

# **Chronic Daily Headache: Classification, Diagnosis, and Treatment Strategies**

# Chronic Daily Headache: Mechanisms

Defective interaction between endogenous nociceptive brainstem activity and peripheral input:

- Hypersensitive trigeminal nucleus caudalis neurons (central sensitization)
  - Supraspinal facilitation
  - Decreased antinociceptive system activity (iron deposition in the periaqueductal gray matter)
  - Increased peripheral input
  - Cutaneous allodynia
- Sensitized peripheral nociceptor (peripheral sensitization)
- Physical/psychologic stress/nonphysiologic conditions can increase nociception
  - Stress can reduce endogenous antinociception

# Chronic Daily Headache: Epidemiology

- Occurs in about 4% of the population
  - China: 3.9%<sup>1</sup>
  - United States: 4.1%<sup>2</sup>
  - Spain: 4.7%<sup>3</sup>
- Only 0.5% with moderate to severe headache<sup>2</sup>
- Most common problem at headache centers<sup>1,2</sup>
- Often complicated by medication overuse<sup>1</sup>
- Often associated with comorbid psychologic diagnoses<sup>2</sup>

1. Wang SJ et al. *Neurology*. 2000;54:314–319.

2. Scher AI et al. *Headache*. 1998;38:497–506.

3. Castillo J et al. *Headache*. 1999;39:190–196.

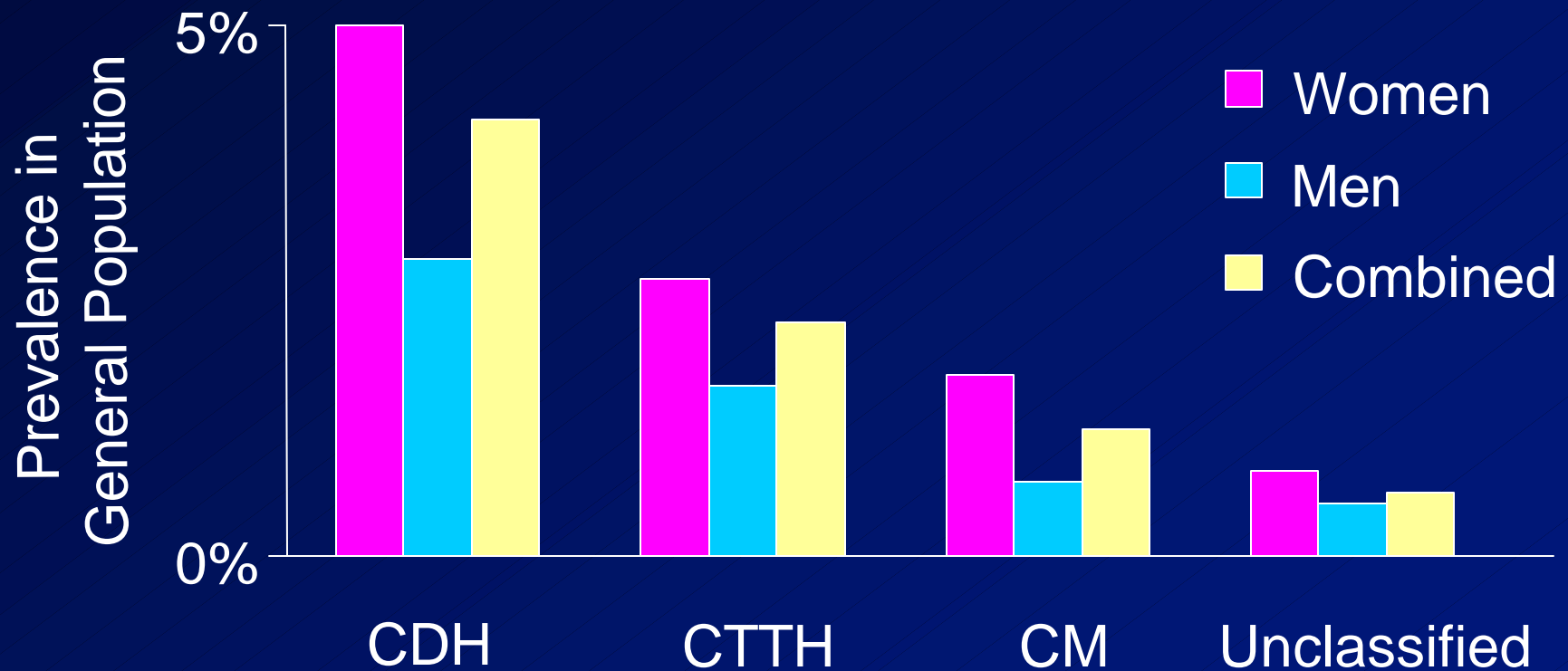
# Chronic Daily Headache: Classification<sup>1,2</sup>

- Chronic (transformed) migraine (CM)
- Chronic tension-type headache (CTTH)
- New daily persistent headache (NDPH)
- Hemicrania continua (HC)
  
- 2 subtypes for each of the above:
  - With medication overuse
  - Without medication overuse

1. Silberstein SD et al. *Neurology*. 1996;47:871–875.

2. Silberstein SD et al. *Headache in Clinical Practice*. 2<sup>nd</sup> ed., Martin Dunitz; 2002.

# Headache Prevalence



CDH = chronic daily headache

CTTH = chronic tension-type headache

CM = chronic migraine

Scher AI et al. *Headache*. 1998;38:497-506.

# Chronic Migraine

- Episodic migraine<sup>1</sup>
  - Onset age:  $22 \pm 9$  years
  - Duration:  $16 \pm 11$  years
- Attacks become more frequent<sup>1</sup>
  - Low-grade interictal headaches develop
- Daily headache by age  $39 \pm 11$  years<sup>1</sup>
  - Superimposed bouts of migraine<sup>2</sup>
- Common features<sup>2</sup>
  - Sleep disturbances
  - Depression/anxiety
  - Medication overuse

1. Mathew NT et al. *Headache*. 1987;27:102–106.

2. Mathew NT. *Cephalalgia*. 1993;13:78–83.

# Chronic Migraine: Proposed Diagnostic Criteria

- Headache >15 days/month for >1 month
- Duration >4 hours/day
- At least 1 of:
  - History of any episodic migraine type
  - Increasing frequency and decreasing severity for ≥3 months
  - Current headache condition meets IHS criteria for migraine, other than duration

# Chronic Tension-Type Headache: IHS Diagnostic Criteria

(Previously called chronic daily headache)

- Occurs <sup>≥</sup>15 days/month for <sup>≥</sup>6 months
- Headache consists of at least 2 of:
  - Pressing or tightening in quality
  - Mild or moderate in severity
  - Bilateral location
  - No aggravation by routine physical activity
- Both of the following:
  - No vomiting
  - Only one of: nausea, photophobia, or phonophobia

IHS = International Headache Society

Headache Classification Committee of the International Headache Society.  
*Cephalalgia*. 1988;8(suppl 7):1–96.

# Chronic Tension-Type Headache vs Chronic Migraine

Symptom	CTTH <sup>1</sup>	CM <sup>2</sup>
Nausea, photophobia, phonophobia	Only 1 of these	Any/all of these
Vomiting	No	Possibly
Severity	Mild to moderate	Moderate to severe
Typical location	Bilateral	Unilateral

CTTH = chronic tension-type headache

CM = chronic migraine

1. Headache Classification Committee of the International Headache Society. *Cephalalgia*. 1988;8(suppl 7):1–96.

2. Silberstein SD et al. *Neurology*. 1996;47:871–875.

# New Daily Persistent Headache

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- Peak age of onset
  - Women: 11–30 years
  - Men: 41–50 years
- Nausea, photophobia, or phonophobia occur in 2 of 3 patients
- Acute onset related to illness in 30%
  - Associated with Epstein-Barr virus?

