Remote monitored in-home EEG:
A high-quality, patient-preferred epilepsy testing solution in the era of value-based care

Leading alternative diagnostic option for academic facilities, rural providers and private practices
Treating epilepsy is an expensive endeavor.

The United States spends approximately $15.5 billion each year on epilepsy-related expenses, including medical expenditures and informal care, and individuals with epilepsy who make frequent ER visits due to uncontrolled seizures spend an average of $33,006 annually on this emergency care. CDC researchers have found that a child or adolescent with epilepsy had an additional $9,102 per year in associated medical costs than children without the disorder.

While epilepsy affects more than 60 million individuals around the globe, less than 25 percent of patients with uncontrolled seizures have access to epilepsy specialists, whose appointment backlogs can be as long as a month.

When comparing EEG testing options, there are a variety of different factors involved, such as cost, quality, and patient convenience and comfort. The four primary testing options are:

- **Inpatient:** Patients are admitted to the hospital for the test and monitored by staff.
- **Outpatient:** Patients come to the clinic to be hooked up for the EEG by a technician and return home for the duration of the test. Patients must go back to the outpatient facility once the testing period is complete for the removal of the equipment.
- **Unmonitored in-home:** Technologists set up and administer the testing in the home of the patient.
- **Remote monitored in-home:** Technologists set up and administer the testing in the home of the patient, who is then continuously monitored remotely for the duration of the testing.

Current challenges

Despite epilepsy's prevalence, clinicians struggled for decades to identify a cost-effective, convenient and reliable way to perform diagnostic EEG services outside of an inpatient clinical setting. While EEG tests historically have been administered on an inpatient basis—which may be medically necessary in some cases—hospital admissions come with a greater risk of infection, increased patient anxiety and a variety of additional expenses, including room and board as well as other fees.

Inpatient EEG testing also may require wait times of a month or more. And patients undergoing outpatient EEG testing—historically, the only alternative to an inpatient stay—are typically unmonitored, leading to repeated tests if the data collected is of poor quality and cannot be accurately interpreted by a neurologist. In outpatient and inpatient settings alike, patients and their families may have to travel long distances for testing, placing additional burdens on patients who may have driving restrictions due to their epilepsy.

As the healthcare industry transitions away from a fee-for-service model and towards value-based care, the traditional inpatient and outpatient EEG testing options also pose considerable challenges for providers. With 50 percent of Medicare payments expected to be outcomes-based by 2018, clinicians are searching for a convenient, comfortable and reliable way to perform diagnostic EEG services in a more cost-effective manner.

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Remote monitored in-home EEG: A value-based, high-quality solution patients prefer

At typically half the cost of a comparable inpatient assessment, remote monitored in-home EEG testing has emerged as a leading alternative to the traditional inpatient and outpatient options available for assessing individuals with epilepsy. Today, more than half of all EEG tests are ordered with video, which provides visual verification of patient seizures and allows clinicians to correlate images with brain activity on the EEG. With unmatched quality, scheduling flexibility, patient convenience and cost-effective service, it provides accurate, high-quality testing while improving the lives of patients and their families. Recent clinical research confirms the benefits of remote monitored in-home EEG testing in a variety of clinical situations.

“This option is substantially more cost-effective than its inpatient counterparts, safe, and readily available, and it may obviate the need for intensive inpatient vEEG monitoring in select patients,” according to a 2013 Epilepsy & Behavior Case Reports study. “A further advantage of aEEG may be that spontaneous seizure frequency appears to decrease in patients with drug-refractory epilepsy on admission to a monitoring unit.”

To ensure high-quality testing and avoid costly repeated tests, remote monitored in-home EEG tests are performed by credentialed technologists who monitor patients 24-hours a day. During testing, these professionals continually monitor the impedance level of each patient’s electrode connections. All video recordings are monitored by a technologist to verify the patient is on camera. This way, if an issue arises during a test, a technologist can correct it remotely or dispatch staff to a patient’s home to remedy the issue—virtually eliminating costly re-testing.

Patients prefer remote monitored in-home EEG testing. Satisfaction scores show that more than 97 percent of patients give high marks to this alternative diagnostic option. It allows patients to remain in their home environment and alleviates the need for them to drive—a common restriction for many individuals with epilepsy. Economically, this option results in lower out-of-pocket costs for individuals with high-deductible health plans.

