

SAEMS
SEISURE STANDING ORDER
Self-Learning Module

Dawn Daniels
Tucson Medical Center
August 2010

SAEMS Seizure STANDING ORDER TRAINING MODULE

PURPOSE

This SAEMS Standing Order Training Module has been developed to serve as a template for EMS provider training. The intent is to provide consistent and concise information to all providers practicing within the SAEMS Region. The content of the Training Module has been reviewed by the Protocol Development and Review Subcommittee, and includes the specific standing order, resource and reference material, and instructions for completing the Training Module to obtain continuing education credit. One hour of SAEMS continuing education may be issued following successful completion of the module.

OBJECTIVES

Upon completion of this learning module the participant will be able to:

1. List three benefits of the Seizure Standing Order (SO)
2. Outline inclusion and exclusion criteria for this Standing Order
3. Describe the dosing for: diazepam, midazolam and lorazepam
4. List two different types of seizures
5. Describe the BLS appropriate seizure Standing Order patient

INSTRUCTIONS

1. Read the accompanying information, standing order and any additional reference material as necessary.
2. Complete the attached post test and return to your Base Hospital Manager/Coordinator.
3. A SAEMS CE Form will be issued to providers scoring greater than ___% on the pretest.
4. Please contact your Prehospital Manager/Coordinator for questions, suggestions or concerns.

TABLE OF CONTENTS

1. Purpose	2
2. Objectives	2
3. Instructions	2
4. Table of Contents	2
5. History	3-5
6. Signs and Symptoms	6
7. Prehospital Care	8-10
8. Standing Order	11
9. Drug Profiles	12-18
10. Reference	19
11. Post Test	20-22
11. Evaluation	23

SAEMS Seizure STANDING ORDER TRAINING MODULE

Seizures are often very frightening to witnesses and are a common reason why people call 911. The EMS system may be activated when it might not be truly necessary for a patient with a long history of epilepsy who has had a single, typical seizure.

The role of the EMS responder is crucial in obtaining a history of the seizure, evaluating the patient's current status, initiating treatment, and transporting the patient, if necessary. Those cases most likely to result in a call to paramedics are the generalized convulsive seizures, also called generalized tonic-clonic (GTC) or grand mal seizures. Generalized convulsive seizures can also be purely tonic (stiff) or clonic (jerking), or clonic-tonic.

History

Generalized non-convulsive seizures used to be called petit mal, but that term has fallen out of favor, and they are now called absence seizures. Generalized seizures involve the whole brain.

Partial or localization-related seizures are seizures that arise from a specific part of the brain. The most common type of partial seizure is the complex partial seizure, which involves an impairment of consciousness without its complete loss. The most common area of the brain from which these seizures arise is the temporal lobe; hence, they are often called temporal lobe seizures. Complex partial seizures may, however, arise from almost any part of the brain. Because symptoms of this type of seizure often involve mental symptoms; a dreamy feeling of déjà vu, for example; fumbling movements of the hands, and orofacial movements such as lip smacking and chewing, these seizures are also sometimes called psychomotor seizures.

Simple partial seizures are those that do not involve any impairment of consciousness but are characterized by sensations or movements in one part of the body. Partial seizures, either simple or complex, may generalize secondarily into GTC seizures if the electrical seizure in the brain spreads from its limited area of origin to the rest of the brain. Epilepsy is just one cause of seizures. Only about 50 percent of seizures are due to epilepsy. But it remains one of the nation's most common disabling neurological conditions.

Epilepsy

Epilepsy is a disorder characterized by recurrent seizures which are *not* the result of a specific, immediate insult to the brain, such as alcohol withdrawal, drug intoxication or low serum sodium. Such seizures are termed reactive seizures. Epilepsy may be generalized or localization-related.

Epilepsy affects about 2.5 million Americans, and results in an estimated annual cost of \$15.5 billion in medical costs and lost or reduced earnings and production. People of all ages are affected, but particularly the very young and the elderly. About 10 percent of Americans will experience a seizure sometime during their lifetime, and about 3 percent

SAEMS Seizure STANDING ORDER TRAINING MODULE

will have had a diagnosis of epilepsy by age 80.

Unprovoked seizures are often associated with epilepsy and related seizure disorders. While any seizure is cause for concern, having a seizure does not by itself mean a person has epilepsy. First seizures, febrile seizures, non-epileptic events, and eclampsia are examples of seizures that may not be associated with epilepsy.

First Seizures

Many people have a single seizure at some point in their lives. Often these seizures occur in reaction to anesthesia or a strong drug, but they also may be unprovoked, meaning that they occur without any obvious trigger factor. Unless the person has suffered brain damage or there is a family history of epilepsy or other neurological abnormalities, these single seizures usually are not followed by additional seizures.

