

Neurology

Epilepsy made simple

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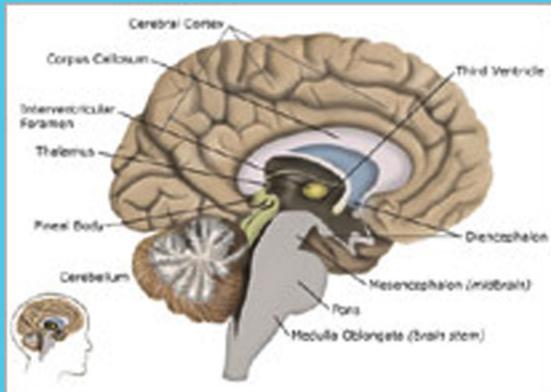
Epilepsy, sometimes called “fits” or “seizure disorder,” refers to a sudden surge in electrical activity in the brain that may cause momentary loss of consciousness, staring spells, repetitive movements, or convulsions involving the entire body. To understand why seizures occur and why they induce a variety of physical manifestations, it is important to understand normal brain function as well as what causes cells in the brain to function abnormally.

The brain is the most complex organ in the human body, and the only evidence most of us have that it is functioning properly so we often take it for granted. We wake, we walk and talk, our hearts beat, we taste, we breathe, and we think, all as a result of the highly coordinated electrical and chemical activity within and between the cells that make up our brains.

Occasionally, however, these cells function abnormally—they misfire. In some people, brain cells misfire repeatedly and this causes changes in behavior, sensation, or motor function. These occurrences are called seizures, and a person who has experienced two or more seizures is said to have epilepsy.

The brain is made up of three main structures: the cerebrum, the brain stem, and the cerebellum. The cerebrum is the largest of the three structures and is responsible for thinking, feeling and action. The brainstem is responsible for functions that includes

consciousness, heart beat, respiration, etc. The cerebellum is responsible for balance and coordination.

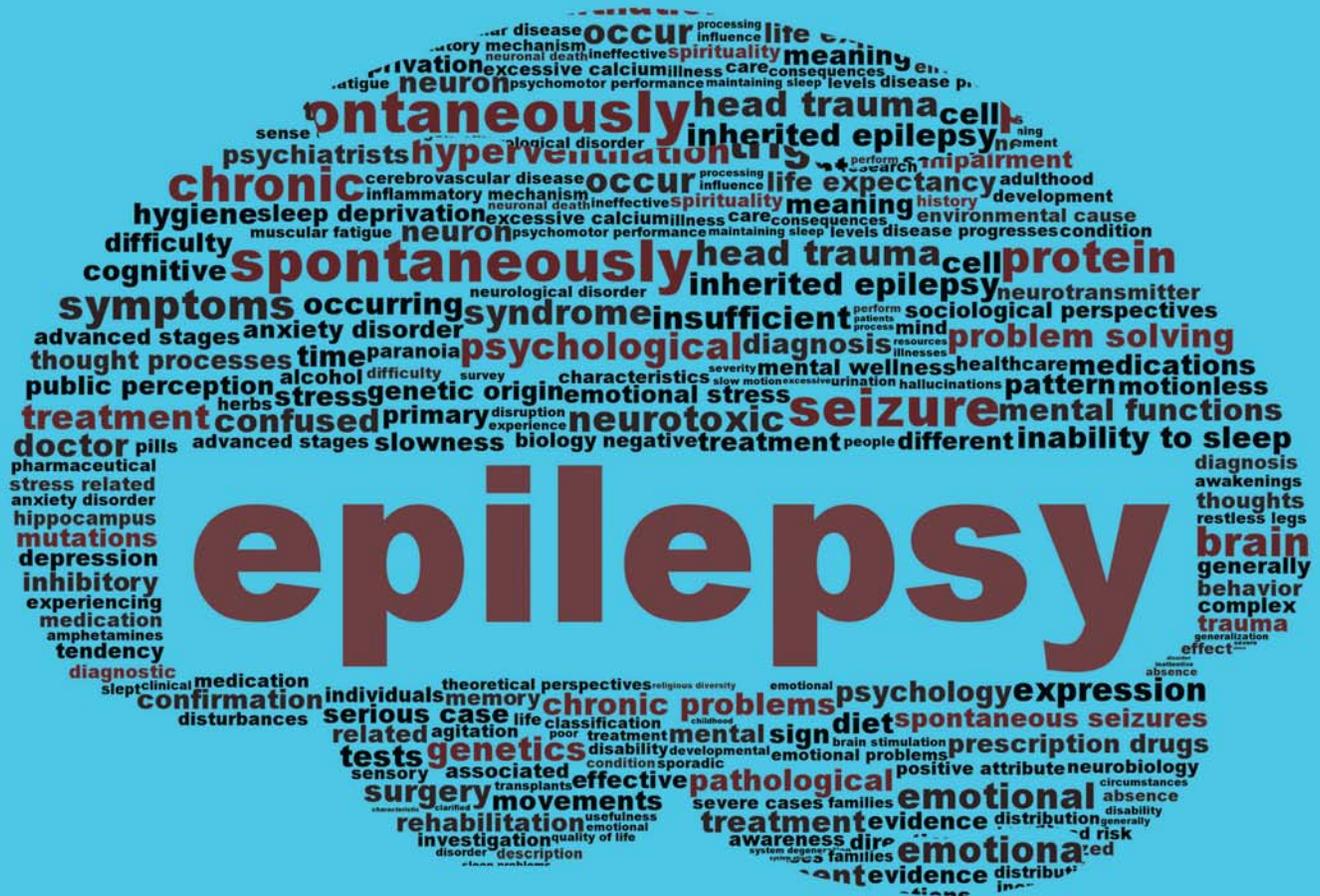


dination.

