

PAGE 2 | Clinical Policy: Critical Issues In The Evaluation And Management Of Adult Patients Presenting To The Emergency Department With Acute Headache »

Annals of Emergency Medicine

PAGE 4 | Diagnosis And Management Of Headache In Adults (SIGN Guideline 107) »

Scottish Intercollegiate Guidelines Network

PAGE 6 Practice Parameter: Evidence-Based Guidelines For Migraine Headache (An Evidence-Based Review) »

Quality Standards Subcommittee of the American Academy of Neurology

Prior to beginning this activity, see "CME Information" on page 10.

Editor's Note: To read more about this publication and the background and methodologies for practice guideline development, go to: <http://www.ebmedicine.net/introduction>

Current Guidelines For Management Of Headache In The Emergency Department

In this issue of *EM Practice Guidelines Update*, we review 2 guidelines that address the diagnosis and management of headache and another on the specific topic of migraine. The National Hospital Ambulatory Medical Care Survey for 1999-2001 found that headache accounted for 2.1 million emergency department (ED) visits (2.2% of all ED visits). Of the 14% of the patients who underwent imaging, 5.5% received a pathologic diagnosis,¹ but most patients do not require further investigation. Emergency clinicians must determine which patients need neuroimaging or other testing in the ED and which patients can be deferred and evaluated in the outpatient setting.² Providing symptom relief to patients with severe headache is another important management objective, and clinicians should also be aware of recommended analgesia protocols.

Practice Guideline Impact

- Patients presenting with new sudden-onset, severe headache or with headache and new abnormal neurological examination findings should undergo emergent noncontrast head computed tomography (CT).
- In patients with sudden-onset, severe headache and a negative noncontrast head CT scan result, lumbar puncture (LP) should be performed to rule out subarachnoid hemorrhage (SAH).
- Patients being ruled out for SAH who have negative findings on a head CT, normal opening pressure, and negative findings in cerebrospinal fluid (CSF) analysis do not need emergent angiography and can be discharged from the ED with follow-up recommended.
- Non-steroidal anti-inflammatory drugs (NSAIDs) are recommended for acute treatment in patients with all severities of migraine. Anti-dopaminergic antiemetics and oral triptans are recommended for acute treatment in patients if previous attacks have not been controlled using simple analgesics.

September 2010
Volume 2, Number 9

Author

Jonathan Edlow, MD

Associate Professor of Medicine, Harvard Medical School; Vice-Chair, Department of Emergency Medicine, Beth Israel Deaconess Medical Center, Boston, MA

Vincent Bounes, MD

Praticien Hospitalier, SAMU 31, Pôle de Médecine d'Urgences, Hôpitaux de Toulouse, Toulouse, France; International Research Fellow, Beth Israel Deaconess Medical Center, Boston, MA

Editor-In-Chief

Reuben J. Strayer, MD

Assistant Professor of Emergency Medicine, Mount Sinai School of Medicine, New York, NY

Editorial Board

Nicole C. Bouchard, MD, FRCP

Assistant Clinical Professor, Assistant Site Director; Director of Medical Toxicology, New York-Presbyterian Hospital, Columbia University Medical Center, New York, NY

Andy Jagoda, MD, FACEP

Professor and Chair, Department of Emergency Medicine, Mount Sinai School of Medicine, New York, NY

Erik Kulstad, MD, MS

Research Director, Department of Emergency Medicine, Advocate Christ Medical Center, Oak Lawn, IL

Eddy S. Lang, MDCM, CCFP (EM), CSPQ

Senior Researcher, Alberta Health Services; Associate Professor, University of Calgary; Adjunct Professor, McGill University, Montreal, Quebec, Canada

Lewis S. Nelson, MD

Associate Professor of Emergency Medicine, New York University School of Medicine; Director, Fellowship in Medical Toxicology, New York City Poison Control Center, New York, NY

Gregory M. Press, MD, RDMS

Assistant Professor, Director of Emergency Ultrasound, Emergency Ultrasound Fellowship Director, Department of Emergency Medicine, University of Texas at Houston Medical School, Houston, TX

