

Epilepsy and Seizure Management for Home Health Providers

Learning Objectives

1. What epilepsy is, symptoms and causes
2. Different types of seizures, their signs and symptoms
3. Current treatment options and side-effects
4. How and when to administer seizure first aid
5. The need for a seizure emergency plan

Glossary

- Epilepsy - a chronic neurological disorder characterized by a tendency to have recurrent, unprovoked seizures.
- Seizure - a brief change in the electrical activity of the brain.
- Status epilepticus - 30 minutes of either continuous seizure activity or repetitive seizures without a return of consciousness.
- Conscious - having awareness of one's self, acts, and surroundings.
Consciousness - the state of being conscious.
- Electroencephalogram (EEG) – a device that measures the electrical activity of the brain by recording from external electrodes.
- Epileptologist - neurologist that specializes in the treatment of epilepsy. Neurological Relating to the nervous system.
- Vagus nerve - a large nerve in the neck that leads directly to the brain.

An Introduction to Epilepsy

- What is a Seizure?
 - A brief change in the electrical activity of the brain that alters one or more of the following:
 - Movement
 - Sensation
 - Behavior
 - Awareness
 - Emotions
- Seizure symptoms depend on where in the brain the electrical activity occurs and how much of the brain is affected during the seizure. Most seizures occur spontaneously and unpredictably.
- Brain cells use tiny electrical signals to send information to other brain cells. During a seizure, too many brain cells send these signals at the same time. The result may be a change in consciousness, movement and/or behavior.

- Seizures that affect the entire brain usually result in a loss of consciousness. If only part of the brain is affected, it may cloud awareness, block normal communication, and produce a variety of undirected, uncontrolled, unorganized movements.
- Most seizures last only a minute or two, and end naturally. After a seizure, the person may feel sick (nauseated), tired, and disoriented. In these cases, caregivers should follow basic seizure first aid, keep the individual safe during the seizure and monitor for a return to baseline after the seizure ends.
- Sometimes, seizures can last longer than expected. Seizures lasting longer than five minutes require emergency action. For this reason, all caregivers must have access to a seizure emergency plan. Check the Doctors Orders for directives such as ER transportation if client exhibits any signs or symptoms of Respiratory distress, or seizures lasting longer than 3 minutes, or a change from the usual seizure movement might require ER transportation.

What is Epilepsy?

- Epilepsy is a chronic neurological disorder characterized by a tendency to have recurrent, unprovoked seizures. Epilepsy is diagnosed when a person has two or more unprovoked seizures. By unprovoked we mean a seizure that isn't caused by a fever, low blood sugar, drug or alcohol intoxication, etc.
 - Epilepsy is also known as a "seizure disorder."

Who Gets Epilepsy?

- Epilepsy affects roughly one percent of the population, with an estimated 3 million Americans living with epilepsy. It occurs more often in young children, the elderly and developmentally disabled populations. Children and adults with autism, mental retardation, cerebral palsy and other developmental disorders are at increased risk for developing epilepsy.
- Epilepsy is the leading neurological disorder in childhood and the third leading neurological disorder in adults.
- One in ten people will have a seizure in their lifetime.

Causes of Epilepsy

- The cause is unknown in 70% of occurrences
- Brain Trauma (ex. injury, stroke)
- Brain Lesions (ex. tumors)
- Poisoning (ex. lead)
- Infections of the brain (ex. meningitis, encephalitis, measles)
- Brain injury at birth
- Genetic causes
- Abnormal brain development
- Chronic alcohol/ drug abuse

Diagnoses

- How is Epilepsy Diagnosed?
 - A physician can diagnosis epilepsy based on a medical history, physical examination, blood work, description of seizure activity, electroencephalogram (EEG), brain imaging such as a magnetic resonance imaging (MRI) or computer tomography (CT Scan) and possibly genetic testing.
 - An EEG measures the electrical activity of the brain by recording from electrodes placed on the head.
 - People with epilepsy are treated by neurologists, family doctors or pediatricians.
 - Epileptologists are neurologists with specialized training in epilepsy.

Types of Seizures

- There are over 20 different types of seizures
 - A person may experience just one type or more than one.
 - The kind of seizure a person has depends on which part of the brain is affected and the amount of seizure activity.
 - Seizures present in a variety of ways but often they present in the same way each time in an individual.
- Seizures can and do vary based on a number of factors.
- Seizures can be categorized based on whether they involve the whole brain or part of the brain.

