



A Patient's Guide to Chronic Traumatic Encephalopathy (CTE)

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by UCSF Weill Institute
for Neurosciences as
an educational resource
for patients.



UCSF Weill Institute for Neurosciences
Memory and Aging Center



What is chronic traumatic encephalopathy?

Chronic traumatic encephalopathy (CTE) is a condition that may result from head injuries, especially in athletes of contact sports like boxing or football and combat veterans. The condition slowly damages parts of the brain and may cause trouble with memory, other thinking skills, behavior, personality, speech, or balance.

What causes chronic traumatic encephalopathy?

Why head injuries lead to CTE is unknown. Scientists know that in CTE there is a large build-up of a protein called tau. Tau occurs normally in the brain, but we do not yet understand what causes it to build up in large amounts. As more and more proteins clump in the nerve cells, the cells lose their ability to function and eventually die. This causes the affected parts of the brain to shrink.

Studies have shown that CTE can result from repeated head injuries, including traumatic brain injury (TBI) or concussions from contact sports, accidents, or combat. It is still unclear if a single head injury can cause CTE, and not everyone who has a concussion(s) develops CTE.

How is age related to chronic traumatic encephalopathy?

Research suggests that people with CTE often begin to have symptoms years or even decades after the last brain injury or end of active participation in contact sports, although this can vary from person to person. Symptoms may start between the ages of 40 and 60 years old.

What happens in chronic traumatic encephalopathy?

CTE may manifest in different ways in different people. People with CTE may have trouble remembering things and concentrating. They may have changes in their behavior and personality, including

violent outbursts, increased frustration, mood swings, and lack of interest in people and things they previously cared about.

Thinking and behavior changes in CTE usually begin very mildly, and the person and their family may not notice significant changes at first. Early symptoms may include mild memory loss, headaches, irritable mood, slurred speech, or unsteadiness when walking. People with CTE may have trouble concentrating, organizing or planning tasks, remembering answers to questions they ask, or doing more than one task at a time.

Later in the disease, problems with memory, mood, behavior, and speech may occur. People with CTE may become depressed or anxious, and may act more aggressively and inappropriately in social situations. They may get lost. Speech may also get worse, and people with CTE may become harder and harder to understand. Worsening problems with walking and balance may increase the risk for falls late in the disease.

A person with CTE can live many years with the disease.

Resources

Boston University Center for Traumatic Brain Injury: bu.edu/cste

Sports Legacy Institute: sportslegacy.org

The Patrick Risha CTE Awareness Foundation: stopcte.org

Family Caregiver Alliance: caregiver.org

National Institutes of Health: nih.gov

UCSF Memory and Aging Center: memory.ucsf.edu

Research: clinicaltrials.gov