One recent study that followed patients for an average of 8 years found that only 33 percent of people have a second seizure within 4 years after an initial seizure. People who did not have a second seizure within that time remained seizure free for the rest of the study. For people who did have a second seizure, the risk of a third seizure was about 73 percent on average by the end of 4 years.

Once someone has experienced a first seizure, the doctor will usually order an electroencephalogram, or EEG, to determine what type of seizure the person may have had and if there are any detectable abnormalities in the person's brain waves. The doctor also may order brain scans to identify abnormalities that may be visible in the brain. These tests may help the doctor decide whether or not to treat the person with antiepileptic drugs. In some cases, drug treatment after the first seizure may help prevent future seizures and epilepsy. However, the drugs also can cause detrimental side effects, so doctors prescribe them only when they feel the benefits outweigh the risks. Evidence suggests that it may be beneficial to begin anticonvulsant medication once a person has had a second seizure, as the chance of future seizures increases significantly after this occurs.

Febrile Seizures

Sometimes a child will have a febrile seizure during the course of an illness with a high fever. There are probably few things more frightening to parents than watching their child have a seizure, particularly the first seizure, parents often think the child is dying, and the febrile seizures in a child will inevitably result in a 911 call. The same considerations, both in terms of evaluation and treatment, apply to children as they do to adults.

Hypoglycemia is a particularly important consideration, as prolonged hypoglycemia may cause irreversible brain damage, and it is easily treatable. Approximately 6 percent of children may have one or more febrile seizures, simple febrile seizures occur between the ages of three months and six years.

SAEMS Seizure STANDING ORDER TRAINING MODULE

They occur in the context of a febrile illness, last less than five minutes, and show no evidence of focality, either at the time of onset, during the seizure or during the postictal period. Seizures occurring with a fever, which last longer than five minutes or are associated with focal features, are more likely to be associated with an underlying neurological illness. Simple febrile seizures require no specific treatment. The child may require cooling measures and should be evaluated in the emergency department to rule out a serious cause such as meningitis. Prolonged seizures will require treatment with particular attention being paid to the possibility of respiratory depression.

The child's parents will require a great deal of reassurance and support. In cases where the child has frequent febrile seizures, the parents may be given rectal diazepam to give to the child at the time of a fever in order to prevent a seizure. It is important to ask about this since, if the parents have already given the child rectal diazepam before EMS arrives, any further diazepam given to the patient may precipitate a respiratory arrest.

Experts at a 1980 consensus conference coordinated by the National Institutes of Health concluded that preventive treatment after a febrile seizure is generally not warranted unless certain other conditions are present: a family history of epilepsy, signs of nervous system impairment prior to the seizure, or a relatively prolonged or complicated seizure. The risk of subsequent non-febrile seizures is only 2 to 3 percent unless one of these factors is present.

Researchers have now identified several different genes that influence the risk of febrile seizures in certain families. Studying these genes may lead to new understanding of how febrile seizures occur and perhaps point to ways of preventing them.

Non-epileptic Events

Sometimes people appear to have seizures, even though their brains show no seizure activity. This type of phenomenon has various names, including non-epileptic events and pseudoseizures. Both of these terms essentially mean something that looks like a seizure but isn't one. Non-epileptic events that are psychological in origin may be referred to as psychogenic seizures. Psychogenic seizures may indicate dependence, a need for attention, avoidance of stressful situations, or specific psychiatric conditions. Some people with epilepsy have psychogenic seizures in addition to their epileptic seizures. Other people who have psychogenic seizures do not have epilepsy at all. Psychogenic seizures cannot be treated in the same way as epileptic seizures. Instead, they are often treated by mental health specialists.

Other non-epileptic events may be caused by narcolepsy, Tourette syndrome, cardiac arrhythmia, and other medical conditions with symptoms that resemble seizures. Because symptoms of these disorders can look very much like epileptic seizures, they are often mistaken for epilepsy.

SAEMS Seizure STANDING ORDER TRAINING MODULE

Distinguishing between true epileptic seizures and non-epileptic events can be very difficult and requires a thorough medical assessment, careful monitoring, and knowledgeable health professionals. Improvements in brain scanning and monitoring technology may improve diagnosis of non-epileptic events.

Seizures without epilepsy

Unprovoked seizures are often associated with epilepsy and related seizure disorders.

