Treatment of Migraine

An oral nonopioid analgesic may be sufficient for treatment of mild to moderate migraine without severe nausea or vomiting. A triptan is the drug of choice for treatment of moderate to severe migraine.1,2 Use of a triptan early in an attack when pain is still mild to moderate in intensity improves headache response and reduces recurrence rates.

ANALGESICS – Aspirin and acetaminophen, used alone or together in combination with caffeine (Excedrin Migraine, and others), and nonsteroidal anti-inflammatory drugs (NSAIDs) such as naproxen sodium (Aleve, and others) and ibuprofen (Advil, Motrin, and generics) are effective in relieving mild to moderate migraine pain.3-5 The NSAID diclofenac is FDA-approved as a powder for oral solution (Cambia) for treatment of migraine; it has a rapid onset of action (about 15 minutes).6 Some patients may respond better to one NSAID than to another.

Products that combine butalbital and caffeine with aspirin (Fiorinal, and others) or acetaminophen (Fioricet, and others) are used for treatment of migraine despite evidence that butalbital is not effective in relieving migraine pain. Their frequent use can lead to tolerance, addiction, and medication overuse headache. Oral combinations of aspirin or acetaminophen with an opioid can be effective for relief of migraine pain, but they cause the usual opioid adverse effects (e.g., nausea, drowsiness, and constipation), and regular use can lead to dependence and addiction.

Pregnancy – Occasional use of acetaminophen for treatment of mild to moderate migraine during pregnancy is generally considered safe.

TRIPTANS – The short-acting oral serotonin (5-HT1B/1D) receptor agonists (triptans) sumatriptan (Imitrex, and others), almotriptan (Axert, and generics), eletriptan (Relpax), rizatriptan (Maxalt, and generics), and zolmitriptan (Zomig, and generics) are similar in efficacy.7 Onset of pain relief generally occurs 30-60 minutes after administration. The longer-acting oral triptans naratriptan (Amerge, and generics) and frovatriptan (Frova, and generics) have a slower onset of action and lower initial response rate than other triptans, but they are better tolerated.8 Patients with migraine who have nausea or vomiting may not be able to take an oral triptan.

An oral fixed-dose combination of sumatriptan and naproxen (Treximet) is more effective in relieving moderate or severe migraine pain than either of its components alone.9

Intranasal triptan formulations have a more rapid onset of action than oral tablets, but their efficacy is partially dependent on GI absorption of the portion of the dose that is swallowed. Use of sumatriptan nasal powder (Onzetra Xsail) results in a faster rise in sumatriptan

Recommendations for Treatment and Prevention of Migraine

Treatment
▶ A nonopioid analgesic may be effective for mild to moderate migraine.
▶ A triptan is the drug of choice for moderate to severe migraine.
▶ The short-acting oral triptans sumatriptan, almotriptan, eletriptan, rizatriptan, and zolmitriptan are similar in efficacy and speed of onset.
▶ Intranasal triptan formulations have a faster onset of action than oral triptans.
▶ Subcutaneous sumatriptan is the fastest-acting and most effective triptan formulation.
▶ Patients who do not respond to one triptan may respond to another.
▶ Use of opioids and butalbital for migraine treatment is discouraged.

Prevention
▶ Topiramate, valproate, and the beta blockers propranolol, timolol, and metoprolol are effective for prevention of migraine.
plasma concentrations and higher peak concentrations than use of a similar dose of sumatriptan nasal spray, suggesting that a larger portion of the dose is absorbed intranasally with the powder.10

Subcutaneously administered sumatriptan relieves pain faster (in about 10 minutes) and more effectively than other triptan formulations, but it causes more adverse effects.

**Recurrence** – In patients with moderate to severe migraine, the rate of recurrence within 24 hours after treatment with a triptan is generally 20-40%. Early treatment of an attack reduces recurrence rates. Recurrences may respond to a second dose of the triptan.

