



Regularly evaluate closely, particularly during initiation and titration (5.13).

- **Adrenal Insufficiency:** If diagnosed, treat with physiologic replacement of corticosteroids, and wean patient off the opioid (5.14).
- **Severe Hypotension:** Regularly evaluate during dosage initiation and titration. Avoid use of QDOLO in patients with circulatory shock (5.15).
- **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 QDOLO in patients with impaired consciousness or coma (5.16).

#### ADVERSE REACTIONS

The most common incidence of treatment-emergent adverse events ( $\geq 15.0\%$ ) in patients from clinical trials were dizziness/vertigo, nausea, constipation, headache, somnolence, vomiting and pruritus (6).

To report SUSPECTED ADVERSE REACTIONS, contact Athena Bioscience, LLC. at 1-833-874-2664 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 QDOLO because they may reduce analgesic effect of QDOLO or precipitate withdrawal symptoms (7).

#### USE IN SPECIFIC POPULATIONS

- **Pregnancy:** May cause fetal harm (8.1)
  - **Lactation:** Breastfeeding not recommended (8.2)
- See 17 for PATIENT COUNSELING INFORMATION and Medication Guide.

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## FULL PRESCRIBING INFORMATION

### WARNING: SERIOUS AND LIFE-THREATENING RISKS FROM USE OF QDOLO

#### Risk of Medication Errors

Ensure accuracy when prescribing, dispensing, and administering QDOLO oral solution. Dosing errors due to confusion between mg and mL can result in accidental overdose and death [see *Dosage and Administration (2.1), Warnings and Precautions 5.1*].

#### Addiction, Abuse and Misuse

Because the use of QDOLO 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 and reassess all patients regularly for the development of these behaviors and conditions [see *Warnings and Precautions (5.2)*].

#### Life-Threatening Respiratory Depression

Serious, life-threatening, or fatal respiratory depression may occur with use of QDOLO, especially during initiation or following a dosage increase. To reduce the risk of respiratory depression, proper dosing and titration of QDOLO are essential [see *Warnings and Precautions (5.3)*].

#### Accidental Ingestion

Accidental ingestion of even one dose of QDOLO, especially by children, can result in a fatal overdose of tramadol [see *Warnings and Precautions (5.3)*].

#### 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. Reserve concomitant prescribing of QDOLO and benzodiazepines or other CNS depressants for use in patients for whom alternative treatment options are inadequate [see *Warnings and Precautions (5.4), Drug Interactions (7)*].

#### Neonatal Opioid Withdrawal Syndrome (NOWS)

If opioid use is required for an extended period of time in a pregnant woman, advise the patient of the risk of NOWS, which may be life-threatening if not recognized and treated. Ensure that management by neonatology experts will be available at delivery [see *Warnings and Precautions (5.5)*].

#### Opioid Analgesic Risk Evaluation and Mitigation Strategy (REMS)

Healthcare providers are strongly encouraged to complete a REMS-compliant education program and to counsel patients and caregivers on serious risks, safe use, and the importance of reading the Medication Guide with each prescription [see *Warnings and Precautions (5.6)*].

#### Ultra-Rapid Metabolism of Tramadol and Other Risk Factors for Life-Threatening Respiratory Depression in Children

Life-threatening respiratory depression and death have occurred in children who received tramadol. Some of the reported cases followed tonsillectomy and/or adenoidectomy; in at least one case, the child had evidence of being an ultra-rapid metabolizer of tramadol due to a CYP2D6 polymorphism [see *Warnings and Precautions (5.7)*]. QDOLO is contraindicated in children younger than 12 years of age and in children younger than 18 years of age following tonsillectomy and/or adenoidectomy [see *Contraindications (4)*]. Avoid the use of QDOLO in adolescents 12 to 18 years of age who have other risk factors that may increase their sensitivity to the respiratory depressant effects of tramadol [see *Warnings and Precautions (5.7)*].

#### 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 QDOLO requires careful consideration of the effects on the parent drug, tramadol, and the active metabolite, M1 [see *Warnings and Precautions (5.8), Drug Interactions (7)*].

## 1 INDICATIONS AND USAGE

QDOLO is indicated in adults for the management of pain severe enough to require an opioid analgesic and for which alternative treatments are inadequate.

#### Limitations of Use

Because of the risks of addiction, abuse, and misuse with opioids, which can occur at any dosage or duration [see *Warnings and Precautions (5.2)*], reserve QDOLO for use in patients for whom alternative treatment options (e.g., non-opioid analgesics):

- Have not been tolerated or are not expected to be tolerated.
- Have not provided adequate analgesia or are not expected to provide adequate analgesia.

QDOLO should not be used for an extended period of time unless the pain remains severe enough to require an opioid analgesic and for which alternative treatment options continue to be inadequate.

