U.S. Department of Veterans Affairs
Epilepsy Centers of Excellence

Safety in the Epilepsy Monitoring Unit

Epilepsy Center of Excellence
Nursing Workgroup
2023

Learning Objectives

- Discuss what LTM/VEEG is and its risks and benefits
- Explain different seizure types
- Describe the optimal Epilepsy Monitoring Unit (EMU) environment for patient safety
- Discuss what to do when a patient is having a seizure
- Discuss a post-seizure assessment

What is Video EEG Monitoring (LTM/VEEG)?

- Continuous video-EEG recording of a patient with disabling events to evaluate for change in electrical brain activity during those events
- Monitoring is done in an inpatient unit over a period of days

Why Do We Need Video-EEG Monitoring (LTM/VEEG)?

- Localize seizure origin
- Diagnose psychogenic non-epileptic seizures (PNES)
- Identify and characterize seizures
- Determine appropriate treatment

Risks of LTM/VEEG

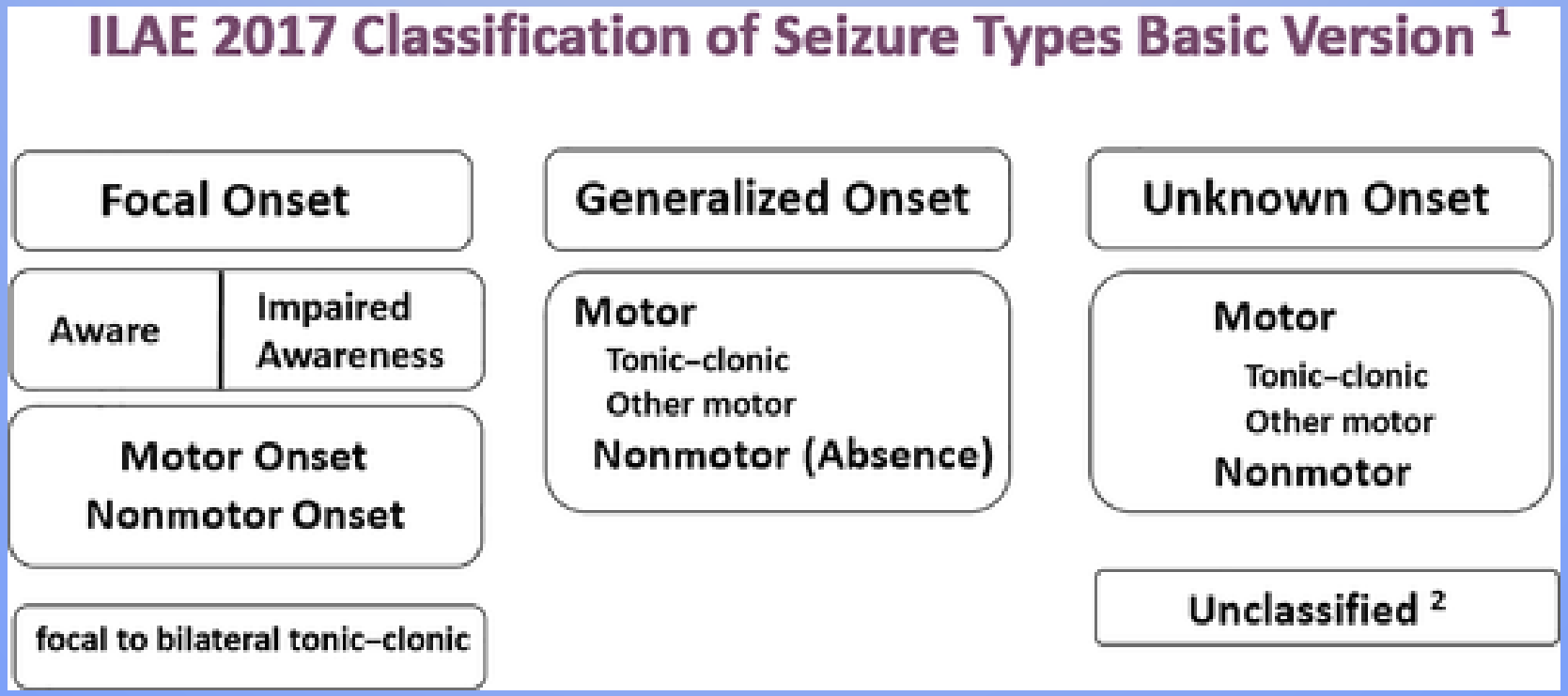
- Morbidity during LTM
  - 9% (n = 44) of 507 patients who underwent VEM had 53 adverse events
  - These included postictal psychosis, panic attacks, status epilepticus, falls with minor injuries, falls with fractures, a fall with an epidural hematoma, and fractures without falls