Maia S. Rutman, MD

Medical Director, Pediatric Emergency Services, Dartmouth-Hitchcock Medical Center; Assistant Professor of Pediatric Emergency Medicine, Dartmouth Medical School, Lebanon, NH

Scott M. Silvers, MD

Chair, Department of Emergency Medicine, Mayo Clinic, Jacksonville, FL

Scott Weingart, MD, FACEP

Assistant Professor, Director of the Division of Emergency Critical Care, Department of Emergency Medicine, Mount Sinai School of Medicine, New York, NY

Clinical Policy: Critical Issues In The Evaluation And Management Of Adult Patients Presenting To The Emergency Department With Acute Headache³

Annals of Emergency Medicine. 2008;52:407-436.

Link: <http://www.acep.org/workarea/downloadasset.aspx?id=8802>

This document was developed by a subcommittee of the American College of Emergency Physicians (ACEP) Clinical Policies Subcommittee and was published in October 2008. The group identified 5 Critical Questions and utilized an explicit strategy for their literature search and review. Evidence was evaluated for quality according to predefined criteria and sorted into 3 classes (I, II, III). Recommendations were graded (A, B, C) based on the strength of the evidence for each question.

The panel members reported that they had no relevant industry relationships, as defined explicitly in the document. No external funding was obtained for the development of the ACEP guideline.

The policy targets clinicians working in hospital-based EDs. The guidelines presented in this policy apply to the evaluation and management of adult patients presenting to the ED with acute, nontraumatic headache. This Clinical Policy is not intended to address the care of pediatric patients or the care of patients with trauma-related headaches.

Critical Question 1. Does a response to therapy predict the etiology of an acute headache?

Level C Recommendation

- Pain response to therapy should not be used as the sole diagnostic indicator of the underlying etiology of an acute headache.

Critical Question 2. Which patients with headache require neuroimaging in the ED?

Level B Recommendations

- Patients presenting to the ED with headache and new abnormal findings in a neurologic examination (eg, focal deficit, altered mental status, altered cognitive function) should undergo emergent* noncontrast head CT.
- Patients presenting with new sudden-onset, severe headache should undergo an emergent* head CT.
- HIV-positive patients with a new type of headache should be considered for an emergent* neuroimaging study.

Level C Recommendation

- Patients who are older than 50 years and presenting with a new type of headache but with a normal neurologic examination should be considered for an urgent** neuroimaging study.

**Emergent studies* are those essential for a timely decision regarding potentially life-threatening or severely disabling entities.

***Urgent studies* are those that are arranged prior to discharge from the ED (scan appointment is included in the disposition) or performed prior to disposition when follow-up cannot be assured. ["Routine" studies are indicated when the study is not considered necessary to make a disposition in the ED.]

Critical Question 3. Does lumbar puncture need to be routinely performed on ED patients being worked up for nontraumatic subarachnoid hemorrhage whose noncontrast brain CT scans are interpreted as normal?

Level B Recommendation

- In patients presenting to the ED with sudden-onset, severe headache and a negative noncontrast head CT scan result, lumbar puncture should be performed to rule out subarachnoid hemorrhage.

Critical Question 4. In which adult patients with a complaint of headache can a lumbar puncture be safely performed without a neuroimaging study?

Level C Recommendations

- Adult patients with headache and exhibiting signs of increased intracranial pressure (eg, papilledema, absent venous pulsations on funduscopic examination, altered mental status, focal neurologic deficits, signs of meningeal irritation) should undergo a neuroimaging study before having a lumbar puncture.
- In the absence of clinical findings suggestive of increased intracranial pressure, a lumbar puncture can be performed without obtaining a neuroimaging study. [Note: A lumbar puncture does not assess for all causes of a sudden severe headache.]

Critical Question 5. Is there a need for further emergent diagnostic imaging in the patient with sudden-onset, severe headache who has negative findings in both CT and lumbar puncture?

Level B Recommendation

- Patients with a sudden-onset, severe headache who have negative findings on a head CT, normal opening pressure, and negative findings in CSF analysis do not need emergent angiography and can be discharged from the ED with follow-up recommended. ■

Copyright © 2008 by the American College of Emergency Physicians. Used with permission.

