

# It's Time to Stop Flying Blind: How Not Looking at the Brain Leads to Missed Diagnoses, Failed Treatments, and Dangerous Behaviors

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**I**t was late at night in April 1995 when I got a call from my sister-in-law, Sherry, who told me that my 9-year-old nephew, Andrew, had attacked a little girl on the baseball field that day for no particular reason.

"He hurt her," she said crying.

Horrified, I asked Sherry what else was going on with Andrew.

"He's not right," she said. "He's mean and never smiles anymore. After the incident, I found two pictures he had drawn. In one, he was hanging from a tree. In the other, he was shooting other children."

I told Sherry I wanted to see Andrew the next day. Most child psychiatrists would have prescribed powerful medications to sedate his aggressive impulses. Maybe they would have recommended psychotherapy. I knew I needed to look at his brain first. At the time, it was a radical idea. Unfortunately, it still is.

Andrew's SPECT (single photon emission computed tomography) brain scan, a nuclear-medicine study that looks at blood flow and activity patterns, showed a large defect in the left side of his brain. He had an arachnoid cyst the size of a golf ball occupying the space of his left temporal lobe, an area often abnormal in violent patients.<sup>1</sup> When the neurosurgeon removed the cyst, Andrew returned to his usual, sweet self.

How could a child psychiatrist know what was going on in Andrew's brain unless he or she actually looked at how it functioned? Was the cause of the aggression his personality? The result of family stress? Or a brain that was troubled?

Even as research piles up showing that SPECT can provide valuable information in a wide variety of cases, traditional psychiatry has been resistant to using it in clinical practice. In a recent debate, Jair Soares, chairman of the Department of Psychiatry at the University of Texas, Houston, said that the field needs more research and that scans are not ready for clinical use. This argument is the same one that academic psychiatrists have given for more than 20 years.

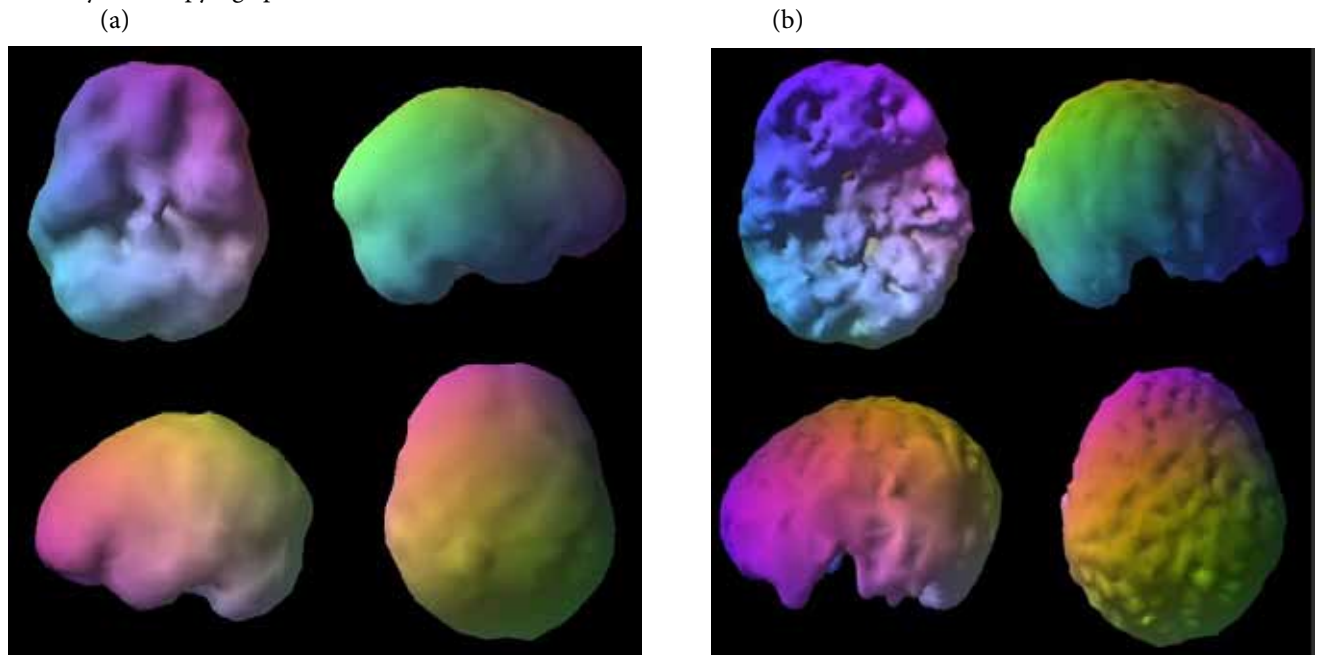
Most psychiatrists still ignore the technology, many ridicule it, and others accuse professionals who use it of being modern-day phrenologists.<sup>2</sup>