Remote monitored in-home EEGs have emerged as a leading alternative diagnostic option for three specific provider types that routinely experience challenges with existing options on the market:

**PRIVATE PRACTICES**

In today’s busy private practices, physicians are looking for comprehensive solutions that allow them to see more patients without sacrificing quality or placing additional burdens on staff.

Remote monitored in-home EEG testing provides private practice physicians with a high-end, turnkey diagnostic solution that eliminates additional preauthorization and scheduling burdens. Dedicated billing staff works closely with referring physicians and all insurers, providing all necessary documentation, checking eligibility and insurance benefits, obtaining prior authorization, if necessary, and pre-determining benefits prior to each patient’s scheduling.

Remote monitored in-home EEG testing allows physicians to read and interpret their own patients’ test results; physicians gain access to the technical aspects of epilepsy monitoring while maintaining the primary relationship with the patient.

**ACADEMIC FACILITIES**

A 2012 study from the Institute of Medicine Committee on the Public Health Dimensions of the Epilepsies suggests that patients in the United States may experience extended wait times to see a specialist at an epilepsy center.

“Waiting times to see a specialist at a center or to be admitted to the hospital for an epilepsy evaluation are three to four weeks. The data also show that many patients receive their ongoing epilepsy care at the center,” the researchers concluded in their study. “This means that epilepsy clinics rapidly fill up with returning patients and leave few appointments available for new patient evaluations.”

With remote monitored in-home EEG testing, clinicians have a high-quality alternative to traditional inpatient treatment options, freeing up bed space and streamlining the process for more complicated cases—all while lowering wait times for less severe patients and expanding access to highly desired specialists at academic facilities.

RURAL HOSPITALS AND HEALTH SYSTEMS

Studies show that rural populations in the United States suffer from more health problems and have access to fewer treatment options than their urban counterparts. Logistics undoubtedly play a large role in this disparity, as rural populations often must travel long distances for other healthcare services.

The cost of care also appears to play a role in limiting the access to care in rural populations. A 2008 study by the Rural Health Research and Policy Centers suggests rural populations are more likely to defer healthcare services than urban populations in the United States because of cost. This phenomenon is exacerbated perhaps by the increasing prevalence of high-deductible health insurance plans, which Maine Rural Health Research Center data indicates rural populations are more likely to use.

Uneven Medicaid expansion under the Affordable Care Act also is complicating healthcare access issues for the nation’s rural populations, according to a 2014 study by The Henry J. Kaiser Family Foundation. Individuals living in these areas are less likely to be covered under employment-based healthcare plans, and in many areas, fall into “coverage gaps” in states that did not expand Medicaid under new ACA limits, Kaiser research shows.

“People in rural areas may face particularly high barriers to accessing coverage, such as transportation barriers or limited provider availability and may also continue to face financial barriers to accessing needed care,” according to Kaiser.

A U.S. Dept. of Health and Human Services study found that fewer than half (45%) of Critical Access Hospitals, a network of about 1,300 Medicare-contracted U.S. providers serving rural populations, offered any EEG services. Remote monitored in-home EEG testing can alleviate the challenges of limited provider access and high out-of-pocket costs in rural areas, strengthening a CAH’s service offering and providing clinicians with a high-quality, convenient alternative to traditional inpatient and outpatient diagnostic options.

CONCLUSION

As the healthcare industry continues to transition towards a value-based care model, finding a cost-effective, convenient, comfortable and reliable alternative to traditional diagnostic EEG services is a priority for patients and providers, especially physicians in private practice, rural communities and academic facilities that face unique challenges.

Remote monitored in-home EEG testing offers a turnkey solution for these physicians. By providing long-term, monitored EEG testing in patient residences for the purpose of detecting seizures, this alternative oftentimes can replace an unnecessary inpatient hospital stay, resulting in significant financial savings.

This option begins and ends in a patient’s home, eliminating transportation concerns, capturing familiar seizure triggers, enhancing patient compliance, reducing patient anxiety, and allowing patients to perform everyday tasks. It also typically is scheduled and completed within two weeks, leading to prompt diagnosis, fewer emergency room visits and improved patient outcomes.

About Neurotech, LLC

Neurotech has been providing the most clinically comprehensive in-home electroencephalogram (EEG) service in the industry since 2006 with a commitment to consistently deliver a positive patient experience. We provide Routine, Sleep Deprived, Short- and Long-Term EEG recordings that are monitored by registered, on-call technologists. Our integrity, prompt scheduling and cost-effective service enables timely, accurate diagnoses of neurological disorders while improving the lives of our patients and their families.