LTC Physician Information Tool Kit Series

American Medical Directors Association

Seizures

in the Long-Term Care Setting

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INTRODUCTION

Seizures are the third most common neurological disorder in older persons, exceeded only by cerebrovascular disease and dementia.[1] Seizures in elderly patients are often associated with injuries, especially falls and fractures, which may result in functional dependence, chronic pain, anxiety, depression, and impaired quality of life.

This information kit is intended to help the interdisciplinary team in the long-term care facility to:

- Become aware of the prevalence of seizures in the long-term care population.
- Identify the signs and symptoms of a seizure in an elderly long-term care patient.
- Determine which patients should undergo diagnostic evaluation for seizures.
- Manage seizures effectively and appropriately.
- Minimize overuse and inappropriate use of antiepileptic medications in the long-term care facility.

DEFINITION

Seizure disorders involve periodic disturbances of the brain's electrical activity, resulting in some degree of temporary brain dysfunction.[2] Seizures may cause symptoms such as altered cognition, blackouts, confusion, disturbance of sensation, and memory lapse. Some types of seizures may cause convulsions and loss of consciousness.

INCIDENCE OF SEIZURE DISORDERS IN ELDERLY PATIENTS

The incidence of seizure disorders increases with age. In persons over age 60, the incidence of seizure disorders is more than double that in the 40-59 age group. In the over-85 age group, the incidence of seizure disorders is more than three times that in the 65-69 age group.[3]

In the United States, the annual incidence of seizures is more than 100 per 100,000 persons aged 70 and over.[4] The Veterans Affairs Cooperative Study 428 showed that the incidence of seizures in patients aged 60 and older would be higher if underdiagnosis was taken into account and that the incidence of seizures in persons aged 75 and over may be 6-10 times higher than that in persons aged under 75.[5] About half of new-onset seizures occur in persons over age 60. The recurrence rate of untreated seizures is more than 90%.[5]

As the population ages, new-onset seizure disorders in older persons will be a significant and increasingly recognized problem.

CAUSES OF SEIZURES IN ELDERLY PATIENTS

Seizures are classified as follows[3]:

- **Idiopathic:** having no identifiable cause.
- **Symptomatic:** having an identified or suspected cause.
- **Cryptogenic:** having a suspected but not definitively identified cause.

Seizures are most commonly provoked by structural abnormalities (e.g., stroke, neurodegenerative disorders). Seizures may also be provoked by metabolic disturbances (e.g., hypoglycemia, hyponatremia, hypoxia), medication use or withdrawal,

or substance abuse.

In elderly patients, the most common cause of seizures is cerebrovascular disease, which accounts for 40% to 50% of new-onset symptomatic seizure disorders in the elderly.[3] According to the Epilepsy Foundation, 22% of elderly patients who suffer strokes will go on to develop a seizure disorder.[6] In addition to strokes, other acute cerebrovascular causes of seizures include subarachnoid hemorrhage, subdural hematoma, intracranial hemorrhage and head injury.[7] Other chronic brain conditions associated with seizures are degenerative dementias (e.g., Alzheimer's disease, Creutzfeldt-Jakob disease), brain tumors, and head injuries.

Seizures may be caused by toxic or metabolic conditions, most commonly from hypoglycemia and/or hyponatremia that are induced by diabetes, kidney or liver failure, and medication reactions. Alcohol withdrawal, electrolyte disturbances, hypoxia from cardiac causes, and infection also may provoke seizures. Table 1 lists commonly used medications that may either lower the seizure threshold or induce a seizure.

Seizures and Strokes

As previously noted, about 22% of elderly patients who suffer a stroke will subsequently develop a seizure disorder.[6] Seizures may be the first manifestation of otherwise unrecognized cerebrovascular disease.[9]

Cleary et al. found that patients aged over 60 who presented with a late-onset seizure with no apparent predisposing cause were at increased risk of stroke.[9] This suggests that seizures may be a manifestation of ischemic brain disease, which may lead to stroke.

Berges hypothesizes that patients who have had a stroke may develop a seizure disorder because their brains are "chronically injured by several morphological, physiological, and cellular parameters involved in aging."[10]

A hemorrhagic stroke is more likely than a thromboembolic stroke to produce an acute seizure. Aneurysms, arteritis, bleeding disorders, brain tumors, head injuries, and vascular damage may contribute to the occurrence of a hemorrhagic stroke.

