

M.D. NEWS

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A photograph of three men in professional attire (suits and ties) standing in an office. The man on the left is standing, the man in the center is sitting, and the man on the right is standing. They are all smiling. The background shows office equipment, a computer monitor, and a sign that says "Station".

The New England Epilepsy Institute at Lawrence General Hospital

Multidisciplinary Approach and State-of-the-Art Technology for Patients With Seizure Disorders

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By Kathryn J. Siranosian, M.S.

According to the Epilepsy Foundation of America, more than 3 million people in the U.S. currently have some form of epilepsy, and about 200,000 new cases of the disorder are diagnosed each year. A recent multistate study by the Centers for Disease Control and Prevention confirmed these statistics and then went on to add one more troubling piece of data: Of the one in 10 Americans who have active epilepsy, more than one-third are not receiving sufficient treatment.

The findings of the CDC study suggest that despite its prevalence, epilepsy remains largely misunderstood — by both patients and their practitioners. That's unfortunate, because without sufficient treatment, patients typically face a diminished quality of life, as well as a much greater risk of subsequent seizures, seizure-related injuries and disability. By contrast, among patients who do receive adequate medical treatment,

as many as 65% can control their seizures completely and live normal, or close to normal, lives.

As with other medical conditions, the successful management of epilepsy hinges on an accurate diagnosis. And, that's why patients in the Merrimack Valley now have a significant advantage.

Earlier this year, Lawrence General Hospital and New England Neurological Associates, P.C., one of the largest multidisciplinary neuroscience group practices in the eastern United States, joined forces to open the New England Epilepsy Institute at Lawrence General Hospital. The New England Epilepsy Institute specializes in the diagnosis and treatment of seizure disorders and includes an inpatient diagnostic unit specially equipped with state-of-the-art EEG/video monitoring technology.

Specifically, physicians at the New England Epilepsy

Institute focus on patients with poorly controlled seizure disorders or unusual seizures that may resemble fainting, panic attacks or other types of spells. Often, patients like these may have an unclear diagnosis, or they may be suffering with negative side effects of anti-epileptic drugs. In other cases, patients may have convulsive episodes, or seizures that cannot be controlled by medication.

"Epilepsy is quite common. We're not treating a rare disease here. We're treating a common problem which affects, in particular, young people who are in their most productive years," explains epileptologist Jonathan Ross, M.D., Medical Director of the New England Epilepsy Institute. "In the Merrimack

Epileptologist Lanny Y. Xue, M.D., Ph.D., reviewing the long-term EEG/video recording of a patient at the New England Epilepsy Institute at Lawrence General Hospital



In the Merrimack Valley alone, we have over a million people, so we're looking at a large number of people who could potentially benefit from complete treatment for epilepsy, should they have it.

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Medical Director of the New England Epilepsy Institute

Valley alone, we have over a million people, so we're looking at a large number of people who could potentially benefit from complete treatment for epilepsy, should they have it. We're the only hospital in the Valley that offers these kinds of services.”

In addition to Dr. Ross, the medical staff at the New England Epilepsy Institute includes epileptologist Arya Farahmand, M.D., and epileptologist Lanny Y. Xue, M.D., Ph.D. All three physicians are board-certified neurologists who have advanced fellowship training in epilepsy. Their work at the New England Epilepsy Institute is complemented by nurses, EEG technicians and emergency medical personnel, all of whom are also specially trained in epilepsy care.

STATE-OF-THE-ART EEG/ VIDEO MONITORING

Epilepsy is broadly defined as a neurological disorder that causes recurring seizures. It is characterized by abnormal electrical activity in the brain and can be caused by a variety of factors, including brain injury, infection, tumors and abnormal brain development.

Because epilepsy is such a complex neurological condition, effective seizure management depends on an accurate and thorough diagnosis. That's why patients referred to the

New England Epilepsy Institute begin their treatment with a detailed neurological evaluation that includes not only a physical exam, but also a review of their symptoms, prior medical care and seizure history. (Optimally, details of seizure history are provided by a family member or caregiver who has witnessed the patient's episodes.) Most patients also receive a routine (40-minute) EEG tracing, and other medical imaging tests such as MRI, CT or PET may be recommended, as well.

“Although the history is key, because you have to get a sense

Epileptologist Jonathan Ross, M.D., Medical Director of the New England Epilepsy Institute



of what the patient's complaint is, you can't necessarily make a diagnosis based solely on the history," Dr. Ross says. "Seizures are quite variable, and often people will describe symptoms that they think are definitely a seizure, but in fact, they may not be."

Complicating matters further, most epilepsy patients have normal routine EEG tracings. And, even an imaging test that finds a structural anomaly in the brain doesn't "prove" epilepsy, Dr. Ross explains.

"That simply proves that the patient has a brain malformation," he says.

