EPILEPSY AND AGING

FOREWORD

Epilepsy and Aging

As the growing population of patients with epilepsy ages, so too do their treatment challenges. Not only are there increased risks associated with cognitive concerns, but with seizure frequency and fractures, as well. This digital format provides an engaging, interactive platform from which to read more about these treatment challenges and watch experienced clinicians provide their insight on the topic.

More about EPILOG

EPILOG is an epilepsy-focused disease awareness program offering the latest in evidence-based scientific data, current therapy issues, and expert insights. Our goal is to support you in your efforts to manage patients with epilepsy and optimize outcomes.

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Fostering Critical Dialog on Epilepsy

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AN INTRODUCTION
TO AGING AND EPILEPSY

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Epidemiology at a glance

Are the effects of aging on epilepsy patients a cause for concern? According to the Epilepsy Foundation, of the nearly 3 million Americans with epilepsy, 300,000 are over the age of 65.[1] What's more, the prevalence of the disease increases with age, and new-onset epilepsy is higher in those 65 years or older than in any others.[1] Still another telling statistic—3% of the population will be diagnosed with epilepsy by age 75 (vs approximately 1% the population by age 20).[1]

These trends are not unique to the United States. According to a large study on incidence and prevalence of epilepsy in the United Kingdom, the incidence of treated epilepsy trends upward in adults after age 60.[2]

ANNUAL INCIDENCE OF TREATED EPILEPSY BY AGE GROUP IN THE UK IN 1995[2]

Age Group (in years)	Incidence per 100,000 people (95% CI)
5-9	63·2 (50·5–79·1)
10-14	53·8 (42·4–68·3)
15-19	101·3 (84·4–121·5)
20-24	113·6 (97·0–133·0)
25-29	83·8 (70·7–99·2)
30-34	69·6 (58·0–83·5)
35-39	81·7 (68·0–98·0)
40-44	56·0 (43·0–71·1)
45-49	58·7 (46·8–73·4)
50–54	64·7 (51·6–80·8)
55–59	61·9 (47·7–80·5)
60–64	91·8 (73·3–114·8)
65–69	85·9 (68·5–107·3)
70–74	82·8 (65·0–105·2)
75–79	144·5 (116·9–179·2)
80–84	159·5 (125·2–202·6)
≥85	135·4 (100·4–178·7)
All ages	80·8 (76·9–84·7)

As the population ages, the number of elderly people with epilepsy is expected to rise.[3]

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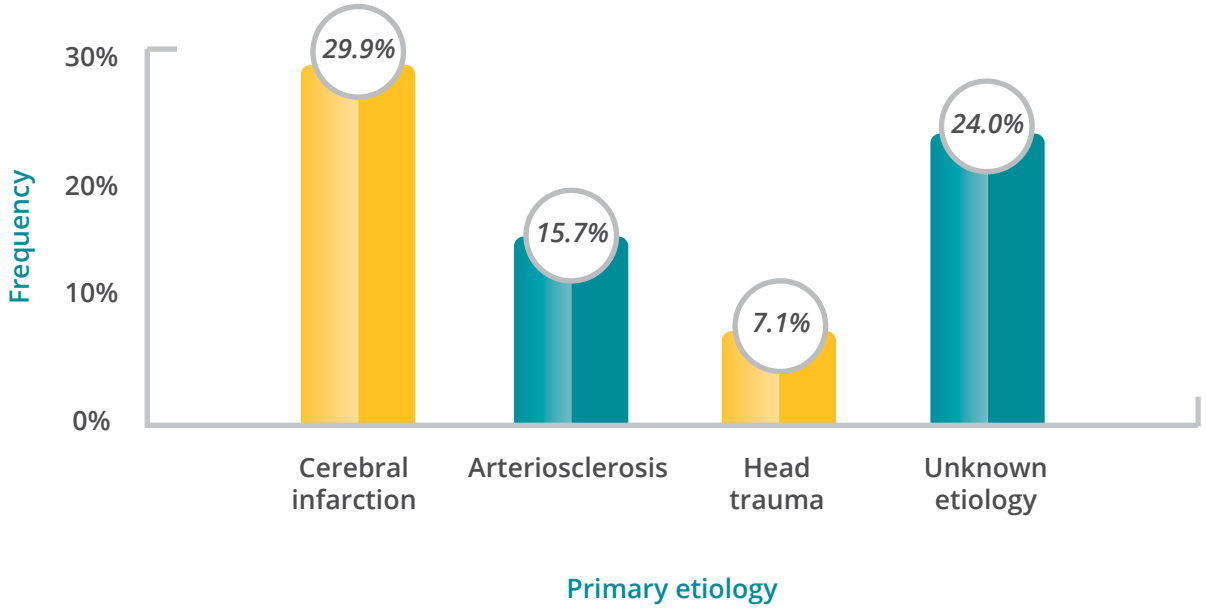
Etiology