Generalized Seizures

- In generalized seizures, abnormal electrical activity involves large areas of both sides of the brain and causes a loss of consciousness. Symptoms include convulsions, staring, muscle spasms and falls. Examples of generalized seizures include tonic-clonic, absence, atonic and myoclonic.
1. **Tonic-Clonic Seizures**
 - Previously referred to as Grand Mal.
 - Generalized Tonic-Clonic seizures are the most common and best known type of generalized seizure.
 - They have a sudden onset and render the person unconscious.
 - They begin with stiffening of the arms and legs (tonic phase), followed by whole body convulsing (clonic phase).
 - The person may fall to the ground and emit an involuntary cry.
 - The person may lose bowel and/or bladder function.
 - During the tonic phase, breathing may decrease or cease altogether, producing cyanosis (blueing) of the lips, nail beds, and face.

- Breathing typically returns during the clonic (jerking) phase, but it may be irregular. This clonic phase usually lasts less than a minute.
- Some people experience only the tonic, or stiffening phase of the seizure; others exhibit only the clonic or jerking movements; still others may have a tonic-clonic
- Most tonic-clonic seizures last one to three minutes.
- Following the seizure, the person will be lethargic, sore, possibly confused, and want to sleep. Headaches are common. Full recovery can take minutes to hours.

2. Absence Seizure

- Previously referred to as Petit Mal.
- Most common in children with an onset between 3 and 10 years of age.
- The person stares vacantly and experiences a very brief loss of consciousness, typically just a few seconds.
- May involve small involuntary movements of the face (twitching, blinking, etc.) and/or arm movements.
- The person does not talk and does not hear what is being said.
- Consciousness returns quickly and the person resumes previous activity.
- Absence seizures can occur in clusters, with up to 100 seizures in a single day.
- Up to 40% of patients can outgrow this type of seizure.
- Most children with typical absence seizures are otherwise normal.

3. Atonic Seizures

- Cause a sudden loss of muscle tone.
- Motor symptoms include head drops, loss of posture, or sudden collapse.
- Because they occur without warning, atonic seizures can result in injuries to the head and face. Protective headgear is sometimes used by children and adults.
- Other names include drop attacks, astatic or akinetic seizures.

4. Myoclonic Seizures

- The person experiences sudden jerks or muscle contractions, often both sides of the body at the same time.
- Occasionally, they involve one arm or a foot.
- A similar but normal experience is the sudden jerk of a foot during sleep.

Partial Seizures

- Partial seizures are the most common type of seizure, also called focal seizures. The electrical disturbance begins in a specific area of one side of the brain. They typically do not involve a loss of consciousness but can result in an altered awareness.
- A person's symptoms depend on the specific part of the brain affected.
- Nearly any movement, sensory, or emotional symptom can occur as part of a partial seizure, including complex visual or auditory hallucinations.
- Partial seizures can spread to involve the whole brain resulting in a generalized seizure.

1. Simple Partial Seizures

- Consciousness is maintained during a simple partial seizure.
- The person may be unable to speak or move during the seizure, but will often remember what happened during the seizure.
- Symptoms can include emotional changes (fear, anxiety), isolated, involuntary movements, sensory sensations (tingling, weakness, sounds, smells, tastes, visual distortions) and psychic symptoms (déjà vu, hallucinations).
- Most partial seizures last less than a minute.
- Can result in a complex-partial seizure or generalized tonic-clonic seizure.

2. Complex Partial Seizures

- Complex partial seizures result in a state of altered consciousness.
- Symptoms are variable, but often start with a blank stare followed by chewing, lip smacking or other purposeless repetitive movements.
- Aimless walking, random movements and incoherent speech are common.
- Some report an aura or warning sign, such as an abnormal taste or smell, sensations or emotions
- Complex partial seizures typically last 30 seconds to 2 minutes. Longer seizures can occur and seizures can generalize to a tonic-clonic seizure.
- Complex partial seizures are the most common type of seizure.
- They frequently arise from the temporal lobe of the brain.

3. Intractable Seizures

- Seizures of any kind that do not respond to medications.
- Twenty percent of people with epilepsy have seizures that are resistant to medication, otherwise known as refractory epilepsy.