**Adverse Effects** – Tingling, flushing, dizziness, drowsiness, fatigue, and a feeling of heaviness, tightness, or pressure in the chest can occur with all triptans, but most commonly with SC sumatriptan. A burning sensation at the injection site is also common with SC sumatriptan. Intranasal formulations of sumatriptan and zolmitriptan can have an unpleasant taste. CNS symptoms such as somnolence and asthenia following triptan therapy may be part of the migraine attack, unmasked by the successful treatment of pain, rather than adverse effects of the drugs. Sumatriptan is contraindicated for use in patients with severe hepatic impairment. Naratriptan is contraindicated in patients with severe renal or hepatic impairment.

Angina, myocardial infarction, cardiac arrhythmia, stroke, seizure, and death have occurred rarely with triptans.11 All triptans are contraindicated for use in patients with ischemic or vasospastic coronary artery disease, Wolff-Parkinson-White syndrome, peripheral vascular disease, ischemic bowel disease, uncontrolled hypertension, or a history of stroke, transient ischemic attack, hemiplegic migraine, or migraine with brainstem aura. Triptans should be used with caution in patients with other significant risk factors for vascular disease, particularly diabetes.

**Drug Interactions** – The labels of all triptans state that a triptan should not be taken within 24 hours of another triptan or an ergot because vasoconstriction could be additive. MAO inhibitors increase serum concentrations of rizatriptan, sumatriptan, and zolmitriptan; they should not be used within 2 weeks of each other. Propranolol increases serum concentrations of eletriptan, frovatriptan, rizatriptan, and zolmitriptan. Cimetidine increases serum concentrations of zolmitriptan. Inhibitors of CYP3A4 can increase serum concentrations of almotriptan and eletriptan.12 Cases of serotonin syndrome have been reported with concurrent use of triptans and selective serotonin reuptake inhibitors (SSRIs) or serotonin-norepinephrine reuptake inhibitors (SNRIs), but data from large observational databases suggest that the risk is low.13,14

**Pregnancy and Lactation** – Based on available evidence, use of sumatriptan, or possibly rizatriptan, eletriptan, or zolmitriptan during pregnancy does not appear to be associated with an increased risk of birth defects.15,16 Levels of sumatriptan and eletriptan in breast milk are low and these drugs would not be expected to cause adverse effects in most breastfed infants17; avoiding breastfeeding for 8-12 hours after taking a short-acting triptan would reduce the infant’s risk of exposure to the drug.

**ERGOTS** – A fixed-dose combination of ergotamine tartrate, a nonspecific serotonin agonist and vasoconstrictor, and caffeine is available as tablets (Cafergot) and suppositories (Migergot) for treatment of moderate to severe migraine. The combination is less effective than a triptan for acute treatment of migraine.18 Dihydroergotamine, which can be administered subcutaneously, intramuscularly, intravenously (D.H.E., and generics), or intranasally (Migranal), is effective for acute treatment of migraine. Dihydroergotamine nasal spray relieves migraine after 2 hours in about 50% of patients, with a 15% incidence of recurrence within 24 hours. It can be effective in some patients who do not respond to triptans.

**Adverse Effects** – Dihydroergotamine is a weaker arterial vasoconstrictor than ergotamine and causes fewer serious adverse effects. Nausea and vomiting are fairly common with ergotamine, but pretreatment with or concurrent use of an antiemetic such as metoclopramide (Reglan, and generics) can reduce GI effects. Serious adverse effects, such as vascular (including coronary) occlusion and gangrene, are rare and are usually associated with overdosage (>6 mg in 24 hours or >10 mg per week). Hepatic impairment

