

Please join us for an...  
**OPEN HOUSE**



National Sleep Awareness Week® is March 3-9, 2008. In recognition of this public education and awareness campaign, Sleep HealthCenters will be hosting events throughout the Boston area, including two open houses. Take a tour of our facilities and learn more about our services and programs, including our Cognitive Behavioral Therapy program for the treatment of insomnia. Meet our physicians and CPAP therapists while our sleep technicians explain the process of having a sleep study.

### Monday - March 3rd

#### BRIGHTON OPEN HOUSE

Hosted by: **Dr. John Winkelman, Medical Director  
Sleep HealthCenter associated with  
Brigham and Women's Hospital**

Time: **6:00 - 8:00 pm**

Location: **1505 Commonwealth Avenue, Brighton, MA**

Phone: **617-783-1441**

### Wednesday - March 5th

#### FRAMINGHAM OPEN HOUSE

Hosted by: **Dr. Sandra Horowitz, Medical Director  
Sleep HealthCenter at Framingham**

Time: **6:00 - 8:00 pm**

Location: **125 Newbury Street, Framingham, MA**

Phone: **508-270-6020**

Please visit our website at [www.sleephealth.com](http://www.sleephealth.com)  
for additional events and locations.



Sleep HealthCenters is a network of sleep medicine centers staffed by experts in the field of sleep medicine. Our integrated care system provides all the services needed to diagnose and treat patients with the entire array of sleep disorders including obstructive sleep apnea, insomnia, narcolepsy and restless legs syndrome.

#### In this issue of the Sleep HealthCenters Newsletter...

- ▶ Sleep and Seizures by Milena Pavlova, MD
- ▶ CEO Corner:
  - Sleep HealthCenter Facilities Update
    - Sleep HealthCenters Partners with Marlborough Hospital
    - Sleep Health Center affiliated with New England Sinai Hospital Expands
    - Sleep HealthCenter at Framingham and Stoughton Receives AASM Accreditation
  - Sleep HealthCenters welcomes new staff Stuart F. Quan, MD and Claudia M. Toth, PsyD
  - National Sleep Awareness Week
  - Upcoming Sleep Apnea Awareness Meeting
- ▶ Research Activities

*Massachusetts Affiliations:* Beth Israel Deaconess Medical Center, Brigham and Women's Hospital, Faulkner Hospital, Hallmark Health, Marlborough Hospital, Massachusetts Eye and Ear Infirmary, McLean Hospital, New England Sinai Hospital, Southcoast Hospitals Group, UMass Memorial Medical Group; *New York Affiliations:* Beth Israel Medical Center

*Massachusetts Locations:* Bedford, Beverly, Boston, Brighton, Framingham, Jamaica Plain, Marlborough, Medford, North Dartmouth, Stoughton, Weymouth, Worcester; *New York Locations:* Manhattan

For more information, please contact us at: 1-877-SLEEPHC (1-877-753-3742) or visit our website at [www.sleephealth.com](http://www.sleephealth.com).

**Requisition forms are available on our website.**

# Sleep HealthCenters® Newsletter

Lawrence J. Epstein, MD, Editor

Winter 2008

Dear Colleague,

In this issue of the Sleep HealthCenters Newsletter, Milena Pavlova, MD, Medical Director of the Sleep HealthCenter affiliated with Faulkner Hospital, writes our feature article on Sleep and Seizures.

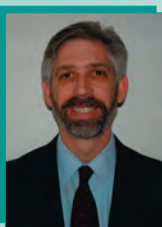
Epilepsy is a common neurological disorder but the relationship between sleep and seizures is still being uncovered. Dr. Pavlova describes the interaction between sleep and seizures, how sleep stage, quality and duration can affect seizure frequency and how seizures can disrupt normal sleep and wake patterns. She also gives some helpful tips on how to evaluate the epilepsy patient who complains of excessive daytime sleepiness.

Sleep HealthCenters is proud to announce that our Framingham center received full accreditation from the American Academy of Sleep Medicine. Accreditation is a marker of high quality and is a goal for all of our facilities.

