

# Migraine and Tension Headache Guideline

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## Last guideline approval: April 2018

**Guidelines** are systematically developed statements to assist patients and providers in choosing appropriate health care for specific clinical conditions. While guidelines are useful aids to assist providers in determining appropriate practices for many patients with specific clinical problems or prevention issues, guidelines are not meant to replace the clinical judgment of the individual provider or establish a standard of care. The recommendations contained in the guidelines may not be appropriate for use in all circumstances. The inclusion of a recommendation in a guideline does not imply coverage. A decision to adopt any particular recommendation must be made by the provider in light of the circumstances presented by the individual patient.

This evidence-based guideline was developed by **Kaiser Permanente Washington (KPWA)**.

# Background

This guideline includes diagnosis and treatment of the most common headache types that are managed in primary care:

- Tension headache
- Migraine headache, including menstrual migraine
- Medication overuse headache (also known as rebound headache)

Cluster headaches are excluded from this guideline because of their low prevalence in the general population and the severity of the symptoms. For patients with suspected cluster headaches, consider consulting with Neurology for evaluation and treatment.

Populations excluded from this guideline include pregnant women and children aged 13 years and younger.

**Note:** KPWA and national guidelines advise **against** the use of **opioids and butalbital-containing medications** (e.g., Fiorinal, Fioricet) for treatment of headaches.

## Diagnosis

### Red flag warning signs

*For patients with a rapidly accelerating course, a recent history of head injury, or focal neurologic findings, consult with a neurologist or neurosurgeon.*

Use the **SNOOP** mnemonic to identify red flag warning signs requiring immediate or urgent evaluation:

#### Systemic

- Conditions: malignancy, HIV, pregnancy
- Signs: fevers, sweats, rash, weight loss

#### Neurologic

- Symptoms: any neurologic symptoms other than classic aura (such as confusion or double vision)
- Signs: optic nerve edema, abnormal neurologic exam

#### Onset sudden (< 5 minutes)

#### Older than 50 years

#### Pattern change

- Change in type or quality of headache
- More than 50% increase in frequency or severity

Consider using the Patient Questionnaire for Headaches (internal SharePoint site) to evaluate patients for red flags.

**When patients have no red flags or indications for imaging**, ask them to gather more data on their headaches and schedule follow-up in primary care in 1 to 2 weeks to assess their response to empiric treatment. The SmartPhrase **.AVSHEADACHEDIARY** and the handout Your Headache Log (internal SharePoint site) provide patients instructions for keeping a headache log and advice about when to seek immediate medical attention.

### Differential diagnosis

Consider the following “can’t miss” headache causes at least once in your evaluation of a new-onset headache or a change in an existing headache pattern.

Create a concrete differential diagnosis to rule out “can’t miss” causes of headache using the DATA C<sup>2</sup>A<sup>2</sup>N save lives (internal SharePoint site) mnemonic from David Newman-Toker, MD.

**D**issection (carotid or vertebral)

**A**rteritis (giant cell)

**T**hrombosis (dural venous)

**A**neurysm (leak, expansion, or subarachnoid hemorrhage)

**C**arbon monoxide, **C**olloid cyst

**A**ngle closure glaucoma, **A**ngina

**N**orepinephrine neoplasm (pheochromocytoma)

## Imaging

Order imaging only when your differential diagnosis supports it. Imaging should not be done solely for reassurance. High-end imaging (CT or MRI) for uncomplicated headache increases costs, radiation, and anxiety for patients without improving quality of care.

Most urgent causes for headache are **not** ruled out with a non-contrast head CT and need to be excluded with specific imaging, exam, or serologic testing. **A head CT does not “clear” a patient with headache.**

## Migraine versus tension headache

Source: International Headache Society 2013

<b>Migraine headache</b>	<b>Tension headache</b>
4–72 hours' duration. Aura may be present.  <i>At least two</i> of the following bullets are true: <ul style="list-style-type: none"><li>• Unilateral location.</li><li>• Moderate to severe pain intensity.<sup>1</sup></li><li>• Pain described as pulsating.</li><li>• Aggravated by routine activity.</li></ul> <i>At least one</i> of the following two bullets is true: <ul style="list-style-type: none"><li>• Sensitivity to light and/or sound is present.</li><li>• Nausea and/or vomiting is present.</li></ul>	30 minutes' to 7 days' duration. No aura.  <i>At least two</i> of the following bullets are true: <ul style="list-style-type: none"><li>• Bilateral location.</li><li>• Mild to moderate pain intensity.<sup>1</sup></li><li>• Pain described as pressing or tightening (not pulsating).</li><li>• Not aggravated by routine activity.</li></ul> <i>Both</i> of the following bullets are true: <ul style="list-style-type: none"><li>• No sensitivity to light or sound, <b>or</b> sensitivity to only one of the two.</li><li>• Neither nausea nor vomiting is present.</li></ul>
<sup>1</sup> Pain intensity <ul style="list-style-type: none"><li>• Mild: Patient is aware of headache, but able to continue daily routine with minimum alterations.</li><li>• Moderate: Headache inhibits daily activities, but is not incapacitating.</li><li>• Severe: Headache is incapacitating.</li></ul>	

## Medication overuse headache (MOH)

Source: International Headache Society 2013

Medication overuse headache (MOH; also known as *rebound headache*) is headache occurring at least 15 days per month in patients with pre-existing headache disorder who have regularly overused acute or symptomatic headache medication for 3 months or longer. (“Overuse” is defined as > 10 days or > 15 days per month, depending on the medication.) **It is important to rule out MOH prior to initiating therapy for any acute headache.** See p. 12.

## Menstruation-related migraine headache

Source: International Headache Society 2013

Episodes of migraine without aura (as defined in Table 1) occurring in the window of 2 days before to 3 days after menstruation, in at least two out of three menstrual cycles. (Menstruation is endometrial bleeding resulting from either the normal menstrual cycle or from the withdrawal of exogenous progestogens, as in the use of combined oral contraceptives or cyclical hormone replacement therapy.)