### Table 1. Triptans

<table>
<thead>
<tr>
<th>Triptan</th>
<th>Onset of action</th>
<th>Elimination half-life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almotriptan</td>
<td>30-60 min</td>
<td>3-4 hrs</td>
</tr>
<tr>
<td>Eletriptan</td>
<td>30-60 min</td>
<td>~4 hrs</td>
</tr>
<tr>
<td>Frovatriptan</td>
<td>~2 hrs</td>
<td>~25 hrs</td>
</tr>
<tr>
<td>Naratriptan</td>
<td>1-3 hrs</td>
<td>~6 hrs</td>
</tr>
<tr>
<td>Rizatriptan</td>
<td>30-60 min</td>
<td>2-3 hrs</td>
</tr>
<tr>
<td>Sumatriptan tablets</td>
<td>30-60 min</td>
<td>~2 hrs</td>
</tr>
<tr>
<td>Sumatriptan nasal spray and powder</td>
<td>10-15 min</td>
<td>~10 min</td>
</tr>
<tr>
<td>SC injection</td>
<td>~10 min</td>
<td></td>
</tr>
<tr>
<td>Zolmitriptan tablets</td>
<td>30-60 min</td>
<td>2-3 hrs</td>
</tr>
<tr>
<td>Zolmitriptan nasal spray</td>
<td>10-15 min</td>
<td></td>
</tr>
</tbody>
</table>
# Some Drugs for Treatment of Migraine

<table>
<thead>
<tr>
<th>Drug Formulations</th>
<th>Usual Adult Dosage</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Triptans</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Almotriptan</td>
<td>6.25, 12.5 mg tabs</td>
<td>6.25 or 12.5 mg PO; can be repeated after 2 hrs (max 25 mg/d)</td>
</tr>
<tr>
<td>Axert (Janssen)</td>
<td>20, 40 mg tabs</td>
<td>20 or 40 mg PO; can be repeated after 2 hrs (max 80 mg/d)</td>
</tr>
<tr>
<td>Eletriptan – Relpax (Pfizer)</td>
<td>2.5 mg tabs</td>
<td>2.5 mg PO; can be repeated after 2 hrs (max 7.5 mg/d)</td>
</tr>
<tr>
<td>Frovatriptan – generic Frova (Endo)</td>
<td>2.5 mg tabs</td>
<td>2.5 mg PO; can be repeated after 5 hrs (max 7.5 mg/d)</td>
</tr>
<tr>
<td>Naratriptan – generic Amerge (GSK)</td>
<td>1, 2.5 mg tabs</td>
<td>2.5 mg PO; can be repeated after 4 hrs (max 5 mg/d)</td>
</tr>
<tr>
<td>Rizatriptan – generic Maxalt (Merck)</td>
<td>5, 10 mg tabs</td>
<td>5 or 10 mg PO; can be repeated after 2 hrs (max 30 mg/d)</td>
</tr>
<tr>
<td>Maxalt-MLT</td>
<td>5, 10 mg tabs</td>
<td>5 or 10 mg PO; can be repeated after 2 hrs (max 30 mg/d)</td>
</tr>
<tr>
<td>Sumatriptan – generic Imitrex (GSK)</td>
<td>25, 50, 100 mg tabs</td>
<td>50 or 100 mg PO; can be repeated after 2 hrs (max 200 mg/d)</td>
</tr>
<tr>
<td>Onzetra Xsail (Avanir)</td>
<td>11 mg nasal powder capsules</td>
<td>11 mg nasal powder capsules; can be repeated after 2 hrs (max 12 mg/d)</td>
</tr>
<tr>
<td>Sumavel DosePro (Endo)</td>
<td>6 mg/0.5 mL needle-free delivery system</td>
<td>6 mg SC; can be repeated after 1 hr (max 12 mg/d)</td>
</tr>
<tr>
<td>Zembrace SymTouch (Promius)</td>
<td>3 mg/0.5 mL auto-injector</td>
<td>3 mg SC; can be repeated after 1 hr (max 12 mg/d)</td>
</tr>
<tr>
<td>Zolmitriptan – generic Zomig (Impax)</td>
<td>2.5, 5 mg tabs</td>
<td>2.5 or 5 mg PO; can be repeated after 2 hrs (max 10 mg/d)</td>
</tr>
<tr>
<td>Zomig-ZMT</td>
<td>2.5, 5 mg orally disintegrating tabs</td>
<td>2.5 or 5 mg orally disintegrating tabs</td>
</tr>
<tr>
<td>Zomig nasal spray³</td>
<td>2.5, 5 mg/0.1 mL nasal spray</td>
<td>2.5 or 5 mg intranasally; can be repeated after 2 hrs (max 10 mg/d)</td>
</tr>
<tr>
<td><strong>Triptan/NSAID Combination</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sumatriptan/naproxen³ – Treximet (Pernix)</td>
<td>10/60, 85/500 mg tabs</td>
<td>85/500 mg PO; can be repeated after 2 hrs (max 170/1000 mg/d)</td>
</tr>
<tr>
<td><strong>Ergots</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dihydroergotamine mesylate – generic D.H.E. 45 (Valeant)</td>
<td>1 mg/mL ampules</td>
<td>1 mg IM or SC; can be repeated at 1 hr intervals (max 3 mg/d, 6 mg/wk)</td>
</tr>
<tr>
<td>Migranal nasal spray (Valeant)</td>
<td>4 mg/mL nasal spray</td>
<td>1 spray (0.5 mg) into each nostril, repeated 15 min later (2 mg/dose; max 3 mg/d)</td>
</tr>
<tr>
<td>**Ergotamine/caffeine – generic Cafergot (Sandoz)</td>
<td>1/100 mg tabs</td>
<td>2 tabs PO at attack onset, then 1 tab q30 min PRN (max 6 tabs/attack)</td>
</tr>
<tr>
<td>Migergot (Horizon)</td>
<td>2/100 mg rectal suppository</td>
<td>1 supp at attack onset, repeat in 1 hr if needed (max 2 supp/attack)</td>
</tr>
</tbody>
</table>

