

# Traumatic Brain Injury

## What Attorneys Need to Know About its Complexities and Challenges

BY DAVID M. PARIS

The risks of traumatic brain injury have been attracting a great deal of well-deserved attention in recent years. Will Smith's new movie, "Concussion," draws much-needed attention to the types of brain injuries suffered by professional football players, as has the class action lawsuit brought against the National Football League by former players seeking damages for injuries resulting from repeated head trauma. As many as one in five returning veterans suffer from traumatic brain injury as well. Traumatic brain injury, however, is not limited to the football field or the field of battle. It is one of the most common injuries suffered by motor vehicle accident and fall victims.

According to the Centers for Disease Control, falls and motor vehicle crashes are the leading causes of traumatic brain injury, accounting for more than half of the traumatic brain injuries resulting in emergency room care, hospitalization or death in the United States,<sup>1</sup> which means that attorneys who handle personal injury cases must have a thorough understanding of traumatic brain injury, its mechanisms, and the devastating effects it can have on its victims.

### The Basics of Traumatic Brain Injury

Traumatic brain injury (TBI) arises from two causes — either open or closed head injuries. Open head injuries, also called penetrating injuries, occur when an object penetrates the brain causing specific injuries. Closed head injuries, on the other hand, are caused by direct blows to the head (such as when the head strikes an interior surface in a car crash, or a hard surface as a result of a fall) as well as by sudden acceleration or deceleration accompanying an impact, causing the brain to move quickly back and forth within the skull cavity. In addition, there are two types of traumatic brain injury — primary brain damage and secondary brain damage. Primary brain damage is the damage

caused immediately at the time of the impact, while secondary brain damage arises from swelling or increased blood pressure in the skull following the initial injury, or by other factors such as oxygen deprivation (hypoxia) resulting from the interruption of blood flow, or the effects of persistent inflammation caused by the immune system and resulting degeneration following even a single injury.<sup>2</sup>

Objective physical evidence of the most common forms of TBI has been difficult to obtain in the past, especially where the types of closed head injuries most commonly associated with motor vehicle accidents are concerned. Sudden acceleration and deceleration can cause what is known as a "coup-contrecoup" injury, where the brain essentially "bounces" off one side of the interior of the skull and strikes the other. Localized lesions or bleeding caused by the brain striking the interior of the skull may be detectable through the use of standard imaging studies, but this is not true of all brain injury. The most common damage associated with acceleration/deceleration injuries in motor vehicle crashes is diffuse axonal injury (DAI). DAI occurs when the brain deforms in response to sudden acceleration or deceleration, which causes the white matter fibers of the brain to tear in a non-localized, or "diffuse" manner, most frequently in the portions of the brain associated with cognition and social and behavioral control (such as the medial orbital surface of the frontal lobes and the anterior surface of the temporal lobes).<sup>3</sup>

Injuries of this type clearly can have both an immediate and lasting effect on their victims, but they can elude standard imaging technologies. However, newer imaging technologies such as diffusion tensor imaging (DTI) now permit precise visualization of damage to white matter that can result from such an injury.<sup>4</sup> Other radiological innovations include susceptibility weighted imaging (SWI), which is a 3D magnetic resonance imaging (MRI) sequence that is particularly attuned to detect small hemorrhages in the brain, as well as fluid-attenuated inversion recovery (FLAIR), which allows for the precise

assessment of lesions associated with neurological injury. Radiological imaging, however, is not the only means by which the existence and scope of TBI can — or should — be diagnosed. Neuropsychological assessment is also a critical component of determining the scope and severity of a person's injury, and its impact on his or her cognitive and emotional capabilities.<sup>5</sup>

### What Traumatic Brain Injury Means in Personal Injury Cases

An attorney presenting a case involving traumatic brain injury must have a comprehensive understanding of the medicine and technology involved in detecting, diagnosing and treating TBI, and must keep him or herself informed of the most recent advances in the science of TBI and the effects of TBI, both short and long term, on its victims. He or she must also make sure to engage appropriate experts who are trained in and understand the most current diagnostic tools, both radiological and clinical.

