



Keeping
your
players
(*safe*) in
the game.



Introduction

Each year more than 1 out of every 10 players in your hockey association will suffer a concussion injury (1). This is likely a gross underestimation with research demonstrating that as many as 50% of injuries are never reported or detected (2). Due to widespread media attention as well as the risk for potential long-term brain damage, amateur sports associations must find effective ways for reducing these risks in order for grassroots hockey to continue safely. The concern over concussion injuries has reduced hockey registration drastically over the past few years with parents seeking 'safer' alternatives for their kids.

The Canadian Concussion Collaborative published recommendations in July 2014 which stated that "organizations responsible for operating, regulating or planning sport and sporting events with a risk of concussion should be required to develop/adapt and implement a concussion management protocol" (3). Contained within this document are the tools essential for creating a comprehensive concussion management strategy in our association that will improve the safety of our players, reduce the risk of long-term brain damage due to concussions, and reduce the liability on behalf of the association. Best of all, this comprehensive concussion policy is already made providing the association with easy, one-step installation.

Concussion Basics

A concussion is a type of traumatic brain injury that can have serious effects on a young, developing brain(4-8). Having one concussion has not been shown to have any serious long-term effects, however having a second concussion prior to fully recovering from the first is known to cause long-lasting, potentially permanent, or even fatal, brain damage (9,10).

A concussion is due to acceleration of the brain within the skull that can happen with any type of contact or a fall, even if the individual does not hit their head (11). When the brain undergoes a large amount of acceleration it causes the brain cells to discharge uncontrollably (12,13). This can cause a number of different immediate symptoms in the child such as headaches, dizziness, confusion, nausea, and many more (11).

After the immediate injury the brain enters into a state of energy crisis, which is why typically after a concussion the individual will be very fatigued and irritable. This energy crisis within the brain can last anywhere from a week or two up to even a month or more after injury (14,15). During this energy crisis the brain is extremely vulnerable to additional trauma, where even smaller impacts can cause another concussion and these second concussions can lead to permanent

or even fatal brain injury (10,16). These devastating second injuries are what hockey associations need to be concerned with and should be taking proper steps to avoid.

Research on both humans and animals has shown that if an individual has completely recovered from this energy deficit and receives another concussion, the two injuries will not add up and there will be no increased danger to this individual (10,14,17,18). On the other hand, the research has also demonstrated that if an individual has not completely recovered from one concussion and they get another one, this can cause the energy crisis to become so extreme that brain cells are permanently damaged, potentially leading to life-long impairment, or death of the individual (10,16,19,20).

For a greater explanation please visit the www.completeconcussions.com and watch our informational video.

What is WRONG With Most Concussion Policies

It has been well established that *SYMPTOMS*, meaning, “How someone feels” do not correspond with the recovery of the energy deficit within the brain (21-23). Put another way: an individual could feel 100% better but their brain could still be in this vulnerable state and therefore at risk for a serious injury. The only way to truly know when an individual has fully recovered and is out of this vulnerable state (and therefore safe to step back into play) is by comparing their brain function to when they were healthy – this is what is known as a “baseline test” (24,25). Many recent studies have suggested that the key to a successful concussion management program is having objective pre-injury evaluation metrics due to massive variability in brain function person to person (11,24,26-31). The issue however is that we must have this starting point for every single player in order to make these decisions safely and prevent a potentially catastrophic outcome.

The concussion policy in many amateur sports associations is that the coach or trainer must see a doctor’s note prior to allowing the child back on the ice. The problem with this is that most doctors are not educated on concussion as it is not a part of the core curriculum covered in Canadian medical schools resulting in incomplete adherence to proposed return-to-learn and return-to-play guidelines (32). Two 2012 studies published in the Canadian Journal of Neurological Science found that concussion was not even on the curriculum at most medical schools in Canada and that most medical students and Neurology/Neurosurgery residents had incomplete knowledge of concussion diagnosis and management (33,34). As a result, most doctors are not aware of

the potential dangers of a second concussion and do not have the necessary pre-season baseline metrics to be used as a comparison. Because the majority of hockey associations do not require their athletes to undergo any type of pre-season testing, most return-to-play decisions made by family doctors are based on *SYMPTOMS* alone, which are very unreliable indicators of true brain recovery (22,35). Without any comparative tests and data there is great risk of a serious or catastrophic brain injury happening in minor hockey due to a player coming back before they are ready.

Computerized “Baseline” Testing

These tests are NOT baseline tests by themselves!

The purpose of a baseline test is to measure every area of brain function, which could become affected following a concussion. This way, if an athlete does get a concussion, we can compare their post-injury state to their baseline parameters in order to help make an accurate diagnosis as well as to determine when they are fully healthy and are safe to return to their sport.

There are many different areas that can become affected during a concussion and every single concussion is different. Some individuals may show problems in 4 to 5 areas of brain function, whereas some individuals may only show a deficit in 1 area. Computerized tests have been found in numerous research studies to be inadequate on their own as they only measure 1 or 2 of the potential areas that could become affected and have been shown to have numerous reliability issues (36-42). This is just one test. Consider the target scenario.