## 2 DOSAGE AND ADMINISTRATION

### 2.1 Important Dosage and Administration Instructions

- Ensure accuracy when prescribing, dispensing, and administering QDOLO to avoid dosing errors due to confusion between mg and mL which could result in accidental overdose and death. Ensure the proper dose is communicated and dispensed. When writing prescriptions, include both the total dose in mg and the total dose in volume.
- Instruct patients and caregivers on how to measure and take or administer the correct dose of QDOLO.
- Strongly advise patients and caregivers to always use a graduated oral syringe or measuring cup, with metric units of measurements (i.e., mL), to correctly measure the prescribed amount of medication.
- Inform patients that oral dosing devices may be obtained from their pharmacy and to never use household teaspoons or tablespoons to measure QDOLO .
- Do not use QDOLO concomitantly with other tramadol-containing products.
- Do not administer QDOLO at a dose exceeding 400 mg (80 mL) per day.
- QDOLO should be prescribed only by healthcare professionals who are knowledgeable about the use of opioids and how to mitigate the associated risks.
- Use the lowest effective dosage for the shortest duration of time consistent with individual patient treatment goals [see *Warnings and Precautions (5)*]. Because the risk of overdose increases as opioid doses increase, reserve titration to higher doses of QDOLO for patients in whom lower doses are insufficiently effective and in whom the expected benefits of using a higher dose opioid clearly outweigh the substantial risks.
- Many acute pain conditions (e.g., the pain that occurs with a number of surgical procedures or acute musculoskeletal injuries) require no more than a few days of an opioid analgesic. Clinical guidelines on opioid prescribing for some acute pain conditions are available.
- There is variability in the opioid analgesic dose and duration needed to adequately manage pain due both to the cause of pain and to individual patient factors. Initiate the dosing regimen for each patient individually, taking into account the patient's underlying cause and severity of pain, prior analgesic treatment and response, and risk factors for addiction, abuse, and misuse [see *Warnings and Precautions (5.2)*].
- Respiratory depression can occur at any time during opioid therapy, especially when initiating and following dosage increases with QDOLO. Consider this risk when selecting an initial dose and when making dose adjustments [see *Warnings and Precautions (5)*].

### 2.2 Patient Access to Naloxone for the Emergency Treatment of Opioid Overdose

Discuss the availability of naloxone for the emergency treatment of opioid overdose with the patient and caregiver and assess the potential need for access to naloxone, both when initiating and renewing treatment with QDOLO [see *Warnings and Precautions (5.3)*].

Inform patients and caregivers about the various ways to obtain naloxone as permitted by individual state naloxone dispensing and prescribing requirements or guidelines (e.g., by prescription, directly from a pharmacist, or as part of a community-based program).

Consider prescribing naloxone, based on the patient's risk factors for overdose, such as concomitant use of CNS depressants, a history of opioid use disorder, or prior opioid overdose. The presence of risk factors for overdose should not prevent the proper management of pain in any given patient [see *Warnings and Precautions (5.2, 5.3, 5.4)*].

Consider prescribing naloxone if the patient has household members (including children) or other close contacts at risk for accidental ingestion or overdose.

### 2.3 Initial Dosage

#### Initiating Treatment with QDOLO

Initiate treatment at the lowest dose necessary to achieve adequate analgesia. Titrate the dose based upon the individual patient's response to their initial dose of QDOLO.

For patients not requiring rapid onset of analgesic effect, the tolerability of QDOLO can be improved by initiating therapy with the following titration regimen: Start QDOLO at 25 mg/day and titrate in 25 mg increments as separate doses every 3 days to reach 100 mg/day (25 mg four times a day). Thereafter the total daily dose may be increased by 50 mg as tolerated every 3 days to reach 200 mg/day (50 mg four times a day). After titration, QDOLO 50 mg to 100 mg can be administered as needed for pain relief every 4 to 6 hours not to exceed 400 mg/day.

For the subset of patients for whom rapid onset of analgesic effect is required and for whom the benefits outweigh the risk of discontinuation due to adverse events associated with higher initial doses, QDOLO 50 mg to 100 mg can be administered as needed for pain relief every four to six hours, not to exceed 400 mg/day.

#### Conversion from QDOLO to Extended-Release Tramadol

The relative bioavailability of QDOLO compared to extended-release tramadol is unknown, so conversion to extended-release formulations may lead to increased risk of excessive sedation and respiratory depression.

#### Dosage Modification in Patients with Hepatic Impairment

The recommended dose for adult patients with severe hepatic impairment is 50 mg every 12 hours.

#### Dosage Modification in Patients with Renal Impairment

In all patients with creatinine clearance less than 30 mL/min, it is recommended that the dosing interval of QDOLO be increased to 12 hours, with a maximum daily dose of 200 mg. Since only 7% of an administered dose is removed by hemodialysis, dialysis patients can receive their regular dose on the day of dialysis.

