Poster title:  
3D HMPAO Brain Spect Scans as an Aid in the Diagnosis and Management of ADHD

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<thead>
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Abstract (300 word maximum):  
**Objective:**  
There is controversy whether neuroimaging is clinically useful in the diagnosis and management of ADHD (attention-deficit/hyperactivity disorder). In Amen 1997, during intellectual stress, 65% of ADHD patients showed reducedprefrontal cortical perfusion on SPECT scan compared to 5% of the control group, and of those in the ADHD group that didn’t show reduced perfusion, two-thirds did so at rest. Amen 2008 showed that prefrontal deficits shown on SPECT scan could be used to predict response to stimulants. We replicate Amen’s techniques with the objective of determining the relationship between SPECT images and clinical diagnosis of ADHD, and response to treatment. We do so first on a qualitative individual case basis before proceeding with a quantitative study.  

**Design and Methods:**  
Over the last three years we have replicated Amen’s 2D and 3D brain HMPAO SPECT scans in Toronto on some four hundred patients across the lifespan and across the diagnostic spectrum.  

**Results:**  
Cases with a clinical diagnosis of ADHD often showed on SPECT scan functional defects in their infraorbital prefrontal cortex (example shown in Figure 1). These cases tended to respond to stimulants. After treatment the defects in the prefrontal cortex often diminished or resolved (Figure 2). Other cases with a clinical diagnosis of ADHD occasionally showed on scan a pattern associated with bipolar disorder. In cases where there were no defects in the prefrontal cortex yet there were ADHD clinical symptoms (example shown in Figure 3), often there was a mediocre response to stimulants. These cases and images are presented.  

**Conclusions:**  
Patients with a clinical diagnosis often show on SPECT neuroimaging a dysfunctional prefrontal cortex. There is a better response to stimulant treatment of ADHD symptoms when such prefrontal cortical defects exist on scan. A prospective study is indicated to better quantify these results.  

**References**  