

## Concussion

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Concussion has been a hot topic in sports medicine for many years. Many businesses, schools, and sporting leagues have proactively introduced protocols to follow in cases where concussion is suspected. In Ontario, Rowan's law, named for an Ottawa-area high school rugby player who died in 2013 after suffering multiple concussions, was recently passed taking a first step towards protecting our children from harm. But there are still many questions regarding concussion. What is it and how does it really heal? Scientists are finding more and more answers.

**What is Concussion?** The Mayo Clinic defines concussion as a “traumatic brain injury that alters the way your brain functions. Effects are usually temporary but can include headaches and problems with concentration, memory, balance and coordination”. It can also cause headache, dizziness, fogginess, irritability, sensitivity to light or noise and nausea. You do not have to hit your head, and you do not have to lose consciousness to experience concussion. In fact, less than 90% of diagnosed concussions involved loss of consciousness.



**How does concussion progress?** Concussion causes an “uncontrolled discharge” (of cellular neuro-transmitters) which usually resolves rapidly, so the person starts to feel better within a couple of minutes to an hour. At this point, however, the cells are not done repairing the damage. The body will spend the next 2-7 days restoring function and balance to the affected brain cells. This takes an incredible amount of effort, resulting in an energy crisis in the body. During this healing phase, the patient often feels tired, irritable, and emotional. The brain is also more susceptible to incremental cellular injury (*Signoretti et al, 2011*), so a

second incident can lead to an injury not proportional to the trauma and with a considerably longer recovery and a substantial increase in symptom severity. As a result, the mere risk of a second injury should prevent return to play or activity on the same day as the original incident.

The best current treatment during the energy crisis is rest. Because it is a brain injury, rest is not only physical rest, but cognitive and visual rest. This means no TV, video games, texting, reading or screens. Most children and teenagers find the visual rest frustrating, but it is critical as 70-80% of the brain's work is associated with visual processing.

**Return to Learn and Return to Physical Activity.** Approximately 80 to 90 % of individuals will recover from the concussion in 7-10 days (*McCrory et al, BJSM, 2013*). At this point, the person should enter a Return to Learn and/or a Return to Physical Activity program. *This program is medically supervised* and slowly increases the demands on the brain. A minimum of 24 hours must be spent on each step of the program to ensure that the brain does not have a delayed reaction to increased stress. It normally takes a minimum of one week to complete the process to safely return to competition, particularly when considering contact sports.

10-15 % of people will have symptoms that last longer than 10 days. They often complain about a wide range of symptoms that are not specific to concussion and may be due to a secondary injury. Current medical experts state that "Cases of concussion in sport where clinical recovery falls outside the expected window (i.e. 10 days) should be managed in a multidisciplinary manner by healthcare providers with experience in sports-related concussion." (*McCrory et al, BJSM, 2013*).

The team should involve not only a Sports Medicine Physician, but also a trained Physiotherapist or Chiropractor and potentially a strength and conditioning coach. Further medical support may be sought from a specially trained optometrist, psychologist, dietitian and audiologist. Together this team can assess you for injuries to your visual tracking, visual reflex system and vestibular system. You should also address whiplash injuries to your cervical spine (neck) as the forces needed to cause a concussion are well beyond what is required to cause whiplash. Anxiety disorder can also be addressed.

**5<sup>th</sup> International Conference on Concussion.** In an effort to reduce the rampant misinformation and further the understanding of concussion, the 5th International Conference (the most widely recognized scientific body) on Concussion in Sport wound up in Berlin in October 2016. Once published (May, 2017) this will bring in the up to date science and new protocols to advance our understanding and management of concussion. This will replace the 2012 Zurich protocol which is currently in wide usage.

The scientific agenda aims at the following:

- 1) Clarify the definition of concussion
- 2) Define the critical elements of on field screening to establish an accurate diagnosis
- 3) Update and elaborate the currently used SCAT tool.
- 4) Look at advanced or novel tests being proposed.
- 5) Assess the evidence and efficacy of specific treatment interventions.
- 6) Look at the time course of physiological recovery
- 7) Assess the modifiers of concussion outcomes
- 8) Differentiate management of children vs adults
- 9) Understand long term post concussive symptoms and CTE management .
- 10) Strategies to reduce concussion in sport.

**How we Help.** At PhysioSportMed we aim to manage concussion based on conservative scientifically acceptable principles. Therefore no magic bullets, but rather maintaining safety first using accepted return to learn/ return to play protocols.

The team at Physio Sport Med of Oakville is ready to answer any of your questions regarding concussions, and help you get back to the life and sport that you love.

### References

*Signoretti S et al. The pathology of concussion. PM&R. 2011; 3: S359-68*

*McCrory P, Meeuwisse W, Aubry M et al. Consensus statement on concussion in sport: the 4<sup>th</sup> international conference on concussion in sport held in Zurich, November 2012, Br J Sports Med 2013; 47: 250-258*