

Causes of Epilepsy

Patients often ask **“Can you tell me why I am experiencing seizures?”**.

Well that question can and certainly needs to be answered on several different levels. The first level is what a seizure actually is and what it constitutes. The second is what particular causes of seizures and epilepsy exist. A seizure is a sudden increase in electrical activity within the brain as brain cells increase their communication. This increased communication is abnormal and can worsen until those brain cells affected by this increased electrical activity produce an outward change in a person we call a seizure. The tendency to have increased amounts of electrical activity can come from a number of different sources and these involve two principal possibilities. Possibility #1 is that the individual was born with a defect in each brain cell making it susceptible to this increased electrical activity. Possibility #2 is an injury to brain cells leaving them damaged and not functioning in the correct way. Once damaged, brain cells may show this excitable behavior and produce that outward manifestation we call a seizure.

But they are more curious why they are having seizures. Many think epilepsy is a childhood illness. They ask **“Why would I be getting epilepsy at this point in my life?”**

It is a common misperception in our society that seizures and epilepsy are illnesses of childhood. While epilepsy and seizures can begin in childhood, many forms of seizures and epilepsy occur later in life. So in fact it is important to identify the causes of seizures and epilepsy at various stages of life.

Children have seizures for some of the same reasons as adults but have their own causes for seizures. These causes include 1) improperly formed brain tissue which can malfunction and produce un-due or excessive excitation, 2) inborn errors in the breakdown of normal chemicals that accumulate producing a brain cell capable of making seizures, and 3) finally injuries related to the birthing process. All of these particular causes are common in childhood, but may be seen infrequently in adulthood. In adulthood, we see seizures related to head trauma. In adulthood, we see brain abnormalities caused from growths (tumors) or blood vessel abnormalities (aneurysms) present with seizures for the first time. These abnormalities have been present for a long time but brain cells damaged by these processes require time for the easy excitation producing a seizure. The causes of seizures in older Americans are different. Where some seizure causes are unknown, for the first time the majority of seizure causes are identifiable and most frequently associated with stroke or other types of brain blood vessel diseases.

Patients often remain confused about the frequency of seizures. **“Why should I be getting seizures at this point in my life? They are rare.”**

There is the misconception that seizures and epilepsy are uncommon. In fact, seizures occur in approximately 4 or more percent of children and up to 1 in 10 Americans experiences a seizure some time in their life. The frequency of epilepsy in the population as a whole is estimated to be 0.5 – 0.7%. Studies have revealed as many as 385,000 individuals present for the treatment of a seizure on an annual basis and 185,000 people in the United States develop recurring seizures, or epilepsy, each year. So you see, epilepsy is a relatively common illness and seizures are even more common. Beginning in childhood, seizures described as Febrile Convulsions (seizures associated with rising temperature) occur in between 3-4% of children. Identifying these is important because Febrile Convulsions reoccur between the ages of 6 months and 5 years of age but then stop. These seizures in young children are always associated with fever and the treatment is simply the use of fever-reducing medications. Adults may experience seizures related to low blood sugar, as in diabetes, and the treatment is the control of the blood sugar. Seizures brought on by other causes such as fever and low blood sugar even though they reoccur, are not defined as epilepsy.

And the definitions we use are different than the general public's understanding. They ask **“So since I have had one seizure, you are saying I do not have epilepsy?”**

This statement is correct. Until the time a seizure reoccurs, someone is defined as only experiencing a single seizure. After a reoccurrence, epilepsy may be the correct term.

But defining the problem only starts the process. We need to investigate how the seizure occurred. We do a series of tests looking for evidence of injury to the brain. It is important to realize we may not identify a specific cause for the seizures. Over half of children, at least half of adults, and approximately 1/3 of older adults never have identifiable causes for their seizures. While sometimes viewed as “negative”, it is” a good thing. The absence of a cause (“Idiopathic” or Cryptogenic”) is good for several reasons. Number 1, some causes of seizures such as blood vessel abnormalities and tumors can by themselves cause patients great harm. Not finding a specific cause is therefore potentially a better sign for the patient doing well in the long term. It is important also when choosing who to treat without medications and who will remain free of seizures in the future. The absence of abnormalities predicts more success with seizures remaining under control even when medications are no longer taken.