

# Sports and Concussions: Protecting Our Brains

BY MARK KITRICK

Anyone who engages in sports, recreationally or professionally, should know they can sustain a wide panoply of injuries. Perhaps the most feared, serious and sometimes deadly injury, is suffering a concussion.

How is a concussion defined today? In essence, a concussion is a traumatic brain injury ("TBI") and in the United States, one occurs every 15 seconds. More specifically, a concussion is a complex pathophysiological process affecting the brain, typically caused by either a direct blow to the head or an indirect blow to the body, e.g. whiplash. One very common situation is the brain rapidly moving from one side (contre) to the other (contrecoup) inside the skull. Another typical scenario is a rotational concussion where the brain twists quickly inside, thereby tearing or shearing brain matter. Either way, delicate neural pathways become damaged.<sup>i</sup>

Symptoms can be mild and go away in days to weeks with little to no treatment. Or the complaints can be severe and a person suffers long-term damage, such as dementia, coma or death. Repetitive hits in activities like football, soccer, martial arts, rugby or boxing can lead to major brain trauma, i.e. long term cognitive changes. In fact, the more concussions a person sustains, the greater probability of long-term brain damage.<sup>iii</sup> Consider, for

instance, professional football players who suffer from chronic traumatic encephalopathy (CTE), a progressive degenerative disease caused by repetitive head injuries. Because of their brain damage, they are recipients of the class action settlement with the National Football League.

In the last few years, scientists and physicians have evolved significantly in their understanding and treatment of concussions, primarily due to advanced technological scanning and imaging, brain autopsies, treating veterans injured from explosives, and specific scientific studies focusing on brain injuries. Not long ago, doctors diagnosed a concussion only if the skull was fractured (broken), or if someone was knocked unconscious.

What do experts now consider common concussion symptoms? They are wide ranging-and one or more complaints can occur immediately or over time: loss of consciousness, headaches, dizziness, nausea, fatigue, being dazed, confusion, emotional

disturbances, visual problems with light, vomiting, seizures, behavioral alterations, sleepiness, amnesia, depression, ringing in the ears (tinnitus), pupil size differences, slurred speech, forgetfulness, moving slowly and clumsiness. Concussion experts are now realizing that there may be as many as six types: anxiety/mood, cervical, post traumatic migraine, ocular dysfunction, vestibular and cognitive.

Concussions are expensive. To begin, 10 to 12 percent of ER visits involve concussions. Second, there are significant treatment costs. Third, consider the intangible costs when a sports participant has not been functionally normal, not being able to work, worrying about and dealing with multiple symptoms, as well as the deleterious effects on loved ones. Fourth, delays are costly as this disorder is not easy to diagnose, whether someone denies the injury or does not treat it immediately, or because with these typically functional injuries, brain damage is not seen or found

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on regular X-Rays and other usual scans. Fortunately, science has advanced brain imaging technology. Tests such as the fNCI (functional neurocognitive imaging), which use six cognitive views to look at over 60 brain regions, can now "see" brain damage.

The common causes of concussions from sports are football (highest for men), ice hockey, lacrosse, soccer (highest for women), and wrestling. Interestingly, women suffer more concussions than men; scientists don't know why. Because scientists know that the brains and bodies of those under 26 years old are still developing, concussions for those in this age range are more dangerous. And if any sports enthusiast sustains another concussion before the first one resolves, this additional impact substantially increases the risk of long-term damage. Notably, the sports that cause concussions in children ages 5 to 18 are bicycling, football, basketball, playground activities and soccer. The Weill Cornell Medicine Brain & Spine Center has an excellent card anyone can download that helps one ascertain whether an athlete or sports participant has sustained a concussion.

There is still medical debate on how to treat concussions. As experts study our complex brains and become more sophisticated, mainstream medical thinking has moved away from the typical rest and do nothing strategy. Instead, experts are encouraging sports patients to actively treat soon after the concussion. New protocols encompass prompt education, visual and ocular or vestibular therapy, cognitive rehabilitation, psychological support, nutrition and sleep guidance, neuromuscular therapy and a host of other modalities. As a side note, concussion doctors advise patients

to wear sun glasses inside and out, and to drink more water than usual because the brain gets dehydrated when injured.

Ultimately, when one engages in any sport, protecting one's head, i.e. one's brain, should be the highest priority. Enjoy sports in a practical, safe way by wearing a helmet for those sports that typically use one. If you or someone you know exhibits concussion symptoms, get to the emergency room or see the primary physician – do not let denial be the response. If symptoms do not go away fairly quickly, consult with a concussion clinic expert or neurologist. Be proactive. No one takes better care of you than you, so always advocate for your own health, and specifically, do all you can to protect your brain.

- <sup>i</sup> Concussiontreatment.com; nationwidechildrens.org-concussion basics
- <sup>ii</sup> Cdc.gov-brain injury basics
- <sup>iii</sup> Brainline.org
- <sup>iv</sup> Health.usnews.com
- <sup>v</sup> Ncbi.nlm.nih.gov-Military-related traumatic brain injury and neurodegeneration
- <sup>vi</sup> Nsc.org
- <sup>vii</sup> Cdc.gov-TBI: Get the facts
- <sup>viii</sup> Outsideonline.com-The New Science of Concussion Recovery
- <sup>ix</sup> Fivethirtyeight.com
- <sup>x</sup> Protectthebrain.org
- <sup>xi</sup> Weillcornellbrainandspine.org-Concussions in the Field
- <sup>xii</sup> Gstatic.com:concussion
- <sup>xiii</sup> Nfhslearn.com
- <sup>xiv</sup> Cognitivefxusa.com-Concussion Treatment



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