

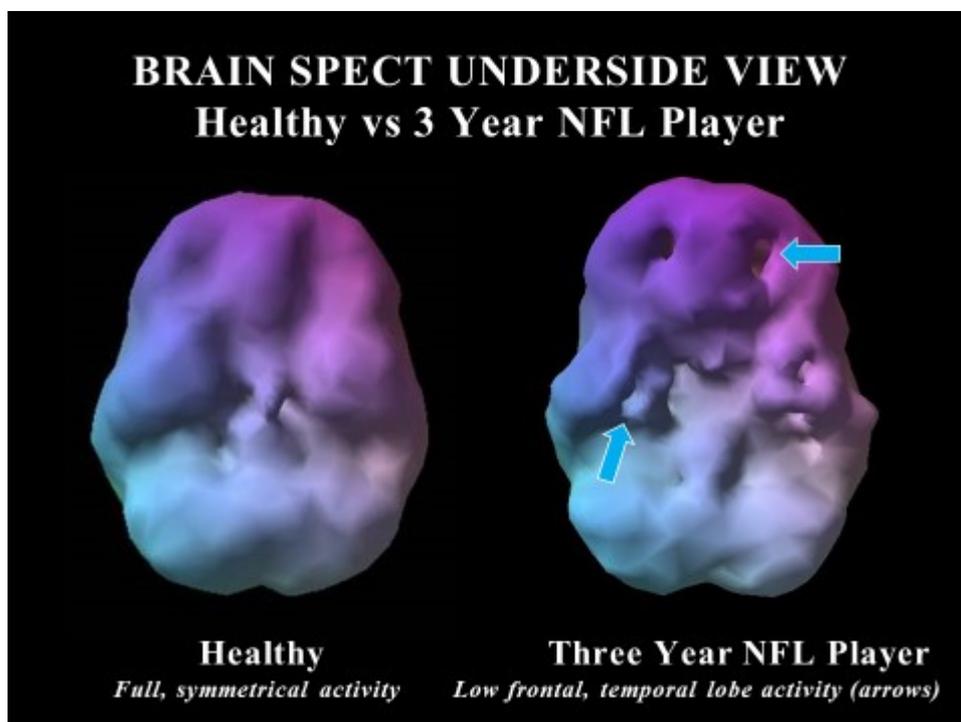
# Abnormal Blood Flow Indicates Traumatic Brain Injury in Football Players

By ACSH Staff — April 26, 2016

Chronic traumatic encephalopathy is a big concern in sports where concussions happen -- which is a lot of sports. There are gaps in understanding (see the Council's peer-reviewed look at concussions [here](#) [1]) and both nature and commerce abhor a vacuum, so any number of wacky treatments have sprung up claiming to treat concussions.

Before they can be treated it's best to understand what is really happening, and the authors of a study in the *Journal of Alzheimer's Disease* claim to have made some progress.

They used cerebral perfusion imaging technology called SPECT (single photon emission computed emission tomography) to examine the brains of 161 retired and current NFL players, with an average age of 52. Looking at blood flow to every region of the brain, they said they could identify areas of abnormally low blood flow. Using that information in a quantitative approach allowed them to distinguish NFL players with abnormal brain patterns compared to health controls with 92-94 percent accuracy.



*SPECT brain scans showing abnormal low blood flow in an NFL player compared to a normal healthy control subject. Credit:*

*University of California Los Angeles Medical Center*

On average, NFL players had lower blood flow in 36 areas of the brain and decreased blood flow in the six regions of the brain were the most important in determining who had football related

health trauma:

- anterior superior temporal lobes
- rolandic operculum
- insula
- superior temporal poles
- precuneus
- cerebellar vermis.

Those regions are important in memory, mood and learning, and when damaged can produce cognitive and psychiatric problems. The authors correlated that to the fact that 83 percent of players in this study had memory problems and 29 percent had a history of depression.

Citation: "Perfusion Neuroimaging Abnormalities Alone Distinguish National Football League Players from a Healthy Population," by Daniel G. Amen, Kristen Willeumier, Bennet Omalu, Andrew Newberg, Cauligi Raghavendra, and Cyrus A. Raji, DOI: 10.3233/JAD-160207, Volume 53, Issue 1 of the Journal of Alzheimer's Disease

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[1] <http://acsh.org/publications/concussions/>