Status Epilepticus

- Most seizures end after a few minutes. If seizures are prolonged, or occur in a series, there is an increased risk of status epilepticus, **a true life threatening emergency.**
- Status epilepticus is usually defined as 30 minutes of uninterrupted seizure activity or repeat seizures without a return to consciousness.
- The Epilepsy Foundation advises parents and the public to call for emergency assistance when a convulsive seizure lasts for more than five minutes without signs of stopping, or when successive seizures last more than five minutes without a return to consciousness.
- **Check your ER protocol and Doctors Orders; be aware of the parameters for your client.**

Treatment Options

The goal of all epilepsy treatment is to stop the seizures with as few side effects as possible. The most common treatment is medication. If medication does not work, other options may include surgery, a medical device or a highly specialized diet.

- Medication
 - Anti-seizure medication is the first line of treatment for epilepsy and is effective in approximately 75% of patients. For 25% of patients, current medications are not effective at controlling their seizures. In these cases, other treatments such as surgery and diet need to be explored.
 - Ideally, patients will gain adequate seizure control with one medication, but sometimes, multiple drugs are needed to control seizures.

- Common Anti-Seizure Drugs
 - Carbamazepine (Tegretol, Carbatrol)
 - Clonazepam (Klonopin)
 - Ethosuximide (Zarontin)
 - Felbamate (Felbatol)
 - Gabapentin (Neurontin)
 - Lacosamide(Vimpat)
 - Lamotrigine (Lamictal)
 - Levetiracetam (Keppra)
 - Oxcarbazepine (Trileptal)
 - Phenobarbital
 - Phenytoin (Dilantin, Phenytek)
 - Pregabalin (Lyrica)
 - Primidone (Mysoline)
 - Rufinamide (Banzel)
 - Tiagabine (Gabitril)
 - Topiramate (Topamax)
 - Valproate
 - Vigabatrin (Sabril)
 - Zonisimide (Zonegran)

- Common Side Effects of Anti-Seizure Drugs
 - Drug-related:
 - Cognitive problems
 - Fatigue
 - Weight gain or loss
 - Cosmetic – acne, excessive hairiness or hair loss
 - Hyperactivity – excitable
 - Hypoactivity - reduced activity
 - Personality/mood changes and/or depression

- Dose-related/toxicity:
 - Double vision, blurry vision
 - Dizziness, lightheadedness
 - Sedation
 - Slowed thinking
 - Feels drunk
 - Coordination problems
 - Unsteady walking
- Drug Reaction Warning Signs:
 - Rash
 - Prolonged fever
 - Severe sore throat
 - Mouth ulcers
 - Easy bruising
 - Weakness
 - Excessive fatigue
 - Swollen glands
 - Lack of appetite
 - Increased seizure frequency
- Emergency Medication
 - Diazepam rectal gel (Diastat), a form of Valium, is a common emergency medication prescribed for patients who tend to have poorly controlled seizures, cluster seizures or status epilepticus.
 - Diastat has been approved by the FDA for use by family members and other non-medical caregivers.
 - Training is required for proper administration and safety. For more information and a free video on administration, visit www.diastat.com.
- Vagus Nerve Stimulator (VNS)
 - A small battery powered device is implanted under the skin in the chest wall. The device sends small, regular bursts of electrical energy to the vagus nerve, a large nerve in the neck that leads directly to the brain. ☐ A programmable pulse generator implanted under the skin in left chest electrode is surgically wrapped around the left vagus nerve Sends bursts of electrical energy to the brain via the vagus nerve
 - Exact mechanism of action not known
 - Can be activated or turned off with an external magnet
 - Side effects may include hoarseness, coughing and shortness of breath and occur during stimulation
- VNS Magnet Use
 - Typically worn on wrist or belt – or carried in a travel bag at all times.
 - A small battery powered device is implanted under the skin in the chest wall. The device sends small, regular bursts of electrical energy to the vagus nerve, a large nerve in the neck that leads directly to the brain. ☐ A programmable pulse generator implanted under the skin in left chest electrode is surgically wrapped around the left vagus nerve Sends bursts of electrical energy to the brain via the vagus nerve

