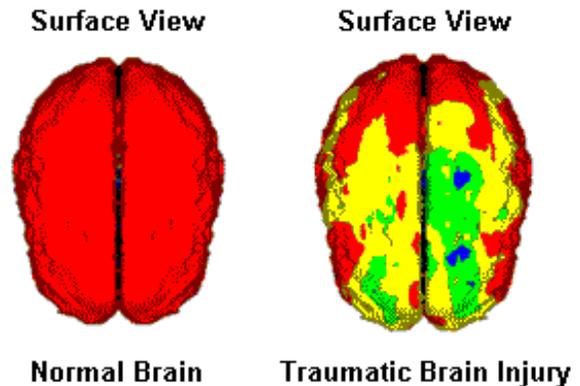


SPECT Studies for Traumatic Brain Injuries

In this newsletter I will be reviewing the use of SPECT studies for evaluation of brain injury.

First we need to define what SPECT imaging is and what it does. SPECT is an acronym for Single Photon Emission Computed Tomography. It provides an indirect measure of brain metabolism by measuring cerebral blood flow. Studies to date have shown that SPECT studies may correlate better with outcome and cognitive dysfunction compared to MRI and CT scanning. Generally, SPECT imaging has been more readily available and less costly than PET scanning. It is therefore more practical than PET for routine evaluation of brain injury.

A Brain SPECT Imaging scan requires that radioactive isotopes be injected into a patient's vein and are taken-up by brain tissue. The isotopes circulate to areas of the brain where blood is flowing, the general principle being that areas where more blood is flowing will receive more isotopic labeling and vice versa. The increased blood flow generally correlates with increased underlying brain activity. The isotope (Technetium99) is immediately fixed to areas of the brain proportional to its flow and emits gamma rays which are then detected by the SPECT gamma camera.



Brain SPECT imaging is recognized as one of the best tools for evaluating functional deficits from mild and moderate head trauma that are often missed by other studies such as MRI and CT. This leads to better understanding and effective treatment for patients. One of the greatest clinical values of SPECT is the correlation with outcome. SPECT correlates well with the severity of the trauma; therefore, a negative SPECT early on is a reliable predictor of favorable clinical outcome. If a SPECT is initially positive then the study should be followed serially and correlated with clinical data.. Jacobs et al, in the Journal of Nuclear Medicine, report that *“Our results demonstrate that repeat SPECT shows perfusion deficits in 95% of patients with persistence of post-concussive symptoms and/or clinical signs. This high SPECT sensitivity represents an important instrument in the objectification of otherwise undetectable sequelae.”*

SPECT studies have now become accepted as a reasonable modality for the evaluation of TBI. If your clients have suspected brain injuries you may want to speak with the attending neurologist about the appropriateness of ordering a SPECT study early on in management.