trchealthcare

Drugs for Acute Migraine

Updated June 2025

--Information from US and Canadian product labeling unless otherwise denoted. Other information may differ from product labeling.--

Interactive Note: Roll over each gray bar containing a drug class to view its specific footnote. (All footnote content is also provided on page 6.)
It is recommended to open this PDF in Adobe Acrobat Reader for best viewing results.

Drug	Dose	Pharmacokinetics	Comments
TRIPTANS[b]			
Almotriptan oral tablet	• **≥12 years of age**: 6.25 to 12.5 mg (6.25 mg in liver or severe kidney impairment, or with potent CYP3A4 inhibitors). » **May repeat**[c] after 2 h • **Max** daily dose 25 mg (12.5 mg in liver or severe kidney impairment, or with potent CYP3A4 inhibitors).	• Onset: 0.5 to 2 h[7] • Half-life: 3 to 4 h • Bioavailability: 70%	• Better tolerated and better 2-hr efficacy than oral sumatriptan.[4] • For adolescents, approved specifically for those whose untreated migraines usually last ≥4 h. About 70% of adolescents achieve no or mild pain within 2 h.
Eletriptan oral tablet (Relpax, generics)	• **Adult**: 20 to 40 mg. • **May repeat** after 2 h. • **Max** daily dose 80 mg (Canada: 40 mg).	• Onset: 30 min[8] • Half-life: 4 h • Bioavailability: 50%	• Better 2-hr efficacy and lower recurrence rate than oral sumatriptan.[4] • Contraindicated for use within 72 h of clarithromycin, itraconazole, ketoconazole, nelfinavir, ritonavir (potent CYP3A4 inhibitors).
Frovatriptan oral tablet (Frova, generics)	• **Adult**: 2.5 mg. » **May repeat**[c] after 2 h (Canada: 4 h). » **Max** daily dose 7.5 mg (Canada: 5 mg). • **12 to 17 years of age**:* consider adult dosing based on pharmacokinetics.[24] ***Not** FDA- or Health Canada-approved for children or adolescents.	• Onset: 2 to 3 h[7] • Half-life: 26 h • Bioavailability: 20% to 30%	• Consider for patients with a history of recurrence (longest half-life).[23] • Better tolerated and lower recurrence rate than oral sumatriptan.[4]
Naratriptan oral tablet	• **Adult**: 1 to 2.5 mg (start with 1 mg in mild or moderate kidney or liver impairment). » **May repeat** once after 4 h. » **Max** daily dose 5 mg (2.5 mg [Canada: 2 mg] in mild or moderate kidney or liver impairment).	• Onset: 1 to 3 h[7] • Half-life: 5 to 8 h • Bioavailability: 70%	• Better tolerated than oral sumatriptan.[4] • Lower recurrence rate than oral sumatriptan.[6]
Rizatriptan oral tablet or ODT (Maxalt, generics)	• **Adult**: 5 to 10 mg (5 mg with propranolol. Canada: 5 mg with propranolol, hemodialysis, or moderate liver impairment). » **May repeat** after 2 h. » **Max** daily dose 30 mg (15 mg with propranolol). Canada: 20 mg max (10 mg with propranolol, hemodialysis, or moderate liver impairment). • **6 to 17 years of age**: » **(≥40 kg)(US)**: 10 mg (5 mg with propranolol). Max daily dose 10 mg (5 mg with propranolol). » **(<40 kg)(US)**: 5 mg. Max daily dose 5 mg.	• Onset: 0.5 to 2 h[7] • Half-life: 2 to 3 h • Bioavailability: 45%	• Better 2-hr efficacy than oral sumatriptan.[4] • Orally disintegrating tablet has slower absorption than the oral tablet. • One in three kids historically nonresponsive to NSAIDs or acetaminophen achieve complete pain relief within 2 h. • Do not prescribe to propranolol-treated patients 6 to 17 years of age who weigh <40 kg.