# Tension Headache

## Acute treatment of tension headache

**Note:** It is important to rule out medication overuse headache (MOH) prior to initiating therapy for any acute headache. See p. 12.

<b>Table 2. Pharmacologic options for acute treatment of tension headache</b>				
<b>ASPIRIN/NSAIDS (contraindicated if history of GI bleeds)</b>				
<b>Medication</b>	<b>Initial dose</b>	<b>Max dose</b>	<b>Relative <i>contraindications</i></b>	<b>Special considerations</b>
Aspirin	500 mg x1, may repeat in 4-6 hours	4000 mg	Age < 19 years Post-Roux-en-Y gastric bariatric surgery	OTC Possible side effects: GI
Ibuprofen	400 mg x1, may repeat in 4-6 hours	1200 mg	Post-Roux-en-Y gastric bariatric surgery	OTC Possible side effects: GI
Acetaminophen/aspirin/caffeine	500 mg (aspirin component), may repeat in 6 hours	4000 mg (acetaminophen component)	Age < 19 years Post-Roux-en-Y gastric bariatric surgery	OTC Ask about acetaminophen from other sources. Lower max dose in severe liver disease.
Naproxen	500 mg x1, may repeat in 6-8 hours	1250 mg	Post-Roux-en-Y gastric bariatric surgery	OTC Possible side effects: GI
Diclofenac	50 mg x1, may repeat in 8-12 hours	150 mg	Safety/efficacy not established in pediatrics Post-Roux-en-Y gastric bariatric surgery	Possible side effects: Cardiovascular GI
<b>NOT RECOMMENDED</b>				
KPWA and national headache guidelines advise <b>against</b> the use of <b>opioids and butalbital-containing medications</b> (e.g., Fiorinal, Fioricet) for treatment of headaches.				

# Prophylaxis of tension headache

<b>Table 3. Prophylaxis of tension headache</b>
<b>SELF-CARE</b>
<ul style="list-style-type: none"><li>• Keep a regular schedule of sleep, exercise, and good nutrition. Poor sleeping and eating patterns are triggers for headaches.</li><li>• Rearrange your work or study area to avoid physical strain. For example, move computer screens to eye level, lower your chair so that your thighs are parallel to the floor, and use a lumbar roll to maintain a good sitting posture. Use a phone headset if you often cradle a phone on your neck.</li><li>• Prevent neck pain with gentle stretching exercises and relaxation techniques. If you have neck pain, apply heat and ice to relieve pain and do gentle stretches to help loosen tension in your neck. Robin McKenzie's book <i>Treat Your Own Neck</i> is a good source for effective self-care exercises to lower neck muscle tension naturally. Consider effects of depression and anxiety in neck tension.</li><li>• If you get headaches when you don't have caffeine, these are caffeine withdrawal headaches. Cut your coffee or tea intake to no more than 2 cups a day to help avoid these headaches.</li><li>• Don't use over-the-counter pain medicines (such as Tylenol, Excedrin, aspirin, or ibuprofen) or decongestants (such as Sudafed or pseudoephedrine) for more than 3 days a week for headaches. This can lead to overusing medicines for your headaches.</li></ul>
<b>MONITORING AND PROPHYLAXIS PLANNING</b>
<ul style="list-style-type: none"><li>• Advise the patient to keep and review a headache diary to monitor the effects of treatment on severity, frequency, and disability. Use the <b>.AVSHEADACHEDIARY</b> SmartPhrase in Epic. Patients may opt to use a smartphone app, such as Migraine Buddy, an electronic headache diary.</li><li>• Work with the patient to establish an individualized goal of prophylaxis, noting that reducing the frequency and/or severity of headaches—rather than eliminating them completely—is a realistic target.</li><li>• Consider follow-up by phone visit in 4 to 6 weeks to check and adjust treatment options.</li></ul>
<b>ACUPUNCTURE</b>
Consider a course of up to 10 sessions of acupuncture over 5–8 weeks for the prophylactic treatment of chronic headaches. For questions about coverage for acupuncture, patients can contact Member Services. A list of preferred complementary alternative medicine (CAM) providers can be found on the <a href="#">KPSA member website</a> (log-in required).
<b>MEDICATION</b>
While no well-designed randomized controlled trials have shown clear benefit of using SSRIs in prophylaxis of tension headache, this could be considered but may not be effective until at least one month at the maximally tolerated or recommended dose of the SSRI (expert opinion). If there is a concern about concurrent migraine, consider migraine prophylaxis (see p. 8).

# Migraine Headache

## Acute treatment of migraine in primary care

The choice of acute migraine treatments should be dictated by the rapidity of onset, headache severity, associated symptoms (e.g., nausea/vomiting), and patient preference. If a patient doesn't respond to 1–2 adequate doses of a given medication during a migraine episode, it is appropriate to try another medication.

**Note:** It is important to rule out medication overuse headache (MOH) prior to initiating therapy for any acute headache. See p. 12.