Dobesberger et al, 2011

Benefits of LTM/VEEG

- Study by Lee et al. (2009) concluded:
  - Changes in diagnosis – 41%
  - Management change – 40%
- Benefits of LTM outweigh the risks
  - However, risks emphasize the need for diligent nursing care to ensure safety

Seizure Classification



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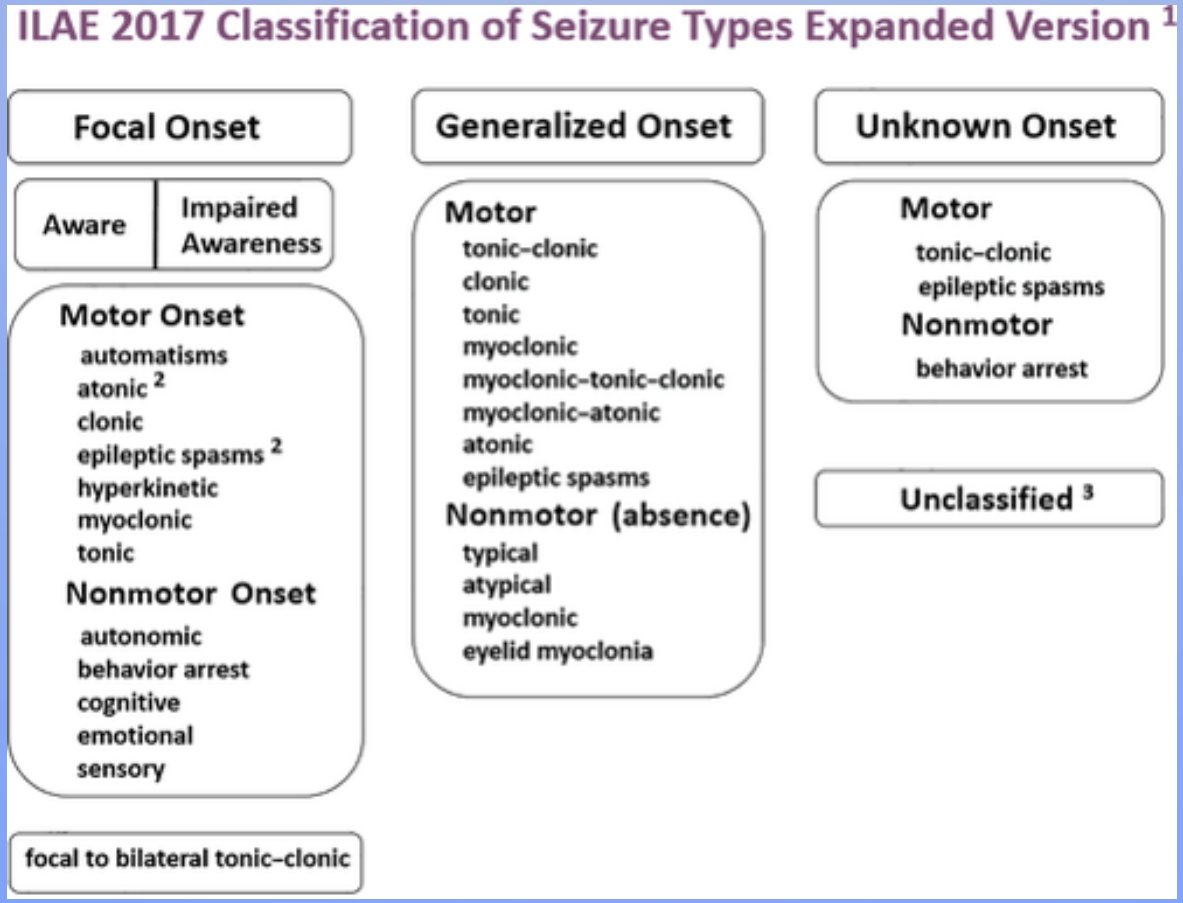

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Focal Seizures

- **Without** impaired awareness
  - Seizure begins in one part of the brain
  - Can involve sensory, motor, autonomic, or psychic phenomena
  - Patient remains alert and oriented

Focal Seizures

- **With** impaired awareness
  - Formerly called complex partial seizures
  - Seizure begins in one part of brain but can evolve into a bilateral tonic clonic seizure

