

## TEACHING EVIDENCE AND MEASURING CONCURRENCE WITH EVIDENCE-BASED GUIDELINES, USING ESCENARIO

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“*Learning how*, or improving an ability, is not like *learning that*, or acquiring information. Truths can be imparted, [behaviors] can only be inculcated.” (Ryle, 1949)

Medical decisions and medical actions are guided by multiple information sources. These include personal experience, physiological reasoning, expert opinion, societal norms and regulations, and experimental evidence. All of these can be useful, but an important premise of evidence-based medicine is that the latter source is the most consistently reliable guide, particularly when the evidence is derived from well-designed, randomized, controlled trials. A major recent thrust of medical education has been to encourage physicians to use evidence-based reasoning in the clinical management of their patients.

With more than 25,000 medical journals publishing more than 4 million articles a year, staying abreast of the “best evidence” is a daunting task for practitioners (Bhargava, 2001). To aid in this task and to encourage the adoption of sound evidence-based practices, the tactic of distilling evidence into succinct practice guidelines has become common. The American Academy of Neurology has published more than 60 practice guidelines for its membership since 1990. These are listed in *Appendix One* (AAN 2002).

Even so, evidence-based practice guidelines, alone, are an insufficient tool for implementing evidence-based practices. In fact, one finds “disconcertingly low rates of compliance with widely disseminated evidence-based treatment guidelines.” (Rich, 2002) Despite the best efforts of AAN and other organizations, the slowness to adopt evidence-based recommendations may be due to a continuing lack of evidence-awareness by physicians. Many physicians seem to lack even an awareness of evidence-based resources (Bandolier Library, 2002). A partial listing of useful Internet-accessible resources is given in *Appendix Two*.

Awareness may not be the only explanation for the modest implementation rate of evidence-based recommendations. There is a distinction between *knowing that* one should do something and *actually doing it*.

The gap between *knowing* and *doing* can be alarmingly large. A study of the National Cholesterol Education Program guidelines showed that 95 % of physicians were aware of the guidelines, but in only 18% of their patients were the guidelines effectively implemented (Pearson, 2000).

Those charged with teaching evidenced-based medicine to neurology residents, would do well to understand that they bear a dual responsibility: imparting facts *and* inculcating behaviors. Teaching guidelines alone will likely have limited impact. It should be noted that physician-related barriers are not the only impediments to the implementation of evidence-based guidelines. Barriers are also found among patients and within health care systems (Rich, 2002). Suggested strategies to overcome these barriers include: local physician "champions"; grand rounds, lectures and other materials to publicize guidelines; educational resources for staff and patients; clinical pathways; standardized admission and discharge order forms; reminders or "ticklers" in the patients' charts. (Mehta, 2002).

The focus of this presentation, however, is on overcoming physician-related barriers to evidence-based practices -- in particular, “How might physicians move from *learning that* to *learning how*?”

Learning strategies that promote attention, arousal, and motivation, are more likely to be more effective in changing behavior than those that do not, particularly when they are combined with the use of feedback and reinforcement to convey an unambiguous message.

Practice guidelines typically fail to incorporate these strategies. Publishing constraints dictate that guidelines are general, not specific. Guidelines usually lack examples to help clarify where they apply. They ignore common clinical variables -- leading the reader to be uncertain about whether they “fit” the clinical situation at hand. They cite evidence of differing weights. In doing so, they risk confusion by mixing strong recommendations with weak ones. Finally, they do not engage the reader because they make for boring reading.

In an effort to address some of the shortcomings of practice guidelines, eScenario was created. eScenario is a computer-based tool that includes many of the above learning strategies. It uses a simple interactive format that requires the user to commit to dichotomous management decisions in specific, clinically relevant scenarios. The scenarios themselves are built upon general recommendations in published practice guidelines. Once a decision is made, immediate text and graphic feedback become available, as does access to the practice guideline from which the scenario was constructed. The feedback includes the evidence-based “correct answer.” In addition, it gives the strength of the evidence *and* the independent opinions from a panel of experts.

The user may explore the scenarios in an ad-hoc manner for situations of personal interest. An efficient, iterative method of presenting the scenarios allows many scenarios to be worked through quickly. Once a set of scenarios has been completed, the user’s answers are stored and a detailed “report card” is generated. This compares the user’s decisions against the evidence-based recommendations and against the verdicts of the expert panel. For these comparisons, eScenario calculates a kappa score to correct for chance agreement.