The cerebrum is the highly folded, neuron-rich outer layer of at the top of the brain that is referred to as grey matter. The grey matter can be further divided into four functionally distinct lobes: frontal, parietal, occipital, and temporal. The frontal lobe is most often associated with personality, motor function, and execution of ac-

tivities; the parietal lobe is involved in sensory interpretations and in creating associations among experiences; the occipital lobe processes visual information; and the temporal lobe is involved in memory, speech, and auditory and olfactory functions.

Seizures can occur anywhere in the brain, and symptoms manifest depending on where they occur. A seizure that begins in the region of the frontal lobe that is responsible for motor control may cause rhythmic jerking movements of a finger, a hand, an arm, a leg, or the face. Seizures originating in the region of the parietal lobe responsible for sensory perception in the extremities may cause a burning or tingling sensation in the arms, hands, legs, or feet. Seizures originating in the temporal lobe may cause sudden abdominal discomfort, palpitation, flushing of the face, and feelings of fear. Seizures originating in the occipital lobe may cause flashes of light to be seen. These





are all called partial seizures as they occur in one part of the brain.

Partial seizures are seizures that begin in one area, or focus, of the brain. They may or may not affect consciousness, depending on where in the brain they occur and the specialized brain structures they might involve. A partial seizure that does not affect consciousness is called a simple partial seizure. A partial seizure that alters consciousness is called a complex partial seizure.

All these manifestations of seizures are transient and last for a few seconds to a few minutes (usually less than 5 minutes). They do not affect consciousness and the affected person is fully aware of what is happening. However, seizure activity that begins in one part of the brain

can spread through the vast networks of neurons in the brain, producing more widespread seizure activity which involves the entire brain. When this happens, the person loses consciousness, falls to the ground and has convulsions involving the entire body. A seizure that begins focally, meaning in one area, and progresses to involve the entire brain is classified as a partial seizure that becomes generalized.

Complex partial seizures may begin as simple partial seizures and then progress, or spread, to other areas of the brain, where they may affect consciousness or cause staring, confusion, or loss of alertness. In some cases, they also cause aimless movements, such as lip smacking or picking at clothes, the repetition of words or phrases, or inappropriate laughter etc.,

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(Continued from December 2015 issue)

One variant of seizures known as 'Absence seizures' typically occur without warning and cause lapses of attention lasting from 5 to 30 seconds. Following the seizure the individual is immediately alert but unaware of what transpired during the seizure. This occurs mostly in children who find that they suddenly lose track of what is happening in class and are unable to follow the lesson because they "lose time" or "lose part of the lesson" that is being taught. Some children with absence seizures describe their lives as movies from which segments have been removed.

Often partial seizures with secondary generalization begin with an aura, a smell or other sensation that is unrelated to an individual's reality. Such sensations, if they normally precede recurrent generalized seizures, can serve as a warning that the larger seizure is forthcoming.

Diagnosis of generalized seizures with loss of consciousness and

jerks of the body is fairly easy and can be done by any qualified physician. However, diagnosis of all other types of epilepsy may not be easy and requires a specialist. Diagnosis may include CT or MRI scans of the brain and an EEG. Treatment of epilepsy is with medicines called anti-convulsants.

Most seizures are self-limited, and last less than a few minutes, and do not require immediate medical attention. Occasionally, however, a seizure will persist for longer, or an individual will experience back-to-back seizures without sufficient recovery time in between. This condition is called status epilepticus and should be considered as a medical emergency. In rare cases, if left untreated, status epilepticus may cause respiratory arrest and death.

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The best course of action to guard against future seizures is to follow a treatment plan prescribed by a qualified physician or specialist. This typically involves taking medications as prescribed and having regular medical evaluations. In addition, it is important to get sufficient and regular sleep, and avoid stressful situations. It may also be possible to identify specific triggers that increase the risk of a seizure and find ways to avoid these.

In addition to controlling of seizures with medicines, it is important to protect the individual with seizures from harm. This is especially important in children. Children who have frequent seizures are often advised to use elevators instead of stairs or to use stairs only when accompanied by an adult or older child. No child with epilepsy, regardless of





who is teaching, caring for, coaching, or otherwise closely related to a child with epilepsy should be informed about the child's disorder and be prepared to respond in a medically appropriate way.

Often, because the term epilepsy continues to carry a stigma, parents and children with epilepsy may be uncomfortable sharing this information. Regardless of the stigma and associated feelings, it is important that the child's health take precedence over other concerns. The more parties informed about a child's condition, the more likely someone will be available to act quickly in case of an emergency.



age, should be allowed to take a bath unsupervised.

The level of supervision a child needs while swimming depends on the type of seizures he or she has and how well the seizures are controlled. A child whose seizures affect consciousness or motor control and are poorly controlled should be closely supervised by a lifeguard who knows about the child's condition. In contrast, children whose seizures are well controlled require less supervision, although they should never swim alone.

For some children with epilepsy, bicycling poses a serious risk. Children whose seizures affect consciousness or motor control may

suddenly veer off of a path or sidewalk, out of a parent's reach and protection. For this reason, children who have such seizures should not ride near roads or other hazards and instead restrict their bicycling to parks and other places where cars are not permitted. Children whose seizures are well controlled or do not affect consciousness or motor control need not be restricted. Because most serious bicycle injuries involve the head, all cyclists should wear helmets.

A child with well-controlled or only occasional seizures generally can attend regular camp, with precautions in place for that particular child determined in advance. Anyone