Causes of provoked seizures include:

- Fever leading to febrile convulsions
- Arteriovenous malformation (AVM) is a treatable medical condition that can cause seizures, headaches, and brain hemorrhages
- Head injury may cause non-epileptic post-traumatic seizures or post-traumatic epilepsy, in which the seizures chronically recur
- Intoxication with drugs
- Drug toxicity, for example aminophylline or local anesthetics
- Normal doses of certain drugs that lower the seizure threshold, such as tricyclic antidepressants
- Infection, such as encephalitis or meningitis
- Metabolic disturbances, such as hypoglycemia, hyponatremia or hypoxia
- Withdrawal from drugs (anticonvulsants and sedatives such as alcohol, barbiturates, and benzodiazepines)
- Space-occupying lesions in the brain (abscesses, tumors)
- Seizures during (or shortly after) pregnancy can be a sign of eclampsia
- Hemorrhagic stroke can occasionally present with seizures, embolic strokes generally do not (though epilepsy is a common later complication); cerebral venous sinus thrombosis, a rare type of stroke, is more likely to be accompanied by seizures than other types of stroke
- Multiple sclerosis sufferers may rarely experience seizures
- Certain light patterns, such as those found in video games or other media

SIGNS AND SYMPTOMS

Seizures can cause involuntary changes in body movement or function, sensation, awareness, or behavior. A seizure can last from a few seconds to status epilepticus. Seizures are often associated with a sudden and involuntary contraction of a group of muscles and loss of consciousness.

However, a seizure can also be as subtle as marching numbness of a part of the body, a brief – long term loss of memory, sparkling or flashes, sensing/discharging of an unpleasant odor similar to alcohol base is produced by internal organs, a strange epigastric sensation or a sensation of fear and total state of confusion which in some case leads to suicide during seizure. Therefore, seizures are typically classified as motor, sensory, autonomic, emotional or cognitive.

SAEMS Seizure STANDING ORDER TRAINING MODULE

In some cases, the full onset of a seizure event is preceded by some of the sensations described above. These sensations can serve as a warning to the sufferer that a full tonic-clonic seizure is about to occur. These “warning sensations” are cumulatively called an aura. Also, it is commonly believed among healthcare providers that many seizures, especially those in children, are preceded by tachycardia that frequently persists throughout the seizure. This early increase in heart rate may supplement an aura as a physiological warning sign of an imminent seizure.

Symptoms experienced by a person during a seizure depend on where in the brain the disturbance in electrical activity occurs. Recent studies show that seizures happen in sleep more often than was thought. A person having a tonic-clonic seizure may cry out, lose consciousness and fall to the ground, and convulse, often violently. A person having a complex partial seizure may appear confused or dazed and will not be able to respond to questions or direction. Some people have seizures that are not noticeable to others. Sometimes, the only clue that a person is having an absence seizure is rapid blinking, extreme confusion for a few seconds or sometimes hours.

PATIENT ASSESSMENT

Carefully examine the patient for evidence of head injury or serious injury to any other part of the body. Fractures, lacerations, bruises and shoulder dislocations are seen in approximately 14 percent of patients and death in another 1 percent as a result of GTC seizures.

Look for a Medic-Alert bracelet or necklace, as this may confirm a history of epilepsy or indicate other disorders that may have caused the seizure. Is there any evidence of drug abuse, such as track marks or white powder in the nose? Is there any drug paraphernalia in the area?

During the seizure, check the pupils for size and symmetry. The pupils will often be dilated during a seizure, but should be symmetrical and at least somewhat reactive to light. Look for deviation of the eyes, as this may be a sign of a focal seizure. Are the patient’s body movements symmetrical? Lateralized tonic or clonic movements also indicate a focal onset of the seizure. Is there evidence of tongue-biting, bowel or bladder incontinence, or self-injury?

These findings are suggestive of an epileptic seizure as opposed to a fainting spell or psychogenic seizure. Cyanosis is most common during a seizure, while pallor is commonly seen during syncope.

Getting a detailed history from any witnesses is of critical importance in evaluating seizures. Does the patient have a history of epilepsy? How often does the patient have seizures? Was this one typical?

If the patient is epileptic, does family or friends indicate that he may not have been

SAEMS Seizure STANDING ORDER TRAINING MODULE

taking prescribed anticonvulsant medications? Does the patient have any other medical problems that might predispose him or her to seizures, such as diabetes? Is the patient taking any medication, such as insulin, that might cause a seizure?

Is there anything to suggest that the patient may have taken an overdose of medication? Does the patient drink alcohol or use illicit drugs? If the patient drinks alcohol, has he recently cut down or stopped drinking, heading to withdrawal seizures? Has the patient suffered a significant (with loss of consciousness) head injury recently or in the past? Ask witnesses to give a detailed description of the event. (It is often difficult to get a good description of a seizure from witnesses who are frightened or agitated). Of particular interest is the question of how the seizure started. Staring spell? Movement of a particular part of the body? How long did the seizure last? Witnesses' estimates of the duration of a seizure are often wildly inaccurate.

EMS personnel should document precisely how long the seizure continued after their arrival. Did the seizure start with a sudden, severe headache, raising the possibility of intracranial bleeding? More prolonged, progressive headache may be associated with meningitis, a brain abscess or a tumor. Other questions should be directed toward assessing the patient's psychological state prior to the event. A stressful event just prior to the seizure may suggest wither a psychogenic seizure or a syncope episode, although, keep in mind that stress may bring on epileptic seizures as well.