In the CEO Corner, Paul Valentine introduces our newest center, the Sleep HealthCenter affiliated with Marlborough Hospital. Marlborough Hospital provides a wide range of inpatient and outpatient medical, surgical, and ancillary services and our partnership will bring expanded and improved sleep health services to the Marlborough area. He also announces the expansion of our center affiliated with New England Sinai Hospital and our continued partnership with Faulkner Hospital.

Stuart F. Quan, MD, a Past President of the American Academy of Sleep Medicine and a Visiting Professor of Medicine at Harvard Medical School, has joined our sleep medicine staff and is working at the Sleep HealthCenter affiliated with Hallmark Health. We also welcome Dr. Claudia Toth, PsyD to our behavioral sleep medicine faculty.

National Sleep Awareness Week is March 3-9, 2008. We have many activities planned, including an open house at both our Brighton and Framingham centers. These free events will provide the public with information on sleep and sleep disorders and help raise community awareness of the importance of getting a good night's sleep. Please check our website for additional information.



If you have any questions about sleep disorders, our services, our affiliations, or our locations, please feel free to contact us.

Sincerely,  
Lawrence J. Epstein, MD  
Medical Director  
Sleep HealthCenters LLC



## Sleep and Seizures

Milena Pavlova, MD

Medical Director, Sleep HealthCenter affiliated with Faulkner Hospital  
Instructor in Neurology, Harvard Medical School  
Associate Physician, Department of Neurology, Brigham and Women's Hospital

Our patients spend a third of their life sleeping. Thus, it is necessary to understand the relation of sleep to various disorders. This article focuses on the relationship of sleep to pathological alterations of consciousness, i.e., seizures.

In many otherwise healthy individuals, seizures can be provoked by various factors causing physiologic stress: severe hypoglycemia, extreme hyperglycemia, other metabolic disturbances, various toxins, trauma, as well as withdrawal from alcohol and certain medications. Similarly, sleep deprivation, primary sleep disorders and even the normal progression through the stages of sleep can provoke seizures. Repeated unprovoked seizures characterize epilepsy – a condition that affects nearly 1% of the population.

Generalized convulsive seizures are characterized by loss of consciousness, bilateral tonic and clonic movements, and a postictal state. Because of their dramatic presentation, they can be identified and usually reasonably well described even by non-medical personnel who witness them.

Partial seizures can be subtle and thus easy to miss. Simple partial seizures present as stereotypic activity without alteration of awareness and can be misinterpreted as another disorder. For example, one of my patients with epilepsy partialis continua was seeking treatment for tremor.

Complex partial seizures may also present as subtle activity or simply as interruption of usual activity. Thus, they can be missed or misinterpreted as inattention or drowsiness if the patient is relatively inactive. Similar to excessive drowsiness, seizures can have serious consequences if they occur while the patient's concentration is required for safety. However, unlike sleep or inattention, seizures cannot be reversed by interaction or stimulation. The most common hazardous situation is driving. Driving laws in the US have specific provisions for patients who have had a loss of consciousness (seizure or syncope) and require that the patient voluntarily surrender his/her license until the condition is treated effectively. For most states, a seizure-free period of 3 months to 2 years is required before driving privileges can be resumed.

### Effects of Seizures on Sleep

Patients with epilepsy commonly complain of fatigue and sleepiness. Antiepileptic medications are frequent culprits as nearly all have some sedating effect. If seizures occur during the day, they can be followed by a postictal state, which commonly involves drowsiness or sleep.

Seizures themselves can disrupt sleep if they occur at night. Nocturnal seizures can be associated with sleep fragmentation and arousal or awakening may occur before or after the event. Frequently, temporal lobe seizures occur after awakening, while frontal lobe seizures occur from sleep. However, the causal relationship is still debated.

Even in the absence of seizures, patients with temporal lobe epilepsy (TLE) are reported to have multiple stage shifts and numerous awakenings. For example, Crespel et al. (1998, 2000) report highly fragmented sleep in epilepsy patients.

