Safety in the Epilepsy Monitoring Unit
Learning Objectives

• Discuss what VEM is and its risks and benefits
• Explain different seizure types
• Describe the optimal 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 (VEM)?

- 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 (VEM)?

• Essential diagnostic tool, especially when a standard EEG is not clear in localizing where in the brain the patient’s seizures initiate

• Gold standard in providing a diagnosis of psychogenic non-epileptic seizures (PNES)

• Identify and characterizes seizures

• Helps determine the appropriate treatment for the patient
Risks of VEM

• Morbidity during VEM
  – 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 a epidural hematoma, and fractures without falls

Dobesberger et al, 2011
Benefits of VEM

• Study by Lee et al. (2009) concluded:
  – Changes in diagnosis – 41%
  – Management change – 40%

• Benefits of VEM outweigh the risks
  – However, risks emphasize the need for diligent nursing care to ensure safety
Seizure Classification

In 2010 the International League Against Epilepsy updated the classification of seizures. The 3 categories of seizures are now:

- Focal seizures
  - With and without impaired awareness
- Generalized seizures
- Psychogenic non-epileptic seizures
## Seizure Classification

<table>
<thead>
<tr>
<th>Current Terms (April 2010)</th>
<th>Previous Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focal</td>
<td>- Simple Partial, Focal Motor</td>
</tr>
<tr>
<td>Focal with impaired awareness</td>
<td>- Complex Partial, Psychomotor Temporal Lobe</td>
</tr>
<tr>
<td>Generalized</td>
<td>- Tonic Clonic, Grand Mal</td>
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<tr>
<td></td>
<td>- Petit Mal, Absence</td>
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</table>
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

• Categorized into several major types:
  • Generalized tonic clonic
  • Tonic
  • Myoclonic
  • Absence
  • Atonic
Psychogenic Non-epileptic seizures

• Patients experience events that resemble a seizure but the events are not caused by abnormal electric discharges in the brain
• Most likely psychological in origin
• Important to diagnosis PNES in order to treat the patient appropriately
Goal of VEM

• Capture patient’s typical disabling events
• Provoke the disabling events by tapering anti-epileptic medications in a controlled environment
• Patients may also be subjected to sleep deprivation, hyperventilation, or photic stimulation to provoke seizures
EMU Environment: Patient Room

- Room is clear of clutter
- Nurse light and alarm within patient reach
- Low bed height
- Bed rails padded
- Suction canister with yankauer suction tip
- Oxygen ready with new nasal cannula
- OOB with assistance
- Saline lock PIV
- Bed rails up when in bed
- Nonskid footwear
- Patient in full view of camera when in bed
- Posted description above the bed of what to do if patient has seizures
EMU Environment: Bathroom

• Bathrooms are high risk area for falls
• Outswing 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 seizures
  – Performs and documents patient neuro assessments after seizures
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 seizure events on EEG
Clinical Roles in the EMU

• Neurologist
  – Interprets EEG
  – Determines treatment plan with input of EMU team
What to do during an event

• 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
• Note the time when seizure began
• Avoid standing between the patient and camera
• Remove sheets off of patient
• Verbalize any activity that is not easily seen on camera
• Start patient seizure assessment
What to do during a tonic clonic seizure

- Patients having a generalized seizure are at high risk for injury
- Roll patient to their side to protect their airway
- Administer oxygen by protocol
- Do not place anything in the patient’s mouth when they are actively seizing
- Suction any secretions from mouth after seizure has stopped
- Notify the MD
Seizure Response and Rescue Medications

- The best seizure response happens when the EMU is prepared and has protocols in place
- MD available in house
- Rescue medication readily available
- PRN IV benzodiazepine order in place
Seizure Response and Rescue Medications

• Outline of a competent protocol:
  – Customized orders
  – Treatment parameters
  – When to call physician
  – 24 hour limit on IV benzodiazepines
  – Ward capabilities and limitations
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
• Frequent neurological checks
Patient Seizure Assessment

• Ask if the patient is 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
  – “Please hold up 3 fingers.”
  – Be sure to repeat the motor command on the other side of the body for comparison of 2 sides
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.
Documentation of Seizure

• Use standardized “Seizure Assessment” note in CPRS
  – Date/time of seizure
  – Aura, if any
  – Description of seizure and postictal phase
  – Duration of seizure
Takeaway Points

• Safety first!
• Reassure patient
• Accurate documentation of seizure
References


• Faminu, Olujimi. (March 2012). Safety in the Epilepsy Monitoring Unit. West LA VAMC – Epilepsy Center of Excellence