# New Daily Persistent Headache: Proposed Diagnostic Criteria<sup>1,2</sup>

- Headache >15 days/month for >1 month
- Duration >4 hours/day
  - Pain usually constant but may fluctuate
- Location of headache pain constant
- No history of evolving tension-type headache or migraine headache
- Acute onset (<3 days)
- Does not meet criteria for hemicrania continua (HC)

1. Silberstein SD et al. *Headache*. 1994;34:1–7.

2. Li D et al. *Cephalalgia*. 2002;22:66–69.

# Hemicrania Continua: Proposed Diagnostic Criteria

- Headache is:
  - Present <sup>3</sup>1 month
  - Always unilateral
  - Continuous but fluctuating pain
  - Pain is moderate
  - Without precipitating mechanism or factors
- One of:
  - Complete response to indomethacin
  - Any of these autonomic features with exacerbation of pain:
    - Conjunctival injection, lacrimation, nasal congestion, rhinorrhea, ptosis, or eyelid edema

# Question

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- What is the most common form of chronic daily headache (CDH) that you see in your practice?
  - A. Chronic migraine
  - B. Chronic tension-type headache
  - C. New daily persistent headache
  - D. Hemicrania continua

# Medication Overuse

- 2 subtypes for each of the 4 primary headache disorders:
  - With medication overuse
  - Without medication overuse
- Rebound: Chronic daily headache (CDH) due to overuse of acute headache medication in a headache-prone individual
  - Develops over weeks to months

# Medication Overuse: Consequences

- Refractory chronic daily headache<sup>1,2</sup>
  - Rebound: Chronic daily headache (CDH) due to overuse of acute headache medication in a headache-prone individual
  - Tolerance to drugs used to treat acute headache
  - Withdrawal symptoms occur if drug stopped, including increased headache
  - Headache improves after washout period
  - Medication used for headache prevention is ineffective
- Drug toxicity<sup>2</sup>
  - Ergotism, nephropathy, gastrointestinal problems

1. Silberstein SD et al. *Headache in Clinical Practice*. 2<sup>nd</sup> ed., Martin Dunitz; 2002.

2. Diener HC et al. In: Olesen J et al. *The Headaches*. Lippincott Williams & Wilkins; 2000:871–877.

# Medication Overuse

- Simple analgesics
  - >3 tablets >5 days/week
- Combination analgesics
  - >3 tablets >3 days/week
- Ergotamine
  - 1 mg PO or 0.5 mg PR =3 days/week
- Opioids
  - >2 days/week

# Chronic Daily Headache With Medication Overuse: Detoxification

- Other medications usually don't work during overuse<sup>1</sup>
- Aggressive headache management is required<sup>1</sup>
  - Home, infusion center, or hospital
- Withdrawal symptoms can persist for up to 4 weeks<sup>1,2</sup>
  - Severe headache exacerbation accompanied by:
    - Nausea/vomiting
    - Agitation/restlessness/sleep disorder
    - Seizures (rarely)
- After washout, headache frequently improves<sup>1</sup>

1. Silberstein SD et al. *Headache in Clinical Practice*. 2<sup>nd</sup> ed., Martin Dunitz; 2002.

2. Diener HC et al. In: Olesen J et al. *The Headaches*. Lippincott Williams & Wilkins; 2000:871–877.

# Chronic Daily Headache With Medication Overuse: Prognosis

- Natural history unknown<sup>1</sup>
  - Periods of stable drug consumption alternate with phases of increased medication use
  - Patients treated aggressively generally improve
  - Spontaneous improvement rarely noted
- Follow-up on 50 hospitalized chronic daily headache (CDH) patients who overused medication and became headache-free:
  - 72% improved at 3 months<sup>1</sup>
  - 87% improved after 2 years<sup>1</sup>
  - Consistent with reported long-term success rates<sup>2</sup>

1. Silberstein SD et al. *Headache in Clinical Practice*. 2<sup>nd</sup> ed., Martin Dunitz; 2002.

2. Diener HC et al. In: Olesen J et al. *The Headaches*. Lippincott Williams & Wilkins; 2000:871–877.

# Chronic Daily Headache Without Medication Overuse: Treatment

## ■ Acute:

- Chronic migraine (CM)<sup>1</sup>
  - Antimigraine medications
- Chronic tension-type headache (CTTH)<sup>2</sup>
  - Analgesics
- New daily persistent headache (NDPH)<sup>3</sup>
  - Anecdotal reports only
- Hemicrania continua (HC)<sup>4</sup>
  - Indomethacin

## ■ Preventive:

- Goal: reduce headache frequency

1. Mathew NT et al. *Headache*. 1987;27:102–106.

2. Millea PJ et al. *Am Fam Phys*. 2002;66:797–804.

3. Rozen TD. *Headache*. 2001;41:830–832.

4. Goadsby PJ et al. *Brain*. 1997;120:193–209.

# Chronic Daily Headache: Nonpharmacologic Treatment

- Regular sleep, exercise, and meals
- Reassurance, counseling, and education
- Stress management/cognitive-behavioral therapy
- Relaxation training and biofeedback
- Physical therapy
- Formal individual and family psychotherapy

# Chronic Daily Headache: Summary

- Most common problem seen in headache clinics
- Prevalence in general population about 4%
- Includes:
  - Chronic (transformed) migraine (CM)
  - Chronic tension-type headache (CTTH)
  - New daily persistent headache (NDPH)
  - Hemicrania continua (HC)
- Frequently complicated by medication overuse
- Consequence of altered central nociceptive mechanisms (central sensitization) and peripheral sensitization
- Requires a comprehensive treatment plan

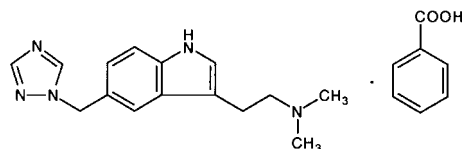


**MAXALT®**  
**(RIZATRIPTAN BENZOATE)**  
TABLETS  
**MAXALT-MLT®**  
**(RIZATRIPTAN BENZOATE)**  
ORALLY DISINTEGRATING TABLETS

**DESCRIPTION**

MAXALT\* contains rizatriptan benzoate, a selective 5-hydroxytryptamine<sub>1B/1D</sub> (5-HT<sub>1B/1D</sub>) receptor agonist.

Rizatriptan benzoate is described chemically as: *N,N*-dimethyl-5-(1*H*-1,2,4-triazol-1-ylmethyl)-1*H*-indole-3-ethanamine monobenzoate and its structural formula is:



Its empirical formula is C<sub>15</sub>H<sub>19</sub>N<sub>5</sub>•C<sub>7</sub>H<sub>6</sub>O<sub>2</sub>, representing a molecular weight of the free base of 269.4. Rizatriptan benzoate is a white to off-white, crystalline solid that is soluble in water at about 42 mg per mL (expressed as free base) at 25°C.

MAXALT Tablets and MAXALT-MLT\* Orally Disintegrating Tablets are available for oral administration in strengths of 5 and 10 mg (corresponding to 7.265 mg or 14.53 mg of the benzoate salt, respectively). Each compressed tablet contains the following inactive ingredients: lactose monohydrate, microcrystalline cellulose, pregelatinized starch, ferric oxide (red), and magnesium stearate.

Each lyophilized orally disintegrating tablet contains the following inactive ingredients: gelatin, mannitol, glycine, aspartame, and peppermint flavor.