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TRIPTANS[b] (continued)			
Rizatriptan/Meloxicam (Symbravo [US])	• **Adult**: one tablet » **Max** daily dose one tablet.	• Onset: <2 h • Half-life: 2 h (R)/~18 h (M) • Bioavailability: NA	• NNT ~ 8 for pain-free at 2 h • Combo lasts longer than either drug alone. • Rizatriptan 10 mg plus meloxicam 20 mg taken separately may be just as effective. • Contraindicated in moderate to severe kidney impairment in patients with volume depletion, and in dialysis.
Sumatriptan subcutaneous injection (Imitrex, generics; Zembrace SymTouch [US])	• **Adult**: 1 to 6 mg (Canada: 6 mg). (Zembrace SymTouch: 3 mg) » **May repeat** after 1 h. » **Max** daily dose 12 mg.	• Onset: 10 to 15 min • Half-life: ~2 h • Bioavailability: ~97%	• Fastest and most effective treatment but has a higher rate of adverse effects.[4] • Imitrex STATdose cartridges are only for patients needing 4 mg or 6 mg.
Sumatriptan oral tablet (Imitrex, generics)	• **Adult**: 25, 50, or 100 mg (US: 50 mg in mild to moderate liver impairment). » **May repeat** after 2 h. » **Max** daily dose 200 mg (US: 100 mg if used after injection).	• Onset: 30 min • Half-life: ~2 h • Bioavailability: ~15%	• NNT ~5 in adults for pain-free at 2 h[2] • Canada: not recommended in mild or moderate liver impairment.
Sumatriptan nasal spray (Imitrex, generics)	• **Adult**: 5, 10, or 20 mg. » **May repeat** once after 2 h. » **Max** daily dose 40 mg. • **Pediatric** max dose (based on pharmacokinetic data):[25,26] » 6 to 8 years: ≤25 kg: 5 mg; >25 kg: 10 mg » 9 to 11 years: ≤40 kg: 10 mg; >40 kg: 20 mg » ≥12 years: 20 mg	• Onset: 15 min • Half-life: ~2 h • Bioavailability: ~17%	• Taste and nasal route not acceptable to some patients.[13] Butterscotch candy before use may minimize bad taste.[28]
Sumatriptan nasal spray (Tosymra [US])	• **Adult**: 10 mg. » **May repeat** after 1 h. » **Max** daily dose 30 mg.	• Onset: 10 min • Half-life: ~2.5 h • Bioavailability: 87%	• Approval based on pharmacokinetic studies. • Taste and nasal route not acceptable to some patients.[13]
Sumatriptan nasal powder (Onzetra Xsail [US])	• **Adult**: 22 mg (11 mg in each nostril). » **May repeat** after 2 h. » **Max** daily dose 44 mg.	• Onset: 30 min • Half-life: 3 h • Bioavailability: 19%	• Patient blows with mouth into the device to deliver medication to the back of nose. • 20% of patients report bad taste.
Sumatriptan/naproxen (Treximet [US], Suvexx [Canada])	• **Adults**: one tablet. » **May repeat** after 2 h. » **Max** daily dose two tablets.	• Onset: <2 h • Half-life: ~2 h (S)/~19 h (N) • Bioavailability: ~15% (S)/ 95% (N)	• Sumatriptan 50 mg plus naproxen 500 mg taken separately may be just as effective.[3] • Combo more effective and lasts longer than either drug alone.[3] • Pain relief at 2 h ~60% in adults. • Not recommended in mild liver impairment (Canada).

