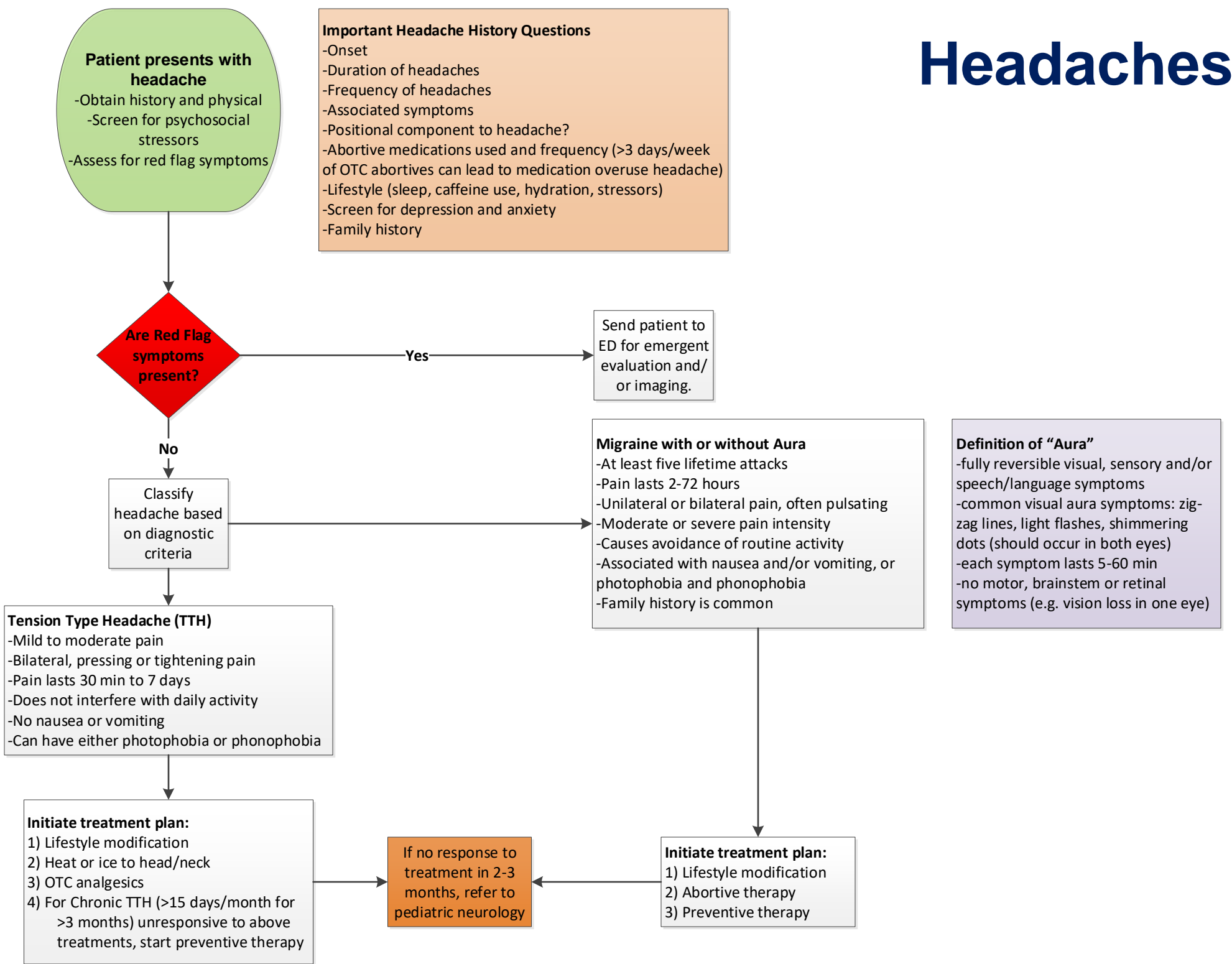


Headaches



Red Flag Symptoms

- New neurologic deficit on exam (e.g. papilledema, weakness, numbness, cranial nerve abnormality)
- Altered mental status, confusion
- Worst headache of life
- Meningeal signs, fevers, rigors, new onset seizures
- Headaches occurring when supine or with valsalva maneuver (suggestive of increased intracranial pressure or intracranial mass)
- Waking up from sleep with new onset headache and vomiting
- Sudden loss of vision or new double vision
- Recurrent thunderclap headaches

Abortive Treatments

- Goal: Stop headache within 1-2 hours so that patient can function
- How to counsel patient: Take at onset of headache, no more than 2-3 days/week to prevent medication overuse headache.
- Over-the-Counter Medications:
 - Ibuprofen
 - Naproxen
 - Acetaminophen
- Triptans: If patient does NOT respond to first triptan at optimized dose, try combining triptan with NSAID. If not effective, use a different triptan. Side effects include flushing, nausea, chest pressure. Do not use in patients with heart disease, stroke, or hypertension.
 - Sumatriptan (25mg/50mg/100mg tabs or nasal spray 20 mg)
 - Rizatriptan (5mg/10mg tab or dissolving tab)
 - Zolmitriptan (2.5 mg/5 mg tab, melt or nasal spray)
- Anti-emetics: If patient has significant nausea/vomiting, offer anti-emetic which can be taken at same time as NSAID and/or triptan.
 - Zofran
 - Compazine (can combine with Benadryl to prevent extra-pyramidal symptoms)

***Screen all patients for medication overuse headache. Ask the frequency with which they use abortive medications, including over the counter medications. If patient uses abortive medication >2-3 times/week, need to optimize preventive regimen and advise to decrease frequency of abortive.

