

An alert on any
traumatic brain injury
and stressing out the
necessity of careful...

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Traumatic Brain Injury

The Freeform network (formerly known as ABC Family) broadcasts a fictional, drama television series called *The Fosters*. It is focused around a lesbian couple raising four adopted children and one biological child. (*The Fosters* (2013 TV series)) In Season 4 one of their sons, Jesus, was covering for his biological father at work and accidentally shot himself in the forehead with a nail gun. The nail was removed and there was no brain damage, but later in the season he was hit in the same spot during a fight. This caused fluid build-up in his brain which resulted in him having seizures. He had surgery to drain the fluid but the seizures still occurred along with other permanent and temporary symptoms. Even though Jesus is a fictional character that was diagnosed with TBI and the scenario is make believe, TBI is a real thing. TBI or traumatic brain injury, is a very serious chronic disease that contributes to about 30% of all injury deaths. (Traumatic Brain Injury & Concussion) Though Jesus does not die, this show brings to light the severity of TBI.

TBI “ is a nondegenerative, noncongenital insult to the brain from an external mechanical force, possibly leading to permanent or temporary impairment of cognitive, physical, and psychosocial functions, with an associated diminished or altered state of consciousness. (Traumatic Brain Injury (TBI) - Definition, Epidemiology, Pathophysiology) Some individuals can have a more critical case of TBI than others, which is where the Glasgow Coma Scale comes in. The Glasgow Coma Scale is used to estimate and categorize the outcome of a brain injury, as well as to categorize the four possible levels for survival. The test is based on a 15-point scale that

measures the motor response, verbal response, and eye-opening response. The three values are added together and the final score determines which survival category the individual gets put in to: a score of 13-15 is mild TBI, 9-12 is moderate disability, 3-8 is severe disability, and less than 3 is vegetative state. (TraumaticBrainInjury. com) Though TBI can be severe, moderate, or even dire, the most common TBI is MTBI or mild traumatic brain injury. “ The American Congress of Rehabilitation Medicine defines a mild traumatic brain injury as a patient “ who has had a traumatically induced physiological disruption of brain function, as manifested by at least one of the following: any period of loss of consciousness; any loss of memory for events immediately before or after the accident; any alteration in mental state at the time of the accident (e. g., feeling dazed, disoriented, or confused); and focal neurological deficit(s) that may or may not be transient. But where the severity of the injury does not exceed the following: loss of consciousness approximately 30 minutes or less; after 30 minutes, an initial Glasgow Coma Scale (GCS) of 13-15; and post-traumatic amnesia (PTA) not greater than 24 hours.” (International Brain Injury Association - IBIA)

There are various injuries an individual can sustain that results in a TBI. For example, a gunshot wound can cause an open head injury which would then be considered a TBI. An injury from falling or from a car accident can cause a TBI because these injuries are associated with closed head injuries. Hence, the top three causes of TBI being: car accidents, falls and firearms. Car accidents are first because they “ account for approximately 50% of all TBIs.” (Traumatic Brain Injury (TBI) - Definition, Epidemiology, Pathophysiology) Second is falls seeing as they account for 20-30% of all

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TBIs. In individuals aged 75 years or older, falls are the most common cause of TBI and very young people also commonly sustain TBI due to falls. “

Firearms are the third leading cause of TBI (12% of all TBIs) and are a leading cause of TBI among individuals aged 25-34 years. Gunshot-related, fatal TBIs are higher among men than among women and are more prevalent among African Americans than they are among whites.”

