

Seizure Training
For
School Nurses







Please scan the QR code so we can email you the post-assessment.




Stop Seizures. Find Cures. Save Lives.
Our mission is to help people and families affected by epilepsy in New England.



Who are we?

We serve five states in our New England area.

- Maine
 - New Hampshire
 - Massachusetts
 - Vermont
 - Rhode Island
- We provide programs to families that are impacted by seizures. We work with area hospitals and neurologists in all our 5 states we service.
 - We provide education, camps, share groups, coordinated care, resources, college scholarships, financial aid, conferences, and more. We are with the families their entire journey with epilepsy



Objectives

Recognize	3 most common seizure types
Describe	3 seizure first aid steps to assist a student having a seizure
Recognize	3 key factors that would make a seizure a medical emergency/ Using rescue medications
Describe	3 ways to support a student living with epilepsy and understanding seizure action plans



Where It All Begins...

Effective management begins with:

- Observing and recognizing
- Documenting
- Communicating

Challenging because symptoms are often:

- Subtle and difficult to detect
- Lack warning signs
- Confused with other medical, behavioral or psychological issues



Who Has Epilepsy?

- 65 million people worldwide
- 3.4 million people in US
- 470,000 youth 0-17 yrs old in US
- 1 in 26 people will develop epilepsy in their lifetime



Kobau Ret al. (2012) MMWR, 61(49), 909.
 ZekMM, (2017) KobauR, MMWR, 66(31), 821.
 US Census Bureau, Population Division April 1, 2010 to July 1, 2013.
 Russ SA et al. (2012) Pediatrics, 129(2), 266.
 IOM (2012), Epilepsy across the spectrum: Promoting health and understanding.



The Epilepsies are Diseases of the Brain

**4TH MOST COMMON
NEUROLOGICAL DISORDER!**

Defined as

- 2 or more unprovoked seizures (es than 24 hours apart
- 1 seizure with risk of recurrent seizures
- Diagnosis of an epilepsy syndrome
- Tendency to have unprovoked recurring seizures, not caused by any known medical condition

Elshor PS et al. (2014) Epilepsia, 55(4), 475



Early Death in Epilepsy

Causes of early death

- o During or after a seizure
- o Status epilepticus
- o Suicide
- o Accidents



SUDEP (Sudden Unexpected Death in Epilepsy)

- o Most common cause of early death in epilepsy (1 in 1,000)
- o Applies to a sudden death in someone known to have epilepsy, without an obvious cause for the death

Harden C et al. (2017) Neurology, 88(17), 1674.



Children At Risk for Bullying



Survey of 20,000 teens with out epilepsy about knowledge, attitudes and beliefs

- o > 50% – never heard of or read about epilepsy
- o 37% – feel teens with epilepsy more likely to get picked on
- o > 50% – would not (or not sure) date a person with epilepsy
- o 19% – thought epilepsy was a form of mental illness
- o 52% thought that people often die from seizures

Austin J et al. (2002) Epilepsy Behav, 3(4), 368



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Seizure Recognition



Anything the brain can do normally, the brain can do during a seizure.



2

The Brain And Seizures

- A seizure occurs when there is a temporary change in the way the brain sends electrical signals
- When a seizure happens, there is a “short circuit” in the way messages are sent between brain cells
- Seizures can occur with other conditions



Seizure Recognition & First Aid Certification v2.0
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Imitators of Epilepsy

Other medical problems that may look like seizures/epilepsy could be:

- Related to underlying cause of epilepsy
- Nonepileptic events
- Comorbidities



About 1 in 5 people with uncontrolled seizures seen in an Epilepsy Monitoring Unit – found to have another diagnosis

Yogarajah M et al. (2018) J Neurol Neurosurg Psychiatry, 89(3):305; Birmie CD et al. (1981) Neurology, 31(3):298; Sridowitz L et al. (2007) Am J Med Qual, 22(2): 117.



3 Seizure Types

The brain is divided into two hemispheres

- **Focal** onset seizures: begin in one hemisphere
- Generalized seizures: begin in both hemispheres
- Unknown seizures: not sure where it begins

Determine if AWARENESS is affected

Look for other SYMPTOMS



Seizure Recognition & First Aid Certification v2.0
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Characteristics of Seizures

Behaviors in a seizure are:

- Episodic
- Often sudden and unexpected
- Stereotypic
- Variable intensity
- May or may not be modifiable

Phases of a seizure may include:



Focal Aware Seizures

- Person is aware and alert
- Rhythmic movements of 1 side or part of body
- Sensory symptoms: tingling, sounds, smells, tastes, upset stomach, visual distortions
- Psychic symptoms: déjà vu, hallucinations, feeling of fear or anxiety, or a "funny" indescribable feeling
- No seizure first aid is needed.



