Brain SPECT Imaging in Clinical Practice

To the Editor: I agree with the statement by Bryon Adinoff, M.D., and Michael Devous, Ph.D. (1), in their Letter to the Editor published in the May 2010 issue of the *Journal*, that "it is likely that, within the next decade, Dr. Amen's claims [and fervent hope] will be realized in that psychiatrists will enjoy the ability to diagnose and prescribe treatments based, in part, upon neuroimaging findings" (1, p. 598). Imaging is now being used by psychiatrists here in the United States, in Canada, and abroad to aid patients. I cannot imagine anything more damaging to the imaging field, however, than encouraging medical board investigations for those who are early adopters. The California Medical Board investigated my use of single photon emission computed tomography (SPECT) 13 years ago, found no violation, and encouraged me to publish our findings, which I have done.

One would think that a more enlightened attitude toward a field, as plagued by uncertainties as psychiatry still is, would welcome the practical application of neuroimaging. In 2001, Camargo wrote "Brain SPECT is rapidly becoming a clinical tool in many places, particularly in dementias, head injury, [obsessive compulsive disorder] OCD, Tourette's, schizophrenia, depression, panic disorder, and drug abuse" (2). Additionally, Brockman demonstrated SPECT's usefulness in choosing between treatments for depression (3).

Our work is based on hundreds of texts and scientific articles, including 26 articles and the chapter on functional imaging in the *Comprehensive Textbook of Psychiatry* that I coauthored (4). Respected hospitals, such as Sierra Tucson, have added SPECT to their armamentarium. Thoughtful clinicians would never use SPECT in isolation, and contrary to what was written about me, I have never recommended such use.

Clinical practice and careful observations have provided researchers with important hypotheses to test, and I have successfully invited researchers to use our database of rigorously diagnosed patients, including SPECT when indicated, to advance neuroimaging, and I extend the same invitation here.

The Society of Nuclear Medicine has never formally approached me to perform a study. Plus, I would never engage in a charade where I was expected to give a diagnosis from a scan. That is not how imaging is or should be practiced. The notion of Adinoff and Devous that SPECT is dangerous is disingenuous. Devous recently wrote, "SPECT and PET have no more risk than MRI-based procedures" (5).

The hope that SPECT and other imaging modalities will be as routine and useful to psychiatry as imaging the heart is to cardiology has animated my practice for nearly 20 years. It, indeed, is starting to happen. My hope is that our journal will help translate imaging research into clinical practice rather than threaten practitioners who have been trying to make it happen.

References

1. Adinoff B, Devous MD: Scientifically unfounded claims in diagnosing and treating patients. Am J Psychiatry 2010; 167:598–598
2. Camargo EE: Brain SPECT in neurology and psychiatry. J Nucl Med 2001; 42:611–623
3. Brockmann H, Zobel A, Joe A, Biermann K, Scheef L, Schuhmacher A, von Widdern O, Metten M, Biersack HJ, Maier W, Boecker H: The value of HMPAO SPECT in predicting treatment response to citalopram in patients with major depression. Psychiatry Res 2009; 173:107–112
4. http://www.amenclinics.com/meet-dr-amen/credentials/
5. Devous MD: SPECT functional brain imaging, in Functional Cerebral SPECT and PET Imaging. Edited by Van Heertum RL, Tikofsky RS, Ichise M. Philadelphia, Lippincott, Williams and Wilkins, 2009

DANIEL AMEN, M.D.
Newport Beach, Calif.

Dr. Amen is the CEO and owner of Amen Clinics, Inc.

This letter (doi: 10.1176/appi.ajp.2010.10060814) was accepted for publication in June 2010.

Response to Amen Letter

To the Editor: We appreciate the opportunity to respond to the points Dr. Amen raises. Since we have made major professional and research efforts to investigate the use of imaging modalities for psychiatric diagnosis and treatment, we are acutely aware of the need to assure that any clinical tool, particularly those used in children, must be supported by empirical evidence.

As noted in our letter as well as in the book review by Leuchter (1), there is presently no evidence to support neuroimaging techniques to aid, substantiate, or otherwise illuminate the diagnosis or treatment of psychiatric disorders. The references offered by Dr. Amen do not suggest otherwise. Camargo (2) notes that "Brain SPECT in psychiatric disorders is still investigational. Despite considerable research interest in this area, specific patterns of the various diseases have not been definitely recognized." Although Carmago goes on to state that "perfusional and receptor imaging findings may be used as an additional diagnostic tool to guide clinicians searching for a definite diagnosis," no validated examples of this approach were provided. Brockman et al. also did not advocate the use of SPECT in clinical practice. In fact, Brockman et al. (3) specifically noted that the use of SPECT in predicting treatment response "is beyond the sensitivity of this method."

Dr. Amen's own publications do not support the use of SPECT imaging in assisting with the diagnosis or treatment of psychiatric disorders. His study of patients with completed suicide includes only 12 subjects (4). His retrospective study of 157 patients showed that regional cerebral blood flow, as measured by SPECT, predicted stimulant response in only 29 of these subjects. While of theoretical interest, these findings do not support the use of SPECT in clinical practice. Dr. Amen's recent book (5) also offers only anecdotal examples of imaging being useful in the treatment or diagnosis of psychiatric disorders.