Generalized Seizures

- Seizure begins in both sides of the brain
- Currently categorized as:
  - Motor
  - Non motor (absence)
- Previously categorized into several major types:
  - Generalized (Motor and Absence)
  - Tonic
  - Clonic
  - Myoclonic
  - Atonic (such as drop attack)

Psychogenic Non-Epileptic Seizures

- Events that resemble a seizure but are not caused by abnormal electric discharges in the brain
- 21-25% of all admissions to EMU
- ECoE have various treatments including Cognitive Behavioral Therapy

Salinsky et al, 2011 and Chen et al, 2017

Goal of LTM/VEEG

- Capture patient's typical disabling events/seizures
- Provoke the disabling events/seizures by tapering anti-epileptic medications in a controlled environment.
  - Patients may be subjected to sleep deprivation, hyperventilation, or photic stimulation
- Characterize types of seizures
- Determine surgical candidates
- Determine medication adjustments

EMU Environment: Patient Room

- Room is clear of clutter
- Nurse light and alarm within patient reach
- Low bed height
- Bed rails padded
- Side rails up and padded
- Suction canister with Yankauer suction tip
- Oxygen ready with new nasal cannula
- OOB with assistance
- Saline lock PIV
- Nonskid footwear
- Patient in full view of camera when in bed
- Posted description above the bed of what to do if patient has seizures
- Bathroom door cracked open with nurse doing constant verbal contact

EMU Environment: Bathroom

- Bathrooms are a high risk area for falls
- Out-swinging design of doors
- Curtain instead of door
- Padded sink edges and toilet seats
- Use of assistive rails
- "Bird baths"
  - Bath at the beside with warm washcloth and soap or wipes

Clinical Roles in the EMU

- EMU nurse
  - Obtains admission history
  - Ensures patient safety during EMU stay and during events/seizures
  - Performs and documents patient neuro assessments after events/seizures
  - Review the safety plan with patient at each encounter

Beniczky, S. et al, 2016

Clinical Roles in the EMU

- EEG technologist
  - Monitors EEG recording for correct reading
  - Ensures that EEG equipment is working correctly
  - Communicates with nursing staff about possible events/seizures on EEG or video
  - Reviews EMU safety standards with patient at each bedside encounter

Clinical Roles in the EMU

- Neurologist
  - Interprets EEG
  - Determines treatment plan with input of EMU team
  - Discusses Medication taper with Nursing staff and medical team
  - Communicates daily with EEG Techs/Nurses any new treatment plans

What to Do During a Seizure

- Press the seizure alarm button as soon as possible in order to mark the event on the EEG
- Press the nurse call button to alert staff
- Try to prop on their side, & pillow support his/her back
- Note the time when seizure began
- Avoid standing between the patient and camera
- Remove sheets off of patient for camera
- Verbalize any activity that is not easily seen on camera
- Start patient seizure assessment

What to Do During a Generalized (motor) Seizure

- Patients having a generalized seizure are at high risk for injury
- Roll patient to the side to protect their airway
- Administer oxygen by protocol
- Do not place anything in the patient's mouth during the seizure
- IV Benzodiazepine per institutional protocol
- Suction any secretions from mouth after seizure has stopped
- Notify the MD

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Seizure Response and Rescue Medications

- The best seizure responses happen when the EMU is prepared and has protocols in place, such as:
  - MD available in house
  - Rescue medication and route are readily available
  - Good communication with team

Seizure Response and Rescue Medications

- Outline of a competent protocol:
  - Customized orders
  - Treatment parameters
  - When to call physician
  - IV benzodiazepines use per order
  - Maximum benzodiazepine dosage specified until evaluated by MD at the bedside (or per your institution's parameters)

Intracranial Electrode Safety

- Voluntary restraints or one-to-one sitter
- Ambulation with assistance
  - In some EMUs, no ambulation is allowed
- Bedpan use only
- Secure extra wiring to avoid falls
- Monitor for signs of infection
- Neurological checks documented per orders

Patient Seizure Assessment

- Ask “Are you OK?”
- Ask an orientation question
  - For example, “Where are you right now?”
- Ask a memory question
  - Please repeat the phrase “black cat.”
  - Ask the patient to remember the phrase after the seizure is over
- Ask the person to do a motor command with each limb
  - “Please hold up 3 fingers.”
  - Be sure to repeat the motor command on the other side of the body for comparison of 2 sides
- Ask to identify an object

Patient Seizure Assessment

These questions are repeated by protocol (usually every 15 minutes) until the patient returns to baseline.