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TRIPTANS[b] (continued)			
Zolmitriptan oral tablet or ODT (Zomig [Canada], generics)	• **Adult**: 1.25 to 5 mg (1.25 mg for moderate to severe liver impairment). » **May repeat** after 2 h. » **Max** daily dose 10 mg (5 mg in severe liver impairment [Canada: moderate or severe] or with CYP1A2 inhibitors [e.g., cimetidine]).	• Onset: 45 min[7] • Half-life: 2.5 to 3 h • Bioavailability: 40%	• Zolmitriptan 5 mg is not much more effective than 2.5 mg but has more adverse effects. • Zolmitriptan ODT can NOT be cut in in half.
Zolmitriptan nasal spray (Zomig, generics [US])	• ≥12 years of age (Canada: ≥18 years of age): 2.5 to 5 mg. (2.5 mg with CYP1A2 inhibitors [cimetidine]. » **May repeat** after 2 h. » **Max** daily dose 10 mg (5 mg in moderate or severe liver impairment or with CYP1A2 inhibitors [e.g., cimetidine])	• Onset: 15 min[9] • Half-life: 3 h • Bioavailability: ~41%	• About half of patients achieve no or mild pain relief within 2 h. • Taste may be more tolerable than sumatriptan nasal spray. • Not recommended in moderate to severe liver impairment (US).
CALCITONIN GENE-RELATED PEPTIDE (CGRP) ANTAGONISTS[f]			
Rimegepant (Nurtec ODT) US:[d] ~$130/dose Canada: $25/dose	• **Adult**: 75 mg. • **May repeat** after 24 h (wait at least 48 h if also taking a moderate CYP3A4 inhibitor or potent P-gp inhibitor).	• Onset: <2 h • Half-life: 11 h • Bioavailability: 64%	• NNT ~10 (For comparison, NNT ~ 5 for oral sumatriptan.[2]) • Side effects include nausea and hypersensitivity. • Avoid with severe liver impairment or CrCl <15 mL/min. • Avoid with strong CYP3A4 inhibitors, strong or moderate CYP3A4 inducers. • Also approved for prophylaxis.
Ubrogepant (Ubrelvy) US:[d] ~$110/dose Canada: $15/dose	• **Adult**: 50 to 100 mg (50 mg in severe liver or kidney impairment [avoid if CrCl <15 mL/min]). » **May repeat** after 2 h. » **Max** daily dose 200 mg (100 mg in severe liver or kidney impairment [avoid if CrCl <15 mL/min]). • See **footnote e** for dosing with **interacting drugs**.	• Onset: <2 h • Half-life: 5 to 7 h • Bioavailability: NA	• NNT = ~10 (100 mg) for pain-free at • 2 h. (For comparison, NNT ~5 for oral sumatriptan.[2]) • Side effects include nausea and sedation. • Contraindicated with strong CYP3A4 inhibitors. Avoid strong CYP3A4 inducers. • Limited information on use with a CGRP antagonist used for prophylaxis.[17]
Zavegepant nasal spray (Zavzpret [US only]) US:[d] $190/dose	• **Adults**: 10 mg » **Max** daily dose 10 mg.	• Onset: <2 h • Half-life: 6.6 h • Bioavailability: ~5%	• NNT = 11 to 12 for pain-free at 2 h. (For comparison, NNT ~5 for oral sumatriptan.[2]) • Side effects include taste disorders, nausea/vomiting, and nasal discomfort. • Avoid with severe liver impairment, CrCl <30 mL/min, or drugs that induce or inhibit OATP1B3 or NTCP transporters.

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Drug	Dose	Pharmacokinetics	Comments
SELECTIVE SEROTONIN 5-HT1F AGONIST			
Lasmiditan (Reyvow)(US) US:[c] $90/dose	• **Adult:** 50, 100, or 200 mg x 1 dose. **Do not repeat** within 24 h.	• Onset: 20 to 40 min[10] • Half-life: 5.7 h • Bioavailability: 40%[10]	• NNT = 8 to 10 (100 mg) for pain-free at 2 h. (For comparison, NNT ~5 for oral sumatriptan.[2]) • Consider for patients who can't use triptans or who have failed two triptans.[29] • Side effects include dizziness, paresthesia, sedation, fatigue, hallucinations, euphoria, nausea, vomiting, decreased heart rate, and increased blood pressure. • Tachycardia and palpitations have also been reported.[14] • Patients should not drive or operate machinery for at least 8 h after a dose. • Controlled substance (C-V). • Poses risk of serotonin syndrome, alone or with serotonergic drugs (e.g., triptans, SSRIs, SNRIs).[1]
DIHYDROERGOTAMINE[g]			
Atzumi nasal powder (US)	• **Adult**: 5.2 mg in one nostril. » **May repeat** after 1 h. » Max dose 10.4 mg in 24 h.	• Onset: <30 min[32] • Half-life: ~13 h • Bioavailability: >80%[32,h]	• Approval based on pharmacokinetic studies. • Pharmacokinetic data suggest better efficacy than Migranal.[32]
Brekiya subcutaneous autoinjector (US)	• **Adult**: 1 mg » May repeat after 1 h. » Max dose 3 mg in 24 h.	• Onset: NA • Half-life: ~9 h • Bioavailability: NA	
Migranal, generics	• **Adult**: 2 mg (one 0.5 mg spray in each nostril), repeated in 15 minutes (Canada: optional). » **Max dose** 3 mg (six sprays) in 24 h (Canada: 2 mg [four sprays]).	• Onset: 30 min • Half-life: 10 h • Bioavailability: 15.2%[32]	• Variable dose delivery limits efficacy.[27] • Rhinitis is common (26%).[27]
Trudhesa nasal spray (US)	• **Adult**: 1.45 mg (one 0.725 mg spray in each nostril). » **May repeat** after 1 h. » **Max dose** four sprays (two doses) in 24 hrs.	• Onset: 15 min[31] • Half-life: 12 h • Bioavailability: 58.9%[30]	• Approval based on pharmacokinetic studies.

