Complete Summary

GUIDELINE TITLE

Clinical policy: critical issues in the evaluation and management of adult patients presenting to the emergency department with seizures.

BIBLIOGRAPHIC SOURCE(S)

Clinical policy: critical issues in the evaluation and management of adult patients presenting to the emergency department with seizures. Ann Emerg Med 2004 May;43(5):605-25. [95 references] PubMed

GUIDELINE STATUS

This is the current release of the guideline.

COMPLETE SUMMARY CONTENT

SCOPE
METHODOLOGY - including Rating Scheme and Cost Analysis
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BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS
QUALIFYING STATEMENTS
IMPLEMENTATION OF THE GUIDELINE
INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES
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SCOPE

DISEASE/CONDITION(S)

Seizures and seizure-related complications

GUIDELINE CATEGORY

Evaluation
Management
Treatment

CLINICAL SPECIALTY

Emergency Medicine
Internal Medicine
Neurology

GUIDELINE OBJECTIVE(S)

- To provide evidence-based recommendations for the evaluation and management of adult patients who present to the emergency department with a seizure or seizure-related complaint
- To address the following 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?
    - What agent(s) should be administered to a patient in status epilepticus who continues to seize after having received benzodiazepine and phenytoin?
    - When should electroencephalographic (EEG) testing be performed in the ED?

TARGET POPULATION

Adult patients presenting to the emergency department with seizures or seizure-related complaints

INTERVENTIONS AND PRACTICES CONSIDERED

Evaluation

1. Serum glucose and sodium level
2. Pregnancy test, if female of childbearing age
3. Lumbar puncture
4. Head computed tomography (CT)
5. Neuroimaging of the brain
6. Electroencephalograph (EEG)

Treatment

1. Phenytoin
2. Fosphenytoin
3. Phenobarbital
4. Valproic acid
5. Midazolam

6. Pentobarbital
7. Propofol

MAJOR OUTCOMES CONSIDERED

- Identification of etiology of a new onset seizure in a patient who has returned to a normal baseline
- Achievement of a "therapeutic" phenytoin level
- Termination of motor status epilepticus

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The medical literature (1960 to 2002) was reviewed for articles that pertained to each critical question posed. Subcommittee members and expert peer reviewers also supplied articles with direct bearing on this policy.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Literature Classification Schema^

Class 1

- *Therapy**: Randomized, controlled trial or meta-analyses of randomized trials
- *Diagnosis***: Prospective cohort using a criterion standard
- *Prognosis****: Population prospective cohort

Class 2

- *Therapy**: Nonrandomized trial
- *Diagnosis***: Retrospective observational
- *Prognosis****: Retrospective cohort; case control

Class 3

- *Therapy**: Case series; case report; other (e.g., consensus, review)
- *Diagnosis***: Case series; case report; other (e.g., consensus, review)
- *Prognosis****: Case series, case report; other (e.g., consensus, review)

^ Some designs (e.g., surveys) will not fit this schema and should be assessed individually.

*Objective is to measure therapeutic efficacy comparing $\geq$2 interventions

**Objective is to determine the sensitivity and specificity of diagnostic tests

*** Objective is to predict outcome including mortality and morbidity

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review with Evidence Tables

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

This clinical policy was created after careful review and critical analysis of the medical literature. All articles were graded by at least 2 subcommittee members for strength of evidence.

During the review process, all articles used in the formulation of this clinical policy were classified by the subcommittee members into 3 classes of evidence on the basis of the design of the study, with design 1 representing the strongest evidence and design 3 representing the weakest evidence for therapeutic, diagnostic, and prognostic clinical reports respectively. Articles were then graded on 6 dimensions thought to be most relevant to the development of a clinical guideline: blinded versus nonblinded outcome assessment, blinded or randomized allocation, direct or indirect outcome measures (reliability and validity), biases (e.g., selection, detection, transfer), external validity (i.e., generalizability), and sufficient sample size. Articles received a final grade (I, II, III) on the basis of a predetermined formula taking into account design and grade of study. Articles with fatal flaws were given an "X" grade and not used in the creation of this policy. An evidentiary table was constructed and is included in the original guideline document.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Clinical findings and strength of recommendations regarding patient management were made according to the following criteria:

Strength of Recommendations

Level A recommendations. Generally accepted principles for patient management that reflect a high degree of clinical certainty (i.e., based on "strength of evidence Class I" or overwhelming evidence from "strength of evidence Class II" studies that directly address all the issues)

Level B recommendations. Recommendations for patient management that may identify a particular strategy or range of management strategies that reflect moderate clinical certainty (i.e., based on "strength of evidence Class II" studies that directly address the issue, decision analysis that directly addresses the issue, or strong consensus of "strength of evidence Class III" studies)

Level C recommendations. Other strategies for patient management based on preliminary, inconclusive, or conflicting evidence, or, in the absence of any published literature, based on panel consensus

There are certain circumstances in which the recommendations stemming from a body of evidence should not be rated as highly as the individual studies on which they are based. Factors such as heterogeneity of results, uncertainty about effect magnitude and consequences, strength of prior beliefs, and publication bias, among others, might lead to such a downgrading of recommendations.

