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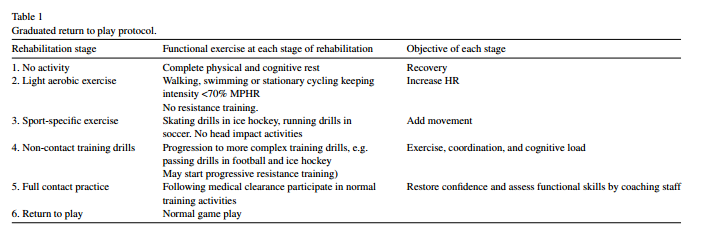
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Sports Related Concussions in Regards to Post Injury Life-Long Disabilities

*ABSTRACT: According to the CDC, 1.6 million to 3.8 million concussions, or mild Traumatic Brian Injuries (mTBI) occur each year and are often sports related. Unfortunately, the typical return-to-play protocol remains vague and through a lack of responsibility among some players and medical professionals, a handful of athletes return too early and risk even greater and prolonged TBI. This paper will delve into case studies of athletes who have had repeated concussions and the neurodegenerative, cognitive and physical disabilities that may evolve from repeated injury over a long period of time. This piece will do so by explaining the physiological cause of mTBI, the return-to-play protocol set by medical professionals, and certain case studies in which a breach of safety was conducted and the athlete returned too early. The last part of this paper will examine potential correctives for reducing mTBIs.*

All over the world, millions experience Traumatic Brain Injuries (TBI) on an annual basis particularly in the form of Mild Traumatic Brain Injuries (mTBI), also known as concussions. Concussions occur when an impact to the head causes the brain to hit the wall of the skull, which causes ion imbalances in the brain and damage to the tissue and vasculature of the brain (Stern 460). Concussions can range in severity depending on the symptoms shown, which includes dizziness, fatigue, loss of consciousness, motor control impairment, headache and many more (McCrory 341). A large portion of concussions that occur annually are sports related from high contact sports such as American Football, Wrestling, Rugby, Lacrosse, Hockey, and Boxing, as well as, on occasion, some lower contact sports. When concussed, athletes who seek help are monitored through the return-to-play protocol to help minimize the lasting damage that can take place from the concussion. With this being said, there are still a large number of athletes who end up reporting lasting damage years after from repeated concussions that happened during the their active days.

In the United States alone, 1.6-3.8 million athletes suffer concussions annually from high contact sports (Langlois 375). If given enough time, only 15% of concussions remain symptomatic after one year (Stern S461). Although most singular event concussions generally don’t show many lasting effects, repeated concussions have been shown to have dire, and sometimes deadly repercussions. Returning to play before an athlete is ready may cause repeated head injuries and lead to neurodegenerative disease and cognitive and physical disabilities throughout the athletes life. Unfortunately, many athletes return to playing before they are fully healed. Some argue that this is a fault of the protocol itself. However, research shows that the problem lies not with the protocol, but with the individual athlete. Many athletes jump the gun and misjudge the protocol, unaware of the risk they bring to themselves. Through a series of case studies such as that of Muhammad Ali and lawsuits filed against the NFL for play-sustained head trauma, this paper argues that there isn’t one perfect protocol for all athletes, but that the time frame for when an athlete can return to playing should be determined on a case by case basis.

The Return-To-Play (RTP) protocol was designed to limit an athletes’ ability to participate in sports and to promote correct recovery from concussions. In the “Consensus statement on Concussion in Sport—The 3rd International Conference on Concussion in Sport held in Zurich, November 2008”, McCrory et al. outlined the six different stages of the RTP protocol as shown below. As you can see from Table 1, the six stages cover immediate post-concussion regarding very little activity to preparation for full play. Each stage is not set to a certain time restraint but is dependent on the personal recovery of the athlete since concussion severities have a large range. Concussions may be diagnosed on the sideline of sporting events, or at a later time if brought in to see a physician. Once diagnosed with a concussion, the athlete must not return to play that same day. This may not always be the case with adult athletes, who can occasionally return to play the same day of evaluation, which can run the risk for re-injury resulting in an even worse concussion since symptoms sometimes don’t fully appear for up to several hours after the initial concussion (McCrory 342). 