**CLINICAL PHARMACOLOGY**

*Mechanism of Action*

Rizatriptan binds with high affinity to human cloned 5-HT<sub>1B</sub> and 5-HT<sub>1D</sub> receptors. Rizatriptan has weak affinity for other 5-HT<sub>1</sub> receptor subtypes (5-HT<sub>1A</sub>, 5-HT<sub>1E</sub>, 5-HT<sub>1F</sub>) and the 5-HT<sub>7</sub> receptor, but has no significant activity at 5-HT<sub>2</sub>, 5-HT<sub>3</sub>, alpha- and beta-adrenergic, dopaminergic, histaminergic, muscarinic or benzodiazepine receptors.

Current theories on the etiology of migraine headache suggest that symptoms are due to local cranial vasodilatation and/or to the release of vasoactive and pro-inflammatory peptides from sensory nerve endings in an activated trigeminal system. The therapeutic activity of rizatriptan in migraine can most likely be attributed to agonist effects at 5-HT<sub>1B/1D</sub> receptors on the extracerebral, intracranial blood vessels that become dilated during a migraine attack and on nerve terminals in the trigeminal system. Activation of these receptors results in cranial vessel constriction, inhibition of neuropeptide release and reduced transmission in trigeminal pain pathways.

*Pharmacokinetics*

Rizatriptan is completely absorbed following oral administration. The mean oral absolute bioavailability of the MAXALT Tablet is about 45%, and mean peak plasma concentrations (C<sub>max</sub>)

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are reached in approximately 1-1.5 hours ( $T_{max}$ ). The presence of a migraine headache did not appear to affect the absorption or pharmacokinetics of rizatriptan. Food has no significant effect on the bioavailability of rizatriptan but delays the time to reach peak concentration by an hour. In clinical trials, MAXALT was administered without regard to food. The plasma half-life of rizatriptan in males and females averages 2-3 hours.

The bioavailability and  $C_{max}$  of rizatriptan were similar following administration of MAXALT Tablets and MAXALT-MLT Orally Disintegrating Tablets, but the rate of absorption is somewhat slower with MAXALT-MLT, with  $T_{max}$  averaging 1.6-2.5 hours. AUC of rizatriptan is approximately 30% higher in females than in males. No accumulation occurred on multiple dosing.

The mean volume of distribution is approximately 140 liters in male subjects and 110 liters in female subjects. Rizatriptan is minimally bound (14%) to plasma proteins.

The primary route of rizatriptan metabolism is via oxidative deamination by monoamine oxidase-A (MAO-A) to the indole acetic acid metabolite, which is not active at the 5-HT<sub>1B/1D</sub> receptor. N-monodesmethyl-rizatriptan, a metabolite with activity similar to that of parent compound at the 5-HT<sub>1B/1D</sub> receptor, is formed to a minor degree. Plasma concentrations of N-monodesmethyl-rizatriptan are approximately 14% of those of parent compound, and it is eliminated at a similar rate. Other minor metabolites, the N-oxide, the 6-hydroxy compound, and the sulfate conjugate of the 6-hydroxy metabolite are not active at the 5-HT<sub>1B/1D</sub> receptor.

The total radioactivity of the administered dose recovered over 120 hours in urine and feces was 82% and 12%, respectively, following a single 10 mg oral administration of <sup>14</sup>C-rizatriptan. Following oral administration of <sup>14</sup>C-rizatriptan, rizatriptan accounted for about 17% of circulating plasma radioactivity. Approximately 14% of an oral dose is excreted in urine as unchanged rizatriptan while 51% is excreted as indole acetic acid metabolite, indicating substantial first pass metabolism.

**Cytochrome P450 Isoforms:** Rizatriptan is not an inhibitor of the activities of human liver cytochrome P450 isoforms 3A4/5, 1A2, 2C9, 2C19, or 2E1; rizatriptan is a competitive inhibitor ( $K_i=1400$  nM) of cytochrome P450 2D6, but only at high, clinically irrelevant concentrations.

#### *Special Populations*

**Age:** Rizatriptan pharmacokinetics in healthy elderly non-migraineur volunteers (age 65-77 years) were similar to those in younger non-migraineur volunteers (age 18-45 years).

**Gender:** The mean  $AUC_{0-\infty}$  and  $C_{max}$  of rizatriptan (10 mg orally) were about 30% and 11% higher in females as compared to males, respectively, while  $T_{max}$  occurred at approximately the same time.

**Hepatic impairment:** Following oral administration in patients with hepatic impairment caused by mild to moderate alcoholic cirrhosis of the liver, plasma concentrations of rizatriptan were similar in patients with mild hepatic insufficiency compared to a control group of healthy subjects; plasma concentrations of rizatriptan were approximately 30% greater in patients with moderate hepatic insufficiency. (See PRECAUTIONS.)

**Renal impairment:** In patients with renal impairment (creatinine clearance 10-60 mL/min/1.73 m<sup>2</sup>), the  $AUC_{0-\infty}$  of rizatriptan was not significantly different from that in healthy subjects. In hemodialysis patients, (creatinine clearance < 2 mL/min/1.73 m<sup>2</sup>), however, the AUC for rizatriptan was approximately 44% greater than that in patients with normal renal function. (See PRECAUTIONS.)

**Race:** Pharmacokinetic data revealed no significant differences between African American and Caucasian subjects.

**Drug Interactions** (See also PRECAUTIONS, *Drug Interactions*.)

**Monoamine oxidase inhibitors:** Rizatriptan is principally metabolized via monoamine oxidase, 'A' subtype (MAO-A). Plasma concentrations of rizatriptan may be increased by drugs that are selective MAO-A inhibitors (e.g., moclobemide) or nonselective MAO inhibitors [type A and B] (e.g., isocarboxazid, phenelzine, tranylcypromine, and pargyline). In a drug interaction study, when MAXALT 10 mg was administered to subjects (n=12) receiving concomitant therapy with the selective, reversible MAO-A inhibitor, moclobemide 150 mg t.i.d., there were mean increases in

rizatriptan AUC and  $C_{max}$  of 119% and 41% respectively; and the AUC of the active N-monodesmethyl metabolite of rizatriptan was increased more than 400%. The interaction would be expected to be greater with irreversible MAO inhibitors. No pharmacokinetic interaction is anticipated in patients receiving selective MAO-B inhibitors. (See CONTRAINDICATIONS; PRECAUTIONS, *Drug Interactions*.)

*Propranolol*: In a study of concurrent administration of propranolol 240 mg/day and a single dose of rizatriptan 10 mg in healthy subjects (n=11), mean plasma AUC for rizatriptan was increased by 70% during propranolol administration, and a fourfold increase was observed in one subject. The AUC of the active N-monodesmethyl metabolite of rizatriptan was not affected by propranolol. (See PRECAUTIONS; DOSAGE AND ADMINISTRATION.)

*Nadolol/Metoprolol*: In a drug interactions study, effects of multiple doses of nadolol 80 mg or metoprolol 100 mg every 12 hours on the pharmacokinetics of a single dose of 10 mg rizatriptan were evaluated in healthy subjects (n=12). No pharmacokinetic interactions were observed.

*Paroxetine*: In a study of the interaction between the selective serotonin reuptake inhibitor (SSRI) paroxetine 20 mg/day for two weeks and a single dose of MAXALT 10 mg in healthy subjects (n=12), neither the plasma concentrations of rizatriptan nor its safety profile were affected by paroxetine.

*Oral contraceptives*: In a study of concurrent administration of an oral contraceptive during 6 days of administration of MAXALT (10-30 mg/day) in healthy female volunteers (n=18), rizatriptan did not affect plasma concentrations of ethinyl estradiol or norethindrone.

