Alzheimer's Seizure Risk Management Guide

An Evidence-Based Resource from Seagull Health's SeizureSafe™ Platform

Executive Overview

This guide provides senior living administrators and clinical leads with essential insights into the significant challenge of seizure management in residents with Alzheimer's Disease (AD). Seizures are notably more prevalent in individuals with AD, often presenting subtly and leading to under-recognition, which can accelerate cognitive decline and increase adverse events. Effective management, underpinned by specialized staff education and robust protocols, is critical for enhancing resident safety, ensuring quality of care, maintaining regulatory compliance, and mitigating organizational risk. This document translates key research findings into actionable strategies and operational considerations for your facilities.

1. The Scope of the Challenge: Seizures in Alzheimer's Disease

Understanding the prevalence and impact of seizures in residents with Alzheimer's Disease is fundamental for effective risk management and resource allocation within senior living communities.

1.1. Epidemiological Burden: A Significant Comorbidity

The link between Alzheimer's Disease (AD) and epilepsy is well-documented, with AD significantly increasing the risk of seizures.

- Patients with AD face a **2 to 17 times higher risk** of developing epileptic seizures compared to age-matched individuals without dementia (Imfeld et al., 2013; Scarmeas et al., 2009).
- Meta-analyses show a pooled seizure prevalence among patients with pathologically verified AD at **16%** (Subota et al., 2017), and for clinically diagnosed AD, the pooled incidence rate is approximately **8.4 per 1000 person-years** (Subota et al., 2017), markedly higher than in dementia-free elderly populations.
- Beyond clinically overt seizures, **subclinical epileptiform activity (SEA)**—electrical seizure activity without obvious physical symptoms—is also highly prevalent, with some studies reporting rates up to **42.4%** in AD patients undergoing prolonged EEG monitoring (Vossel et al., 2016). This indicates that neuronal hyperexcitability may be more widespread than clinically apparent seizures suggest.
- With the global population affected by AD projected to triple by 2050 potentially (Fiest et al., 2016), the associated burden of comorbid seizures will continue to

grow, demanding proactive strategies from care providers.

1.2. Clinical Impact: Beyond the Seizure Event

The consequences of seizures and subclinical epileptiform activity in residents with AD extend beyond the immediate event and can significantly affect their overall health and disease trajectory.

- **Accelerated Cognitive Decline:** A substantial body of evidence indicates that seizures and SEA are associated with faster cognitive decline and worse cognitive and functional outcomes in AD patients (Lam et al., 2020; Vossel et al., 2013; Vossel et al., 2016). Seizures may signify a more aggressive disease course.
- **High Recurrence Risk:** Once a seizure occurs, AD patients face an exceptionally high risk of recurrence. One study reported a seizure recurrence risk of **70.4% within 7.5 months** in AD dementia patients (Vöglein et al., 2020). This high recurrence is a critical factor in treatment decisions.
- **Increased Morbidity & Mortality:** Seizures can lead to falls, injuries (e.g., fractures, head trauma), aspiration pneumonia, and cardiac stress (Born, 2015). Mortality rates for older adults hospitalized due to seizures are significantly higher (Johnson et al., 2020).
- **Diminished Quality of Life:** Seizures and their aftermath, including prolonged postictal confusion, can severely impact a resident's quality of life and increase caregiver burden (Horváth et al., 2016).

2. Identifying and Understanding Risk

Proactive management requires identifying residents at higher risk and understanding the factors contributing to seizure occurrence.

2.1. Key Risk Factors for Seizures in AD

Several factors are consistently associated with an increased likelihood of seizures in individuals with AD:

- **Younger Age at Dementia Onset:** Early-onset AD (typically before age 65) carries a markedly higher seizure risk, potentially up to 87-fold greater for those with onset between 50-59 years (Scarmeas et al., 2009; Vöglein et al., 2019).
- **Dementia Severity and Duration:** Increasing severity and longer duration of AD are generally linked to a higher probability of seizures (Amatniek et al., 2006).
- **Male Sex:** Some studies have identified male sex as an independent risk factor (Scarmeas et al., 2009).
- **Genetic Factors:**
    - Autosomal dominant AD (ADAD) caused by mutations in *PSEN1, PSEN2*, and

APP genes, or *APP* duplication, carries a significant seizure risk (20-66%) (Cortini et al., 2018; Cabrejo et al., 2006).
    - The *APOEε4* allele, a major genetic risk factor for AD, is also associated with an increased risk for epilepsy (Scarmeas et al., 2009).
- **Biomarkers:** Increased CSF total tau levels have been linked to seizures in AD (Nous et al., 2024).
- **Acute Symptomatic Triggers:** Transient factors can provoke seizures, including infections (e.g., UTIs, pneumonia), metabolic disturbances (e.g., hypoglycemia, electrolyte imbalances), toxins, or drug-related causes. Certain medications, including some antipsychotics (e.g., clozapine, quetiapine) used in dementia care, may lower the seizure threshold (Adan et al., 2021; Mauritz et al., 2022).
- **Other Neurological Comorbidities:** A history of stroke, traumatic brain injury, or encephalitis also increases seizure risk (Adan et al., 2021).
- **EEG Findings:** Focal epileptiform findings on an EEG may predict future clinical seizures (Lam et al., 2020).

