Headache Patterns

★ = primary HA
⚡ = most worrisome!

Most often benign
Question #13

Is this a primary or secondary headache?

A 15-year-old girl who has just started to take acne medication presents to your office with poorly-localizing, daily headaches, blurry vision, and tinnitus.

Of the following, which diagnosis is MOST likely to explain the findings above

A. Idiopathic intracranial hypertension
B. Medulloblastoma
C. Migraine headache
D. Tension headache
E. Trigeminal autonomic cephalalagia (cluster headache)
Headache Syndromes - Primary

- Migraine +/- aura
  - Multifactorial etiology!
  - Vomiting and vertigo may be more prominent
  - Uni- or bilateral
  - Frontal or temporal
  - Pounding or pulsing pain
  - Phono-/photophobia
  - Typically last 30-60 min (shorter than adult)
  - Sleep provides relief

- Other: blurry vision, difficulty reading, stomach pain, flushing, sweating, pallor, dark circles around eyes

- Triggers: stress, “let-up” from stress, poor sleep, illness/fasting, dehydration

- Aura: <30 minutes before the headache, lasting 5-20 min
Headache Syndromes - Primary

➢ Tension headache
  • Mild to moderate pain
  • Last 1 hour to several days
  • “Band-like”, pressure, or tightening
  • Triggers similar to migraine, also including: muscle pain and tension (neck and shoulders)
  • Episodic or chronic

➢ Chronic headache
  • >15 headache days per month
  • 3 types: transformed migraine, tension-type, new daily persistent
  • New daily persistent headache: new HA that becomes daily within 3 days of onset and is not caused by another disorder; should obtain eval for secondary causes
Headache Syndromes - Secondary

- **Abnormal intracranial pressure**
  - Hydrocephalus, mass lesions, edema, inflammation, hemorrhage
  - Progressive, nighttime wakening, worse with Valsalva
  - Persistent vomiting, neuro deficits, lethargy, personality change
  - Low ICP → CSF leak from spinal surgery, trauma, connective tissue disease

- **Idiopathic intracranial hypertension**
  - Elevated ICP without evidence of specific cause
  - Daily headache is the most common symptom
  - Poorly characterized
  - Classically: transient obscuration of vision, tinnitus, diplopia
  - Young children: HA, neck stiffness, strabismus, irritability, apathy, somnolence, dizziness, ataxia
  - Likely to have underlying condition
Headache Syndromes - Secondary

- **Infection**
  - Most common cause of pediatric HA evaluated in ED?
  - Acute viral illness with fever
  - Acute onset with resolution as other sx dissapate
  - NDPH associated with **EBV**
  - Sinusitis
    - Pressure-like, with dull periorbital pain, worse in the morning, +congestion, lasts for several days, NO nausea/visual changes/phono- or photophobia
  - % due to meningitis: **2-9%**

- **Structural disorders**
  - Tumors, cysts, etc cause headache by hydrocephalus, mass effect, hemorrhage
  - Chiari I malformation

- **Vascular disorders**
  - Acute onset of severe HA with abnormal neurologic exam
Headache Syndromes - Secondary

- **Trauma**
  - No imaging if: >age 2 years with normal MS, no signs of skull fracture, no LOC, no vomiting, nonsevere mechanism of injury, and nonsevere HA
  - Post-traumatic HA: develops within 1 week of trauma/concussion/whiplash

- **Substances**
  - Caffeine, alcohol use, illicit drug use, CO poisoning, lead toxicity, meds

- **Systemic disease**
  - Fasting
Question #11

A 4-year-old boy comes in with the complaint of headache. His father asks whether a brain scan should be performed. Which of the following characteristics would be the STRONGEST indication for a magnetic resonance imaging study of this child’s brain?

A. Age under 5 years
B. Detection of a slight limp on examination
C. Headache that awakens him from sleep
D. Male gender
E. Unilateral headache
Red Flags for secondary

- Exclusively occipital
- Progressive pattern
  - Becomes more severe or frequent
- Increased HA with straining, coughing, sneezing
- Explosive or sudden onset of severe HA
- Systemic symptoms
- Risk factors:
  - Immunosuppression, hypercoagulable, neurocutaneous d/o, cancer
- Neuro factors:
  - AMS, papilledema, abnormal eye movements, asymmetric findings on exam
- New or different severe headache, change in attack frequency, severity or clinical features
- Sleep related HA, HA waking the patient from sleep, always present in morning
A 17-year-old girl presents with complaints of recurring headaches that are becoming more frequent. She was diagnosed with migraine headaches two years ago. Previously she had an average of one migraine per month, but she now has one per week. She has no double vision, vomiting, or awakening from sleep with headaches. Headaches can occur at any time of day, are throbbing and bifrontal, and are associated with nausea and phonophobia. They are relieved by nonsteroidal anti-inflammatory drugs and by lying down in the dark. They rarely last more than four hours. The adolescent and her mother are concerned that the increased headache frequency could be due to a brain tumor or aneurysm.