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MIGRAINE RESCUE MEDICATIONS

Drug	Comments
Antiemetics (dopamine antagonists, parenteral)	• Metoclopramide and prochlorperazine are commonly used in the emergency department, are recommended in adult treatment guidelines, and are effective in pediatric migraine.[12,33,34,38] Metoclopramide may be superior in children.[12] • Metoclopramide » adult: 10 mg IV is the most commonly-studied dose/route.[35] » pediatric: 0.1 to 0.2 mg/kg, 10 mg max.[1] • Prochlorperazine » adult: 10 mg.[1] » pediatric: 0.15 mg/kg, 10 mg max.[1]
Dihydroergotamine, intravenous	• Not a preferred option. Based on low-level evidence in adults, benefits may not outweigh risks.[38] There are no randomized controlled trials (RCTs) in children. • Do not give within 24 hours of a triptan.[1] • May cause nausea, transient increase in pain, chest pain, or catheter-associated thrombosis.[12] • Multiple doses commonly needed.[12]
Magnesium sulfate, intravenous	• Commonly used in the emergency department.[43] Deemed "probably effective" for adult migraine with aura.[29] » Adults: consider magnesium sulfate 2 g in 50 mL D5W (5% dextrose in water) infused over 20 minutes, as an adjunct, or alternative if prochlorperazine or metoclopramide cannot be used.[43] • Data in children are very limited.[12]
NSAIDs, parenteral	• Relatively poor efficacy in adults.[39] • Ibuprofen adult dose: 800 mg IV.[40] • Ketorolac » adult: 30 to 60 mg IM or IV[38] » pediatrics: ketorolac (0.5 mg/kg, max 30 mg) is not as effective as prochlorperazine in pediatric migraine, but about half of patients respond, and it can be used in combination with prochlorperazine.[41,42]
Valproic acid, intravenous	• Limited data, especially in children.[12] • Relatively poor efficacy in adults.[39] • Adult dose: 500 to 1,000 mg IV.[38]
Other	• Greater occipital nerve block.[44,45]

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Footnotes

a. **Analgesics (NSAIDs, acetaminophen)**
- Adults: For mild to moderate migraines, options include oral acetaminophen, oral NSAIDs, or an acetaminophen/aspirin/caffeine combination.[29]
  - » Acetaminophen can be combined with an NSAID.[37]
  - » Patients who do not respond to the optimum dose of one NSAID might respond to another.[37]
  - » Head-to-head studies comparing NSAIDs for migraine are lacking. Only Cambia oral solution is FDA-approved for migraine, but others have been studied (mainly naproxen and ibuprofen). NNTs for pain-free at 2 hrs are ~7 for ibuprofen and 11 for naproxen.[15,16]
- Pediatric migraine: NSAIDs and acetaminophen are first-line options for pediatric migraine.[12,18,21]
  - » Ibuprofen oral solution 7.5 to 10 mg/kg has the most evidence.[12,18,19,21] NNT = 3 for pain relief within 2 hrs.[19] Acetaminophen 15 mg/kg, NNT = 9 for pain relief within 2 hrs.[20,21]

