

**\*HIGHLIGHTS OF PRESCRIBING INFORMATION**

These highlights do not include all the information needed to use ULTRAM ER safely and effectively. See full prescribing information for ULTRAM ER.

ULTRAM® ER (tramadol hydrochloride) extended-release tablets for oral use, C IV  
Initial U.S. Approval: 1995

**WARNING: ADDICTION, ABUSE, AND MISUSE; LIFE-THREATENING RESPIRATORY DEPRESSION; ACCIDENTAL INGESTION; NEONATAL OPIOID WITHDRAWAL SYNDROME; INTERACTIONS WITH DRUGS AFFECTING CYTOCHROME P450 ISOENZYMES; and RISKS FROM CONCOMITANT USE WITH BENZODIAZEPINES AND OTHER CNS DEPRESSANTS**  
*See full prescribing information for complete boxed warning.*

- **ULTRAM ER exposes users to risks of addiction, abuse, and misuse, which can lead to overdose and death. Assess patient’s risk before prescribing and monitor regularly for these behaviors and conditions. (5.1)**
- **Serious, life-threatening, or fatal respiratory depression may occur. Monitor closely, especially upon initiation or following a dose increase. Instruct patients to swallow ULTRAM ER tablets intact, and not to cut, break, chew, crush, or dissolve the tablets to avoid exposure to a potentially fatal dose of tramadol. (5.2)**
- **Accidental ingestion of ULTRAM ER, especially by children, can result in a fatal overdose of tramadol. (5.2)**
- **Prolonged use of ULTRAM ER during pregnancy can result in neonatal opioid withdrawal syndrome, which may be life-threatening if not recognized and treated. If prolonged opioid use is required in a pregnant woman, advise the patient of the risk of neonatal opioid withdrawal syndrome and ensure that appropriate treatment will be available. (5.3)**
- **The effects of concomitant use or discontinuation of cytochrome P450 3A4 inducers, 3A4 inhibitors, or 2D6 inhibitors with tramadol are complex. Use of cytochrome P450 3A4 inducers, 3A4 inhibitors, or 2D6 inhibitors with ULTRAM ER requires careful consideration of the effects on the parent drug, tramadol, and the active metabolite, M1 (5.4, 7)**
- **Concomitant use of opioids with benzodiazepines or other central nervous system (CNS) depressants, including alcohol, may result in profound sedation, respiratory depression, coma, and death. Reserve concomitant prescribing for use in patients for whom alternative treatment options are inadequate; limit dosages and durations to the minimum required; and follow patients for signs and symptoms of respiratory depression and sedation. (5.5, 7)**

-----RECENT MAJOR CHANGES-----

Boxed Warning	12/2016
Indication and Usage (1)	12/2016
Dosage and Administration (2)	12/2016
Contraindications (4)	12/2016
Warnings and Precautions (5)	12/2016

-----INDICATIONS AND USAGE-----  
ULTRAM ER is an opioid agonist indicated for the management of pain severe enough to require daily around-the-clock, long-term opioid treatment and for which alternative treatment options are inadequate. (1)

Limitations of Use

- Because of the risks of addiction, abuse, and misuse with opioids, even at recommended doses, and because of the greater risks of overdose and death with extended-release opioid formulations, reserve ULTRAM ER for use in patients for whom alternative treatment options (e.g., non-opioid analgesics or immediate-release opioids) are ineffective, not tolerated, or would be otherwise inadequate to provide sufficient management of pain. (1)
- ULTRAM ER is not indicated as an as-needed (prn) analgesic. (1)

-----DOSAGE AND ADMINISTRATION-----  

- To be prescribed only by healthcare providers knowledgeable in use of potent opioids for management of chronic pain. (2.1)
- Use the lowest effective dosage for the shortest duration consistent with individual patient treatment goals (2.1).

- Individualize dosing based on the severity of pain, patient response, prior analgesic experience, and risk factors for addiction, abuse, and misuse. (2.1)
- Do not exceed a daily dose of 300 mg tramadol. Do not use with other tramadol products. (2.1)
- For opioid-naïve and opioid non-tolerant patients, initiate ULTRAM ER at a dose of 100 mg once daily, then titrate up by 100 mg increments every 5 days according to need and tolerance. (2.2)
- For patients currently on tramadol IR, calculate total 24-hr IR dose, and initiate ULTRAM ER at a dose rounded down to next lower 100 mg increment; then adjust dose according to need and tolerance. See full prescribing information for instructions on conversion, titration, and maintenance of therapy. (2.2, 2.3)
- Do not abruptly discontinue ULTRAM ER in a physically-dependent patient. (2.4)

-----DOSAGE FORMS AND STRENGTHS-----  

- Extended-release tablets 100 mg, 200 mg, and 300 mg (non-scored) (3)

- CONTRAINDICATIONS-----
- Significant respiratory depression (4)
  - Acute or severe bronchial asthma in an unmonitored setting or in absence of resuscitative equipment (4)
  - Known or suspected gastrointestinal obstruction, including paralytic ileus (4)
  - Hypersensitivity to tramadol (4)
  - Concurrent use of monoamine oxidase inhibitors (MAOIs) or use within the last 14 days (4)

- WARNINGS AND PRECAUTIONS-----
- **Serotonin Syndrome:** Potentially life-threatening condition could result from concomitant serotonergic drug administration. Discontinue ULTRAM ER if serotonin syndrome is suspected. (5.6)
  - **Risk of Seizure:** Present within recommended dosage range, Risk is increased with higher than recommended doses and concomitant use of SSRIs, SNRIs, anorectics, tricyclic antidepressants and other tricyclic compounds, other opioids, MAOIs, neuroleptics, other drugs that reduce seizure threshold, in patients with epilepsy or at risk for seizures. (5.7, 7)
  - **Risk of Suicide:** Do not use ULTRAM ER in suicidal or addiction-prone patients. Use with caution in those taking tranquilizers, antidepressants or abuse alcohol. (5.8)
  - **Adrenal Insufficiency:** If diagnosed, treat with physiologic replacement of corticosteroids, and wean patient off of the opioid. (5.9)
  - **Life-Threatening Respiratory Depression in Patients with Chronic Pulmonary Disease or in Elderly, Cachectic, or Debilitated Patients:** Monitor closely, particularly during initiation and titration. (5.10)
  - **Severe Hypotension:** Monitor during dosage initiation and titration. Avoid use of ULTRAM ER in patients with circulatory shock. (5.11)
  - **Risks of Use in Patients with Increased Intracranial Pressure, Brain Tumors, Head Injury, or Impaired Consciousness:** Monitor for sedation and respiratory depression. Avoid use of ULTRAM ER in patients with impaired consciousness or coma. (5.12)

-----ADVERSE REACTIONS-----  
Most common adverse reactions (≥10% and ≥2 x placebo rate): Dizziness, constipation, nausea, headache, somnolence, flushing, pruritus, vomiting, insomnia, dry mouth. (6.1)

**To report SUSPECTED ADVERSE REACTIONS, contact Ortho-McNeil-Janssen Scientific Affairs Communication Center at 1-800-526-7736 or FDA at 1-800-FDA-1088 or [www.fda.gov/medwatch](http://www.fda.gov/medwatch).**

-----DRUG INTERACTIONS-----  

- **Mixed Agonist/Antagonist and Partial Agonist Opioid Analgesics:** Avoid use with ULTRAM ER because they may reduce analgesic effect of ULTRAM ER or precipitate withdrawal symptoms. (5.15, 7)

-----USE IN SPECIFIC POPULATIONS-----  

- **Pregnancy:** May cause fetal harm. (8.1)
- **Lactation:** Not recommended. (8.2)
- **Severe Hepatic or Renal Impairment:** Use not recommended. (8.6, 8.7)

See 17 for PATIENT COUNSELING INFORMATION and Medication Guide.

*Revised: 12/2016*

---

## FULL PRESCRIBING INFORMATION: CONTENTS\*

**WARNING: ADDICTION, ABUSE, AND MISUSE; LIFE-THREATENING RESPIRATORY DEPRESSION; ACCIDENTAL INGESTION; NEONATAL OPIOID WITHDRAWAL SYNDROME; INTERACTIONS WITH DRUGS AFFECTING CYTOCHROME P450 ISOENZYMES; and RISKS FROM CONCOMITANT USE WITH BENZODIAZEPINES AND OTHER CNS DEPRESSANTS**

### 1 INDICATIONS AND USAGE

### 2 DOSAGE AND ADMINISTRATION

- 2.1 Important Dosage and Administration Instructions
- 2.2 Initial Dosage
- 2.3 Titration and Maintenance of Therapy
- 2.4 Discontinuation of ULTRAM ER

### 3 DOSAGE FORMS AND STRENGTHS

### 4 CONTRAINDICATIONS

### 5 WARNINGS AND PRECAUTIONS

- 5.1 Addiction, Abuse, and Misuse
- 5.2 Life-Threatening Respiratory Depression
- 5.3 Neonatal Opioid Withdrawal Syndrome
- 5.4 Risks of Interactions with Drugs Affecting Cytochrome P450 Isoenzymes
- 5.5 Risks from Concomitant Use with Benzodiazepines or Other CNS Depressants
- 5.6 Serotonin Syndrome Risk
- 5.7 Increased Risk of Seizures
- 5.8 Suicide Risk
- 5.9 Adrenal Insufficiency
- 5.10 Life-Threatening Respiratory Depression in Patients with Chronic Pulmonary Disease or in Elderly, Cachectic, or Debilitated Patients
- 5.11 Severe Hypotension
- 5.12 Risks of Use in Patients with Increased Intracranial Pressure, Brain Tumors, Head Injury, or Impaired Consciousness

- 5.13 Risks of Use in Patients with Gastrointestinal Conditions
- 5.14 Anaphylaxis and Other Hypersensitivity Reactions
- 5.15 Withdrawal
- 5.16 Risks of Driving and Operating Machinery

### 6 ADVERSE REACTIONS

- 6.1 Clinical Trials Experience
- 6.2 Postmarketing Experience

### 7 DRUG INTERACTIONS

### 8 USE IN SPECIFIC POPULATIONS

- 8.1 Pregnancy
- 8.2 Lactation
- 8.3 Females and Males of Reproductive Potential
- 8.4 Pediatric Use
- 8.5 Geriatric Use
- 8.6 Hepatic Impairment
- 8.7 Renal Impairment

### 9 DRUG ABUSE AND DEPENDENCE

- 9.1 Controlled Substance
- 9.2 Abuse
- 9.3 Dependence

### 10 OVERDOSAGE

### 11 DESCRIPTION

### 12 CLINICAL PHARMACOLOGY

- 12.1 Mechanism of Action
- 12.2 Pharmacodynamics
- 12.3 Pharmacokinetics

### 13 NONCLINICAL TOXICOLOGY

- 13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility

### 14 CLINICAL STUDIES

### 16 HOW SUPPLIED/STORAGE AND HANDLING

### 17 PATIENT COUNSELING INFORMATION

\*Sections or subsections omitted from the full prescribing information are not listed.

## **FULL PRESCRIBING INFORMATION**

**WARNING: ADDICTION, ABUSE, AND MISUSE; LIFE-THREATENING RESPIRATORY DEPRESSION; ACCIDENTAL INGESTION; NEONATAL OPIOID WITHDRAWAL SYNDROME; INTERACTIONS WITH DRUGS AFFECTING CYTOCHROME P450 ISOENZYMES; and RISKS FROM CONCOMITANT USE WITH BENZODIAZEPINES OR OTHER CNS DEPRESSANTS**

### **Addiction, Abuse, and Misuse**

**ULTRAM ER** exposes patients and other users to the risks of opioid addiction, abuse, and misuse, which can lead to overdose and death. Assess each patient's risk prior to prescribing **ULTRAM ER**, and monitor all patients regularly for the development of these behaviors and conditions [*see Warnings and Precautions (5.1)*].

### **Life-Threatening Respiratory Depression**

Serious, life-threatening, or fatal respiratory depression may occur with use of **ULTRAM ER**. Monitor for respiratory depression, especially during initiation of **ULTRAM ER** or following a dose increase. Instruct patients to swallow **ULTRAM ER** tablets intact, and not to cut, break, chew, crush, or dissolve the tablets to avoid exposure to a potentially fatal dose of tramadol [*see Warnings and Precautions (5.2)*].

### **Accidental Ingestion**

Accidental ingestion of even one dose of **ULTRAM ER**, especially by children, can result in a fatal overdose of tramadol [*see Warnings and Precautions (5.2)*].

### **Neonatal Opioid Withdrawal Syndrome**

Prolonged use of **ULTRAM ER** during pregnancy can result in neonatal opioid withdrawal syndrome, which may be life-threatening if not recognized and treated, and requires management according to protocols developed by neonatology experts. If opioid use is required for a prolonged period in a pregnant woman, advise the patient of the risk of neonatal opioid withdrawal syndrome and ensure that appropriate treatment will be available [*see Warnings and Precautions (5.3)*].