Although this information may not affect the prehospital care of a seizure patient, it is critical information for emergency physicians or neurologists in evaluating the patient. More often than not, witnesses at the scene will not be available to hospital personnel, so the information collected by EMS becomes crucial.

PREHOSPITAL CARE

As with all patients, the first step in dealing with patients with seizures is the assessment and treatment of airway problems, breathing and circulation. This is due to obstruction and the pharynx by the tonic activity of the muscles in the area during the seizure, and complete loss of tone in these same muscles in the postictal period.

It is not due to patients "swallowing" their tongue, an unfortunate popular belief that may lead witnesses to try to insert something into the patient's mouth, thereby causing injury, such as breaking a tooth, which then may be aspirated by the patient when the seizure is over.

The nasopharyngeal airway or nasal trumpet may be the safest, easiest and most effective way of establishing an airway in a patient during a seizure. Its advantages are that it does not necessitate opening and inserting something into the mouth with the danger of causing injury, it is well tolerated by the patient in the postictal period, and it is not likely to induce vomiting and the risk of aspiration as an oropharyngeal airway might.

The other cause of airway compromise during the postictal period is the secretions and

SAEMS Seizure STANDING ORDER TRAINING MODULE

possible blood that have accumulated in the mouth during the seizure and may be aspirated when the patient starts breathing again. It is therefore necessary to have suction available to clear the upper airway when the seizure ends.

High-flow oxygen should be placed using either a nasal cannula or a mask. The nasal cannula is usually better tolerated when the patient awakens after the seizure. Attempts to ventilate the patient may be of some benefit during the beginning of a seizure and will surely be so if there is postictal respiratory depression. Such postictal respiratory depression is usually brief, unless the patient has been given any drugs to stop the seizure, and can be managed using a bag-valve-mask device.

During the seizure itself, particularly during the tonic phase, the patient may be making little, if any, respiratory effort. This results in the cyanosis often seen in patients during a seizure. Attempts to ventilate the patient during this phase of a seizure are usually futile, as the chest muscles are so tightly contracted that it is impossible to expand the chest.

Another concern is the cervical spine, which may be injured as the result of an accident that involved a head injury. Injury to the cervical spine may also occur during the seizure itself if there is any evidence to suggest a head or neck injury, the cervical spine should be stabilized. Putting on a cervical collar and placing the patient on a backboard may make it difficult to maintain the airway, due to secretions and blood pooling in the posterior pharynx, so frequent suctioning is important.

The other potential problem with stabilization of the cervical spine may occur as the patient awakes and becomes agitated, confused and possibly combative at being restrained. Often, patients will clam down if no attempt is made to restrain them, but this is not always possible.

The pulse and blood pressure usually rise significantly during a convulsive seizure, but return to normal quickly after the end of the seizure and usually do not require treatment.

Occasionally, patients may become bradycardic or hypotensive, particularly after a prolonged seizure. If the postictal respiratory depression is prolonged, as may be seen if the patient has been given diazepam or lorazepam, the patient should be intubated and ventilated.

Seizures lasting more than five minutes have a much greater chance of going on to status epilepticus. Status epilepticus is defined as a seizure lasting more than 20 (some say 30) minutes, or repetitive seizures without return to the patient's normal mental state between seizures. Status epilepticus is a true medical emergency, with mortality of up to 15 percent.

There are three drugs of choice for you to treat a prolonged seizure or status epilepticus in the field. They are the benzodiazepines diazepam, lorazepam and midazolam.

