Concussions

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"**L**ights out", as many sports commentators would say during a violent collision between two competitive athletes, is not far from the truth when it comes to the shock of everyday head injuries. These injuries are not restricted to sports, occurring anytime when the head is impacted against a solid object: car accidents, bicycle accidents, or even falls around the home or work can certainly achieve the same effect. Regardless of the mechanism, a concussion is important to recognize and treat. After all, this is your brain we are talking about!

The human brain is a 3 lb mass with the consistency of a gelatin dessert. Its delicate nature and importance to our everyday function mandates the finest protection available. The human skull does a remarkable job even under some of the most extreme circumstances, but it does not work alone, being filled with a fine liquid (cerebrospinal fluid) that helps cushion the brain during impact. This entire apparatus can be likened to the suspension system on a vehicle. And like the suspension on a car, our brains suspension system permits a smooth transition of movement under general acceleration and stopping. However, just like a large pot hole will certainly jar a passenger, during an abrupt stop the movement of the brain will overpower its fluid-filled cushion and jar itself against the inside of the skull. It is during and after this impact we observe the effects of a true concussion. But what exactly happens to the brain that causes people to act strange or pass out? Let's look at the science behind it.

A concussion is, in fact, a mild traumatic brain injury, characterized as a sudden, short lived alteration in the brains ability to function properly. Current thought is that violent impact or shaking of the brain may cause a microscopic shearing or grinding-like injury to the nerve cells that compose the brain, temporarily stopping the current running through them that allows us to think and function properly. This can be recognized in a victim as a sudden state of confusion or change in awareness (i.e. passing out). Moreover, a concussion may affect a person's memory, judgment, speech, balance, and overall muscle coordination. The person may complain of headache, double vision, loss of balance, ringing in their ears, and nausea. If these symptoms do not resolve in a short amount of time, regardless of whether you are at a game, scene of a car accident, or home, this person should see a healthcare professional as soon as possible. A more serious blow to the head may cause

the brain to bruise (bleed), swell, or develop a pocket of blood, and this may only be recognized by careful physical examination or imaging technology such as a CAT scan.

Standard treatment for a simple, short lived concussion is rest. Over-the-counter acetaminophen may be taken for mild headaches. Most single concussions are indeed mild and do not typically cause any long-term damage to the brain. Repeated injuries are more serious, can cause anything from early deterioration of the brain to sudden death. This is why it is important not to just "shrug off" a head injury. Guidelines have been developed to help those who suffer a concussion during a recreational event know when it is time take a break.

Dr. Robert Cantu, a neurosurgeon, developed the following grades and recommendations for concussions encountered during a sports event. A Grade 1 concussion is where one does not lose consciousness but experiences a transient loss of intellectual function or confusion (90% of concussions). These are sometimes difficult to catch, but if recognized, this player should only return to the game if they are symptom free at rest and exertion (ex. 40 yard sprint) within 20 minutes of the injury. A Grade 2 concussion involves a loss of consciousness for less than five minutes or amnesia that lasts between 30 minutes and 24 hours after injury. This person may return to play in a week if they are symptom-free during rest or activity. A grade 3 concussion involves a loss of consciousness greater than five minutes or amnesia lasting more than 24 hours. These players should be taken to the nearest emergency room, and may return to play only after a month of rest and clearance by a physician. If a player experiences more than one concussion in a game or season, they should be held out until they are, again, cleared by a physician.

So how do you prevent these types of head injuries? First off, listen to your mother and give your brain maximum protection by wearing an approved helmet. Secondly, prevent falls at home and the workplace by making sure all walkways are clear of obstacles and slick surfaces. Last but not least, use your brain and not your head when participating in activities. Unlike a set of car shocks, your brain is irreplaceable.

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