If we were to assess someone’s target shooting ability, would we give them only one shot? No, because one single shot does not provide us with enough information to know how good of a shooter they are. We would likely give them 10 shots so that we could assess their overall shooting ability. Computerized testing being used as a “baseline” test is the same scenario; we are giving athletes one shot and then, when they get injured, we are trying to assess their injury by simply giving them another shot at a different time and comparing the two.

Most experts in the world agree that the results of computerized tests do not provide the amount of information required to make proper decisions and should not be used in isolation.

CCMI Concussion Program

Complete Concussion Management™ (CCMI) is a concussion research company with a network of fully trained and certified concussion clinics across the country. These clinics and practitioners have received extensive concussion training based on the most current and cutting-edge medical research. Utilization of this program ensures the highest level of safety, as well as the best treatment and rehabilitation for your players when concussions occur. Researchers have been calling for an extensive specialized program for some time (22,43-50); we are simply taking these recommendations and existing medical evidence to deliver 'best-practices' concussion management programs to youth sports programs and schools alike.

This program offers:

1. Comprehensive baseline test battery that measures all areas of brain function prior to each season.
2. Fully developed concussion policy for your association ready for one-step implementation.
3. Coach and trainer educational seminars to teach them what to look for and also what to do when suspecting a concussion.
4. Parent education seminars to educate the parents on the new concussion policy and why it is an important addition to your program.
5. Effective concussion treatments and rehabilitation to improve concussion outcomes and prevent long-term problems and complications.
6. Return-to-learn and Return-to-play programs that work in collaboration with your coaches, trainers, as well as the association.
7. Easy accessibility to one or more specially trained CCMI concussion clinics in your area.
8. A network of additional clinics across the country to provide preferential access to players injured out of town or even out of province.
9. Yearly injury tracking data for all athletes within your program with our secure concussion electronic health records system. This information can be used to track the success of imposed rule changes and safety initiative campaigns.

CCMI Network

There are currently over 90 certified Complete Concussion Management™ clinics from Vancouver to Halifax. There will be over 200 CCMI locations by December 2015. Athletes receiving a baseline test at one of our certified facilities receive an ID tag that is fastened on to their hockey bag. Should that athlete receive a possible concussion, they can contact ANY clinic within our network and be seen for a full concussion assessment within 24-hours. All athlete baseline and injury data is kept on a secure electronic health records system that can be accessed by any one of our clinics, via the ID tag, and used for post-injury analysis helping to guide management decisions, thereby creating a seamless concussion care program no matter where in the country you happen to be.

CCMI Baseline Testing

Baseline testing sessions are set up through the CCMI partnered clinic in your area. Testing can be done either at the clinic or at any other location, such as an arena, provided the space is sufficient.

Testing protocols include tests for:

- Visual & Auditory Memory
- Visual & Auditory Concentration
- Orientation & Mental Status
- Visual Tracking Speed and Visual Processing Abilities
- Reaction Time
- Balance (utilizing force-plate technology)
- Motor Strength & Performance
- Neurocognitive Function (computerized testing)

Clinics can generally test 20 people per hour or more depending on your requirements. Baseline tests are valid for 365 days from the date of completion.

Baseline testing is generally performed by a physiotherapist or a chiropractor and as such, receipts for these tests can be submitted by any member with secondary health coverage for re-imbursement from their provider. This means that baseline testing will be little to no cost to the majority of your players.

Suggested Implementation Strategy

Baseline testing is the most important aspect of having a proper concussion management strategy. Without this information it is impossible to assess true brain recovery and make safe return-to-play decisions. The best approach to implementation is to make baseline testing a mandatory part of hockey participation within your association for ages 8 and up. Players must show proof of completion prior to stepping on the ice at the beginning of each season. Fees for the added cost of baseline testing can be added to athlete registration at the start of the season making baseline tests an added feature provided by your hockey association. This also provides parents with the peace of mind that your association is tackling the concussion problem head on and making safety a top priority. Upon successful completion of the baseline test a receipt will be issued back to the parents so that they may submit it to their insurance provider for reimbursement.

Post-Injury Care

Following an injury, athletes may present to any one of our certified CCMI clinics for a full assessment. Our practitioners are trained on the most current and cutting-edge concussion therapies and treatments to help injured athletes through the tough recovery process. Our practitioners also work with each and every athlete to guide them through the return-to-learn and return-to-play process providing consistent feedback and follow-up.

All appointments are subject to reimbursement through secondary health benefits via physiotherapy or chiropractic depending on which practitioner the athlete is seeing. For those that do not have coverage, Hockey Canada provides \$500 of physiotherapy and/or chiropractic care for any athlete injured during, or on their way to, a Hockey Canada sanctioned event. This ensures that everyone in your association will be able to receive post-injury follow-up appointments at absolutely no cost to them.

Your Concussion Policy is *Complete*

Most associations know that they should have a concussion policy in place at this point, however many associations are not sure where to turn to help create and implement this policy. We have constructed a concussion policy complete with return-to-learn and return-to-play programs already in place. This provides for

an easy and seamless integration of the most research-based concussion program available anywhere with a simple cut and paste. If you would like to see a copy of our *Concussion Policy For Associations* please contact pthomas@completeconcussions.com.

Concussions have become a major problem in sports. But they don't have to be. This program virtually eliminates the risk of serious consequences due to concussions through increased access to trained professionals, improved diagnosis, and safer return-to-play decisions. Please do not wait until it's too late. Be proactive, not reactive.

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