The most common etiologic factor associated with newly diagnosed epilepsy in the elderly appears to be related to cerebrovascular disease.[4] As seen with epilepsy across all ages, a large portion of elderly patients have epilepsy of an unknown etiology.[4] The primary etiologies of new-onset geriatric epilepsy in the Veterans Affairs Cooperative Study (VACS) #428 are detailed in the figure below.

MOST COMMON ETIOLOGIES OF NEW-ONSET SEIZURES IN VACS #428 (N=592)[4]



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Diagnosing challenges

Diagnosing epilepsy in older patients can be more difficult than in younger patients.[5] Here's why:

- Seizures may be provoked (non-epileptic)[5]
- Obtaining a good history may be difficult[5]
- Seizures may be subtle complex partial events[5]
- Differentiation between epilepsy and syncope, in particular, in elderly patients can be difficult[2,3]

In a 2009 review of epilepsy in later life, Brodie suggests several clinical clues to the diagnoses of epilepsy in elderly patients, including loss or impairment of consciousness; involuntary movement or sensory disturbance of a limb, limbs or face without a loss of consciousness; and frequent falls with no recollection of how they happened.[3]

Elderly epilepsy patients had **somnolence scores 1.7 times greater than** controls.[6]

View more statistical data on epilepsy and aging

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Epilepsy impact on an aging population

In the last decade, there has been a growing awareness of the impact of epilepsy in older patients. Research suggests that the consequences of epilepsy have as important an impact in older adults as it does in younger adults.[3]

18% OF ELDERLY EPILEPSY PATIENTS MET THE SCREENING CRITERIA FOR DEPRESSION.[6]

++

View more insightful data regarding the impact of comorbidities on patients with epilepsy

One impact on elderly patients with epilepsy is that they may have a risk of social isolation due to fear of leaving the house alone or of the prospect of having a seizure in public.[3] In an Australian study of epilepsy patients ≥60 years old versus age-matched, healthy controls, health-related quality of life (HRQOL) and psychosocial functioning were significantly impaired in the epilepsy patients. Stigma was the strongest predictor of impaired HRQOL, possibly due to negative historical impressions of epilepsy.[7] Haut et al examined several well-known comorbidities associated with epilepsy that increase with age. Their study demonstrated that elderly patients with epilepsy had decreased mental status, higher rates of depression and anxiety, and poorer sleep health compared to age- and gender-matched controls.[6]

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Another impact is the association of epilepsy with Alzheimer's and dementia. Studies suggest a significant association between these conditions and epilepsy, as well as an age-accelerated risk of dementia in people with epilepsy as they age compared to persons with other medical conditions.[8]

Q: As people with epilepsy age, are they at increased risk of cognitive impairment versus people without epilepsy?