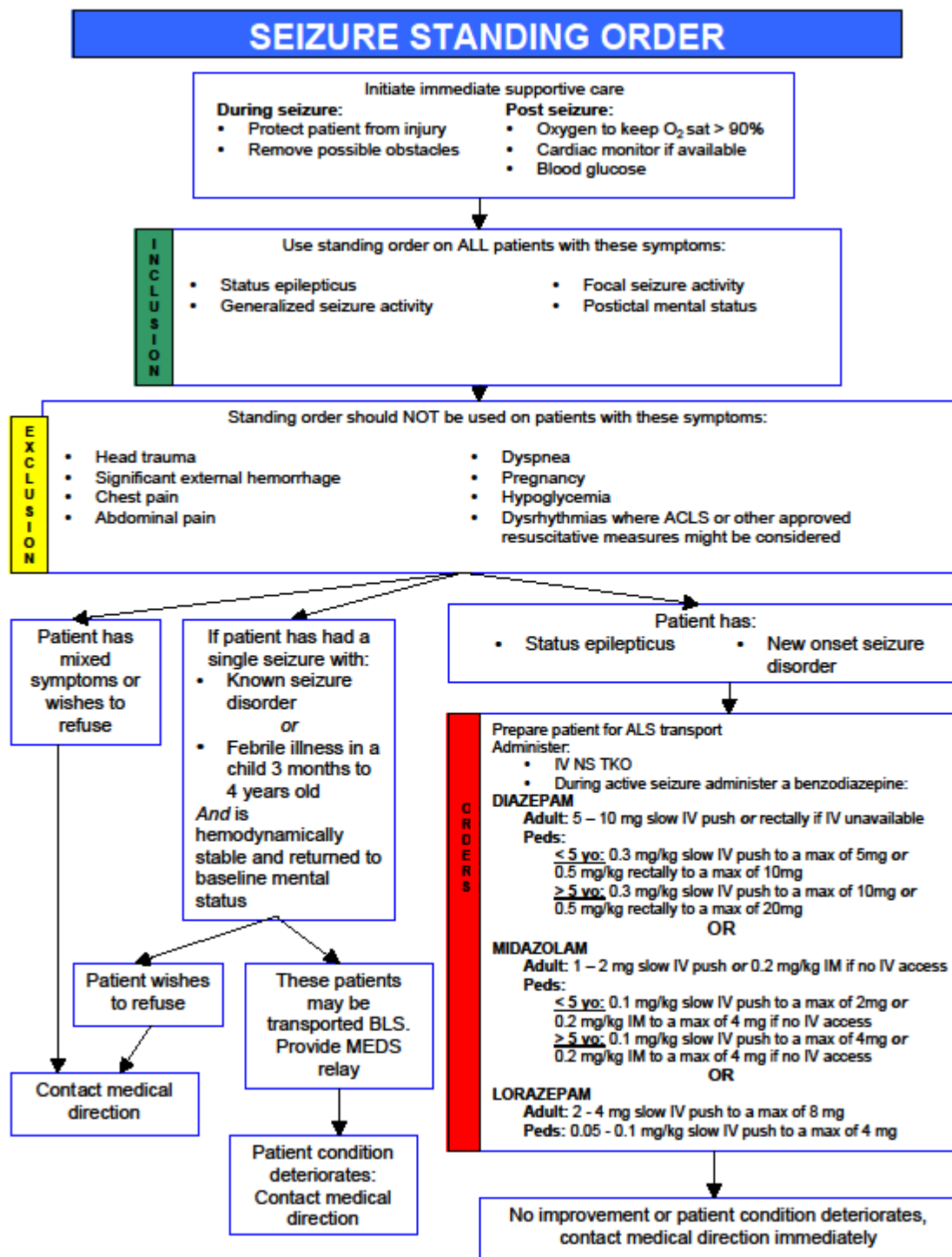
SAEMS Seizure STANDING ORDER TRAINING MODULE

Diazepam and lorazepam are equally effective, but lorazepam has the advantage of a longer functional half-life in the brain. Midazolam is usually used when diazepam is unavailable. All these drugs may cause respiratory depression to the point of apnea and hypotension, and EMS personnel must be ready to support ventilation and give a bolus of normal saline, if necessary. If intravenous access is impossible, there are several alternative routes for all these drugs; they may be given intraosseously or rectally. There is not a premade kit for giving rectal diazepam. Lorazepam is better absorbed and not irritating to the tissues, but the absorption is too slow to be useful in an emergency situation. Diazepam and lorazepam should be used for the treatment of prolonged (longer than 5 minutes) or recurrent seizures.

The use of diazepam or lorazepam for treating postictal confusion and agitation should be avoided if at all possible. Most patients who are postictal will be calm and go to sleep if left alone for a few minutes. They will, however, frequently become combative if attempts are made to restrain them, or to cover their face with an oxygen mask. Some patients will become agitated or do things in their confused state that could injure them. Clearly, these patients will need restraint.

It is helpful to remember that the vast majority of patients with epilepsy rarely come to the hospital after a typical seizure; they are cared for by their family or friends, or simply return to baseline on their own.

SAEMS Seizure STANDING ORDER TRAINING MODULE



SAEMS Seizure STANDING ORDER TRAINING MODULE

GENERIC NAME: DIAZEPAM

112.09

BRAND NAME: Valium

CLASS: benzodiazepine

Mechanism of Action:

Acts on parts of the limbic system, the thalamus, and hypothalamus producing calming effects; decreases seizures by increasing the seizure threshold; transient analgesia; amnesic; sedative.

Indications and Field Use:

Grand mal seizures, especially status epilepticus.
Transient analgesia/amnesia for medical procedures (e.g., fracture reduction, cardioversion, pacing).
Delirium tremens.
Treat the cause first.

