



## Psychiatry & Behavioral Science Section – 2010

### I11 Pitfalls in the Forensic Application of Functional Neuroimaging to Traumatic Brain Injury

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By attending this presentation, attendees will understand how SPECT imaging can be misused in Traumatic Brain Injury (TBI) cases.

This presentation will impact the forensic science community by informing attorneys and psychiatrists that the misuse of brain SPECT imaging is a concern in both criminal and civil forensic psychiatry.

“The frequencies of mild TBI, the increasing clinical availability and application of SPECT, and a litigious environment have united to produce an atmosphere in which the introduction of evidence involving the interpretation of SPECT images is inevitable (Wortzel, 2009).”

Although most survivors of mild TBI fully recover within one year of their injury, a minority have ongoing, mostly subjective disturbances of cognition, emotion, and behavior, which is characterized as poorly-defined “post-concussive syndrome.” Because the majority of these subjects have no demonstrable abnormalities on either conventional diagnostic electrophysiological or structural neuroimaging studies, SPECT imaging, a (relatively) affordable and available functional imaging modality, has become popular with litigants.

Juries’ increasing expectation of visual aids in the courtroom reinforces the use of such evidence. The Society of Nuclear Medicine has cautioned that such use may be unethical, stating that it can lead to unsupportable conclusions if introduced as “objective evidence.” The color-coding of statistical data can create an illusion of lesions where none exists. There is no generally accepted standard for the diagnosis of mild TBI and there are no published standards for pathognomonic lesion determination using either PET or SPECT after mild traumatic brain injury (Granacher, 2009). SPECT imaging does not meet the *Daubert* or *Frye* standards for presentation of scientific evidence in legal settings.

The goal of this presentation is to help the audience understand key elements of this important forensic area.

**Brain SPECT, Mild TBI, Post-concussive Disorder**