Documentation of Seizure

Even though the EEG and video are recording the seizure, nothing substitutes for an eyewitness account of the seizure.

Rheims & Ryvlin, 2014

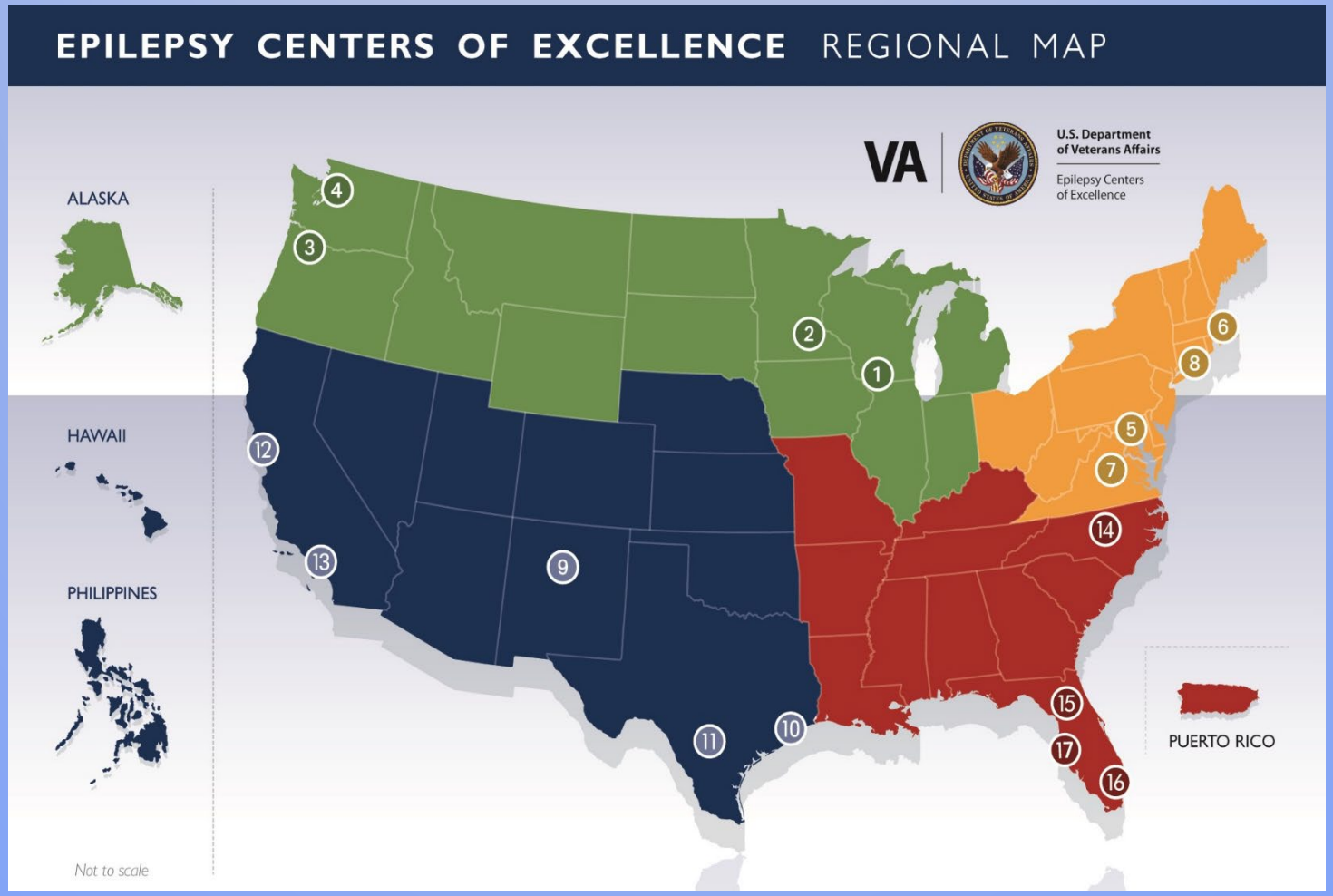
Documentation of Seizure

- Use standardized “Seizure Assessment ” note in CPRS if available
  - Date/time of seizure
  - Warning signs per patient’s report
  - Aura, if any
  - Description of seizure and postictal phase
  - Duration of seizure

Takeaway Points

- Safety first!
- Trained staff is essential
- Reassure patient (and caregiver)
- Accurate documentation of seizure
- Team communication

Rheims & Ryvlin, 2014



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