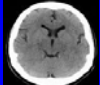



**Putting it All Together with Seizure Clinical Policies:  
Making Good Clinical Decisions & Improving ED Seizure Patient Care**

Edward P. Sloan, MD, MPH, FACEP

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Seizure Patient Care**



Edward P. Sloan, MD, MPH, FACEP



**FERNE/EMRA  
Session**

**Chicago, IL  
May 18, 2007**

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**Disclosures**

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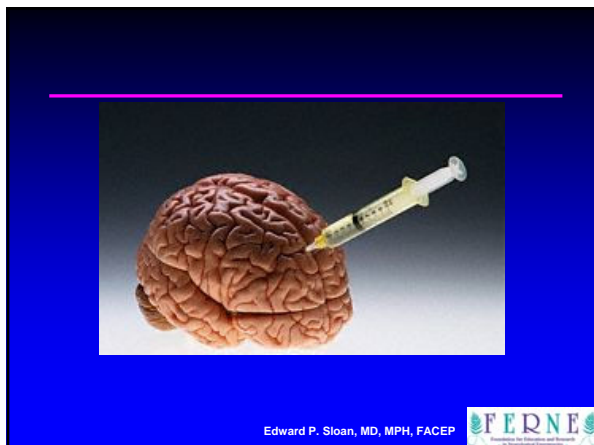
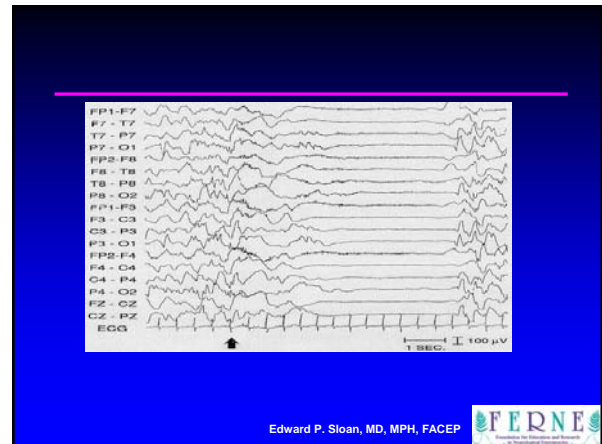
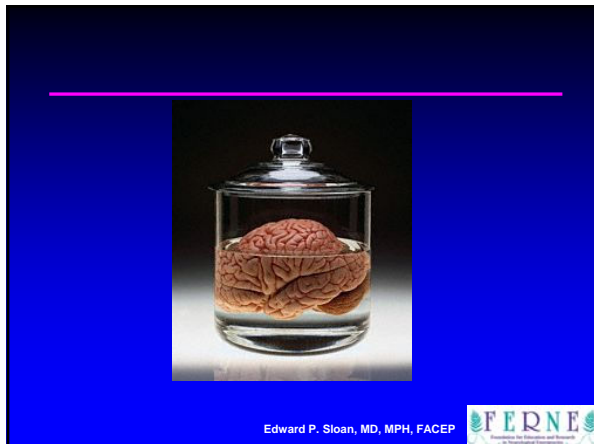


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- ### Global Objectives
- Maximize patient outcome
  - Utilize health care resources well
  - Practice good medicine
  - Optimize evidence-based medicine
  - Enhance Emergency Medicine practice
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- FERNE  
Federation for Education and Research in Neurology and Epileptology

- ### What Do We Have?
- Two clinical policies
  - Policies address clinical issues
  - Limited conclusive recommendations
  - A search for clinical relevance
  - A need to know
  - People who care
- Edward P. Sloan, MD, MPH, FACEP
- FERNE  
Federation for Education and Research in Neurology and Epileptology


## What Do We Know?

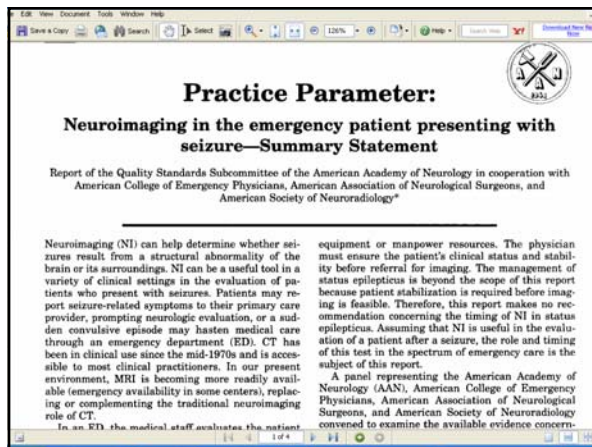
- We learn by the oral tradition
- We know what someone has told us
- On the job training maximized
- Do one, see one, teach one

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## What Do We Know?