1. Dosage may need to be adjusted for renal or hepatic impairment or for drug interactions.
2. Approximate WAC for one dose at the lowest usual dosage. WAC = wholesaler acquisition cost or manufacturer’s published price to wholesalers; WAC represents a published catalogue or list price and may not represent an actual transactional price. Source: AnalySource® Monthly. January 5, 2017. Reprinted with permission by First Databank, Inc. All rights reserved. ©2017. www.fdbhealth.com/policies/drug-pricing-policy.
3. Also approved for use in patients 12-17 years old.
4. Also approved for use in patients 6-17 years old.
5. Dose for pediatric patients is 5 mg (<40 kg) or 10 mg (≥40 kg). In pediatric patients, the efficacy and safety of redosing within 24 hours have not been established.
6. Adults and children (≥40 kg) also taking propranolol should only use a 5-mg dose (max 15 mg/d for adults and 5 mg/d for children). Combined use not recommended for children weighing <40 kg.
7. Generic also available as a 6-mg syrup.
8. Patients also taking cimetidine should only use a 2.5-mg dose (max 5 mg/d).
9. Dosage for adolescents 12-17 years old is 10/60 mg (max 85/500 mg/d).

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or fever can accelerate development of severe vasoconstriction. Ergots are contraindicated in patients with arterial disease or uncontrolled hypertension.

**Drug Interactions** – The effects of ergots can be potentiated by triptans, beta blockers, dopamine, nicotine, or CYP3A4 inhibitors. Use of ergots is contraindicated with strong CYP3A4 inhibitors such as clarithromycin (Biaxin, and generics) or itraconazole (Sporanox, and generics).¹² Ergots and triptans should not be taken within 24 hours of each other.

**Pregnancy and Lactation** – Ergots can reduce placental blood flow and are contraindicated for use during pregnancy. Ergotamine is excreted in human breast milk; women who take an ergot should avoid breastfeeding.
TRANSCRANIAL MAGNETIC STIMULATION — The FDA has approved the use of a transcranial magnetic stimulation device (SpringTMS – eNeura) for self-treatment of migraine with aura. In one trial, the pain-free response rate 2 hours after treatment of the first migraine attack was significantly higher with use of transcranial magnetic stimulation at the onset of aura than with sham stimulation (39% vs 22%).

MEDICATION OVERUSE HEADACHE — Overuse of drugs for headache, particularly butalbital and opioids, can lead to chronic headache with structural and functional changes in the brain. Treatment of medication overuse headache involves withdrawing the overused drug(s); abrupt withdrawal may require hospitalization and bridge therapy with other drugs. Preventive treatment for migraine should be considered. Future use of acute migraine treatments should be limited to ≤2 days per week.

