


How Do We Evaluate, Treat, and Disposition New Onset Seizure Patients?

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Question 1

A 25 year old female with no known medical problems has a generalized tonic clonic seizure that lasts 3 minutes. After a short postictal period, she returns to her baseline, feels well, has a normal physical and neurologic exam. Which of the following laboratory tests is/are indicated?

- A. Pregnancy test, glucose, lytes
- B. Drug of abuse screen
- C. Mg, Ca, PO4
- D. A, B, and C
- E. A and C

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Question 2

Which of the following is not a strong indication for a neuroimaging study in the ED?

- A. New onset seizure
- B. Focal neurologic examination
- C. Age over 50
- D. History of cancer
- E. Prolonged postictal period

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Question 3

CT and EEG help to risk stratify those patients with new onset seizures who should be started on an AED

- True
- False

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Question 4

Which of the following patients with a new onset seizure should be admitted to the hospital?

- A. All patients with new onset seizures
- B. Patients with new focal neurologic deficits
- C. Patients with known cardiovascular dx
- D. All of the above
- E. B and C

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New Onset Seizures

- 5% - 6% of the population will have at least one seizure during their lifetime
- Diagnostic work-up in the ED depends on the clinical exam and co-morbidities
- Etiologies of first time adult seizures (age group dependent and co-morbidity dependent (eg HIV):
 - Chronic alcohol consumption (30-60 year olds)
 - Cerebral vascular insults (>60 year old)

Tardy. Adult first generalized seizure. Am J Emerg Med 1995;13;1-5 Retrospective. 247 patients

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What laboratory tests are indicated in the ED evaluation of a patient with a new onset sz?

- ACEP Clinical Policy. Ann Emerg Med 1997; 29:706
 - Patients with a normal exam and no co-morbidities: Glucose level, electrolytes, and pregnancy test
 - Consider a drug of abuse screen
 - Patients with co-morbidities require more extensive testing
 - CPK and prolactin levels are of limited value in the ED

Turnbull. Utility of laboratory studies in the ED in patients with a new onset sz. Ann Emerg Med 1990; 19:373-377. Prospective. 136 patients)

Nypaver. ED laboratory evaluation of children with seizures: Dogma or dilemma? Ped Emerg Care 1992; 8:13-21. Retrospective 308 patients)

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Lumbar Puncture

- A LP in the ED is not indicated if the patient:
 - Is not immunocompromised
 - Has returned to baseline
 - Has no fever or meningeal signs
- There are no cases reported of meningitis presenting as a simple tonic clonic seizure
- Postictal pleocytosis (>5 polys in the CSF) has been reported in 2 - 18% of patients who have had a GTCS

Pesola G, Westfal R. New onset generalized seizures in patients with AIDS presenting to an ED. Acad Emerg Med. 1998; 5:905-911. Retrospective review, 26 patients

Green S, Rothrock S, Clem K, Zurcher R, Mellick L. Can seizures be the sole manifestation of meningitis in febrile children? Pediatrics 1993; 92:527-534. Retrospective. 503 cases

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Neuroimaging: Head CT and MR

- Three per cent to 41% of patients with a first time seizure have an abnormal head CT
- Imaging is dependent on the urgency of the evaluation and patient stability
- Literature interpretation depends on outcome measure used

Tardy. Adult first generalized seizure: etiology, biological tests, EEG, CT scan, in an ED. AJEM. 1995; 13:1-5. Retrospective review. 247 patients.

Henneman P, DeRoos F, Lewis R. Determining the need for admission in new-onset seizures. AEM 1994; 24:1108-1114. Retrospective. 294 patients).

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Neuroimaging in New Onset Seizures

- ACEP, AAN, AANS, ASNR. Practice Parameter: ED neuroimaging in the seizure pt. Ann Emerg Med 1996; 27:114-118. Evidence based practice guideline
 - Emergent CT for patients with altered mental status, trauma, focal exam, immunocompromise, fever, co-morbidity
 - Patients who are alert with a nonfocal exam can have an outpatient study
- Focal abnormalities on CT are reported in up to 40% of patients with new onset seizures; up to 20% have non-focal exams
- MRI is better than CT in detecting subtle lesions (e.g., hippocampal sclerosis) but impact on care is controversial

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Treatment and Disposition

- Decision to admit or to initiate AED treatment depends on the risk of recurrence
 - Etiology and EEG are the strongest predictors
 - Recurrence risk in the first 24 hours is up to 23% in patients with a focal lesion and 9% in patients with a first time seizure of undetermined etiology (Tardy: study has many flaws)
- No prospective studies exist; no outcome studies

Hauser. Seizure recurrence after first seizure. Neurology 1990; 40:1163

Tardy. Adult first generalized seizure: etiology, biological tests, EEG, CT scan, in an ED. AJEM. 1995; 13:1-5. Retrospective review. 247 patients.

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Treatment and Disposition


- Management must be coordinated with a neurologist or primary care provider
- Patients needing immediate AED treatment can be loaded with intravenous phenytoin or valproic acid
- Decision to admit depends on the assessed risk of recurrence, patient compliance and social circumstance

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Recommendations

- **Class A:** None specified.
- **Class B:**
 1. Perform a lumbar puncture either in the emergency department or after admission in patients with a first time seizure with HIV disease following a head CT.
 2. Determine a serum glucose and electrolytes on patients with first time seizure with no co-morbidities who have returned to their baseline.
 3. Obtain a pregnancy test if a woman is of child bearing age.
 4. Perform a Neuroimaging of the brain in the emergency department on patients with a first time seizure. If Neuroimaging of the brain is not available in the emergency department, discuss the risk of recurrence with the patient and the patient's primary physician and either admit the patient to the hospital or make arrangement for an outpatient evaluation.

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Recommendations

- **Class C:**
 1. Patients with a first time seizure who have a normal neuroimaging of the brain, normal serum glucose and sodium, and normal neurologic examination can be discharged from the ED with outpatient follow-up.
 2. Patients with a first time seizure who have a normal neurologic exam, normal neuroimaging of the brain, normal serum glucose and sodium, and no co-morbidities do not need to be started on an antiepileptic drug (AED) in the ED.

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Question 5

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Question 7

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Question 8

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Areas in need of future research

- **Prospective study investigating laboratory testing in patients with new onset seizures**
- **Prospective study of neuroimaging in new onset seizures and impact on outcome**
- **Prospective study on seizure recurrence within 72 hours in patients with new onset seizure and no etiology identified in the ED**
- **Prospective study on risk stratification in the ED and implementation of AED therapy**