- If the person has a seizure warning sign (aura) s/he or a trained observer may swipe the magnet over the VNS device to activate it and help abort a seizure. Always following Doctors Orders with regards to VNS use and number of swipes/length of seizures and transport plans.
- Magnet may be swiped during an actual seizure to shorten seizure length
- Magnet may be used as often as needed with at least a minute between swipes
- Magnet held in place over VNS can turn it off if unit malfunctions
- For a free video and more information visit www.vnstherapy.com
- Surgery
 - Surgery is a treatment option when the area of the brain causing the seizures is small and focal and when the area can be safely removed without a loss of function.
 - In certain cases, surgery can significantly reduce or eliminate seizure activity.
- Ketogenic Diet
 - A medically supervised diet comprised of a high proportion of fat and very little protein and carbohydrates.
 - By forcing the body to burn fat, the body enters a state of ketosis which somehow works to reduce seizures in some people with epilepsy. Strict adherence to the diet is necessary as deviation from the diet can cause breakthrough seizures.
 - Modified Atkins diet as alternative.

Seizure Triggers

- Breakthrough Seizures
 - Even when an individual's seizures are well controlled, breakthrough seizures can and do occur.
 - Below is a list of the leading causes of breakthrough seizures. Seizure triggers are highly individual and most individuals might not have any recognizable triggers.
- Possible Seizure Triggers
 - Missed or late medication (#1 reason)
 - Change in medication
 - Change from brand name medication to generic and vice versa
 - Lack of sleep/fatigue
 - Illness/fever
 - Poor diet/missed meals
 - Low blood sugar / high blood sugar
 - Hunger / Dehydration
 - Flashing lights (rare)
 - Overheating/overexertion
 - Stress/anxiety
 - Hormonal changes
 - Alcohol / Recreation drug use
 - Drug interactions

Seizure First Aid

- Most seizures are not medical emergencies. Basic first aid varies by seizure type and whether there is a change in consciousness. Every individual with epilepsy should have a Seizure Action Plan for seizure emergencies.
- Dangerous First Aid for All Seizure Types
 - Don't put anything in the person's mouth
 - Don't try to hold down or restrain the person
 - Don't attempt to give oral anti-seizure medications
- First Aid for Generalized Tonic-Clonic Seizures:
 - Stay calm, note time seizure began and duration of event
 - Lay person down and turn on side – if client has a GTT ,vent GTT to prevent possible aspiration
 - Place something soft under head
 - Clear objects away from jerking extremities
 - Loosen tight clothing
 - Protect head and remove glasses
 - Do not restrain
 - Client with trach often have increased in secretions- be prepared to suction trach tube.
 - Provide privacy if possible
 - Stay with the person until the seizure ends and a full return to consciousness is observed.
 - After the seizure ends, re-orient the person to their surroundings
 - **Activate Emergency Protocol after five minutes of continuous seizure activity, if another seizure begins before a full return to consciousness. Follow Doctors Orders which may be client specific.**
- First Aid for Complex Partial Seizures:
 - Note time seizure began and duration of event
 - Speak softly and calmly, reassure others
 - Do not restrain or grab (may result in combativeness)
 - Gently guide away from hazards
 - Verbal instructions may not be obeyed
 - Stay with the person until the seizure ends and a full return to consciousness is observed
 - Activate Emergency Protocol if:
 - Seizure lasts for five minutes beyond what is routine for that individual. – Check doctors orders for client specific parameters.
 - If a second seizure begins before a full return to consciousness.
 - If confusion or disorientation lasts for more than 30 minutes after the seizure ends.
- Absence, Simple Partial, Myoclonic and Atonic Seizures:
 - Follow the directives for Complex seizures
 - Seizure progresses to a generalized tonic-clonic seizure
 - Repeated seizures occur without a return to consciousness
 - Confusion or altered state lasting 30 minutes or more after seizure ends
 - Person is injured during the seizure

- When is a Seizure an Emergency?
 - First time seizure
 - Convulsive seizure lasting more than 5 minutes
 - Repeated seizures without a return to consciousness
 - More seizures than usual or change in type
 - Person is injured
 - Person has trouble breathing after seizure
 - Person has diabetes or is pregnant
 - Seizure occurs in water

- Use of Emergency Medications (Diastat)
 - Prescribed for seizure clusters and prolonged seizures
 - Must be fully trained in administration
 - Emergency protocol should include:
 - Medication name
 - Details about exactly when it should be given
 - Specific administration instructions
 - Monitor responses and side effects
 - Follow Seizure Action Plan emergency response protocol and or ER protocol/Doctors Orders.