PREVENTION OF MIGRAINE

Patients with frequent or severe migraine headaches and those who cannot take vasoconstrictors or are refractory to acute treatment should receive preventive treatment. Menstrual migraine attacks may sometimes be prevented by a brief course of an NSAID or triptan, particularly frovatriptan or naratriptan, taken for several days before and after the onset of menstruation. Preventive therapy is generally not recommended during pregnancy.

BETA BLOCKERS — Beta blockers are commonly used for prevention of migraine. Propranolol (Inderal LA, and others) and timolol are the only beta blockers approved by the FDA for this indication, but metoprolol (Lopressor, and others), nadolol (Corgard, and generics), and atenolol (Tenormin, and generics) are also effective in preventing migraine. All beta blockers can cause fatigue, exercise intolerance, and orthostatic hypotension, and should not be used in patients with decompensated heart failure. All are relatively contraindicated in patients with asthma. Patients with migraine often have comorbid depression, which may be aggravated by beta blockers.

Pregnancy — Intrauterine growth retardation, small placentas, and congenital abnormalities have been reported with use of propranolol during pregnancy. Atenolol has been associated with the birth of small for gestational age infants and, at high doses, with embryofetal resorptions in animals.

ANTEPILEPTIC DRUGS — Valproate (Depakote, and others) and topiramate (Topamax, and generics) are similarly effective in decreasing migraine frequency and are FDA-approved for migraine prevention. About 50% of patients achieve a ≥50% reduction in headache frequency with these drugs. In randomized, double-blind trials, topiramate was at least as effective as propranolol for migraine prevention. Topiramate has reduced the number of migraine headache days per month and improved associated symptoms in patients with chronic migraine (≥15 headache days/month for ≥3 months) and medication overuse headache. In a trial in pediatric patients, however, topiramate was no better than placebo in preventing migraine.

Adverse Effects — Adverse effects of valproate include nausea, fatigue, tremor, weight gain, and hair loss. Acute hepatic failure, pancreatitis, and hyperammonemia (in patients with urea cycle disorders) occur rarely. Other adverse effects include polycystic ovary syndrome, hyperinsulinemia, lipid abnormalities, hirsutism, and menstrual disturbances. Topiramate commonly causes paresthesias; fatigue, language and cognitive impairment, taste perversion, weight loss, and nephrolithiasis can also occur. Topiramate can rarely cause secondary narrow-angle glaucoma, oligohydrosis, and symptomatic metabolic acidosis.

Pregnancy — Use of topiramate or valproate during pregnancy has been associated with congenital malformations; neither drug should be used for migraine prevention in pregnant women.

Antidepressants — Amitriptyline is the only tricyclic antidepressant shown to be effective for migraine prevention in clinical trials, but it often causes sedation, dry mouth, and weight gain. Other tricyclics such as nortriptyline, which may have fewer adverse effects than amitriptyline, are frequently used for migraine prevention in adults. In a trial in pediatric patients, amitriptyline was no better than placebo in preventing migraine.

The SNRIs venlafaxine (Effexor, and others) and duloxetine (Cymbalta, and generics) may also be effective in preventing migraine. They can cause nausea, vomiting, sweating, tachycardia, urinary retention, and increased blood pressure.

Pregnancy — Tricyclic antidepressant use during pregnancy has been associated with jitteriness and seizures in newborns. Fetal malformations are uncommon with SNRIs, but increased risks of neonatal behavioral syndrome and perinatal complications have been reported with use of SNRIs during pregnancy.
Table 3. Some Drugs for Prevention of Migraine in Adults

<table>
<thead>
<tr>
<th>Drug</th>
<th>Some Available Formulations</th>
<th>Usual Adult Dosage¹</th>
<th>Cost²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Beta Blockers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metoprolol³ – generic</td>
<td>25, 50, 100 mg tabs / 50, 100 mg tabs</td>
<td>50–100 mg bid</td>
<td>$1.80</td>
</tr>
<tr>
<td>Inderal LA (Validus)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Timolol – generic</td>
<td>5, 10, 20 mg tabs</td>
<td>10–15 mg bid</td>
<td>75.30</td>
</tr>
</tbody>
</table>