### Effects of Sleep on Seizures

Diurnal and nocturnal variations in seizure rate have been noted by clinicians for centuries and it has been suggested that state of consciousness or sleep architecture may play a role. Two recent prospective studies examined the distribution of seizures in relation to sleep stage and depth. Both Herman et al. (2001) and Minecan et al. (2002) reported that non rapid eye movement (NREM) sleep, especially stage 2 sleep, is associated with the highest proportion of seizures of all sleep stages. Interestingly, rapid eye movement (REM) sleep is the state with lowest number of seizures, with less than 1% of all seizures occurring in REM in most studies.

The occurrence of seizures from sleep (vs. wakefulness) may depend on epileptogenic region. In TLE, there is a tendency for arousals to occur before seizures (Malow et al., 1997) while frontal lobe epilepsy seizures were more likely to occur during sleep and were not associated with arousal from sleep (Herman et al., 2001; Crespel et al., 1998).

Lack of sleep is one of the commonly reported triggers of seizures. In a study of more than one thousand participants in three epilepsy registries, the three common provoking factors for seizures were fatigue, emotional stress, and sleep deprivation. In another prospective study, sleep deprivation was among the most common preventable factors that precipitated individual seizures in a patient with epilepsy (Tan et al., 2005; Nakken et al., 2005). Thus, adequate sleep is (continued on page 2)



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# Sleep HealthCenters® Newsletter

(continued from page 1) important both for alertness and for optimal seizure control in our epilepsy patients.

Primary disorders of sleep are more frequent in epilepsy patients than in the general population. Malow et al. (2000) reported that a third of a clinic population with medically refractory epilepsy had an abnormal respiratory disturbance index (RDI), defined as more than five events per hour of sleep, and 13% had moderate to severe obstructive sleep apnea (OSA). Of the primary sleep disorders, OSA deserves special attention for two reasons: 1) both the hypoxemia and the arousal that result from respiratory disturbances at night can be detrimental to seizure control; 2) small prospective studies suggest that treatment of OSA may improve seizure control (Malow et al., 2003).

## Effects of Sleep on Interictal Discharges

Interictal discharges (IID) are EEG abnormalities seen between seizures. They distinguish patients with epilepsy from healthy individuals. IID are not evenly distributed through all sleep stages. There is a higher rate of IID during stage 3-4 sleep compared to stage 1-2 sleep in patients with TLE (Malow, 1998; Sammaritano et al., 1991) and generalized epilepsy (Ross et al., 1966; Sato et al., 1973). In TLE, the rate of IIDs in deep NREM sleep is up to nine times higher than the waking IID rate. Similar to seizures, interictal discharges are rare in REM. Thus nighttime sleep EEG recordings can be especially helpful in the evaluation of seizures. A caveat is that sleep preferentially occurs at specific circadian times, so it is possible that these sleep related effects are at least partially caused by an underlying circadian rhythm in IID propensity.

## Seizures and Circadian Rhythms

Many physiologic conditions have an endogenous circadian periodicity that is independent of sleep. For example, cortisol retains its morning peak in secretion even in individuals who are kept continuously awake.

Central nervous system activity is not spared from the effect of circadian rhythms. In healthy individuals, alertness and memory are lowest during the individual's 'biological night'. There is a significant circadian variation in multiple EEG variables, such as theta activity, that is independent of the state of sleep or wakefulness. Seizures may not be equally distributed through the period of wakefulness. For example, two independent studies (Quigg et al., 1998; Pavlova et al., 2004) reported that temporal lobe seizures tend to occur in the mid-afternoon. Other classic examples include morning predominant myoclonic seizures in patients with Juvenile Myoclonic Epilepsy, and nocturnal seizures in Autosomal Dominant Nocturnal Frontal Lobe epilepsy. The circadian component in these patients has not been comprehensively studied, though preliminary reports suggest a circadian variation in awake IID in generalized epilepsy (Pavlova et al., 2005).

## Effect of Medications on Seizure Threshold

Medications that affect sleep and wakefulness can also affect the likelihood that seizures will occur (seizure threshold). Medications that lower the seizure threshold make seizures more likely to occur. Most stimulants, such as amphetamines or methylphenidate, as well as some activating antidepressants, including Wellbutrin, lower the seizure threshold. Withdrawal of medications and other substances can provoke seizures, even in patients who do not have epilepsy. Such withdrawal seizures have been described with alcohol, benzodiazepines, gabapentin, and other anticonvulsants.