*Clinical Studies*

The efficacy of MAXALT Tablets was established in four multicenter, randomized, placebo-controlled trials. Patients enrolled in these studies were primarily female (84%) and Caucasian (88%), with a mean age of 40 years (range of 18 to 71). Patients were instructed to treat a moderate to severe headache. Headache response, defined as a reduction of moderate or severe headache pain to no or mild headache pain, was assessed for up to 2 hours (Study 1) or up to 4 hours after dosing (Studies 2, 3 and 4). Associated symptoms of nausea, photophobia, and phonophobia and maintenance of response up to 24 hours postdose were evaluated. A second dose of MAXALT Tablets was allowed 2 to 24 hours after dosing for treatment of recurrent headache in Studies 1 and 2. Additional analgesics and/or antiemetics were allowed 2 hours after initial treatment for rescue in all four studies.

In all studies, the percentage of patients achieving headache response 2 hours after treatment was significantly greater in patients who received either MAXALT 5 or 10 mg compared to those who received placebo. In a separate study, doses of 2.5 mg were not different from placebo. Doses greater than 10 mg were associated with an increased incidence of adverse effects. The results from the 4 controlled studies using the marketed formulation are summarized in Table 1.

Table 1  
 Response Rates 2 Hours Following Treatment of Initial Headache

Study	Placebo	MAXALT Tablets 5 mg	MAXALT Tablets 10 mg
1	35% (n=304)	62%* (n=458)	71%*,** (n=456)
2†	37% (n=82)	—	77%* (n=320)
3	23% (n=80)	63%* (n=352)	—
4	40% (n=159)	60%* (n=164)	67%* (n=385)

\* p value < 0.05 in comparison with placebo

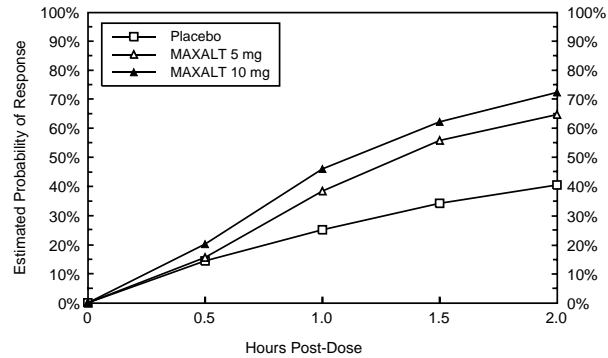
\*\* p value < 0.05 in comparison with 5 mg

† Results for initial headache only.

**Comparisons of drug performance based upon results obtained in different clinical trials are never reliable. Because studies are conducted at different times, with different samples of patients, by different investigators, employing different criteria and/or different interpretations of the same criteria, under different conditions (dose, dosing regimen, etc.), quantitative estimates of treatment response and the timing of response may be expected to vary considerably from study to study.**

The estimated probability of achieving an initial headache response within 2 hours following treatment is depicted in Figure 1.

Figure 1: Estimated Probability of Achieving an Initial Headache Response by 2 Hours††

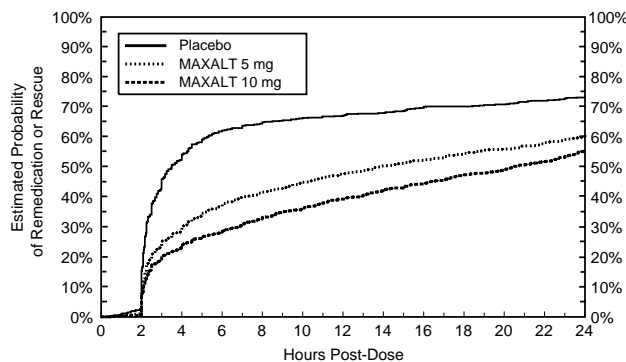


†† Figure 1 shows the Kaplan-Meier plot of the probability over time of obtaining headache response (no or mild pain) following treatment with rizatriptan or placebo. The averages displayed are based on pooled data from 4 placebo-controlled, outpatient trials providing evidence of efficacy (Studies 1, 2, 3, and 4). Patients taking additional treatment or not achieving headache response prior to 2 hours were censored at 2 hours.

For patients with migraine-associated photophobia, phonophobia, and nausea at baseline, there was a decreased incidence of these symptoms following administration of MAXALT compared to placebo.

Two to 24 hours following the initial dose of study treatment, patients were allowed to use additional treatment for pain response in the form of a second dose of study treatment or other medication. The estimated probability of patients taking a second dose or other medication for migraine over the 24 hours following the initial dose of study treatment is summarized in Figure 2.

Figure 2: Estimated Probability of Patients Taking a Second Dose of MAXALT Tablets or Other Medication for Migraines Over the 24 Hours Following the Initial Dose of Study Treatment†††



††† This Kaplan-Meier plot is based on data obtained in 4 placebo-controlled outpatient clinical trials (Studies 1, 2, 3, and 4). Patients not using additional treatments were censored at 24 hours. The plot includes both patients who had headache response at 2 hours and those who had no response to the initial dose. Remediation was not allowed within 2 hours post-dose.

Efficacy was unaffected by the presence of aura; by the gender, or age of the patient; or by concomitant use of common migraine prophylactic drugs (e.g., beta-blockers, calcium channel blockers, tricyclic antidepressants) or oral contraceptives. In two additional similar studies, efficacy was unaffected by relationship to menses. There were insufficient data to assess the impact of race on efficacy.

In a single study in adolescents (n=291), there were no statistically significant differences between treatment groups. The headache response rates at 2 hours were 66% and 56% for MAXALT 5 mg Tablets and placebo, respectively.

*MAXALT-MLT Orally Disintegrating Tablets*

The efficacy of MAXALT-MLT was established in two multicenter, randomized, placebo-controlled trials that were similar in design to the trials of MAXALT Tablets. Patients were instructed to treat a moderate to severe headache. Patients treated in these studies were primarily female (88%) and Caucasian (95%), with a mean age of 42 years (range 18-72).

In both studies, the percentage of patients achieving headache response 2 hours after treatment was significantly greater in patients who received either MAXALT-MLT 5 or 10 mg compared to those who received placebo. The results from the 2 controlled studies using the marketed formulation are summarized in Table 2.

Table 2  
 Response Rates 2 Hours Following Treatment of Initial Headache

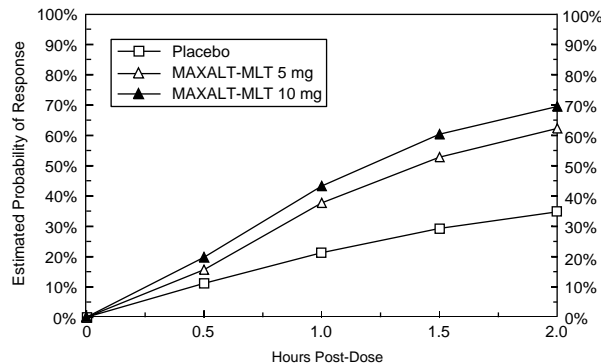
Study	Placebo	MAXALT-MLT 5 mg	MAXALT-MLT 10 mg
1	47% (n=98)	66%* (n=100)	66%* (n=113)
2	28% (n=180)	59%* (n=181)	74%*,** (n=186)

\* p value < 0.01 in comparison with placebo

\*\* p value < 0.01 in comparison with 5 mg

The estimated probability of achieving an initial headache response by 2 hours following treatment with MAXALT-MLT is depicted in Figure 3.