Diagnosis And Management Of Headache In Adults. A National Clinical Guideline (SIGN Guideline 107)⁴

Scottish Intercollegiate Guidelines Network.

Link to: <http://www.sign.ac.uk/guidelines/fulltext/107/index.html>

This document was developed by a multidisciplinary group fully funded and organized by the Scottish Intercollegiate Guidelines Network (SIGN) and was published in November 2008. Part of the National Health Service (NHS) Quality Improvement Scotland, SIGN is a collaborative network of clinicians, other healthcare professionals, and patient organizations. The evidence base for this guideline was synthesized in accordance with SIGN methodology. Evidence was evaluated for quality according to predefined criteria and sorted into 8 classes (1++, 1+, 1-, 2++, 2+, 2-, 3, and 4). Recommendations were graded (A, B, C, and D) based on the strength of the evidence for each question.

This guideline focuses on the common primary headaches such as migraine and tension-type headaches but also addresses some of the less common primary headache disorders. Secondary headache due to medication overuse is also addressed, and “red flags” for secondary headache are highlighted. This guideline targets healthcare professionals in primary and secondary care, including general practitioners, community pharmacists, opticians, and dental practitioners, and patients with headache.

All members of the guideline development group made declarations of interest, but these data are not available in the document; further details of these are available on request from the SIGN organization.

Only recommendations pertinent to emergency medicine are excerpted here. The guideline’s original numbering has been retained. The grading of recommendations is based on the strength of supporting evidence, which does not necessarily correlate with the clinical importance of the recommendation. Recommendations noted in the Clinical Guideline as “Key Recommendations” (noted here with the

designation “✪KR”) are recommendations that SIGN sees as clinically most important, regardless of the strength of the evidence.

3. Symptoms And Signs

Level C Recommendation

- 3.2.1 Patients who present with a pattern of recurrent episodes of severe disabling headache associated with nausea and sensitivity to light, and who have a normal neurological examination, should be considered to have migraine. ✪KR

Level D Recommendations

- 3.3 Patients who present with headache and red flag features for potential secondary headache should be referred to a specialist appropriate to their symptoms for further assessment. ✪KR
- 3.3 Patients presenting with headache for the first time or with headache that differs from their usual headache should have a clinical examination, a neurological examination including fundoscopy, and blood pressure measurement.
- 3.3.1 Patients with a first presentation of thunderclap headache should be referred immediately to hospital for same day specialist assessment. ✪KR
- 3.3.6 Giant cell arteritis should be considered in any patient over the age of 50 presenting with a new headache or change in headache. ✪KR

5. Investigations

Level C Recommendation

- 5.2 Patients with thunderclap headache and a normal CT should have a lumbar puncture. ✪KR

Level D Recommendations

- 5.1 Neuroimaging is not indicated in patients with a clear history of migraine, without red flag features for potential secondary headache, and a normal neurological examination. ✪KR

- 5.1 Brain CT should be performed in patients with headache who have unexplained abnormal neurological signs, unless the clinical history suggests MRI is indicated.
- 5.1.1 In patients with thunderclap headache, unenhanced CT of the brain should be performed as soon as possible and preferably within 12 hours of onset. **✪KR**

6. Migraine

Level A Recommendations

- 6.1.1 Aspirin 900 mg is recommended for acute treatment in patients with all severities of migraine.
- 6.1.1 Ibuprofen 400 mg is recommended for acute treatment in patients with migraine.
- 6.1.2 Oral triptans are recommended for acute treatment in patients with all severities of migraine if previous attacks have not been controlled using simple analgesics. **✪KR**
- 6.1.2 Almotriptan 12.5 mg, eletriptan 40-80 mg or rizatriptan 10 mg, are the preferred oral triptans for acute migraine.

Level B Recommendations

- 6.1.1 Paracetamol [acetaminophen] 1000 mg is recommended as acute treatment for mild to moderate migraine.
- 6.1.2 If a patient does not respond to one triptan, an alternative triptan should be offered.

Level D Recommendation

- 6.1.6 Opioid analgesics should not be routinely used for the treatment of patients with acute migraine due to the potential for development of medication overuse headache. **✪KR**

7. Tension-Type Headache

Level A Recommendation

- 7.1 Aspirin and paracetamol [acetaminophen] are recommended for acute treatment in patients with tension-type headache.