A: The risk of cognitive impairment and dementia increases with each decade of life.[9] This has a bidirectional effect on epilepsy; dementia increases the incidence of epilepsy – patients with dementia are more likely to develop seizures and epilepsy.[8] On the other hand, when patients are treated with AEDs, one of the most common side effects is cognitive impairment. This is compounded in the elderly when there is an underlying dementia or memory disorder.

Answer provided by Aatif M. Husain, MD, Program Director of the Clinical Neurophysiology Fellowship/Professor of Medicine, Division of Neurology, at Duke University Medical Center.

References: 8. Hermann B, Seidenberg M, Sager M, et al. Growing old with epilepsy: the neglected issue of cognitive and brain health in aging and elder persons with chronic epilepsy. *Epilepsia*. 2008;49(5):731-740. 9. Larson EB. Prospects for delaying the rising tide of worldwide, late-life dementias. *Int Psychogeriatr*. 2010;22(8):1196-1202.

Do you have a question about epilepsy treatment challenges?

Ask the experts and get answers to your own epilepsy questions

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Risks associated with epilepsy in aging patients

Falls, faints, and transient neurological attacks are all common reasons for elderly patients to present to emergency rooms or physician offices. Some of these individuals will have epilepsy.[3] Elderly patients with epilepsy are at risk for fractures from seizure- and antiepileptic drug (AED)-related falls and from epilepsy- and AED-related lowered bone mass.[10] In one retrospective study, elderly patients (over age 66) with new-onset epilepsy had a 52% hospitalization rate (vs 15% in elderly patients overall). In fact, the elderly new-onset epilepsy patients had an almost 5-fold increased relative odds of hospitalization and a 3-fold increased relative odds of psychiatric admission.[11]

Be part of the dialog and receive expert opinions to your questions about epilepsy

AN OVERVIEW
OF PHARMACOKINETICS AND PHARMACODYNAMICS

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As a patient ages, polypharmacy is a common issue regardless of whether he or she has epilepsy. Likewise, as a person with epilepsy ages, the development of **comorbid conditions** requiring medication in addition to current AEDs poses challenges for providers.[13]

In one study, **45.5%** of elderly veterans had potential for clinically significant **drug interactions** with their **AEDs**.[14]

View more statistical data on epilepsy and aging

Potential drug interactions are a concern for most physicians prescribing an AED. In a retrospective cohort study of veterans ≥66 years old with a new diagnosis of epilepsy, 45.5% of patients, nearly half, received an AED that interacted with an existing chronic medication. Common chronic drugs in the study with potential AED interactions were cardiovascular drugs, statins, and psychotropic drugs.[14]

Despite the potential severity of drug interactions involving AEDs, another study suggests that physicians are not selecting AEDs based on the likelihood of drug interactions. The authors suggest this may be due to a lack of awareness of the drug interactions or a fear of increased seizures as a consequence of switching AEDs.[15]

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Clinically Meaningful AED Drug Interactions (this is not a comprehensive list)[14]

Drug Class or Drug	Anticonvulsant	Interaction or Potential Outcomes
Cardiovascular drugs		
Disopyramide, mexiletine, and quinidine	CBZ, PHT, PB	Decreased antiarrhythmic concentrations
Propranolol, metoprolol	CBZ, PHT, PB	May require increase dosage of beta-blocker
Nifedipine, felodipine, and nimodipine	CBZ, PHT, PB	May nullify effects of the calcium channel blocker
Diltiazem	CBZ, PHT	Increase AED plasma concentration
Nimodipine	VPA	Increase plasma concentrations of nimodipine
Verapamil	CBZ	CBZ toxicity
Atorvastatin, fluvastatin, lovastatin, and simvastatin	CBZ, PHT, PB	May reduce statin efficacy
Ticlopidine	PHT, CBZ	CNS toxicity by elevated AED plasma concentration
Hematological agents		
Warfarin	CBZ, PHT	Decreased anticoagulant effect
Central nervous system agents		
Amitriptyline	CBZ, VPA	Increases metabolism of and reduces plasma concentration of amitriptyline
Bupropion, paroxetine	PHT, PB	Reduced plasma concentrations of the antidepressant
Nefazodone	CBZ	Contraindicated; CBZ toxicity and reduced effectiveness of nefazodone
Nortriptyline, clomipramine, and amitriptyline	PHT	Concurrent use can result in PHT toxicity
Nortriptyline, clomipramine	VPA	May inhibit metabolism of antidepressant causing elevated plasma concentrations
Chlorpromazine, clozapine, haloperidol, ziprasidone, olanzapine, quetipine, mesoridazine, risperidone	CBZ, PHT	Decreased antipsychotic plasma concentrations can result in therapeutic failure
Gastrointestinal agents		
Cimetidine	CBZ, PHT	AED toxicity
Sucralfate	PHT	Decreased phenytoin effectiveness
Omeprazole	CBZ, PHT	AED toxicity
Systemic anti-infective agents		
Erythromycin	CBZ, VPA	AED toxicity
Doxycycline	CBZ, PHT, PB	May reduce doxycycline effectiveness

