EMERGENCY MEDICINE PRACTICE
POINTS & PEARLS
A Quick-Read Review Of Key Points & Clinical Pearls, February 2019

Evaluation and Management of Life-Threatening Headaches in the Emergency Department

Points

- The most common life-threatening causes of headaches are subarachnoid hemorrhage (SAH), cervical artery dissection (CAD), cerebral venous thrombosis (CVT), idiopathic intracranial hypertension (IIH), giant cell arteritis (GCA), and posterior reversible encephalopathy syndrome (PRES), and pre-eclampsia.
- SAH is commonly caused by aneurysm rupture; 75% present with abrupt onset. Administer nimodipine in aneurysmal SAH to improve outcomes. The use of prophylactic antiepileptic drugs is controversial.
- CAD is commonly associated with trauma and connective tissue disorders. Treat extracranial dissections with IV heparin followed by warfarin or a direct oral anticoagulant. Treat intracranial dissections with aspirin or clopidogrel.
- CVT presents as a gradual-onset headache that is often the result of thrombotic disease and spreading facial infections. Treat with low-molecular weight heparin or heparin bridge to warfarin. Consider broad-spectrum antibiotics if an infectious etiology is suspected.
- IIH is associated with obese women of childbearing age as well as hypervitaminosis A. Lumbar puncture (LP) is both diagnostic and therapeutic for IIH. Opening pressures will be ≥ 25 mm H_2O. Acetazolamide is a first-line pharmacotherapy.
- GCA is more common in women, almost exclusively in patients aged > 50 years. Common features include fever, fatigue, myalgias, jaw claudication, and visual symptoms. Polymyalgia rheumatica is present in more than half of all cases. Treat with steroids.
- Treat PRES with medication cessation and blood pressure control, typically nicardipine or labetalol.
- When treating hypertensive emergencies, aim for a 25% reduction in MAP in the first hour.
- For ICH, based on data from the INTERACT-2 and ATACH-2 trials, lowering systolic BP to < 140 mm Hg is safe. This does not impact death or disability, but it is associated with improved functional outcomes.
- Treat pre-eclampsia with a 4-6 g magnesium loading dose followed by 1-2g/hr maintenance, in addition to antihypertensives.

Pearls

- ESR and CRP are poor screening tests for GCA. Biopsy should be obtained in those with high suspicion for GCA after treatment has already been begun.
- Consider a D-dimer to exclude CVT in low-risk patients.
- Head CT should be reserved for suspected acute intracranial hemorrhage (noncontrast CT) and space-occupying lesions (contrast CT). Magnetic resonance venography is the test of choice when there is concern for CVT.
- Noncontrast head CT performed within 6 hours of headache onset is adequate to rule out SAH. Outside of this time window, LP will be required.
- Ocular ultrasound can rapidly diagnose raised intracranial pressure. Optic nerve sheath diameter > 5 mm is predictive of ICP > 20 mm Hg.

Issue Authors

David Zodda, MD, FACEP
Assistant Program Director, Emergency Medicine Residency, Hackensack University Medical and Trauma Center; Assistant Professor, Department of Emergency Medicine, Hackensack Meridian School of Medicine at Seton Hall University, Hackensack, NJ

Gabrielle Procopio, PharmD, BCPS
Emergency Medicine Clinical Pharmacist, Department of Pharmacy, Hackensack University Medical and Trauma Center; Assistant Professor, Department of Emergency Medicine, Hackensack Meridian School of Medicine at Seton Hall University, Hackensack, NJ

Amit Gupta, MD
Assistant Program Director, Emergency Medicine Residency, Hackensack University Medical and Trauma Center; Assistant Professor, Department of Emergency Medicine, Hackensack Meridian School of Medicine at Seton Hall Medical School, Hackensack, NJ

Points & Pearls Contributors

Nachi Gupta, MD, PhD
Department of Emergency Medicine, Icahn School of Medicine at Mount Sinai, New York, NY

Jeffrey Nusbaum, MD
EMS Fellow, University of Pittsburgh Medical Center, Pittsburgh, PA

- Acute angle closure glaucoma, found most commonly in the elderly, presents with headache, pain, redness, tearing, photophobia, nausea, blurred vision, and vision loss. Treat with timolol, pilocarpine, and apraclonidine while awaiting an ophthalmology consult.

