

Critical Headache Diagnoses for the Emergency Physician

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Diagnosis	Critical Clinical Features	Critical Diagnostic Tests	Critical Interventions	Comments
Subarachnoid hemorrhage	Sudden onset Maximal at onset Different than previous headaches	CT Head LP	Neurosurgical consultation Blood pressure control Nimodipine Ventriculostomy	CT Head and other neuroimaging modalities are insufficient to rule out the diagnosis
Occult trauma	Signs of abuse or neglect Anticoagulation or coagulopathy	CT Head	Neurosurgical consultation Admission	Patients in at-risk populations may not volunteer a history of trauma
Bacterial meningitis	Fever Meningeal irritation Immune compromise Head and neck infection or instrumentation	CT Head LP	Antibiotics Corticosteroids Isolation	Treatment should be initiated prior to diagnostic confirmation by CSF analysis when clinical suspicion is high. Corticosteroids should be initiated before or with the first dose of antibiotics in clinically apparent cases.
Temporal arteritis	Jaw claudication Superficial temporal artery tenderness or nodularity Visual symptoms	Temporal artery biopsy	Systemic corticosteroids	ESR is an adequately sensitive screening test in patients without these high risk features. Empiric corticosteroids are indicated in patients with high-risk features and findings or a markedly elevated ESR.
CO toxicity	Symptomatic cohabitants Flu-like illness that is worse each morning Potentially toxic environment (e.g. home furnace in winter)	Arterial co-oximetry	Hyperbaric oxygen therapy (HBOT)	HBOT is indicated for patients with neurological and cardiovascular signs and beyond certain arbitrary cut-off levels.
Acute glaucoma	Red eye Mid-range fixed pupil Cloudy cornea	Intraocular pressure	Topical ocular therapy Systemic osmotic agents Ophthalmological consultation	A cursory examination prior to neuroimaging should prevent costly delays in consultation and therapy
Cervical artery dissection	SAH like onset Facial (carotid), neck (vertebral) pain Cranial nerve abnormalities	Angiography	Neurological/ neurosurgical consultation Anticoagulation	In the absence of brain hemorrhage, anticoagulation is initiated to reduce the risk of thrombus formation and embolization

Cerebral/dural venous sinus thrombosis	Hypercoagulable state (pregnancy and puerperum, oral contraceptives, malignancy) Head and neck infection Proptosis (cavernous sinus thrombosis)	MR Head Venography	Neurosurgical consultation Systemic anticoagulation	D-dimer may be falsely negative.
Space Occupying Lesion	Progressively worse over time New onset in patient >50 years old History of malignancy Worse in morning Worse in head down position	CT Head	Neurosurgical consultation ICP lowering therapies Lesion specific therapies	Emergent ICP lowering therapies may include elevating the head of the bed, restriction of IV fluids, mannitol and hyperventilation. Lesion specific therapies may include emergent surgery/neuroradiological procedures, corticosteroids, and antimicrobial agents.
Cerebellar infarction	Headache with dizziness Cerebellar signs Cranial nerve abnormalities	CT Head	Neurological/neurosurgical consultation	Although CT Head is insensitive for infarction, it is helpful initially to rule out hemorrhage and identify life-threatening edema and mass effect
Idiopathic intracranial hypertension	Obese, young female patient Cranial nerve 6 palsy (false localizing sign)	LP	CSF drainage Neurological referral	After negative neuroimaging, an LP will reveal a markedly elevated opening pressure and provide temporary headache relief.
Pituitary apoplexy	Thunderclap headache Vomiting Visual acuity, field deficits Ocular palsies	CT Head MR Head	Neurosurgical consultation	Many pituitary infarctions and hemorrhages will not be easily visible on CT. MR is considered the diagnostic modality of choice.
Pre-eclampsia	Post-partum (up to four weeks)	CBC Chemistry panel with LFTs Coagulation studies	Intravenous magnesium Obstetrical consultation	Up to half of all patients present in the post-partum period, the majority with a chief complaint of headache.