sanctioned sports programs.

- a. Mandate that coaches, referees, trainers and sports therapists "receive nationally standardized and certified education about the signs and symptoms, potential long-term consequences, and appropriate steps for managing sport related concussions"
- b. Mandate that coaches, referees, athletic trainers, therapists, and school communities are trained how to use SCAT 2 if they suspect concussion
 - i. Promote self-learning through CE webinar participation (i.e., Sports Concussion Library, ThinkFirst Canada, BIAC, BIANYS, etc.) at no or low cost to participants
- c. Require a physical for each athlete before each playing season for all contact sports, including a yearly SCAT 2 assessment placed on file and copies made available to parents.
 - i. Impose rigorous penalties for failure to comply.
- d. Require that ALL athletic injuries are documented, including TBI
 - i. Monitor team documentation
 - ii. Impose rigorous penalties for failure to comply

4. Expand community-based neurobehavioral treatment options for people with brain injury

- a. Support GiveBack, and other evidence-based, holistic cognitive education self-help programs that help TBI survivors and their families regain hope and deal better with the frustrations of daily life.
- b. Support the establishment of advanced neurorehabilitation centres in rural communities

5. Strengthen the role of family members / caregivers as advocates for people with brain injury through the development of ombudsman programs province wide



a. Rural community members are particularly vulnerable when it comes to getting timely identification, diagnoses, treatment, referral, and support for traumatic brain injury.

A brain injury can be the start of a lonely, confusing, and stressful journey for the injured as well as his or her loved ones. With help, hope for a better tomorrow is possible.

Thank you for taking the time to read this letter and thoughtfully considering my recommendations. I trust that you are:

- 1. Willing to take responsibility for learning more about traumatic concussive brain injury;
- 2. Willing to take responsibility for ensuring that all health care professionals are up to date in their training to successfully identify, diagnose, manage care, and support individuals with traumatic concussive brain injury;
- 3. Willing to take responsibility for ensuring that school communities are current in their knowledge of traumatic concussive brain injury and have up to date guidelines;
- 4. Willing to take responsibility for ensuring the safety of young athletes by implementing rigorous protective policies;
- 5. Willing to take responsibility for implementing a brain injury data collection system to establish a more concise picture of traumatic concussive brain injury in Saskatchewan and inform policy;
- 6. Willing to take responsibility for improving access to recovery for all people suffering from post-concussive symptoms who seek help.

I look forward to meeting with you in the very near future to discuss the aforementioned concerns.

Sincerely,

Meredith Ottoson Box 895 Davidson, SK S0G 1A0 (306) 567-4357



The Canadian Medical Association

- 1. Recommends that coaches, trainers and sports therapists receive nationally standardized and certified education about the signs and symptoms, potential long-term consequences, and appropriate steps for managing sport related concussions.
- 2. Works with the Provincial/Territorial Medical Associations and other national medical organizations to encourage sporting organizations to improve training and education, and to raise awareness on the potential consequences of concussion.
- 3. Recommends that parents who enroll their children in contact/collision sports be provided with information on the signs and symptoms of concussion.
- 4. Recommends that students involved in sports and physical education programs should be taught the specific signs and symptoms of concussion with emphasis on the potential serious consequences of ignoring concussion symptoms.
- 5. Recommends that <u>any athlete</u> with a suspected concussion be immediately removed from play until he/she is evaluated by a physician to confirm the diagnosis and to institute an appropriate assessment <u>and</u> provision of follow-up care with a physician experienced in concussion management.
- 6. Is working with the Canadian Academy of Sport and Exercise Medicine on the development of a Continuing Medical Education module on concussions for family physicians and specialists. (See Recommendation 1.b.i.)
- 7. Recommends that physicians discourage participation in sports in which intentional trauma to the head and body is the objective of the sport.
- 8. Recommends that a physician knowledgeable in concussion management determine when the athlete can return to sport.
- 9. Recommends further research on both the incidence of sport-related concussions in children and appropriate management protocols, in order to ascertain the effects of concussion in children and determine the most appropriate return to play guidelines for children.
- 10. Recommends that current surveillance tools, such as the Canadian Hospitals Injury Reporting and Prevention Program, coroners' databases, Canadian Agricultural Injury Reports and mortality databases be supplemented and coordinated in such a way that it is possible to have a <u>national sports injury surveillance system</u> to collect and analyze timely and complete information about sports related head injuries.

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