<b>Table 4. Pharmacologic options for acute treatment of migraine in primary care</b>					
<b>TRIPTANS</b>					
<ul style="list-style-type: none"> <li>• Triptans are first-line treatment for severe migraines as they are generally highly effective, with a low risk of side effects.</li> <li>• Failure of one triptan does not indicate failure of the entire class of medication. Consider trying a second triptan medication if the first one does not improve symptoms.</li> <li>• A combination of triptan and NSAID may be more effective than either medication alone.</li> </ul>					
Medication	Initial dose	Max dose	Relative indications	Relative contraindications	Special considerations
Sumatriptan - oral	25-100 mg x1, may repeat in 2 hours	200 mg	Relatively safe in pregnancy	Concomitant ergot or MAOI use	Good choice for most people, most of the time
Rizatriptan - oral	5-10 mg x1, may repeat in 2 hours	30 mg		Cerebrovascular syndrome	Prescribe 5 mg dose with concomitant propranolol
Naratriptan - oral	1-2.5 mg x1, may repeat in 4 hours	5 mg	People with ≥ 3-day headaches (long half-life)	Significant cardiovascular disease	Complement to NSAIDs for perimenopausal women
Sumatriptan – nasal	5-20 mg x1, may repeat in 2 hours	40 mg	Nausea/vomiting or rapid peak in migraine intensity	Hemiplegic or basilar migraine	Prescribe 1 mg dose in mild to moderate renal or hepatic disease
Sumatriptan – SQ	6 mg x1, may repeat in 1 hour	12 mg	Nausea/vomiting or rapid peak in migraine intensity		Taste not acceptable to some patients High cost
<b>ASPIRIN &amp; NSAIDs (contraindicated if history of GI bleeding)</b>					
Medication	Initial dose	Max dose	Relative indications	Relative contraindications	Special considerations
Aspirin + acetaminophen + caffeine (Excedrin Migraine or similar)	500 mg (aspirin component), may repeat in 6 hours	4000 mg (acetaminophen component)		Age < 19 years Post-Roux-en-Y gastric bariatric surgery	OTC Ask about acetaminophen from other sources Lower max dose in severe liver disease
Naproxen	500 mg x1, may repeat in 6-8 hours	1250 mg		Post-Roux-en-Y gastric bariatric surgery	OTC Possible side effects: GI
Ibuprofen	400 mg x1, may repeat in 4-6 hours	1200 mg		Post-Roux-en-Y gastric bariatric surgery	OTC Possible side effects: GI
Diclofenac	50 mg x1, may repeat in 8-12 hours	150 mg		Safety/efficacy not established in pediatrics Post-Roux-en-Y gastric bariatric surgery	Possible side effects: cardiovascular, GI
<i>Table 4 continues...</i>					

**Table 4. Pharmacologic options for acute treatment of migraine in primary care, *continued***

ANTIEMETICS					
Medication	Initial dose	Max dose	Relative indications	Relative contraindications	Special considerations
Metoclopramide (Reglan)	5 mg x1, may repeat with adjunctive medication	20 mg	Nausea/vomiting	People at risk for extrapyramidal syndromes (EPS)	Adjunct only, not standalone Caution with long-term use
ERGOTS					
Medication	Initial dose	Max doses	Relative indications	Relative contraindications	Special considerations
Dihydroergotamine - nasal	0.5 mg x1, may repeat in 15 minutes	2 mg daily 4 mg weekly	More severe headache Nausea/vomiting	Safety/efficacy not established in pediatrics Pregnancy	After failure of preferred treatment High cost
Dihydroergotamine -SQ/IM	1 mg x1, may repeat in 1 hour	3 mg daily 6 mg weekly		Hemiplegic or basilar migraine Ischemic heart disease Severe hepatic or renal impairment	Possible side effects: ergotism (peripheral vascular ischemia, headache, vomiting, diarrhea, gangrene of the fingers and toes)
NOT RECOMMENDED					
KPWA and national headache guidelines advise <b>against</b> the use of <b>opioids and butalbital-containing medications</b> (e.g., Fiorinal, Fioricet) for treatment of headaches.					

## Treatment of refractory migraine

For patients with migraines that are not relieved by home care, consider treatment with **fluids, an antiemetic, and an NSAID**.

The choice of medication should be directed by the severity of the attack, the type of symptoms present, patient preference, and patient-specific factors. Two possible starting points are:

- A “cocktail” of IV fluids, IV or IM ondansetron, and IM ketorolac
- A “cocktail” of medications that has worked for the patient before and does **not** include opioids

Sumatriptan SQ may be a useful adjunct if indicated. For other IV or IM options, consult with Urgent Care or Neurology.

For patients who have repeated refractory migraines, consider medication overuse as an underlying cause.

# Migraine prophylaxis

## Overview

There are no clear evidence-based recommendations for when to start preventive therapy for migraine.

The choice of migraine prevention medication should be made based on comorbid conditions (e.g., tricyclics for patients with depression and/or neuropathic pain syndromes, valproic acid/divalproex for persons with seizure disorders) and the relative value the patient places on efficacy versus avoidance of side effects.

Develop a **written headache treatment plan** for prevention and management of acute migraine to:

- Decrease headache frequency. (Aim for fewer than 5 headache days per month.)
- Decrease headache severity. (Headaches will respond quickly to an abortive therapy.)
- Avoid medication/caffeine overuse headache. (See p. 12.)
- Consider using the Epic SmartText **Medical Treatment Plan for Migraine Headache** to document the headache treatment plan for the After Visit Summary.

## Guiding principles of migraine prophylaxis

- Each medication dose change may take 2–4 weeks to reach maximal effectiveness.
- Using fewer than 5 headache days per month as a goal, the initial dose of each medication should be fairly low, and gradually increased to the maximal tolerated or maximal safe dose. Keep medication at that dose for 1 month before making modifications to therapy.
- Ideally, an adequate trial of a prophylactic medication is 4 weeks at the maximum recommended or tolerated dose before considering an alternative medication.
- When headache days remain fewer than 5 per month for 1 to 2 months, start tapering therapy of the least well-tolerated medication to find the lowest effective dose.
- **Note:** It is important to rule out medication overuse headache (MOH) prior to initiating headache prophylaxis. See p. 12. Patients not responding to combinations of two or three prophylactic medications should be reassessed for MOH, an alternative diagnosis, or confounding psychiatric or social stresses. Drug therapy alone may not be sufficient.
- Before considering a patient to have failed treatment with a given migraine prevention medication, advance to the maximum recommended dose.