### **Interactions with Drugs Affecting Cytochrome P450 Isoenzymes**

The effects of concomitant use or discontinuation of cytochrome P450 3A4 inducers, 3A4 inhibitors, or 2D6 inhibitors with tramadol are complex. Use of cytochrome P450 3A4 inducers, 3A4 inhibitors, or 2D6 inhibitors with **ULTRAM ER** requires careful consideration of the effects on the parent drug, tramadol, and the active metabolite, M1 [*see Warnings and Precautions (5.4), Drug Interactions (7)*].

### **Risks From Concomitant Use With Benzodiazepines Or Other CNS Depressants**

Concomitant use of opioids with benzodiazepines or other central nervous system (CNS) depressants, including alcohol, may result in profound sedation, respiratory depression, coma, and death [*see Warnings and Precautions (5.5), Drug Interactions (7)*].

- **Reserve concomitant prescribing of ULTRAM ER Injection and benzodiazepines or other CNS depressants for use in patients for whom alternative treatment options are inadequate.**
- **Limit dosages and durations to the minimum required.**
- **Follow patients for signs and symptoms of respiratory depression and sedation.**

## 1 INDICATIONS AND USAGE

ULTRAM ER is indicated for the management of pain severe enough to require daily, around-the-clock, long-term opioid treatment and for which alternative treatment options are inadequate.

### Limitations of Use

- Because of the risks of addiction, abuse, and misuse with opioids, even at recommended doses, and because of the greater risks of overdose and death with extended-release opioid formulations [*see Warnings and Precautions (5.1)*], reserve ULTRAM ER for use in patients for whom alternative treatment options (e.g., non-opioid analgesics or immediate-release opioids) are ineffective, not tolerated, or would be otherwise inadequate to provide sufficient management of pain.
- ULTRAM ER is not indicated as an as-needed (prn) analgesic.

## 2 DOSAGE AND ADMINISTRATION

### 2.1 Important Dosage and Administration Instructions

ULTRAM ER should be prescribed only by healthcare professionals who are knowledgeable in the use of potent opioids for the management of chronic pain.

- Do not use ULTRAM ER concomitantly with other tramadol products [*see Warnings and Precautions (5.4), (5.12)*].
- Do not administer ULTRAM ER at a dose exceeding 300 mg per day.
- Use the lowest effective dosage for the shortest duration consistent with individual patient treatment goals [*see Warnings and Precautions (5.5)*].
- Initiate the dosing regimen for each patient individually, taking into account the patient's severity of pain, patient response, prior analgesic treatment experience, and risk factors for addiction, abuse, and misuse [*see Warnings and Precautions (5.1)*].
- Monitor patients closely for respiratory depression, especially within the first 24-72 hours of initiating therapy and following dosage increases with ULTRAM ER and adjust the dosage accordingly [*see Warnings and Precautions (5.2)*].
- Instruct patients to swallow ULTRAM ER tablets whole [*see Patient Counseling Information (17)*], and to take it with liquid. Crushing, chewing, splitting, or dissolving ULTRAM ER tablets will result in uncontrolled delivery of tramadol and can lead to overdose or death [*see Warnings and Precautions (5.1)*].
- ULTRAM ER may be taken without regard to food, It is recommended that ULTRAM ER be taken in a consistent manner [*see Clinical Pharmacology (12.3)*].

## 2.2 Initial Dosage

### Patients Not Currently on a Tramadol Product

The initial dose of ULTRAM ER is 100 mg once daily.

### Patients Currently on Tramadol Immediate-Release (IR) Products

Calculate the 24-hour tramadol IR dose and initiate a total daily dose of ULTRAM ER rounded down to the next lower 100 mg increment. The dose may subsequently be individualized according to patient need.

Due to limitations in flexibility of dose selection with ULTRAM ER, some patients maintained on tramadol IR products may not be able to convert to ULTRAM ER.

### Conversion from Other Opioids to ULTRAM ER

Discontinue all other around-the-clock opioid drugs when ULTRAM ER therapy is initiated. There are no established conversion ratios for conversion from other opioids to ULTRAM ER defined by clinical trials. Initiate dosing using ULTRAM ER 100 mg once a day.

## 2.3 Titration and Maintenance of Therapy

Individually titrate ULTRAM ER by 100 mg every five days to a dose that provides adequate analgesia and minimizes adverse reactions. The maximum daily dose of ULTRAM ER is 300 mg per day.

Continually reevaluate patients receiving ULTRAM ER to assess the maintenance of pain control and the relative incidence of adverse reactions, as well as monitoring for the development of addiction, abuse, or misuse [*see Warnings and Precautions (5.1)*]. Frequent communication is important among the prescriber, other members of the healthcare team, the patient, and the caregiver/family during periods of changing analgesic requirements, including initial titration. During chronic therapy, periodically reassess the continued need for the use of opioid analgesics.

Patients who experience breakthrough pain may require a dosage adjustment of ULTRAM ER, or may need rescue medication with an appropriate dose of an immediate-release analgesic. If the level of pain increases after dosage stabilization, attempt to identify the source of increased pain before increasing the ULTRAM ER dosage.

If unacceptable opioid-related adverse reactions are observed, consider reducing the dosage. Adjust the dosage to obtain an appropriate balance between management of pain and opioid-related adverse reactions.

## 2.4 Discontinuation of ULTRAM ER

When a patient no longer requires therapy with ULTRAM ER, taper the dose gradually, by 25% to 50% every 2 to 4 days, while monitoring carefully for signs and symptoms of withdrawal. If the patient develops these signs or symptoms, raise the dose to the previous level and taper more slowly, either by increasing the interval between decreases, decreasing the amount of change in dose, or both. Do not abruptly discontinue ULTRAM ER [*see Warnings and Precautions (5.15), Drug Abuse and Dependence (9.3)*].

### 3 DOSAGE FORMS AND STRENGTHS

Extended-release tablets are available as:

100 mg tablets: Round, convex, white to off-white, non-scored, imprinted with “100” over “ER” on one side in black ink

200 mg tablets: Round, convex, white to off-white, non-scored, imprinted with “200” over “ER” on one side in black ink

300 mg tablets: Round, convex, white to off-white, non-scored, imprinted with “300” over “ER” on one side in black ink

### 4 CONTRAINDICATIONS

ULTRAM ER is contraindicated in patients with:

- Significant respiratory depression [*see Warnings and Precautions (5.2)*]
- Acute or severe bronchial asthma in an unmonitored setting or in the absence of resuscitative equipment [*see Warnings and Precautions (5.10)*]
- Known or suspected gastrointestinal obstruction, including paralytic ileus [*see Warnings and Precautions (5.13)*]
- Hypersensitivity to tramadol (e.g., anaphylaxis) [*see Warnings and Precautions (5.14), Adverse Reactions (6.2)*]
- Concurrent use of monoamine oxidase inhibitors (MAOIs) or use within the last 14 days [*see Drug Interactions (7)*].

### 5 WARNINGS AND PRECAUTIONS

#### 5.1 Addiction, Abuse, and Misuse

ULTRAM ER contains tramadol, a Schedule IV controlled substance. As an opioid, ULTRAM ER exposes users to the risks of addiction, abuse, and misuse. Because extended-release products such as ULTRAM ER deliver the opioid over an extended period of time, there is a greater risk for overdose and death due to the larger amount of tramadol present [*see Drug Abuse and Dependence (9)*].

Although the risk of addiction in any individual is unknown, it can occur in patients appropriately prescribed ULTRAM ER. Addiction can occur at recommended dosages and if the drug is misused or abused.

Assess each patient’s risk for opioid addiction, abuse, or misuse prior to prescribing ULTRAM ER, and monitor all patients receiving ULTRAM ER for the development of these behaviors and conditions. Risks are increased in patients with a personal or family history of substance abuse (including drug or alcohol abuse or addiction) or mental illness (e.g., major depression). The potential for these risks should not, however, prevent the proper management of pain in any given patient. Patients at increased risk may be prescribed opioids such as ULTRAM ER, but use in such patients necessitates intensive counseling about the risks and proper use of ULTRAM ER along with intensive monitoring for signs of addiction, abuse, and misuse.

Abuse or misuse of ULTRAM ER by cutting, breaking, chewing, crushing, snorting, or injecting the dissolved product will result in the uncontrolled delivery of tramadol and can result in overdose and death [*see Overdosage (10)*].

Opioids are sought by drug abusers and people with addiction disorders and are subject to criminal diversion. Consider these risks when prescribing or dispensing ULTRAM ER. Strategies to reduce these risks include prescribing the drug in the smallest appropriate quantity and advising the patient on the proper disposal of unused drug [see *Patient Counseling Information (17)*]. Contact local state professional licensing board or state controlled substances authority for information on how to prevent and detect abuse or diversion of this product.

## 5.2 Life-Threatening Respiratory Depression

Serious, life-threatening, or fatal respiratory depression has been reported with the use of opioids, even when used as recommended. Respiratory depression, if not immediately recognized and treated, may lead to respiratory arrest and death. Management of respiratory depression may include close observation, supportive measures, and use of opioid antagonists, depending on the patient's clinical status [see *Overdosage (10)*]. Carbon dioxide (CO<sub>2</sub>) retention from opioid-induced respiratory depression can exacerbate the sedating effects of opioids.

While serious, life-threatening, or fatal respiratory depression can occur at any time during the use of ULTRAM ER, the risk is greatest during the initiation of therapy or following a dosage increase. Monitor patients closely for respiratory depression, especially within the first 24-72 hours of initiating therapy with and following dosage increases of ULTRAM ER.

To reduce the risk of respiratory depression, proper dosing and titration of ULTRAM ER are essential [see *Dosage and Administration (2)*]. Overestimating the ULTRAM ER dosage when converting patients from another opioid product can result in a fatal overdose with the first dose.

Accidental ingestion of even one dose of ULTRAM ER, especially by children, can result in respiratory depression and death due to an overdose of tramadol.

## 5.3 Neonatal Opioid Withdrawal Syndrome

Prolonged use of ULTRAM ER during pregnancy can result in withdrawal in the neonate. Neonatal opioid withdrawal syndrome, unlike opioid withdrawal syndrome in adults, may be life-threatening if not recognized and treated, and requires management according to protocols developed by neonatology experts. Observe newborns for signs of neonatal opioid withdrawal syndrome and manage accordingly. Advise pregnant women using opioids for a prolonged period of the risk of neonatal opioid withdrawal syndrome and ensure that appropriate treatment will be available [see *Use in Specific Populations (8.1)*, *Patient Counseling Information (17)*].

## 5.4 Risks of Interactions with Drugs Affecting Cytochrome P450 Isoenzymes

The effects of concomitant use or discontinuation of cytochrome P450 3A4 inducers, 3A4 inhibitors, or 2D6 inhibitors on levels of tramadol and M1 from ULTRAM ER are complex. Use of cytochrome P450 3A4 inducers, 3A4 inhibitors, or 2D6 inhibitors with ULTRAM ER requires careful consideration of the effects on the parent drug, tramadol which is a weak serotonin and norepinephrine reuptake inhibitor and  $\mu$ -opioid agonist, and the active metabolite, M1, which is more potent than tramadol in  $\mu$ -opioid receptor binding [see *Drug Interactions (7)*].

### Risks of Concomitant Use or Discontinuation of Cytochrome P450 2D6 Inhibitors

The concomitant use of ULTRAM ER with all cytochrome P450 2D6 inhibitors (e.g., amiodarone, quinidine) may result in an increase in tramadol plasma levels and a decrease in the

levels of the active metabolite, M1. A decrease in M1 exposure in patients who have developed physical dependence to tramadol, may result in signs and symptoms of opioid withdrawal and reduced efficacy. The effect of increased tramadol levels may be an increased risk for serious adverse events including seizures and serotonin syndrome.

Discontinuation of a concomitantly used cytochrome P450 2D6 inhibitor may result in a decrease in tramadol plasma levels and an increase in active metabolite M1 levels, which could increase or prolong adverse reactions related to opioid toxicity and may cause potentially fatal respiratory depression.

Follow patients receiving ULTRAM ER and any CYP2D6 inhibitor for the risk of serious adverse events including seizures and serotonin syndrome, signs and symptoms that may reflect opioid toxicity, and opioid withdrawal when ULTRAM ER are used in conjunction with inhibitors of CYP2D6 [*see Drug Interactions (7)*].

#### Cytochrome P450 3A4 Interaction

The concomitant use of ULTRAM ER with cytochrome P450 3A4 inhibitors, such as macrolide antibiotics (e.g., erythromycin), azole-antifungal agents (e.g., ketoconazole), and protease inhibitors (e.g., ritonavir) or discontinuation of a cytochrome P450 3A4 inducer such as rifampin, carbamazepine, and phenytoin, may result in an increase in tramadol plasma concentrations, which could increase or prolong adverse reactions, increase the risk for serious adverse events including seizures and serotonin syndrome, and may cause potentially fatal respiratory depression.

The concomitant use of ULTRAM ER with all cytochrome P450 3A4 inducers or discontinuation of a cytochrome P450 3A4 inhibitor may result in lower tramadol levels. This may be associated with a decrease in efficacy, and in some patients, may result in signs and symptoms of opioid withdrawal.

Follow patients receiving ULTRAM ER and any CYP3A4 inhibitor or inducer for the risk for serious adverse events including seizures and serotonin syndrome, signs and symptoms that may reflect opioid toxicity and opioid withdrawal when ULTRAM ER are used in conjunction with inhibitors and inducers of CYP3A4 [*see Drug Interactions (7)*].