These features can be useful to both the teacher and the student of evidence-based medicine. For teachers, it provides a simple numerical score indicating the student’s level of concurrence with evidence-based recommendations. For researchers, the score can be used to assess differences among groups and changes over time. For students, eScenario offers a “virtual clinic” in which evidence-based practices can be inculcated. Efficiency and ease of use allow the student to build evidence-based skills by encountering of a large number and variety of “virtual patients” in the low stress environment of his or her own PC.

Through repeated variations on a theme eScenario can reinforce strong evidence-based recommendations. In addition, eScenario can be used to highlight clinical uncertainties. Scenarios can be crafted to mirror the complex and controversial situations encountered in clinical practice. In these, the evidence may be silent, and the expert consensus may be evenly divided. eScenario can thus teach both evidence-based recommendations and the limitations of the evidence-based approach.

Since the half life of “truth” in medicine is known to be finite (Poynard 2002), “best practice” is a continually moving target. eScenario can be updated to reflect the latest iteration of best practice guidelines. Adapting eScenario for Internet access could provide organizations such as AAN with an additional tool for up-to-the-moment continuing medical education. It could be used as a measure of evidence-awareness among the organization’s membership. It could measure the membership’s consensus about difficult scenarios for which evidence is lacking. These measures can be tracked over time and across organization-specified variables.

Finally, eScenario can be used to compliment and amplify the educational effect of didactic lectures in grand rounds, conferences and similar group settings. eScenario was presented to the Education Committee of the AAN at the 2002 annual meeting in Denver. A consensus of opinion was that it showed promise as a tool for teaching evidence-based medicine to neurology residents -- and to neurologists in general. Proof of its value remains to be established, however.

The current presentation is intended to familiarize a wider circle of neurologists with the tool. Those interested in creating additional content for the program, and those interested in testing the program's efficacy, may obtain a copy of eScenario from the author by contacting Don B Smith, MD at [dbsmd@qwest.net](mailto:dbsmd@qwest.net)

#### **References:**

AAN Practice Guidelines.  
Available at: [www.aan.com/professionals/practice/guidelines.cfm](http://www.aan.com/professionals/practice/guidelines.cfm)  
Accessed: November 30, 2002  
Bandolier Library.  
Where do GPs get evidence-based information?  
Available at: [www.jr2.ox.ac.uk/bandolier/band55/b55-7.html](http://www.jr2.ox.ac.uk/bandolier/band55/b55-7.html)  
Accessed: November 30, 2002  
Bhargava K and Jaeschke, R.  
Evidence-based medicine: an overview.  
SQU Journal for Scientific Research: Medical Sciences 2001; 2: 105-112.  
Mehta RH, Montoye CK, Gallogly M, et al.  
Improving the quality of care for acute myocardial infarction: The Guidelines Applied in Practice (GAP) initiative.  
JAMA 2002; 287: 1369-1276.  
Pearson TA.  
The Lipid Treatment Assessment Project.  
Arch Intern Med 2000; 160:459-467.  
Poynard T, Munteanu M, Ratziu V, et al.  
Truth Survival in Clinical Research: An Evidence-Based Requiem?  
Ann Intern Med 2002; 136: 888-895  
Rich MW.  
From Clinical Trials to Clinical Practice : Bridging the GAP.  
JAMA 2002; 287: 1321-1323.  
Ryle G.  
The Concept of Mind. Chicago: University of Chicago Press (page 58), 1949..

#### **Appendix One: AAN Practice Guidelines**

Available at: [www.aan.com/professionals/practice/guidelines.cfm](http://www.aan.com/professionals/practice/guidelines.cfm)

##### **Mo. Year Subject**

Jan 1998 AIDS: Evaluation and Management of Intracranial Mass Lesions in  
Sep 1997 ALS: Practice Advisory on Treatment with Riluzole  
Apr 1999 ALS: The Care of the Patient with  
Nov 1990 Antiepileptic Drugs: Generic Substitution for Antiepileptic Medication  
May 1999 Antiepileptic Drugs: Use of Felbamate in Treatment of Intractable Epilepsy  
May 2000 Antiepileptic Drugs: Anticonvulsant Prophylaxis in Newly Dx Brain Tumors  
Aug 1996 Antiepileptic Drugs: Guideline for Discontinuing in Seizure-Free Patients  
Mar 1994 Aphasia: Melodic Intonation Therapy  
Aug 2000 Autism: Screening and Diagnosis of  
Mar 1996 Autonomic Testing: Clinical  
Apr 2001 Bell's Palsy: Steroids, Acyclovir, and Surgery for  
Dec 1994 Botulinum Toxin: Training Guidelines for use of Tx of Neurologic Disorders  
Sep 1990 Botulinum Toxin-A: in Treating Neurologic Disorders