## Options for migraine prophylaxis

Table 5. Options for migraine prophylaxis
<b>SELF-CARE</b>
<ul style="list-style-type: none"><li>• Pay attention to the food and beverages you consume as they can trigger migraine attacks. Possible triggers include red wine (sulfites, aged cheeses, and chocolate).</li><li>• Keep a regular schedule of sleep, exercise, and good nutrition. Poor sleeping and eating patterns are triggers for headaches.</li><li>• Rearrange your work or study area to avoid physical strain. For example, move computer screens to eye level, lower your chair so that your thighs are parallel to the floor, and use a lumbar roll to maintain a good sitting posture. Use a phone headset if you often cradle a phone on your neck.</li><li>• Prevent neck pain with gentle stretching exercises and relaxation techniques. If you have neck pain, apply heat and ice to relieve pain and do gentle stretches to help loosen tension in your neck. Robin McKenzie's book <i>Treat Your Own Neck</i> is a good source for effective self-care exercises to lower neck muscle tension naturally.</li><li>• If you get headaches when you don't have caffeine, these are caffeine withdrawal headaches. Cut your coffee or tea intake to no more than 2 cups a day to help avoid these headaches.</li><li>• Don't use over-the-counter pain medicines (such as Tylenol, Excedrin, aspirin, or ibuprofen) or decongestants (such as Sudafed or pseudoephedrine) for more than 3 days a week for headaches. This can lead to overusing medicines for your headaches.</li><li>• Keep a headache diary on paper or consider use of an electronic headache diary via a smartphone app, such as Migraine Buddy.</li></ul>
<b>MONITORING AND PROPHYLAXIS PLANNING</b>
<ul style="list-style-type: none"><li>• Advise the patient to keep and review a headache diary to monitor the effects of treatment on severity, frequency, and disability. Use the <b>.AVSHEADACHEDIARY</b> SmartPhrase in Epic. Patients may opt to use a smartphone app, such as Migraine Buddy, an electronic headache diary.</li><li>• Work with the patient to establish an individualized goal of prophylaxis, noting that reducing the frequency and/or severity of headaches—rather than eliminating them completely—is a realistic target.</li><li>• Consider follow-up by phone visit in 4 to 6 weeks to check and adjust treatment options.</li></ul>
<i>Table 5 continues...</i>



**Table 5. Options for migraine prophylaxis, *continued***

**COMPLEMENTARY/ALTERNATIVE THERAPIES**

**Acupuncture**

Moderate evidence supports the effectiveness of acupuncture over sham acupuncture in reducing migraine frequency and medication use in adult patients who have not responded to prophylactic medications. There is no evidence on the impact of acupuncture on migraine severity. There is no evidence of the effectiveness of acupuncture in teens.

**Cefaly device**

One high-quality randomized controlled trial indicates that transcutaneous supraorbital stimulation using the Cefaly device may be more effective than sham procedure in the short term as prevention therapy. Long-term effect is not known. [Not likely to be covered. Patients can purchase personal device, returnable after 90-day trial.]

**SUPPLEMENTS**

<b>Supplement</b> For more information on supplements, see <a href="#">Consumer Reports</a> or <a href="#">ConsumerLab.com</a>	<b>Initial dose</b>	<b>Max dose</b>	<b>Relative indications</b>	<b>Relative contraindications</b>	<b>Special considerations</b>
Riboflavin	400 mg daily	400 mg		Pregnancy	OTC Consider combination w/magnesium and CoQ10 Onset 1–3 months
Magnesium	600 mg elemental magnesium daily	600 mg			OTC Possible side effects: GI
Co-enzyme Q10	100 mg t.i.d.	300 mg			OTC
Butterbur	75 mg daily	75 mg		Pregnancy Liver disease	OTC

**BETA BLOCKERS**

<b>Medication</b>	<b>Initial dose</b>	<b>Max dose</b>	<b>Relative indications</b>	<b>Relative contraindications</b>	<b>Special considerations</b>
Propranolol	40 mg b.i.d.	240 mg (divided t.i.d.)	Hypertension Angina Essential tremor Stress-related migraine Tachycardia	Asthma Depression CHF Raynaud’s disease Diabetes Bradycardia	

**CALCIUM CHANNEL BLOCKERS**

<b>Medication</b>	<b>Initial dose</b>	<b>Max dose</b>	<b>Relative indications</b>	<b>Relative contraindications</b>	<b>Special considerations</b>
Verapamil	80 mg daily	240 mg (divided t.i.d.)	Hypertension Arrhythmia Angina Aura Asthma Cluster headache	Constipation Hypotension Sick sinus syndrome Second- or third-degree AV block without pacemaker Severe left ventricular dysfunction	

*Table 5 continues...*

**Table 5. Options for migraine prophylaxis, *continued***

<b>ACE INHIBITORS</b>					
<b>Medication</b>	<b>Initial dose</b>	<b>Max dose</b>	<b>Relative indications</b>	<b>Relative contraindications</b>	<b>Special considerations</b>
Enalapril	5 mg	40 mg	Intolerance to other migraine meds Hypertension ASCVD	Pregnancy Hereditary or idiopathic angioedema	Possible side effects: cough
Lisinopril	5 mg	40 mg	Intolerance to other migraine meds Hypertension ASCVD	Pregnancy Hereditary or idiopathic angioedema	Possible side effects: cough
<b>ANTIEPILEPTICS</b>					
<b>Medication</b>	<b>Initial dose</b>	<b>Max dose</b>	<b>Relative indications</b>	<b>Relative contraindications</b>	<b>Special considerations</b>
Topiramate	25 mg daily	100 mg (divided b.i.d.)	Seizure disorder Bipolar disorder Obesity	Pregnancy Kidney stones Weight loss concerns Cognitive impairment Glaucoma	Titrate by 25 mg weekly Monitor serum bicarbonate, BUN, Cr while titrating Consider in obese patients Possible side effects: "Brain fog" Weight loss Metabolic acidosis
Divalproex DR	125 mg b.i.d.	2000 mg (divided b.i.d.)	Seizure disorder Bipolar disorder Mania	Pregnancy Liver disease Bleeding disorder Obesity	Titrate by 125 mg weekly Monitor ALT, AST, CBC while titrating Possible side effects: Weight gain/loss Hair loss
<b>ANTIDEPRESSANTS</b>					
<b>Medication</b>	<b>Initial dose</b>	<b>Max dose</b>	<b>Relative indications</b>	<b>Relative contraindications</b>	<b>Special considerations</b>
Nortriptyline - TCA	10–25 mg daily	150 mg	Neuropathic pain Depression Anxiety	Mania Urinary retention Heart block High risk in elderly	
Amitriptyline – TCA	25 mg daily	150 mg	Depression Anxiety Insomnia Pain	Mania Urinary retention Heart block High risk in elderly	Effective combined w/topiramate
<b>NOT RECOMMENDED</b>					
<p>KPWA and national headache guidelines advise <b>against</b> the use of <b>opioids and butalbital-containing medications</b> (e.g., Fiorinal, Fioricet) for treatment of headaches.</p> <p>There is <b>insufficient evidence to support</b> the use of SSRIs, venlafaxine, or gabapentin as prophylactic treatment for migraine.</p>					