### **5.5 Risks from Concomitant Use with Benzodiazepines or Other CNS Depressants**

Profound sedation, respiratory depression, coma, and death may result from the concomitant use of ULTRAM ER with benzodiazepines or other CNS depressants (e.g., non-benzodiazepine sedatives/hypnotics, anxiolytics, tranquilizers, muscle relaxants, general anesthetics, antipsychotics, other opioids, alcohol). Because of these risks, reserve concomitant prescribing of these drugs for use in patients for whom alternative treatment options are inadequate.

Observational studies have demonstrated that concomitant use of opioid analgesics and benzodiazepines increases the risk of drug-related mortality compared to use of opioid analgesics alone. Because of similar pharmacological properties, it is reasonable to expect similar risk with the concomitant use of other CNS depressant drugs with opioid analgesics [*see Drug Interactions (7)*].

If the decision is made to prescribe a benzodiazepine or other CNS depressant concomitantly with an opioid analgesic, prescribe the lowest effective dosages and minimum durations of

concomitant use. In patients already receiving an opioid analgesic, prescribe a lower initial dose of the benzodiazepine or other CNS depressant than indicated in the absence of an opioid, and titrate based on clinical response. If an opioid analgesic is initiated in a patient already taking a benzodiazepine or other CNS depressant, prescribe a lower initial dose of the opioid analgesic, and titrate based on clinical response. Follow patients closely for signs and symptoms of respiratory depression and sedation.

Advise both patients and caregivers about the risks of respiratory depression and sedation when ULTRAM ER is used with benzodiazepines or other CNS depressants (including alcohol and illicit drugs). Advise patients not to drive or operate heavy machinery until the effects of concomitant use of the benzodiazepine or other CNS depressant have been determined. Screen patients for risk of substance use disorders, including opioid abuse and misuse, and warn them of the risk for overdose and death associated with the use of additional CNS depressants including alcohol and illicit drugs [see *Drug Interactions (7)*, *Patient Counseling Information (17)*].

## 5.6 Serotonin Syndrome Risk

Cases of serotonin syndrome, a potentially life-threatening condition, have been reported with the use of tramadol, including ULTRAM ER, particularly during concomitant use with serotonergic drugs. Serotonergic drugs include selective serotonin reuptake inhibitors (SSRIs), serotonin and norepinephrine reuptake inhibitors (SNRIs), tricyclic antidepressants (TCAs), triptans, 5-HT<sub>3</sub> receptor antagonists, drugs that affect the serotonergic neurotransmitter system (e.g., mirtazapine, trazodone, tramadol), and drugs that impair metabolism of serotonin (including MAO inhibitors, both those intended to treat psychiatric disorders and also others, such as linezolid and intravenous methylene blue) [see *Drug Interactions (7)*]. This may occur within the recommended dosage range.

Serotonin syndrome symptoms may include mental status changes (e.g., agitation, hallucinations, coma), autonomic instability (e.g., tachycardia, labile blood pressure, hyperthermia), neuromuscular aberrations (e.g., hyperreflexia, incoordination, rigidity), and/or gastrointestinal symptoms (e.g., nausea, vomiting, diarrhea). The onset of symptoms generally occurs within several hours to a few days of concomitant use, but may occur later than that. Discontinue ULTRAM ER if serotonin syndrome is suspected.

## 5.7 Increased Risk of Seizures

Seizures have been reported in patients receiving tramadol within the recommended dosage range. Spontaneous post-marketing reports indicate that seizure risk is increased with doses of tramadol above the recommended range.

Concomitant use of tramadol increases the seizure risk in patients taking: [see *Drug Interactions (7)*].

- Selective serotonin re-uptake inhibitors (SSRIs) and Serotonin-norepinephrine re-uptake inhibitors (SNRIs) antidepressants or anorectics,
- Tricyclic antidepressants (TCAs), and other tricyclic compounds (e.g., cyclobenzaprine, promethazine, etc.),
- Other opioids,
- MAO inhibitors [see *Warnings and Precautions (5.9)*, *Drug Interactions (7)*]
- Neuroleptics, or

- Other drugs that reduce the seizure threshold.

Risk of seizures may also increase in patients with epilepsy, those with a history of seizures, or in patients with a recognized risk for seizure (such as head trauma, metabolic disorders, alcohol and drug withdrawal, CNS infections).

In tramadol overdose, naloxone administration may increase the risk of seizure.

## 5.8 Suicide Risk

- Do not prescribe ULTRAM ER for patients who are suicidal or addiction-prone. Consideration should be given to the use of non-narcotic analgesics in patients who are suicidal or depressed. [*see Drug Abuse and Dependence (9.2)*]
- Prescribe ULTRAM ER with caution for patients with a history of misuse and/or are currently taking CNS-active drugs including tranquilizers, or antidepressant drugs, or alcohol in excess, and patients who suffer from emotional disturbance or depression [*see Drug Interactions (7)*].
- Inform patients not to exceed the recommended dose and to limit their intake of alcohol [*see Dosage and Administration (2.1), Warnings and Precautions (5.5, 5.6, 5.12)*].

## 5.9 Adrenal Insufficiency

Cases of adrenal insufficiency have been reported with opioid use, more often following greater than one month of use. Presentation of adrenal insufficiency may include non-specific symptoms and signs including nausea, vomiting, anorexia, fatigue, weakness, dizziness, and low blood pressure. If adrenal insufficiency is suspected, confirm the diagnosis with diagnostic testing as soon as possible. If adrenal insufficiency is diagnosed, treat with physiologic replacement doses of corticosteroids. Wean the patient off of the opioid to allow adrenal function to recover and continue corticosteroid treatment until adrenal function recovers. Other opioids may be tried as some cases reported use of a different opioid without recurrence of adrenal insufficiency. The information available does not identify any particular opioids as being more likely to be associated with adrenal insufficiency.

## 5.10 Life-Threatening Respiratory Depression in Patients with Chronic Pulmonary Disease or in Elderly, Cachectic, or Debilitated Patients

The use of ULTRAM ER in patients with acute or severe bronchial asthma in an unmonitored setting or in the absence of resuscitative equipment is contraindicated.

Patients with Chronic Pulmonary Disease: ULTRAM ER -treated patients with significant chronic obstructive pulmonary disease or cor pulmonale, and those with a substantially decreased respiratory reserve, hypoxia, hypercapnia, or pre-existing respiratory depression are at increased risk of decreased respiratory drive including apnea, even at recommended dosages of ULTRAM ER [*see Warnings and Precautions (5.2)*].

Elderly, Cachectic, or Debilitated Patients: Life-threatening respiratory depression is more likely to occur in elderly, cachectic, or debilitated patients because they may have altered pharmacokinetics or altered clearance compared to younger, healthier patients [*see Warnings and Precautions (5.2)*].

Monitor such patients closely, particularly when initiating and titrating ULTRAM ER and when ULTRAM ER is given concomitantly with other drugs that depress respiration [*see Warnings and Precautions (5.2, 5.5)*]. Alternatively, consider the use of non-opioid analgesics in these patients.

### **5.11 Severe Hypotension**

ULTRAM ER may cause severe hypotension including orthostatic hypotension and syncope in ambulatory patients. There is increased risk in patients whose ability to maintain blood pressure has already been compromised by a reduced blood volume or concurrent administration of certain CNS depressant drugs (e.g., phenothiazines or general anesthetics) [*see Drug Interactions (7)*]. Monitor these patients for signs of hypotension after initiating or titrating the dosage of ULTRAM ER. In patients with circulatory shock, ULTRAM ER may cause vasodilation that can further reduce cardiac output and blood pressure. Avoid the use of ULTRAM ER in patients with circulatory shock.

### **5.12 Risks of Use in Patients with Increased Intracranial Pressure, Brain Tumors, Head Injury, or Impaired Consciousness**

In patients who may be susceptible to the intracranial effects of CO<sub>2</sub> retention (e.g., those with evidence of increased intracranial pressure or brain tumors), ULTRAM ER may reduce respiratory drive, and the resultant CO<sub>2</sub> retention can further increase intracranial pressure. Monitor such patients for signs of sedation and respiratory depression, particularly when initiating therapy with ULTRAM ER.

Opioids may also obscure the clinical course in a patient with a head injury. Avoid the use of ULTRAM ER in patients with impaired consciousness or coma.

### **5.13 Risks of Use in Patients with Gastrointestinal Conditions**

ULTRAM ER is contraindicated in patients with known or suspected gastrointestinal obstruction, including paralytic ileus.

The tramadol in ULTRAM ER may cause spasm of the sphincter of Oddi. Opioids may cause increases in serum amylase. Monitor patients with biliary tract disease, including acute pancreatitis, for worsening symptoms.

### **5.14 Anaphylaxis and Other Hypersensitivity Reactions**

Serious and rarely fatal hypersensitive reactions have been reported in patients receiving therapy with tramadol. When these events do occur it is often following the first dose. Other reported hypersensitivity reactions include pruritus, hives, bronchospasm, angioedema, toxic epidermal necrolysis and Stevens-Johnson syndrome. Patients with a history of hypersensitivity reactions to tramadol and other opioids may be at increased risk and therefore should not receive ULTRAM ER. If anaphylaxis or other hypersensitivity occurs, stop administration of ULTRAM ER immediately, discontinue ULTRAM ER permanently, and do not rechallenge with any formulation of tramadol. Advise patients to seek immediate medical attention if they experience any symptoms of a hypersensitivity reaction [*see Patient Counseling Information (17)*].

### **5.15 Withdrawal**

Avoid the use of mixed agonist/antagonist (e.g., pentazocine, nalbuphine, and butorphanol) or partial agonist (e.g., buprenorphine) analgesics in patients who are receiving a full opioid agonist analgesic, including ULTRAM ER. In these patients, mixed agonist/antagonist and partial

agonist analgesics may reduce the analgesic effect and/or may precipitate withdrawal symptoms [see *Drug Interactions (7)*].

When discontinuing ULTRAM ER, gradually taper the dosage [see *Dosage and Administration (2.4)*]. Do not abruptly discontinue ULTRAM ER [see *Drug Abuse and Dependence (9.3)*].

### **5.16 Risks of Driving and Operating Machinery**

ULTRAM ER may impair the mental or physical abilities needed to perform potentially hazardous activities such as driving a car or operating machinery. Warn patients not to drive or operate dangerous machinery unless they are tolerant to the effects of ULTRAM ER and know how they will react to the medication [see *Patient Counseling Information (17)*].

## **6 ADVERSE REACTIONS**

The following serious adverse reactions are described in greater detail, in other sections:

- Addiction, Abuse, and Misuse [see *Warnings and Precautions (5.1)*]
- Life-Threatening Respiratory Depression [see *Warnings and Precautions (5.2)*]
- Neonatal Opioid Withdrawal Syndrome [see *Warnings and Precautions (5.3)*]
- Interactions with Benzodiazepines and Other CNS Depressants [see *Warnings and Precautions (5.5)*]
- Serotonin Syndrome [see *Warnings and Precautions (5.6)*]
- Seizures [see *Warnings and Precautions (5.7)*]
- Suicide [see *Warnings and Precautions (5.8)*]
- Adrenal Insufficiency [see *Warnings and Precautions (5.9)*]
- Severe Hypotension [see *Warnings and Precautions (5.11)*]
- Gastrointestinal Adverse Reactions [see *Warnings and Precautions (5.13)*]
- Hypersensitivity Reactions [see *Warnings and Precautions (5.14)*]
- Withdrawal [see *Warnings and Precautions (5.15)*]

### **6.1 Clinical Trials Experience**

Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in the clinical trials of another drug and may not reflect the rates observed in practice.

ULTRAM ER was administered to a total of 3108 patients during studies conducted in the U.S. These included four double-blind studies in patients with osteoarthritis and/or chronic low back pain and one open-label study in patients with chronic non-malignant pain. A total of 901 patients were 65 years or older. The frequency of adverse reactions generally increased with doses from 100 mg to 400 mg in the two pooled, twelve-week, randomized, double-blind, placebo-controlled studies in patients with chronic non-malignant pain (see [Table 1](#)). The most common adverse reactions from [Table 1](#) occurring in  $\geq 10\%$  and  $\geq 2 \times$  placebo rate of the patients treated with ULTRAM ER are dizziness (not vertigo), nausea, constipation, headache, somnolence, flushing, pruritus, vomiting, insomnia, and dry mouth.