Level C Recommendation

- 3.2.2 [from Signs and Symptoms section] A diagnosis of tension-type headache should be considered in a patient presenting with bilateral headache that is non-disabling where there is a normal neurological examination.

8. Trigeminal Autonomic Cephalalgias

Level A Recommendation

- 8.1.1 Subcutaneous injection of 6 mg sumatriptan is recommended as the first choice treatment for the relief of acute attacks of cluster headache. **✪KR**

9. Medication Overuse Headache

Level C Recommendation

- 9.1 When diagnosing medication overuse headache, psychiatric comorbidity and dependence behavior should be considered.

Level D Recommendations

- 9.1 Medication overuse headache must be excluded in all patients with chronic daily headache (headache \geq 15 days / month for $>$ 3 months). **✪KR**
- 9.1 Clinicians should be aware that patients using any acute or symptomatic headache treatment are at risk of medication overuse headache. Patients with migraine, frequent headache and those using opioid-containing medications or overusing triptans are at most risk. **✪KR** ■

Used with permission, Scottish Intercollegiate Guidelines Network.

Practice Parameter: Evidence-Based Guidelines For Migraine Headache (An Evidence-Based Review)⁵

Report Of The Quality Standards Subcommittee Of The American Academy Of Neurology

Neurology. 2000;55;754-762.

Link: <http://www.aan.com/professionals/practice/pdfs/gl0085.pdf>

This practice parameter by the Quality Standards Subcommittee (QSS) of the American Academy of Neurology summarizes the treatment recommendations from the 4 evidence-based reviews on the management of patients with migraine: specifically, acute, preventive, and nonpharmacologic treatments for migraine, and the role of neuroimaging in patients with headache.

Evidence was evaluated for quality according to predefined criteria and sorted into 4 classes (I, II, III, IV). Recommendations were graded (A,B,C) based on the strength of the evidence for each question. Moreover, scientific effect measures and clinical impression of effect were graded into 4 classes. Panel members' conflicts of interests are not disclosed in the document.

The target and audience for the guidelines are not specifically identified. These guidelines aim to give evidence-based recommendations for the drug treatment of migraine attacks and of migraine prophylaxis, so only recommendations pertinent to emergency medicine are abstracted here.

Triptans (Serotonin_{1B/1D} Receptor Agonists)

- Triptans (naratriptan, rizatriptan, sumatriptan, and zolmitriptan) are effective and relatively safe for the acute treatment of migraine headaches and are an appropriate initial treatment choice in patients with moderate to severe migraine who have no contraindications for its use (Grade A).
- Initial treatment with any triptan is a reasonable choice when the headache is moderate to severe or in migraine of any severity when nonspecific medication has failed to provide adequate relief in the past (Grade C).
- Patients with nausea and vomiting may be given intranasal or subcutaneous sumatriptan (Grade C).

Ergot Alkaloids And Derivatives

- Ergotamine PO/PR (and caffeine combination) may be considered in the treatment of selected patients with moderate to severe migraine (Grade B).
- Dihydroergotamine (DHE) nasal spray is safe and effective for the treatment of acute migraine attacks and should be considered for use in patients with moderate to severe migraine (Grade A).
- DHE SC/IV/IM and nasal spray may be given to patients with nausea and vomiting (Grade C).
- DHE SC, IM, and nasal spray are reasonable initial treatment choices when the headache is moderate to severe, or in migraine of any severity when nonspecific medication has failed to provide adequate relief in the past (Grade C).
- DHE IM, SC may be considered in patients with moderate to severe migraine (Grade B).
- DHE IV plus antiemetics IV is an appropriate treatment choice for patients with severe migraine (Grade B).

Antiemetics

- Oral antiemetics are an adjunct to treat nausea associated with migraine (Grade C).
- Metoclopramide IM / IV is an adjunct to control nausea (Grade C) and may be considered as IV monotherapy for migraine pain relief (Grade B).
- Prochlorperazine IV, IM, and PR may be a therapeutic choice for migraine in the appropriate setting (Grade B).
- Prochlorperazine PR is an adjunct in the treatment of acute migraine with nausea and vomiting (Grade C).
- Chlorpromazine IV may be a therapeutic choice for migraine in the appropriate setting (Grade B).
- Serotonin receptor (5-HT₃) antagonists [eg, ondansetron] are not as effective as monotherapy for migraine pain relief (Grade B), but may be considered as adjunct therapy to control nausea in selected patients with migraine attacks (Grade C).