May 1995 Brain Death: Determining in Adults  
Apr 1990 Carotid Endarterectomy  
Mar 1997 Concussion: Management of, in Sports  
Jan 2000 Dementia/Alzheimer's Disease: Alzheimer's Disease and Risk of Driving  
May 2001 Dementia: Detection of Dementia-Mild Cognitive Impairment  
May 2001 Dementia: Diagnosis of  
May 2001 Dementia: Management of  
Nov 2000 Dizziness: Vestibular Testing Techniques in Adults and Children  
Jul 1997 EEG, Digital: Quantitative EEG and EEG Brain Mapping  
Jul 1995 EEG: Electroencephalogram in the Evaluation of Headache  
Jun 2002 EMG/NC: Electrodiagnostic Studies in Carpal Tunnel Syndrome  
Mar 1999 EMG/NC: Electrodiagnostic Studies in Ulnar Neuropathy at the Elbow  
Jul 2000 EMG: Clinical Utility of Surface EMG  
Jun 1996 ENG: Electronystagmography  
Oct 1998 Epilepsy: Management Issues for Women With Epilepsy  
Sep 1999 Epilepsy: Vagus Nerve Stimulation for Epilepsy  
Oct 1997 Evoked Potentials: Dermatomal Somatosensory  
Nov 1990 Evoked Potentials: Intraoperative Neurophysiology  
May 2000 Evoked Potentials: Use in Identifying Silent Lesions in Suspected MS  
Nov 1996 Genetic Testing Alert  
May 1999 Immunization, Neurologic Risk of  
Apr 1994 Low Back Syndrome: Magnetic Resonance Imaging in the Evaluation of  
Aug 1998 Low Back Syndrome: Spinal Ultrasound for the Evaluation of  
Mar 1992 Lumbar Puncture  
Oct 2000 Lumbar Puncture: Prevention of Post-Lumbar Puncture Headache  
Mar 1996 Lyme Disease: Diagnosis of Patients with Nervous System Lyme Disease  
Jan 1992 Magnetoencephalography  
Dec 1995 Male Sexual Dysfunction: Neurological Evaluation of.  
Sep 2000 Migraine  
Apr 2000 Migraine: Behavioral & Physical Treatments  
Apr 2000 Migraine: Neuroimaging in Patients with Acute Headache  
Apr 2000 Migraine: Pharmacological Management of Acute Attacks  
Mar 1995 Migraine: Use of Ergotamine and DHE: in Migraine & Status Migrainosus  
Feb 2002 MS: Disease Modifying Therapies in  
Jun 2000 MS: Corticosteroids in Acute Monosymptomatic Optic Neuritis  
Jun 1999 MS: The Relationship to Physical Trauma and Psychological Stress  
Jul 2000 Myasthenia Gravis: Thymectomy for Autoimmune Myasthenia Gravis  
Jul 1996 Neuroimaging: in the Emergency Patient Presenting with Seizure  
Jun 2002 Neuroimaging: in the Neonate  
Aug 1996 Neuropsychological Testing of Adults  
Dec 1999 Parkinson's Disease: Evaluation of Surgery for  
Jan 2002 Parkinson's Disease: Initial Treatment of Parkinson's Disease  
Jan 2002 Parkinson's Disease: Initiation of Treatment for  
May 1995 Persistent Vegetative State: Assessment and Management of Patients  
Sep 1996 Plasmapheresis  
Sep 2000 Seizure in Children: Evaluating a First Nonfebrile Seizure  
Jun 1997 Silicon Breast Implants and Neurologic Disorders  
Feb 1992 Sleep Disorders: Techniques in the Diagnosis and Management of  
Jul 2002 Stroke: AAN and AHA guidelines on Anticoagulation & Antiplatelet Agents  
Jul 2002 Stroke: Anticoagulants and antiplatelet agents in acute ischemic stroke  
Sep 1998 Stroke: Prevention in Patients with Nonvalvular Atrial Fibrillation  
Sep 1996 Stroke: Thrombolytic Therapy for Acute Ischemic Stroke  
Mar 1990 Thermography  
Apr 1990 Transcranial Doppler.