**Table 1: Incidence (%) of patients with adverse reaction rates  $\geq 5\%$  from two 12-week placebo-controlled studies in patients with moderate to moderately severe chronic pain by dose (N=1811).**

MedDRA Preferred Term	ULTRAM ER				Placebo
	100 mg (N=403) n (%)	200 mg (N=400) n (%)	300 mg (N=400) n (%)	400 mg (N=202) n (%)	(N=406) n (%)
Dizziness (not vertigo )	64 (16)	81 (20)	90 (23)	57 (28)	28 (7)
Nausea	61 (15)	90 (23)	102 (26)	53 (26)	32 (8)
Constipation	49 (12)	68 (17)	85 (21)	60 (30)	17 (4)
Headache	49 (12)	62 (16)	46 (12)	32 (16)	43 (11)
Somnolence	33 (8)	45 (11)	29 (7)	41 (20)	7 (2)
Flushing	31 (8)	40 (10)	35 (9)	32 (16)	18 (4)
Pruritus	25 (6)	34 (9)	30 (8)	24 (12)	4 (1)
Vomiting	20 (5)	29 (7)	34 (9)	19 (9)	11 (3)
Insomnia	26 (7)	32 (8)	36 (9)	22 (11)	13 (3)
Dry Mouth	20 (5)	29 (7)	39 (10)	18 (9)	6 (2)
Diarrhea	15 (4)	27 (7)	37 (9)	10 (5)	17 (4)
Asthenia	14 (4)	24 (6)	26 (7)	13 (6)	7 (2)
Postural hypotension	7 (2)	17 (4)	8 (2)	11 (5)	9 (2)
Sweating increased	6 (2)	8 (2)	15 (4)	13 (6)	1 (0)
Anorexia	3 (1)	7 (2)	21 (5)	12 (6)	1 (0)

Adverse reactions With Incidence Rates of 1.0% to <5.0% During Clinical Trials

The following adverse reactions were reported from all the chronic pain studies (N=3108).

The lists below include adverse reactions not otherwise noted in [Table 1](#).

*Eye disorders:* vision blurred

*Gastrointestinal disorders:* abdominal pain upper, dyspepsia, abdominal pain, sore throat

*General disorders:* weakness, pain, feeling hot, influenza like illness, fall, rigors, lethargy, pyrexia, chest pain

*Infections and infestations:* nasopharyngitis, upper respiratory tract infection, sinusitis, influenza, gastroenteritis viral, urinary tract infection, bronchitis

*Investigations:* blood creatine phosphokinase increased, weight decreased

*Metabolism and nutrition disorders:* appetite decreased

*Musculoskeletal, connective tissue and bone disorders:* arthralgia, back pain, pain in limb, neck pain

*Nervous system disorders:* tremor, paresthesia, hypoesthesia

*Psychiatric disorders:* nervousness, anxiety, depression, restlessness

*Respiratory, thoracic and mediastinal disorders:* sneezing, cough, rhinorrhea, nasal congestion, dyspnea, sinus congestion

*Skin and subcutaneous tissue disorders:* sweating increased, dermatitis

*Vascular disorders:* hot flushes, vasodilatation

Adverse Reactions With Incidence Rates of 0.5% to <1.0% and Serious Adverse Reactions Reported in at Least 2 patients During Clinical Trials

*Cardiac disorders:* palpitations, myocardial infarction

*Ear and labyrinth disorders:* tinnitus, vertigo

*Gastrointestinal disorders:* flatulence, toothache, constipation aggravated, appendicitis, pancreatitis

*General disorders:* feeling jittery, edema lower limb, shivering, joint swelling, malaise, drug withdrawal syndrome, peripheral swelling

*Hepato-biliary disorders:* cholelithiasis, cholecystitis

*Infections and infestations:* cellulitis, ear infection, gastroenteritis, pneumonia, viral infection

*Injury and poisoning:* joint sprain, muscle injury

*Investigations:* alanine aminotransferase increased, blood pressure increased, aspartate aminotransferase increased, heart rate increased, blood glucose increased, liver function tests abnormal

*Musculoskeletal, connective tissue and bone disorders:* muscle cramps, muscle spasms, joint stiffness, muscle twitching, myalgia, osteoarthritis aggravated

*Nervous system disorders:* migraine, sedation, syncope, disturbance in attention, dizziness aggravated

*Psychiatric disorders:* euphoric mood, irritability, libido decreased, sleep disorder, agitation, disorientation, abnormal dreams

*Renal and urinary disorders:* difficulty in micturition, urinary frequency, hematuria, dysuria, urinary retention

*Respiratory, thoracic and mediastinal disorders:* yawning

*Skin and subcutaneous tissue disorders:* contusion, piloerection, clamminess, night sweats, urticaria

*Vascular disorders:* hypertension aggravated, hypertension, peripheral ischemia

## **6.2 Postmarketing Experience**

The following adverse reactions have been identified during post approval use of tramadol. Because these reactions are reported voluntarily from a population of uncertain size, it is not always possible to reliably estimate their frequency or establish a causal relationship to drug exposure.

Serotonin syndrome: Cases of serotonin syndrome, a potentially life-threatening condition, have been reported during concomitant use of opioids with serotonergic drugs.

Adrenal insufficiency: Cases of adrenal insufficiency have been reported with opioid use, more often following greater than one month of use.

Anaphylaxis: Anaphylaxis has been reported with ingredients contained in ULTRAM ER.

Androgen deficiency: Cases of androgen deficiency have occurred with chronic use of opioids [see *Clinical Pharmacology (12.2)*].

## 7 DRUG INTERACTIONS

Table 2 includes clinically significant drug interactions with ULTRAM ER.

**Table 2: Clinically Significant Drug Interactions with ULTRAM ER**

<b>Inhibitors of CYP2D6</b>	
<i>Clinical Impact:</i>	<p>The concomitant use of ULTRAM ER and CYP2D6 inhibitors may result in an increase in the plasma concentration of tramadol and a decrease in the plasma concentration of M1, particularly when an inhibitor is added after a stable dose of ULTRAM ER is achieved. Since M1 is a more potent <math>\mu</math>-opioid agonist, decreased M1 exposure could result in decreased therapeutic effects, and may result in signs and symptoms of opioid withdrawal in patients who had developed physical dependence to tramadol. Increased tramadol exposure can result in increased or prolonged therapeutic effects and increased risk for serious adverse events including seizures and serotonin syndrome.</p> <p>After stopping a CYP2D6 inhibitor, as the effects of the inhibitor decline, the tramadol plasma concentration will decrease and the M1 plasma concentration will increase which could increase or prolong therapeutic effects but also increase adverse reactions related to opioid toxicity, and may cause potentially fatal respiratory depression [see <i>Clinical Pharmacology (12.3)</i>].</p>
<i>Intervention:</i>	<p>If concomitant use of a CYP2D6 inhibitor is necessary, follow patients closely for adverse reactions including opioid withdrawal, seizures, and serotonin syndrome.</p> <p>If a CYP2D6 inhibitor is discontinued, consider lowering ULTRAM ER dosage until stable drug effects are achieved. Follow patients closely for adverse events including respiratory depression and sedation.</p>
<i>Examples</i>	Quinidine, fluoxetine, paroxetine and bupropion
<b>Inhibitors of CYP3A4</b>	
<i>Clinical Impact:</i>	<p>The concomitant use of ULTRAM ER and CYP3A4 inhibitors can increase the plasma concentration of tramadol and may result in a greater amount of metabolism via CYP2D6 and greater levels of M1. Follow patients closely for increased risk of serious adverse events including seizures and serotonin syndrome, and adverse reactions related to opioid toxicity including potentially fatal respiratory depression, particularly when an inhibitor is added after a stable dose of ULTRAM ER is achieved.</p> <p>After stopping a CYP3A4 inhibitor, as the effects of the inhibitor decline, the tramadol plasma concentration will decrease [see <i>Clinical Pharmacology (12.3)</i>], resulting in decreased opioid efficacy and possibly signs and symptoms of opioid withdrawal in patients who had developed physical dependence to tramadol.</p>
<i>Intervention:</i>	<p>If concomitant use is necessary, consider dosage reduction of ULTRAM ER until stable drug effects are achieved. Follow patients closely for seizures and serotonin syndrome, and signs of respiratory depression and sedation at frequent intervals.</p> <p>If a CYP3A4 inhibitor is discontinued, consider increasing the ULTRAM ER dosage until stable drug effects are achieved and follow patients for signs and symptoms of opioid withdrawal.</p>
<i>Examples</i>	Macrolide antibiotics (e.g., erythromycin), azole-antifungal agents (e.g. ketoconazole), protease inhibitors (e.g., ritonavir)
<b>CYP3A4 Inducers</b>	
<i>Clinical Impact:</i>	The concomitant use of ULTRAM ER and CYP3A4 inducers can decrease the plasma concentration of tramadol [see <i>Clinical Pharmacology (12.3)</i> ], resulting in decreased efficacy or onset of a withdrawal syndrome in patients who have

	<p>developed physical dependence to tramadol, [see <i>Warnings and Precautions (5.4)</i>].</p> <p>After stopping a CYP3A4 inducer, as the effects of the inducer decline, the tramadol plasma concentration will increase [see <i>Clinical Pharmacology (12.3)</i>], which could increase or prolong both the therapeutic effects and adverse reactions, and may cause seizures and serotonin syndrome, and potentially fatal respiratory depression.</p>
<i>Intervention:</i>	<p>If concomitant use is necessary, consider increasing the ULTRAM ER dosage until stable drug effects are achieved. Follow patients for signs of opioid withdrawal.</p> <p>If a CYP3A4 inducer is discontinued, consider ULTRAM ER dosage reduction and monitor for seizures and serotonin syndrome, and signs of sedation and respiratory depression.</p> <p>Patients taking carbamazepine, a CYP3A4 inducer, may have a significantly reduced analgesic effect of tramadol. Because carbamazepine increases tramadol metabolism and because of the seizure risk associated with tramadol, concomitant administration of ULTRAM ER and carbamazepine is not recommended.</p>
<i>Examples:</i>	Rifampin, carbamazepine, phenytoin
<b>Benzodiazepines and Other Central Nervous System (CNS) Depressants</b>	
<i>Clinical Impact:</i>	Due to additive pharmacologic effect, the concomitant use of benzodiazepines or other CNS depressants, including alcohol, can increase the risk of hypotension, respiratory depression, profound sedation, coma, and death.
<i>Intervention:</i>	Reserve concomitant prescribing of these drugs for use in patients for whom alternative treatment options are inadequate. Limit dosages and durations to the minimum required. Follow patients closely for signs of respiratory depression and sedation [see <i>Warnings and Precautions (5.5)</i> ].
<i>Examples:</i>	Benzodiazepines and other sedatives/hypnotics, anxiolytics, tranquilizers, muscle relaxants, general anesthetics, antipsychotics, other opioids, alcohol.
<b>Serotonergic Drugs</b>	
<i>Clinical Impact:</i>	The concomitant use of opioids with other drugs that affect the serotonergic neurotransmitter system has resulted in serotonin syndrome.
<i>Intervention:</i>	If concomitant use is warranted, carefully observe the patient, particularly during treatment initiation and dose adjustment. Discontinue ULTRAM ER if serotonin syndrome is suspected.
<i>Examples:</i>	Selective serotonin reuptake inhibitors (SSRIs), serotonin and norepinephrine reuptake inhibitors (SNRIs), tricyclic antidepressants (TCAs), triptans, 5-HT <sub>3</sub> receptor antagonists, drugs that affect the serotonin neurotransmitter system (e.g., mirtazapine, trazodone, tramadol), monoamine oxidase (MAO) inhibitors (those intended to treat psychiatric disorders and also others, such as linezolid and intravenous methylene blue).
<b>Monoamine Oxidase Inhibitors (MAOIs)</b>	
<i>Clinical Impact:</i>	MAOI interactions with opioids may manifest as serotonin syndrome [see <i>Warnings and Precautions (5.6)</i> ] or opioid toxicity (e.g., respiratory depression, coma) [see <i>Warnings and Precautions (5.2)</i> ].
<i>Intervention:</i>	Do not use ULTRAM ER in patients taking MAOIs or within 14 days of stopping such treatment.
<i>Examples:</i>	phenelzine, tranylcypromine, linezolid
<b>Mixed Agonist/Antagonist and Partial Agonist Opioid Analgesics</b>	
<i>Clinical Impact:</i>	May reduce the analgesic effect of ULTRAM ER and/or precipitate

	withdrawal symptoms.
<i>Intervention:</i>	Avoid concomitant use.
<i>Examples:</i>	butorphanol, nalbuphine, pentazocine, buprenorphine
<b>Muscle Relaxants</b>	
<i>Clinical Impact:</i>	Tramadol may enhance the neuromuscular blocking action of skeletal muscle relaxants and produce an increased degree of respiratory depression.
<i>Intervention:</i>	Monitor patients for signs of respiratory depression that may be greater than otherwise expected and decrease the dosage of ULTRAM ER and/or the muscle relaxant as necessary.
<b>Diuretics</b>	
<i>Clinical Impact:</i>	Opioids can reduce the efficacy of diuretics by inducing the release of antidiuretic hormone.
<i>Intervention:</i>	Monitor patients for signs of diminished diuresis and/or effects on blood pressure and increase the dosage of the diuretic as needed.
<b>Anticholinergic Drugs</b>	
<i>Clinical Impact:</i>	The concomitant use of anticholinergic drugs may increase risk of urinary retention and/or severe constipation, which may lead to paralytic ileus.
<i>Intervention:</i>	Monitor patients for signs of urinary retention or reduced gastric motility when ULTRAM ER is used concomitantly with anticholinergic drugs.
<b>Digoxin</b>	
<i>Clinical Impact:</i>	Post-marketing surveillance of tramadol has revealed rare reports of digoxin toxicity.
<i>Intervention:</i>	Follow patients for signs of digoxin toxicity and adjust the dosage of digoxin as needed.
<b>Warfarin</b>	
<i>Clinical Impact:</i>	Post-marketing surveillance of tramadol has revealed rare reports of alteration of warfarin effect, including elevation of prothrombin times.
<i>Intervention:</i>	Monitor the prothrombin time of patients on warfarin for signs of an interaction and adjust the dosage of warfarin as needed.