## Evaluation

The typical differential diagnosis in a sleepy patient with epilepsy includes:

- 1) Medication effect
- 2) Daytime unwitnessed complex partial seizures
- 3) Nighttime unwitnessed complex partial seizures

that lead to sleep fragmentation and, consequently, poor daytime attention

- 4) A primary sleep disorder that leads to sleep fragmentation and, consequently, poor daytime attention

We may have to accept that some sedating effect from the antiepileptics is an inevitable part of the patient's treatment if the medication is necessary to control seizure activity. But how do we differentiate among the other possible causes of sleepiness? The overnight polysomnogram can allow us to diagnose most primary sleep disorders. However, the arrangement of electrodes (montage) used in a typical polysomnogram is not designed to evaluate epilepsy. Epileptiform abnormalities, especially focal ones, may not be visible. Addition of a full EEG montage with video monitoring to the standard polysomnographic montage allows us to identify focal electrographic seizures and interictal EEG abnormalities at night.

## Main Therapeutic Strategies

The following principles are recommended when treating a sleepy patient with epilepsy:

- 1) Optimize antiepileptic drug (AED) regimen. The frequency of side effects from AEDs increases with the number of medications used. Sleepiness is one of the most common side effects of AEDs. Thus, limiting the number and optimizing the dose of the medications helps reduce the associated drowsiness.
- 2) Optimize sleep hygiene. As discussed above, obtaining an adequate amount and quality of sleep is essential not only to prevent sleepiness, but for optimal seizure control. A detailed discussion of sleep hygiene measures is available on our website.
- 3) Evaluate for and treat primary disorders of sleep.

For a fully referenced version of this article, visit the Sleep HealthCenters website at [www.sleephealth.com](http://www.sleephealth.com).

## CASE STUDY

Mr. Y was a 52-year-old engineer with a nearly life-long history of seizures, who was seen in sleep clinic with a complaint of episodes of altered awareness during the day.

His seizures started in childhood, soon after a bicycle accident. During the episodes, he would stop activity, lose awareness and demonstrate stereotypic hand movements. He had no aura, the seizures lasted approximately one minute and typically, he had no postictal period. He reported secondary generalized seizures in the past, but none in the 10 years prior to the visit.

His medication had produced full seizure control. However, within the past several years he had recurrent episodes of altered consciousness, that might be partial complex seizures. He complained of worsening memory and attention. He also had a tendency to fall asleep while in meetings or watching television. He stopped driving, had difficulty with his work, and suffered significant limitations of his social life and financial state. Increasing his antiepileptic medication did not stop the episodes, caused greater sleepiness, and decreased alertness.

He went to bed around 10 p.m. and awoke at 6:30 a.m., but did not feel refreshed from his sleep. He frequently woke up with a dry mouth and headaches. He snored so loudly that his wife moved to a different room. His wife reported occasional loud "banging" noises in his room, and was worried he might be having seizures at night.

His exam was notable for an elevated body mass index and a small upper airway with mild erythema.

Several factors might cause this patient's complaints:

- 1) daytime complex partial seizures;
- 2) nighttime seizures from sleep could cause the unusual noises his wife described at night and sleep fragmentation can lead to daytime sleepiness and limited attention;
- 3) obstructive sleep apnea (OSA) can cause fragmented sleep at night, daytime sleepiness and more frequent seizures. Morning headaches and dry mouth are also frequent in patients with OSA.

Higher doses of antiepileptic medications can help with seizure control, but would not help any sleep disorders

(in fact, OSA may worsen, as some antiepileptic medications are associated with weight gain). Thus, it is important to evaluate whether the nighttime and daytime complaints are primarily due to seizures or to a sleep disorder.

Nighttime evaluation by polysomnography revealed severe OSA (respiratory disturbance index of 46 per hour, minimum oxygen saturation of 82%). The full montage video-EEG monitoring revealed right frontal interictal discharges (consistent with his diagnosis of epilepsy).