Some seizures are caused by a transient ischemic attack (TIA) or thromboembolic stroke. Brain tissue may become hypoxic, swell, compress cerebral tissue, and result in a seizure during or after the acute event.

TABLE 1. Medications That May Be Associated With Lowered Seizure Threshold[7,8]

Antibiotics (especially quinolones and imipenem)
Anticholinesterases
Antidepressants (especially tricyclics and bupropion particularly at higher doses)
Aminophylline/theophylline
Antipsychotics
Baclofen
Cyclosporine
Hypoglycemic agents causing hypoglycemia
Levodopa
Opioid analgesics (especially fentanyl and meperidine)
Tramadol

Seizures that occur during or shortly after a stroke may be less likely than seizures that occur weeks or months following a stroke to predict the development of chronic epilepsy. In a large prospective international multicenter study involving 1,897 patients with acute stroke, late onset of the first seizure (>2 weeks following the stroke) was an independent risk factor for a seizure disorder after ischemic stroke, but not after hemorrhagic stroke.[11]

Seizures and Degenerative Dementia

Patients with dementia often have concomitant cerebrovascular disease, which (as discussed above) may cause seizures.[12] Alzheimer's disease (AD) is the most common cause of dementia in the elderly.[12] The prevalence of AD increases significantly after age 65. According to the Epilepsy Foundation, 10% of all AD patients develop a seizure disorder. New-onset nonsymptomatic seizures have been reported in 16% to 17% of patients with AD.[12] The frequency of seizures associated with other dementias (e.g., multi-infarct, Lewy body, frontotemporal, Parkinson's dementias) is less clear.

The diagnosis of a seizure disorder is difficult in patients with dementia. The symptoms of a seizure are easily confused with nonspecific symptoms of dementia. Patients with severe dementia are at risk for head injuries (unrecognized or recognized) and subdural hematomas, which are risk factors for seizures.

IMPACT OF SEIZURES ON ELDERLY PATIENTS

Patients who have had a seizure that has not been diagnosed and treated are at risk for additional seizures. Elderly patients who have had one seizure are highly likely to have another seizure if not treated.[13]

Seizure disorders in elderly patients are associated with anxiety, a decline in the ability to perform activities of daily living, depression, diminished cognitive function and self-esteem, falls and fractures, functional dependence, and increased social isolation. Seizures are associated with greater morbidity in elderly patients than in other groups.[14]

Older adults with seizure disorders may have a higher risk of developing progressive dementia; conversely, chronic seizures may have deleterious effect on cognitive function, resulting in functional dependence.[15] Older adults with seizure disorders have higher rates of hospitalization and mortality than older adults who do not have seizure disorders.[15]

TYPES OF SEIZURES

Seizures are of two types: **generalized** and **partial**.

- In a **generalized** seizure, abnormal electrical activity occurs in both brain hemispheres, producing symptoms that may range from subtle blinking and staring for a few seconds to convulsions and loss of consciousness.
- In a **partial** (or **focal**) seizure, the abnormal electrical activity is confined to a small area of the brain. Symptoms will vary depending upon the specific area of the brain that is affected. For example, if the seizure occurs in the brain's left parietal lobe, which controls the right side of the body, the right arm may begin to shake and jerk.[2,16]

Most seizures that occur in childhood and adolescence are generalized seizures, whereas new-onset seizures in the elderly are usually partial or focal seizures, which tend to occur in the frontal and parietal lobes.

Partial seizures may be further categorized as **simple** or **complex**:

- In a **simple partial seizure** (SPS), the patient is fully conscious and aware of the surroundings but may be confused.
- In a **complex partial seizure** (CPS), consciousness is impaired but not completely lost. Other symptoms of a CPS may include amnesia, confusion, repetitive behaviors, and staring. This is the most common type of seizure in elderly patients.[17] Outcomes are poorer for patients who have a CPS following a stroke.[18]

A partial seizure may spread over the course of several seconds and may secondarily become a generalized seizure such as a **tonic-clonic** (or **grand mal**) seizure. A tonic-clonic seizure may also be caused by a reversible toxic, metabolic, or iatrogenic cause. This type of seizure is generally characterized by complete loss of consciousness at onset and by convulsive movements in all limbs.

Metabolic or toxic etiologies are usually associated with generalized tonic-clonic seizures, whereas vascular or other circumscribed brain damage is most often associated with partial seizures with or without secondary generalization.[1]

An **aura** may precede a seizure. During this pre-seizure phase, the patient may experience unusual sensations and odd tastes and smells. An aura may be a simple partial seizure. Auras occur less commonly in the elderly than in younger patients, and, when they do occur, they are often nonspecific.[5]

Patients who are about to have a generalized tonic-clonic seizure may experience a prodrome (an early or premonitory symptom) instead of an aura. The prodrome may include such symptoms as anxiety, mood changes, and sleep disturbance.

