

## What is a Seizure?

Seizures are neurologic episodes characterized by sudden disruption of the brain's normal electrical activity. Symptoms can vary from a momentary lapse of attention to convulsions. Synchronously firing brain cells cause a sudden change in the individual's awareness and/or change in motor activity or behavior. An individual who has had two or more seizures without preceding incident such as head trauma has epilepsy. Although seizures can be frightening, usually they last only a few minutes, stop on their own, and are almost never life threatening.

Seizures affect people of all ages, races, and nationalities although they are more prevalent in some individuals with MPS and ML. According to national statistics, two million people in the United States have some type of seizure disorder. The symptoms, frequency, intensity, and types of seizures greatly vary from person to person. The purpose of seizure medications, or anti-epileptics, is to reduce the severity or frequency of seizures.

## Seizures in MPS

In MPS and ML, the cause of seizures is typically due to primary brain dysfunction. However, seizures can still occur as a result of an infection, head injury, brain tumor, hydrocephalus, toxic reaction to drugs and alcohol, or other conditions which injure the brain and damage brain cells. Seizures are common in individuals with MPS III and may occur in up to one half of these individuals; typically this happens in the later stages of the disease. In MPS diseases, seizures are most likely secondary to the progressive brain damage that occurs due to the stored material.

## Symptoms

There are two basic types of seizures: generalized and partial. These refer to how much of the brain experiences the abnormal electrical activity.

In generalized seizures the whole brain is affected. The individual is likely to experience lapse of consciousness. Abnormal movements and incontinence might also occur.

In a partial seizure, abnormal electrical activity occurs in only a part of the brain. There can be alteration of consciousness in partial onset seizures but this is less common than in generalized seizures. Simple partial seizures do not affect consciousness; however, they can cause abnormal motor movements such as automatic, purposeless behavior such as lip-smacking, or jerking movements in a certain part of the body.

In a complex partial seizure, there is alteration of consciousness sometimes with

associated abnormal movements. Any abnormal movements or apparent alterations of consciousness warrant evaluation by a neurologist.

Staring spells are common in children with intellectual disabilities. To help your neurologist differentiate between a staring spelling and an absence seizure, record a video while attempting to get the child's attention (e.g. pulling up on the arm, pinching their arm or leg, shouting their name, etc.).

Seizure activity can be subtle and may produce sensations involving the five senses, such as a sound, an unpleasant odor or taste, a sinking or rising feeling in the stomach or head, or spots before the eyes. When these occur prior to a secondary seizure, they may be referred to as an "aura." Some people may be able to train themselves to recognize the aura as a warning sign and prepare themselves for the oncoming seizure by taking preventative measures to protect themselves from possible injury.

## **Diagnosis**

Evaluation by a neurologist is recommended. Diagnosis is typically made by history told by the individual or caregiver. Medical evaluations will vary according to the needs of each individual. Evaluations usually involves a thorough physical and neurological examination, a detailed medical history, analysis of blood and or other bodily fluids, an electroencephalogram (EEG), and a computerized tomography (CT) or magnetic resonance imaging (MRI) scan. The pattern of seizures must be recorded, including types, frequency, and duration. This evaluation will help determine the best medication to use.

## **Treatment**

There is no known cure for epilepsy. The goal of treatment is to eliminate seizures or make the symptoms less frequent and less severe. Long term anticonvulsant drug therapy is the most common form of treatment. There are many effective medications to treat seizures, and the specific medication prescribed depends on the type of seizure experienced. These medications act by blocking the spread of excess electrical discharge to other parts of the brain. Treatment methods may also consist of surgery, or an implanted system of electrical stimulation of the brain.

Certain types of seizures are difficult to control even with medication, and it's not unusual to try several medications before finding the one that works best. In some cases, a combination of medications can be used. Often times, lab work needs to be done frequently to measure medications levels. Your physician or neurologist will give you a specific timetable to follow. However, if you or your child continue to have seizures after beginning a medication, you should contact your neurologist by phone prior to scheduled follow-up.

A person with epilepsy can be potentially seizure-free and participate in most activities.

Many things can potentially increase seizure likelihood or frequency including illness, stress, or emotional upset.

The following is a general guideline in case of seizures:

- Remain calm and remove any sharp objects in the area
- Loosen the clothing around the neck to help the person breathe.
- Place something soft under the person's head.
- Turn the person on his/her side to keep the air passage clear. Do not attempt to open the person's mouth or insert any objects into the mouth.
- If at all possible, time the duration of the seizure and video the event to inform the physician and or neurologist.
- Do not try to hold the person down or stop his/her movements.
- Do not attempt CPR, unless the person does not start breathing again after the seizure has stopped.
- Remain with the person until the seizure has ended and reassure the person as consciousness returns.
- Offer to call a friend, relative or taxi to help the person get home if he/she seems confused.
- Follow up with your physician or neurologist. Often times, medication levels will need to be taken to ensure proper levels are met.

**If a seizure continues for more than five minutes, or recurs, call 911.**

