



Seizures & Teens

When Emergencies Happen, What To Do?

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Introduction: When are seizures a medical emergency? What can I do and how do I know when emergency treatment is needed? These are common questions teens, parents and caregivers frequently wonder about, but often don't talk about until an emergency happens. Some people think seizures are nothing to worry about, while others mistakenly believe every seizure is a medical emergency. Knowing the difference between seizures that only need basic first aid, as compared to those that require urgent treatment is critical to treat seizures appropriately. This article discusses types of seizure emergencies and options for treating seizure clusters. Developing seizure action plans that incorporate seizure first aid and interventions that spell out when emergency care is needed help teens and parents take a proactive step in seizure management. These plans can serve as a vital means of communication between doctors, caregivers, teens and family members.

Ordinary brief seizures do not usually warrant emergency treatment. They usually end on their own and routine seizure first aid is all that is needed (Table 1) unless an injury occurs. In some situations, people may be able to

intervene to stop a seizure before an emergency occurs. For example, people who have an implanted device such as a vagus nerve stimulator (also called VNS Therapy) may swipe a magnet over the implanted generator in

the left chest wall. This sends off additional bursts of stimulation that may shorten or stop a seizure. People with VNS Therapy often use the magnet as part of standard seizure first aid.

Some people may find that other factors can help abort seizures. For example, if certain environments aggravate seizures, removing themselves from the triggering situation may help. Behavioral strategies such as distraction, deep breathing or other relaxation strategies may help lessen seizure activity or intensity. While little research is available on the benefit of behavioral techniques, some people find them instrumental in managing seizures in select circumstances. Since seizures can seem like intimidating and frightening events, it's helpful to develop a plan in advance detailing what to do in typical situations, what interventions can be done at home and when to intervene if standard first aid doesn't help or if seizures continue. Developing these action plans ideally should be a joint effort between the teen, parents, doctor and other caregivers and can be shared as needed with friends, school personnel and anyone else who spends significant time with the teenager and may be present during a seizure.

Types of Seizure Emergencies

A seizure is considered an emergency when it lasts a long time (usually defined as 30 minutes) or when there are frequently occurring seizures without recovery of consciousness between seizures. This situation is called status epilepticus which is a medical emergency and can be life-threatening. A series of seizures in a short amount of time, even if consciousness returns between seizures, is called a seizure cluster and is also considered an emergency.

STATUS EPILEPTICUS ~

Convulsive status epilepticus is the more common form of emergency situation and occurs with prolonged or repeated tonic-clonic (also called grand mal) or convulsive seizures. Since tonic-clonic seizures usually only last one to two minutes, a person who has a generalized seizure lasting five minutes is considered at risk for status and emergency help should be obtained.

NONCONVULSIVE STATUS EPILEPTICUS

is the term used to describe long or repeated absence (also called petit mal) or complex partial seizures. These situations can be harder to recognize as the person may just appear confused but not unconscious. It may also be difficult to tell the difference between behaviors that occur during a seizure and those that occur after a seizure (the postictal phase). Sometimes these types of repeated seizures can only be detected by monitoring an electroencephalogram (EEG) during the event. Knowing a person's baseline behavior and seizure activity, and how long their seizures typically last helps observers identify changes more easily.

ACUTE REPETITIVE SEIZURES OR CLUSTERS ~

Seizures may occur in groups or clusters over a period of hours or days. The person will return to normal consciousness or awareness between seizures and the clusters will usually end on their own. At times,

Table 1: First Aid for Seizures

- Stay calm
- Prevent injury – move harmful objects out of the way
- Time the seizure
- Make the person as comfortable as possible
- Keep onlookers away
- Do not hold a person down
- Do not put anything in the person's mouth
- Turn the person on their side if not conscious or awake
- Do not give water, pills or food until the person is fully alert
- If the seizure lasts longer than five minutes, call 9-1-1
- Be sensitive and supportive; ask others to do the same!

clusters may continue longer than normal or seizures occur closer together, resulting in status epilepticus. When repetitive seizures or clusters are recognized early and medications given, emergency situations can often be prevented.

Table 2: Call 9-1-1 if ...