b. Triptan general overview:
- Consider combining with an NSAID or acetaminophen for moderate-to-severe migraine.[37]
- Patients who do not respond to one triptan might respond to another.[37]
- Contraindicated in ischemic, vasospastic, valvular (Canada), or congenital (Canada) heart disease; history of stroke or TIA; accessory pathway arrhythmia (Canada: any arrhythmia); uncontrolled HTN; peripheral vascular disease (including ischemic bowel disease); other triptans or ergot derivatives within 24 h; history of hemiplegic or basilar migraines (i.e., migraine with brainstem aura[46]); severe liver impairment (almotriptan [Canada], eletriptan [Canada], frovatriptan [Canada], naratriptan, sumatriptan); moderate liver impairment (Suvexx [Canada]); CrCl <30 mL/min (Suvexx [Canada]); CrCl <15 mL/min (naratriptan, zolmitriptan [Canada]); MAOI use in the past two weeks (rizatriptan, sumatriptan, zolmitriptan). **Not a complete list of contraindications**.
  - » In patients with multiple CV risk factors, evaluate for coronary artery disease or vasospasm before use.
  - » Life-threatening CV events due to triptans are likely very rare.[47] Tightness, pain, or pressure in the chest, throat, neck, and jaw are common and are not usually cardiac.
  - » Triptan contraindications were set based on theoretical concerns and older understanding of triptan pharmacology and CV pathophysiology.[21,48]
- Avoid triptans in subarachnoid hemorrhage or reversible cerebral vasoconstriction syndrome (thunderclap headache).[48]
- Triptans are unlikely to cause serotonin syndrome.[22]
- Consider injection or nasal formulations for patients with severe nausea and vomiting, migraines that intensify quickly, or migraine on awakening.[5]
- **Pediatrics**: Triptans are NOT used first line.[21] Triptans without pediatric dosing in chart have either not been studied in the pediatric population, or do not seem to be effective. There is a high placebo response rate in kids.[12] Recent studies have used a placebo run-in to identify placebo-responders. Sumatriptan/naproxen and zolmitriptan nasal spray have the best evidence for pain relief in adolescents.[21] Offer antiemetics for nausea and vomiting.[21]

c. Almotriptan: the efficacy of a second dose has not been established; Frovatriptan: no evidence of benefit of a second dose if the first dose doesn't work.

d. Wholesale average cost. US medication pricing by Elsevier, accessed June 2025.

e. **Ubrogepant** drug interaction dosing:
- with moderate CYP3A4 inhibitors: 50 mg. Do not repeat within 24 h.
- with weak CYP3A4 inhibitors, or breast cancer resistance protein (BCRP) and/or P-gp inhibitors only: 50 mg. May repeat after 2 h. Max daily dose 100 mg.
- with CYP3A4 inducers (avoid with strong inducers): 100 mg. May repeat after 2 h. Max daily dose 200 mg.

f. **CGRP antagonists** may be harder to access than triptans due to cost or payer requirements.[11] Consider for adults who can't use triptans or who have failed two triptans.[29] Well-tolerated.[11] Current CV safety data is reassuring.[11] Do not appear to cause medication overuse headache ("rebound").[29]

g. **Dihydroergotamine** general overview:
- Contraindicated in ischemic or vasospastic heart disease; uncontrolled HTN; peripheral vascular disease; triptans or ergot derivatives within 24 h; concomitant use of other vasoconstrictors; arrhythmias (Canada); valvular heart disease (Canada); or history of hemiplegic or basilar migraines (i.e., migraine with brainstem aura[41]) due to stroke risk (Migranal), with strong CYP3A4 inhibitors, or in severe kidney or liver impairment. **Not a complete list of contraindications**.
- In patients with multiple CV risk factors, evaluate for coronary artery disease or vasospasm before use.
- Effective at any time after migraine starts.[27] Consider for patients who awake with migraine.[27]
- Consider as an alternative to non-oral triptans for patients with severe nausea and vomiting with their migraines,[29] patients who respond poorly to triptans, or patients who have prolonged migraines.[27]

h. Atzumi bioavailability compared to IM dihydroergotamine.[32]

US product information used in creation of this document: almotriptan (Ajanta, April 2025), Relpax (January 2024), Frova (August 2018), naratriptan (Bionpharma, December 2023), Maxalt/Maxalt MLT (June 2021), Imitrex subcutaneous injection (auto-injector) (February 2023), sumatriptan subcutaneous injection (vial) (Eugia, May 2025), Imitrex oral tablet (February 2024), Imitrex nasal spray (March 2024), Onzetra Xsail (January 2024), Treximet (November 2024), Tosymra (October 2023), Zembrace SymTouch (November 2023), Symbravo (February 2025), zolmitriptan ODT (Jubilant, December 2024), zolmitriptan tablet (July 2024), Zomig nasal spray (April 2019), Nurtec ODT (March 2025), Ubrelvy (March 2025), Zavzpret (March 2025), Reyvow (September 2022), Atzumi (April 2025), Brekiya (May 2025), Migranal (September 2022), Trudhesa (September 2021), Cambia (November 2024)

Canadian product monographs used in creation of this document: almotriptan (Sanis Health, August 2017), Relpax (August 2023), Frova (June 2024), naratriptan (Sandoz, July 2017), Maxalt/Maxalt RPD (May 2021), Imitrex (October 2022), Suvexx (December 2021), Zomig (February 2025), Nurtec ODT (December 2023), Ubrelvy (November 2022), Migranal (May 2010).

