



# EPILEPSY UPDATE • A CASE SERIES

*A CME Activity*

*Making the Diagnosis:  
Is It Really Epilepsy?*



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Release Date: July 31, 2008  
Expiration Date: July 31, 2009

# Making the Diagnosis: Is It Really Epilepsy?

We all know the basics of how to treat epilepsy. There is a relatively small selection of medications to choose from, and most often the medications do the job. In many cases, however, the diagnosis is presumptive, based on symptoms that are reported by untrained observers who are often in a state of panic or who saw only part of the event. The diagnosis seeks support from imaging and EEG, but information from these sources is often inconclusive. When all is going well with treatment, we rarely question the diagnosis, but when things aren't doing what they're supposed to, the first question that should be asked is, "Do I have the right diagnosis?"

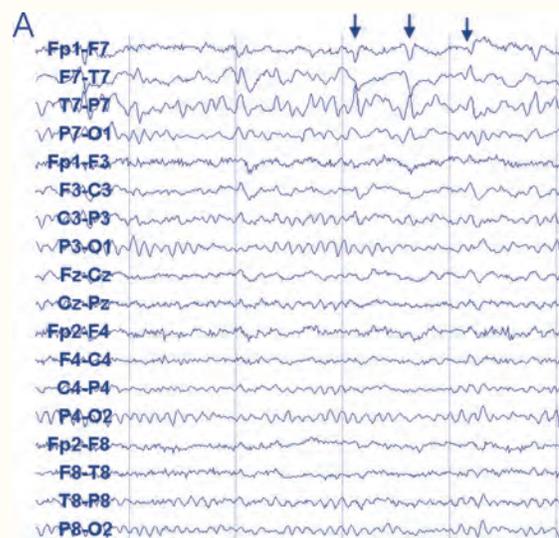
The cases we discuss illustrate the importance of asking that question, even if the diagnosis appears certain.

## Case 1

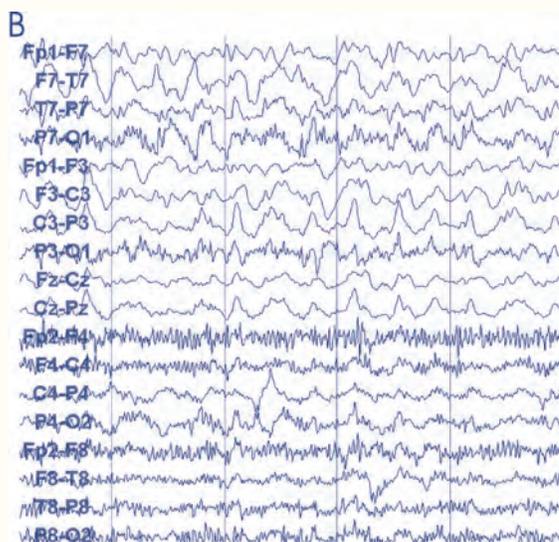
S. W. is a 53-year-old woman who was referred for evaluation of uncontrolled nocturnal seizures. Her seizures began approximately 3 years before the referral, about 6 months following a subarachnoid hemorrhage that had resulted from an aneurysm that was successfully clipped. At the time of the hemorrhage she had suffered significant right-sided weakness and some speech difficulties that were poorly described, but she made a good recovery from these deficits. The seizures had remained essentially the same from the very first. According to her husband, the seizures were characterized by the patient's awakening from sleep and wandering about the house confusedly, unable to speak or occasionally mumbling words that were out of context. She did not respond to questions, nor did she follow any instructions for periods of up to 30 minutes. The patient herself had no recollection of the events, although from time to time she had a vague sense that something had happened. In addition to her subarachnoid hemorrhage and the associated surgery, she had a history of hypertension and insulin-dependent diabetes for over 20 years. Based on her history, as well as an EEG that demonstrated left sided sharp waves and slowing (Fig. 1A), as well as an MRI scan that revealed an old left anterior temporal infarct, she was diagnosed with partial complex epilepsy and started on carbamazepine. Before the referral, she had been tried on the additional antiepileptic drugs of phenytoin and lamotrigine. She noted no benefit from any of the medications. To determine the nature of her seizures, she underwent video EEG monitoring. On the first night she had a typical spell of wandering and confusion with occasional mumbling. EEG showed bilateral irregular to semirhythmic

slowing in the theta and delta range which was clearly more prominent over the left hemisphere with frequent sharp waves noted on the left suggesting a seizure (Fig. 1B). Her blood glucose, however, was 45. She was diagnosed with nocturnal hypoglycemia, secondary to an aggressive treatment regimen. Her symptoms completely resolved with a readjustment of her insulin schedule, and the antiepileptics were later successfully tapered.