PRESENTATION OF SEIZURES IN ELDERLY PATIENTS

Recognition of seizures in elderly patients can be challenging. In an elderly patient, a seizure may be either the first manifestation of a problem not previously recognized or the root cause of previous symptoms not understood. Older persons may be predisposed to seizures as a result of physiologic changes associated with aging, medication use, and comorbid conditions associated with seizures (e.g., cerebrovascular disease).[5]

Two-thirds of elderly patients who have a seizure disorder do not have convulsions.[13] Seizures caused primarily by vascular disease frequently present only with a lapse of consciousness.[13] Features of partial seizures–the type most commonly seen in the elderly population–are listed in Table 2.

Seizures usually last for a very short time (typically 2–5 minutes). A patient may have several seizures in one day.

The **postictal** state is the state that follows a seizure. This state may last for more than 24 hours and in some cases for several days or a week.[16] The postictal state generally lasts longer in elderly patients than in younger people and for this reason often has a significant impact on qualify of life. Some features of the postictal state are listed in Table 3.

The following steps should be considered when direct-care nursing staff notice any of the signs and symptoms of seizures listed in Table 2 or in the "Be a Seizure Detective" tool (Appendix 1), or when the Minimum Data Set (MDS) nursing assess-

TABLE 2. Features of Partial Seizures

- Altered mental status (e.g., disorientation, lapse of consciousness, memory disturbance, "tuning out," unexplained confusion, unresponsive staring into the distance)
- Chewing
- Disrobing
- Dizziness
- Falling
- Fear
- Incontinence
- Language difficulties
- Lip smacking
- Physical injuries (e.g., bruises, cuts, falls, fractures, tongue-biting)
- Staring
- Swallowing
- Temporary paralysis

TABLE 3. Some Features of the Postictal State[8]

- Confusion
- Disorientation
- Falling
- Headache
- Hyperactivity
- Incontinence
- Language difficulties
- Temporary paralysis
- Wandering

ment coordinator notices that many of the clues to a seizure in the MDS (Appendix 2) are present:

- Review the patient's risk factors for seizures.
- Verify the signs and symptoms noted by direct-care staff with nursing staff
- Alert the patient's practitioner that the patient may have a seizure disorder.

Because seizures are under-recognized in the elderly, the medical director or director of nursing may request a chart audit to find out how many patients are at risk for seizures. After this information has been collected, patient-specific audits may be conducted. Such an audit may include assessing whether the patient has symptoms of seizures such as bizarre behaviors, increased confusion, and temporary memory lapses.

DIAGNOSIS OF SEIZURES IN ELDERLY PATIENTS

For various reasons, seizures are often underdiagnosed in elderly patients. Clinicians and long-term care staff may be unaware of the incidence and presentation of seizures in the elderly. The occurrence of a seizure may not be witnessed and postictal symptoms are nonspecific enough to be misdiagnosed. Symptoms of a new-

onset seizure disorder in the elderly are often misdiagnosed as symptoms of comorbid conditions, especially if the symptoms are regarded as single events and not followed longitudinally.

Determining which patients should undergo diagnostic evaluation for seizures is based on clinical judgment and must be individualized according to the patient's life expectancy, goals of care, and the cause and severity of the patient's seizures. If the patient has a reasonable life expectancy and is willing to undergo invasive laboratory testing and other diagnostic procedures, a work-up may be justified. However, if the patient has very limited life expectancy and the burden of testing and treatment outweighs the potential benefits of testing and treatment, a full diagnostic evaluation may not be warranted. In patients with terminal or end-stage conditions, treatment of seizures may be considered if palliation is the goal of care.

EVALUATION OF A POSSIBLE SEIZURE IN A LONG-TERM CARE PATIENT INVOLVES SEVERAL STEPS:

STEP 1

Determine whether the event was a seizure or not. Determining whether an event was a seizure can be difficult because patients may present with a variety of episodic symptoms. Some symptoms of seizures in an elderly patient (e.g., altered mental status, bizarre behavior, confusion, hallucinations, and staring off into the distance) may be mistaken for symptoms of dementia (especially Lewy body variants). Symptoms such as aphasia, dizziness, and transient memory loss may be ascribed to syncope, TIAs, transient global amnesia, or vertigo. Blackouts or falls may not be recognized as symptoms of seizures. Temporary weakness, which often occurs after a seizure, may look like a stroke.