We initiated treatment with CPAP. After a relatively short adjustment period, the patient was using CPAP compliantly. He reported improvement in his daytime alertness and complete resolution of his headaches. He no longer had episodes of altered awareness. His wife reported that she no longer heard the nighttime noises. He continued to report some residual daytime sleepiness, which persisted even after his antiepileptic regimen was optimized. Addition of low dose modafinil improved his alertness and was well tolerated. He was again productive at his work, resumed driving, and enjoyed a fulfilling social life with his family.



## CEO CORNER

Paul S. Valentine  
President and  
Chief Executive Officer

We are happy to announce the Sleep HealthCenter affiliated with Marlborough Hospital is now open. Diagnostic sleep studies will be performed at the newly opened sleep laboratory located at the Embassy Suites Hotel, 123 Boston Post Road West (Route 20). Patients have comfortable, private bedrooms and bathrooms and access to all hotel amenities, including complimentary buffet breakfast.

The clinic, where patients receive treatment and follow-up care, is located in the Physician Suites at the

Changes may be forthcoming regarding the diagnostic evaluation of patients with obstructive sleep apnea (OSA). The Centers for Medicare and Medicaid Services (CMS) announced preliminary rules regarding their policy for payment of CPAP to treat OSA. Previously, CPAP was reimbursed only for patients diagnosed with OSA using in-lab polysomnography. Under the new guidelines, home sleep testing may also be acceptable. Final guidelines are due March 14, 2008. The American Academy of Sleep Medicine has recently published clinical guidelines for the use of portable monitors in the diagnosis of OSA. These guidelines support the use of home testing in certain patient populations and describe best methodologies for evaluation and testing. Sleep HealthCenters has already established protocols for providing home sleep testing in those cases where reimbursement will support such use. Contact us with questions about this service.

## RESEARCH ACTIVITIES

Sleep HealthCenters is proud to work with some of the premier sleep researchers in the country. The following research studies are currently underway in conjunction with our partners. To take part in a study or for more information, please contact us toll free at 877-SLEEPHC (877-753-3742). For a full listing of our research activities, please log onto our website at [www.sleephealth.com](http://www.sleephealth.com).

### Portable Monitoring for Sleep Apnea

Sleep HealthCenters is evaluating several portable monitors which will eventually be used in the patient's home to diagnose obstructive sleep apnea. During the course of the study, the monitor will be assessed for efficacy in the sleep laboratory and in the patient's home. The patient will evaluate the monitor's comfort and ease of use. *Please contact Melissa Maywalt at 617-783-1441 or 617-783-1496 x298 (voicemail).*

**Do you get out of bed to eat at night, after you have gone to sleep?** Do episodes of repetitive eating at night feel out of your control? You may have Sleep-Related Eating Disorder, which can disrupt your sleep and health. The Sleep HealthCenter associated with Brigham and Women's Hospital is conducting a research study on an investigational medication for Sleep-Related Eating Disorder. Qualified participants can receive study medication and medical evaluation at no cost. *If interested, please call Lisa at 617-783-1496 x115 or email [SleepResearch@sleephealth.com](mailto:SleepResearch@sleephealth.com).*

Marlborough Hospital main campus. Board certified sleep specialists, nurse practitioners, and respiratory therapists staff the clinic.

Due to the growing demand for sleep-related diagnostics and treatment, we have doubled the size of our Sleep HealthCenter affiliated with New England Sinai Hospital. Our increased capacity allows us to care for patients more quickly with appointment availability within two weeks.

Both the Sleep HealthCenter at Framingham and the Sleep HealthCenter affiliated with New England Sinai Hospital received full accreditation from the American Academy of Sleep Medicine. The AASM has rigid guidelines and we are extremely proud that our centers continually meet and exceed AASM standards.

We are thrilled that Stuart F. Quan, MD, has joined us as Senior Medical Consultant. Dr. Quan will be practicing at the Sleep HealthCenter affiliated with Hallmark Health in Medford, MA. Dr. Quan is well known in the field of sleep medicine and some of his impressive credentials include: Professor Emeritus of Medicine, University of Arizona; Visiting Professor of Medicine, Harvard Medical School, Boston; Editor, Journal of Clinical Sleep Medicine; President, American Academy of Sleep Medicine, 1999-2000. We also welcome Claudia M. Toth, PsyD, to our staff. Dr. Toth will specialize in treating patients with insomnia and other behavioral sleep-related disorders.