Contraindications:

Hypersensitivity (allergy)
Glaucoma, acute narrow angle (relative)

Adverse Reactions:

CV: Bradycardia, hypotension, cardiovascular collapse; venous thrombosis; phlebitis; vascular spasm
Resp: Respiratory arrest; may be prolonged in neonate
CNS: Somnolence, confusion, coma, diminished reflexes; s/s may be prolonged in neonate
Other: Burning proximal to IV injection site; local irritation; swelling; extravasation will cause tissue necrosis

NOTES ON ADMINISTRATION

Incompatibilities/Drug Interactions:

Do not mix or dilute diazepam with other solutions or drugs in syringe, tubing or IV container.

Adult Dosage:

2 mg increments slow IV push. Administer no faster than 2 mg/minute.

SAEMS Seizure STANDING ORDER TRAINING MODULE

Pediatric Dosage:

IV Dose: 0.2-0.3 mg/kg every 15-30 minutes (max. of 1.0 mg/kg); administer IV over at least 3 minutes or until seizure activity subsides.

IV Dose after rectal dose: 0.1 mg/kg with same administration instructions.

Rectal dose (≤ 6 years): 0.3-0.5 mg/kg rectally at IV push rate; may repeat in 15-30 min at 0.25 mg/kg.

Routes of Administration:

Slow IV push

Rectally for children ≤ 6 years

Onset of Action:

Minutes

Peak Effects:

Minutes

Duration of Action:

20 minutes to 50 minutes

Dosage Forms/Packaging:

10 mg/2 ml prefilled syringes, ampules and vials

Diazepam Rectal Delivery Gel (optional) - 10 mg twin pack pediatric (total 20 mg)

Arizona Drug Box Supply Range:

PARAMEDIC: 2 prefilled syringes (20 mg)
10 mg twin pack pediatric (20 mg)

INTERMEDIATE: 2 prefilled syringes (20 mg)
10 mg twin pack pediatric (20 mg)

Special Notes:

- > Valium must be injected slowly and small veins such as those on the dorsum of the hand or wrist should be avoided. Risk of venous thrombosis, phlebitis, local irritation, swelling and vascular spasm is increased.
- > Extreme care must be taken to avoid intra-arterial injection or extravasation.
- > Diazepam may cause prolonged CNS depression in the neonate (30 days of age or less).

SAEMS Seizure STANDING ORDER TRAINING MODULE

MIDAZOLAM HYDROCHLORIDE

BRAND NAME: Versed

CLASS: Central nervous system depressant, benzodiazepine

Mechanism of Action:

CNS effects are mediated through the inhibitory neurotransmitter gamma-aminobutyric acid (GABA).

Acts at the limbic, thalamic, and hypothalamic levels of the CNS, producing anxiolytic, sedative, hypnotic, and anticonvulsant effects.

Capable of producing all levels of CNS depression, from mild sedation to coma.

Indications and Field Use:

Anti-convulsant
Sedation
Management of acute agitation/treat cause first
Induction for intubation

Contraindications:

Hypersensitivity to midazolam

Relative contraindication in: Myasthenia gravis or other neuromuscular disorders; acute alcohol intoxication; severe, chronic obstructive pulmonary disease; and acute pulmonary insufficiency

Adverse Reactions:

CV: Hypotension (especially in patients premedicated with narcotic); cardiac arrest; irregular or fast heartbeat

Respiratory: Apnea; respiratory depression, respiratory arrest; hyperventilation; wheezing or difficulty in breathing; hiccups; coughing

CNS: Emergence delirium; muscle tremor; uncontrolled or jerky movements of body; unusual excitement, irritability, or restlessness; dizziness, light-headedness, or feeling faint; prolonged drowsiness; headache

GI: nausea and/or vomiting

SAEMS Seizure STANDING ORDER TRAINING MODULE

Notes on Administration:

Midazolam administered intravenously has been associated with respiratory depression and respiratory arrest, especially when used concomitantly with opioid analgesics for conscious sedation or when rapidly administered. Midazolam may cause phlebitis. May need to adjust midazolam dose down for patients on erythromycin.

Incompatibilities/Drug Interactions:

Midazolam may potentiate the action of other CNS depressants, including opiate agonists or other analgesics, barbiturates or other sedatives, anesthetics, or alcohol.

Erythromycin may double the half-life of midazolam.

Adult Dosage:

Patients 14 to 60 years of age: 2 to 5 mg IM

1 to 5 mg IV, titrate to effect, administer slowly in small increments of no more than 2.5 mg over at least 2 minutes.

Patients over 60 years of age: 1 to 3 mg IM

1 to 3.5 mg IV, titrate to effect, administer slowly in small increments of no more than 1.5 mg over at least 2 minutes.

Total dose: Should not exceed 20 mg

For emergency intubation: 0.1 mg/kg up to 0.3 mg/kg with dosage limit of 20 mg.

Seizures: 0.2 mg/kg IM for status seizures if no IV access

Pediatric Dosage:

Pediatric patients: 0.05 to 0.1 mg/kg slow IV push

0.2 mg/kg IM for status seizures if no IV access

Routes of Administration:

For IM administration, inject deep into large muscle mass.