Source: Patsalos and Perucca (2003).
AED = antiepileptic drug; CBZ = carbamazepine; PB = phenobarbital; PHT = phenytoin; VPA = valproic acid.

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Aging, epilepsy, and managing adverse events

Managing adverse events associated with certain AEDs can be another cause for concern in the elderly.

For example, some AEDs can be associated with cognitive impairment or sedation and may cause problems in older patients.[16] Additionally, normal physiologic changes associated with aging can play a role in AED pharmacokinetics. These changes can include hepatic or renal impairment and changes in gastrointestinal function (eg, altered gastric pH, gastric emptying rates, or internal transit times).[13]

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LISTEN TO THE PODCAST

Listen to Barry Gidal, PharmD, RPh, a Professor of Pharmacy and Neurology at the University of Wisconsin-Madison, School of Pharmacy and Department of Neurology and the Chair of the Pharmacy Practice Division, discuss Pharmacologic Concerns in Patients With Epilepsy as They Age.

"Pharmacologic Concerns in Patients With Epilepsy as They Age" audio commentary/ podcast with Dr. Barry Gidal

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Q: What are the core issues associated with epilepsy and aging that concern you most in your patients?

A: There are many issues about epilepsy in the aging population that must be considered. First, the diagnosis of epilepsy is more difficult in older patients.[2] In my experience, seizure semiology is different in the elderly, and often the seizures do not have the typical characteristics healthcare providers are used to associating with seizures. For example, tonic-clonic and focal clonic movements are much less common. Seizures are often misdiagnosed as strokes, TIA, altered mental status, encephalopathy and dementia, to name a few.

Antiepileptic drugs (AEDs) can have different effects on the elderly compared to younger patients.[4,13] Most medications are tested in younger patients and their effects on older patients are not known. My experience with older patients is that the absorption of medications may be different, the therapeutic dose range may be lower, and side effects manifest differently. Some side effects such as cognitive problems, dizziness and ataxia may occur more often. This makes using AEDs in these patients more challenging.

A diagnosis of epilepsy in the elderly can lead to significant psychosocial issues.[4] Loss of the ability to drive and reduced self-confidence may lead to greater social isolation. Psychiatric issues such as depression may occur from social isolation as well as from side effects of AEDs. Injuries and falls during seizures can lead to more morbidity than in younger patients and sometimes even mortality.

Answer provided by Aatif M. Husain, MD, Program Director of the Clinical Neurophysiology Fellowship/Professor of Medicine, Division of Neurology, at Duke University Medical Center.

Review more FAQS. Visit our FAQ Library and get answers to your own questions from epilepsy experts in the field.

ON TREATING
AGING WOMEN WITH EPILEPSY

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In the Women & Epilepsy section available at **epilog.us**, Dr. Cynthia L. Harden, Chief of the Comprehensive Epilepsy Care Center in New Hyde Park, NY, reviews the special considerations one must take into account when treating women with epilepsy. One of the aspects reviewed is treating women with epilepsy as they age. For these women, considerations include earlier onset of menopause, increases in seizure frequency in women with catamenial epilepsy during perimenopause and increased risk of osteoporosis.

