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Your Depression and Bipolar Disorder Source

Knowledge is Necessity

Research may lead to diagnosis.

"Dr Tamminga used before and after PET scans to track Haldol and Clozaril at work."

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Brain Scans

Carol Tamminga MD, of the University of Texas Southwestern Medical Center at Dallas, told a seminar at the 2003 NAMI convention how she and her colleagues eagerly waited outside the door in anticipation of viewing their first **brain scans** of a patient with schizophrenia. Much to their dismay, the images looked normal, which was their first lesson in the art of subtlety.

How far we have come:

A study by Ahmad Hariri PhD et al of the NIMH appearing in the July 19, 2002 Science divided 28 subjects into two groups, those who had a short form (allele) of the serotonin transporter gene SLC6A4, and those with the long allele. Cells with the long variant express nearly double the serotonin reuptake as those with the short allele. The subjects were placed in an MRI machine and completed a simple exercise involving processing the images of three different faces. The brain scans revealed that those with the short allele displayed a significantly greater response in the right amygdala while engaged in the task. The amygdala is a tiny, almond-shaped part of the brain which governs fear. When the subjects were given a thinking task not involving emotions, no variants were seen.

In the authors' words: "Our results directly implicate a genetically determined link between serotonin transporter function and the response of brain regions critical for emotion processing."

This may very well be the first study linking genes to emotions in humans, and it certainly won't be the last, thanks to our increasing ability to literally peer inside the skull and view what is taking place.

Perhaps the number one question about brain scans concerns whether it will be possible to use the technology to diagnose **depression** or **bipolar disorder**. The short answer is maybe. In early 2002, a possible taste of the future occurred in a Washington DC courtroom when plaintiff Jane Fitts successfully used brain scans showing an atrophied parietal lobe and other abnormalities to convince a federal judge that her bipolar disorder was "physical" in nature, thus allowing her to accrue extended disability according to the terms of her health plan (see [article](#)).

The technology we have may already be sufficient to make a diagnosis. What is lacking is our knowledge of what makes a particular brain abnormality unique to a certain illness. But that may change, with researchers increasingly turning to brain scans to discover how we tick.

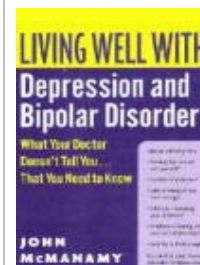
Positron emission tomography (PET) involves the subject inhaling or being injected with radioactive tracers, which are absorbed into the brain tissue. A positively-charged particle (positron) collides with an electron in the tissue, destroying both and resulting in two photons that are detected by the PET scanners. Increases or decreases in cerebral blood flows to and from regions of the brain are measured by radiation counts.

Dr Tamminga is the author of a classic 1992 study involving PET scans on 12 patients with schizophrenia, which identified functional abnormalities in their limbic circuits compared with normal controls. In a study published in 2003, Dr Tamminga used before and after PET scans to track Haldol and Clozaril at work, finding both similarities and differences in blood flows to certain regions of the brain that could account for their clinical benefits and side effects.

A pioneering study by Baxter et al using PET to measure resting glucose

John McManamy

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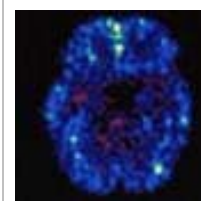
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focus of investigation in mental illnesses.

Gerard Sanacara MD, PhD of Yale has used magnetic resonance spectroscopy to measure the neurotransmitter GABA in the brain, finding that those with melancholic depression show low GABA concentrations in the occipital cortex, while the depletion is not as pronounced for those with atypical depression, indicating a diagnostic potential for subtypes of depression (March, 2003 *AJP*). Before and after scans of eight patients who had ECT found a doubling of GABA, and similar scans of patients on SSRIs showed a slow rise in GABA levels in nine of 11 of them.

Conclusion

The next time you encounter a skeptic who tells you your illness is all in your head, you may want to download and print brain scans and keep them handy for future encounters. At the very least, these images eloquently portray in a way that words cannot that our illness is demonstrably real.

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