- Our references are Internet-based
- Google is not always the answer
- Evidence-based medicine is standard
- Knowledge transfer (KT) is in
- Profound limits to these efforts exist

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**Practice Parameter:**  
**Neuroimaging in the emergency patient presenting with seizure—Summary Statement**

Report of the Quality Standards Subcommittee of the American Academy of Neurology in cooperation with American College of Emergency Physicians, American Association of Neurological Surgeons, and American Society of Neuroradiology\*


Neuroimaging (NI) can help determine whether seizures result from a structural abnormality of the brain or its surroundings. NI can be a useful tool in a variety of clinical settings in the evaluation of patients who present with seizures. Patients may report seizure-related symptoms to their primary care provider, prompting neurologic evaluation, or a sudden convulsive episode may hasten medical care through an emergency department (ED). CT has been in clinical use since the mid-1970s and is accessible to most clinical practitioners. In our present environment, MRI is becoming more readily available (emergency availability in some centers), replacing or complementing the traditional neuroimaging role of CT.

In an ED, the medical staff evaluates the patient equipment or manpower resources. The physician must ensure the patient's clinical status and stability before referral for imaging. The management of status epilepticus is beyond the scope of this report because patient stabilization is required before imaging is feasible. Therefore, this report makes no recommendation concerning the timing of NI in status epilepticus. Assuming that NI is useful in the evaluation of a patient after a seizure, the role and timing of this test in the spectrum of emergency care is the subject of this report.

A panel representing the American Academy of Neurology (AAN), American College of Emergency Physicians, American Association of Neurological Surgeons, and American Society of Neuroradiology convened to examine the available evidence concern-


## First Time Seizure

- **Emergent Neuroimaging:**
  - Suspect structural lesion
    - New focal deficits, Persistent altered mental status, fever, trauma, headache, cancer, anticoagulation, HIV/AIDS
  - Age over 40
  - Partial-onset seizure

Heather Prendergast, MD, FACEP 


## Epilepsy with Recurrent Seizure (s)

- **Emergent Neuroimaging :**
  - Suspect structural lesion
    - New focal deficits, Persistent altered mental status, fever, trauma, headache, cancer, anticoagulation, HIV/AIDS
  - New seizure type or pattern
  - Prolonged postictal confusion
  - Worsened mental status

Heather Prendergast, MD, FACEP 

## What Do You Need to Know?

- Liberal cranial CT neuroimaging is key
- There may be instances where this is not the standard or indicated in order to improve ED seizure patient care
- This is of limited importance clinically

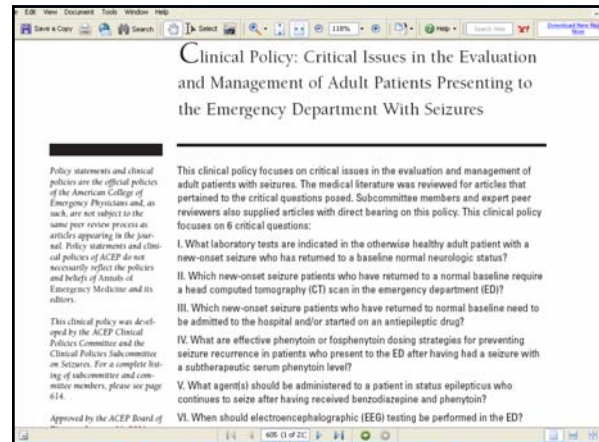
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## What Do We Need?

- Not much related to cranial CT per se
- No clinical policy will change clinical practice for this clinical question

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## What Lab Testing?

Level A recommendations. None specified

Level B recommendations.

1. Determine a serum glucose and sodium level....
2. Obtain a pregnancy test if a woman is of childbearing age
3. Perform a LP, after a CT, either in the ED or after admission, on immunocompromised pts

Level C recommendations. None specified

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## What Do You Need to Know?

- Liberal lab testing is useful in the ED
- We determine problem etiologies for the patient, the consultants, and the primary care providers
- Casting a net widely is our standard
- This is not the place to “save money”

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## What Do We Need?