As a result, psychiatry remains the only medical specialty that rarely looks at the organ it treats. Cardiologists, orthopedists, gynecologists, and all other medical specialists look. Psychiatrists guess. Most still make diagnoses, as Dr Anson Henry did in 1840 when he evaluated Abraham Lincoln for depression, by talking to an individual and looking for certain symptom patterns. By failing to look at the brain's function in complex cases, psychiatrists miss important information, which leads to erroneous diagnoses and missed opportunities for effective treatment.

The need for sophisticated neuroimaging tools has been highlighted yet again in the rash of horrific mass killings by mentally ill patients in Arizona, Colorado, and Connecticut. All of these murderers received psychiatric evaluations and treatment and likely no one ever looked at how their brains functioned. A good possibility exists that my nephew Andrew could have been one of them if he had not received an appropriate intervention.

SPECTs are different from anatomical scans such as CTs or MRIs that look at the brain's structure and are rarely useful in psychiatry. SPECT visualizes how the brain functions by looking at blood flow and activity. SPECT scans, and other related tools, came into clinical use in the late 1980s to help evaluate seizures, strokes, dementia, and brain injuries. When I first started to use it, I felt it made me a better doctor. For example, a 44-year-old patient of mine was in denial about his alcohol and cocaine abuse. After seeing the toxic pattern on his scan, he completely stopped using the sub-

**Figure 1.** (a) Healthy SPECT Scan—Full, Even, Symmetrical Activity of Left Temporal Lobe; (b) Andrew’s SPECT Scan—Brain Cyst, Occupying Space



stances. In another case, a 16-year-old teen was depressed, aggressive, and impulsive. She had seen multiple psychiatrists before I recommended getting a scan, which clearly showed a pattern of brain injury. After further questioning, she remembered a bad fall from her bike a month before her symptoms began. With appropriate treatment, she functioned much better.

As the enthusiasm for SPECT and other imaging tools ramped up among clinical psychiatrists, academic physicians actively tried to suppress this interest, saying the tools were meant for research only. The academicians argued that the scans lacked specific indications required to give a diagnosis. Physicians in favor of SPECT’s use contended that academicians had missed the point, because SPECT scans can add important information that physicians can’t get from talking to patients. These physicians thought that getting some biological data on patients, even if imperfect, was better than getting no information at all. At the 1993 annual meeting of the American Psychiatric Association, physicians from Nebraska reported on a study that found that having a SPECT scan on admission cut hospital stays for bipolar teenagers by more than half.<sup>3</sup>

But other academic psychiatrists complained bitterly to the program committee. Personally, I hated the conflict; so for the next 2 years I stopped talking about my work with SPECT. Then I saw my nephew Andrew’s scan. That case was the first time I had seen an arachnoid cyst cause behavior problems. I have since seen it 20 times, once in a boy who wanted to cut his mother up into little pieces. He had a cyst the size of a tennis ball occupying the left front side of his brain. Before he came to see my psychiatric group, he had failed to improve after visits to multiple psychiatrists, 18

months in a residential facility, drug rehabilitation, and six medications.

After Andrew’s neurosurgeon told me that my nephew, without the surgery, would have been dead within 6 months from the pressure in his brain, I felt compelled to advocate for clinical use of functional neuroimaging (Figures 1 and 2). Too many people like Andrew need this technology.

#### REASONS NOT TO LOOK?

So, what’s the fight about? Why shouldn’t doctors use SPECT or other imaging tools in clinical practice with complex cases? Having participated in many debates, the arguments can be summarized as follows:

##### (1) Scans will not give an accurate psychiatric diagnosis.

This statement is true. Psychiatric diagnoses are symptom-based, not brain-based (major depression, panic disorder, obsessive-compulsive disorder, etc). The scans can help clinicians see the underlying biology of these disorders to target treatment better. In Andrew’s case, he would have been diagnosed with intermittent explosive disorder. That diagnosis gives no information about why he had it or how to help him. That is how the scans can help.