2.2. Diagnostic Challenges: The Need for Vigilance

Diagnosing seizures in residents with dementia is notoriously challenging due to several factors:

- **Subtle and Non-Convulsive Presentations:** Seizures often manifest atypically, without dramatic convulsions. Signs can include brief staring spells, sudden changes in awareness or responsiveness, episodic confusion, increased drowsiness, new-onset clumsiness, or repetitive non-purposeful movements (automatisms) (Palop & Mucke, 2009; Kang, 2021).
- **Overlap with Dementia Symptoms:** These subtle signs can be easily mistaken for the resident's baseline dementia symptoms, behavioral disturbances, or other common geriatric conditions like syncope or delirium (Kinney et al., 2017).
- **Communication Barriers:** Residents with advanced dementia may be unable to report pre-seizure auras or post-seizure symptoms.
- **Limitations of Standard EEG:** Routine scalp EEG has low sensitivity for detecting intermittent or deep focal epileptiform activity common in AD. More specialized and prolonged monitoring (LTM-EEG, video-EEG) is often required but is less accessible (Faught, 2021; Cretin et al., 2017).

Operational Implication: Given these challenges, a high index of clinical suspicion among all care staff, coupled with structured observation and documentation protocols, is paramount for timely identification and referral.

3. Strategic Management Principles for Senior Living Leadership

Effective seizure management in AD is a multifaceted endeavor requiring a proactive, evidence-informed approach integrated into facility operations.

3.1. Antiseizure Medication (ASM) Considerations

While ASMs are the primary treatment, specific guidelines for their use in AD are lacking. Decisions require careful clinical judgment.

- **Individualized Approach:** Treatment should be individualized, considering seizure type and frequency, potential drug interactions, comorbidities, patient/family preferences, and quality of life (Cretin, 2021).
- **High Recurrence Risk:** Unprovoked seizures in AD have a high recurrence rate, often warranting ASM consideration (Vöglein et al., 2020). However, minor seizures with minimal impact may not always require medication.
- **Acute Symptomatic Seizures:** Focus on treating the underlying trigger; chronic ASM therapy may not be needed (Mauritz et al., 2022).
- **Choice of ASM:** Newer generation ASMs like levetiracetam (LEV) and lamotrigine (LTG) are generally preferred due to better tolerability and fewer cognitive side effects in older adults, though robust RCT data in AD is limited (Cretin, 2021; Liu & Wang, 2021). Medications with significant cognitive side effects (e.g., some older ASMs, benzodiazepines for chronic use) should generally be avoided (Cretin, 2021).
- **Start Low, Go Slow:** Initiate ASMs at low doses and titrate slowly, monitoring for efficacy and adverse effects.
- **Potential Disease Modification:** Preclinical research suggests some ASMs (e.g., levetiracetam) might positively influence AD pathology by reducing neuronal hyperexcitability, but this needs more clinical validation (Palop et al., 2007; Lehmann & Barker-Haliski, 2023).

3.2. The Imperative of Structured Programs & Protocols

A systematic approach within the facility is crucial for effective seizure risk management:

- **Specialized Staff Training:** Implement comprehensive, ongoing training for *all levels of care staff* focusing on:
  - The increased seizure risk in dementia.
  - Recognition of diverse seizure types, especially subtle and non-motor presentations specific to dementia.
  - Appropriate first aid and emergency response protocols tailored for older

adults with cognitive impairment.
    - Detailed post-seizure care and monitoring.
    - Accurate and timely documentation procedures.
- **Standardized Documentation Tools:** Utilize standardized forms like the "SeizureSafe™ Initial Alert Card," "Subtle Seizure Signs Observation Checklist," and "Seizure Event Documentation Form." These tools ensure consistent and thorough data collection, which is vital for clinical assessment and regulatory compliance.
- **Clear Communication Pathways:** Establish and maintain robust communication channels between direct care staff, nurses, physicians, and families regarding suspected or confirmed seizure activity.
- **Regular Protocol Review:** Periodically review and update seizure management protocols based on the latest evidence and facility-specific data.

4. Future Directions and Continuous Improvement

The understanding and management of seizures in AD is an evolving field.

- **AI in Diagnostics:** Research into AI applications for analyzing EEG and MEG data holds promise for more accurate and earlier detection of epileptiform activity (West et al., 2022).
- **Novel Therapeutics:** Ongoing research aims to identify disease-modifying treatments targeting shared pathophysiological mechanisms between AD and epilepsy, such as neuronal hyperexcitability (Lu et al., 2023).
- **Clinical Trials:** There is a significant need for more robust clinical trials, including RCTs, to establish clear guidelines for ASM use and other interventions in AD patients with seizures.

Strategic Implication for Leadership: Staying informed about these advancements will be important for future planning and adoption of new best practices. Fostering a culture of continuous learning and quality improvement, supported by data from well-documented observations and interventions, will be key.

Conclusion: A Call for Proactive Seizure Risk Management

The co-occurrence of seizures and Alzheimer's Disease presents a substantial clinical and operational challenge for senior living organizations. A proactive, evidence-based approach to seizure risk management is essential—encompassing specialized staff education, vigilant observation for subtle signs, standardized documentation, appropriate clinical response, and strategic use of resources. By implementing comprehensive programs like SeizureSafe™, leadership can significantly enhance resident safety, improve quality of life, ensure regulatory compliance, and mitigate

organizational risks. This commitment addresses a critical care need and reinforces a culture of excellence in dementia care.

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