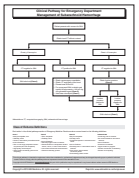
Table 4. Historical Factors and Concerning Descriptors

Historical Factors	Concerning Descriptors
Onset	Sudden-onset headaches or those elicited during exercise, straining, or orgasm are concerning for SAH, ICH, or CVT.
Provocation	Headaches exacerbated by changes in position, particularly the supine position or coughing, are concerning for decompensated elevated ICP.
Quality	Change in the quality, pattern, or intensity of a known pre-existing headache syndrome requires the same evaluation as a new-onset headache.
Radiation	Headaches with associated pain that radiates to the neck should prompt consideration of SAH and CAD.
Severity	"Thunderclap" or "worst headache" descriptors should prompt the clinician to have a high index of suspicion for SAH, CVT, and ICH.
Temporal	Chronic headaches that have changed over time should raise concern for structural abnormalities such as an intracranial mass or tumor.

Abbreviations: CAD, cervical artery dissection; CVT, cerebral venous thrombosis; ICH, intracranial hemorrhage; ICP, intracranial pressure; SAH, subarachnoid hemorrhage.

Most Important References

1. Headache Classification Subcommittee of the International Headache Society. The International Classification of Headache Disorders, 3rd edition. *Cephalalgia*. 2018;38(1):1- 211. **(Clinical guideline)** **DOI: https://doi.org/10.1177/0333102413485658**
7. Edlow JA, Panagos PD, Godwin SA, et al. 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(4):407-436. **(Clinical policy) DOI: https://doi.org/10.1016/j.annemergmed.2008.07.001**
15. Carpenter CR, Hussain AM, Ward MJ, et al. Spontaneous subarachnoid hemorrhage: a systematic review and meta-analysis describing the diagnostic accuracy of history, physical examination, imaging, and lumbar puncture with an exploration of test thresholds. *Acad Emerg Med*. 2016;23(9):963-1003. **(Meta-analysis; 22 studies)** **DOI: https://doi.org/10.1111/acem.12984**
54. Perry JJ, Stiell IG, Sivilotti ML, et al. Sensitivity of computed tomography performed within six hours of onset of headache for diagnosis of subarachnoid hemorrhage: prospective cohort study. *BMJ*. 2011;343:d4277. **(Prospective; 3132 patients) DOI: https://doi.org/10.1136/bmj.d4277**
65. Anderson CS, Heeley E, Huang Y, et al. Rapid blood-pressure lowering in patients with acute intracerebral hemorrhage. *N Engl J Med*. 2013;368(25):2355-2365. **(Prospective; 2794 patients) DOI: https://doi.org/10.1056/NEJMoa1214609**
87. ACOG Task Force on Hypertension and Pregnancy. Hypertension in pregnancy. American College of Obstetricians and Gynecologists. Available at: www.acog. org/resources-and-publications/task force-hypertension-and-pregnancy. Accessed January 10, 2019. **(Expert/ guideline recommendations)**



Clinical Pathway for Emergency Department Management of Subarachnoid Hemorrhage

Access the issue by scanning the QR code with a smartphone or tablet.

Questions, comments, suggestions? To write a letter to the editor, email: JagodaMD@ebmedicine.net

Contact EB Medicine:
Phone: 1-800-249-5770 or 678-366-7933
Fax: 770-500-1316
Address: 5550 Triangle Parkway,
Suite 150,
Norcross, GA 30092

Emergency Medicine Practice (ISSN Print: 1524-1971, ISSN Online: 1559-3908, ACID-FREE) is published monthly (12 times per year) by EB Medicine (5550 Triangle Parkway, Suite 150, Norcross, GA 30092). 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, 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.