Of the following, the MOST appropriate next step is
A. Brain magnetic resonance imaging to rule out aneurysm
B. Brain magnetic resonance imaging to rule out brain tumor
C. Head computed tomography scan with contrast to rule out brain tumor
D. Lumbar puncture with manometry to rule out elevated intracranial pressure
E. Perform no diagnostic testing at this time
Question #7

A 16-year-old girl who is new to your practice complains of a nearly constant headache for the past year. She describes the pain as a band around her head that often is throbbing and is worse during the middle of the day. She denies nausea or vomiting but reports occasional fatigue. There is no family history of headaches. She has missed more than 20 days of school this year because of the headache, and she is struggling to maintain a C average. She admits to hating school and does not participate in extracurricular activities because “she does not like anything”. Findings on her physical examination including complete neurologic and fundoscopic evaluation are normal.

Of the following, the BEST next step in the management of this girl’s headaches is to

A. Advise her to keep a headache diary and return in 2 months
B. Obtain a lumbar puncture
C. Obtain computed tomography scan of the brain
D. Prescribe oral sumatriptan
E. Refer her for a psychosocial evaluation and counseling
To image or not to image? (That is the first question...)

- Based on the likelihood of primary vs secondary HA
  - Look for those red flags: worsening at night or immediately upon awakening, vomiting, worsened pain with cough

- Question 4
  - FHx aneurysms may increase risk, but is NOT an indication for imaging in those <30 yo
  - FHx brain tumors is not a reason as most cases are sporadic
  - No signs/sxs given to make you think you need an LP
  - Our patient has pain typical of stress-related or tension-like headaches
    - Should also obtain history regarding sleep patterns, emotional or social behaviors, and school performance ➔ may lead to underlying etiology and potential treatment plans just like in...

- Question 7
  - Family stressors and depression are known causes of HA
    - Kids with freq or severe HA have greater impairment in academic and social functioning
  - Diary would only prolong symptoms and not address cause
  - LP and CT would help with acute issues you may be concerned about, but unlikely in this pt
  - Oral sumatriptan ➔ treatment for migraines, BUT the history points to depression and prescribing medications without psychosocial evaluation would not be effective
A 17-year-old girl complains of clumsiness over the past 3 days. She has had moderate headaches for 1 month and neck discomfort for 3 days. Physical examination reveals right-sided dysmetria and left upper and lower numbness to pinprick and weakness rated as a 4/5. The remainder of her examination results are normal.

Of the following, the MOST appropriate evaluation to establish the patient’s diagnosis is

A. Computed tomography scan of the brain
B. Lumbar puncture
C. Measurement of nerve conduction velocities
D. Measurement of somatosensory evoked potentials
E. Urine toxicology screen
To image or not to image?

Now we’re worried about a secondary cause!

- New onset neurologic symptoms in the first 2-6 months after onset of HA are especially concerning; specifically strabismus, papilledema, unilateral weakness, ataxia.

Emergent imaging is required

- CT without contrast can be obtained easily and without sedation to identify structural lesions.

What does our patient have?

- HA, ataxia, left hemisensory loss, right dyscoordination, neck pain → posterior fossa mass.

LP contraindicated with suspicion of mass.

Nerve conduction, evoked potentials evaluate peripheral neuropathies, demyelination.

Toxins would not produce this set of sx.

Neuropathies without sedation, months after fully strabismus.
A 13-year-old girl has had five days of unremitting headache that is relieved by vomiting but not sleep and one day of double vision. She was previously healthy and has no history of migraine headaches, but she was treated for otitis media six weeks ago. Findings on physical examination are normal except for some tenderness over her left mastoid. On neurologic examination, you note normal mental status and normally reactive pupils and vision but florid papilledema. She cannot abduct her right eye fully and has subjective double vision with both eyes open looking to the right but not looking to the left or with either eye covered. Facial sensation and movements are normally symmetric, and the rest of the findings are normal. Head computed tomography scan yields normal results.

Of the following, the diagnostic test or procedure that is MOST likely to be helpful is

A. Brain magnetic resonance imaging
B. Cerebral angiography
C. Lumbar puncture with manometry
D. Ocular nerve sheath fenestration
E. Serum vitamin A measurement
Other diagnostics...