The clinical applications of SPECT imaging in children are even more restricted, with only the assessment of epilepsy generally accepted as a diagnostic indication. Indeed, in 2005, the APA Council on Children, Adolescents, and Their Families concluded the following:

> "Although knowledge is increasing regarding specific pathways and specific brain areas involved in mental disease states, at present the use of brain imaging to study psychiatric disorders is still considered a research tool. Particular caveats are indicated with regard to brain imaging involving radioactive nucleotides for children and adolescents because

of children's known greater sensitivity to radiation and risk of radiation induced-cancer. At the present time, the available evidence does not support the use brain imaging for clinical diagnosis or treatment of psychiatric disorders in children and adolescents." (6)

Dr. Amen states that we have a "notion that SPECT is dangerous." We stand by our previous statement that the unfounded clinical application of any diagnostic technique, including SPECT imaging, provides several dangers to patients, three of which were outlined in our letter. SPECT brain imaging, when applied based on a solid foundation of empirical evidence, is a powerful diagnostic tool capable of providing clinicians with critically valuable information for patient management (7).

References

1. Leuchter AF: Healing the hardware of the soul by Daniel Amen (book review). Am J Psychiatry 2009; 166:625
2. Camargo EE: Brain SPECT in neurology and psychiatry. J Nucl Med 2001; 42:611–623
3. Brockmann H, Zobel A, Joe A, Biermann K, Scheef L, Schuhmacher A, von Widdern O, Metten M, Biersack HJ, Maier W, Boecker H: The value of HMPAO SPECT in predicting treatment response to citalopram in patients with major depression. Psychiatry Res 2009; 173:107–112
4. Amen DG, Prunella JR, Fallon JH, Amen B, Hanks C: A comparative analysis of completed suicide using high resolution brain SPECT imaging. J Neuropsychiatry Clin Neurosci 2009; 21:430–439
5. Amen D: Healing the Hardware of the Soul: Enhance Your Brain to Improve Your Work, Love, and Spiritual Life. New York, Simon and Schuster, 2008
6. American Psychiatric Association Council on Children, Adolescents, and Their Families: Brain Imaging and Child and Adolescent Psychiatry, With Special Emphasis On Single Photon Emission Computed Tomography (SPECT). Washington, DC, American Psychiatric Association, 2005
7. Holman BL, Devous MD: Functional brain SPECT: The emergence of a powerful clinical method. J Nucl Med 1992; 33: 1888–1904

BRYON ADINOFF, M.D.
MICHAEL D. DEVOUS, SR., PH.D.
Dallas, Texas

The authors' disclosures accompany the original letter.

This letter (doi: 10.1176/appi.ajp.2010.10050671r) was accepted for publication in June 2010.

Editor's Note:

The American Journal of Psychiatry *is charged with bringing new research on mental disorders and their treatment to the attention of our readers and providing informed guidance on its translation into evidence-based clinical practice. These research and clinical articles are peer-reviewed by reviewers drawn from several thousand of our colleagues for their accuracy and completeness as part of the publication process. We have championed the publication of research articles about diagnostic tests and treatments that are still early in development, before their reliability can be fully determined, with the caveat that their early experimental nature be clearly identified. We have also published letters and editorials warning about the risks of widespread distribution of tests and treatment to doctors and patients before the published evidence warrants their use in clinical practice. Commercialization of a diagnostic test, even if the underlying procedure such as brain imaging or DNA analysis is approved for human use, strongly indicates to physicians and families that the test adds significant new information to guide clinical judgment. We have published this exchange of letters as part of our responsibility to readers to point out when a procedure may lack sufficient evidence to justify its widespread clinical use.*

ROBERT FREEDMAN, M.D.

Integrating Pharmaceutical-Supported Research Evidence in Residency Training

TO THE EDITOR: As residency program directors, we read with interest the recent article by David B. Merrill, M.D., et al. (1), published in the April 2010 issue of the *Journal* (1). This article highlighted a number of very important issues in resident education. As pointed out, pharmaceutical-industry-supported research has been playing an increasingly important role in academia, but most residency programs provide little or no training about the controversies and intricacies involved in these relationships (2). Although this area encompasses a number of core competence issues, such issues are not covered in most residency curricula (3). It is encouraging that the psychiatric field as a whole is moving away from this once cozy and awkward relationship with the big pharmaceutical companies, but it is important to introduce ways to educate future residents about the financial, ethical, and clinical implications of collaboration with the pharmaceutical industry on a consistent basis.

We recommend that involvement with pharmaceutical-supported research be an integral part of any resident training program. This can certainly be achieved through the participation of residents with an ongoing pharmaceutical-sponsored research project. However, in practice, these opportunities are limited outside of research-oriented training programs. These relationships can also be addressed in the didactics program for residents, preferably by a senior researcher who is knowledgeable about these relationships.

At the Delaware Psychiatry Residency Program, we have introduced lectures based on the empirical data of physician interactions with industry. Residents develop a better understanding about their biases and prescribing practices but also develop an appreciation of the ethical framework in which to evaluate physician contact and dealings with industry. In addition to the didactics highlighting these topics, residents have also visited a local pharmaceutical manufacturing facility with three senior faculty members. This opportunity not only provided them with the unique experience of learning about what is involved in medication development but also encouraged discussion about physicians' attitudes toward the drug industry.

Although most physicians participate only occasionally in company-sponsored trials, most see detailers and attend company-sponsored CME courses. Appropriate and ethical interaction with the pharmaceutical industry should be an integral part of psychiatry training.

References

1. Merrill MB, Girgis RR, Bickford LC, Vorel SR, Lieberman JA: Teaching trainees to negotiate research collaborations with industry: a mentorship model. Am J Psychiatry 2010; 167:381–386
2. Lexchin J: Interactions between physicians and the pharmaceutical industry: What does the literature say? Can Med Assoc J 1993; 149:1401–1407