- Seizures do not stop
- Seizures last longer than normal
- When injury occurs or is suspected
- If a person is pregnant or has other medical conditions
- If a seizure occurs in water
- If rescue medicine does not work
- If a parent or onlooker is uncomfortable

When to Intervene

Stopping seizures early is the key to preventing seizure emergencies. If seizures are not stopping or an emergency situation is occurring, it is necessary to call an ambulance. However, parents can give medicines to a child who is having a cluster of seizures, breakthrough seizures, a prolonged seizure or to someone who is prone to seizure emergencies. These medicines, sometimes called 'rescue medicines,' have a rapid onset of action and results should be seen within a short period of time. When and how to use this would be discussed with your child's physician and would be a vital part of the seizure action plan.

Often parents of children with frequent seizures know their child's pattern and use rescue medications when the child is having more frequent seizures than usual and do not feel the need to call emergency services. However, parents should call 911 (Table 2) or other emergency personnel as soon as they feel uncomfortable with the situation or if seizures persist after a rescue medicine is used.

What to Use

The antiepileptic medications most often prescribed to prevent or treat acute situations are from a group of medicines known as benzodiazepines. Oral medications are avoided when a person is having a seizure. However, people who are alert between seizures can be given a fast acting one

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such as lorazepam or midazolam. These medicines can be swallowed or absorbed from under the tongue or between the gum and cheek. Some medicines can be given rectally, where they are absorbed quickly from the rectum into the bloodstream. The most commonly prescribed medication to use out of the hospital in acute or cluster seizures is rectal diazepam gel or Diastat®. While this has been shown to be very effective in stopping cluster seizures, some people don't like the idea of giving medications rectally. The pros and cons of using rectal diazepam as compared to other 'rescue' medicine should be discussed with the teen's doctor to see which option may be most appropriate.

Giving Diastat - Practical Tips

Diastat® is supplied in pre-packaged applicators or syringes for rectal administration, with dosages tailored to the child's weight. The drug is easy to administer - the person is usually turned on his or her side while the tip of the syringe is inserted into the rectum and the plunger pushed in slowly to dispense the medicine. The cheeks of the buttocks are then held together for a few seconds until it has all been absorbed. Diastat® is approved by the Food and Drug Administration (FDA) for use by family members or non-medical caregivers. It is effective, well tolerated and side effects such as changes in breathing are not common.

A variety of dosage strengths are available (2.5 mg, 10 mg, and 20 mg), prescribed by the doctor and prefilled by a pharmacist. Applicators or syringes will have different size tips - the 2.5 mg and the 10 mg have a tip size of 4.4 cm, while the 20 mg syringe's tip size is 6cm. While the 2.5 mg syringe is designed to deliver only that dose, the other two syringes can

TABLE 3: Parts of a Seizure Action Plan

- Seizure type – Preferred name and medical term
- Description of typical seizure
- Seizure triggers
- Daily medication schedule
- Other seizure treatments
- Rescue medicine
- Routine seizure first aid
- Seizure emergencies and what to do
- Important contacts and preferred hospitals

be adjusted to deliver a specific amount tailored to the child's body weight. The physician's order includes the size of the tip and the exact amount of medication to be given. If the order says 4.4 cm tip size, 7.5 mg Diastat, the pharmacist takes a 10 mg syringe and sets it to deliver 7.5 mg only. Parents should be advised to check and make sure that the syringe has been preset before leaving the pharmacy, or the dose will not be given properly.

There are many benefits to giving medications rectally during a seizure. The drug can be given and absorbed quickly and stops seizures quicker than many oral medications. Since pills are not being swallowed, there is no risk of aspiration, or getting the drug into the lungs instead of the stomach. However, rectal administration of drugs in an emergency can also be difficult in some settings. While it is relatively easy to use in an infant or a young child, when a large child or teen is having a tonic-clonic seizure, it may be difficult to remove the clothes, place them in the proper position, and place the applicator into the rectum without help. Also, finding a place to give the drug in public may be difficult and receiving a rectal medication is embarrassing for a teenager. School settings can be particularly challeng-

ing to navigate as there may be limited privacy, but creative solutions should be explored to avoid the teen's seizure from becoming a medical emergency. Unfortunately, some caregivers or educators may feel uncomfortable removing part of a teen's clothes and giving the medicine. Usually, working together with the school nurse to train teachers and designated school personnel on the use of rectal medication and seizure first aid is all that is needed.

Other Rescue Meds

Some rescue medications can also be given by mouth, under the tongue, between the cheek and the gum and as a nasal spray. Although these methods appear to be easier, they are not without problems, and none of them are FDA approved for the treatment of seizure clusters. If the child is alert between seizures, it is possible to give lorazepam to swallow or place under the tongue. This may be a very good solution for the older child or teen. However, lorazepam only comes in small doses (0.5mg, 1mg, 2 mg tablets), and more than one tablet may be needed in an older child or teenager. Also, putting something in a person's mouth during a convulsion could result in aspiration.