## Menstruation-related migraine prophylaxis

**Note:** For acute treatment of menstruation-related migraine, see “Acute treatment of migraine in primary care” on p. 6.

Table 6. Options for menstruation-related migraine prophylaxis					
<b>MONITORING AND PROPHYLAXIS PLANNING</b>					
<ul style="list-style-type: none"> <li>Advise a woman with suspected menstrual migraine to keep a headache diary for at least 2 months to determine if she is having regular and predictable menses and if these correlate with headache onset. Some women experience migraines during ovulation (either alone or in addition to during menses).</li> <li>Use the <b>.AVSHEADACHEDIARY</b> SmartPhrase in Epic. Patients may opt to use a smartphone app, such as Migraine Buddy, an electronic headache diary.</li> <li>Work with the patient to establish an individualized goal of prophylaxis, noting that reducing the frequency and/or severity of headaches—rather than eliminating them completely—is a realistic target.</li> <li>Consider follow-up by phone visit in 4 to 6 weeks to check and adjust treatment options.</li> </ul>					
<b>ORAL CONTRACEPTIVES</b>					
Oral contraceptives are first-line treatment for women with irregular menses and premenstrual migraines <b>without aura</b> . Aura is defined as non-headache symptoms (e.g., tingling in limbs, visual disturbances) that precede the onset of a migraine headache.					
Medication	Initial dose	Max dose	Relative indications	Relative contraindications	Special considerations
Use shared decision making to choose appropriate option for the individual				Migraine with aura	
<b>NSAID</b>					
Consider a short course of prophylaxis with naproxen or a triptan twice a day starting 2–3 days before the anticipated onset of the headache and continuing for 5 days through the at-risk period.					
Medication	Initial dose	Max dose	Relative indications	Relative contraindications	Special considerations
Naproxen	500 mg x1, may repeat in 6-8 hours	1250 mg		Post-Roux-en-Y gastric bariatric surgery	OTC Possible GI side effects
<b>TRIPTANS</b>					
Long-acting forms are recommended. Consider a short course of prophylaxis with naproxen or a triptan twice a day starting 2–3 days before the anticipated onset of the headache and continuing for 5 days through the at-risk period.					
Medication	Initial dose	Max dose	Relative indications	Relative contraindications	Special considerations
Naratriptan	1-2.5 mg x1, may repeat in 4 hours	5 mg	Women with ≥ 3-day headaches (long half-life)	Concomitant ergot or MAOI use Cerebrovascular syndrome Significant cardiovascular disease	Complement to NSAIDs for perimenopausal women Prescribe 1 mg dose in mild to moderate renal or hepatic disease
Zolmitriptan	1.25-2.5 mg x1, may repeat in 2 hours	5 mg	Women with ≥ 3-day headaches (long half-life)	Hemiplegic or basilar migraine	
<b>NOT RECOMMENDED</b>					
KPWA advises <b>against</b> the use of <b>oral contraceptive pills</b> for menstrual migraine <b>with aura</b> due to increased risk for stroke. KPWA and national headache guidelines advise <b>against</b> the use of <b>opioids and butalbital-containing medications</b> (e.g., Fiorinal, Fioricet) for treatment of headaches.					

# Medication Overuse Headache Treatment

Medication overuse headache (MOH) is a state of daily or near-daily refractory headaches. Also known as *rebound headache*, MOH occurs at least 15 days per month in patients with pre-existing headache disorder who have regularly overused acute or symptomatic headache medication for 3 months or longer. (“Overuse” is defined as > 10 days or > 15 days per month, depending on the medication.)

**Rule out medication overuse headache prior to initiating therapy for any acute headache.** If MOH is present, prevention and acute headache medications may not be effective. Overuse is a concern with all headache medications, including over-the-counter or prescribed symptomatic medications (all NSAIDs, narcotics, analgesics, triptans, DHE, benzodiazepines, or decongestants) and caffeine in more than moderate amounts.

For patients found to have MOH,

1. Advise that it will take 2–6 weeks to resolve the MOH after withdrawing all acute headache medications that the patient has been taking.
2. Stop all acute headache medications. Tapering may be required.
3. Start a prophylactic medication at the same time or, ideally, prior to stopping acute headache medications. See “Options for migraine prophylaxis,” p. 8.
4. Treat symptoms during withdrawal of acute headache medications.
5. Use the SmartPhrase **.AVSHEADACHEMEDOVERUSE** to develop a written headache treatment plan that includes acute and prophylactic treatment as well as a plan for close follow-up and relapse prevention.

# Evidence Summary

The Migraine and Tension Headache Guideline was developed using an evidence-based process, including systematic literature search, critical appraisal, and evidence synthesis.