Equally, symptoms of other conditions (e.g., essential tremors, myoclonic movements, Parkinsonian symptoms) may be misinterpreted by clinical staff and reported as seizures.[19] Arrhythmias, breath-holding spells, movement disorders, psychological disorders, sleep disorders, syncope, and TIAs may be confused with seizures.[20] A TIA that includes "brief, involuntary, coarse, irregular, wavering movements of the extremity" may be mistaken for a seizure, especially when associated with confusion.[12]

To avoid a misdiagnosis, nursing staff must be careful to report a description of the patient's condition rather than a diagnosis. Practitioners, for their part, should learn to challenge a nurse's diagnosis of seizures if the clinical description is incomplete. They might begin by asking for a detailed description of the event and any preceding events.[19]

When new-onset seizures are suspected, practitioners should consider the appropriateness of hospitalizing the patient. Take into consideration the resident's age, stability, comorbidities, advance directives, and the preferences of the resident and family. Might the seizures be associated with a heart attack or stroke? Will the resident benefit from urgent evaluation? Some patients may have chosen treatment goals that emphasize relief of symptoms while maintaining function and possibly forgoing extensive evaluation and curative interventions. In such cases the most appropriate course may be not to transfer the patient but to intervene empirically to manage his or her symptoms.

STEP 2

Obtain information about events that may have precipitated the seizure. Patients, roommates, families, and nursing facility staff may be able to provide information about events precipitating the patient's seizure. It may be difficult to obtain information from an elderly patient who has moderate to severe Alzheimer's disease, but the patient's roommate may be capable of providing information. Learning how the patient acted before, during, and after the seizure may help to identify the type of seizure and the most appropriate treatment for it.

STEP 3

Obtain a medical history. The medical history should include a history of prior seizures, an exploration of risks and predisposing factors for seizures, and a complete medication history. Past diagnoses of seizures should be verified to the extent feasible to ensure that they are accurate. If the patient has a history of taking antiepileptic drugs (AEDs), investigate the reasons for the use of these medications. AEDs are increasingly being used to treat disorders other than seizures (e.g., migraines, mood disorders, peripheral neuropathy).

STEP 4

Perform a complete physical examination and, if appropriate, laboratory tests. In patients who present with suspected seizures of recent onset, the physical examination should focus on neurologic function. Laboratory studies (e.g., serum electrolytes, serum calcium and magnesium, serum glucose, renal function,) as well as electrocardiogram (ECG), electroencephalogram (EEG), and neuroimaging studies (computed tomography [CT], magnetic resonance imaging [MRI]) may be obtained. An ECG will help to determine the existence of a cardiovascular etiology for the suspected seizure. A CT or MRI scan may determine whether brain abnormalities support the diagnosis of a seizure.

The primary diagnostic tool for evaluation of a suspected seizure is the EEG, which examines epileptiform features to classify seizures accurately. It is important to note that a normal EEG does not rule out a seizure disorder, just as an EEG alone does not necessarily indicate the presence of a seizure disorder. The history must be consistent with a seizure, as the diagnosis of a seizure disorder is made on clinical grounds.

MANAGEMENT OF SEIZURES

In general, treatment of seizures should be based on the type of seizure and the patient's symptoms (e.g., uncontrolled limb jerking). However, the same factors that make the recognition of seizures challenging in the elderly–physiological changes associated with aging, medication use, and comorbid conditions associated with seizures (e.g., cerebrovascular disease)[5]–may also present challenges to the pharmacologic management of seizures.

Initial Treatment

When a patient is experiencing a seizure, the primary consideration is to protect the patient from harm. Remove from the area around the patient any objects that could present a hazard. Observe the patient carefully during the seizure because a

seizure that begins as an SPS may progress to become a CPS or a secondarily generalized seizure.

Speak quietly and calmly to the patient who is wandering or confused or whose consciousness is partially impaired (e.g., the patient is motionless or is staring into the distance) but who is able to react to emotional or physical stimulation. If the patient begins to scream, kick, disrobe, or make sexually suggestive movements, lead the patient gently to a private area.[21]

The Epilepsy Foundation suggests taking the following steps to protect the elderly patient who is having a generalized seizure with convulsions[6]:

- Gently place the patient into a reclining position on the floor or other flat surface.
- Place something soft and flat under the patient's head.
- Turn the patient gently onto one side to prevent choking and to keep the airway clear.
- If the patient is seated (e.g., in a wheelchair), turn the head gently to one side so that any fluids drain away from the mouth.
- Do not try to force anything into the patient's mouth. Seizures do not cause people to swallow their tongues.
- Do not give fluids or medicine until the seizure is completely over and the person is fully alert again.
- Do not try to restrain jerking movements because muscles contract with force during seizures and applying a restraint could tear a muscle or, in an elderly patient with fragile bones, break a bone.