Lifestyle Modification

- Sleep: 8-10 hours/night, consistent sleep routine
- Diet: Eat 3 healthy meals/day. Do not skip meals.
- Fluids: Drink 64-100 ounces of water daily. Avoid caffeine.
- Exercise: 30 minutes/day at least 5 times/week
- Avoid excessive heat/sun exposure
- Limit screen time and use blue light filters
- Headache Diary: Keep a log of headaches to help identify headache triggers.
 - Phone Apps: Migraine Buddy, N1 Headache, Migraine Insight
- Once identified, try to avoid triggers (e.g. wear sunglasses, avoid certain foods, etc.)
 - Common food triggers: aged cheese, artificial sweetener, chocolate, MSG, processed meats
- Mindfulness and Meditation: use relaxation techniques to manage stress and pain
 - Phone Apps: Headspace, Curable, Calm

Preventive Treatments

- Goal: Decrease frequency and intensity of migraines or chronic tension type headaches over time
- Consider if patient is having >1 migraine week or >15 tension type headaches/month, especially if headaches affect school and social activities
- First Line Treatments
 - 1) Lifestyle Modification
 - 2) Nutraceuticals: Take for at least 3 months to see an effect
 - A. Magnesium Oxide 400 mg daily (side effect is diarrhea)
 - B. Riboflavin 400 mg daily (side effect is bright urine)
 - C. Can use Migrelief (combination of Magnesium, Riboflavin, and Feverfew) instead of the above
 - 3) Cognitive behavioral therapy if patient endorses anxiety and/or depression
- Second Line Treatments (choose 1)
 - 1) Nortriptyline or Amitriptyline: Can help with sleep. Side effects include dry mouth, dizziness, sleepiness, weight gain, sun sensitivity. Obtain baseline EKG to evaluate for QT prolongation.
 - 2) Topiramate or Zonisamide: Can help with weight loss. Side effects: renal stones, tingling, decreased appetite, word finding difficulties. Teratogenic and can lower efficacy of oral contraceptives so counsel adolescent females.

Medication Dosage

Preventive Medications:

With all preventive medications, use the highest tolerable dose. If patient cannot tolerate the max dose due to side effects, it is fine to decrease to highest tolerable dose rather than discontinue the medication.

Topiramate or Zonisamide:

- Topiramate has been studied in pediatric migraine, though Zonisamide is often better tolerated with fewer side effects.
- Ages 12 or older
- Start at 25 mg nightly x1 week, then 50 mg x1 week, then 75 mg x1 week, then 100 mg nightly or ~2 mg/kg/day.

Amitriptyline or Nortriptyline:

- Amitriptyline has been studied in pediatric migraine, though Nortriptyline is often better tolerated.
- Ages 10 or older
- Start at 10 mg nightly x1 week, then 20 mg nightly x1 week, then 30 mg nightly and continue at that dose.
- If not improving at 30 mg, can increase weekly by 10 mg increments to max dose of 1 mg/kg if tolerating without side effects. Obtain repeat EKG with doses >50 mg.

Magnesium:

- Formulations: magnesium citrate gummies (100 mg/gummy), magnesium oxide, magnesium glycinate, magnesium gluconate, CALM powder (325 mg/2 tsp)
- <40 kg, 200-400 mg nightly
- >40 kg, 400-800 mg nightly, highest tolerated dose

Riboflavin:

- <40 kg: 200 mg daily
- >40 kg: 400 mg daily

Citations:

Papetti L, Ursitti F, Moavero R, et al. Prophylactic Treatment of Pediatric Migraine: Is There Anything New in the Last Decade?. *Front Neurol.* 2019;10:771. Published 2019 Jul 16.
doi:10.3389/fneur.2019.00771

TABLE 8-3

Triptan Dosing in Children and Adolescents^a

Medication	<40 kg (88 lb)	≥40 kg (88 lb)	Notes
Sumatriptan tablet	12.5-25 mg	50-100 mg	Combined sumatriptan/naproxen is labeled by the US Food and Drug Administration (FDA) for ages 12 to 17 years: 10 mg/60 mg to 85 mg/500 mg ⁷⁷
Sumatriptan nasal spray ⁷⁹⁻⁸²	5 mg	10-20 mg	Studied in children aged 6 and older; labeled in Europe for ages 12 to 17 years
Sumatriptan nasal powder	11 mg	11-22 mg	Not specifically studied in children
Sumatriptan subcutaneous injection	0.1 mg/kg	4-6 mg	Doses <6 mg will typically need to be drawn up in a syringe
Rizatriptan (melt or tablet) ^{83,84}	5 mg	10 mg	Doses are FDA labeled for ages 6 to 17 years, by weight
Zolmitriptan tablet ⁸⁵	2.5 mg	5 mg	
Zolmitriptan nasal spray ⁸⁶	2.5 mg	5 mg	FDA labeled for ages 12 to 17 years
Almotriptan tablet ⁸⁷	6.25 mg	12.5 mg	FDA labeled for ages 12 to 17 years
Naratriptan tablet	1 mg	2.5 mg	Some studies of naratriptan for menstrual migraine included girls 15 years of age or older
Frovatriptan tablet	1.25 mg (1/2 tablet)	2.5 mg	Not specifically studied in children
Eletriptan tablet	20 mg	40-80 mg	Not specifically studied in children

^a The doses listed are intended to be single doses given once in a 24-hour period. While giving a second dose of a triptan 2 hours after the first may be safe, additional efficacy has not been demonstrated.

Gelfand AA. Pediatric and Adolescent Headache. *Continuum (Minneapolis)*. 2018;24(4, Headache):1108-1136.