As part of our improvement process, the Kaiser Permanente Washington guideline team is working towards developing new clinical guidelines and updating the current guidelines every 2–3 years. To achieve this goal, we are adapting evidence-based recommendations from high-quality national and international external guidelines, if available and appropriate. The external guidelines should meet several quality standards to be considered for adaptation. They must: be developed by a multidisciplinary team with no or minimal conflicts of interest; be evidence-based; address a population that is reasonably similar to our population; and be transparent about the frequency of updates and the date the current version was completed.

In addition to identifying the recently published guidelines that meet the above standards, a literature search was conducted to identify studies relevant to the key questions that are not addressed by the external guidelines.

## Key questions addressed in the KPWA guideline

1. What is the clinical effectiveness of antiemetics, aspirin, NSAIDs, opioids, triptans, ergots, and corticosteroids for acute treatment of migraine with or without aura in patients aged > 13 years?
2. What is the clinical effectiveness of lisinopril, calcium channel blockers, antidepressants, beta blockers, and antiepileptics for prophylactic treatment of migraine with or without aura in patients aged > 13 years?
3. What is the clinical effectiveness of riboflavin (vitamin B2), magnesium, coenzyme Q10, butterbur, and acupuncture for prophylactic treatment of migraine in adults and adolescents?
4. What is the clinical effectiveness of aspirin, NSAIDs, and opioids for acute treatment of tension headache in patients aged > 13 years?
5. What is the clinical effectiveness of antidepressants, ACE inhibitors, beta blockers, and antiepileptics for prophylactic treatment of tension headache in patients aged > 13 years?
6. What is the clinical effectiveness of acupuncture for the treatment of tension-type headaches?
7. What is the clinical effectiveness of oral contraceptive pills or triptans for prophylactic treatment of menstrual migraine with aura in adolescents and adults?
8. What is the clinical effectiveness of repeated doses of triptans for refractory migraine?
9. What is the clinical effectiveness of corticosteroids, tricyclics, and withdrawal strategies (of abortive treatments) for the treatment of medication overuse headache?
10. Is it useful for patients with suspected primary headaches to undergo brain imaging for reassurance or to detect underlying pathology?
11. What is the efficacy and safety of the Cefaly device for migraine?

## External guidelines meeting KPWA criteria for adaptation/adoption

- 2015 American Headache Society. Marmura MJ, Silberstein SD, Schwedt TJ. The Acute Treatment of Migraine in Adults: The American Headache Society Evidence Assessment of Migraine Pharmacotherapies. *Headache*. 2015;55:3-20.
- 2015 National Institute for Health and Care Excellence (NICE). *Headaches in over 12s: diagnosis and management*. Clinical guideline CG150. Last updated: November 2015.

## Key question 1

**What is the clinical effectiveness of antiemetics, aspirin, NSAIDs, opioids, triptans, ergots, and corticosteroids for acute treatment of migraine with or without aura in patients aged > 13 years?**

### Antiemetics, aspirin, NSAIDs, opioids, and ergots

No new studies challenging the American Headache Society (AHS) 2015 or NICE 2015 recommendations were identified. However, for aspirin, two studies (Deitch 2014, Goldstein 2014) with moderate evidence support the use of AAC (aspirin, acetaminophen, and caffeine) in acute migraine. For NSAIDs, four studies with moderate evidence (Cady 2014, Calhoun 2014, Derosier 2012, Winner 2015) indicated that naproxen in combination with sumatriptan may be more effective than placebo in adolescents and adults with acute migraine.

### Triptans

Eight randomized controlled trials (RCTs) with one systematic review (on adolescents) provided moderate- to high-level evidence to support the effectiveness of sumatriptan, zolmitriptan, and rizatriptan in adults and adolescents with moderate to severe migraine. Six of these studies compared sumatriptan with placebo, and sumatriptan nasal spray, transdermal, and in combination with naproxen were assessed. Safety assessment indicated that these medications were well tolerated, although the most common adverse event was dysgeusia. No new published RCTs were identified for naratriptan and almotriptan. This did not challenge the AHS 2015 or NICE 2015 recommendations.

### Corticosteroids

Three RCTs with moderate evidence compared dexamethasone to valproate sodium, propofol, or magnesium sulfate in adults with acute migraine and reported that the comparators were more effective than dexamethasone IV. Studies comparing oral corticosteroids to placebo or other medications were not identified.

## Key question 2

**What is the clinical effectiveness of lisinopril, calcium channel blockers, antidepressants, beta blockers, and antiepileptics for prophylactic treatment of migraine with or without aura in patients aged > 13 years?**

### Lisinopril, enalapril

No new published RCTs on lisinopril were identified. A low-quality RCT (Sonbolestan 2013) on enalapril 10 mg versus placebo indicated that enalapril may be more effective in migraine prophylaxis, as statistically significant reduction of migraine attack of more than 50% at 2 months was reported (47.61% for enalapril vs. 10.52% placebo,  $P=0.016$ ).

### Calcium channel blockers

No new published RCTs on calcium channel blockers except flunarizine were identified. The study on flunarizine (Lai 2017) indicated that flunarizine may be more effective than topiramate (moderate evidence).

### Antidepressants

- **TCAs:** NICE 2015 should be adopted. No new studies comparing amitriptyline and nortriptyline versus placebo were identified. The studies identified assessed amitriptyline versus divalproate, amitriptyline and aerobic exercise versus amitriptyline, and the combination of nortriptyline and topiramate. The quality of individual studies was low. Divalproate was more effective than amitriptyline in improving headache frequency at 3 months (Kalita 2014). The effectiveness of amitriptyline increased when combined with aerobic exercise (Santiago 2014). Topiramate in combination with nortriptyline was effective in patients who did not respond to single agents (Krymchantowski 2012).
- **SSRIs/SNRIs:** No studies were identified comparing fluoxetine or venlafaxine versus placebo.

### Beta blockers

The studies identified did not challenge NICE 2015 recommendations regarding nadolol, metoprolol, and propranolol.