**Antiepileptic Drugs**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Some Available Formulations</th>
<th>Usual Adult Dosage¹</th>
<th>Cost²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valproate³ – generic</td>
<td>250, 500 mg delayed-release tab; 125 mg sprinkle caps</td>
<td>250–500 mg bid</td>
<td>17.80</td>
</tr>
<tr>
<td>Sodium Valproate (Abbvie)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Topiramate³ – generic</td>
<td>25, 50, 100, 200 mg tabs; 15, 25 mg sprinkle caps</td>
<td>50 mg bidh</td>
<td>574.60</td>
</tr>
</tbody>
</table>

**Tricyclic Antidepressants³**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Some Available Formulations</th>
<th>Usual Adult Dosage¹</th>
<th>Cost²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amitriptyline – generic</td>
<td>10, 25, 50, 75, 100, 150 mg tabs</td>
<td>25–150 mg once/d</td>
<td>9.50</td>
</tr>
<tr>
<td>Nortriptyline – generic</td>
<td>10, 25, 50, 75 mg caps</td>
<td>25–150 mg once/d</td>
<td>8.00</td>
</tr>
</tbody>
</table>

**SNRI³**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Some Available Formulations</th>
<th>Usual Adult Dosage¹</th>
<th>Cost²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Venlafaxine – generic</td>
<td>25, 37.5, 50, 75, 100 mg tabs</td>
<td>25–50 mg tid</td>
<td>47.70</td>
</tr>
<tr>
<td>Effexor XR (Pfizer)</td>
<td></td>
<td>75–150 mg once/d</td>
<td>11.70</td>
</tr>
</tbody>
</table>

**Botulinum Toxin Type A**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Some Available Formulations</th>
<th>Usual Adult Dosage¹</th>
<th>Cost²</th>
</tr>
</thead>
<tbody>
<tr>
<td>BotulinumtoxinA – Botox (Allergan)³</td>
<td>100, 200 unit vials</td>
<td>155 units IM every 12 weeks²</td>
<td>1158.00³</td>
</tr>
</tbody>
</table>

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**OTHER PREVENTIVE TREATMENTS — NSAIDs, such as naproxen and ibuprofen, have been used for prevention of migraine and for aborting acute attacks.³⁸**

The angiotensin-converting enzyme (ACE) inhibitor lisinopril (Prinivil, and others) and the angiotensin receptor blocker (ARB) candesartan (Atacand, and generics) have reduced migraine frequency by about 30–35% in small, double-blind trials.³⁹ In a randomized, placebo-controlled, crossover trial, candesartan was noninferior to propranolol for prevention of migraine.⁴⁰

The calcium channel blocker verapamil (Calan, and others) was somewhat more effective than placebo in some small studies.⁴¹

The combination of simvastatin (Zocor, and others) and vitamin D was effective for migraine prevention in one small, randomized, placebo-controlled trial.⁴²

The dietary supplement petasites (butterbur; Petadolex) 100–150 mg daily reduced migraine attack frequency by 36–60% in two randomized, placebo-controlled trials in about 300 patients,³⁸ but it has been associated with hepatic toxicity.⁴³ Melatonin, riboflavin, magnesium citrate, coenzyme Q10, and feverfew have also been effective in preventing migraine in small, randomized, placebo-controlled trials.³⁸,⁴³,⁴⁴

Pericranial intramuscular injections of onabotulinumtoxinA (Botox) are FDA-approved for prevention of headaches in adults with chronic migraine (≥15 headaches/month).³⁵ Botulinum toxin is not recommended for prevention of episodic migraine.²⁸

A transcutaneous electrical nerve stimulation device (Cefaly) that is worn on the forehead has been approved by the FDA for prevention of episodic migraine in adults. In one small study, daily 20-minute treatments for 3 months were modestly effective in reducing the number of migraine days per month.⁴⁶ ■
44. AL Gonçalves et al. Randomised clinical trial comparing melatonin 3 mg, amitriptyline 25 mg and placebo for migraine prevention. J Neurol Neurosurg Psychiatry 2016; 87:1127.
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Through this program, The Medical Letter expects to provide the healthcare community with unbiased, reliable, and timely educational content that they will use to make independent and informed therapeutic choices in their practice.