She was imaged and you ruled out hydrocephalus but not other causes of increased ICP...you suspect?

- **Most helpful study is LP with manometry**
  - Should be in lateral decubitus position with legs relaxed
  - Pressure >20 cm H2O confirms
  - Pressure often low for several days as CSF drains into soft tissues around LP site

- **This patient has mastoiditis. The cause of her pseudotumor was venous sinus thrombosis**
  - MRI with contrast and venography is more sensitive than CT or routine MRI
  - Cerebral angiography for arterial vascular pathology, not used commonly
  - Ocular nerve sheath: longer term treatment for refractory pseudotumor to reduce pressure and preserve vision
  - Vitamin A level could be drawn AFTER the LP to workup causes
A 12-year-old, 40-kg girl presents for a health supervision visit. Physical examination, including vital signs, yields normal results. The mother notes that the girl had to come home from school three times last semester due to headaches. Her typical headaches are bifrontal, with sensitivity to light and sound and often nausea. They last 1 to 6 hours. During the headache, she feels and looks sick and prefers to lie in a dark room. The mother requests an acute treatment plan for her daughter. You provide education about migraine headaches and discuss lifestyle issues, including good sleep hygiene, exercise, diet, hydration, and stress management. For abortive headache treatment, you explain that it is ideal to treat within 30 minutes, even at school.

Of the following, the PREFERRED abortive treatment for this girl is

A. Butalbital (50 mg), acetaminophen (325 mg), caffeine (40 mg) orally
B. Ibuprofen (400 mg) orally
C. Promethazine (12.5 mg) rectally
D. Sumatriptan (5 mg) intranasally
E. Topiramate (25 mg) orally
Treatment options

- Lifestyle and healthy habits education
- Early intervention!
  - Use tx no more than 2-3 days/week; <15 days/month NSAIDs and <10 days/month triptans
- Abortive treatment
  - Ibuprofen - readily available, inexpensive, no Rx required, ok at school
  - Ibuprofen/Tylenol are as effective as triptans with fewer adverse effects
- Combination products are not first line
- Triptans have a higher risk profile and should be deferred until after implementation of healthy habits and appropriate use of ibuprofen
- Promethazine and metoclopramide (Dopamine blockers) → adverse effects like akathisia and acute dystonic reactions
  - Topamax for preventive therapy
    - If pt has >4 days disabling HA/month
A 14-year-old girl has been diagnosed as having migraine. The headaches occur twice weekly and have caused her to miss school at least once per month. The family is interested in prophylactic medication to prevent her attacks, and you plan to start amitriptyline. Of the following studies, which is indicated as part of amitriptyline therapy?

A. Chest radiograph  
B. Complete blood count  
C. Electrocardiogram  
D. Serum alanine aminotransferase  
E. Serum creatinine
Question #3

A 14-year-old boy who was diagnosed with migraines at 11 years of age presents to the emergency department with a severe migraine. For the past two months, he has had two to three such headaches per week. His mother asks about using stronger pain medications. You are concerned about the possible complications of medication overuse.

Of the following, the class of abortive medications that is MOST likely to induce chronic headaches is

A. Caffeine-containing medications
B. Isomethptene compounds
C. Nonsteroidal anti-inflammatory drugs
D. Opiates
E. Triptans
Selected side effects

- TCAs → may cause/exacerbate conduction studies
- Cyproheptadine → sedation, weight gain
- Topiramate → cognitive changes, word finding difficulty

Overuse of medications and chronic HAs
- 3rd most common type chronic HA after migraine and tension HA
- Opiates and barbiturates are more likely
- Most often results from NSAIDs due to them being most commonly used medications
Content Specs:

1. Recognize the physical characteristics of a headache due to increased intracranial pressure
2. Know the elements of history that characterize a migraine
3. Be aware of neurologic defects that can be associated with a migraine
4. Know the elements of history that characterize a headache due to stress/tension/emotion
5. Know that a headache can be caused by depression
6. Know the elements of history that characterize a headache due to increased intracranial pressure
7. Know the signs and symptoms of a headache that indicate a need for follow-up with magnetic response imaging or CT scan
8. Know the values and limitations of ancillary neurodiagnostic tests in the evaluation of a headache
9. Plan the abortive treatment of an acute migraine
10. Plan the treatment of a headache due to stress/tension/emotion
11. Recognize the potential complications of using narcotics, sedatives, and nonsteroidal anti-inflammatory drugs to treat a chronic or recurrent headache
12. Plan prophylactic treatment for recurrent migraine