For IV bolus and infusion, administer slowly in small increments over at least 2 minutes and allow 2 more minutes between doses to evaluate effect.

Onset of Action:

IM - 15 minutes, IV - immediate

SAEMS Seizure STANDING ORDER TRAINING MODULE

Peak Effects:

IM - 15 to 60 minutes, IV - 3 to 5 minutes

Duration of Action:

2 to 6 hours

Dosage Forms/Packaging:

1 mg midazolam/1 mL: 5 mL vials (5 mg)

Arizona Drug Box Supply Range:

Paramedic: optional, 2-4 vials of 5 mg/5 mL

Intermediate: optional, 2-4 vials of 5 mg/5mL

Special Notes:

- > Flumazenil is the accepted antagonist for midazolam
- > Midazolam is an optional drug

SAEMS Seizure STANDING ORDER TRAINING MODULE

GENERIC NAME: LORAZEPAM

CLASS: Antianxiety

Benzodiazepine, short or intermediate acting

Mechanism of Action:

Agent binds highly to the gamma-amino butyric acid (GABA) benzodiazepine receptor complex without displacing GABA, (GABA is the major inhibitory neurotransmitter in the brain). It exerts tranquilizing action on the central nervous system.

Indications and Field Use:

Status epilepticus
Seizure
Agitation

Contraindications:

Known sensitivity to the benzodiazepines
Acute narrow angle glaucoma or myasthenia gravis
Known hypersensitivity to polyethylene glycol, propylene glycol, or benzyl alcohol
Pregnancy

Adverse Reactions:

Most frequent adverse reaction is sedation
Transient amnesia or memory impairment
Confusion
Hypotension
Respiratory depression
Dizziness
Headache

NOTES ON ADMINISTRATION

Incompatibilities/Drug Interactions:

Concomitant use of CNS sedatives such as phenothiazines, narcotic analgesics, barbiturates, antidepressants, and alcohol should be assessed prior to administration of IV Lorazepam.

SAEMS Seizure STANDING ORDER TRAINING MODULE

Administration:

IM: Should be administered deep into the muscle mass

IV/IO: Do not exceed 2mg/minute or 0.05mg/kg over 2-5 minutes. Dilute IV dose with equal volume of compatible diluent (D5W, NS, SWI).

**Inadvertent intra-arterial injection may produce arteriospasm resulting in necrosis and potential amputation.

Adult Dosage:

Status epilepticus: 2mg to 4mg IV given slowly (over 2-5 minutes) May repeat dose in 10-15 minutes if needed (maximum 8mg). May give IM/IO if no IV access.

Pediatric Dosage:

Status epilepticus: 0.05-0.1 mg/kg IV over 2-5 minutes (maximum 4mg). May repeat in 10-15 minutes.

Routes of Administration:

IV injection is the route of choice

IM injection with large bore needle

IO

Onset of Action:

1-2 minutes if given IV

Peak Effects:

Less than 15 minutes when given IV

Within 3 hours when given IM

Duration of Action:

Approximately 6 - 8 hours

Dosage Forms/Packaging:

Optional [8 mg] Injection Solution: 2mg/mL, 4mg/mL

Special Notes:

Care must be used when administering Lorazepam IV to elderly patients, seriously ill patients, and those with limited pulmonary reserve. Apnea and/or cardiac arrest may occur.

Patients over the age of 50 years may have a more profound and prolonged sedation with IV Lorazepam.

All patients should be monitored for respiratory depression and hypotensive effects.

Stability above room temperature has not been established.

SAEMS Seizure STANDING ORDER TRAINING MODULE

References

1. http://www.azdhs.gov/diro/admin_rules/guidance_PHS.htm#Drug%20Profiles
2. Blume W, Lders H, Mizrahi E, Tassinari C, van Emde Boas W, Engel J (2001). "Glossary of descriptive terminology for ictal semiology: report of the ILAE task force on classification and terminology." *Epilepsia* 1212-8. doi: 10.1046/j1528-1157.2001.22001.x.PMID 11580774.
3. Krumholz A, Wiebe S, Gronseth G, Shinnar S, Levisohn P, Ting T, Hopp J, Shafer P, Morris H, Seiden L, Barkley G, French J; Quality Standards Subcommittee of the American Academy of Neurology; American Epilepsy Society. Practice Parameter: evaluating an apparent unprovoked first seizure in adults (an evidence-based review): report of the Quality Standards Subcommittee of the American Academy of Neurology and the American Epilepsy Society. *Neurology* 2007; 1996-2007. PMID 18025394
4. Passman R, Horvath G, Thomas J, *et al* (2003). "Clinical spectrum and prevalence of neurologic events provoked by tilt table testing". *Arch. Intern. Med.* (16): 1945–8. doi:10.1001/archinte.163.16.1945. PMID 12963568.
5. Benbadis SR, Wolgamuth BR, Goren H, Brener S, Fouad-Tarazi F (1995). "Value of tongue biting in the diagnosis of seizures". *Arch. Intern. Med.*: 2346–9. doi:10.1001/archinte.155.21.2346. PMID 7487261.
6. Ahmad S, Beckett MW (2004). "Value of serum prolactin in the management of syncope". *Emergency medicine journal: EMJ* 21 (2): e3. doi:10.1136/emj.2003.008870. PMID 14988379.