The patient may be confused both during the seizure and during the post-seizure recovery period. It is important to be reassuring, comforting, and calm as the patient returns to full consciousness.

Treating the Causes of a Seizure

Treat the underlying conditions that may have precipitated a seizure. In older patients, identifying and treating conditions such as hypoglycemia, hyponatremia, hypoxia, and infections may help to prevent further seizures. Appropriate and thorough treatment of underlying disease is important in preventing conditions that may be associated with seizures. Be aware of medications and drug interactions that can promote seizures. Understand the effects that common conditions and the medications used to treat them may have on blood concentrations of AEDs.[22] (See ***Monitoring Patients Who Are Taking Antiepileptic Drugs***, p. 10.)

Treating Seizures With Antiepileptic Drugs

AEDs are commonly prescribed in long-term care facilities. Frequently a patient is taking an AED upon admission to the facility because of a history of seizures and the drug is continued. One study found that 7.7% of newly admitted residents were taking AEDs, of whom about 60% had a seizure indication; the others were taking an AED for neuropathic pain, behavior disturbance, migraines, bipolar disorder, or another diagnosis.[23]

New-onset seizures in elderly patients are often readily controlled by AEDs. In addition to efficacy, however, tolerability and potential side effects should be taken into account when considering whether to use an AED or which agent to use. Of the

three most commonly used AEDs in long-term care facilities (phenytoin, carbamazepine, and phenobarbital), phenobarbital has the highest incidence of side effects and generally should be avoided.[19] These three AEDs, along with valproate, are commonly referred to as first-generation AEDs. Second-generation AEDs were developed later and generally have fewer side effects, greater costs, and broader nonseizure indications (such as mania and neuropathic pain).

The Veterans Affairs Cooperative Study 428 assessed the efficacy and tolerability of three AEDs for new-onset seizures in patients 60 and over. The drugs studied were carbamazepine, a first-generation AED that is most commonly used to treat partial seizures, and two second-generation AEDs, gabapentin and lamotrigine. This study found no significant differences in efficacy among the three agents, but carbamazepine was associated with a larger number of adverse effects.[24] Bergey concludes that in this respect the newer AEDs introduced during the past decade offer advantages over older agents.[3]

Bergey notes that older AEDs may have pharmacokinetic disadvantages when used in elderly patients, who may be more sensitive to adverse effects. The normal range of therapeutic values may be too high and should be reduced in elderly patients (e.g., change phenytoin 5–20 mcg/dL to 5–15 mcg/dL). Bergey further notes that certain side effects (e.g., ataxia, cognitive changes, sedation, tremor, unsteadiness) may not be reported when they occur in elderly patients because they may be mistaken for symptoms of dementia or neurologic disorders.[3] Drug levels for newer AEDs are not well established and are of limited utility in determining either therapeutic levels or potential toxicity. Clinical observation and use of standard doses are more useful in making these determinations.

First-generation AEDs may promote osteoporosis by increasing the metabolism of vitamin D or by having other direct effects on bone. These agents are not recommended in elderly patients, especially those who have osteopenia or who are at high risk for osteoporosis due to immobility. If first-generation AEDs are prescribed to these patients, supplemental calcium and vitamin D should be given as well.[3]

Newer AEDs that are appropriate as first-line treatment for seizures in elderly patients include oxcarbazepine, gabapentin, and lamotrigine. These agents have fewer drug interactions and better side-effect profiles than the older antiepileptic

Table 4. Side Effects of AEDS

Older AEDs

Drug	Adverse Event
Phenytoin	Ataxia
Carbamazapine	Tremor, myoclonus, hyponatremia, cardiotoxicity, sexual dysfunction
Valproate	Tremor, encephalopathy, pedal edema
Phenobarbital	Connective tissue disorders, erectile dysfunction, sedation
Primidone	Connective tissue disorders, erectile dysfunction, sedation

