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**EMRA/FERNE  
ED Clinical Policies Session:  
Optimizing the Care of  
ED Patients with  
Neurological Emergencies**

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**Optimizing Seizure and  
SE Patient Management:  
Seizure Therapies  
Clinical Policy Review**



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**A Seizure/SE  
Patient Case**

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## Patient EMS Data

- 50?? yo male John Doe
- Generalized tonic-clonic seizure
- Chicago Fire Department
- Diazepam 5 mg IM, 15 mg IV
- Seizure continuous for 15 minutes +
- EMS to ED

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## Patient Clinical History

- Unknown meds
- Unknown medical history
- Hx Needs surgery next month ??
- EtOH ??
- Does not appear to be homeless
- Accucheck 119

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## ED Presentation

- Facial and shoulder twitching R
- Pt with gurgling BS
- Nasopharyngeal airway
- No evidence of trauma or toxicity
- IV access in neck
- Seizure x minutes

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### Clinical Policy: Critical Issues in the Evaluation and Management of Adult Patients Presenting to the Emergency Department With Seizures

*Policy statements and clinical policies are the official policies of the American College of Emergency Physicians and, as such, are not subject to the same peer review process as articles appearing in the journal. Policy statements and clinical policies of ACEP do not necessarily reflect the policies and beliefs of Annals of Emergency Medicine and its editors.*

This clinical policy was developed by the ACEP Clinical Policies Committee and the Clinical Policies Subcommittee on Seizures. For a complete list of all clinical policies, visit [www.acep.org/clinical\\_policies](http://www.acep.org/clinical_policies).


This clinical policy focuses on critical issues in the evaluation and management of adult patients with seizures. The medical literature was reviewed for articles that pertained to the critical questions posed. Subcommittee members and expert peer reviewers also supplied articles with direct bearing on this policy. This clinical policy focuses on 6 critical questions:

- What laboratory tests are indicated in the otherwise healthy adult patient with a new-onset seizure who has returned to a baseline normal neurologic status?
- Which new-onset seizure patients who have returned to a normal baseline require a head computed tomography (CT) scan in the emergency department (ED)?
- Which new-onset seizure patients who have returned to normal baseline need to be admitted to the hospital and/or started on an antiepileptic drug?
- What are effective phenytoin or fosphenytoin dosing strategies for preventing seizure recurrence in patients who present to the ED after having had a seizure with a subtherapeutic serum phenytoin level?

6/5 x 11/0


## New Onset Sz: Lab Testing

- What lab tests are indicated in the otherwise healthy adult patient with a new onset seizure who has returned to a baseline normal neurological status?
- (Outcome measure: abnormal lab that changes management)

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## New Onset Sz: Lab Testing

- Level B recommendations:
  - Determine a serum glucose and sodium on patients with a first time seizure with no co-morbidities who have returned to their baseline
  - Obtain a pregnancy test in women of child bearing age
  - Perform a LP after a head CT either in the ED or after admission on patients who are immuno-compromised

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### New Onset Sz: Neuroimaging

- Which new onset seizure patients who have returned to a normal baseline require neuroimaging in the ED?
- (Outcome measure: abnormal CT)

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### New Onset Sz: Neuroimaging

- Level B recommendations:
  - When feasible, perform a head CT of the brain in the ED on patients with a first time seizure
  - Deferred outpatient neuroimaging may be utilized when reliable follow-up is available

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### New Onset Sz: Dispo/AED Use

- Which new onset seizure patients who have returned to normal baseline need to be admitted to the hospital and / or started on an AED?
- (Outcome measure: short term morbidity or mortality)

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### New Onset Sz: Dispo/AED Use

- Level C recommendations:
  - Patients with a normal neurological examination can be discharged from the ED with outpatient follow-up
  - Patients with a normal neurological examination and no co-morbidities and no known structural brain disease do not need to be started on an anti-epileptic drug in the ED

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### Sz/SE: Phenytoin Loading

- What are effective phenytoin dosing strategies for preventing seizure recurrence in patients who present to the ED with a sub-therapeutic serum phenytoin level?
- (Outcome measure: short term seizure recurrence)

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### Sz/SE: Phenytoin Loading

- Level C recommendation:
  - Administer an intravenous or oral loading dose of phenytoin or intravenous or intramuscular fosphenytoin, and restart daily oral maintenance dosing.