SAEMS Seizure STANDING ORDER TRAINING MODULE

TRAINING MODULE FOR STANDING ORDER SEIZURE POST TEST

NAME: _____ AGENCY: _____ DATE: _____

1. In conducting your secondary assessment with a 3 year old male patient and/or family regarding past medical history, what should you ask?
 - a. Febrile illness between 3 months to 4 years
 - b. Known seizure disorder
 - c. Hydration status, i.e., how many wet diapers/day
 - d. All of the above

2. Your patient exhibits the signs and symptoms of Status Epilepticus and you prepare for ALS transport. What do you administer first?
 - a. IV NS TKO
 - b. IV LR 20cc per kg .hr
 - c. O2 NRB if patient will tolerate
 - d. C-Spine precautions; never too careful!

3. Causes of provoked seizures are fever, head injury and drug toxicity.
 - a. True
 - b. False

4. During your transport, your 4 year old patient has a 60 minute seizure. What do you give? (Circle each that apply)
 - a. Valium 0.03 mg/kg slow IV push to a max of 10 mg
 - b. Valium 0.3 mg/kg slow IV push to a max of 5 mg
 - c. Versed 0.1 mg/kg slow IV push to a max of 3 mg
 - d. Ativan 0.05-0.1 mg/kg slow IV push to max 5 mg

5. Epilepsy is a disorder characterized by recurrent seizures which are the result of a specific, immediate insult to the brain.
 - a. True
 - b. False

6. All patients require ALS transport for care given under the Seizure Standing Order?
 - a. True
 - b. False

7. When a patient has a simple partial seizure, they could experience a dreamy feeling or “déjà vu” with fumbling movement of their hands.
 - a. True
 - b. False

SAEMS Seizure STANDING ORDER TRAINING MODULE

8. Epilepsy is just one cause of seizures and is thought to be about 70% of all related seizures.
 - a. True
 - b. False
9. You arrive on scene for a 36 year-old male whose wife called 911 for what appeared to be a seizure. She states he does not have any medical problems or allergies and the seizure was a least 2 minutes long. The patient is unresponsive to your assessment; you place the patient on O2 with a NRB, start an IV of NS at TKO and obtain a blood glucose which reads 48. You give the patient 1 amp of D50 and then continue to follow the Seizure Standing Order and transport the patient to the closest appropriate hospital. You may use two different Standing Orders.
 - a. True
 - b. False
10. Standing Orders never require you to call for medical direction.
 - a. True
 - b. False
11. Immediate supportive care, both during and post seizure, includes all the following actions, except:
 - a. Protect patient from injury
 - b. Oxygen to keep O₂ SAT >90%
 - c. Finger stick blood sugar
 - d. Place restraints on patient to keep them from injuring you
12. Inclusion criteria for using the Seizure Standing Order include all the following, except:
 - a. Status Epilepticus or generalized seizure activity
 - b. Completely unresponsive and/or GCS<8
 - c. Postictal mental status
 - d. Focal seizure activity
13. The Standing Order for Seizures can be used on pregnant patients.
 - a. True
 - b. False
14. If the patient chooses to refuse treatment, you should let them and return to quarters without taking any further actions.
 - a. True
 - b. False
15. You arrive on scene for a 2 year-old female whose parents have reported a febrile seizure. Your assessment shows the patient postictal, respirations are 12, heart rate 100, pulse ox 96% and temperature 104 rectal. All these are treatments expect:

SAEMS Seizure STANDING ORDER TRAINING MODULE

- a. O2 15L blow-by
- b. IV of NS start bolus of 20cc/kg
- c. Obtain blood glucose
- d. Start cooling measures

SAEMS Seizure STANDING ORDER TRAINING MODULE

SAEMS EVALUATION FORM

EVALUATION

Please answer the following questions by marking the appropriate response:

	Lowest Worst Least				Highest Best Most
1. To what extent did this module meet your needed?	1	2	3	4	5
2. There was a balance between theoretical and practical information.	1	2	3	4	5
3. The time required was appropriate to content.	1	2	3	4	5
4. The module increased my knowledge and understanding of the topic.	1	2	3	4	5
5. References or audiovisuals were adequate.	1	2	3	4	5
6. Overall, this program was worthwhile.	1	2	3	4	5
7. Additional comments:					