Newer AEDs

Drug	Adverse Event
Gabapentin	Myoclonus, pedal edema, weight gain
Pregabalin	Similar to gabapentin
Lamotrigine	Dose- and titration-dependent rash
Topiramate	Renal stones, word-finding difficulties, paresthesia, weight loss, glaucoma, metabolic acidosis
Zonisamide	Renal stones, paresthesia, weight loss
Tiagabine	Encephalopathy, knee-buckling, spike-wave stupor
Levetiracetam	Sedation, behavioral changes
Oxcarbazepine	Hyponatremia

Adapted from Ramsay et al.[5]

drugs (see Table 4). Because of serious hematologic and hepatic side effects, felbamate is no longer generally recommended for use in older adults.[25]

With increasing age, most body organs undergo changes that may affect the pharmacokinetics of AEDs.[1] Increased drug sensitivity, altered drug metabolism, polypharmacy, inability to self-report symptoms, and comorbid conditions all make it more difficult to treat elderly patients optimally.[26] It is advisable to be aware of package prescribing guidelines: Start with a low dose of the AED, and increase the dose slowly to avoid toxic side effects. Tailor the treatment to the individual patient, giving consideration to the type of seizure and the side effects of the chosen drug.[1]

Treatment of seizures with AEDs is usually associated with improved quality of life if the patient can tolerate the medication. In some patients with dementia, treatment with standard doses of AEDs may worsen existing cognitive disorders. Low doses of AEDs may, however, help to control symptoms such as neuropathy and mood disturbance in patients with dementia.

Monitoring Patients Who Are Taking Antiepileptic Drugs

Carefully monitor all patients on AEDs, especially when starting therapy and when the patient's condition changes. All AEDs have multiple potential adverse effects, including ataxia, blood disorders, confusion, dizziness, liver damage, nausea, serious skin problems, somnolence, tremor, and visual disturbances.[19]

Concentrations of AEDs in the blood are frequently misunderstood and misinterpreted. At any dosage level, most AEDs can cause sedation and other side effects. Therapeutic ranges for the newer AEDS have yet to be firmly established, and for all AEDS clinicians should use blood level information only as a guide to therapy, not a goal of therapy. Many medications for other conditions can affect blood concentrations of AEDs, making it difficult to obtain concentrations that are consistent and accurate. Caregiving staff should be taught to focus on the patient's clinical condition and not to over-rely on serum concentrations.

Practitioners should assess in a timely fashion patients who are not responding to AED therapy or are experiencing adverse effects.

There are no specific guidelines for stopping AED therapy. If an older person has had unprovoked recurrent seizures, their risk for continued seizures is elevated. In that case, the clinician should aim for a dose that is effective that would cause minimal side effects. However, clinicians should reconfirm that patients on an AED have a true diagnosis of a seizure disorder. For example, when a patient has had a stroke, he or she may be put on an AED for prophylactic reasons; then admitted to the nursing home on the drug. As time goes by, there often is an assumption that the person has a seizure disorder and he or she remains on the drug unnecessarily. Clinicians new to the patient on an AED need to be sure there is an established diagnosis of epilepsy/seizure disorder. These types of patients should be reevaluated for the continuation of those drugs.

It is unclear whether the recommendation in younger patients to gradually reduce therapy after the patient has been seizure-free for 3-5 years is relevant in the elderly. Factors that are relatively predictive of seizure reoccurrence include an abnormal EEG, focal neurologic signs, head injury, mental retardation, neurologic abnormalities, severe epilepsy, and stroke.[22] If tapering is undertaken, it is generally deemed wise to taper by no more than about 20% every 4-6 weeks except in cases of medical urgency, such as neutropenia or thrombocytopenia.

Importance of Documentation in Seizure Management

Careful documentation is important in seizure management. Develop a treatment plan and note the risk of seizures on the patient's problem list so that other providers are aware of the diagnosis. Documentation should address assessment; the diagnosis of clinical problems; the development, communication, and implementation of the care plan; evaluation of the response to treatment; and revision of the care plan as needed.

Role of the Medical Director

Critical review of the use of AEDs and awareness of the potential risks of these agents are often lacking in long-term care. For this reason, the medical director may wish to educate facility staff about the benefits and risks of these agents, the rationale for their use in frailer residents, and issues associated with monitoring AED therapy. It may be helpful for the medical director to work in concert with the consulting pharmacist to review AED use to ensure appropriate dosing, drug selection, and monitoring for adverse effects and drug interactions.

