

# **Car Crashes: Concussive Brain Injury**

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The most common and least serious type of traumatic brain injury is called a concussion. The word comes from the Latin *concutere*, which means "to shake violently."

How can you tell if you have had a concussion? Is it always serious? And what should you do if you have a concussion? Here are answers to some important questions about concussions.

Statistics show that someone in the U.S. gets into a vehicular accident every ten seconds. This report comes from the National Highway Traffic Safety Administration. Luckily, a lot of these numbers aren't fatal cases, yet this doesn't guarantee that long-term anxiety, phobias, and fears won't be experienced. A smaller percentage of this number comprises brain injuries and other serious effects of car crashes.

## **Angular Acceleration**

The mechanism of the trauma was previously thought to be a shearing of axons which result from abrupt acceleration and deceleration of brain tissue. During a low speed whiplash injury (7 mph) the head may be accelerated to 9-18 g.

Since the brain is a soft structure, shear strains are created as the outer part of the brain moves at a different pace than the inner part of the brain. This is intensified as the momentum of the head changes rapidly in a sagittal direction during a whiplash trauma. Ommaya and Hirsch studied the tolerances of primates to whiplash and calculated, by interpolation, that angular accelerations of 1800 rad/sec<sup>2</sup> would result in a cerebral concussion in man about 50% of the time. They noted, however, that this threshold may very well be as low as 1600 rad/sec<sup>2</sup>.

As an interesting note, recent crash studies have produced angular accelerations of volunteers' heads of up to 1000 rad/sec<sup>2</sup> in one study to as high as 1260 rad/sec<sup>2</sup> in another and these are low speed crashes. The most important factors in whiplash-induced concussion are angular acceleration, flexion/extension tensions in the neck, and intracranial pressure gradients.

The medical treatment for traumatic brain injuries is sure to cost money – tons of it. It can be very expensive, yet it wouldn't even guarantee that the crash victim's brain is ever going to be the same again.

Brain injuries are considered serious medical cases as the damage could extend to other parts of the victim's body. The probable effects of brain injury may include one or more of the following:

- Impaired motor skills
- Damaged cognitive function
- Loss of stored memories
- Difficulty in remembering some information
- Loss of reading, writing, or speech skills
- Alteration of personality
- Mood swings
- Sexual inhibition
- Delirium
- Stupor
- Coma

The most serious brain injuries are often treated in hospitals. Depending on the seriousness of the injury, though, patients can also receive their treatments and therapies in the comfort of their home. With the advancement of technology, more and more patients are being saved from a vegetative state and a great number of sufferers actually regain some of their lost motor or speech skills.

Majority of these cases are never 100% cured, though. Patients and their loved ones must also keep in mind that the effects of therapies and treatments are never instantaneous. Several stages of therapies need to be done in order for patients to get back some or all of their brain's capacity. Experienced surgeons and neurologists need to tend to such cases.

Since these therapies can cost a lot of money, it's also advisable for the patient's family to file an insurance claim. The family plays an important role in the patient's life at this point in time. They will serve as the patient's source of strength as he is represented in the court of law. A skilled attorney can make or break the case in securing a settlement for the patient. Where another driver is to

blame, a legal action can be filed and the compensation may be used for medical bills as well as lost wages and vehicle repairs.

The extent of a brain injury due to a car crash can, indeed, be far-reaching. It doesn't only damage the life of the patient but more so his loved ones who spend grueling days, months or years of uncertainty.

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