- Not much
- No new information will likely change clinical practice for this clinical question

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## CT Neuroimaging?

Level A recommendations. None specified

Level B recommendations

1. When feasible, perform neuroimaging of the brain in the ED on pts with a first-time seizure
2. Deferred neuroimaging may be used when reliable followup is available.

Level C recommendations. None specified

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## What Do You Need to Know?

- Liberal cranial CT neuroimaging is key
- This policy protects you if a cranial CT must be delayed and follow-up is secured
- Must document that acute CT neuroimaging is NCI “not clinically indicated”

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## What Do We Need?

- More information on MRI indications
- This test will be requested and will increase health care costs
- It is uncertain whether this increased expenditure will improve patient care

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## Admission, AED Initiation?

Level A recommendations. None specified.

Level B recommendations. None specified.

Level C recommendations.

1. Patients with a normal neurologic examination can be discharged from the ED with outpatient followup.
2. Patients with a normal neurologic examination, no comorbidities, and no known structural brain disease do not need to be started on an AED in the ED.

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## What Do You Need to Know?

- When in doubt, admit +/- start an AED
- You do not have to admit unless the patient's clinical evaluation is not likely or there is significant SE risk
- AEDs are initiated in order to reduce SE risk and to manage potential long-term seizure complications
- This is a complex issue

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## What Do We Need?

- More information on short-term seizure recurrence risk and SE risk
- More guidance on those situations that increase risk such that admission and/or AED use is of benefit
- A greater working knowledge of how neurologists address this issue

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## Phenytoin Loading?

Level A recommendations. None specified

Level B recommendations. None specified

Level C recommendations.

Administer an intravenous or oral loading dose of phenytoin or intravenous or intramuscular fosphenytoin, and restart daily oral maintenance dosing.

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## What Do You Need to Know?

- What is the risk of your pt population?
- How does your ED system work best?
- Can you use phenytoin safely?
- What are the particulars of the use of fosphenytoin in seizure and SE patients?

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## What Do We Need?

- Studies that address the different phenytoin loading strategies
- Information of fosphenytoin use in SE
- More education regarding optimal fosphenytoin use

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## Status Epilepticus Rx?

Level A recommendations. None specified.

Level B recommendations. None specified.

Level C recommendations.

Administer one of the following agents intravenously: "high-dose" phenytoin, phenobarbital, valproic acid, midazolam infusion, pentobarbital infusion, or propofol infusion.

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## What Do You Need to Know?

- How to provide the SE AED drugs?
- What is your institutions SE protocol?
- How does your ED system work?
- Can you quickly order and administer a series of AEDs?
- Which AEDs might work best for which SE patients?

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## What Do We Need?

- Studies that address the different AEDs that could be used in SE
- More education regarding optimal SE protocols and AED use in SE patients

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## ED EEG Testing?

Level A recommendations. None specified.

Level B recommendations. None specified.

Level C recommendations.

Consider an emergent EEG in patients suspected of being in nonconvulsive SE or in subtle convulsive SE, patients who have received long-acting paralytic, or patients who are in drug-induced coma.

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## What Do You Need to Know?

- What is subtle SE and when must it be detected clinically?
- Can you get an EEG in your ED?
- When is it the standard of care regarding EEG use in order to maximize SE patient outcome?
- Could you identify SE on a two channel or full EEG ?

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## What Do We Need?

- Studies that address the use of EEG patients with AMS and suspected subtle SE
- Studies that examine EEG caps, telemetry, and two channel EEGs
- More information on optimal EEG utilization in the ED

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## Conclusions

- Despite our best efforts and intentions, the medical literature, KT, and evidence-based medicine are not the major drivers of clinical practice and the standard of care
- We must be skilled and current
- We must know what we need to know

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## Recommendations

- Read every clinical policy you can get your hands on from [www.acep.org](http://www.acep.org)
- Use [www.guidelines.gov](http://www.guidelines.gov)
- Ask every clinically useful question you can think of to every person with whom you work
- Answer these questions in order to improve ED seizure pt care, outcome

Edward P. Sloan, MD, MPH, FACEP



## Conclusions

ACEP practice parameter defines role and timing of emergency management of seizures  
Largely based upon Class II and III evidence  
Many simple questions without answers

Edward P. Sloan, MD, MPH, FACEP



## Questions?

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