Figure 1.



A. Interictal recording from patient 1 showing left temporal sharp waves (arrows) intermixed with left hemispheric slowing (left side designated by vertical line)



B. EEG during episode of confusion showing bilateral slowing, clearly worse on the left (vertical solid line), but with some changes on the right (vertical dashed line)

## Case 2

M.R. is a 35-year-old who presented because of a number of episodes of blanking out, frequently while at work. She was the director of a small medical facility, and she would note that, often while sitting at her desk, she would have episodes when she lost time for periods of up to a minute. A co-worker observed an episode in which the patient stopped talking, stared, and was unresponsive. The duration of the postictal phase was unclear, but was probably brief. These events occurred about two to three times a week under a variety of circumstances. MRI was normal but EEG showed occasional left temporal sharp waves. Based on a history of recurrent, stereotyped spells of altered behavior together with epileptiform activity on her EEG, she was diagnosed with epilepsy, and treatment was started with carbamazepine. The spells continued unchanged in spite of regular increases in the doses, as well as through trials of lamotrigine and topiramate that were pushed to maximum tolerance. Because of uncontrolled epilepsy, she underwent evaluation for possible surgery. Two typical events were recorded in the first 24 hours, and neither was associated with EEG change. After discussing the findings with the patient, she was reassured that the spells were not of medical significance. She stopped the AEDs, and has done well.

### DISCUSSION

These cases, followed by epilepsy specialists for several years before the right diagnosis was made, illustrate how difficult it can be to determine the cause of a patient's symptoms. Because epileptic seizures occur only intermittently, they are rarely observed by a physician. We are thus left with making the diagnosis based on the history, often relying on the intuition that the history "sounds like it was a seizure." We usually rely on two key features of the history: that the spells have been recurrent and that the clinical features of the event were stereotyped. The diagnostic testing that is usually obtained (brain imaging and interictal EEG) can provide support for the clinical impression, but neither test, whether it shows an abnormality or not, can definitively rule in or rule out whether the events of concern were epileptic. In the first case the patient had a history that could be reasonably interpreted as epilepsy (recurrent, stereotyped). In addition there was an historical risk factor (subarachnoid hemorrhage) as well as abnormalities on MRI and EEG that could be associated with epilepsy. The second case also had a supportive history and EEG, although the imaging was unremarkable. In **Table 1** we list conditions that can mimic epilepsy and that can be mimicked by epilepsy. You will note the overlap.

Unfortunately, the reality is that our diagnostic acumen is not as sharp as we would like it to be. As noted earlier, we make the presumptive diagnosis of epilepsy based on the history, assisted in part by imaging and EEG, and treat according to what type of epilepsy we think the patient has (**Table 2**). If all goes well, we are pleased with the outcome and rarely give the diagnosis a second thought, whether it is truly the right diagnosis or not. It is only when the outcomes are less than successful that we are forced into rethinking things. For the overwhelming majority of patients we get it right, and for many of those who don't respond to the initial treatments, perhaps the majority, the diagnosis is correct and they suffer from a medically unresponsive form of epilepsy. But if, after several attempts with AEDs, the spells continue uncontrolled, one should question whether the diagnosis is correct and attempt to obtain a definitive diagnosis. Figure 2 outlines the general approach to evaluating and reevaluating spells that might be epileptic.

### Table 1: Epilepsy and Other Disorder Gray Zones

Hypoglycemia

Transient ischemic attacks

Transient global amnesia

Cardiac events (e.g. asystole)

Migraine variants

Panic attacks

Sleep disturbances (e.g. REM behavior disorder, night terrors)

Myoclonic disorders

Psychogenic events/somatization disorders

Transient psychosis (e.g. postictal)

### Table 2: Tools to Assist in Making the Diagnosis

(n.b., none are infallible)

History

Clinical description

Interictal EEG

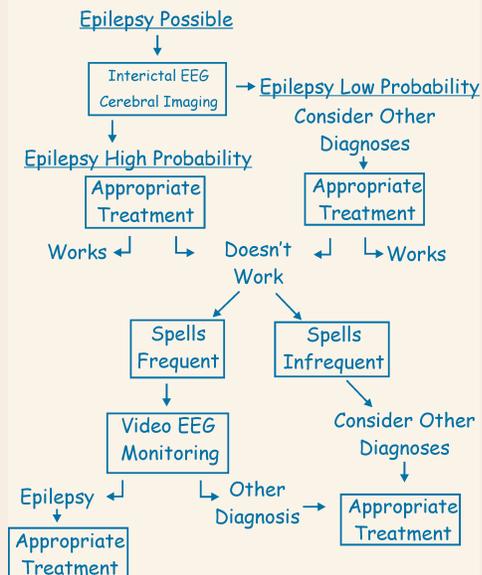
Brain imaging

Ictal EEG

Continued on page 3 (Back)

Figure 2.