NSAIDs, Nonopiate Analgesics, And Combination Analgesics

- Acetaminophen alone is not recommended for migraine (Grade B).
- NSAIDs (oral) and combination analgesics containing caffeine are a reasonable first-line treatment choice for mild to moderate migraine attacks or severe attacks that have been responsive in the past to similar NSAIDs or nonopiate analgesics (Grade A).
- Ketorolac IM is an option that may be used in a physician-supervised setting, although conclusions regarding clinical efficacy cannot be made at this time (Grade C).

Opiate Analgesics

- Butorphanol nasal spray is a treatment option for some patients with migraine (Grade A). Butorphanol may be considered when other medications cannot be used or as a rescue medication when significant sedation would not jeopardize the patient (Grade C). Butorphanol is widely used despite the established risk of overuse and dependence. Special attention should be given to these clinical concerns.
- Parenteral opiates are a rescue therapy for acute migraine when sedation side effects will not put the patient at risk and when the risk of abuse has been addressed (Grade B).

- Consider parenteral and oral combination use in acute migraine *only* when the risk of abuse has been addressed and sedation will not put the patient at risk (Grade A).

Other Medications

- Isometheptene and isometheptene combination agents may be a reasonable choice for patients with mild-to-moderate headache (Grade B).
- Corticosteroids (dexamethasone or hydrocortisone) are a treatment choice for rescue therapy for patients with status migrainosus (Grade C).
- Evidence is insufficient at this time to establish a defined role for intranasal lidocaine or lidocaine IV in the management of acute migraine headache (Grade B). ■

Abbreviations: IM, intramuscular; IV, intravenous; PO, by mouth; PR, by rectum; SC, subcutaneous.

Reproduced with permission from Wolters Kluwer/Lippincott, Williams & Wilkins.

Editorial Comment

Patients with headache account for 1% to 2% of visits to the ED and up to 4% of visits to physicians' offices.^{1,2} Because most of these patients have primary headache disorders such as migraine and tension-type headaches, it is important for emergency clinicians to know the treatment recommendations for migraine. Relatively few patients have treatable secondary causes that threaten life, limb, brain, or vision, such as SAH. Between 20% and 50% of patients with documented SAH report a distinct, unusually severe headache in the days or weeks before the index episode of bleeding, referred to as a "warning headache."⁶ Roughly half of all patients with SAH have episodes of minor bleeding, often with atypical features.⁷

According to the International Headache Society, a first episode of severe headache cannot be classified as migraine or tension-type headache; diagnostic criteria require multiple episodes with specific characteristics (more than 9 episodes for tension-type headache and more than 4 episodes for migraine without aura).⁸ Although patients with primary headache disorders must have their first headache at some point, the diagnosis cannot be made definitively at that time.⁹ The first headache requires evaluation, as do qualitatively different headaches in patients with established headache patterns, even if the headache is not the "worst ever." It is not necessary for emergency clinicians to diagnose a specific primary headache disorder, and the focus should be on excluding dangerous secondary headaches and providing symptom relief.

The first diagnostic study should be noncontrast CT performed with adequate technique. Very thin cuts (3 mm in thickness) through the base of the brain are recommended.¹⁰ Lumbar puncture should be performed in a patient whose clinical presentation necessitates the exclusion of SAH and whose CT scan is negative, equivocal, or technically inadequate. This recommendation, however, is often not followed in practice.¹¹ Lumbar puncture prior to or instead of CT has been postulated to be cost-effective and safe in carefully selected

patients who have completely normal physical examinations.¹² Furthermore, CT followed by CT angiography (CTA) (instead of LP) has also been proposed to be effective.¹³ Both of these studies used mathematical modeling and neither of these alternative strategies has been clinically tested in large trials. Regarding the CT/CTA strategy, there are many reasons to question some of the basic tenets—most centrally, whether an aneurysm that is found in the diagnostic workup of a headache patient is the cause of the patient's symptoms or an incidental finding.¹⁴ The authors of this issue of *EMPGU* do not recommend use of CTA instead of LP to confirm the absence of SAH after a negative CT.