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## Sz/SE SE Therapeutics

- What agent(s) should be administered to a patient in status who continues to seize despite a loading dose of a benzodiazepine and a phenytoin?
- (Outcome measure: cessation of
  - motor activity)

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## Sz/SE SE Therapeutics

- Level C recommendation:
  - Administer one of the following agents intravenously: “high-dose phenytoin,” phenobarbital, valproic acid, midazolam infusion, pentobarbital infusion, or propofol infusion.

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## Sz/SE: EEG Monitoring

- When should an EEG be performed in the ED?

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## Sz/SE: EEG Monitoring

- Level C recommendation:
  - Consider an emergent EEG for patients suspected of being in non-convulsive SE or in subtle convulsive SE, for patients who have received a long-acting paralytic, or for patients who are in a drug-induced coma.

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## ACEP Summary

- Evidence based clinical policies are useful tools in clinical decision making
- Policy does not create a “standard of care”
- Provides a foundation for clinical practice at a national level

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## ACEP Summary

- The current literature does not support the creation of any “level A” recommendations
  - 2 of the 6 clinical questions have sufficient evidence to support “level B” recommendations
  - 4 of the 6 recommendations are “level C”

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## Postscript

- What does the policy tell us, and how does it help us?
- What is relevant years later?
- Why should we care?

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## New Onset Seizure Patients

- Normal mental status
- Individualized care
- No risk
- Do the right thing
- Optimize patient outcome

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## Phenytoin Loading

- Choose a method that is useful
- Individualized care
- No risk
- Do the right thing
- Optimize patient outcome

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## Phenytoin Loading

- Some implications with use
- May impact long term AED choice over the short term
- This is a secondary concern
- Document partial seizure onset
- Inform the neurologist

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## Refractory SE

- Benzodiazepines optimized
- Second drugs equal in efficacy
- Some choose general anesthesia
- Burst suppression
- IV midazolam, IV propofol

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## EEG Use

- To diagnose subtle SE
- When pt sedated, intubated
- Non-responsive without sedation
- Schedule for the ICU ASAP
- Duty of the neurologist and institution to provide this diagnostic test in a timely manner

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## This Clinical Policy

- This policy creates value for the practitioner
- No liability in variability, as long as something happens according to plan in support of the patient
- Your lawyers (and you) will be helped the most by reviewing and using this policy

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## Subsequent Policies

- 1993 EFA SE Guidelines in JAMA
- ~2000 attempt to revise using evidence only (class I data)
- Only one publication, NEJM, VA cooperative study
- Proposes benzodiazepines, then it is dealer's choice, more or less
- No revision to data

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## Big Picture

- It's time to review the clinical policy
- There are no new data to support our clinical care or the policy
- Industry pressures
- Exception to informed consent
- NETT is one source of optimism
- There will be no change in our treatment paradigm

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## What Should You Do?

- Read the clinical policy
- Look at the clock when a seizing patient arrives, and look again
- Know what meds you should use, and how to get them in a timely manner
- Know if your institution has a policy or guideline that directs your care

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## ED Patient Outcome

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## ED Patient Management

- Lorazepam 2 mg IVP x 5 over 10 minutes
- Persistent facial and R shoulder activity
- AMS: generalized seizure continues
- Fosphenytoin 1 gram PE over 10 min x2
- Seizure ended, pt remained obtunded
- Intubation immediately followed
- Lidocaine, sux, rocuronium

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## ED Diagnostic Evaluation

- Non-contrast CT: Prior strokes, atrophy
- Metabolic tests normal
- Toxicology screening negative
- Phenytoin level cancelled
- Diagnoses:
  - AMS
  - Status Epilepticus
  - Respiratory Failure

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## Family Arrives, Pt History

- Pt with history refractory seizures
- Hx carotid artery occlusion R
- Due for carotid endarterectomy
- Phenobarbital & dilantin, compliant
- Prior history of SE treated at UIC
- No recent illness, trauma, EtOH
- No medic alert bracelet

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## Patient Outcome

- EEG in ED, within 150 minutes
- Neuro consultation, no subtle SE
- Admit to Neuro ICU
- Repeated doses of rocuronium
- Final disposition for carotid Rx

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## Conclusions

- Status epilepticus: medical emergency
- Few hospitals utilize a SE protocol
- SE protocol improves patient outcome
- Guidelines exist that facilitate practice
- New useful medications exist

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## A Proposed Protocol

- 0-20 min: Initial evaluation and benzos
- 20-40 min: Fosphenytoin infusions
- 40-60 min: Phenobarbital infusion, (valproate, levetiracetam infusions??)
- 60-90 min: Continuous infusion AEDs
- 90-120 min: CT, neuro consult
- 120-150 min: ICU, EEG monitoring

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## Questions?

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