Abbreviations: CrCl = creatinine clearance, CV = cardiovascular, DHE = dihydroergotamine, h = hour or hours, HTN = hypertension, IM = intramuscular, IV = intravenous, MAOI = monoamine oxidase inhibitor, NA = not available, NNT = number needed to treat, NSAID = nonsteroidal anti-inflammatory drug, NTCP = sodium taurocholate co-transporting polypeptide, OATP = organic anion transporting polypeptide, ODT = orally disintegrating tablet, P-gp = P-glycoprotein, SNRI = serotonin-norepinephrine reuptake inhibitor, SSRI = selective serotonin reuptake inhibitor, TIA = transient ischemic attack.

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Levels of Evidence

In accordance with our goal of providing Evidence-Based information, we are citing the **LEVEL OF EVIDENCE** for the clinical recommendations we publish.

Level	Definition	Study Quality
A	Good-quality patient-oriented evidence.*	1. High-quality randomized controlled trial (RCT) 2. Systematic review (SR)/Meta-analysis of RCTs with consistent findings 3. All-or-none study
B	Inconsistent or limited-quality patient-oriented evidence.*	1. Lower-quality RCT 2. SR/Meta-analysis with low-quality clinical trials or of studies with inconsistent findings 3. Cohort study 4. Case control study
C	Consensus; usual practice; expert opinion; disease-oriented evidence (e.g., physiologic or surrogate endpoints); case series for studies of diagnosis, treatment, prevention, or screening.	

***Outcomes that matter to patients** (e.g., morbidity, mortality, symptom improvement, quality of life).
[Adapted from Ebell MH, Siwek J, Weiss BD, et al. Strength of Recommendation Taxonomy (SORT): a patient-centered approach to grading evidence in the medical literature. Am Fam Physician 2004;69:548-56. https://www.aafp.org/pubs/afp/issues/2004/0201/p548.html.]