(Traumatic Brain Injury (TBI) - Definition, Epidemiology, Pathophysiology)

Deceleration injury, “ caused by acceleration and deceleration forces or rotation forces acting on the head leading to shearing of the brain tissue,” is another way an individual can acquire a TBI and is commonly known as diffuse axonal injury (DAI). (International Brain Injury Association - IBIA) If a person has a metabolic disorder or is chemically/toxically poisoned they can sustain a TBI. TBI can occur from a person having a heart attack, respiratory failure, or a drop-in blood pressure because these events result in hypoxia or lack of oxygen. Tumors caused by cancer, infections from a virus or bacteria, and even a stroke can cause TBI. (TraumaticBrainInjury. com)

There are numerous methods to diagnose a brain injury. Scans, like that of a CAT (computerized tomography) scan, MRI (magnetic resonance imaging), SPECT (single photon emission computed tomography) and PET (positron emission tomography) scan, can be useful to “ directly or indirectly image the structure, function, or pharmacology of the brain.” (Boundless. “ Brain Imaging Techniques.”) Like the Glasgow Coma Scale that was mentioned earlier, there is also the Ranchos Los Amigos Scale. This scale “ measures the levels of awareness, cognition, behaviors and interaction with the environment.” There are eight various levels: level I is no response, level II is

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generalized response, level III is localized response, level IV is confused-agitated, level V is confused-inappropriate, level VI is confused-appropriate, level VII is automatic-appropriate, and level VIII is purposeful-appropriate. (TraumaticBrain-Injury. com) Evaluations by neuropsychologists are important in assessing how mild TBIs have affected cognitive function. These evaluations are done by examining: attention, speech and language, memory or orientation, visual-spatial or constructional ability, executive function, affect and mood, and thought processing. (TraumaticBrainInjury. com)

A TBIs effects, which can be long-lasting or even permanent, can affect many areas of a person's life, including physical functions, thinking abilities, and behaviors. The physical effects of a TBI may include one or all the following: headaches, dizziness or trouble with balance, trouble hearing or sensitivity to noises, difficulty speaking, change in sense of taste or smell, blurry eyesight or sensitivity to light, and loss of energy. The cognitive effects may include: difficulty concentrating, repeating things, trouble with attention, forgetfulness, and difficulty making decisions. Becoming angry or frustrating easily and acting without thinking are behavioral effects an individual may experience after sustaining a TBI. (Effects of Traumatic Brain Injury) You see Jesus experience most of these symptoms when you watch Season 4 of The Fosters. Jesus gets confused with certain events and sometimes forgetful about where he is, what he is doing, or the names of objects. For example, he is shown a hammer and believes it is a screwdriver. He has trouble with speaking, a tough time reading things, and experiences headaches. These symptoms cause him to become angry, frustrated, and act without thinking.

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Jesus also has trouble with individual relationships, the ability to return to school, and having false memories. This is evident in Season 5 episode 1 when he believes that his girlfriend was pregnant by his brother, which was the reason why she did not tell him she had an abortion. “ False memories aren’t usually irrelevant, they are memories that could have happened. It appears the hippocampus, a small region of the brain that forms part of the limbic system and is primarily associated with memory and spatial navigation (Mandal, MD Dr Ananya. “ What is the Hippocampus?”), will assemble memories that fit the context, even when the sensory data is not there. There is enough sensory data to build a context, but our brain may fill in missing details.” (Zull, James E. The Art of Changing the Brain)

Studies show that moderate and severe traumatic brain injury has been linked to a greater risk of developing PTSD (post-traumatic stress disorder) or Alzheimer’s disease. PTSD and TBI are sustained during traumatic experiences, which is why they frequently coexist with one another. A study of 939 health plan members shows “ that patients with a history of mild TBI were 2. 8 times more likely to develop a psychiatric disorder than patients with no TBI history.” (Bryant, Richard) To explain how PTSD can develop following TBI, first you must understand what PTSD is. PTSD “ is a mental health problem that some people develop after experiencing or witnessing a life-threatening event, like combat, a natural disaster, a car accident, or sexual assault.” (PTSD: National Center for PTSD) There are several ways TBI can lead to PTSD. First, individuals can experience fear during a traumatic event which causes the brain to trigger trauma reminders resulting in trauma elicit anxiety. Secondly, after a traumatic event a patient can