In conclusion, in addition to symptom control for all patients, emergency clinicians must determine which patients need neuroimaging and other ancillary testing in the ED and which patients can be appropriately deferred and evaluated in the outpatient setting. Patients being evaluated for SAH should undergo CT followed by LP if the CT is non-diagnostic. Properly performed and interpreted, CT and LP in patients with acute, severe headache will identify the vast majority of patients with treatable secondary causes; however, a small proportion of patients will have headache of dangerous cause that could present with normal CT and LP results. Potentially dangerous causes include cervical artery dissection, cerebral venous sinus thrombosis, carbon monoxide toxicity, temporal arteritis, pituitary apoplexy, hypertensive encephalopathy, and others.¹⁵

Once these conditions have been excluded and symptoms have been controlled, discharge with outpatient followup is appropriate. Dopamine antagonist antiemetics appear to be the most effective ED therapy for undifferentiated headache; however, simple analgesics (aspirin and NSAIDs preferred to acetaminophen), triptans, and ergot alkaloids are all acceptable abortive therapies. Opiates should be considered second- or third-line therapy for patients with primary headache disorders. ■

References

1. Goldstein JN, Camargo CA Jr, Pelletier AJ, et al. Headache in United States emergency departments: demographics, work-up and frequency of pathological diagnoses. *Cephalalgia*. 2006;26:684-690. **(Systematic sample from NHAMCS national database)**
2. Edlow JA, Caplan LR. Avoiding pitfalls in the diagnosis of subarachnoid hemorrhage. *N Engl J Med*. 2000;342:29-36. **(Systematic review)**
3. Edlow JA, Panagos PD, Godwin SA, et al. American College of Emergency Physicians. Clinical policy: critical issues in the evaluation and management of adult patients presenting to the emergency department with acute headache. *Ann Emerg Med*. 2008;52:407-436. **(Clinical policy)**
4. Scottish Intercollegiate Guidelines Network. Diagnosis and management of headache in adults. A national clinical guideline. 107. Edinburgh. 2008. Also published in a modified format as: Duncan CW, Watson DPB, Stein A, et al. Diagnosis and management of headache in adults. A national clinical guideline. *BMJ*. 2008;337:1231-1236. **(National clinical guideline)**
5. Silberstein SD. Practice parameter: evidence-based guidelines for migraine headache (an evidence-based review): Report of the Quality Standards Subcommittee of the American Academy of Neurology. *Neurology*. 2000;55:754-762. **(Practice parameter)**
6. Jakobsson KE, Säveland H, Hillman J, et al. Warning leak and management outcome in aneurysmal subarachnoid hemorrhage. *J Neurosurg*. 1996;85:995-999. **(Consecutive series; 422 patients)**
7. Rosenorn J, Eskesen V, Schmidt K, et al. Clinical features and outcome in 1076 patients with ruptured intracranial saccular aneurysms: a prospective consecutive study. *Br J Neurosurg*. 1987;1:33-45. **(Analysis; 1076 patients)**
8. Headache Classification Committee of the International Headache Society. Classification and diagnostic criteria for headache disorders, cranial neuralgias and facial pain. *Cephalalgia*. 1988;8:Suppl 7:1-96. **(International classification scheme)**
9. Edlow JA, Malek A, Ogilvy CS. Aneurysmal subarachnoid hemorrhage: update for the emergency physician; *JEM*. 2008;34:237-251. **(Review)**
10. Frishberg BM. The utility of neuroimaging in the evaluation of headache in patients with normal neurologic examinations. *Neurology*. 1994;44:1191-1197. **(Review; opinion piece)**
11. Morgenstern LB, Luna-Gonzales H, Huber JC Jr, et al. Worst headache and subarachnoid hemorrhage: prospective, modern computed tomography and spinal fluid analysis. *Ann Emerg Med*. 1998;32:297-304. **(Series)**
12. Schull MJ. Lumbar puncture first: an alternative model for the investigation of lone acute sudden headache. *Acad Emerg Med*. 1999;6:131-136. **(Mathematical model)**
13. McCormick RF and Hutson A; Can CT angiography of the brain replace LP in the evaluation of acute-onset headache after a negative noncontrast cranial CT scan? *Acad Emerg Med*. 2010;17:444-451. **(Mathematical model)**
14. Edlow JA. What are the unintended consequences of changing the diagnostic paradigm for subarachnoid hemorrhage after brain computed tomography to computed tomographic angiography in place of lumbar puncture? *Acad Emerg Med*. In press. **(Commentary)**
15. Savitz SI, Levitan EB, Wears R, et al. Pooled analysis of patients with thunderclap headache evaluated by CT and LP: is angiography necessary in patients with negative evaluations? *J Neurol Sci*. 2009;276:123-125. **(Pooled analysis; more than 800 patients from 7 studies)**