## 8 USE IN SPECIFIC POPULATIONS

### 8.1 Pregnancy

#### Risk Summary

Prolonged use of opioid analgesics during pregnancy may cause neonatal opioid withdrawal syndrome [see *Warnings and Precautions (5.3)*]. Available data with ULTRAM ER in pregnant women are insufficient to inform a drug-associated risk for major birth defects and miscarriage.

In animal reproduction studies, tramadol administration during organogenesis decreased fetal weights and reduced ossification in mice, rats, and rabbits at 1.4, 0.6, and 3.6 times the maximum recommended human daily dosage (MRHD). Tramadol decreased pup body weight and increased pup mortality at 1.2 and 1.9 times the MRHD [see *Data*]. Based on animal data, advise pregnant women of the potential risk to a fetus.

The estimated background risk of major birth defects and miscarriage for the indicated population is unknown. All pregnancies have a background risk of birth defect, loss, or

other adverse outcomes. In the U.S. general population, the estimated background risk of major birth defects and miscarriage in clinically recognized pregnancies is 2-4% and 15-20%, respectively.

## Clinical Considerations

### *Fetal/Neonatal Adverse Reactions*

Prolonged use of opioid analgesics during pregnancy for medical or nonmedical purposes can result in physical dependence in the neonate and neonatal opioid withdrawal syndrome shortly after birth. Neonatal opioid withdrawal syndrome presents as irritability, hyperactivity and abnormal sleep pattern, high pitched cry, tremor, vomiting, diarrhea, and failure to gain weight. The onset, duration, and severity of neonatal opioid withdrawal syndrome vary based on the specific opioid used, duration of use, timing and amount of last maternal use, and rate of elimination of the drug by the newborn. Observe newborns for symptoms and signs of neonatal opioid withdrawal syndrome and manage accordingly [see *Warnings and Precautions (5.3)*].

Neonatal seizures, neonatal withdrawal syndrome, fetal death and stillbirth have been reported with tramadol during post-approval use of tramadol immediate-release products.

### *Labor or Delivery*

Opioids cross the placenta and may produce respiratory depression and psychophysiologic effects in neonates. An opioid antagonist, such as naloxone, must be available for reversal of opioid-induced respiratory depression in the neonate. ULTRAM ER is not recommended for use in pregnant women during or immediately prior to labor, when use of shorter-acting analgesics or other analgesic techniques are more appropriate. Opioid analgesics, including ULTRAM ER, can prolong labor through actions which temporarily reduce the strength, duration, and frequency of uterine contractions. However, this effect is not consistent and may be offset by an increased rate of cervical dilation, which tends to shorten labor. Monitor neonates exposed to opioid analgesics during labor for signs of excess sedation and respiratory depression.

Tramadol has been shown to cross the placenta. The mean ratio of serum tramadol in the umbilical veins compared to maternal veins was 0.83 for 40 women given tramadol during labor.

The effect of ULTRAM ER, if any, on the later growth, development, and functional maturation of the child is unknown.

## Data

### *Animal Data*

Tramadol has been shown to be embryotoxic and fetotoxic in mice, (120 mg/kg), rats (25 mg/kg) and rabbits (75 mg/kg) at maternally toxic dosages, but was not teratogenic at these dose levels. These doses on a mg/m<sup>2</sup> basis are 1.9, 0.8, and 4.9 times the maximum recommended human daily dosage (MRHD) for mouse, rat and rabbit, respectively.

No drug-related teratogenic effects were observed in progeny of mice (up to 140 mg/kg), rats (up to 80 mg/kg) or rabbits (up to 300 mg/kg) treated with tramadol by various routes. Embryo and fetal toxicity consisted primarily of decreased fetal weights, decreased skeletal ossification, and increased supernumerary ribs at maternally toxic dose levels. Transient delays in developmental or behavioral parameters were also seen in pups from rat dams allowed to deliver. Embryo and fetal lethality were reported only in one rabbit study at 300 mg/kg, a dose that would cause extreme maternal toxicity in the rabbit. The dosages listed for mouse, rat, and rabbit are 2.3, 2.6, and 19 times the MRHD, respectively.

Tramadol was evaluated in pre- and post-natal studies in rats. Progeny of dams receiving oral (gavage) dose levels of 50 mg/kg (1.6 times the MRHD) or greater had decreased weights, and pup survival was decreased early in lactation at 80 mg/kg (2.6 times the MRHD).

## **8.2 Lactation**

### Risk Summary

Following a single IV 100-mg dose of tramadol, the cumulative excretion in breast milk within sixteen hours post-dose was 100 mcg of tramadol (0.1% of the maternal dose) and 27 mcg of M1. It is not known whether this drug is excreted in human milk following an oral dose.

ULTRAM ER is not recommended for obstetrical preoperative medication or for post-delivery analgesia in nursing mothers because its safety in infants and newborns has not been studied.

Because of the potential for serious adverse reactions, including excess sedation and respiratory depression in a breastfed infant, advise patients that breastfeeding is not recommended during treatment with ULTRAM ER.

### Clinical Considerations

Monitor infants exposed to ULTRAM ER through breast milk for excess sedation and respiratory depression. Withdrawal symptoms can occur in breastfed infants when maternal administration of an opioid analgesic is stopped, or when breast-feeding is stopped.

## **8.3 Females and Males of Reproductive Potential**

### Infertility

Chronic use of opioids may cause reduced fertility in females and males of reproductive potential. It is not known whether these effects on fertility are reversible [*see Adverse Reactions (6.2), Clinical Pharmacology (12.2), Nonclinical Toxicology (13.1)*].

## **8.4 Pediatric Use**

The safety and efficacy of ULTRAM ER in patients under 18 years of age have not been established. The use of ULTRAM ER in the pediatric population is not recommended.

## **8.5 Geriatric Use**

Nine-hundred-one elderly (65 years of age or older) subjects were exposed to ULTRAM ER in clinical trials. Of those subjects, 156 were 75 years of age and older. In general, higher incidence rates of adverse events were observed for patients older than 65 years of age compared with patients 65 years and younger, particularly for the following adverse events: constipation, fatigue,

weakness, postural hypotension and dyspepsia. For this reason, ULTRAM ER should be used with caution in patients over 65 years of age, and with even greater caution in patients older than 75 years of age [see *Dosage and Administration (2.4)*, *Clinical Pharmacology (12.3)*].

Respiratory depression is the chief risk for elderly patients treated with opioids, and has occurred after large initial doses were administered to patients who were not opioid-tolerant or when opioids were co-administered with other agents that depress respiration. Titrate the dosage of ULTRAM ER slowly in geriatric patients and monitor closely for signs of central nervous system and respiratory depression [see *Warnings and Precautions (5.10)*].

Tramadol is known to be substantially excreted by the kidney, and the risk of adverse reactions to this drug may be greater in patients with impaired renal function. Because elderly patients are more likely to have decreased renal function, care should be taken in dose selection, and it may be useful to monitor renal function.

## **8.6 Hepatic Impairment**

Metabolism of tramadol and M1 is reduced in patients with advanced cirrhosis of the liver. ULTRAM ER has not been studied in patients with severe hepatic impairment. The limited availability of dose strengths and once daily dosing of ULTRAM ER do not permit the dosing flexibility required for safe use in patients with severe hepatic impairment (Child-Pugh Class C). Therefore, ULTRAM ER should not be used in patients with severe hepatic impairment [see *Clinical Pharmacology (12.3)*].

## **8.7 Renal Impairment**

Impaired renal function results in a decreased rate and extent of excretion of tramadol and its active metabolite, M1. ULTRAM ER has not been studied in patients with severe renal impairment (CL<sub>cr</sub> < 30 mL/min). The limited availability of dose strengths and once daily dosing of ULTRAM ER do not permit the dosing flexibility required for safe use in patients with severe renal impairment (Child-Pugh Class C). Therefore, ULTRAM ER should not be used in patients with severe renal impairment [see *Clinical Pharmacology (12.3)*].

# **9 DRUG ABUSE AND DEPENDENCE**

## **9.1 Controlled Substance**

ULTRAM ER contains tramadol, a scheduled IV controlled substance.

## **9.2 Abuse**

ULTRAM ER contains tramadol, a substance with a high potential for abuse similar to other opioids. ULTRAM ER can be abused and is subject to misuse, addiction, and criminal diversion [see *Warnings and Precautions (5.1)*]. The high drug content in extended-release formulations adds to the risk of adverse outcomes from abuse and misuse.

All patients treated with opioids require careful monitoring for signs of abuse and addiction, because use of opioid analgesic products carries the risk of addiction even under appropriate medical use.

Prescription drug abuse is the intentional non-therapeutic use of a prescription drug, even once, for its rewarding psychological or physiological effects.

Drug addiction is a cluster of behavioral, cognitive, and physiological phenomena that develop after repeated substance use and includes: a strong desire to take the drug, difficulties in controlling its use, persisting in its use despite harmful consequences, a higher priority given to drug use than to other activities and obligations, increased tolerance, and sometimes a physical withdrawal.

“Drug-seeking” behavior is very common in persons with substance use disorders. Drug-seeking tactics include emergency calls or visits near the end of office hours, refusal to undergo appropriate examination, testing, or referral, repeated “loss” of prescriptions, tampering with prescriptions, and reluctance to provide prior medical records or contact information for other treating healthcare providers. “Doctor shopping” (visiting multiple prescribers to obtain additional prescriptions) is common among drug abusers and people suffering from untreated addiction. Preoccupation with achieving adequate pain relief can be appropriate behavior in a patient with poor pain control.

Abuse and addiction are separate and distinct from physical dependence and tolerance. Healthcare providers should be aware that addiction may not be accompanied by concurrent tolerance and symptoms of physical dependence in all addicts. In addition, abuse of opioids can occur in the absence of true addiction.

ULTRAM ER, like other opioids, can be diverted for non-medical use into illicit channels of distribution. Careful record-keeping of prescribing information, including quantity, frequency, and renewal requests, as required by state and federal law, is strongly advised. Proper assessment of the patient, proper prescribing practices, periodic re-evaluation of therapy, and proper dispensing and storage are appropriate measures that help to limit abuse of opioid drugs.

### Risks Specific to Abuse of ULTRAM ER

ULTRAM ER is for oral use only. The abuse of ULTRAM ER poses a risk of overdose and death. The risk is increased with concurrent use of ULTRAM ER with alcohol and other central nervous system depressants. With intravenous abuse the inactive ingredients in ULTRAM ER can result in local tissue necrosis, infection, pulmonary granulomas, embolism and death, and increased risk of endocarditis and valvular heart injury. Parenteral drug abuse is commonly associated with transmission of infectious diseases such as hepatitis and HIV.

### **9.3 Dependence**

Both tolerance and physical dependence can develop during chronic opioid therapy. Tolerance is the need for increasing doses of opioids to maintain a defined effect such as analgesia (in the absence of disease progression or other external factors). Tolerance may occur to both the desired and undesired effects of drugs, and may develop at different rates for different effects.

Physical dependence results in withdrawal symptoms after abrupt discontinuation or a significant dosage reduction of a drug. Withdrawal also may be precipitated through the administration of drugs with opioid antagonist activity (e.g., naloxone, nalmefene), mixed agonist/antagonist analgesics (e.g., pentazocine, butorphanol, nalbuphine), or partial agonists (e.g., buprenorphine). Physical dependence may not occur to a clinically significant degree until after several days to weeks of continued opioid usage.

ULTRAM ER should not be abruptly discontinued in a physically-dependent patient [*see Dosage and Administration (2.4)*]. If ULTRAM ER is abruptly discontinued in a physically-dependent patient, a withdrawal syndrome may occur. Some or all of the following can characterize this syndrome: restlessness, lacrimation, rhinorrhea, yawning, perspiration, chills, myalgia, and mydriasis. Other signs and symptoms also may develop, including irritability, anxiety, backache, joint pain, weakness, abdominal cramps, insomnia, nausea, anorexia, vomiting, diarrhea or increased blood pressure, respiratory rate, or heart rate.

Infants born to mothers physically dependent on opioids will also be physically dependent and may exhibit respiratory difficulties and withdrawal signs [*see Use in Specific Populations (8.1)*].

## 10 OVERDOSAGE

### Clinical Presentation

Acute overdosage with ULTRAM ER can be manifested by respiratory depression, somnolence progressing to stupor or coma, skeletal muscle flaccidity, cold and clammy skin, constricted pupils, and, in some cases, pulmonary edema, bradycardia, hypotension, partial or complete airway obstruction, atypical snoring, and death. Marked mydriasis rather than miosis may be seen with hypoxia in overdose situations [*see Clinical Pharmacology (12.2)*].