## Diagnosing and Treating Spells



Flow chart outlining thought processes in patients who have episodic, stereotyped symptoms



### ABOUT THE AUTHOR

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### ACKNOWLEDGMENT

This program is supported by an educational grant from Ortho-McNeil Janssen Scientific Affairs, LLC.

# FAQs

## Frequently Asked Questions

### Does that mean that anyone with uncontrolled spells should undergo EEG monitoring?

Ideally, having a definitive diagnosis is what we would always like, but it isn't always possible. EEG monitoring usually works best if patients are having their episodes with some regularity and frequency. For patients with events less than monthly, chances for capturing an event on EEG are low, and for patients with even less frequent episodes, monitoring for weeks is not likely to be rewarded.

### I have a patient with uncontrolled spells that I have been treating for years. Isn't his EEG with clear spikes sufficient for the diagnosis?

The short answer is no. Although epileptiform changes on EEG are a strong supporter of the diagnosis of epilepsy, they are not diagnostic of the disorder. Estimates are that one to two percent of patients with epileptiform discharges on EEG do not have a history of epilepsy. Even if a patient does have epilepsy, there are times that the epilepsy is controlled but the nonepileptic events are not; but they are still interpreted as seizures. Similarly, probably a third or more of patients with epilepsy will have consistently normal interictal EEGs so that the absence of spikes and sharp waves does not rule out the diagnosis.

### One of my patients had one of her spells with lots of flailing of the arms and legs. It was pretty strange.

### Can't I just go with my clinical impression that these events are not epileptic?

The short answer is again no. Although we like to pride ourselves on our ability to recognize a real seizure, experience on established monitoring units, supported by a number of studies testing the clinical diagnostic skills of experienced epileptologists, suggests that our ability to differentiate the real from the not so real is a 50-50 proposition. Seizures can be truly bizarre in their clinical manifestations, and nonepileptic spells can, at times, look very realistic. Without EEG to assist, one often is still left guessing.

### A patient had one of his very unusual "seizures" while having an EEG, but there were no changes that I could detect. Is it safe to rule out epilepsy as a cause?

No, once again. Some seizure types (simple partial and frontal lobe) frequently have no EEG accompaniment or subtle changes at best. In this situation, sometimes recording multiple events reveals those subtle EEG changes; at other times one is forced to rely on one's clinical impression, which as we noted above, is far less than perfect.

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# 62<sup>ND</sup> ANNUAL MEETING

December 5-9, 2008

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Washington State Convention  
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## EPILEPSY UPDATE: A CASE SERIES Issue #1

### KNOWLEDGE GAP ADDRESSED

Current practice recommendations in the general neurology community are limited and need to be supported. This activity will make the general neurologist more aware of the complex issues involved in treating patients with epilepsy and be able to apply the appropriate resources.

### LEARNING OBJECTIVES

- Utilize additional diagnostic tools to determine the most effective treatment in order to manage the patient with epilepsy more appropriately and to enhance his/her quality of life.
- Recognize that treatments may have consequences that impact a patient beyond seizure control, and how best to address these consequences.
- Given that patients with epilepsy can have a number of medical and psychological issues that require intervention, in addition to control of their seizures, determine the best ways to address these issues.
- Recognize the barriers that patients with epilepsy may encounter in an effort to sustain an optimal quality of life.

### TARGET AUDIENCE

General neurologists, nurses, and other healthcare professionals involved in the care of patients with epilepsy.

### ACCREDITATION STATEMENT

The American Epilepsy Society is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

### CREDIT DESIGNATION

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### FACULTY DISCLOSURES

**Dr. Austin** – has indicated she has nothing to disclose.

**Dr. Bertram** – has indicated he has nothing to disclose.

**Dr. Gilliam** – has indicated he has nothing to disclose.

**Dr. Goodkin** – has indicated he has nothing to disclose.

**Dr. Sperling** – Speakers' Bureau: Pfizer, Inc., Ortho-McNeil, UCB Pharma; Intellectual Property/Patent holder: Daeyang; Consulting/Advisory Board: Valeant, Dainippon Pharmaceuticals; Contracted Research: UCB Pharma, Schwarz Pharma, GlaxoSmithKline, Medtronic, Neuropace, Johnson & Johnson.