LISTEN TO DR. HARDEN PROVIDE AN OVERVIEW OF WOMEN WITH EPILEPSY

"Women and Epilepsy"

DOWNLOAD THE COMPLETE WHITE PAPER

"Special Considerations for Women With Epilepsy"

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In addition, Dr. Harden presents a patient case study reflecting the issues for aging women with epilepsy in the following podcast.

"Issues for Aging Women With Epilepsy: Patient Case Presentation"

COMING SOON

Learn more about the gender-related issues affecting women with epilepsy

EPILEPSY
IN AGING VETERANS

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The landmark Vietnam Head Injury Study (VHIS) published data looking at the development of posttraumatic epilepsy decades after a head injury.[18] Dr. Aatif M. Husain, Professor of Medicine, Division of Neurology and Director of Clinical Neurophysiology Fellowship at Duke University Medical Center, reviews the data from this study and discusses other issues pertaining to veterans and epilepsy.

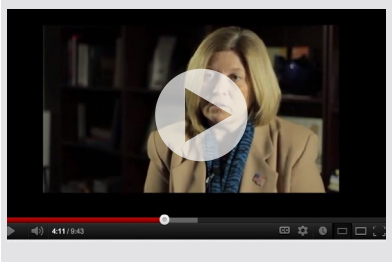
Read a white paper from Dr. Aatif Husain as he provides his insight on "Epilepsy in Aging Veterans."

Watch these captivating videos from YouTube on veterans with epilepsy

Part 1 of 3

Part 2 of 3

Part 3 of 3



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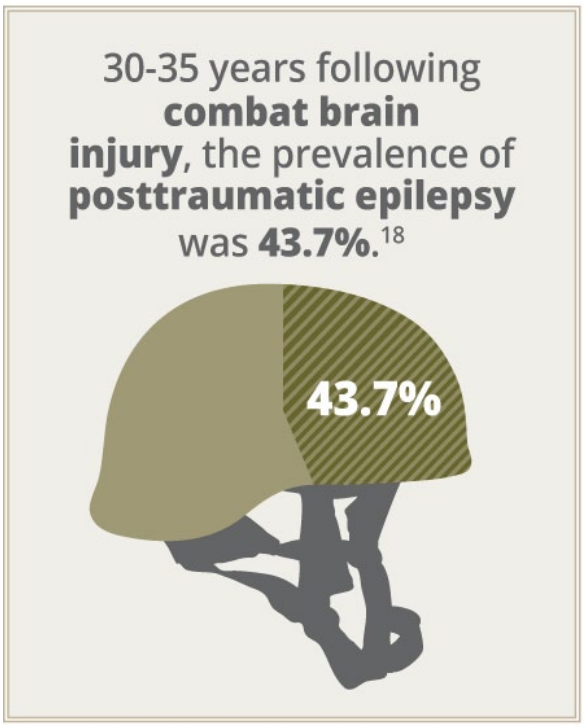

Read more about other comorbidities related to epilepsy

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Managing patients with epilepsy as they age

Epilepsy is most likely to develop later in life; and because patients are living longer, together with the influx of an aging baby-boomer population, it is expected that aging patients with epilepsy will have a significant impact on the healthcare system.

Cognitive impairment, potential drug interactions, comorbid conditions, and the risks of fractures from falls associated with seizures or AED adverse events are some of the many factors that will impact patients with epilepsy as they age.

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CONCLUSION

We hope you found our eBook on epilepsy and aging helpful and thought provoking as it applies to your practice. **For more questions and comments about this eBook, contact us at epilog.us.**

Visit epilog.us for more on aging with epilepsy and other epilepsy-related topics, including statistical data and FAQs.

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