References

1. Clinical Pharmacology powered by Clinical Key. Tampa, FL. Elsevier; 2025. http://www.clinicalkey.com. (Accessed June 3, 2025).
2. Derry CJ, Derry S, Moore RA. Sumatriptan (oral route of administration) for acute migraine attacks in adults. Cochrane Database Syst Rev. 2012 Feb 15;2012(2):CD008615.
3. Law S, Derry S, Moore RA. Sumatriptan plus naproxen for the treatment of acute migraine attacks in adults. Cochrane Database Syst Rev. 2016 Apr 20;4(4):CD008541.
4. British Association for the Study of Headache (BASH). National Headache Management System for Adults. 2019. http://www.bash.org.uk/downloads/guidelines2019/01_BASHNationalHeadache_Management_SystemforAdults_2019_guideline_versi.pdf. (Accessed May 31, 2025).
5. Ong JJY, De Felice M. Migraine Treatment: Current Acute Medications and Their Potential Mechanisms of Action. Neurotherapeutics. 2018 Apr;15(2):274-290. Erratum in: Neurotherapeutics. 2018 Apr;15(2):525-526.
6. Göbel H, Winter P, Boswell D, et al. Comparison of naratriptan and sumatriptan in recurrence-prone migraine patients. Naratriptan International Recurrence Study Group. Clin Ther. 2000 Aug;22(8):981-9.
7. Fidler BD. Review of almotriptan: a 5-HT1B/1D agonist. P&T 2002;27:83-4,88,93-4.
8. McCormack PL, Keating GM. Eletriptan: a review of its use in the acute treatment of migraine. Drugs. 2006;66(8):1129-49.
9. Dodick D, Brandes J, Elkind A, Mathew N, Rodichok L. Speed of onset, efficacy and tolerability of zolmitriptan nasal spray in the acute treatment of migraine: a randomised, double-blind, placebo-controlled study. CNS Drugs. 2005;19(2):125-36.
10. Negro A, Koverech A, Martelletti P. Serotonin receptor agonists in the acute treatment of migraine: a review on their therapeutic potential. J Pain Res. 2018 Mar 8;11:515-526.
11. VA/DoD clinical practice guideline for management of headache. Version 3.0-2023.https://www.healthquality.va.gov/guidelines/pain/headache/VA-DOD-CPG-Headache-Full-CPG.pdf. (Accessed June 3, 2025).
12. Patterson-Gentile C, Szperka CL. The Changing Landscape of Pediatric Migraine Therapy: A Review. JAMA Neurol. 2018 Jul 1;75(7):881-887.
13. Rapoport AM, Tepper SJ, Bigal ME, Sheftell FD. The triptan formulations: how to match patients and products. CNS Drugs 2003;17:431-47.
14. Goadsby PJ, Wietecha LA, Dennehy EB, et al. Phase 3 randomized, placebo-controlled, double-blind study of lasmiditan for acute treatment of migraine. Brain. 2019 Jul 1;142(7):1894-1904.
15. Law S, Derry S, Moore RA. Naproxen with or without an antiemetic for acute migraine headaches in adults. Cochrane Database Syst Rev. 2013 Oct 20;2013(10):CD009455.
16. Rabbie R, Derry S, Moore RA. Ibuprofen with or without an antiemetic for acute migraine headaches in adults. Cochrane Database Syst Rev. 2013 Apr 30;2013(4):CD008039.
17. Jakate A, Blumenfeld AM, Boinpally R, et al. Pharmacokinetics and safety of ubrogepant when coadministered with calcitonin gene-related peptide-targeted monoclonal antibody migraine preventives in participants with migraine: A randomized phase 1b drug-drug interaction study. Headache. 2021 Apr;61(4):642-652.
18. Jeric M, Surjan N, Jelicic Kadic A, et al. Treatment of acute migraine attacks in children with analgesics on the World Health Organization Essential Medicines List: A systematic review and GRADE evidence synthesis. Cephalalgia. 2018 Aug;38(9):1592-1607.
19. Richer L, Billinghurst L, Linsdell MA, Russell K, Vandermeer B, Crumley ET, Durec T, Klassen TP, Hartling L. Drugs for the acute treatment of migraine in children and adolescents. Cochrane Database Syst Rev. 2016 Apr 19;4(4):CD005220.
20. XXX
21. Oskoui M, Pringsheim T, Holler-Managan Y, et al. Practice guideline update summary: Acute treatment of migraine in children and adolescents: Report of the Guideline Development, Dissemination, and Implementation Subcommittee of the American Academy of Neurology and the American Headache Society. Neurology. 2019 Sep 10;93(11):487-499. Erratum in: Neurology. 2020 Jan 7;94(1):50.
22. Foong AL, Grindrod KA, Patel T, Kellar J. Demystifying serotonin syndrome (or serotonin toxicity). Can Fam Physician. 2018 Oct;64(10):720-727.
23. Oliver RL, Taylor A. Choosing the right triptan. Last updated June 16, 2017. Practical Pain Management. https://www.practicalpainmanagement.com/pain/headache/migraine/choosing-right-triptan. (Accessed May 31, 2025).
24. Elkind AH, Wade A, Ishkanian G. Pharmacokinetics of frovatriptan in adolescent migraineurs. J Clin Pharmacol. 2004 Oct;44(10):1158-65.
25. Christensen ML, Mottern RK, Jabbour JT, Fuseau E. Pharmacokinetics of sumatriptan nasal spray in children. J Clin Pharmacol. 2004 Apr;44(4):359-67.

References (continued)