Figure 3: Estimated Probability of Achieving an Initial Headache Response with MAXALT-MLT by 2 Hours†

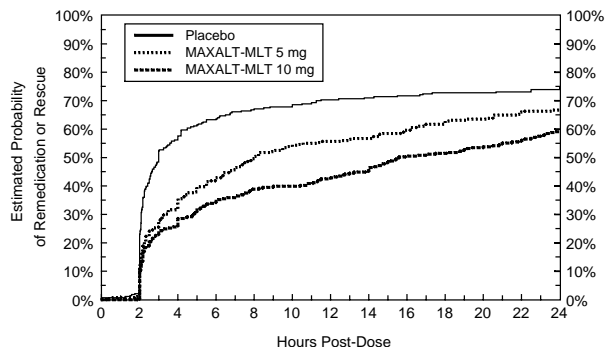


† Figure 3 shows the Kaplan-Meier plot of the probability over time of obtaining headache response (no or mild pain) following treatment with MAXALT-MLT or placebo. The averages displayed are based on pooled data from 2 placebo-controlled, outpatient trials providing evidence of efficacy (Studies 1 and 2). Patients taking additional treatment or not achieving headache response prior to 2 hours were censored at 2 hours.

For patients with migraine-associated photophobia and phonophobia at baseline, there was a decreased incidence of these symptoms following administration of MAXALT-MLT as compared to placebo.

Two to 24 hours following the initial dose of study treatment, patients were allowed to use additional treatment for pain response in the form of a second dose of study treatment or other medication. The estimated probability of patients taking a second dose or other medication for migraine over the 24 hours following the initial dose of study treatment is summarized in Figure 4.

Figure 4: Estimated Probability of Patients Taking a Second Dose of MAXALT-MLT or Other Medication for Migraines Over the 24 Hours Following the Initial Dose of Study Treatment††



‡ This Kaplan-Meier plot is based on data obtained in 2 placebo-controlled outpatient clinical trials (Studies 1 and 2). Patients not using additional treatments were censored at 24 hours. The plot includes both patients who had headache response at 2 hours and those who had no response to the initial dose. Remedication was not allowed within 2 hours post-dose.

## INDICATIONS AND USAGE

MAXALT is indicated for the acute treatment of migraine attacks with or without aura in adults.

MAXALT is not intended for the prophylactic therapy of migraine or for use in the management of hemiplegic or basilar migraine (see CONTRAINDICATIONS). Safety and effectiveness of MAXALT have not been established for cluster headache, which is present in an older, predominantly male population.

## CONTRAINDICATIONS

MAXALT should not be given to patients with ischemic heart disease (e.g., angina pectoris, history of myocardial infarction, or documented silent ischemia) or to patients who have symptoms or findings consistent with ischemic heart disease, coronary artery vasospasm, including Prinzmetal's variant angina, or other significant underlying cardiovascular disease (see WARNINGS).

Because MAXALT may increase blood pressure, it should not be given to patients with uncontrolled hypertension (see WARNINGS).

MAXALT should not be used within 24 hours of treatment with another 5-HT<sub>1</sub> agonist, or an ergotamine-containing or ergot-type medication like dihydroergotamine or methysergide.

MAXALT should not be administered to patients with hemiplegic or basilar migraine.

Concurrent administration of MAO inhibitors or use of rizatriptan within 2 weeks of discontinuation of MAO inhibitor therapy is contraindicated (see CLINICAL PHARMACOLOGY, *Drug Interactions* and PRECAUTIONS, *Drug Interactions*).

MAXALT is contraindicated in patients who are hypersensitive to rizatriptan or any of its inactive ingredients.

## WARNINGS

MAXALT should only be used where a clear diagnosis of migraine has been established.

**Risk of Myocardial Ischemia and/or Infarction and Other Adverse Cardiac Events:** Because of the potential of this class of compounds (5-HT<sub>1B/1D</sub> agonists) to cause coronary vasospasm, MAXALT should not be given to patients with documented ischemic or vasospastic coronary artery disease (see CONTRAINDICATIONS). It is strongly recommended that rizatriptan not be given to patients in whom unrecognized coronary artery disease (CAD) is predicted by the presence of risk factors (e.g., hypertension, hypercholesterolemia, smoker, obesity, diabetes, strong family history of CAD, female with

**surgical or physiological menopause, or male over 40 years of age) unless a cardiovascular evaluation provides satisfactory clinical evidence that the patient is reasonably free of coronary artery and ischemic myocardial disease or other significant underlying cardiovascular disease. The sensitivity of cardiac diagnostic procedures to detect cardiovascular disease or predisposition to coronary artery vasospasm is modest, at best. If, during the cardiovascular evaluation, the patient's medical history, electrocardiographic or other investigations reveal findings indicative of, or consistent with, coronary artery vasospasm or myocardial ischemia, rizatriptan should not be administered (see CONTRAINDICATIONS).**

**For patients with risk factors predictive of CAD, who are determined to have a satisfactory cardiovascular evaluation, it is strongly recommended that administration of the first dose of rizatriptan take place in the setting of a physician's office or similar medically staffed and equipped facility unless the patient has previously received rizatriptan. Because cardiac ischemia can occur in the absence of clinical symptoms, consideration should be given to obtaining on the first occasion of use an electrocardiogram (ECG) during the interval immediately following MAXALT, in these patients with risk factors.**

**It is recommended that patients who are intermittent long-term users of MAXALT and who have or acquire risk factors predictive of CAD, as described above, undergo periodic interval cardiovascular evaluation as they continue to use MAXALT.**

**The systematic approach described above is intended to reduce the likelihood that patients with unrecognized cardiovascular disease will be inadvertently exposed to rizatriptan.**

*Cardiac Events and Fatalities Associated with 5-HT<sub>1</sub> Agonists:* Serious adverse cardiac events, including acute myocardial infarction, have been reported within a few hours following the administration of rizatriptan. Life-threatening disturbances of cardiac rhythm and death have been reported within a few hours following the administration of other 5-HT<sub>1</sub> agonists. Considering the extent of use of 5-HT<sub>1</sub> agonists in patients with migraine, the incidence of these events is extremely low. MAXALT can cause coronary vasospasm. Because of the close proximity of the events to MAXALT use, a causal relationship cannot be excluded. In the cases where there has been known underlying coronary artery disease, the relationship is uncertain.

*Premarketing experience with rizatriptan:* Among the 3700 patients with migraine who participated in premarketing clinical trials of MAXALT, one patient was reported to have chest pain with possible ischemic ECG changes following a single dose of 10 mg.

*Postmarketing experience with rizatriptan:* Serious cardiovascular events have been reported in association with the use of MAXALT. The uncontrolled nature of postmarketing surveillance, however, makes it impossible to determine definitively the proportion of the reported cases that were actually caused by rizatriptan or to reliably assess causation in individual cases.

*Cerebrovascular Events and Fatalities Associated with 5-HT<sub>1</sub> Agonists:* Cerebral hemorrhage, subarachnoid hemorrhage, stroke, and other cerebrovascular events have been reported in patients treated with 5-HT<sub>1</sub> agonists; and some have resulted in fatalities. In a number of cases, it appears possible that the cerebrovascular events were primary, the agonist having been administered in the incorrect belief that the symptoms experienced were a consequence of migraine, when they were not. It should be noted that patients with migraine may be at increased risk of certain cerebrovascular events (e.g., stroke, hemorrhage, transient ischemic attack).

*Other Vasospasm-Related Events:* 5-HT<sub>1</sub> agonists may cause vasospastic reactions other than coronary artery vasospasm. Both peripheral vascular ischemia and colonic ischemia with abdominal pain and bloody diarrhea have been reported with 5-HT<sub>1</sub> agonists.

*Increase in Blood Pressure:* Significant elevation in blood pressure, including hypertensive crisis, has been reported on rare occasions in patients receiving 5-HT<sub>1</sub> agonists with and without a history of hypertension. In healthy young male and female subjects who received maximal doses

of MAXALT (10 mg every 2 hours for 3 doses), slight increases in blood pressure (approximately 2-3 mmHg) were observed. Rizatriptan is contraindicated in patients with uncontrolled hypertension (see CONTRAINDICATIONS).

