

Evidence Discussion Headache (HD-11)

EviCore
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- The majority of headaches are due to benign causes and are self-limited. The yield of positive findings on a CT head for evaluation of headache in the emergency department setting ranged from 7% to 13%.¹
- The American College of Radiology in the Choosing Wisely campaign recommends against imaging for primary headache syndromes in the absence of red flags and with a normal neurologic exam.^{1,7} The American Headache Society and Choosing Wisely Task Force stated that the overuse or misuse of imaging studies for headache was the most commonly mentioned problem.⁷ Overuse of CT head was identified as the main concern.⁷ The authors note that a single CT scan of the head exposes patients to an average of 2 mSV of radiation, the equivalent of 8 months of background radiation.⁷
- Incidental findings are common and can result in anxiety for the patient, additional referrals and specialist consults, and more imaging studies.^{5,6} Incidental findings on MRI occur in 2% of the general population.⁶
- The American Headache Society and the American Academy of Neurology recommend neuroimaging in patients with headaches with atypical features, red flags and/or abnormal neurologic exam findings.^{1,2,3}
- The presence of neurologic or systemic signs, new headaches over age 50, or headaches in the setting of malignancy or immunosuppression, always require further evaluation with advanced imaging, and are considered “red flags,” due to the higher likelihood of intracranial pathology.^{1,5,11,12} CT head in the presence of red flags is helpful to exclude intracranial hemorrhage.¹ However, MRI brain has higher contrast resolution than CT head and is preferred for evaluation of structural pathologies, particularly in non-urgent settings.¹
- Subarachnoid hemorrhage due to ruptured cerebral aneurysm accounts for 4-12% of acute severe headaches.¹ CT head is indicated as initial imaging for thunderclap headache.¹ CT head had a negative predictive value between 99.9-100% in detecting aneurysmal subarachnoid hemorrhage within 6 hours of headache onset.¹ The sensitivity is over 90% when CT head is performed within the first 24 hours.¹ CT Angiography (CTA) head obtained concurrently or in follow up may identify cerebral aneurysm, dissection, and reversible cerebral vasoconstriction syndrome.¹
- In selected cases, CT head is supported for evaluation and follow up of headache caused by subdural or epidural hemorrhage, skull fracture, sinus infection or subarachnoid hemorrhage.⁵
- New headaches in the setting of pregnancy and the postpartum period require special consideration.^{1,5,10} Over a third of pregnant women presenting to the hospital with headache have a secondary cause.^{1,8,9} Of patients with headache in the immediate post-partum period, 41% had an abnormal MRI brain.¹⁰
- Imaging in this scenario includes MRI brain, MR Venogram (MRV) head, and/or MR Angiography (MRA) head. Gadolinium contrast is relatively contraindicated during pregnancy and should be avoided.¹

- Trigeminal autonomic cephalgias, including cluster headaches, are required to have MRI brain to exclude pathology in the pituitary region^{1,5}. MRI should include the brain and the pituitary region.^{1,2}
- Headaches concerning for raised intracranial pressure or intracranial hypotension, required additional evaluation with neuroimaging.^{1,5} To exclude hydrocephalus, a mass, or cerebral venous sinus thrombosis, MRI brain, orbits and venogram are indicated in the setting of papilledema and/or intracranial hypertension.^{1,5} In urgent cases, a CT head can rapidly diagnose causes such as mass, edema or hydrocephalus.¹
- MRI is also useful to evaluate for structural causes of headache due to intracranial hypotension and csf leaks.^{1,5} Depending on the suspected source of the leak, imaging the brain and spinal cord may be required. Spinal imaging may include MRI of the spinal cord, or CT myelogram.¹
- CTA head or MRA head in the evaluation of headache are indicated for suspicion of carotid or vertebral arterial dissections, AVMs and cerebral aneurysm, as secondary causes of headache.¹
- CT Venogram (CTV) head or MRV head in the evaluation of headache are supported for suspicion of cerebral venous sinus thrombosis or stenosis in select cases, included suspected headache associated with pregnancy and the post-partum period, headache with papilledema, intracranial hypertension, and the trigeminal autonomic cephalgias.¹

References

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