In all psychiatric conditions, the diagnosis doesn’t tell physicians if the brain is overactive and needs to be calmed or underactive and needs stimulation. The diagnosis won’t tell if it’s the result of a brain injury for which the patient needs rehabilitation or some form of infection or toxicity that needs further exploration. And acting without knowing can harm patients.

For example, a 16-year-old teenage girl went on a mountain vacation with her family. When they arrived at their

**Figure 2.** Andrew, Immediately After Surgery<sup>a</sup>



<sup>a</sup>According to his mother, “It was the first time he had smiled in a year.”

cabin, they were surrounded by six deer. It was a beautiful moment. Ten days later the girl became agitated and started having auditory hallucinations. Her parents sought help for her, and she was admitted to a psychiatric hospital and prescribed antipsychotic medications, which didn't help. The next 3 months were a torturous road of visits to different doctors and multiple medications, at a cost near \$100 000. The girl had become a shadow of her former self. Desperate, her parents brought her to our clinic for a SPECT scan, which showed areas of unusually high activity. It caused us to look deeper at the potential causes of her symptoms, such as an infection or toxicity. She had Lyme disease, a bacterial infection often caused by bites of deer ticks. On antibiotics, she got her life back.

Ignoring the clinical use of neuroimaging is hurting psychiatry and its patients. Treatment outcomes have shown little improvement since the 1950s, despite 60 years of controlled clinical trials and billions of research dollars.<sup>4</sup> This fact was highlighted on *60 Minutes* recently, which reported on research that antidepressants work no better than a placebo, about 30% of the time, except for the most severely depressed.

Clearly, scans do not help everyone get better, but adding more information can make a meaningful difference. In my psychiatric group's experience, success rates increase when psychiatrists use clinical histories plus scans. In an outcome study of more than 500 patients with complex conditions, who had failed to improve with an average of 3.3 visits to providers and six medications, 75% reported high levels of improvement at 6 months, and 85% had an improved quality of life.<sup>5</sup>

Scans also help decrease stigma, because patients *see* they have a brain problem. According to Rick Lavine, a psychiatrist in the San Francisco Bay area, “SPECT has not only been useful to me as a clinician but also has been of therapeutic value for patients. Initially, I was concerned that patients might experience a drop in self-esteem when seeing what they might interpret as brain damage. Instead, I have

seen the exact opposite. Patients understand themselves more, are more accepting of their condition and its treatment, and actually feel more empowered in dealing with it.”

**(2) Not enough research has occurred.**

My psychiatric group's website, [www.amenclinics.com](http://www.amenclinics.com), offers over 2800 scientific abstracts that underlie our use of functional imaging in psychiatry.<sup>6</sup> Of course, more work is needed, but other specialties don't wait for perfect studies before using helpful technologies. Only 11% of cardiology recommendations use A-level scientific evidence (multiple controlled trials),<sup>7</sup> and only 14% for infectious disease do.<sup>8</sup> A recent study published in the *Journal of Psychoactive Drugs* found that getting a SPECT scan changed the diagnosis or treatment plan 79% of the time.<sup>9</sup>

**(3) Scans are expensive.**

They cost about the same as MRI brain scans. Ineffectively treating brain problems is more expensive than the cost of the scans, not to mention the costs of incarceration, a lost job, or failed marriage.

**(4) The scans use radiation.**

This statement is true, but the radiation exposure is less than that of most CT scans,<sup>10</sup> which are routinely ordered when needed.

**(5) SPECT is not ready for clinical use and should be left in the hands of researchers.**

This argument is disturbing, as it aims to withhold a useful medical procedure from patients until a group of researchers decide to focus on it. But since researchers can obtain no patents on established neuroimaging tools, little financial incentive exists to conduct the clinical research.

**MISSED OPPORTUNITIES**

As soon as I started using SPECT, I noticed that substance abusers had a toxic-looking pattern on scans. The images helped to break their denial that they had a problem and motivate them into treatment. I also saw that a number of medications, especially those commonly prescribed for anxiety and pain, gave the same toxic appearance, which made me more cautious in using them. It was recently reported that prescribing benzodiazepines in the elderly increased the risk of dementia.<sup>11</sup> I saw the same pattern for patients who were prescribed multiple psychiatric medications, which is becoming more common in psychiatry. And because most psychiatrists never look at the brain before or after they prescribe medications, they don't know if the treatments are causing more harm than good. By not looking, they actually avoid taking responsibility for worsening the brain function of their patients. One patient who came to our clinic was on eight medications, and his scan showed extreme toxicity. I spent the next year taking him off medications. He is now on three and doing much better.

