



# Journal of Neurotherapy: Investigations in Neuromodulation, Neurofeedback and Applied Neuroscience

## News from Other Journals and Websites

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## *News from Other Journals and Websites:*

### ***Journals:***

**Hughes, J.R. and John, E.R.**  
**Conventional and Quantitative**  
**Electroencephalography in Psychiatry.**  
*Journal of Neuropsychiatry and Clinical*  
*Neurosciences*, 1999; 11 (2), 190-208

The Hughes and John article was written primarily as a response to the article published as a position paper of the American Academy of Neurology (AAN) and American Clinical Neurophysiology Society (ACNS) (Nuwer, 1997). The position paper was an overview of the current use of quantitative electroencephalography (QEEG) in neurology and psychiatry/psychology, and was not supportive of the clinical use of QEEG in behavioral science and psychiatry. The paper included the following conclusions (Nuwer, 1997, p. 285):

*On the basis of current clinical literature, opinions of most experts, and proposed rationales for their use, QEEG remains investigational for clinical use in postconcussion syndrome, mild or moderate head injury, learning disability, attention disorders, schizophrenia, depression, alcoholism, and drug abuse (Class II and III evidence, Type D recommendation), and*

*Because of the very substantial risk of erroneous interpretations, it is unacceptable for any EEG brain mapping or other QEEG techniques to be used clinically by those who are not physicians highly skilled in clinical EEG interpretation (Strong Class III evidence, Type E recommendation).*

(NB: Please see the definitions of evidence and recommendation levels later in this review.)

The Hughes and John response provided an extensive discussion of the rationale for and neurophysiological basis of QEEG. They further emphasized the remarkable stability of QEEG normative measures across age, culture, and geographical location, and provided an extensive review of the literature utilizing QEEG for differ-

ential diagnosis, remarking upon the very sparse review of the psychiatric literature included in the AAN/ACNS position paper. They discussed the statistical issue of false positive/false negative results, pointing out that a statistically significant QEEG finding of  $p < .05$  replicated in two independent samples could occur by chance only at the  $p < .0025$  level ( $0.05 \times 0.05$ ). The issue of statistical significance vs. clinical significance is at the heart of the controversy, as is the question of whether quantitative analysis provides clinically relevant information that simple visual analysis of the raw record cannot. Other issues raised in the AAN/ACNS position paper that deserve attention are the level of training and experience in EEG/QEEG necessary for valid use of the technology and, the most obvious question, the extent to which use of the technology contributes to improved diagnosis and treatment outcomes.

It is beyond the scope of this review to provide a detailed summary of the Hughes and John paper. They adopted the same criteria for procedure, quality of evidence, and strength of recommendation used in the AAN/ACNS position paper (Nuwer, 1997, pp. 285-286).

### **Quality of Evidence Criteria:**

Class I: Evidence provided by one or more well-designed, prospective, blinded controlled studies.

Class II: Evidence provided by one or more well designed clinical studies, such as case control or cohort studies, etc.

Class III: Evidence provided by expert opinion, non-randomized historical controls, or case reports of one or more.

### **Strength of Recommendation Ratings:**

Type A: Strong positive recommendation, based on Class I evidence, or overwhelming Class II evidence.

Type B: Positive recommendation, based on Class II evidence.

Type C: Positive recommendation, based on strong consensus of Class III evidence.

Type D: Negative recommendation, based on inconclusive or conflicting Class II evidence.

Type E: Negative recommendation, based on evidence of ineffectiveness or lack of efficacy.

Based upon evidence available in the literature, Hughes and John provided the following assessments of the utility of QEEG for the indicated categories of illness or injury (Hughes and John, 1999, p. 201):

Cerebrovascular disease: On the basis of many concordant Class II studies, Type B recommendation.

Dementia: On the basis of multiple Class I and many concordant Class II studies, Type A recommendation.

Learning and Attention Disorders: On the basis of multiple Class II studies and abundant class II evidence, Type B recommendation.

Mood Disorders: On the basis of multiple Class II studies, Type B recommendation.

Postconcussion Syndrome: On the basis of several Class II studies and multiple concordant Class III studies, Type C recommendation.

Schizophrenia: On the basis of conflicting Class II and III evidence, Type D recommendation.

Substance Abuse: On the basis of conflicting Class II and III evidence, Type D recommendation.

There are clearly issues which remain to be addressed, not the least of which are the question of training level for competency in QEEG and the question of the extent to which the clinical use of QEEG may or may not contribute to improved quality of care.

At the time of this writing (July, 1999) the full text of the Hughes and John article could be seen at <http://neuro.psychiatryonline.org> and

downloaded either as txt or pdf files. To request reprints, contact Dr. E. R. John, Brain Research Laboratories, New York University Medical Center, 550 First Avenue, New York, N.Y. 10016.

(Review by T. J. La Vaque, Ph.D.)

## REFERENCES

Hughes, J.R., & John, E.R. (1999). Conventional and quantitative electroencephalography in psychiatry. *Journal of Neuropsychiatry and Clinical Neurosciences*, 11(2), 190-208.

Nuwer, M. (1997). Assessment of digital EEG, quantitative EEG, and EEG brainmapping: report of the American Academy of Neurology and the American Clinical Neurophysiology Society, *Neurology*, 49(1), 277-292.

**Thatcher, R. W., Moore, N., John, E. R., Duffy, F., Hughes, J. R., & Krieger, M. QEEG and traumatic brain injury: Rebuttal of the American Academy of Neurology 1997 Report by the EEG and Clinical Neuroscience Society. *Clinical Electroencephalography*, 1999 ; 30(3), 94-98.**

This very fine article is a reply by the EEG and Clinical Neuroscience Society (ECNS) to the position paper of the American Academy of Neurology and the American Clinical Neurophysiology Society (AAN/ACNS) in 1997 that concluded there was insufficient evidence to support the clinical utility of QEEG in the diagnosis or evaluation of post-concussion syndrome, or mild or moderate head injury. In a very strongly worded paper, the authors systematically point out how Nuwer's AAN/ACNS paper included consistent "bias," "omissions of facts," repeated "misrepresentations of procedures and results," "rumor," and was "misrepresenting the literature and...omitting citations that support opposing views."

The AAN/ACNS paper indicated "others have commented that this technique [QEEG] is predisposed to false-positive 'abnormalities' in normal subjects due to mild drowsiness or other

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