### Treatment of Overdose

In case of overdose, priorities are the reestablishment of a patent and protected airway and institution of assisted or controlled ventilation, if needed. Employ other supportive measures (including oxygen and vasopressors) in the management of circulatory shock and pulmonary edema as indicated. Cardiac arrest or arrhythmias will require advanced life-support techniques.

The opioid antagonists, naloxone or nalmefene, are specific antidotes to respiratory depression resulting from opioid overdose. For clinically significant respiratory or circulatory depression secondary to tramadol overdose, administer an opioid antagonist. Opioid antagonists should not be administered in the absence of clinically significant respiratory or circulatory depression secondary to tramadol overdose.

While naloxone will reverse some, but not all, symptoms caused by overdosage with tramadol, the risk of seizures is also increased with naloxone administration. In animals, convulsions following the administration of toxic doses of ULTRAM ER could be suppressed with barbiturates or benzodiazepines but were increased with naloxone. Naloxone administration did not change the lethality of an overdose in mice.

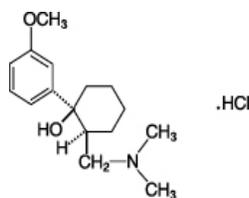
Hemodialysis is not expected to be helpful in an overdose because it removes less than 7% of the administered dose in a 4-hour dialysis period.

Because the duration of opioid reversal is expected to be less than the duration of action of tramadol in ULTRAM ER, carefully monitor the patient until spontaneous respiration is reliably reestablished. ULTRAM ER will continue to release tramadol and add to the tramadol load for 24 to 48 hours or longer following ingestion, necessitating prolonged monitoring. If the response to an opioid antagonist is suboptimal or only brief in nature, administer additional antagonist as directed by the product's prescribing information.

In an individual physically dependent on opioids, administration of the recommended usual dosage of the antagonist will precipitate an acute withdrawal syndrome. The severity of the withdrawal symptoms experienced will depend on the degree of physical dependence and the dose of the antagonist administered. If a decision is made to treat serious respiratory depression in the physically dependent patient, administration of the antagonist should be initiated with care and by titration with smaller than usual doses of the antagonist.

## 11 DESCRIPTION

ULTRAM ER (tramadol hydrochloride) is an opioid agonist in an extended-release tablet formulation for oral use. The chemical name is ( $\pm$ ) cis-2-[(dimethylamino)methyl]-1-(3-methoxyphenyl) cyclohexanol hydrochloride. Its structural formula is:



The molecular weight of tramadol HCl is 299.8. It is a white, bitter, crystalline and odorless powder that is readily soluble in water and ethanol and has a pKa of 9.41. The n-octanol/water log partition coefficient (logP) is 1.35 at pH 7.

ULTRAM ER tablets contain 100, 200 or 300 mg of tramadol HCl in an extended-release formulation. The tablets are white to off-white in color and contain the inactive ingredients: colloidal silicon dioxide, dibutyl sebacate, ethylcellulose, polyvinyl alcohol, polyvinyl pyrrolidone, and sodium stearyl fumarate.

## 12 CLINICAL PHARMACOLOGY

### 12.1 Mechanism of Action

ULTRAM ER contains tramadol, an opioid agonist and an inhibitor of reuptake of norepinephrine and serotonin. Although the mode of action of tramadol is not completely understood, the analgesic effect of tramadol is believed to be due to both binding to  $\mu$ -opioid receptors and weak inhibition of reuptake of norepinephrine and serotonin.

Opioid activity of tramadol is due to both low affinity binding of the parent compound and higher affinity binding of the O-desmethyl metabolite M1 to  $\mu$ -opioid receptors. In animal models, M1 is up to 6 times more potent than tramadol in producing analgesia and 200 times more potent in  $\mu$ -opioid binding. Tramadol-induced analgesia is only partially antagonized by the opioid antagonist naloxone in several animal tests. The relative contribution of both tramadol and M1 to human analgesia is dependent upon the plasma concentrations of each compound.

Tramadol has been shown to inhibit reuptake of norepinephrine and serotonin *in vitro*, as have some other opioid analgesics. These mechanisms may contribute independently to the overall analgesic profile of tramadol.

Apart from analgesia, tramadol administration may produce a constellation of symptoms (including dizziness, somnolence, nausea, constipation, sweating and pruritus) similar to that of other opioids. In contrast to morphine, tramadol has not been shown to cause histamine release. At therapeutic doses, tramadol has no effect on heart rate, left-ventricular function, or cardiac index. Orthostatic hypotension has been observed.

## **12.2 Pharmacodynamics**

### Effects on the Central Nervous System

Tramadol produces respiratory depression by direct action on brain stem respiratory centers. The respiratory depression involves a reduction in the responsiveness of the brain stem respiratory centers to both increases in carbon dioxide tension and electrical stimulation.

Tramadol causes miosis, even in total darkness. Pinpoint pupils are a sign of opioid overdose but are not pathognomonic (e.g., pontine lesions of hemorrhagic or ischemic origins may produce similar findings). Marked mydriasis rather than miosis may be seen due to hypoxia in overdose situations.

### Effects on the Gastrointestinal Tract and Other Smooth Muscle

Tramadol causes a reduction in motility associated with an increase in smooth muscle tone in the antrum of the stomach and duodenum. Digestion of food in the small intestine is delayed and propulsive contractions are decreased. Propulsive peristaltic waves in the colon are decreased, while tone may be increased to the point of spasm, resulting in constipation. Other opioid-induced effects may include a reduction in biliary and pancreatic secretions, spasm of sphincter of Oddi, and transient elevations in serum amylase.

### Effects on the Cardiovascular System

Tramadol produces peripheral vasodilation, which may result in orthostatic hypotension or syncope. Manifestations of histamine release and/or peripheral vasodilation may include pruritus, flushing, red eyes, sweating, and/or orthostatic hypotension.

### Effects on the Endocrine System

Opioids inhibit the secretion of adrenocorticotropic hormone (ACTH), cortisol, and luteinizing hormone (LH) in humans [see *Adverse Reactions (6.2)*]. They also stimulate prolactin, growth hormone (GH) secretion, and pancreatic secretion of insulin and glucagon.

Chronic use of opioids may influence the hypothalamic-pituitary-gonadal axis, leading to androgen deficiency that may manifest as low libido, impotence, erectile dysfunction, amenorrhea, or infertility. The causal role of opioids in the clinical syndrome of hypogonadism is unknown because the various medical, physical, lifestyle, and psychological stressors that may influence gonadal hormone levels have not been adequately controlled for in studies conducted to date [see *Adverse Reactions* (6.2)].

#### Effects on the Immune System

Opioids have been shown to have a variety of effects on components of the immune system in *in vitro* and animal models. The clinical significance of these findings is unknown. Overall, the effects of opioids appear to be modestly immunosuppressive.

#### Concentration–Efficacy Relationships

The minimum effective analgesic concentration will vary widely among patients, especially among patients who have been previously treated with potent opioid agonists. The minimum effective analgesic concentration of tramadol for any individual patient may increase over time due to an increase in pain, the development of a new pain syndrome, and/or the development of analgesic tolerance [see *Dosage and Administration* (2.1)].

#### Concentration–Adverse Reaction Relationships

There is a relationship between increasing tramadol plasma concentration and increasing frequency of dose-related opioid adverse reactions such as nausea, vomiting, CNS effects, and respiratory depression. In opioid-tolerant patients, the situation may be altered by the development of tolerance to opioid-related adverse reactions [see *Dosage and Administration* (2.1, 2.2)].

### **12.3 Pharmacokinetics**

The analgesic activity of tramadol is due to both parent drug and the M1 metabolite. ULTRAM ER is administered as a racemate and both the [-] and [+] forms of both tramadol and M1 are detected in the circulation.

The pharmacokinetics of ULTRAM ER are approximately dose-proportional over a 100 to 400 mg dose range in healthy subjects. The observed tramadol AUC values for the 400-mg dose were 26% higher than predicted based on the AUC values for the 200-mg dose. The clinical significance of this finding has not been studied and is not known.

#### Absorption

In healthy subjects, the bioavailability of a ULTRAM ER 200 mg tablet administered once daily relative to a 50 mg immediate-release (IR) tablet (ULTRAM) administered every six hours was approximately 85 to 90%. Consistent with the extended-release nature of the formulation, there is a lag time in drug absorption following ULTRAM ER administration. The mean peak plasma concentrations of tramadol and M1 after administration of ULTRAM ER tablets to healthy volunteers are attained at about 12 h and 15 h, respectively, after dosing (see [Table 2](#) and [Figure 2](#)). Following administration of the ULTRAM ER, steady-state plasma concentrations of both tramadol and M1 are achieved within four days with once daily dosing.

The mean (%CV) pharmacokinetic parameter values for ULTRAM ER 200 mg administered

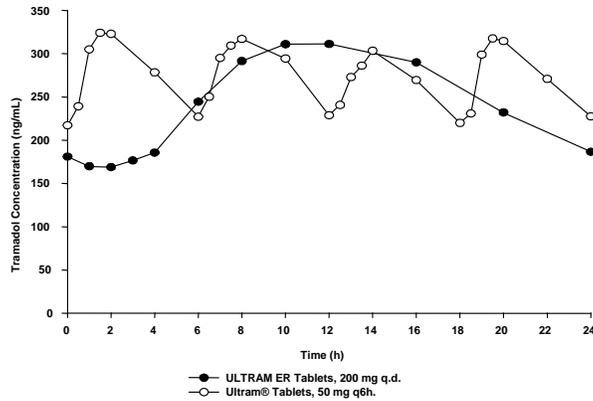
once daily and tramadol HCl IR (ULTRAM) 50 mg administered every six hours are provided in Table 2.

**Table 2. Mean (%CV) Steady-State Pharmacokinetic Parameter Values (n=32)**

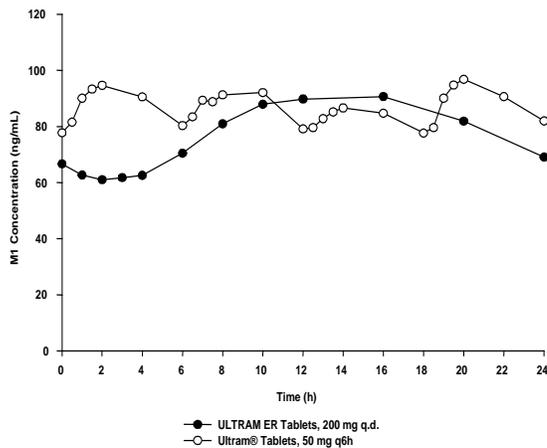
Pharmacokinetic Parameter	Tramadol		M1 Metabolite	
	ULTRAM ER 200-mg Tablet Once-Daily	ULTRAM 50-mg Tablet Every 6 Hours	ULTRAM ER 200-mg Tablet Once-Daily	ULTRAM 50-mg Tablet Every 6 Hours
AUC <sub>0-24</sub> (ng·h/mL)	5975 (34)	6613 (27)	1890 (25)	2095 (26)
C <sub>max</sub> (ng/mL)	335 (35)	383 (21)	95 (24)	104 (24)
C <sub>min</sub> (ng/mL)	187 (37)	228 (32)	69 (30)	82 (27)
T <sub>max</sub> (h)	12 (27)	1.5 (42)	15 (27)	1.9 (57)
% Fluctuation	61 (57)	59 (35)	34 (72)	26 (47)

AUC<sub>0-24</sub>: Area Under the Curve in a 24-hour dosing interval; C<sub>max</sub>: Peak Concentration in a 24-hour dosing interval; C<sub>min</sub>: Trough Concentration in a 24-hour dosing interval; T<sub>max</sub>: Time to Peak Concentration

**Figure 2: Mean Steady-State Tramadol (a) and M1 (b) Plasma Concentrations on Day 8 Post Dose after Administration of 200 mg ULTRAM ER Once-Daily and 50 mg ULTRAM Every 6 Hours.**



a. Tramadol



b. M1

### *Food Effects*

After a single dose administration of 200 mg ULTRAM ER tablet with a high fat meal, the  $C_{max}$  and  $AUC_{0-\infty}$  of tramadol decreased 28% and 16%, respectively, compared to fasting conditions. Mean  $T_{max}$  was increased by 3 hr (from 14 hr under fasting conditions to 17 hr under fed conditions). While ULTRAM ER may be taken without regard to food, it is recommended that it be taken in a consistent manner [see *Dosage and Administration (2.1)*].

### Distribution

The volume of distribution of tramadol was 2.6 and 2.9 L/kg in male and female subjects, respectively, following a 100-mg intravenous dose. The binding of tramadol to human plasma proteins is approximately 20% and binding also appears to be independent of concentration up to 10 mcg/mL. Saturation of plasma protein binding occurs only at concentrations outside the clinically relevant range.

### Elimination

Tramadol is eliminated primarily through metabolism by the liver and the metabolites are eliminated primarily by the kidneys. The mean terminal plasma elimination half-lives of racemic tramadol and racemic M1 after administration of ULTRAM ER are approximately 7.9 and 8.8 hours, respectively.