A neurologist who is experienced in the diagnosis and treatment of TBI and can access the most recent technology is critical, as is a neuropsychologist or neuropsychiatrist who can properly assess the client's deficits and explain them to the jury, as sometimes even the client will not fully understand or appreciate the extent to which he or she has been compromised by the injury.

In addition to diagnostic experts, it is often necessary to retain experts in physical medicine and rehabilitation to address the client's need for physical and occupational therapy. Likewise, it is often necessary to retain a psychologist or other clinical counseling professional who is familiar with the effects of TBI on its victims and on their family members. While personality changes are a common result of TBI, the injured person often has little insight as to their effects on others. Thus, educational and emotional support for the injured person and the family, along with cognitive behavioral therapy, are often necessary elements of treatment,

and it is important to have the appropriate professionals as experts in order to explain these issues to the finder of fact.

Though public awareness of TBI has probably never been higher, its mechanisms and effects still are not commonly known or widely understood, either by laypersons or the legal community. Even front line medical professionals can miss TBI in victims of traumatic injury, as recent studies indicate that as many as 56 percent of mild TBI injuries go undiagnosed by emergency room staff. In those cases, the client's family is typically the first to notice problems with memory loss, impaired cognition, or changes in mood and personality. Clients and families who are struggling with TBI symptoms and rehabilitation can easily get frustrated, and often don't know where to turn. Attorneys who are familiar with the short and long-term difficulties of TBI can help these families connect with the care and resources they need.

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<sup>1</sup> According to the CDC, approximately 2.5 million emergency room visits, hospitalizations and deaths were associated with TBI in 2010 alone, with falls and motor vehicle injuries being the first and third overall largest causes, and unintentional blunt trauma (being hit by an object) being the second largest cause. See Traumatic Brain Injury in the United States: Fact Sheet (available at [http://www.cdc.gov/traumaticbraininjury/get\\_the\\_facts.html](http://www.cdc.gov/traumaticbraininjury/get_the_facts.html) last accessed on January 13, 2016).

<sup>2</sup> Though much attention has been focused on the association between repeated brain trauma and later neurodegenerative diseases, recent scholarship indicates that even a single injury may create a predisposition to future cognitive decline. See Johnson, VE, et al., *Inflammation and white matter degeneration persist for years after a single traumatic brain injury*, *Brain*, 2013 Jan; 136(Pt 1):28-42 (single injury associated with increased risk of dementia and Alzheimer-like pathologies); Wang, Hao-Kuang, et al., *Population based study on patients with traumatic brain injury suggests increased risk of dementia*, *J Neurol Neurosurg Psychiatry* 2012;83-1080-1085 (longitudinal study showing suggesting increased risk of dementia in Asian TBI victims).

<sup>3</sup> See Dilley, M. et al. *Long-Term Neuropsychiatric Disorders After Traumatic Brain Injury*, *Psychiatric Disorders – Worldwide Advances*, Uehara, T. ed.

<sup>4</sup> DTI (also known as diffusion MRI) uses magnetic resonance imaging to produce three dimensional images of the brain's neural tracts by measuring the flow of water molecules as they follow nerve fibers through the tissues of the brain. See, e.g., Alexander, Lee, and Field, *Diffusion Tensor Imaging of the Brain*, *Neurotherapeutics*, 2007 Jul; 4(3): 316-329. Its effectiveness in detecting brain damage in TBI cases is well-accepted in the medical community and has been deemed admissible by federal courts. See, e.g., *Andrew v. Patterson Motor Freight, Inc.*, No. 6:13CV814, 2014 U.S. Dist. LEXIS 151234 (W.D. La. Oct. 23, 2014).

<sup>5</sup> See Kosaka, B, *Neuropsychological assessment in mild traumatic brain injury: A clinical overview*, *BCMJ*, Vol. 48, No. 9, Nov. 2006.



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