#### Dosage Modification in Geriatric Patients

Do not exceed a total dose of 300 mg/day in patients over 75 years old.

### **2.4 Titration and Maintenance of Therapy**

Individually titrate QDOLO to a dose that provides adequate analgesia and minimizes adverse reactions. Continually reevaluate patients receiving QDOLO to assess the maintenance of pain control, signs and symptoms of opioid withdrawal, and other adverse reactions, as well as to reassess for the development of addiction, abuse, or misuse [see *Warnings and Precautions (5.2, 5.19)*]. 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.

If the level of pain increases after dosage stabilization, attempt to identify the source of increased pain before increasing the QDOLO dosage. If after increasing the dosage, unacceptable opioid-related adverse reactions are observed (including an increase in pain after dosage increase), consider reducing the dosage [see *Warnings and Precautions (5)*]. Adjust the dosage to obtain an appropriate balance between management of pain and opioid-related adverse reactions.

### **2.5 Safe Reduction or Discontinuation of QDOLO**

Do not abruptly discontinue QDOLO in patients who may be physically dependent on opioids. Rapid discontinuation of opioid analgesics in patients who are physically dependent on opioids has resulted in serious withdrawal symptoms, uncontrolled pain, and suicide. Rapid discontinuation has also been associated with attempts to find other sources of opioid analgesics, which may be confused with drug-seeking for abuse. Patients may also attempt to treat their pain or withdrawal symptoms with illicit opioids, such as heroin, and other substances.

When a decision has been made to decrease the dose or discontinue therapy in an opioid-dependent patient taking QDOLO, there are a variety of factors that should be considered, including the total daily dose of opioid (including QDOLO) the patient has been taking, the duration of treatment, the type of pain being treated, and the physical and psychological attributes of the patient. It is important to ensure ongoing care of the patient and to agree on an appropriate tapering schedule and follow-up plan so that patient and provider goals and expectations are clear and realistic. When opioid analgesics are being discontinued due to a suspected substance use disorder, evaluate and treat the patient, or refer for evaluation and treatment of the substance use disorder. Treatment should include evidence-based approaches, such as medication assisted treatment of opioid use disorder. Complex patients with comorbid pain and substance use disorders may benefit from referral to a specialist.

There are no standard opioid tapering schedules that are suitable for all patients. Good clinical practice dictates a patient-specific plan to taper the dose of the opioid gradually. For patients on QDOLO who are physically opioid-dependent, initiate the taper by a small enough increment, (e.g., no greater than 10% to 25% of the total daily dose) to avoid withdrawal symptoms, and proceed with dose-lowering at an interval of every 2 to 4 weeks. Patients who have been taking opioids for briefer periods of time may tolerate a more rapid taper.

It may be necessary to provide the patient with a lower dosage strength to accomplish a successful taper. Reassess the patient frequently to manage pain and withdrawal symptoms, should they emerge. Common withdrawal symptoms include 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. If withdrawal symptoms arise, it may be necessary to pause the taper for a period of time or raise the dose of the opioid analgesic to the previous dose, and then proceed with a slower taper. In addition, evaluate patients for any changes in mood, emergence of suicidal thoughts, or use of other substances.

When managing patients taking opioid analgesics, particularly those who have been treated for an extended period of time, and/or with high doses for chronic pain, ensure that a multimodal approach to pain management, including mental health support (if needed), is in place prior to initiating an opioid analgesic taper. A multimodal approach to pain management may optimize the treatment of chronic pain, as well as assist with the successful tapering of the opioid analgesic [see *Warnings and Precautions (5.19), Drug Abuse and Dependence (9.3)*].

## **3 DOSAGE FORMS AND STRENGTHS**

QDOLO (tramadol hydrochloride) oral solution is supplied as a clear liquid in 16 oz white, opaque plastic bottles, containing tramadol hydrochloride, 5 mg/mL (equivalent to tramadol 4.4 mg per 1 mL).

## **4 CONTRAINDICATIONS**

QDOLO is contraindicated for:

- all children younger than 12 years of age [see *Warnings and Precautions (5.7)*].

- postoperative management in children younger than 18 years of age following tonsillectomy and/or adenoidectomy [see *Warnings and Precautions (5.7)*].

QDOLO is also contraindicated in patients with:

- Significant respiratory depression [see *Warnings and Precautions (5.3)*].
- Acute or severe bronchial asthma in an unmonitored setting or in the absence of resuscitative equipment [see *Warnings and Precautions (5.13)*].
- Known or suspected gastrointestinal obstruction, including paralytic ileus [see *Warnings and Precautions (5.17)*].
- Hypersensitivity to tramadol, any other component of this product or opioids [see *Warnings and Precautions (5.18)*].
- Concurrent use of monoamine oxidase inhibitors (MAOIs) or use within the last 14 days [see *Drug Interactions (7)*].