Since most psychiatrists don't look at the brain, people

who have mood or behavior problems after being exposed to mold or other environmental toxins are often misdiagnosed when they seek help. A firefighter and his wife were on the verge of divorce after failing attempts to resolve their problems through visits to four marital therapists. The husband was labeled as having a personality problem. His scan showed a toxic pattern (Figure 3). Further questioning revealed that he had experienced three smoke-inhalation episodes that likely damaged his brain. He needed brain rehabilitation to help his marriage, not another therapist who never thought about the health of his brain.

Perhaps the most important lesson that I've learned from looking at tens of thousands of scans is that brain injuries ruin people's lives and very few physicians know it. The brain is soft and easily damaged. In a study that my psychiatric group did with Sierra Tucson, a psychiatric hospital that uses SPECT, 44% of new patients had a significant history of brain trauma. Past brain injuries are associated with homelessness, depression, suicide, panic attacks, and learning problems.<sup>12</sup> But how would a physician know if the car accident, sports concussion, or childhood fall from a tree caused lasting damage unless he or she actually looked at the brain's function? Abraham Lincoln was kicked in the head by a horse at the age of 10 and was unconscious all night.

In my opinion, not using SPECT routinely, or other scans like it, is one of the major reasons it took the National Football League (NFL) so long to admit it had a serious problem with brain trauma. The NFL formed its concussion committee in 1994 but never did a functional brain-imaging study on players. The experience of looking changes everything. In the last 2 years, my group has published three studies on our work with 120 active and former NFL players. The level of brain damage was highly significant. But the good

news was that 80% of the players showed high levels of improvement with targeted rehabilitation strategies.<sup>13,14,15</sup>

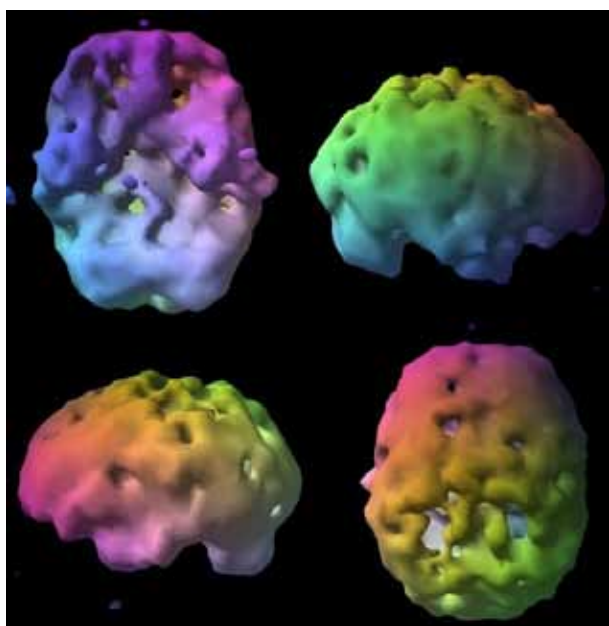
This work has much wider implications. Functional scans should be routinely used with military personnel who experience blast injuries. If you never look at their brains, it is easy to misdiagnose these brave men and women with personality disorders or bad attitudes when they actually have potentially treatable brain damage. This mistake can cost them their jobs, families, and even their lives.

For example, a marine corps captain sustained three blast injuries while serving in Afghanistan. He had headaches, trouble focusing, insomnia, and anger outbursts. After reading one of my books, he came to one of our clinics on his own. He knew the military considered SPECT experimental. He saw the damage in his brain, which helped him understand his symptoms. Through a group of natural treatments, he got much better, so much so that he started a nonprofit called Brain Scans for Warriors to pay for scans for service people who need help.

By failing to look at the brain, it is easy to be in denial about the long-term impact of repeated concussions on football, hockey, and soccer players at all levels, not to mention mixed martial arts (MMA) fighters and boxers. By not looking at the brain, parents have little anxiety about letting their children play contact sports. By not looking at the brain, psychiatrists hurt patients, their families, and our society; we diminish our profession; and patients are mislabeled and mistreated. A better way is available.

Today, Andrew is 26 years old and remains a sweet, hardworking young man. I am so proud of him. Imagine where his life would have been without the scans. It is almost unimaginable (Figure 4).

**Figure 3.** Firefighter's SPECT Scan—Overall Low Activity



**Figure 4.** Andrew With His Uncle Now



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