So, what tests are needed to make an accurate epilepsy diagnosis? According to Dr. Ross, a definitive diagnosis requires long-term EEG/video monitoring, precisely the kind of state-of-the-art, inpatient testing that is now available on the North Shore exclusively through the New England Epilepsy Institute.

Patients at the New England Epilepsy Institute undergo long-term EEG/video monitoring over a period of four to five days within the inpatient setting at Lawrence General Hospital. During their stay, patients are weaned off their anti-convulsant medication, while sophisticated EEG and video devices record both their physical activity and the electrical impulses occurring in their brain. This data is continuously monitored and synchronized, and high-tech software within the EEG/video workstations detects spikes and suspected seizure activity.

"It's absolutely critical to get a definitive diagnosis,

Epilepsy Statistics

- 3 million Americans have epilepsy; 300,000 are children under the age of 14.
- About 65% of adults with epilepsy can control their seizures completely and live normal, or close to normal, lives.
- Epilepsy can be caused by a variety of factors, including brain injury, infection, tumors and abnormal brain development. However, in 50% of patients, the exact cause of seizures remains unknown.
- As many as 30% of patients seen in epilepsy centers for intractable seizures do *not* have epilepsy.
- Generalized seizures are more common in children under the age of 10. After the age of 10, more than 50% of all new cases will have partial seizures.

and there's only one way to get a definitive diagnosis of any kind of spell, whether it's epileptic or not, and that's with what we're doing: video/EEG telemetry. You have to be able to record the spell itself," Dr. Ross explains. "It helps us understand what the patient is going through from a social and an emotional standpoint, and it allows us to coordinate activity in the brain with their physical movements. Usually, neurologists don't get to see their patients actually have a spell, and seeing that can change your perspective completely."

Specifically, long-term EEG/video monitoring enables physicians at the New England Epilepsy Institute to:

- verify a diagnosis of epilepsy
- identify the region of the brain where seizures originate
- quantify seizure frequency
- distinguish between various types of seizures

"After we have recorded a few episodes, the patient's stay is complete. They go home, and then it can take several hours for us to go through all the data. Once we do that, we can design a treatment plan," Dr. Ross says. "When the patient comes in to see us afterward, we have a definitive diagnosis as to what is wrong, why they're continuing to have spells *and* what we're going to do about it."

Epileptologist Arya Farahmand, M.D., conducting a neurological examination



It's absolutely critical to get a definitive diagnosis, and there's only one way to get a definitive diagnosis of any kind of spell, whether it's epileptic or not, and that's with what we're doing: video/EEG telemetry. You have to be able to record the spell itself.

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INDIVIDUALIZED TREATMENT PLANS

To help illustrate the wide range of treatment options that are now available to patients with seizure disorders, Dr. Ross describes a few recent cases.

The first patient is a teenager who was referred to the New England Epilepsy Institute after suffering several staring spells. These spells had progressed to the point where she would fall to the ground, trembling. Anti-convulsant medications were not providing relief. After this patient was evaluated with long-term EEG/video monitoring, the physicians at the New England Epilepsy Institute were able to determine that the staring spells were not epileptic episodes, after all. Instead, they were behavioral in origin. This patient did not require anti-convulsant medication, and she was referred to specialists for a different type of therapy.

“From the descriptions, her spells sounded like epilepsy, but they weren't,” Dr. Ross says. “We were able to tell her that she didn't have a life-threatening condition, and you couldn't tell a patient that without the EEG/video telemetry. With this test, we can make a confident diagnosis.”