The following are other key aspects of the role of the medical director in the management of seizures:

- Ensuring that processes are in place for facility staff to be trained to recognize, describe, and document a seizure.
- Reviewing the facility's nursing policies and procedures for addressing seizures to ensure that they are accurate and complete.

QUALITY ASSURANCE PROGRAM FOR RECOGNIZING AND MANAGING SEIZURES

Long-term care facilities should consider developing a quality assurance (QA) program that considers the steps of the care process as follows:

- **Recognition:** Identifying a history of seizures, risk factors for seizures, or signs and symptoms suggestive of seizures.
- **Assessment:** Clarifying the nature, causes, and impact of seizures on the patient.
- **Treatment:** Selecting and providing appropriate interventions (based on the underlying cause of the problem) to the patient.
- **Monitoring:** Reviewing the patient's response to treatment and deciding whether to continue, change, or stop interventions.

As part of a good QA program, it is important to educate all staff about the signs, symptoms, causes, consequences, and treatment of seizures as well as about the potential adverse effects of medications to treat seizures. The nursing staff should be alert for signs and symptoms of seizures and should know when to initiate an evaluation by notifying the attending practitioner or other health care provider that a patient is exhibiting signs or symptoms suggestive of seizures.

SUMMARY

Late-onset seizure disorders are a significant problem among patients in long-term care facilities. Substantial numbers of patients are at risk for seizures, especially if they have recently suffered a stroke or if they have degenerative dementia. Signs and symptoms of seizures are under-recognized and many patients do not receive the treatment they need. Seizures have a negative impact on the lives of elderly patients, leading to functional dependence and increased morbidity and mortality. Determining which patients should undergo diagnostic evaluation for seizures is based on clinical judgment and must be individualized according to the patient's life expectancy, goals of care, and the cause and severity of the patient's seizures. Treatment of seizures should be based upon the type of seizure and the patient's symptoms, with adequate monitoring of benefit and possible adverse effects.

REFERENCES

1. Kramer G. Epilepsy in the elderly: Some clinical and pharmacotherapeutic aspects. Epilepsia 2001; 42 (Suppl 3): 55–59.

2. Beers MH, Fletcher AJ, Jones TV, et al. The Merck Manual of Medical Information – Second Home Edition, Online Version. http://www.merck.com/mmhe/index.html.

3. Bergey GK. Initial treatment of epilepsy: Special issues in treating the elderly. Neurology 2004; 63 (Supplement 4): S41–S48.

4. Faught E. Epidemiology and drug treatment of epilepsy in elderly people. Drugs Aging 1999; 15: 255–269.

5. Ramsay RE, Rowan AJ, Pryor FM. Special considerations in treating the elderly patient with epilepsy. Neurology 2004; 62 (Suppl 2): S24–S29.

6. Epilepsy Foundation. Epilepsy and seizure statistics. Available at www.epilepsyfoundation.org/answerplace/statistics.cfm [accessed 2/14/2007].

7. Stephen LJ, Brodie MJ. Epilepsy in elderly people. Lancet 2000; 355: 1441–1446.

8. Sander JW, Tallis RC. Epilepsy and seizures in geriatric practice. In Epilepsy 2003: From Synapse to Society–A Practical Guide to Epilepsy. Sander JW, Walker MC, Smalls JE, eds. ILAE, Meritus Communications, 2003: 419–424.

9. Cleary P, Shorvon S, Tallis R. Late-onset seizures as a predictor of subsequent stroke. Lancet 2004; 363: 1184–1186.

10. Berges S, Moulin T, Berger E, et al. Seizures and epilepsy following strokes: Recurrence factors. Eur Neurol 2000; 43: 3–8.

11. Kelly KM. Poststroke seizures and epilepsy: Clinical studies and animal models. Epilepsy Curr 2002 November; 2(6): 173–177. http://www.pubmedcentral.nih.gov

/articlerender.fcgi?artid=321135.

12. Dove GH, Knopman DS. Seizures in the patient with Alzheimer's disease and rates of seizure freedom among second-generation antiepileptic drugs. Princeton Media Associates 2004; 3(5). Available at www.princetoncme.com/public/2004-79-5/report203.html [accessed 2/14/2007].
13. Schneider LS, Ramsay RE, et al. Uses of anticonvulsants in the elderly and long-term care. Ann Long-Term Care 2001; 9(8): 58–62.

14. Schachter SC. Management and treatment of epilepsy in the elderly. Ann Long-Term Care 2002; 10(6): 33–38.

15. Martin RC, Griffith HR, Faught E, et al. Cognitive functioning in community dwelling older adults with chronic partial epilepsy. Epilepsia 2005; 46(2): 298–303.