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Expert review comments were received from emergency physicians, physicians from other specialty societies, such as neurologists and neuroradiologists, and specialty societies, including individual members of the American Epilepsy Society, the American Society of Emergency Radiology, and the Epilepsy Foundation. Their responses were used to further refine and enhance this policy.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Definitions for the strength of evidence (Class 1-3) and strength of recommendations (Level A-C) are repeated at the end of the "Major Recommendations" field.

I. **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?**

Level A recommendations. None specified.

Level B recommendations.

1. Determine a serum glucose and sodium level on patients with a first-time seizure with no comorbidities who have returned to their baseline.
2. Obtain a pregnancy test if a woman is of child-bearing age.
3. Perform a lumbar puncture, after a head computed tomography (CT) scan, either in the emergency department (ED) or after admission, on patients who are immunocompromised.

Level C recommendations. None specified.

II. **Which new-onset seizure patients who have returned to a normal baseline require a head CT scan in the ED?**

Level A recommendations. None specified.

Level B recommendations.

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

Level C recommendations. None specified.

III. **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?**

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 follow-up.
2. Patients with a normal neurologic examination, no comorbidities, and no known structural brain disease do not need to be started on an antiepileptic drug in the ED.

IV. **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?**

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.

V. **What agent(s) should be administered to a patient in status epilepticus who continues to seize after having received a benzodiazepine and a phenytoin?**

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.

VI. **When should electroencephalograph (EEG) testing be performed in the ED?**

Level A recommendations. None specified.

Level B recommendations. None specified.

Level C recommendations. Consider an emergent electroencephalograph (EEG) in patients suspected of being in nonconvulsive status epilepticus or in subtle convulsive status epilepticus, patients who have received a long-acting paralytic, or patients who are in a drug-induced coma.

Definitions:

Literature Classification Schema^

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Class 2

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*Objective is to measure therapeutic efficacy comparing $\geq$2 interventions

**Objective is to determine the sensitivity and specificity of diagnostic tests

*** Objective is to predict outcome including mortality and morbidity

Strength of Recommendations

Level A recommendations. Generally accepted principles for patient management that reflect a high degree of clinical certainty (i.e., based on "strength of evidence Class I" or overwhelming evidence from "strength of evidence Class II" studies that directly address all the issues)

Level B recommendations. Recommendations for patient management that may identify a particular strategy or range of management strategies that reflect moderate clinical certainty (i.e., based on "strength of evidence Class II" studies that directly address the issue, decision analysis that directly addresses the issue, or strong consensus of "strength of evidence Class III" studies)

Level C recommendations. Other strategies for patient management based on preliminary, inconclusive, or conflicting evidence, or, in the absence of any published literature, based on panel consensus

There are certain circumstances in which the recommendations stemming from a body of evidence should not be rated as highly as the individual studies on which they are based. Factors such as heterogeneity of results, uncertainty about effect magnitude and consequences, strength of prior beliefs, and publication bias, among others, might lead to such a downgrading of recommendations.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

This policy is a product of the American College of Emergency Physicians (ACEP) clinical policy development process, including expert review, and is based on the

existing literature; where literature was not available, consensus of emergency physicians was used.

The type of supporting evidence is also identified and graded for each recommendation (see "Major Recommendations").

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate evaluation, management, and treatment of patients with seizures

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

Recommendations offered in this policy are not intended to represent the only diagnostic and management options that the emergency physician should consider. ACEP clearly recognizes the importance of the individual clinician´s judgment. Rather, they define for the clinician those strategies for which medical literature exists to provide strong support for their utility in answering the crucial questions addressed in this policy.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness

IOM DOMAIN

Effectiveness
Timeliness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Clinical policy: critical issues in the evaluation and management of adult patients presenting to the emergency department with seizures. Ann Emerg Med 2004 May;43(5):605-25. [95 references] PubMed

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2004 May

GUIDELINE DEVELOPER(S)

American College of Emergency Physicians - Medical Specialty Society

SOURCE(S) OF FUNDING

American College of Emergency Physicians

GUIDELINE COMMITTEE

ACEP Clinical Policies Committee

Clinical Policies Subcommittee on Seizures

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

At the time of publication, Dr. Jagoda, Dr. Huff, and Dr. Sloan were on the Advisory Board for Eisai Pharmaceuticals.

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the American College of Emergency Physicians Web site.

Print copies: Available from the American College of Emergency Physicians, P.O. Box 619911, Dallas, TX 75261-9911, or call toll free: (800) 798-1822.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI on July 14, 2004. The information was verified by the guideline developer on August 13, 2004.

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