26. Christensen ML, Mottern RK, Jabbour JT, Fuseau E. Pharmacokinetics of sumatriptan nasal spray in adolescents. J Clin Pharmacol. 2003 Jul;43(7):721-6.
27. Silberstein SD, Shrewsbury SB, Hoekman J. Dihydroergotamine (DHE) – Then and Now: A Narrative Review. Headache. 2020 Jan;60(1):40-57.
28. Blumenthal HJ. Butterscotch masks the bitter taste of sumatriptan nasal spray. Headache. 2001 Feb;41(2):210.
29. Ailani J, Burch RC, Robbins MS; Board of Directors of the American Headache Society. The American Headache Society Consensus Statement: Update on integrating new migraine treatments into clinical practice. Headache. 2021 Jul;61(7):1021-1039.
30. Shrewsbury SB, Jeleva M, Satterly KH, et al. STOP 101: A Phase 1, Randomized, Open-Label, Comparative Bioavailability Study of INP104, Dihydroergotamine Mesylate (DHE) Administered Intranasally by a I123 Precision Olfactory Delivery (POD®) Device, in Healthy Adult Subjects. Headache. 2019 Mar;59(3):394-409.
31. Impel Pharmaceuticals. Trudhesa. Frequently asked questions. https://www.trudhesa.com/faqs/. (Accessed June 3, 2025).
32. Albrecht D, Iwashima M, Dillon D, et al. Phase 1, Randomized, Open-Label, Safety, Tolerability, and Comparative Bioavailability Study of Intranasal Dihydroergotamine Powder (STS101), Intramuscular Dihydroergotamine Mesylate, and Intranasal DHE Mesylate Spray in Healthy Adult Subjects. Headache. 2020 Apr;60(4):701-712.
33. Sheridan DC, Laurie A, Pacheco S, et al. Relative Effectiveness of Dopamine Antagonists for Pediatric Migraine in the Emergency Department. Pediatr Emerg Care. 2018 Mar;34(3):165-168.
34. Coppola M, Yealy DM, Leibold RA. Randomized, placebo-controlled evaluation of prochlorperazine versus metoclopramide for emergency department treatment of migraine headache. Ann Emerg Med. 1995 Nov;26(5):541-6.
35. Abdelmonem H, Abdelhay HM, Abdelwadoud GT, et al. The efficacy and safety of metoclopramide in relieving acute migraine attacks compared with other anti-migraine drugs: a systematic review and network meta-analysis of randomized controlled trials. BMC Neurol. 2023 Jun 8;23(1):221.
36. Fan H, Wadolowski J, Shan R, et al. Clinical evaluation of zavegepant for the acute treatment of migraine. J Manag Care Spec Pharm. 2025 Jun;31(6):598-602.
37. Qaseem A, Tice JA, Etxeandia-Ikobaltzeta I, et al. Pharmacologic Treatments of Acute Episodic Migraine Headache in Outpatient Settings: A Clinical Guideline From the American College of Physicians. Ann Intern Med. 2025 Apr;178(4):571-578.
38. Orr SL, Friedman BW, Christie S, et al. Management of Adults With Acute Migraine in the Emergency Department: The American Headache Society Evidence Assessment of Parenteral Pharmacotherapies. Headache. 2016 Jun;56(6):911-40.
39. deSouza IS, Anthony N, Thode H Jr, et al. Effectiveness and Safety of Pharmacologic Therapies for Migraine in the Emergency Department: A Systematic Review and Bayesian Network Meta-analysis. Ann Emerg Med. 2025 Apr;85(4):313-329 [abstract].
40. Dogruyol S, Gur STA, Akbas I, et al. Intravenous ibuprofen versus sodium valproate in acute migraine attacks in the emergency department: A randomized clinical trial. Am J Emerg Med. 2022 May;55:126-132 [abstract].
41. Leung S, Bulloch B, Young C, et al. Effectiveness of standardized combination therapy for migraine treatment in the pediatric emergency department. Headache. 2013 Mar;53(3):491-197.
42. Brousseau DC, Duffy SJ, Anderson AC, Linakis JG. Treatment of pediatric migraine headaches: a randomized, double-blind trial of prochlorperazine versus ketorolac. Ann Emerg Med. 2004 Feb;43(2):256-62.
43. Kandil M, Jaber S, Desai D, et al. MAGraine: Magnesium compared to conventional therapy for treatment of migraines. Am J Emerg Med. 2021 Jan;39:28-33.
44. Li W, Tang L. Influence of greater occipital nerve block on the relief of acute migraine: A meta-analysis. Medicine (Baltimore). 2024 Oct 18;103(42):e39955.
45. Hassan R, Gudiwala V, Dawn P, Jeynes L. Greater Occipital Nerve Block as an Effective Intervention for Medically Refractory Pediatric Migraine: A Retrospective Study. Cureus. 2023 Feb 13;15(2):e34930.
46. Orlova YY, Mehla S, Chua AL. Drug Safety in Episodic Migraine Management in Adults Part 1: Acute Treatments. Curr Pain Headache Rep. 2022 Jul;26(7):481-492.
47. Diener H, Holle-Lee D, Nagel S, et al. Treatment of migraine attacks and prevention of migraine: guidelines by the German Migraine and Headache Society and the German Society of Neurology. Clin Transl Neurosci 2019;3(1). doi:10.1177/2514183X18823377.
48. Diener HC. The Risks or Lack Thereof of Migraine Treatments in Vascular Disease. Headache. 2020 Mar;60(3):649-653.