Much has been written, often by physicians outside of the United States, about the use of midazolam given between the cheek and gum or in the nose for acute seizure management. Midazolam is an injectable benzodiazepine used primarily as a sedative and anesthetic agent. It is used in hospital settings intravenously (in the vein) to treat status epilepticus. It is now being tested as an option to use outside the hospital for seizure emergencies.

Preliminary reports suggest that midazolam may be as effective in stopping seizures as rectal diazepam and is

easier and more socially acceptable to use. It is only available in injectable vials and must be drawn up in a syringe and squirted inside the cheek or into the nostrils. Although this sounds like a better way of giving medicine than rectally, there are drawbacks. First, the FDA has not evaluated this use of midazolam for safety and effectiveness. The amount of Midazolam needed may be too much volume for the nose to handle. As a result, some of the medicine may end up being swallowed. Also, Midazolam has a short half-life, which means the body may eliminate it pretty quickly and a second dose may be needed.

There are studies on new ways of giving diazepam, including an autoinjector delivery system. Similar to an EpiPen, the autoinjector injects the diazepam into the muscle on the outside of the thigh. Ongoing research will help determine the effectiveness of this delivery method for the emergency treatment of seizures outside of the hospital setting.

Choosing the Best Treatment

While emergency or 'rescue' medications can be given many ways, none is perfect for the older child or adolescent. Deciding which drug and how to give it will depend on several factors, including ease of use, cost, location, privacy, and who is available to give it. The decision may be based in part on when and where the child is most likely to have the seizures. For example, if most of the seizures occur at night during sleep, rectal diazepam gel may be the best choice.

In a school situation, the choice may depend on the size and configuration of the classroom, the age and developmental level of the teen and staff concerns. If a child is in a special education program, classes are smaller and the teachers are more familiar with seizures. Giving a rectal medicine in this setting may be quite easy. However, in some classroom situations, it may not be possible to do

it without great embarrassment to the child

Cost and availability of medicines can be of enormous concern. Lorazepam tablets are readily available, but midazolam is only available in an injectable form. Special preparation may be needed if this drug is given into the nose or cheeks which could be costly. Not all medicines are covered by health insurance, particularly those that are not yet approved by the Food and Drug Administration. Even approved drugs may not be covered by some insurance plans or require special approval for their use. Diastat® remains the only drug approved by the FDA for acute repetitive seizures and even Diastat® is not approved for the treatment of a prolonged seizure.


Developing Seizure Action Plans

Seizure action plans are intended to serve as a simple way of sharing information and letting others know what to do and what not to do when a person has a seizure. Certain basic elements should be included in an action plan that will let people know a person's usual seizure behavior, prescribed treatments, devices or strategies that may be used to intervene during a seizure and rescue medicines used to prevent or manage seizure emergencies (Table 3). What to do in situations that may trigger seizures (such as medicine changes, illness and fever) should be addressed, since these are common risk factors for seizure emergencies. Additionally, since seizures are known to be unpredictable, planning how to manage seizures in different settings must be considered. For example, situations like traveling, being among groups of

people, being on the sports field, while shopping—places and activities that adolescents normally do, or will be doing as they become more and more independent.

Teens and their parents will ideally take an active role in the development of this plan with their epilepsy care providers and agree upon what information is written and how it will be used. Teens at risk for seizure emergencies should consider carrying it with them so it could be available for emergency personnel. The process can serve as another way to teach teens and their parents some of the practical steps involved in managing seizures. By reviewing and revising these plans on a regular basis, doctors and nurses can also see what works, what doesn't and make changes accordingly.

Summary

Being prepared for seizure emergencies is one of the most important steps in seizure management. While most people will not experience emergency situations, preparation is critical to ensure proper treatment and allay fears. Teaching people about seizure first aid and interventions is a must. Resources are available for training school nurses about seizure first aid and management from the Epilepsy Foundation and the Centers for Disease Control and Prevention. Extending these efforts to improve awareness and understanding of seizure emergencies for all involved in the care and education of adolescents and young adults is our next challenge. 

Visit www.epilepsy.com and www.eparent.com for sample seizure action plans and additional resources for teens and their families.