### Antiepileptics

- **Topiramate:** Moderate evidence indicates that topiramate may be more or equally effective in reducing migraine frequency compared to flunarizine, gabapentin, frovatriptan, and nortriptyline (Lai 2017, Luo 2012, Zain 2013, Cady 2012, Krymchantowski 2012).
- **Divalproex/sodium valproate/valproic acid:** The four studies identified (Facco 2013, Kalita 2014, Bostani 2013, Afshari 2012) compared sodium valproate with acupuncture, amitriptyline, cinnarizine, or topiramate. Valproate was equally or possibly more effective than comparators (amitriptyline, cinnarizine, topiramate, and

acupuncture) in reducing migraine frequency, intensity, duration, and disability. This did not challenge NICE 2015 recommendations.

- **Gabapentin:** NICE 2015 should be adopted.
- **Lamotrigine:** No new placebo controlled studies were identified.

### **Key question 3**

**What is the clinical effectiveness of riboflavin (vitamin B2), magnesium, coenzyme Q10, butterbur, and acupuncture for prophylactic treatment of migraine in adults and adolescents?**

#### **Riboflavin**

Moderate evidence from three studies (Athallah 2012, Gaul 2015, Rahimdel 2015) supported the effectiveness of riboflavin alone or in combination with magnesium and coenzyme Q10 in reducing migraine frequency, duration, and disability in adolescents and pain intensity in the short term (3 months). Lower incidence of adverse events was reported.

#### **Magnesium**

Two studies (Bian 2013, Tarighat Esfanjani 2012) provided low evidence to support the use of magnesium in migraine prophylaxis. However, one RCT (Gaul 2015) with moderate evidence supports the combination of magnesium, riboflavin, and coenzyme Q10.

#### **Coenzyme Q10**

Studies reviewed did not change previous KPWA recommendations.

#### **Butterbur**

No new published placebo-controlled trials were identified.

#### **Acupuncture**

Three studies (Foroughipour 2014, Li 2012, Facco 2013) with moderate evidence were reviewed. Population included patients who did not respond to prophylactic medications; patients underwent 12 to 20 sessions of acupuncture. Comparators were placebo, valproic acid and other type of acupuncture, and sham. Follow-up lasted 4–6 months. Moderate evidence supports the effectiveness of acupuncture in reducing migraine frequency in patients who did not respond to prophylactic medications. The evidence supports the use of acupuncture in reducing migraine frequency over sham acupuncture.

### **Key question 4**

**What is the clinical effectiveness of aspirin, NSAIDs, and opioids for acute treatment of tension headache in patients aged > 13 years?**

#### **Aspirin**

Three RCTs (Gatoulis 2012, Steiner 2003, Martínez-Martín 2001) were identified. Comparisons were made between aspirin and placebo; oral aspirin 500 mg and 1000 mg were assessed. Age varied from 16 to 66 years; sample size ranged from 360 to 542 patients. Baseline pain intensity was moderate to severe. Frequency ranged from 2 to 15 headaches/month. No difference between aspirin versus placebo in reducing pain intensity at 2 hours was reported. No difference in adverse events was reported. However, more patients in the placebo group used rescue medication than in the aspirin group. The studies provided low-level evidence.

#### **NSAIDs**

NSAIDs evaluated included ibuprofen, ketoprofen, naproxen, and diclofenac. NSAIDs were compared to placebo. The identified studies (Diamond 2000, Kubitzek 2003, Packman 2000, Lange 1994, Laveneziana 1996, Veys 2016, Prior 2002, Kubitzek 2003) provided moderate evidence to support the use of NSAIDs in the treatment of moderate to severe episodic tension headaches in relieving pain and pain intensity in adult patients. Patients consisted of adults with episodic tension-type headache with frequent episodes per month. Baseline pain intensity was moderate to severe. Age ranged from 12 to 73 years. Patients were followed for 6 hours. Adverse events were mild, with gastrointestinal being most common. The use of rescue medications was also less frequent. In addition, active treatments did not show statistical difference between one another.

#### **Opioids**

No new published studies were identified. NICE 2015 should be adopted. (Do not offer opioids for the acute treatment of tension-type headache).

### **Key question 5**

**What is the clinical effectiveness of antidepressants, ACE inhibitors, beta blockers, and antiepileptics for prophylactic treatment of tension headache in patients aged > 13 years?**

#### **Antidepressants**

A meta-analysis (Banzi 2015) comparing SSRIs or SNRIs with placebo reported no difference between these medications and placebo in terms of headache frequency, intensity, duration, and withdrawals due to adverse events. However, SSRIs reduced the use of analgesics, and amitriptyline reduced analgesic use more efficiently than SSRIs. Tricyclics led to more adverse events. The meta-analysis included eight studies with 412 patients who were followed for two to four months. SSRIs included citalopram, sertraline, fluoxetine, paroxetine, fluvoxamine and SNRI included venlafaxine. Tricyclics included amitriptyline, desipramine, sulphiride, and mianserin. Nevertheless, the studies in the meta-analysis provided very low to low quality evidence.

#### **ACE inhibitors, beta blockers (propranolol, nadolol), Antiepileptics (topiramate, valproic acid)**

No new published studies were identified.

### **Key question 6**

**What is the clinical effectiveness of acupuncture for the treatment of tension-type headaches?**

The evidence consisted of one systematic review and meta-analysis (Linde 2016), which compared acupuncture with routine care/treatment of acute headaches, sham or other therapies (physiotherapy, relaxation, combination massage and relaxation). The review included 12 RCTs; the number of acupuncture sessions ranged from 6 to 15; patients were followed for 8 to 64 weeks. In both comparisons (acupuncture versus sham and acupuncture versus routine care), acupuncture reduced tension-type headache frequency (over 3 months with routine care comparison, and over 6 months with sham). Results were inconsistent in comparisons with other treatments. However, the included studies provided low to moderate evidence.