To write a letter to the editor, email Reuben Strayer, MD, Editor-In-Chief, at: strayermd@ebmedicine.net

EM Practice Guidelines Update (ISSN Online: 1949-8314) is published monthly (12 times per year) by EB Practice, LLC d.b.a. EB Medicine 5550 Triangle Parkway, Suite 150; Norcross, GA 30092 Telephone: 1-800-249-5770 or 1-678-366-7933; Fax: 1-770-500-1316 Email: ebm@ebmedicine.net Website: www.ebmedicine.net

CEO: Robert Williford

President and Publisher: Stephanie Ivy

Associate Editor: Dorothy Whisenhunt

Associate Editor and CME Director: Jennifer Pai

Director of Member Services: Liz Alvarez

Marketing and Customer Service Coordinator: Robin Williford

Opinions expressed are not necessarily those of this publication. Mention of products or services does not constitute endorsement. This publication is intended as a general guide and is intended to supplement, rather than substitute, for professional judgment. It covers a highly technical and complex subject and should not be used for making specific medical decisions.

The materials contained herein are not intended to establish policy, procedure, or standard of care. *EM Practice Guidelines Update* is a trademark of EB Practice, LLC. Copyright © 2010 EB Practice, LLC d.b.a. EB Medicine. All rights reserved. No part of this publication may be reproduced in any format without written consent of EB Practice, LLC d.b.a. EB Medicine. This publication is intended for the use of the individual subscriber only and may not be copied in whole or part or redistributed in any way without the publisher's prior written permission — including reproduction for educational purposes or for internal distribution within a hospital, library, group practice, or other entity.

CME information for *EM Practice Guidelines Update*

To take the CME test, visit: www.ebmedicine.net/cme

Date of Original Release: September 1, 2010. Date of most recent review: August 10, 2010. Termination date: September 1, 2013.

Accreditation: EB Medicine is accredited by the ACCME to provide continuing medical education for physicians.

Credit Designation: EB Medicine designates this educational activity for a maximum of 12 AMA PRA Category 1 Credits™ per year. Physicians should only claim credit commensurate with the extent of their participation in the activity.

Needs Assessment: The need for this educational activity was determined by a survey of practicing emergency physicians and the editorial board of this publication; knowledge and competency surveys; and evaluation of prior activities for emergency physicians.

Target Audience: This enduring material is designed for emergency medicine physicians, physician assistants, nurse practitioners, and residents.

Goals: Upon completion of this article, you should be able to: 1) demonstrate medical decision-making based on the strongest clinical evidence; 2) cost-effectively diagnose and treat the most critical ED presentations; and 3) describe the most common medicolegal pitfalls for each topic covered.

Objectives: Upon completion of this article, you should be able to: 1) determine which patients need neuroimaging in the ED and which can be appropriately deferred and evaluated in the outpatient setting; 2) determine the indications and contraindications of lumbar puncture in the ED; and 3) describe the recommended abortive treatments for migraine headache.

Discussion of Investigational Information: As part of the newsletter, faculty may be presenting investigational information about pharmaceutical products that is outside Food and Drug Administration-approved labeling. Information presented as part of this activity is intended solely as continuing medical education and is not intended to promote off-label use of any pharmaceutical product.