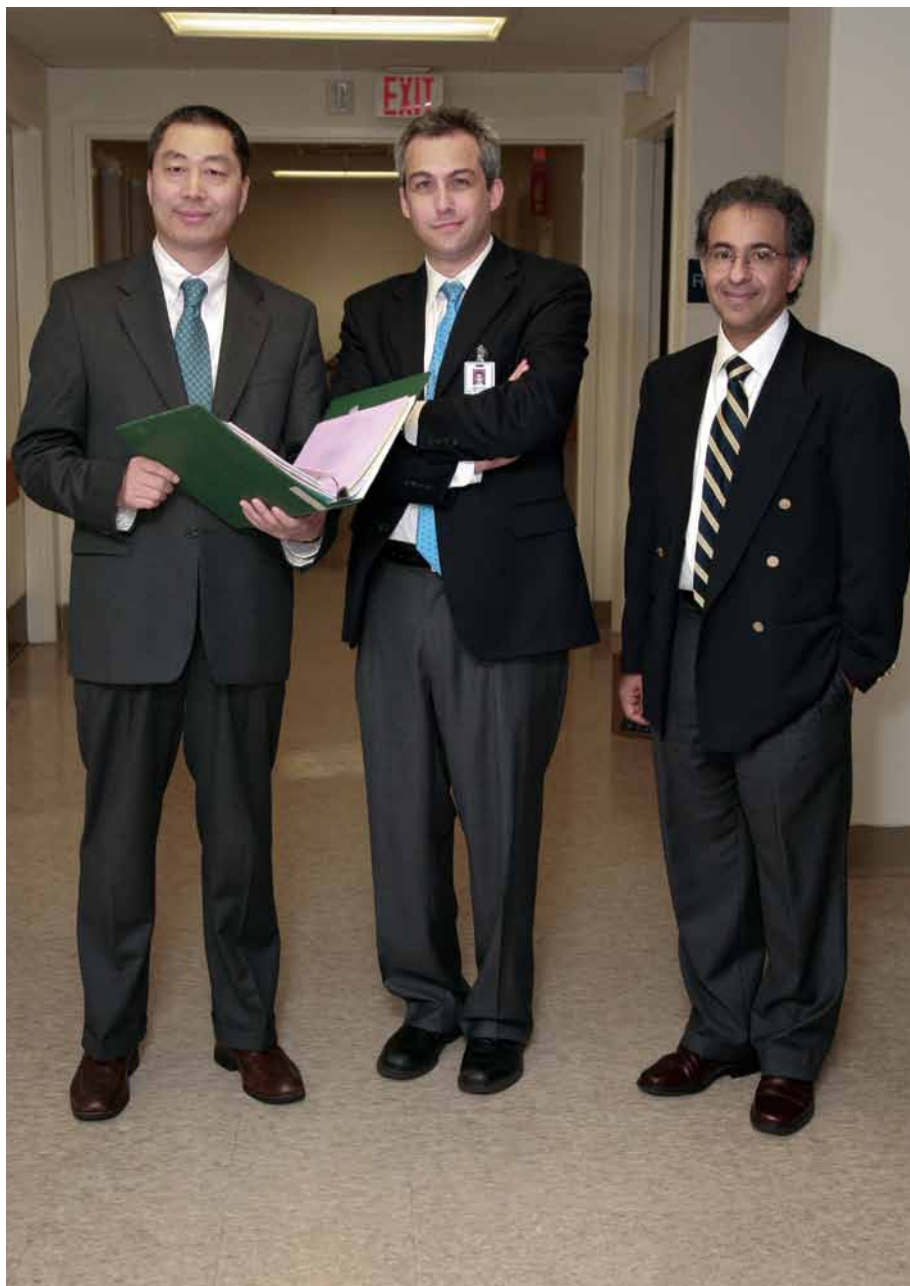
Another patient had an established epilepsy diagnosis, but she was not responding to medication, even after

several years of trying to find the “right” drug. As it turned out, long-term EEG/video monitoring helped the epileptologists at the New England Epilepsy Institute determine that this patient's seizures originated in a specific region of her brain. Removing the malfunctioning foci will allow this patient to live a normal life, and she is now a candidate for brain surgery.

“We knew what she had, and we found out exactly where it was coming from,” Dr. Ross explains. “Medications weren't helping her, but after surgery, her prognosis will be very good.”

A third type of patient may be referred to the New England

Dr. Lanny Y. Xue, Dr. Jonathan Ross and Dr. Arya Farahmand reviewing files of seizure disorder patients at the New England Epilepsy Institute



Some patients will come in because they have difficulty controlling seizures, and we determine that they are on the wrong medication for their particular type of seizure.

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Epilepsy Institute because, like the previous patient, their medication is not working. Long-term EEG/video monitoring at the New England Epilepsy Institute can characterize each individual seizure. Since certain types of seizures respond only to very specific anti-convulsant medications, the epileptologists can adjust each patient's medications based on the data collected during the long-term EEG/video monitoring session.

"Some patients will come in because they have difficulty controlling seizures, and we determine that they are on the wrong medication for their particular type of seizure," Dr. Ross says. "The testing we do allows us to take it a step further and get a complete understanding of what these

patients are going through."

Some patients are not good candidates for either surgery or medical therapy. For these patients, the epileptologists at the New England Epilepsy Institute may recommend a new treatment, implantation of a vagus nerve stimulator. This device is a pacemaker that delivers short electrical stimulations to the brain via the vagus nerve in the neck. Implant surgery of this stimulator is performed at the Lawrence General Hospital by Dr. Henry Ty, a New England Neurological Associates neurosurgeon.

"The work we do is very gratifying for us, and for our patients, too. Sometimes, they are shocked by what we find out. It gives them real insight, and helps their caregivers, too," Dr. Ross concludes. "We can make a big difference in people's lives because there are many different types of treatments available today. We're here in the Merrimack Valley to help make sure patients with epilepsy get the treatment they need."

For more information about the New England Epilepsy Institute at Lawrence General Hospital, please call (978) 722-7281. ■

The New England Epilepsy Institute is located at Lawrence General Hospital.