### REVIEWER

**Fred Lado, M.D., Ph.D.** – has indicated he has nothing to disclose.

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To obtain credit you must read the newsletter, answer the Self-Assessment Quiz and CME Evaluation Survey. Mail them to:

American Epilepsy Society  
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342 North Main Street  
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or Fax to: (860) 586-7550

A CME certificate will be sent to you within three weeks should you obtain a passing grade of 100% or higher.

### 1. A patient has recurrent symptoms of "blinking out." The temporal sharp waves on EEG and the small temporal cortical vascular malformation on MRI are

- diagnostic of epilepsy
- of no diagnostic significance
- supportive of the diagnosis of epilepsy
- none of the above

### 2. Symptoms of epilepsy can overlap with symptoms of

- migraines
- sleep disturbances
- transient ischemic events
- panic attacks
- all of the above

### 3. Once the diagnosis of epilepsy is made from the history and interictal studies

- one should pursue medical treatments until all options are exhausted
- the diagnosis can be considered fixed in stone
- one can be comfortable with the diagnosis as long as the patient does well with treatment
- the physician is obliged to confirm the diagnosis with video EEG monitoring

Please circle the correct answers:

1. a b c d

2. a b c d e

3. a b c d

### 2. Questions Relating to Your Intent to Make Practice Changes

Based upon your participation in this CME activity, please answer the following:

Did the information in this activity increase your knowledge of methods for diagnosing epilepsy?

YES  NO

Did the information in this activity increase your confidence in choosing which additional studies may be helpful and when to order additional studies?

YES  NO

Having read this newsletter are you now more likely to order additional studies in your patients with epilepsy?

YES  NO

Can we contact you in a follow-up survey to measure the impact of this educational intervention?

YES  NO

### 3. Are there any barriers to implementing these strategies? (Check all that apply)

- Time  
 Cost  
 Staffing  
 Institutional treatment algorithm differences  
 Formulary  
 Patient adherence  
 Other: \_\_\_\_\_

### 4. Effectiveness of the Individual Faculty Writer(s):

SCALE: 5=Excellent 4=Very Good 3=Satisfactory 2=Fair 1=Poor  
(Please Circle)

Faculty	Knowledge of Subject Matter	Appropriateness of Teaching Strategies	Was Presentation Free of Commercial Bias?
Edward H. Bertram, M.D.	5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1 <input type="checkbox"/>	5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1 <input type="checkbox"/>	<input type="checkbox"/> Yes <input type="checkbox"/> No If no, please describe below:

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Complete the Evaluation (please be sure to indicate how long it took to complete this activity). The amount of time you attest to on this evaluation will be reflected on your certificate.

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### 1. Effectiveness in Meeting Identified Learning Objectives

Was the activity effective in meeting the identified learning objectives?

SCALE:  5=Excellent  4=Very Good  3=Satisfactory  2=Fair  1=Poor

Utilize additional diagnostic tools to determine the most effective treatment in order to manage the patient with epilepsy more appropriately and to enhance his/her quality of life.

5  4  3  2  1

Recognize that treatments may have consequences that impact a patient beyond seizure control, and how best to address these consequences.

5  4  3  2  1

Given that patients with epilepsy can have a number of medical and psychological issues that require intervention in addition to control of their seizures, determine the best solution to deal with these issues.

5  4  3  2  1

Recognize the barriers that patients with epilepsy may encounter, in an effort to sustain an optimal quality of life.

5  4  3  2  1

### 5. Please rate the educational value/clinical relevance of the content:

Just Right  Too Advanced  Too Basic

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The commercial supporter was acknowledged in the newsletter.

If trade names were used, trade names of all products discussed were used.

If you answered "No" to any of the above questions, please provide details:

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

### 7. Based upon the topic of this case series, "Diagnosis of Epilepsy" please list additional topics that you would like to hear about that will better help you manage your patients.

1.) \_\_\_\_\_

2.) \_\_\_\_\_

3.) \_\_\_\_\_

### 8. Are you interested in the following modalities of learning?

(Check all that apply)

- Podcast/downloadable audio files  Publications  Webcast  Case Studies  
 Audioconference  Interactive CD-ROM/DVD  Monograph  Live Events

### 9. Would you like to continue receiving this publication?

Yes  No

### 10. Please send me AES membership information.

Yes  No

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### How long did you participate in this activity?

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By submitting this request, I certify the above is true and correct.

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