16. Resnick B. Seizures and epilepsy in the older adult. Medscape 2004. Available at www.medscape.com/viewarticle/493672 [accessed 2/14/2007].

17. Rowan AJ. Management of seizures in the elderly. Pharmacotherapy 2000; 20(8): 178S–184S.

18. Buscemi K. Embolic stroke linked with high risk of seizures and poor outcome. Neurology Reviews.com 2001; 9(7). Available at http://www.neurologyreviews.com /jul01/nr_jul01_stroke.html [accessed 2/14/2007].

19. Crecelius C, Levenson S. Use of antiepileptics for seizure disorders. Caring for the Ages 2003; 4(12): 4–9.

20. Beier MT, Horton AM. Epilepsy in the elderly: A comprehensive review of recognition and management. Ann Long-Term Care 1998; 6(6): 206–220.

21. Epilepsy.com

22. Lackner TE. Strategies for optimizing antiepileptic drug therapy in elderly people. Pharmacotherapy 2002; 22: 329–364.

23. Garrard J, Harms S, Hardie N, et.al. Antiepileptic drug use in nursing home admissions. Ann Neurol 2003; 53: 75–85.

24. Rowan AJ, Ramsay RE, Collins JF. VA Cooperative Study 428 Group. New onset geriatric epilepsy: A randomized study of gabapentin, lamotrigine, and carbamazepine. Neurology 2005 (Jun 14); 64(11): 1868–1873.

25. Rowan AJ. Reflections on the treatment of seizures in the elderly population. Neurology 1998; 51(5) suppl 4: S28–33.

26. Leppik IE. Epilepsy in the elderly. Rev Neurol Dis 2004; 1 (Suppl 1): S44–S55.

Further Reading

Bruni J. Epilepsy in the elderly. EAupdates 1996; 7(2). Available at http://www.epilepsytoronto.org/seniors.html [accessed 2/14/2007].

Kilpatrick CJ, Lowe AJ. Management of epilepsy in older people. J Pharm Pract Res 2002; 32(2): 110–114.

MacNeil JS. Epilepsy diagnosis often delayed in elderly. Medscape Medical News 2003. Available at www.medscape.com/viewarticle/465781 [accessed 2/14/2007].

Pathak M. Stroke and seizures. SAFE: Stroke Awareness for Everyone. Available at http://www.strokesafe.org/resources/stroke_and_seizures.html [accessed 2/14/2007].

Polvikoski T, Sulkava R, Myllykangas L, et al. Prevalence of Alzheimer's disease in very elderly people: A prospective neuropathological study. Neurology 2001; 56: 1690–1696.

APPENDIX 1.

Be a Seizures Detective – Part 1

Nonspecific Clues That Suggest the Presence of Seizures

One or more of the following clues may indicate the presence of seizures (although no single clue indicates with certainty that seizures are present). In patients with moderate to severe communication problems (e.g., aphasia, cognitive impairment, language barriers), it is important to observe and document these nonspecific clues and to seek further assessment for possible seizures if any clues are observed. These symptoms usually last a very short time (e.g., about 2 minutes) during a seizure; some symptoms may last for up to a week after a seizure.

- ❑ Altered mental state
- ❑ Convulsions
- ❑ Disorientation
- ❑ Disrobing
- ❑ Dizziness
- ❑ Falls
- ❑ Lapse of consciousness
- ❑ Language change (e.g., slurred speech, aphasia)
- ❑ Memory disturbance
- ❑ Unexplained confusion
- ❑ Unresponsive staring off into the distance
- ❑ Wandering

APPENDIX 2.

Be A Seizures Detective – Part 2

Possible Seizure Clues in the Minimum Data Set (MDS)-Version 2.0

The MDS may be used as a tool for detecting the presence of seizures. In addition to Section I (Disease Diagnoses), other elements of the MDS may provide clues indicating that the patient may have seizures or is at risk for seizures. To look for these hidden clues, study the patient's MDS and complete the following checklist. The checking of one or more items should prompt further investigation for the presence of seizures. (However, no single item conclusively indicates the presence of seizures.)

- ❑ Altered perceptions (B5)
- ❑ Change in cognitive status (B6)
- ❑ Wandering or disrobing (E4)
- ❑ Cerebrovascular accident (I1)
- ❑ Alzheimer's disease (I1)
- ❑ Falls (J4)
- ❑ Stability of conditions (J5)

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