An 18% increase in mean pulmonary artery pressure was seen following dosing with another 5-HT<sub>1</sub> agonist in a study evaluating subjects undergoing cardiac catheterization.

## PRECAUTIONS

### *General*

As with other 5-HT<sub>1B/1D</sub> agonists, sensations of tightness, pain, pressure, and heaviness have been reported after treatment with MAXALT in the precordium, throat, neck and jaw. These events have not been associated with arrhythmias or definite ischemic ECG changes in clinical trials (one patient experienced chest pain with possible ischemic ECG changes). Because drugs in this class may cause coronary artery vasospasm, patients who experience signs or symptoms suggestive of angina following dosing should be evaluated for the presence of CAD or a predisposition to Prinzmetal's variant angina before receiving additional doses of medication, and should be monitored electrocardiographically if dosing is resumed and similar symptoms recur. Similarly, patients who experience other symptoms or signs suggestive of decreased arterial flow, such as ischemic bowel syndrome or Raynaud's syndrome following the use of any 5-HT<sub>1</sub> agonist are candidates for further evaluation (see WARNINGS).

Rizatriptan should also be administered with caution to patients with diseases that may alter the absorption, metabolism, or excretion of drugs (see CLINICAL PHARMACOLOGY, *Special Populations*).

*Renally Impaired Patients:* Rizatriptan should be used with caution in dialysis patients due to a decrease in the clearance of rizatriptan (see CLINICAL PHARMACOLOGY, *Special Populations*).

*Hepatically Impaired Patients:* Rizatriptan should be used with caution in patients with moderate hepatic insufficiency due to an increase in plasma concentrations of approximately 30% (see CLINICAL PHARMACOLOGY, *Special Populations*).

For a given attack, if a patient has no response to the first dose of rizatriptan, the diagnosis of migraine should be reconsidered before administration of a second dose.

### *Binding to Melanin-Containing Tissues*

The propensity for rizatriptan to bind melanin has not been investigated. Based on its chemical properties, rizatriptan may bind to melanin and accumulate in melanin rich tissue (e.g., eye) over time. This raises the possibility that rizatriptan could cause toxicity in these tissues after extended use. There were, however, no adverse ophthalmologic changes related to treatment with rizatriptan in the one year dog toxicity study. Although no systematic monitoring of ophthalmologic function was undertaken in clinical trials, and no specific recommendations for ophthalmologic monitoring are offered, prescribers should be aware of the possibility of long-term ophthalmologic effects.

### *Phenylketonurics*

Phenylketonuric patients should be informed that MAXALT-MLT Orally Disintegrating Tablets contain phenylalanine (a component of aspartame). Each 5-mg orally disintegrating tablet contains 1.05 mg phenylalanine, and each 10-mg orally disintegrating tablet contains 2.10 mg phenylalanine.

### *Information for Patients*

Migraine or treatment with MAXALT may cause somnolence in some patients. Dizziness has also been reported in some patients receiving MAXALT. Patients should, therefore, evaluate their ability to perform complex tasks during migraine attacks and after administration of MAXALT.

Physicians should instruct their patients to read the patient package insert before taking MAXALT. See the accompanying PATIENT INFORMATION leaflet.

*MAXALT-MLT Orally Disintegrating Tablets*

Patients should be instructed not to remove the blister from the outer pouch until just prior to dosing. The blister pack should then be peeled open with dry hands and the orally disintegrating tablet placed on the tongue, where it will dissolve and be swallowed with the saliva.

*Laboratory Tests*

No specific laboratory tests are recommended for monitoring patients prior to and/or after treatment with MAXALT.

*Drug Interactions (See also CLINICAL PHARMACOLOGY, Drug Interactions.)*

*Propranolol:* Rizatriptan 5 mg should be used in patients taking propranolol, as propranolol has been shown to increase the plasma concentrations of rizatriptan by 70% (see CLINICAL PHARMACOLOGY, *Drug Interactions*; DOSAGE AND ADMINISTRATION).

*Ergot-containing drugs:* Ergot-containing drugs have been reported to cause prolonged vasospastic reactions. Because there is a theoretical basis that these effects may be additive, use of ergotamine-containing or ergot-type medications (like dihydroergotamine or methysergide) and rizatriptan within 24 hours is contraindicated (see CONTRAINDICATIONS).

*Other 5-HT<sub>1</sub> agonists:* The administration of rizatriptan with other 5-HT<sub>1</sub> agonists has not been evaluated in migraine patients. Because their vasospastic effects may be additive, coadministration of rizatriptan and other 5-HT<sub>1</sub> agonists within 24 hours of each other is not recommended (see CONTRAINDICATIONS).

*Selective serotonin reuptake inhibitors (SSRIs):* SSRIs (e.g., fluoxetine, fluvoxamine, paroxetine, sertraline) have been reported, rarely, to cause weakness, hyperreflexia, and incoordination when coadministered with 5-HT<sub>1</sub> agonists. If concomitant treatment with rizatriptan and an SSRI is clinically warranted, appropriate observation of the patient is advised. No clinical or pharmacokinetic interactions were observed when MAXALT 10 mg was administered with paroxetine.

*Monoamine oxidase inhibitors:* Rizatriptan should not be administered to patients taking MAO-A inhibitors and non-selective MAO inhibitors; it has been shown that moclobemide (a specific MAO-A inhibitor) increased the systemic exposure of rizatriptan and its metabolite (see CLINICAL PHARMACOLOGY, *Drug Interactions*; CONTRAINDICATIONS).

*Drug/Laboratory Test Interactions*

MAXALT is not known to interfere with commonly employed clinical laboratory tests.

*Carcinogenesis, Mutagenesis, Impairment of Fertility*

*Carcinogenesis:* The lifetime carcinogenic potential of rizatriptan was evaluated in a 100-week study in mice and a 106-week study in rats at oral gavage doses of up to 125 mg/kg/day. Exposure data were not obtained in those studies, but plasma AUC's of parent drug measured in other studies after 5 and 21 weeks of oral dosing in mice and rats, respectively, indicate that the exposures to parent drug at the highest dose level in the carcinogenicity studies would have been approximately 150 times (mice) and 240 times (rats) average AUC's measured in humans after three 10 mg doses, the maximum recommended total daily dose. There was no evidence of an increase in tumor incidence related to rizatriptan in either species.

*Mutagenesis:* Rizatriptan, with and without metabolic activation, was neither mutagenic, nor clastogenic in a battery of *in vitro* and *in vivo* genetic toxicity studies, including: the microbial mutagenesis (Ames) assay, the *in vitro* mammalian cell mutagenesis assay in V-79 Chinese hamster lung cells, the *in vitro* alkaline elution assay in rat hepatocytes, the *in vitro* chromosomal aberration assay in Chinese hamster ovary cells and the *in vivo* chromosomal aberration assay in mouse bone marrow.

*Impairment of Fertility:* In a fertility study in rats, altered estrus cyclicity and delays in time to mating were observed in females treated orally with 100 mg/kg/day rizatriptan. Plasma drug exposure (AUC) at this dose was approximately 225 times the exposure in humans receiving the maximum recommended daily dose (MRDD) of 30 mg. The no-effect dose was 10 mg/kg/day (approximately 15 times the human exposure at the MRDD). There were no other fertility-related effects in the female rats. There was no impairment of fertility or reproductive performance in

male rats treated with up to 250 mg/kg/day (approximately 550 times the human exposure at the MRDD).