### **Key question 7**

**What is the clinical effectiveness of oral contraceptive pills or triptans for prophylactic treatment of menstrual migraine with aura in adolescents and adults?**

#### **Oral contraceptive pills**

NICE 2015 did not recommend combined hormonal contraceptive for contraception to women and girls who have migraine with aura.

#### **Triptans**

While three reviews were identified (Hu 2013, Maasumi 2017, Nierenburg Hdel 2015), only one systematic review with meta-analysis (Hu 2013) was reviewed; the Maasumi and Nierenburg Hdel reviews did not challenge the outcomes of the Hu review. Hu 2013 assessed the efficacy and safety of triptans. Triptans included frovatriptan (2.5 mg q.d. and 2.5 mg b.i.d.), naratriptan (1 mg b.i.d.), and zolmitriptan 2.5 mg b.i.d. or t.i.d. Treatment lasted 5 to 7 weeks. Comparisons were made between triptans and placebo. Triptans were more effective than placebo in reducing headache frequency and severity and the need for rescue medication. Adverse events were minimal with triptans; the most common events were nausea, headache, dizziness, dyspeptic symptoms, somnolence, and asthenia. The review provided moderate evidence.

### **Key question 8**

**What is the clinical effectiveness of repeated doses of triptans for refractory migraine?**

Two studies (Sheftell 2005, Rapoport 2003) with low evidence were identified. The evidence is insufficient to recommend for or against the use of naratriptan 2.5 mg b.i.d. as a prevention option in adults with refractory migraine.



## Key question 9

**What is the clinical effectiveness of corticosteroids, tricyclics, and withdrawal strategies (of abortive treatments) for the treatment of medication overuse headache?**

### **Corticosteroids**

Two RCTs (Rabe 2013, Taghdiri 2015) were reviewed. One compared prednisone with placebo. The other trial compared prednisone versus celecoxib. On one hand, low evidence shows that prednisone is not better than placebo. On the other hand, moderate evidence shows no difference between prednisone and celecoxib in terms of headache frequency and rescue medication.

### **Tricyclic antidepressants**

The evidence is limited to one pilot study (Fan 2014). Low evidence supports the effectiveness of early introduction of amitriptyline in combination with abrupt withdrawal in patients with MOH.

### **Withdrawal strategies**

- **Inpatient versus outpatient withdrawal treatment:** Three studies (Creac'h 2011, Rossi 2006, Rossi 2013) show no difference between inpatient and outpatient withdrawal at improving responder rate and number of headache days. However, inpatient withdrawal may be more effective in reducing days with medication use.
- **Withdrawal strategies versus prophylactic treatment:** Low evidence indicates that prophylactic treatment may be more effective than withdrawal treatment. NICE 2015 should be adopted.

## Key question 10

**Is it useful for patients with suspected primary headaches to undergo brain imaging for reassurance or to detect underlying pathology?**

Seven studies were reviewed (Cull 1995, Demaerel 1996, Grimaldi 2009, Jordan 2000, Sempere 2005, Tsushima 2005, Wang 2001). The studies were retrospective in design. There was variation in the population studied; most of the studies did not report primary headache diagnosis while others reported a range of primary headaches. Overall, the studies provide low-level evidence. Low evidence shows fewer serious abnormalities in patients with primary headaches who underwent imaging. Imaging should be recommended when there is suspicion of underlying pathology.

## Key question 11

**What is the efficacy and safety of the Cefaly device for migraine?**

The body of evidence consists of non-randomized trials (Chou 2017, Di Fiore 2017, Vikelis 2017, Przeklasa-Muszynska 2017) that provide low-level evidence to support the effectiveness and safety of the Cefaly device in migraine. However, one high-quality RCT (Schoenen 2013) indicates that transcutaneous supraorbital stimulation using the Cefaly device may be more effective than sham in the short term as prevention therapy. There is insufficient evidence to recommend for or against the use of the Cefaly device in the treatment of acute migraine. The technology is safe.

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# Guideline Development Process and Team

## Development process

To develop the Migraine and Tension Headache Guideline, the guideline team adapted recommendations from external developed evidence-based guidelines and/or recommendations organizations that establish community standards. The guideline team reviewed additional evidence in several areas. For details, see Evidence Summary and References.

This edition of the guideline was approved for publication by the Guideline Oversight Group in April 2018.

## Team

The Headache Guideline development team included representatives from the following specialties: Adolescent Medicine, Family Practice, Neurology, Nursing Operations, Obstetrics/Gynecology, Pharmacy, Residency, and Urgent Care.

Clinician lead: [Angie Sparks, MD](#), Medical Director, Clinical Knowledge Development & Support

Guideline coordinator: [Avra Cohen, RN, MN](#), Clinical Improvement & Prevention

Saïd Adjao, MD, MPH, Clinical Epidemiologist, Clinical Improvement & Prevention

Beth Arnold, PharmD, Pharmacy

Cynthia Burdick, MD, Family Practice

Staci E.B. Dumas, PA-C, Family Practice/Urgent Care

Janice Graham, MD, Family Practice

James Greene, MD, Obstetrics/Gynecology

Robyn Mayfield, Patient Engagement Team, Clinical Improvement & Prevention

Patti Purpura, MD, Urgent Care

Rory Rochelle, PhD, RN, Director, Nursing Operations

Tim Scarce, MD, Neurology

Ann Stedronsky, Clinical Publications, Clinical Improvement & Prevention

Gina Sucato, MD, MPH, Adolescent Medicine

Phyllis Ying, MD, Family Medicine Residency

## Disclosure of conflict of interest

Kaiser Permanente requires that team members participating on a guideline team disclose and resolve all potential conflicts of interest that arise from financial relationships between a guideline team member or guideline team member's spouse or partner and any commercial interests or proprietary entity that provides or produces health care–related products and/or services relevant to the content of the guideline.

Team members listed above have disclosed that their participation on the Migraine and Tension Headache Guideline team includes no promotion of any commercial products or services, and that they have no relationships with commercial entities to report.