**LEARNING OBJECTIVES:**

Activity participants will read and assimilate unbiased reviews of FDA-approved and off-label uses of drugs and other treatment modalities. Activity participants will be able to select and prescribe, or confirm the appropriateness of the prescribed usage of, the drugs and other therapeutic modalities discussed in The Medical Letter with specific attention to clinical trials, pathophysiology, dosage and administration, drug metabolism and interactions, and patient management. Activity participants will make independent and informed therapeutic choices in their practice.

Upon completion of this program, the participant will be able to:

1. Explain the current approach to the management of migraine.
2. Discuss the pharmacologic options available for treatment and prevention of migraine and compare them based on their efficacy, dosage and administration, potential adverse effects, and drug interactions.
3. Determine the most appropriate therapy given the clinical presentation of an individual patient with migraine.

**Privacy and Confidentiality:** The Medical Letter guarantees our firm commitment to your privacy. We do not sell any of your information. Secure server software (SSL) is used for commerce transactions through VeriSign, Inc. No credit card information is stored.

**IT Requirements:** Windows 7/8/10, Mac OS X+, current versions of Microsoft IE/Edge, Mozilla Firefox, Google Chrome, Safari, or any other compatible Web browser. High-speed connection.

**Have any questions?** Call us at 800-211-2769 or 914-235-0500 or e-mail us at: custserv@medicalletter.org

Questions start on next page
Drugs for Migraine

1. Which of the following would be a reasonable choice for initial treatment of a mild migraine attack without nausea or vomiting in a 28-year-old nonpregnant woman?
   a. acetaminophen
   b. butalbital/acetaminophen/cafeine
   c. oxycodone/acetaminophen
   d. ergotamine

2. Orally administered short-acting triptans have an onset of action of about:
   a. 5-10 minutes
   b. 15-30 minutes
   c. 30-60 minutes
   d. 60-90 minutes

3. Which of the following triptan formulations has the fastest onset of action?
   a. almotriptan tablets
   b. naratriptan tablets
   c. zolmitriptan nasal spray
   d. frovatriptan tablets

4. Compared to oral sumatriptan, the subcutaneous formulations:
   a. relieve pain faster
   b. are more effective in relieving pain
   c. cause more adverse effects
   d. all of the above

5. A 35-year-old woman with severe episodic migraine attacks with nausea and vomiting asks about switching from sumatriptan oral tablets to the nasal spray formulation. You should tell her that:
   a. intranasal sumatriptan generally starts relieving pain in about 10-15 minutes
   b. intranasal sumatriptan can have an unpleasant taste
   c. sumatriptan nasal spray is partially absorbed in the GI tract, and absorption of the drug could be reduced in patients with vomiting
   d. all of the above

6. Which of the following statements is true?
   a. The combination of ergotamine and caffeine is safer and more effective than a triptan for acute treatment of migraine
   b. Patients who do not respond to a triptan alone should take both a triptan and an ergot
   c. Dihydromegroptamine may be effective in some patients who do not respond to a triptan
   d. all of the above

7. The drug of choice for treatment of moderate to severe migraine is:
   a. aspirin
   b. a triptan
   c. an ergot
   d. onabotulinumtoxinA

8. For migraine prevention, beta blockers should be used with caution or not be used at all in patients who have:
   a. asthma
   b. depression
   c. decompensated heart failure
   d. all of the above

9. About what percentage of patients achieve a ≥50% reduction in migraine headache frequency when taking topiramate or valproate for migraine prevention?
   a. 20%
   b. 50%
   c. 75%
   d. 90%

10. A 31-year-old woman with a history of frequent severe migraine attacks has been taking topiramate for 3 years for migraine prevention. She tells you that she is planning to become pregnant in the near future. You should:
    a. increase her dose of topiramate because serum concentrations of the drug decrease significantly during pregnancy
    b. switch her to valproate because it is safer for use during pregnancy
    c. switch her to dihydromegroptamine nasal spray taken once weekly during pregnancy
    d. discontinue topiramate because it can cause congenital malformations