*Pregnancy: Pregnancy Category C*

In a general reproductive study in rats, birth weights and pre- and post-weaning weight gain were reduced in the offspring of females treated prior to and during mating and throughout gestation and lactation with doses of 10 and 100 mg/kg/day. Maternal drug exposures (AUC) at these doses were approximately 15 and 225 times, respectively, the exposure in humans receiving the maximum recommended daily dose (MRDD) of 30 mg. In a pre- and post-natal developmental toxicity study in rats, an increase in mortality of the offspring at birth and for the first three days after birth, a decrease in pre- and post-weaning weight gain, and decreased performance in a passive avoidance test (which indicates a decrease in learning capacity of the offspring) were observed at doses of 100 and 250 mg/kg/day. The no-effect dose for all of these effects was 5 mg/kg/day, approximately 7.5 times the exposure in humans receiving the MRDD. With doses of 100 and 250 mg/kg/day, the decreases in average weight of both the male and female offspring persisted into adulthood. All of these effects on the offspring in both reproductive toxicity studies occurred in the absence of any apparent maternal toxicity.

In embryofetal development studies, no teratogenic effects were observed when pregnant rats and rabbits were administered doses of 100 and 50 mg/kg/day, respectively, during organogenesis. Fetal weights were decreased in conjunction with decreased maternal weight gain at the highest doses (maternal exposures approximately 225 and 115 times the human exposure at the MRDD in rats and rabbits, respectively). The developmental no-effect dose in these studies was 10 mg/kg/day in both rats and rabbits (maternal exposures approximately 15 times human exposure at the MRDD). Toxicokinetic studies demonstrated placental transfer of drug in both species.

There are no adequate and well-controlled studies in pregnant women; therefore, rizatriptan should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

Merck & Co., Inc. maintains a registry to monitor the pregnancy outcomes of women exposed to MAXALT while pregnant. Healthcare providers are encouraged to report any prenatal exposure to MAXALT by calling the Pregnancy Registry at (800) 986-8999.

*Nursing Mothers*

It is not known whether this drug is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when MAXALT is administered to women who are breast-feeding. Rizatriptan is extensively excreted in rat milk, at a level of 5-fold or greater than maternal plasma levels.

*Pediatric Use*

Safety and effectiveness of rizatriptan in pediatric patients have not been established; therefore, MAXALT is not recommended for use in patients under 18 years of age.

The efficacy of MAXALT Tablets (5 mg) in patients aged 12 to 17 years was not established in a randomized placebo-controlled trial of 291 adolescent migraineurs (see *Clinical Studies*). Adverse events observed were similar in nature to those reported in clinical trials in adults. Postmarketing experience with other triptans includes a limited number of reports that describe pediatric patients who have experienced clinically serious adverse events that are similar in nature to those reported rarely in adults. The long-term safety of rizatriptan in pediatric patients has not been studied.

*Geriatric Use*

The pharmacokinetics of rizatriptan were similar in elderly (aged  $\geq 65$  years) and in younger adults. Because migraine occurs infrequently in the elderly, clinical experience with MAXALT is limited in such patients. In clinical trials, there were no apparent differences in efficacy or in overall adverse experience rates between patients under 65 years of age and those 65 and above (n=17).

## ADVERSE REACTIONS

**Serious cardiac events, including some that have been fatal, have occurred following use of 5-HT<sub>1</sub> agonists. These events are extremely rare and most have been reported in patients with risk factors predictive of CAD. Events reported have included coronary artery vasospasm, transient myocardial ischemia, myocardial infarction, ventricular tachycardia, and ventricular fibrillation (see CONTRAINDICATIONS, WARNINGS, and PRECAUTIONS).**

*Incidence in Controlled Clinical Trials:* Adverse experiences to rizatriptan were assessed in controlled clinical trials that included over 3700 patients who received single or multiple doses of MAXALT Tablets. The most common adverse events during treatment with MAXALT were asthenia/fatigue, somnolence, pain/pressure sensation and dizziness. These events appeared to be dose related. In long term extension studies where patients were allowed to treat multiple attacks for up to 1 year, 4% (59 out of 1525 patients) withdrew because of adverse experiences.

Table 3 lists the adverse events regardless of drug relationship (incidence  $\geq$  2% and greater than placebo) after a single dose of MAXALT. The events cited reflect experience gained under closely monitored conditions of clinical trials in a highly selected patient population. In actual clinical practice or in other clinical trials, these frequency estimates may not apply, as the conditions of use, reporting behavior, and the kinds of patients treated may differ.

Table 3  
 Incidence ( $\geq$  2% and Greater than Placebo) of Adverse Experiences  
 After a Single Dose of MAXALT Tablets or Placebo

Adverse Experiences	% of Patients		
	MAXALT 5 mg (N=977)	MAXALT 10 mg (N=1167)	Placebo (N=627)
<i>Atypical Sensations</i>	4	5	4
Paresthesia	3	4	<2
<i>Pain and other Pressure Sensations</i>	6	9	3
Chest Pain:			
tightness/pressure and/or heaviness	<2	3	1
Neck/throat/jaw:			
pain/tightness/pressure	<2	2	1
Regional Pain:			
tightness/pressure/heaviness	<1	2	0
Pain, location unspecified	3	3	<2
<i>Digestive</i>	9	13	8
Dry Mouth	3	3	1
Nausea	4	6	4
<i>Neurological</i>	14	20	11
Dizziness	4	9	5
Headache	<2	2	<1
Somnolence	4	8	4
<i>Other</i>			
Asthenia/fatigue	4	7	2

MAXALT was generally well-tolerated. Adverse experiences were typically mild in intensity and were transient. The frequencies of adverse experiences in clinical trials did not increase when up to three doses were taken within 24 hours. Adverse event frequencies were also unchanged by concomitant use of drugs commonly taken for migraine prophylaxis (including propranolol), oral contraceptives, or analgesics. The incidences of adverse experiences were not affected by age or gender. There were insufficient data to assess the impact of race on the incidence of adverse events.

*Other Events Observed in Association with the Administration of MAXALT:* In the section that follows, the frequencies of less commonly reported adverse clinical events are presented. Because the reports include events observed in open studies, the role of MAXALT in their causation cannot be reliably determined. Furthermore, variability associated with adverse event reporting, the terminology used to describe adverse events, etc., limit the value of the quantitative

frequency estimates provided. Event frequencies are calculated as the number of patients who used MAXALT (N=3716) and reported an event divided by the total number of patients exposed to MAXALT. All reported events are included, except those already listed in the previous table, those too general to be informative, and those not reasonably associated with the use of the drug. Events are further classified within body system categories and enumerated in order of decreasing frequency using the following definitions: frequent adverse events are those defined as those occurring in at least (>)1/100 patients; infrequent adverse experiences are those occurring in 1/100 to 1/1000 patients; and rare adverse experiences are those occurring in fewer than 1/1000 patients.

**General:** Infrequent were chills, heat sensitivity, facial edema, hangover effect, and abdominal distention. Rare were fever, orthostatic effects, syncope and edema/swelling.

**Atypical Sensations:** Frequent were warm/cold sensations.

**Cardiovascular:** Frequent was palpitation. Infrequent were tachycardia, cold extremities, hypertension, arrhythmia, and bradycardia. Rare was angina pectoris.

**Digestive:** Frequent were diarrhea and vomiting. Infrequent were dyspepsia, thirst, acid regurgitation, dysphagia, constipation, flatulence, and tongue edema. Rare were anorexia, appetite increase, gastritis, paralysis (tongue), and eructation.

**Metabolic:** Infrequent was dehydration.

**Musculoskeletal:** Infrequent were muscle weakness, stiffness, myalgia, muscle cramp, musculoskeletal pain, arthralgia, and muscle spasm.

**Neurological/Psychiatric:** Frequent were hypesthesia, mental acuity decreased, euphoria and tremor. Infrequent were nervousness, vertigo, insomnia, anxiety, depression, disorientation, ataxia, dysarthria, confusion, dream abnormality, gait abnormality, irritability, memory impairment, agitation and hyperesthesia. Rare were: dysesthesia, depersonalization, akinesia/bradykinesia, apprehension, hyperkinesia, hypersomnia, and hyporeflexia.