Repeated Concussions can have detrimental effects on both the mind and body of an individual years after the injury’s occurrence. In “The Epidemiology and Impact of Traumatic Brain Injury,” Jean Langlois et al. summarize some of the conditions related to repeated head injuries earlier on in life. Some of these conditions include physical impairment, Chronic Traumatic Encephalopathy (CTE), trouble with long and short term memory as well as other cognitive disabilities which can effect daily activities such as work due to loss of long-term focus or loss of cognitive processing speed. Repeated concussions also lead to a risk of developing other health issues such as depression, Alzheimer’s disease, Parkinson’s Syndrome, epilepsy and the development of binge drinking (376). Muhammad Ali, one of the most famous and technical boxers of all time, has a large history of concussions and is now dealing with Parkinson’s syndrome (a less severe form of Parkinson’s disease) as a result to the repeated concussions. Dr. Cope, Muhammad Ali’s physician during his active career, believed that the many hits Ali has taken over the years to the head had a direct causation to the state that Ali is in now (Associated). Although Ali was once quoted as having said that, during his 61-bout career, his face “remained pretty,” what was not known at the time was the damage occurring inside due to the rupture of small blood vessels in the brain (Associated). Neurodegenerative diseases such as Parkinson’s and CTE are very common in athletes who have suffered many repeated concussions throughout their career.

Recently, sports leagues such as the NFL have been hit with hundreds of lawsuits from aging athletes who have reported multiple concussions from their professional careers. This does not come as a surprise. At the high school level, linemen who play both offense and defense can experience up to 2000 impacts in a single season (Stern S460). Although this number is high, impacts experienced by professional athletes are bound to be at an even greater force with faster bodies carrying a lot more weight. The damage that can be done to the head from such contact could be detrimental and permanent. As mentioned earlier, adult athletes may sometimes return to play the same day as the diagnosis for a concussion. Although the professional athlete can return the same day, if he were to suffer a concussion right after returning, the athlete will be at a great risk of lasting damage if they were to sustain another injury shortly after.

Some argue that the fault of repeated concussions lies not with the athlete but the RTP protocol itself. Although this could be the case, it would be highly unlikely because as Table 1 above shows, the protocol is not under time restrictions and solely at the per-athlete recovery rate (McCrory 341). The athletes who choose to play through concussions, or continue to play sports after repeated concussions are the ones at fault for later in life disabilities associated with concussions. Some athletes at the High School level could be misinformed on the dangers of repeated concussions, but that excuse is not relevant for athletes at the professional level. Many internal and external loci of control can influence the athletes’ decision to play even if concussed. One could argue that an internal locus involving team playing can influence the decision to continue to play or not. An example from *NBC Sports* of an external locus would be Jamaal Charles, a NFL player for the Kansas City Chiefs. Charles avoided the RTP protocol in order to continue playing even though a concussion was apparent. His reasoning: helping his team to victory. In fact, 56% of NFL athletes were reported saying they would hide a concussion in order to stay in the game, according to the online website *Sporting News*. In many of these cases, money plays a significant role in encouraging players to hide their injuries.

There is and will always be some debate as to who is to blame for repeated concussions, but one thing will remain certain, and that is the urgency to minimize repeated concussions throughout younger athletes. The possible long term cognitive and physical disabilities that are prevalent due to repeated head injuries effect millions, and will only increase due to the larger size and harder impacts seen in professional sports these days, unless athletes respect their prospective future well-being and take the rest when dealing with a concussion. By implementing continuous education even through the professional level of play, athletes must know that no gamble with winning or possible risk of losing a contract is worth the lifetime damages that can result from playing when it is obvious they shouldn’t. Whether due to an internal or external locus of control, the athletes must recognize the danger that they are putting themselves into by risking another brain injury.

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