



## Traumatic Brain Injury-related Q & A from American Brain Foundation eNews

### **Q. Does having a Traumatic Brain Injury increase the likelihood of getting Alzheimer's disease or another form of dementia?**

**A.** The risk of ongoing neurocognitive impairment is likely related to the severity and number of TBIs sustained. There is also a distinction between cognitive impairment (which can be measured at a single time point but may not be progressive) and neurodegeneration (which implies progression over time and is definitively diagnosed longitudinally).

Moderate-to-severe TBI almost always results in some lasting cognitive impairment which may be a static deficit. It is likely also associated with an increased risk for developing Alzheimer disease and possibly Parkinson disease.

Repeated mild TBI has been associated with persistent cognitive impairments. Recent evidence-based review found chronic neurocognitive impairment (namely lower performance on neuropsychological testing) in multiple (8/8) studies of professional athletes, in many studies with a dose response (6/6), implying a causal relationship. The presence of detectable neurocognitive impairment using objective tests was less definitive in amateur sports with only half of studies showing this. The relationship to chronic neurodegeneration is currently only an association, with causality suspected but not clearly proven. The evidence for this is strongest for dementia pugilistica in association with boxing. More recently the term chronic traumatic encephalopathy has been used to refer to pathological tau protein accumulation and presumed neurodegeneration after repeated mild TBI in multiple sports, but particularly professional boxing and football.

There is no proven dementia risk from a single mild TBI, which for most individuals is fully recoverable. Some individuals develop chronic post-concussion syndrome, which should be distinguished from a neurodegenerative disorder or progressive dementia.

### **Q. Is there evidence of the benefits of fish oil on the effects of traumatic brain injury?**

**A.** Fish oil (omega-3 fatty acids) have been shown in laboratory animals to reduce neurobiological markers for TBI, including axonal injury and inflammation. In humans there are no studies that show fish oil is protective for TBI or that it promotes more rapid recovery from TBI when compared to a blinded control group. However, in terms of long-term brain health and cognition overall (in the absence of TBI), diets high in fish oil are associated with lower risk for dementia and/or longer preservation of cognitive function.

### **Q. Is there a relationship between the length of time being in a coma after a traumatic brain injury and the prognosis?**

**A.** Across the whole range of TBI, the depth of coma (as measured by the Glasgow Coma Scale) is strongly associated with long-term global outcomes—although not necessarily the risk for future dementia, which is a separate question. In general duration of coma is associated with injury severity, although acutely it can also be affected by iatrogenic sedation and medications required to treat severe TBI. At the milder end of the spectrum, including concussion, loss of consciousness may be associated with prolonged symptom recovery, but again has not been proven as a risk factor for longer term neurocognitive impairment or neurodegeneration/dementia.

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