Faculty Disclosure: It is the policy of EB Medicine to ensure objectivity, balance, independence, transparency, and scientific rigor in all CME-sponsored educational activities. All faculty participating in the planning or implementation of a sponsored activity are expected to disclose to the audience any relevant financial relationships and to assist in resolving any conflict of interest that may arise from the relationship.

In compliance with all ACCME Essentials, Standards, and Guidelines, all faculty for this CME activity were asked to complete a full disclosure statement. The information received is as follows: Dr. Edlow, Dr. Bounes, Dr. Strayer, and their related parties reported no significant financial interest or other relationship with the manufacturer(s) of any commercial product(s) discussed in this educational presentation.

Method of Participation: Current, paid subscribers of *Emergency Medicine Practice* and *EM Practice Guidelines Update* who read this *EM Practice Guidelines Update* CME article and complete the online CME Evaluation survey at www.ebmedicine.net/CME are eligible for up to 1 hour of Category 1 credit toward the AMA Physician's Recognition Award (PRA). Results will be kept confidential. CME certificates may be printed directly from the website.

Hardware/Software Requirements: You will need a PC or Macintosh to access the online archived articles and CME testing. Adobe Reader is required to view the PDFs of the archived articles. Adobe Reader is available as a free download at www.adobe.com.

Additional Policies: For additional policies, including our statement of conflict of interest, source of funding, statement of informed consent, and statement of human and animal rights, visit: <http://www.ebmedicine.net/policies>

Want to receive *EM Practice Guidelines Update* free?

Subscribe to *Emergency Medicine Practice* and you'll receive *EM Practice Guidelines Update* at no additional charge! Plus, you receive all the benefits of *Emergency Medicine Practice*:

- **A chief-complaint focus:** Every issue starts with a patient complaint — just like your daily practice. You're guided step-by-step in reaching the diagnosis — often the most challenging part of your job.
- **An evidence-based medicine approach:** The degree of acceptance and scientific validity of each recommendation is assessed based on strength of evidence.
- **Diagnosis and treatment recommendations** solidly based in the current literature.
- **Abundant clinical pathways, figures, and tables:** You'll find reliable solutions quickly. The easy-to-read format delivers solid information appropriate for real-time situations.
- **Unlimited online access:** Search and access each monthly issue of *Emergency Medicine Practice* since inception in June 1999 — plus print and read each new issue before it even hits the mail.
- **All the CME you need at no extra charge:** Earn up to 48 *AMA PRA Category 1 Credits™*, 48 ACEP Category 1, 48 AAFP Prescribed, or 48 AOA Category 2B credits over the coming year — plus up to 144 credits from the online repository of articles!



Subscribe to *Emergency Medicine Practice* today and receive *EM Practice Guidelines Update* at no additional charge! Or, subscribe to *EM Practice Guidelines Update* only at the discounted rate below. To subscribe, complete the order form below and mail or fax it to EB Medicine, or visit www.ebmedicine.net/subscribe.

Do you like what you're reading?

Then ask a colleague to become a subscriber too — at this special introductory rate: **Just \$279 for a full year (12 issues) of *Emergency Medicine Practice*. Plus, you receive 3 free issues for each colleague you refer. *Emergency Medicine Practice* subscribers receive *EM Practice Guidelines Update* FREE!**

Please choose your subscription preference

- 1-Year subscription to *Emergency Medicine Practice*, includes *EM Practice Guidelines Update* - \$279 (a \$50 savings)
- 1-Year subscription to *EM Practice Guidelines Update* - \$99

Please choose a payment option

- Check enclosed (payable to EB Medicine)
- Charge my: Visa MC AmEx: _____ Exp: _____
Signature: _____
- Bill me

Promotion Code: **ISSUEG**

Name of new subscriber: _____

Address line 1: _____

Address line 2: _____

City, State, Zip: _____

Email: _____

Colleague's name who referred you: _____

Send to: EB Medicine / 5550 Triangle Pkwy, Ste 150 / Norcross, GA 30092. Or fax to: 770-500-1316.

Or visit: www.ebmedicine.net/subscribe and then enter Promo Code **ISSUEG** in your cart. Or call: 1-800-249-5770 or 678-366-7933.