Electroencephalogram (EEG) and Seizure

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What is an EEG?

Definition

An electroencephalogram detects abnormalities in the brain waves or electrical activity of the brain. During the procedure, electrodes consisting of small metal discs with thin wires are pasted on the scalp. The electrodes detect tiny electrical charges that result from the activity of the brain cells. The charges are amplified and appear as a graph on a computer screen or as a recording that may be printed out on paper. Your doctor then interprets the reading.  

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During an EEG, typically about 100 pages or computer screens of activity are evaluated. Special attention is paid to the basic waveforms, but brief bursts of energy and responses to stimuli, such as light, are also examined.
An EEG records patterns of brain activity. Among the basic waveforms are the alpha, beta, theta, and delta rhythms.

- **Delta waves** occur at a frequency of 0.5 to 3.5 Hz (or $< 3$ Hz). They generally occur only in young children during sleep.
- **Theta waves** occur at a frequency of 4 to 7 Hz. They are most common in children and young adults.
- **Alpha waves** occur at a frequency of 8 to 12 Hz (cycles per second) in a regular rhythm. They are present only when you are awake but have your eyes closed. Usually they disappear when you open your eyes or start mentally concentrating.
- **Beta waves** occur at a frequency of 13 to 30 Hz. They are usually associated with anxiety, depression, or the use of sedatives.
- **Gamma waves** occur at a frequency of 31 to 40 Hz.
Reasons for the procedure

- The EEG is used to evaluate several types of brain disorders. When epilepsy is present, seizure activity will appear as rapid spiking waves on the EEG.
- Patients with lesions of the brain, which can result from tumors or stroke, may have unusually slow EEG waves, depending on the size and the location of the lesion.
- The test can also be used to diagnose other disorders that influence brain activity, such as Alzheimer’s disease, certain psychoses, and a sleep disorder called narcolepsy.
- The EEG may also be used to determine the overall electrical activity of the brain (for example, to evaluate trauma, drug intoxication, or extent of brain damage in comatose patients). The EEG may also be used to monitor blood flow in the brain during surgical procedures.
- There may be other reasons for your doctor to recommend an EEG.


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