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possibly recreate the memories that happened during the impaired consciousness in a way that represents it as traumatic. Lastly, “ many people who sustain a TBI, and frequently those with MTBI, suffer traumatic experiences following resolution of their posttraumatic amnesia. These experiences function similarly to any traumatic scenario observed by people who develop PTSD in the absence of any TBI.” (Bryant, Richard) When it comes to Alzheimer’s disease there is a study that shows “ that older adults with a history of moderate traumatic brain injury had a 2. 3 times greater risk of developing Alzheimer’s than seniors with no history of head injury, and those with a history of severe traumatic brain injury had a 4. 5 times greater risk.” (Traumatic Brain Injury | Signs, Symptoms, & Diagnosis) This is because after a brain injury the chemistry of the brain changes. These changes can lead to abnormalities in proteins like beta-amyloid or tau that could possibly cause Alzheimer’s.

Recovering from a traumatic brain injury is a very lengthy process and is variant on the severity of the injury and the individual who sustained the injury. Predicting how well or how fast a person will recover is very difficult, but it can be based off how long the person was in a coma and the duration of loss of memory following the coma. (Understanding TBI: Part 3 - The Recovery Process) Some individuals may be sent to a rehabilitative care center where they are assigned a rehabilitation team to help them recover from a TBI. This team consists of a psychiatrist, a neuropsychologist, a rehabilitation nurse, a physical therapist, and an occupational therapist. The psychiatrist can assess and prescribe treatment for the patient. The neuropsychologist will assess the patient’s change in thinking and behavior,

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the evaluation done by this team member was discussed earlier. The rehabilitation nurse will assist in maintaining the patient's optimal health. To minimize or overcome paralyzing effects brought on by a brain injury, a physical therapist might be needed. And finally, to " assess functions and potential complications related to the movement of upper extremities, daily living skills, cognition, vision and perception" is the job of the occupational therapist. (TraumaticBrain-Injury. com) The goal of this team is to limit the number of long-term effects a patient will have due to a brain injury. The following statistics are based on individuals two years post-injury who sustained a moderate to severe TBI and received acute medical care and inpatient rehabilitation services:" most people continue to show decreases in disability, 34% of people required some level of supervision during the day and/or night, 93% of people are living in a private residence, 34% are living with their spouse or significant other; 29% are living with their parents, 33% are employed; 29% are unemployed; 26% are retired due to any reason; and 3% are students." (Understanding TBI: Part 3 - The Recovery Process)

A written questionnaire was sent to 46 families of children who survived a traumatic brain injury and received a GCS score of less than or equal to 7, which is a severe disability. The results were: " approximately one third of children have disabilities related to education, socialization, and/or self-care skills; require multiple health care visits each month; and require prescription medications. Over one third of families were impacted in a moderate to profoundly negative way; 30% of families reported a deterioration in finances or loss of job; and 16% reported a worsening of adult relationships. In 13 of 32 cases, modification of current housing or new

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housing was required to facilitate home care. Siblings were adversely affected in approximately 16 of 28 families, exhibiting behavioral problems, increased fear, and withdrawal from the injured child. Only 1 of 32 families stated that they would have considered less aggressive treatment, even if it led to the child's death." (Montgomery, V, et al) These results show that a brain injury doesn't just affect the person that sustained it, it also affects their entire family. Those who look after a TBI patient usually experience feelings of anger, depression, anxiety, distress, and burden.

TBI is a disease that can affect more than just the person suffering from the brain injury. It is a threat to an individual's cognitive health and can result in long-term disabilities. It should be taken seriously, meaning that any person who receives a head or brain injury should seek medical attention as soon as possible. This is because according to the CDC (United States Centers for Disease Control and Prevention), there are approximately 1.5 million people in the U. S. who suffer from a traumatic brain injury each year, 50,000 people die from TBI each year, 85,000 people suffer long term disabilities, and more than 5.3 million people live with disabilities caused by TBI. (TraumaticBrainInjury.com)