LENGTH: Usually 1 to 3 minutes

May be confused with: Acting out, psychosomatic illness, mystical experience, illicit drug use



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Seizure With Confusion or Not Aware

Focal Impaired Awareness Seizure

- Not aware or confused
- May have blank dazed stare
- AUTOMATISMS (repeated purposeless movements)
- Clumsy movements
- May not be able to talk
- May become combative if restrained
- **POSTICTAL**-Often followed by tired, headache, nausea



LENGTH: 1 to 3 minutes

May be confused with:
Substance abuse (alcohol, illicit drugs)
Aggressive behavior
Mental health problems



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Back to slide

www.epilepsy.com/learn-more/seizures



3 Recognizing Seizures



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New England

3 Focal Impaired Awareness Seizure




Courtesy of Epilepsy Foundation and CBS News #ShareMySeizure

EPILEPSY FOUNDATION
New England

First Aid- Focal Impaired Awareness Seizure

- Stay calm, reassure others
- Track time
- Do not restrain
- Gently guide away from hazards
- Don't expect the person to obey verbal instructions
- Stay with the person until fully alert and aware
- If the seizure lasts 5 minutes beyond what is routine for that person or another seizure begins before full consciousness is achieved, follow the seizure action plan.



EPILEPSY FOUNDATION
New England

3 Seizure With Staring And Not Aware

Generalized Absence Seizure

- Generalized seizure
- Affects both sides of the brain
- Presents with a pause or blank stare and brief lapses in awareness
- Person is absent for a moment
- May blink or chew
- May happen once or twice a day or up to fifty or one hundred times
- Person may appear confused or daydreaming



LENGTH:
less than 20 seconds

Often confused with:
Daydreaming
Attention problems



3 Generalized Absence Seizure





First Aid- Absence Seizure



- There is no first aid needed for absence seizures.



3 Seizure With Loss of Consciousness

Tonic Clonic Seizure (Tonic-Stiffening, Clonic-Shaking)

- A sudden, hoarse cry
- Loss of consciousness
- A fall
- Stiff body, arms, and legs [tonic] then rhythmic jerking [clonic]
- Shallow breathing, drooling may occur
- Possible loss of bowel or bladder control
- Lips and skin may look grey or blue
- **POSTICTAL**-Often followed by confusion, headache, fatigue, sore muscles, and difficulty with speech



LENGTH:
Typically, between
1 and 3 minutes
Often followed by
confusion, headache,
tired, sore, tongue
bitten, speech difficulty



3 Tonic Clonic Seizure



4 The 3 Basic Principles of Seizure First Aid



STAY
SAFE +  **5**
SIDE Follow seizure action plan!




4 Seizure First Aid: How to help someone having a seizure

- 1 STAY** with the person until they are awake and alert after the seizure.
 ✓ Time the seizure ✓ Remain calm
 ✓ Check for medical ID
- 2 Keep the person SAFE.**
 ✓ Move or guide away from harm
- 3 Turn the person onto their SIDE** if they are not awake and aware.
 ✓ Keep **airway clear**
 ✓ Loosen tight clothes around neck
 ✓ Put **something small and soft** under the head



Syndromes of Epilepsy

Classified by: • Seizure type • Age of Onset • Clinical Course • Genetic • EEG findings	Dravet Syndrome: Dravet syndrome is a rare, <u>genetic</u> epileptic encephalopathy that gives rise to seizures that <u>don't respond well to seizure medications</u> . It begins in the first year of life in an otherwise healthy infant.
	West Syndrome: West Syndrome/Infantile Spasms is characterized by epileptic spasms, developmental problems, and a specific brain wave pattern on electroencephalography (EEG). The onset is usually in the first year of life, typically between 4-8 months. The seizures often look like a sudden bending forward of the body with stiffening of the arms and legs lasting for 1-2 seconds, some children arch their backs as they extend their arms and legs. Spasms tend to occur upon awakening and often occur in multiple clusters and hundreds of seizures per day.



Syndromes of Epilepsy

Juvenile Myoclonic Epilepsy:

The seizures usually involve the neck, shoulders, and upper arms. In many patients the seizures most often occur soon after waking up.

Lennox-Gastaut Syndrome:

This is an uncommon syndrome that usually includes other types of seizures as well. It begins in early childhood. The myoclonic seizures usually involve the neck, shoulders, upper arms, and often the face. They may be quite strong and are difficult to control.

Sunflower Syndrome:

This is a type of rare photosensitive epilepsy. During these seizures, individuals with Sunflower syndrome turn toward a bright light while simultaneously waving one hand in front of their eyes. This unique behavior is coupled with abrupt lapses in consciousness.