**Respiratory:** Frequent was dyspnea. Infrequent were pharyngitis, irritation (nasal), congestion (nasal), dry throat, upper respiratory infection, yawning, respiratory congestion (nasal), dry nose, epistaxis, and sinus disorder. Rare were cough, hiccups, hoarseness, rhinorrhea, sneezing, tachypnea, and pharyngeal edema.

**Special Senses:** Infrequent were blurred vision, tinnitus, dry eyes, burning eye, eye pain, eye irritation, ear pain, and tearing. Rare were hyperacusis, smell perversion, photophobia, photopsia, itching eye, and eye swelling.

**Skin and Skin Appendage:** Frequent was flushing. Infrequent were sweating, pruritus, rash, and urticaria. Rare were erythema, acne, and photosensitivity.

**Urogenital System:** Frequent was hot flashes. Infrequent were urinary frequency, polyuria, and menstruation disorder. Rare was dysuria.

The adverse experience profile seen with MAXALT-MLT Orally Disintegrating Tablets was similar to that seen with MAXALT Tablets.

#### *Postmarketing Experience*

The following section enumerates potentially important adverse events that have occurred in clinical practice and which have been reported spontaneously to various surveillance systems. The events enumerated represent reports arising from both domestic and non-domestic use of rizatriptan. The events enumerated include all except those already listed in the ADVERSE REACTIONS section above or those too general to be informative. Because the reports cite events reported spontaneously from worldwide postmarketing experience, frequency of events and the role of rizatriptan in their causation cannot be reliably determined.

**Cardiovascular:** Myocardial ischemia, Myocardial infarction (see WARNINGS).

**Cerebrovascular:** Stroke.

**Special Senses:** Dysgeusia.

**General:** *Hypersensitivity:* angioedema (e.g., facial edema, tongue swelling, pharyngeal edema), wheezing, toxic epidermal necrolysis.

## DRUG ABUSE AND DEPENDENCE

Although the abuse potential of MAXALT has not been specifically assessed, no abuse of, tolerance to, withdrawal from, or drug-seeking behavior was observed in patients who received MAXALT in clinical trials or their extensions. The 5-HT<sub>1B/1D</sub> agonists, as a class, have not been associated with drug abuse.

## OVERDOSAGE

No overdoses of MAXALT were reported during clinical trials.

Rizatriptan 40 mg (administered as either a single dose or as two doses with a 2-hour interdose interval) was generally well tolerated in over 300 patients; dizziness and somnolence were the most common drug-related adverse effects.

In a clinical pharmacology study in which 12 subjects received rizatriptan, at total cumulative doses of 80 mg (given within four hours), two subjects experienced syncope and/or bradycardia. One subject, a female aged 29 years, developed vomiting, bradycardia, and dizziness beginning three hours after receiving a total of 80 mg rizatriptan (administered over two hours); a third degree AV block, responsive to atropine, was observed an hour after the onset of the other symptoms. The second subject, a 25 year old male, experienced transient dizziness, syncope, incontinence, and a 5-second systolic pause (on ECG monitor) immediately after a painful venipuncture. The venipuncture occurred two hours after the subject had received a total of 80 mg rizatriptan (administered over four hours).

In addition, based on the pharmacology of rizatriptan, hypertension or other more serious cardiovascular symptoms could occur after overdosage. Gastrointestinal decontamination, (i.e., gastric lavage followed by activated charcoal) should be considered in patients suspected of an overdose with MAXALT. Clinical and electrocardiographic monitoring should be continued for at least 12 hours, even if clinical symptoms are not observed.

The effects of hemo- or peritoneal dialysis on serum concentrations of rizatriptan are unknown.

## DOSAGE AND ADMINISTRATION

In controlled clinical trials, single doses of 5 and 10 mg of MAXALT Tablets or MAXALT-MLT were effective for the acute treatment of migraines in adults. There is evidence that the 10-mg dose may provide a greater effect than the 5-mg dose (see CLINICAL PHARMACOLOGY, *Clinical Studies*). Individuals may vary in response to doses of MAXALT Tablets. The choice of dose should therefore be made on an individual basis, weighing the possible benefit of the 10-mg dose with the potential risk for increased adverse events.

*Redosing:* Doses should be separated by at least 2 hours; no more than 30 mg should be taken in any 24-hour period.

The safety of treating, on average, more than four headaches in a 30-day period has not been established.

*Patients receiving propranolol:* In patients receiving propranolol, the 5-mg dose of MAXALT should be used, up to a maximum of 3 doses in any 24-hour period. (See CLINICAL PHARMACOLOGY, *Drug Interactions*.)

For MAXALT-MLT Orally Disintegrating Tablets, administration with liquid is not necessary. The orally disintegrating tablet is packaged in a blister within an outer aluminum pouch. Patients should be instructed not to remove the blister from the outer pouch until just prior to dosing. The blister pack should then be peeled open with dry hands and the orally disintegrating tablet placed on the tongue, where it will dissolve and be swallowed with the saliva.

## HOW SUPPLIED

No. 3732 — MAXALT Tablets, 5 mg, are pale pink, capsule-shaped, compressed tablets coded MRK on one side and 266 on the other. They are supplied as follows:

MAXALT® (Rizatriptan Benzoate) Tablets  
MAXALT-MLT® (Rizatriptan Benzoate) Orally Disintegrating Tablets

9122111

**NDC** 0006-0266-09, carton of 9 tablets.

No. 3733 — MAXALT Tablets, 10 mg, are pale pink, capsule-shaped, compressed tablets coded MAXALT on one side and MRK 267 on the other. They are supplied as follows:

**NDC** 0006-0267-09, carton of 9 tablets.

No. 3800 — MAXALT-MLT Orally Disintegrating Tablets, 5 mg, are white to off-white, round lyophilized orally disintegrating tablets debossed with a modified triangle on one side, and measuring 10.0-11.5 mm (side-to-side) with a peppermint flavor. Each orally disintegrating tablet is individually packaged in a blister inside an aluminum pouch (sachet). They are supplied as follows:

**NDC** 0006-3800-09, 3 x unit of use carrying case of 3 orally disintegrating tablets (9 tablets total).

No. 3801 — MAXALT-MLT Orally Disintegrating Tablets, 10 mg, are white to off-white, round lyophilized orally disintegrating tablets debossed with a modified square on one side, and measuring 12.0-13.8 mm (side-to-side) with a peppermint flavor. Each orally disintegrating tablet is individually packaged in a blister inside an aluminum pouch (sachet). They are supplied as follows:

**NDC** 0006-3801-09, 3 x unit of use carrying case of 3 orally disintegrating tablets (9 tablets total).


*Storage*

Store MAXALT Tablets at room temperature, 15-30°C (59-86°F). Dispense in a tight container, if product is subdivided.

Store MAXALT-MLT Orally Disintegrating Tablets at room temperature, 15-30°C (59-86°F). The patient should be instructed not to remove the blister from the outer aluminum pouch until the patient is ready to consume the orally disintegrating tablet inside.

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MAXALT Tablets are manufactured for:

 **MERCK & CO., INC.**, Whitehouse Station, NJ 08889, USA

By:

MSD, Ltd. Cramlington  
Northumberland, NE23 9JU, UK

MAXALT-MLT Orally Disintegrating Tablets are manufactured for:

 **MERCK & CO., INC.**, Whitehouse Station, NJ 08889, USA

By:

Cardinal Health UK 416 Ltd.  
Swindon, Wiltshire, SN5 8RU, UK

Issued September 2003

Printed in USA