### *Metabolism*

Tramadol is extensively metabolized after oral administration. The metabolic pathways appear to be N – demethylation (mediated by CYP3A4 and CYP2D6), O – demethylation (mediated by CYP2D6) and glucuronidation or sulfation in the liver. The CYP2D6 metabolite, O-desmethyl tramadol, (denoted M1) is observed to be 6 times more potent than tramadol in producing analgesia and 200 times more potent in  $\mu$ -opioid binding in animal models.

### *Excretion*

Approximately 30% of the dose is excreted in the urine as unchanged drug, whereas 60% of the dose is excreted as metabolites. The remainder is excreted either as unidentified or as

unextractable metabolites.

## Special Populations

### *Hepatic Impairment*

Pharmacokinetics of tramadol was studied in patients with mild or moderate hepatic impairment after receiving multiple doses of ULTRAM ER 100 mg. The exposure of (+)- and (-)-tramadol was similar in mild and moderate hepatic impairment patients in comparison to patients with normal hepatic function. However, exposure of active metabolite (+)- and (-)-M1 decreased ~50% with increased severity of the hepatic impairment (from normal to mild and moderate). The pharmacokinetics of tramadol after the administration of ULTRAM ER has not been studied in patients with severe hepatic impairment (Child-Pugh Class C). After the administration of tramadol IR tablets to patients with advanced cirrhosis of the liver, tramadol exposure was increased and the tramadol and M1 half-lives were longer than patients with normal hepatic function [see *Use in Specific Populations (8.6)*].

### *Renal Impairment*

Impaired renal function results in a decreased rate and extent of excretion of tramadol and its active metabolite, M1. The pharmacokinetics of tramadol were studied in patients with mild or moderate renal impairment after receiving multiple doses of ULTRAM ER 100 mg. There is no consistent trend observed for tramadol exposure related to renal function in patients with mild (CL<sub>cr</sub>: 50 to 80 mL/min) or moderate (CL<sub>cr</sub>: 30 to 50 mL/min) renal impairment in comparison to patients with normal renal function. However, exposure of M1 increased 20 to 40% with increased severity of the renal impairment (from normal to mild and moderate). ULTRAM ER has not been studied in patients with severe renal impairment (CL<sub>cr</sub> < 30 mL/min). The total amount of tramadol and M1 removed during a 4-hour dialysis period is less than 7% of the administered dose [see *Use in Specific Populations (8.7)*].

### *Sex*

Based on pooled multiple-dose pharmacokinetics studies for ULTRAM ER in 166 healthy subjects (111 males and 55 females), the dose-normalized AUC values for tramadol were somewhat higher in females than in males. There was a considerable degree of overlap in values between male and female groups. Dosage adjustment based on sex is not recommended.

### *Age: Geriatric Population*

The effect of age on pharmacokinetics of CONZIP has not been studied. Healthy elderly subjects aged 65 to 75 years administered an immediate-release formulation of tramadol, have plasma concentrations and elimination half-lives comparable to those observed in healthy subjects less than 65 years of age. In subjects over 75 years, mean maximum plasma concentrations are elevated (208 vs. 162 ng/mL) and the mean elimination half-life is prolonged (7 vs. 6 hours) compared to subjects 65 to 75 years of age. Adjustment of the daily dose is recommended for patients older than 75 years [see *Dosage and Administration (2.3)*].

## Drug Interaction Studies

### *Potential for Tramadol to Affect Other Drugs*

*In vitro* studies indicate that tramadol is unlikely to inhibit the CYP3A4-mediated metabolism of other drugs when tramadol is administered concomitantly at therapeutic doses. Tramadol does not appear to induce its own metabolism in humans, since observed

maximal plasma concentrations after multiple oral doses are higher than expected based on single-dose data.

#### *Poor/Extensive Metabolizers, CYP2D6*

The formation of the active metabolite, M1, is mediated by CYP2D6, a polymorphic enzyme. Approximately 7% of the population has reduced activity of the CYP2D6 isoenzyme of cytochrome P450 metabolizing enzyme system. These individuals are “poor metabolizers” of debrisoquine, dextromethorphan and tricyclic antidepressants, among other drugs. Based on a population PK analysis of Phase 1 studies with IR tablets in healthy subjects, concentrations of tramadol were approximately 20% higher in "poor metabolizers" versus "extensive metabolizers," while M1 concentrations were 40% lower.

#### *CYP2D6 Inhibitors*

In vitro drug interaction studies in human liver microsomes indicate that concomitant administration with inhibitors of CYP2D6 such as fluoxetine, paroxetine, and amitriptyline could result in some inhibition of the metabolism of tramadol.

#### *Quinidine*

Tramadol is metabolized to active metabolite M1 by CYP2D6. Coadministration of quinidine, a selective inhibitor of CYP2D6, with ULTRAM ER resulted in a 50-60% increase in tramadol exposure and a 50-60% decrease in M1 exposure. The clinical consequences of these findings are unknown. To evaluate the effect of tramadol, a CYP2D6 substrate on quinidine, an *in vitro* drug interaction study in human liver microsomes was conducted. The results from this study indicate that tramadol has no effect on quinidine metabolism [see [Warnings and Precautions \(5.4\)](#), [Drug Interactions \(7\)](#)].

#### *CYP3A4 Inhibitors and Inducers*

Since tramadol is also metabolized by CYP3A4, administration of CYP3A4 inhibitors, such as ketoconazole and erythromycin, or CYP3A4 inducers, such as rifampin and St. John’s Wort, with ULTRAM ER may affect the metabolism of tramadol leading to altered tramadol exposure [see [Warnings and Precautions \(5.4\)](#), [Drug Interactions \(7\)](#)].

#### *Cimetidine*

Concomitant administration of tramadol IR tablets with cimetidine, a weak CYP3A4 inhibitor, does not result in clinically significant changes in tramadol pharmacokinetics. No alteration of the ULTRAM ER dosage regimen with cimetidine is recommended.

#### *Carbamazepine*

Carbamazepine, a CYP3A4 inducer, increases tramadol metabolism. Patients taking carbamazepine may have a significantly reduced analgesic effect of tramadol. Concomitant administration of ULTRAM ER and carbamazepine is not recommended.

## **13 NONCLINICAL TOXICOLOGY**

### **13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility**

#### Carcinogenesis

Carcinogenicity assessment has been conducted in mice, rats and p53(+/-) heterozygous mice. A slight but statistically significant increase in two common murine tumors, pulmonary and hepatic, was observed in an NMRI mouse carcinogenicity study, particularly in aged mice. Mice were dosed orally up to 30 mg/kg in the drinking water (0.5 times the maximum recommended daily human dosage or MRHD) for

approximately two years, although the study was not done with the Maximum Tolerated Dose. This finding is not believed to suggest risk in humans.

No evidence of carcinogenicity was noted in a rat 2-year carcinogenicity study testing oral doses of up to 30 mg/kg in the drinking water (1 times the MRHD). In a second rat study, no evidence of carcinogenicity was noted in rats at oral doses up to 75 mg/kg/day for males and 100 mg/kg/day for females (approximately 2-fold the maximum recommended human daily dose MRHD) for two years. However, the excessive decrease in body weight gain observed in the rat study might have reduced their sensitivity to any potential carcinogenic effect of the drug. No carcinogenic effect of tramadol was observed in p53(+/-)-heterozygous mice at oral doses up to 150 mg/kg/day for 26 weeks.

#### Mutagenesis

Tramadol was mutagenic in the presence of metabolic activation in the mouse lymphoma assay. Tramadol was not mutagenic in the in vitro bacterial reverse mutation assay using *Salmonella* and *E. coli* (Ames), the mouse lymphoma assay in the absence of metabolic activation, the in vitro chromosomal aberration assay, or the in vivo micronucleus assay in bone marrow.

#### Impairment of Fertility

No effects on fertility were observed for tramadol at oral dose levels up to 50 mg/kg in male rats and 75 mg/kg in female rats. These dosages are 1.2 and 1.8 times the maximum recommended human daily dose based on body surface area, respectively.

## **14 CLINICAL STUDIES**

### Clinical Trial Experience

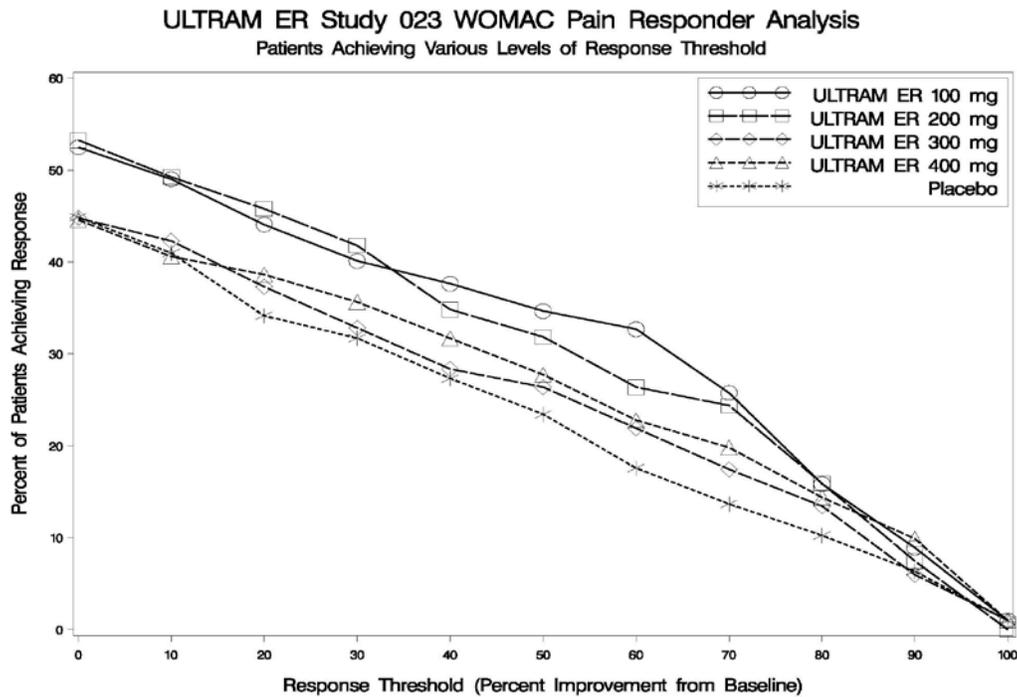
ULTRAM ER was studied in patients with chronic, moderate to moderately severe pain due to osteoarthritis and/or low back pain in four 12-week, randomized, double-blind, placebo-controlled trials. To qualify for inclusion into these studies, patients were required to have moderate to moderately severe pain as defined by a pain intensity score of  $\geq 40$  mm, off previous medications, on a 0 to 100 mm visual analog scale (VAS). Adequate evidence of efficacy was demonstrated in the following two studies:

#### *Study 1 : Osteoarthritis of the Knee and/or Hip*

In one 12-week randomized, double-blind, placebo-controlled study, patients with moderate to moderately severe pain due to osteoarthritis of the knee and/or hip were administered doses from 100 mg to 400 mg daily. Treatment was initiated at 100 mg QD for four days then increased by 100 mg per day increments every five days to the randomized fixed dose. Between 51% and 59% of patients in the ULTRAM ER treatment groups completed the study and 56% of patients in the placebo group completed the study. Discontinuations due to adverse events were more common in the ULTRAM ER 200 mg, 300 mg and 400 mg treatment groups (20%, 27%, and 30% of discontinuations, respectively) compared to 14% of the patients treated with ULTRAM ER 100 mg and 10% of patients treated with placebo.

Pain, as assessed by the WOMAC Pain subscale, was measured at 1, 2, 3, 6, 9, and 12 weeks and change from baseline assessed. A responder analysis based on the percent change in WOMAC Pain subscale demonstrated a statistically significant improvement in pain for the 100 mg and 200 mg treatment groups compared to placebo (see [Figure 3](#)).