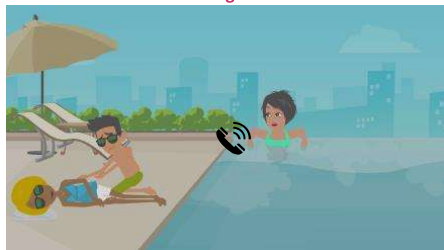


4 ANY SEIZURE Setting: Wheelchair

- If you can, keep the person in the wheelchair.
- Lock the wheelchair in place.
- If there is a seatbelt, loosely fasten it to prevent the person from falling out of the wheelchair.
- If they are having a focal seizure stand in front of them and support them to keep them in the chair.
- If they are having a tonic-clonic seizure you will observe them getting stiff and rigid.
- If they begin to fall out of the chair, unbuckle them and gently guide them to the floor and put them on their side to make sure their breathing is not blocked.



4 Seizure With Loss of Consciousness Setting: In Water or When Swimming



When To Call For Emergency Help

- Seizure lasts longer than 5 minutes
- Repeated seizures
- Difficulty breathing
- Seizure occurs in water
- Person is injured, pregnant or sick
- Person does not return to their usual state
- First time seizure that doesn't end within expected time



1 STAY with the person and start timing the seizure





Any Seizure Setting: School Bus or Public Transportation

- Guide person away from edge of platform/street
- Don't leave student alone
- Seizure with loss of consciousness: Place student on side facing away from seat back or in aisle
- Remain with student until awake and alert
- Call 911 if needed, follow school policy



Other types of generalized seizures.

ATONIC

Loss of muscle tone, "rag doll"; head drop and falling to ground are common



MYOCLONIC

Brief jerks of a muscle or group of muscles

CLONIC

Rhythmic jerking of part or all of body

TONIC

Body, arms or legs become stiff, may fall to the ground



4 Seizure Action Plan

- Helps organize information to care for those known to have seizures
- Made under the guidance of a healthcare team
- Helps you know what to do to prevent an emergency



The Postictal (Recovery) Phase

What is it?

- Postictal refers to the time immediately after a seizure, before a person returns to their usual state of awareness and function
- How a person feels and functions will vary depending of the type of seizure they experienced

How to help ?

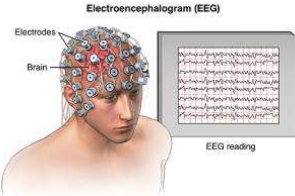
- Help person to a safe place to rest
- Check if they are alert and aware
- Stay with them until another adult arrives

Follow seizure action plan



Nonepileptic Events (PNES) Psychogenic Nonepileptic seizures.

- Events without electrographic correla
 - Physiological
 - Psychogenic
- Gold standard for diagnosis – video-EEG monitoring
- Mental health providers part of treatment team for psychogenic even




Electroencephalogram (EEG)

Electrodes

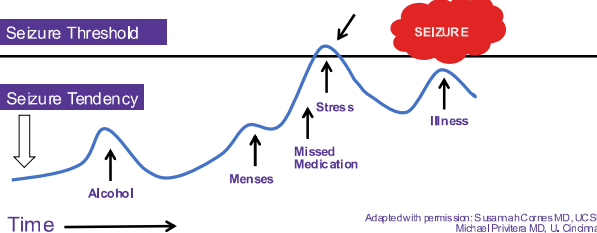
Brain

EEG reading

L. Sperkovic et al. (2012) Epilepsia, 53(11), 2005



Seizure Thresholds and Triggers



Seizure Threshold

Seizure Tendency

Time

Alcohol

Menses

Missed Medication

Stress


Illness

SEIZURE

Adapted with permission: Susannah Connors MD, UCSF; Michael Privitera MD, U. Cincinnati

Seizure Training for School Nurses: Caring for Children
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Definitions

From AES Status Guidelines For Convulsive Status Epilepticus

- **Convulsive status epilepticus occurs when:**
 - The active part (rhythmic shaking) of a tonic-clonic seizure lasts 5 minutes or longer
 - A person goes into a repeated tonic-clonic seizure without recovering consciousness for a period of longer than 5 minutes
- **Nonconvulsive status epilepticus occurs when:**
 - The person is not aware of what is going on and is not able to respond.
 - The seizure lasts longer than 10 minutes. These are unlikely to stop on their own and need emergency attention.



