

EEG identifies seizures in hospital patients, study finds

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Electroencephalogram (EEG), which measures and records electrical activity in the brain, is a quick and efficient way of determining whether seizures are the cause of altered mental status (AMS) and spells, according to a study by scientists at the University of California, San Francisco.

The research, which focused on patients who had been given an EEG after being admitted to the hospital for symptoms such as AMS and spells, appears on March 27 in *Mayo Clinic Proceedings*.

"We have demonstrated a surprisingly high frequency of seizures – more than 7 percent – in a general inpatient population," said senior investigator John Betjemann, MD, a UCSF assistant professor of neurology. "This tells us that EEG is an underutilized [diagnostic tool](#), and that seizures may be an underappreciated cause of spells and AMS."

The results are important, he said, because EEG can identify treatable causes of AMS or spells, and because "it can prompt the physician to look for an underlying reason for seizures in persons who did previously have them."

Seizures are treatable with a number of FDA-approved anticonvulsants, he said, "so patients who are quickly diagnosed can be treated more rapidly and effectively. This may translate to shorter lengths of stay and improved [patient outcomes](#)."

In one of the first studies of its kind, Betjemann and his team analyzed the medical records of 1,048 adults who were admitted to a regular inpatient unit of a tertiary care hospital and who underwent an EEG. They found that 7.4 percent of the patients had a seizure of some kind while being monitored.

"As I tell my patients, seizures come in all different

[flavors](#), from a dramatic convulsion to a subtle twitching of the face or hand or finger," said Betjemann. "There might be no outward manifestation at all, other than that the person seems a little spacey. It's easily missed by family members and physicians alike, but can be picked up by EEG."

Another 13.4 percent of patients had epileptiform discharges, which are abnormal patterns that indicate patients are at an increased risk of seizures.

Almost 65 percent of patients had their first seizure within one hour of EEG recording, and 89 percent within six hours.

"This is good news for smaller hospitals that don't have 24 hour EEG coverage, but that do have a technician on duty during the day," Betjemann said.

He speculated that lack of 24-hour coverage is a major reason that EEG is not used as an inpatient diagnostic tool as often as it might be. "This paper shows that, fortunately, it's not necessary. Almost two thirds of patients with [seizures](#) can be identified in the first hour, and almost 90 percent in the course of a shift."

EEGs are easy to obtain, painless and noninvasive, said Betjemann. "The technician applies some paste and electrodes and hooks up the machine. All the patient has to do is rest in bed."

Betjemann said that the next logical research step would be a prospective study. "We have to start at the beginning, see if patients are altered when they are admitted, and do an EEG in a formal standardized setting. Then we'd want to see how often EEG is changing the management of [patients](#) – either starting or stopping medications," he said. "A patient may be having spells, and an [EEG](#) might tell you this is not a seizure, and that it's important not to treat it with anti-epileptic medications."

Provided by University of California, San Francisco

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