The next Sleep Apnea Awareness meeting will be held on May 13 at The Tufts Library in Weymouth, MA. We encourage you to invite your patients who have been diagnosed with sleep apnea to attend. We are happy to continue to provide sleep medicine services to your patients. Please do not hesitate to contact us if you have any questions.

### Do you have Restless Legs Syndrome?

The Sleep HealthCenter associated with Brigham and Women's Hospital is conducting a research study that is following up on the recent finding of a genetic marker for Restless Legs Syndrome (RLS). To further investigate the genetics of RLS, we are asking patients to give blood to determine if they have genes for RLS. We will then see if these genes affect certain aspects of the disorder and response to treatments. This study may help us learn about what causes RLS, and may help us guide future treatments.

The study will require one visit to the Sleep HealthCenter associated with Brigham and Women's Hospital located in Brighton, MA. The visit will take about 30 minutes. Participants will receive compensation for travel expenses to the clinic. At the study visit, we will describe the research study to you, ask you questions about your sleep and your health, and take a sample of blood from a vein in your arm. *To learn more about this study, please call Lisa at 617-783-1496 x115 or email [SleepResearch@sleephealth.com](mailto:SleepResearch@sleephealth.com).*

## NATIONAL SLEEP AWARENESS WEEK EVENTS

### MONDAY, MARCH 3

#### Sleep HealthCenters Open House – Brighton

Hosted by: Dr. John Winkelman, Medical Director  
Sleep HealthCenter associated with  
Brigham and Women's Hospital  
Time: 6:00 - 8:00 pm  
Location: Sleep HealthCenters  
1505 Commonwealth Ave, Brighton, MA

### MONDAY, MARCH 3

#### Marlborough Hospital – Marlborough

Presenter: Dr. Cynthia Dorsey  
Director of Behavioral Sleep Medicine  
Sleep HealthCenters  
Time: 7:00 - 8:30 pm  
Location: Marlborough Hospital  
157 Union Street, Marlborough, MA

### MONDAY, MARCH 3

#### New England Sinai Hospital – Stoughton

Presenter: Dr. Alexander White, Medical Director  
Sleep HealthCenter affiliated with  
New England Sinai Hospital  
Time: 7:00 - 8:30 pm  
Location: New England Sinai Hospital  
150 York Street, Stoughton, MA

### TUESDAY, MARCH 4

#### Southcoast Hospitals Group – Fall River/New Bedford

Hosted by: Sleep HealthCenters in conjunction with  
Charlton Memorial and St. Luke's Hospital  
Time: 12:00 - 1:00 pm  
Location: Charlton Memorial Hospital  
363 Highland Avenue, Fall River, MA  
St. Luke's Hospital  
101 Page Street, New Bedford, MA

### TUESDAY, MARCH 4

#### Beth Israel Medical Center – New York City

Presenter: Dr. Mangala Narasimhan  
Medical Director, Sleep HealthCenter  
at Beth Israel Medical Center  
Time: 12:00 - 1:00 pm  
Location: Beth Israel Medical Center  
10 Union Square, New York, NY

### WEDNESDAY, MARCH 5

#### Sleep HealthCenters Open House – Framingham

Hosted By: Dr. Sandra Horowitz, Medical Director  
Sleep HealthCenter at Framingham  
Time: 6:00-8:00 pm  
Location: Sleep HealthCenters  
125 Newbury Street, Framingham, MA

### THURSDAY, MARCH 6

#### Faulkner Hospital – Jamaica Plain

Presenter: Dr. Milena Pavlova, Medical Director  
Sleep HealthCenter affiliated with  
Faulkner Hospital  
Time: 7:00 - 8:30 pm  
Location: Faulkner Hospital  
1153 Centre Street, Jamaica Plain, MA

### THURSDAY, MARCH 6

#### YMCA – Malden

Presenter: Dr. Doug Kirsch, Regional Medical Director  
Sleep HealthCenters  
Time: 7:00 - 8:30 pm  
Location: YMCA of Malden  
99 Dartmouth Street, Malden, MA