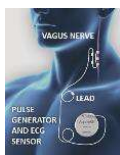
Common Treatment Options For Epilepsy

- Anti-seizure drugs (ASD)
 - Chronic – prevent seizures
 - Rescue – stop seizures and prevent emergencies
- Epilepsy surgery
- Implanted neurostimulation devices
- Medically prescribed diets



Vagus Nerve Stimulation (VNS) Therapy

- Programmable pulse generator under skin in chest, electrode attached to left vagus nerve
- Delivers automatic stimulation and magnet – triggered stimulation, adjusted by provider



Responsive Neurostimulation: RNS® System

- Provides neuromodulation at the source of seizures
- Implantable neurostimulator
 - Generator placed in skull
 - Leads/wires placed in the seizure focus within the brain
- Device continuously monitors brain waves and can deliver stimulation when a seizure is detected
- Requires home internet and cooperative patient/family



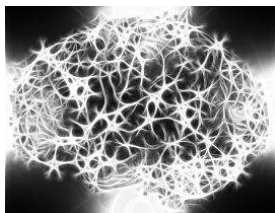
Ketogenic Diet

- High fat, low carbohydrate, adequate protein diet
- All foods and liquids weighed and measured
- Effective for all seizure types
- May require hospitalization to initiate diet
- Possible side effects: constipation, weight changes, metabolic acidosis, dyslipidemia, renal calculi



How do Anti-Seizure Drugs (ASDs) Work?

- Suppress seizure activity
- Do not treat the underlying cause of epilepsy
- Alter electrical activity in neurons
- Alter chemical transmission between neurons



Older Anti-Seizure Drugs (ASDs)

1st Generation

- Bromides (1850s)
- Phenobarbital, mephobarbital
- Phenytoin
- Acetazolamide
- Timethadione
- Corticosteroids /ACTH
- Primidone
- Methsuximide
- Ethosuximide

2nd Generation

- Chlordiazepoxide
- Diazepam
- Carbamazepine
- Clonazepam
- Valproate

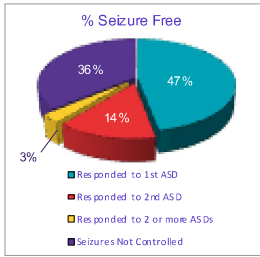
3rd Generation Anti-Seizure Drugs (ASDs)

- Felbamate
- Gabapentin
- Lamotrigine
- Topiramate
- Tiagabine
- Levetiracetam
- Oxcarbazepine
- Zonisamide
- Pregabalin
- Rufinamide
- Vigabatrin
- Lacosamide
- Clobazam
- Stiripentol
- Perampanel
- Eslicarbazepine acetate
- Brivaracetam
- Cannabidiol oral solution
- Midazolam
- Cenobamate



How Well Do ASDs Work?

- Seizures do not respond to ASD in 30-40% of people^{1,2}
- People with symptomatic causes of epilepsy more likely to have persistent seizures



¹Brodie MJ et al. (2012) Neurology, 15(23), 1593.
²Kwon P et al. (2010) NEJM, Feb 3(26)3144.
³Kanner AM et al. (2018) Neurology, 91(2), 82.

Common Side Effects of ASDs

Dose-related/toxic:

- Diplopia, blurry vision
- Dizziness, light-headedness
- Sedation
- Slowed thinking
- Feeling drunk
- Coordination problems
- Unsteady walking

Drug-related:

- Cognitive problems
- Fatigue, sedation
- Weight gain or loss
- Cosmetic – acne, excessive hairiness, or hair loss
- Hyperactivity
- Personality changes
- Mood changes, depression

What is Drug-Resistance or Refractory Epilepsy (DRE)?

- **Drug resistance**¹ – when seizures continue despite at least 2 trials with appropriate drugs tried for appropriate length of time.
- May have structural changes in the brain, other neurological problems
- Can not be determined until
 - Diagnosis of epilepsy and type confirmed
 - Other factors affecting seizure control assessed
 - Appropriate medication trials assessed

¹Kwan P et al. (2010) Epilepsia, 51(6), 1089.
²Kanner AM et al. (2018) Neurology, 91(2), 82.

4 When More Help Is Needed

- A person may have been prescribed a treatment to stop seizures that are too long or too frequent
- These treatments are called rescue therapies
- **Does NOT** take the place of usual seizure medicines or instead of emergency help.



Rescue Therapies



4 Seizure First Aid Demonstration



Resources for you!

<https://learn.epilepsy.com/>
2.75 CNE Continuing Education Credits



Seizure Training for School Personnel
(On Demand) - v2.0



Seizure Training for School Nurses:
Caring for Students (On Demand) -
v2.0



Seizure Training for School Nurses:
Using Rescue Therapies in Epilepsy
Care (On Demand)



Seizure Training for School Nurses:
Caring for Students with Psychogenic
Seizures (On Demand)

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