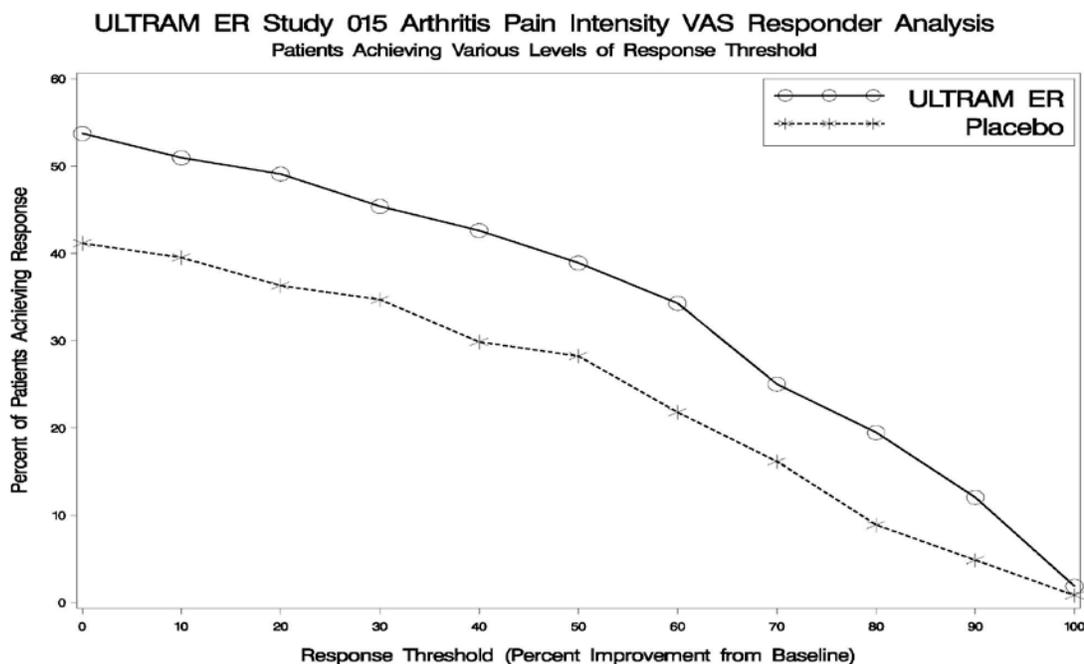
Figure 3



*Study 2 : Osteoarthritis of the Knee*

In one 12-week randomized, double-blind, placebo-controlled flexible-dosing trial of ULTRAM ER in patients with osteoarthritis of the knee, patients titrated to an average daily ULTRAM ER dose of approximately 270 mg/day. Forty-nine percent of patients randomized to ULTRAM ER completed the study, while 52% of patients randomized to placebo completed the study. Most of the early discontinuations in the ULTRAM ER treatment group were due to adverse events, accounting for 27% of the early discontinuations in contrast to 7% of the discontinuations from the placebo group. Thirty-seven percent of the placebo-treated patients discontinued the study due to lack of efficacy compared to 15% of ULTRAM ER-treated patients. The ULTRAM ER group demonstrated a statistically significant decrease in the mean VAS score, and a statistically significant difference in the responder rate, based on the percent change from baseline in the VAS score, measured at 1, 2, 4, 8, and 12 weeks, between patients receiving ULTRAM ER and placebo (see [Figure 4](#)).

**Figure 4**



## 16 HOW SUPPLIED/STORAGE AND HANDLING

ULTRAM ER (tramadol hydrochloride) Extended-release tablets are supplied in the following package and dose strength forms:

100 mg tablets (round, convex, white to off-white, non-scored) imprinted with “100” over “ER” on one side in black ink

Bottle of 30 tablets – NDC 50458-0653-30

200 mg tablets (round, convex, white to off-white, non-scored) imprinted with “200” over “ER” on one side in black ink

Bottle of 30 tablets – NDC 50458-0655-30

300 mg tablets (round, convex, white to off-white, non-scored) imprinted with “300” over “ER” on one side in black ink

Bottle of 30 tablets – NDC 50458-0657-30

Store at 20°C to 25°C (68°F to 77°F); excursions permitted to 15-30°C (59 - 86°F) [see USP Controlled Room Temperature].

## 17 PATIENT COUNSELING INFORMATION

Advise the patient to read the FDA-approved patient labeling (Medication Guide).

### Addiction, Abuse, and Misuse

Inform patients that the use of ULTRAM ER, even when taken as recommended, can result in addiction, abuse, and misuse, which can lead to overdose and death [see *Warnings and Precautions (5.1)*]. Instruct patients not to share ULTRAM ER with others and to take steps to protect ULTRAM ER from theft or misuse.

### Life-Threatening Respiratory Depression

Inform patients of the risk of life-threatening respiratory depression, including information that the risk is greatest when starting ULTRAM ER or when the dosage is increased, and that it can occur even at recommended dosages [see *Warnings and Precautions (5.2)*]. Advise patients how to recognize respiratory depression and to seek medical attention if breathing difficulties develop.

### Accidental Ingestion

Inform patients that accidental ingestion, especially by children, may result in respiratory depression or death [see *Warnings and Precautions (5.2)*]. Instruct patients to take steps to store ULTRAM ER securely and to dispose of unused ULTRAM ER in accordance with the local state guidelines and/or regulations.

### Interactions with Benzodiazepines and Other CNS Depressants

Inform patients and caregivers that potentially fatal additive effects may occur if ULTRAM ER is used with benzodiazepines or other CNS depressants, including alcohol, and not to use these concomitantly unless supervised by a healthcare provider [see *Warnings and Precautions (5.5)*, *Drug Interactions (7)*].

### Serotonin Syndrome

Inform patients that tramadol could cause a rare but potentially life-threatening condition, particularly during concomitant use with serotonergic drugs. Warn patients of the symptoms of serotonin syndrome and to seek medical attention right away if symptoms develop. Instruct patients to inform their healthcare provider if they are taking, or plan to take serotonergic medications [see *Warnings and Precautions (5.6)*, *Drug Interactions (7)*].

### Seizures

Inform patients that ULTRAM ER may cause seizures with concomitant use of serotonergic agents (including SSRIs, SNRIs, and triptans) or drugs that significantly reduce the metabolic clearance of tramadol [see *Warnings and Precautions (5.7)*].

### MAOI Interaction

Inform patients not to take ULTRAM ER while using any drugs that inhibit monoamine oxidase. Patients should not start MAOIs while taking ULTRAM ER [see *Drug Interactions (7)*].

### Adrenal Insufficiency

Inform patients that opioids could cause adrenal insufficiency, a potentially life-threatening condition. Adrenal insufficiency may present with non-specific symptoms

and signs such as nausea, vomiting, anorexia, fatigue, weakness, dizziness, and low blood pressure. Advise patients to seek medical attention if they experience a constellation of these symptoms [*see Warnings and Precautions (5.9)*].

#### Important Administration Instructions

Instruct patients how to properly take ULTRAM ER, including the following:

- ULTRAM ER is designed to work properly only if swallowed intact. Taking cut, broken, chewed, crushed, or dissolved ULTRAM ER tablets can result in a fatal overdose [*see Dosage and Administration (2.1)*].
- Advise patients not to exceed the single-dose and 24-hour dose limit and the time interval between doses, since exceeding these recommendations can result in respiratory depression, seizures, hepatic toxicity, and death. [*see Dosage and Administration (2.1)*].
- Do not discontinue ULTRAM ER without first discussing the need for a tapering regimen with the prescriber [*see Dosage and Administration (2.4)*].

#### Hypotension

Inform patients that ULTRAM ER may cause orthostatic hypotension and syncope. Instruct patients how to recognize symptoms of low blood pressure and how to reduce the risk of serious consequences should hypotension occur (e.g., sit or lie down, carefully rise from a sitting or lying position) [*see Warnings and Precautions (5.11)*].

#### Anaphylaxis

Inform patients that anaphylaxis has been reported with ingredients contained in ULTRAM ER. Advise patients how to recognize such a reaction and when to seek medical attention [*see Contraindications (4), Adverse Reactions (6)*].

#### Pregnancy

##### *Neonatal Opioid Withdrawal Syndrome*

Inform female patients of reproductive potential that prolonged use of ULTRAM ER during pregnancy can result in neonatal opioid withdrawal syndrome, which may be life-threatening if not recognized and treated [*see Warnings and Precautions (5.3), Use in Specific Populations (8.1)*].

##### *Embryo-Fetal Toxicity*

Inform female patients of reproductive potential that ULTRAM ER can cause fetal harm and to inform their healthcare provider of a known or suspected pregnancy [*see Use in Specific Populations (8.1)*].

#### Lactation

Advise patients that breastfeeding is not recommended during treatment with ULTRAM ER [*see Use in Specific Populations (8.2)*].

#### Infertility

Inform patients that chronic use of opioids may cause reduced fertility. It is not known

whether these effects on fertility are reversible [*see Adverse Reactions (6.2), Use in Specific Populations (8.3)*].

#### Driving or Operating Heavy Machinery

Inform patients that ULTRAM ER may impair the ability to perform potentially hazardous activities such as driving a car or operating heavy machinery. Advise patients not to perform such tasks until they know how they will react to the medication [*see Warnings and Precautions (5.5)*].

#### Constipation

Advise patients of the potential for severe constipation, including management instructions and when to seek medical attention [*see Adverse Reactions (6), Clinical Pharmacology (12.1)*].

#### Disposal of Unused ULTRAM ER

Advise patients to throw the unused ULTRAM ER in the household trash following these steps. 1) Remove the drugs from their original containers and mix with an undesirable substance, such as used coffee grounds or kitty litter (this makes the drug less appealing to children and pets, and unrecognizable to people who may intentionally go through the trash seeking drugs). 2) Place the mixture in a sealable bag, empty can, or other container to prevent the drug from leaking or breaking out of a garbage bag.

Manufactured by:

Valeant Pharmaceuticals International, Inc.  
Steinbach, MB, R5G 1Z7  
Canada  
Made in Canada

Distributed by:

Janssen Pharmaceuticals, Inc.  
Titusville, NJ 08560

LB0047-05

Rev. 12/2016

**Medication Guide**

**ULTRAM ER (uhl-tram)([tramadol hydrochloride extended-release tablets] ) , CIV**

**ULTRAM ER is:**

- A strong prescription pain medicine that contains an opioid (narcotic) that is used to manage pain severe enough to require daily around-the-clock, long-term treatment with an opioid, when other pain treatments such as non-opioid pain medicines or immediate-release opioid medicines do not treat your pain well enough or you cannot tolerate them.
- A long-acting (extended-release) opioid pain medicine that can put you at risk for overdose and death. Even if you take your dose correctly as prescribed you are at risk for opioid addiction, abuse, and misuse that can lead to death.
- Not for use to treat pain that is not around-the-clock.

**Important information about ULTRAM ER:**

- **Get emergency help right away if you take too much ULTRAM ER (overdose).** When you first start taking ULTRAM ER, when your dose is changed, or if you take too much (overdose), serious or life-threatening breathing problems that can lead to death may occur.
- Taking ULTRAM ER with other opioid medicines, benzodiazepines, alcohol, or other central nervous system depressants (including street drugs) can cause severe drowsiness, decreased awareness, breathing problems, coma, and death.
- Never give anyone else your ULTRAM ER. They could die from taking it. Store ULTRAM ER away from children and in a safe place to prevent stealing or abuse. Selling or giving away ULTRAM ER is against the law.

**Do not take ULTRAM ER if you have:**

- severe asthma, trouble breathing, or other lung problems.
- a bowel blockage or have narrowing of the stomach or intestines.

**Before taking ULTRAM ER, tell your healthcare provider if you have a history of:**

- head injury, seizures
- liver, kidney, thyroid problems
- problems urinating
- pancreas or gallbladder problems
- abuse of street or prescription drugs, alcohol addiction, or mental health problems.

**Tell your healthcare provider if you are:**

- **pregnant or planning to become pregnant.** Prolonged use of ULTRAM ER during pregnancy can cause withdrawal symptoms in your newborn baby that could be life-threatening if not recognized and treated.
- **breastfeeding.** Not recommended during treatment with ULTRAM ER. It may harm your baby.
- taking prescription or over-the-counter medicines, vitamins, or herbal supplements. Taking ULTRAM ER with certain other medicines can cause serious side effects that could lead to death.

**When taking ULTRAM ER:**

- Do not change your dose. Take ULTRAM ER exactly as prescribed by your healthcare provider. Use the lowest dose possible for the shortest time needed.
- Take your prescribed dose once a day at the same time every day. Do not take more than your prescribed dose. If you miss a dose, take your next dose at your usual time.
- Swallow ULTRAM ER whole. Do not cut, break, chew, crush, dissolve, snort, or inject ULTRAM ER because this may cause you to overdose and die.
- **Call your healthcare provider if the dose you are taking does not control your pain.**
- **Do not stop taking ULTRAM ER without talking to your healthcare provider.**
- After you stop taking ULTRAM ER, dispose the unused ULTRAM ER in accordance with the local state guidelines and/or regulations.

**While taking ULTRAM ER DO NOT:**

- Drive or operate heavy machinery, until you know how ULTRAM ER affects you. ULTRAM ER can make you sleepy, dizzy, or lightheaded.
- Drink alcohol or use prescription or over-the-counter medicines that contain alcohol. Using products containing alcohol during treatment with ULTRAM ER may cause you to overdose and die.

**The possible side effects of ULTRAM ER:**

- constipation, nausea, sleepiness, vomiting, tiredness, headache, dizziness, abdominal pain, seizure. Call your healthcare provider if you have any of these symptoms and they are severe.

**Get emergency medical help if you have:**

- trouble breathing, shortness of breath, fast heartbeat, chest pain, swelling of your face, tongue, or throat, extreme drowsiness, light-headedness when changing positions, feeling faint, agitation, high body temperature, trouble walking, stiff muscles, or mental changes such as confusion.

These are not all the possible side effects of ULTRAM ER. Call your doctor for medical advice about side effects. You may report side effects to FDA at 1-800-FDA-1088. **For more information go to [dailymed.nlm.nih.gov](http://dailymed.nlm.nih.gov)** or call 1-800-321-4576.

Manufactured by: Valeant Pharmaceuticals International, Inc., Steinbach, MB, R5G 1Z7, Canada and Distributed by: Janssen Pharmaceuticals, Inc., Titusville, NJ 08560 [www.valeant.com](http://www.valeant.com)

This Medication Guide has been approved by the U.S. Food and Drug Administration.  
12/2016

Issued: