Your brain is the most complex, mind-blowing organ in the universe. It is estimated to be only about 3 pounds, which is usually around two percent of your body’s weight. It is estimated that the brain has 100 billion nerve cells and more connections in it than there are stars in the universe.

The human brain is dependent on proper stimulation to grow and develop in healthy ways throughout childhood and to maintain its functioning into old age. When you stimulate neurons in the right way, you make them more efficient; they function better, and you are more likely to have an active, learning brain throughout your life. The best sources of stimulation for the brain are physical exercise, mental exercise, and social bonding.

Psychiatrists are the only medical specialists who rarely look at the organ they treat. Psychiatrists continue to make diagnoses the same way they did 100 years ago, based on clinical exams and symptom clusters. There is a better way.

**Brain SPECT Imaging**

A nuclear medicine procedure, Brain SPECT imaging evaluates cerebral blood flow. SPECT evaluates areas of the brain that work well, areas of the brain that work too hard, and areas of the brain that do not work hard enough. The information from the scans, along with a detailed clinical history, helps us understand the underlying brain patterns associated with patients’ problems and helps to pinpoint the right treatment to balance brain function. SPECT imaging helps provide answers to mental health problems and helps clinicians ask better and more targeted questions about such topics as ADHD, head injuries, toxic exposure and past emotional traumas.

At the Amen Clinics we have been using brain SPECT imaging as an aide in making neuropsychiatric diagnoses and individualizing treatment plans since 1991. SPECT does not give us the answer; it teaches us to ask better questions. It is an important piece of the clinical puzzle, but, by itself, it is never the answer.

In both medical school and during my psychiatric training at the Walter Reed Army Medical Center in Washington, DC, I was taught to take a bio-psycho-social-spiritual approach to diagnosing and treating patients. Brain SPECT helps us gain a deeper understanding of the biological underpinnings of our patients’ problems and then helps us formulate the biological part of our patients’ treatment plans.

For example, SPECT helps us understand if an underlying head injury or toxic exposure may be contributing to our patients’ problems. If a patient has an overactive brain, SPECT helps make recommendations to calm the brain, where if a patient has an underactive brain I am more likely to make recommendations to help stimulate it. Always, the SPECT data needs to be correlated with clinical information. SPECT is not a doctor in a box and will never replace a competent physician. It helps him or her be a better doctor as he or she has more information.

SPECT gives a three-dimensional view of brain activity. Basically, SPECT measures three things: areas of the brain that work well; areas of the brain that are low in activity; and areas of the brain that are high in activity.

**What Do Scans Show?**

When physicians look at a SPECT study, they examine it for symmetry and activity levels indicated by shades of color and compare it to what we know a normal brain looks like. Physicians are usually alerted that something is wrong in one of three ways: (1) they see too much activity in a certain area; (2) they see too little activity in a certain area; or (3) they see areas that don’t match with the other side of the brain.
Brain SPECT Imaging
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area; or (3) they see asymmetrical areas of activity, which ought to be symmetrical. A normal SPECT brain image reveals homogeneous and uniform tracer accumulation throughout the cerebral cortex, with the cerebellum being the area with the most intense activity. SPECT images are helpful for looking at strokes, brain trauma, the effects from drug abuse, etc. A normal 3D surface scan shows good, full, symmetrical activity across the brain’s cortical surface.

What is the Procedure?
For a SPECT scan, patients are placed in a quiet room and a small IV line is inserted into the arm. Since a SPECT scan is a nuclear medicine procedure, it requires the injection of a very small amount of a radioisotope through a small needle inserted into a vein in the arm. (The medicine we inject is not a dye and therefore people typically do not have allergic responses to it.) For the concentration study, patients take a 15 minute computerized test of attention and focus. Three or four minutes into performing the test, the imaging solution will be injected through the IV, and then patients complete the test. For the baseline study, patients are instructed to sit quietly. Several minutes later the imaging solution will be injected through the IV. After the injection, patients lie on the imaging table and the SPECT camera slowly rotates around the head taking images of brain blood flow. (Patients are not placed inside a tube). The time on the table is approximately 18 minutes.

The amount of radiation exposure from one brain SPECT scan is comparable to 1/2 to 2/3 of a brain CAT (CT) scan (about 0.7 to 1.0 rem). According to the Health Physics Society, the radiation dose of two SPECT scans is well below the cut off level (10 rem) for any potential or observable health risks. Furthermore, according to the National Institutes of Health (NIH) research data does not show children to have any increased cancer risks from low level radiation.

The Role of Nuclear Medicine in Psychiatry
By the early 1990s when I first started ordering scans there were already hundreds of functional imaging studies (SPECT & PET) on Alzheimer’s disease, head injuries, seizures, strokes, ADD, depression, substance abuse, and schizophrenia. Here is a review article from 1992:

“Nuclear medicine has a place in the study of brain trauma, brain tumors, stroke, dementia, epilepsy, and depression. The development of new tracers labelled with widely available radionuclides, such as technetium-99m (99Tc) and iodine-123, has played a key role here. Practical methodology can now be implemented in the routine setting. Additional applications are reviewed in the context of brain death, encephalitis, post-viral fatigue syndrome, Parkinson’s disease and schizophrenia.”

Many of our critics claim there is no scientific basis for what we do. I initially heard this criticism with disbelief and wondered if these people had actually read the vast scientific literature on brain imaging! Each year more and more studies have been added. If you knew me personally you would know that I tend to be fairly anxious and I like people to like me. Stirring up this controversy was NOT fun. After 1993, when I received intense criticism from my colleagues for doing this work, I limited talking about it publicly for the next two years.

Then Andrew came to my clinic. It was late one night in April 1995 when my sister-in-law Sherrie called me at home to tell me that my nine year old nephew Andrew had attacked a little girl on the baseball field that day, for
no apparent reason, out of the blue. Stunned, I asked her what else was going on with Andrew. “Danny,” she said, “he is different. He is mean and surly, and today I found two pictures in his room that he drew: in one picture he was shooting other children, in the other one he was hanging from a tree.” I asked Sherrie to bring Andrew to see me the next day.

As I sat with Andrew I said, “Buddy, what is going on?” He said, “Uncle Danny, I don’t know. I am mad all the time.” “Is anyone hurting you,” I asked? He said NO. “Is anyone teasing you?” He said NO. “Is anyone touching you in places they shouldn’t be touching you?” He said NO. “I don’t know why I feel this way.”

As part of Andrew’s evaluation I ordered a SPECT study. I had suspected he had a problem in his left temporal lobe. The temporal lobes, which are underneath our temples and behind our eyes are very important structures in the brain involved with language, memory and mood stability. By 1995 researchers had already correlated some types of violence to this part of the brain. I held Andrew’s hand while he had the scan. He held a teddy bear in his other hand. He was 9 years old.

On his scan Andrew was missing the function of his left temporal lobe. I had never seen anything like that before. He had a cyst the size of a golf ball occupying the space of his left temporal lobe. After Andrew’s surgery to drain the cyst I got two phone calls. One, from his mother who said Andrew did great with the surgery and that when he woke up from the anesthesia he smiled at her. “Danny,” she said, “he hadn’t smiled at me for a year.” The next call was from the neurosurgeon, Jorge Lazareff who said, “I am so glad you sent Andrew to me, the cyst had put so much pressure on Andrew’s brain that it had actually thinned the bone over his temporal lobe. If he would have been hit in the head by a baseball it would have killed him instantly. Either way, without the surgery he would have been dead within 6 months.”

Without the cyst pressing on Andrew’s brain he went back to being the sweet, loving boy he always wanted to be. Since Andrew’s surgery I knew I had to speak out about the need to do imaging in psychiatry. Most of my colleagues (and me before doing our brain imaging work), would have found a psychological explanation to make sense of Andrew’s behavior and completely missed the real cause of his trouble. That was no longer acceptable to me. Since Andrew, we have seen 15 other children and adults with temporal lobe cysts who had problems with aggression.

**Important Lessons**

One of the most important lessons I learned early on from

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our imaging work is that most psychiatric illnesses, such as ADD, anxiety, depression, autism or bipolar disorder, are not single or simple disorders. They all have multiple types. This was the major reason why most researchers did not understand how useful imaging was in clinical practice. Researchers would gather a group of ADD, bipolar or depressed patients and look for the underlying signature pattern for them on imaging. But when they did not find the pattern they declared imaging was not yet useful in psychiatry.

Yet, as a clinician I knew that giving people the diagnosis of depression is exactly like giving them the diagnosis of chest pain. Why don't doctors give people the diagnosis of chest pain? Because it is a symptom! There are too many different causes. What can cause chest pain? Heart attacks, heart arrhythmias, pneumonia, ulcers, hepatitis, grief, anxiety, reflux, being hit in the chest. Doctors do not give people the diagnosis of chest pain because it doesn't tell you what causes it or what to do for it. Now, if you give everyone the same treatment for chest pain will some people get better? Yes, but for many nothing will happen or they will get worse.

The same thing is true for depression. It is a symptom with many different causes. One treatment does not fit everyone. What can cause depression? So many different things, from chronic stress, relationship problems, financial losses, head injuries, drug abuse, low thyroid, chemical imbalances, genetic tendencies and grief. On scans you can have too much activity in the front part of your brain and overthink or worry yourself sick. Or, you can have too little activity in this part of the brain and have trouble thinking or controlling your impulses.

Depression is not one thing and giving everyone the same treatment for it invites disaster. Yet, that is exactly what is happening across our country every day. No wonder psychiatric medications are controversial; they make some people better and a lot of people worse! Many patients tell their doctor that they are depressed or anxious and leave the office after a 5 minute appointment with samples of the latest drug to treat depression, without any sense of the type of depression they are treating.

Knowing the type of depression, ADD, autism or bipolar disorder that you have is critical to getting the right help so that your treatment doesn’t make you worse.

What SPECT Scans Cannot Do
1. Give a diagnosis in the absence of clinical information
2. Give the date of a head injury
3. Give the date of an infection or toxic exposure
4. Assess or evaluate IQ
5. Assess or evaluate the guilt, innocence, motivation or sanity of a criminal defendant
Research Based
Some of our critics say if what we do at the Amen Clinics is so good why haven’t we published our work in the scientific literature? I scratch my head when I hear this because since 1993 my team and I have published 25 scientific articles on our work, including papers on suicide, ADHD, predicting treatment response with stimulants, marijuana, aggression, murder, criminal recidivism, brain injury, EMDR and posttraumatic stress disorder. In addition, I have written four book chapters on SPECT including one with Joseph C. Wu in the Comprehensive Textbook of Psychiatry on the clinical application of brain SPECT imaging, the most respected psychiatric textbook in the world.

In addition to our own research, we list over 2300 scientific abstracts on a variety of neuropsychiatric conditions on our website at www.brainplace.com so that clinicians and researchers can see the incredible depth of scientific knowledge underlying the application of Brain SPECT imaging.

We use SPECT in a clinical environment to observe patterns of activity, to guide us in re-balancing a brain whose activity patterns are clearly abnormal. Biology drives our pharmacologic recommendations. In addition, SPECT scans can guide us in the application of treatments such as supplements, neurofeedback, transcranial magnetic stimulation, and hyperbaric oxygen therapy.

We recognize the fact that SPECT is never the complete or final answer. It is part of the answer that when used with a good clinical history and examination gives clinicians and patients more information for diagnosis and to tailor treatments to the specific patient.

On October 27th 2004 we received this letter from one of approximately tens-of-thousands of people who ordered our Colon Cleansing Kit in 2004. He writes:

"Dear Blessed Herbs, this was an email I sent to my family and friends after my amazing experience. Since then, six of them have done your cleanse. This is what I wrote...

Friends, about a month ago, brother Jon sent me a link to BlessedHerbs.com. I had always been interested in cleansing but had never actually participated in a program. After spending time on their website, I ordered the kit. I just finished the program and wanted to share my experience with you.

It is estimated that the average person carries 5-10 pounds of intestinal buildup in their intestines and colon. It is a hard coating of putrefication that releases toxins into the bloodstream and prevents us from effectively absorbing vitamins and minerals into our system.

As a fifteen year vegetarian and life-long non-smoker, non-drinker...I thought the Colon Cleansing Kit would be good for me, but I didn’t expect that much old waste removal. Boy, was I mistaken.

First of all, I followed the program to the letter. It is eight days...the first three are a "pre-cleanse" getting you ready for a five-day liquid-only herbal fast.

There are two herbal elements to the cleanse. The first is Digestive Stimulator capsules that help you get the bowels moving. The second is Toxin Absorber powder. It includes psyllium husk (an intestinal broom...not unlike Metamucil™ but totally herbal), bentonite clay (absorbs forty times its weight in toxins and pulls the buildup from the walls of the intestinal tract), apple pectin and ginger root (anti-bloating and adds flavor to the drink).

During the five-day fast, you take the Toxin Absorber with organic apple juice five times a day, three hours apart. Before bedtime you take the Digestive Stimulator. In addition you drink 6-8 glasses of pure (distilled water) a day. You can also drink additional apple juice and vegetable broths during the day if desired. I never felt hungry during the five days.

The program suggests that you start seeing old waste on the second day of the fast. That is exactly what happened to me. It was absolutely amazing to see what was being removed."

To order the Colon Cleansing Kit ($89.50) by Blessed Herbs.

I played tennis on days 4 and 5 and it was the best I had played in years. My energy and overall sense of well-being is quite extraordinary. Thanks, Jon, for sending me the link."