## 5 WARNINGS AND PRECAUTIONS

### 5.1 Risk of Accidental Overdose and Death due to Medication Errors

Dosing errors can result in accidental overdose and death. Avoid dosing errors that may result from confusion between mg and mL when prescribing, dispensing, and administering QDOLO. Ensure that the dose is communicated clearly and dispensed accurately.

Instruct patients and caregivers on how to measure and take or administer the correct dose of QDOLO and to use extreme caution when measuring the dose. Strongly advise patients and caregivers to always use a graduated device that can measure and deliver the prescribed dose accurately, and to never use household teaspoons or tablespoons to measure a dose because these are not adequate measuring devices.

### 5.2 Addiction, Abuse, and Misuse

QDOLO contains tramadol, a Schedule IV controlled substance. As an opioid, QDOLO exposes users to the risks of addiction, abuse, and misuse [see *Drug Abuse and Dependence (9)*].

Although the risk of addiction in any individual is unknown, it can occur in patients appropriately prescribed QDOLO. 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 QDOLO, and reassess all patients receiving QDOLO 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 QDOLO, but use in such patients necessitates intensive counseling about the risks and proper use of QDOLO along with frequent reevaluation for signs of addiction, abuse, and misuse. Consider prescribing naloxone for the emergency treatment of opioid overdose [see *Dosage and Administration (2.2)*, *Warnings and Precautions (5.2)*].

Opioids are sought for nonmedical use and are subject to diversion from legitimate prescribed use. Consider these risks when prescribing or dispensing QDOLO. Strategies to reduce these risks include prescribing the drug in the smallest appropriate quantity and advising the patient on careful storage of the drug during the course of treatment and proper disposal of unused drug. 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.

### 5.3 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 QDOLO, the risk is greatest during the initiation of therapy or following a dosage increase.

To reduce the risk of respiratory depression, proper dosing and titration of QDOLO are essential [see *Dosage and Administration (2)*]. Overestimating the QDOLO 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 QDOLO, especially by children, can result in respiratory depression and death due to an overdose of tramadol.

Educate patients and caregivers on how to recognize respiratory depression and emphasize the importance of calling 911 or getting emergency medical help right away in the event of a known or suspected overdose.

Opioids can cause sleep-related breathing disorders including central sleep apnea (CSA) and sleep-related hypoxemia. Opioid use increases the risk of CSA in a dose-dependent fashion. In patients who present with CSA, consider decreasing the opioid dosage using best practices for opioid taper [see *Dosage and Administration (2.5)*].

## Patient Access to Naloxone for the Emergency Treatment of Opioid Overdose

Discuss the availability of naloxone for the emergency treatment of opioid overdose with the patient and caregiver and assess the potential need for access to naloxone, both when initiating and renewing treatment with QDOLO. Inform patients and caregivers about the various ways to obtain naloxone as permitted by individual state naloxone dispensing and prescribing requirements or guidelines (e.g., by prescription, directly from a pharmacist, or as part of a community-based program). Educate patients and caregivers on how to recognize respiratory depression and emphasize the importance of calling 911 or getting emergency medical help, even if naloxone is administered.

Consider prescribing naloxone, based on the patient's risk factors for overdose, such as concomitant use of CNS depressants, a history of opioid use disorder, or prior opioid overdose. The presence of risk factors for overdose should not prevent the proper management of pain in any given patient. Also consider prescribing naloxone if the patient has household members (including children) or other close contacts at risk for accidental ingestion or overdose. If naloxone is prescribed, educate patients and caregivers on how to treat with naloxone [see *Dosage and Administration (2.2)*, *Warnings and Precautions (5.2, 5.3, 5.4)*, *Overdosage (10)*].

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

Profound sedation, respiratory depression, coma, and death may result from the concomitant use of QDOLO with benzodiazepines and/or other CNS depressants, including alcohol (e.g., non-benzodiazepine sedatives/hypnotics, anxiolytics, tranquilizers, muscle relaxants, general anesthetics, antipsychotics, other opioids). 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. Inform patients and caregivers of this potential interaction and educate them on the signs and symptoms of respiratory depression (including sedation).

If concomitant use is warranted, consider prescribing naloxone for the emergency treatment of opioid overdose [see *Dosage and Administration (2.2)*, *Warnings and Precautions (5.3)*, *Overdosage (10)*].

Advise both patients and caregivers about the risks of respiratory depression and sedation when QDOLO 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)*].

### **5.5 Neonatal Opioid Withdrawal Syndrome**

Use of QDOLO for an extended period of time 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 an extended period of time of the risk of neonatal opioid withdrawal syndrome and ensure that appropriate treatment will be available [see *Use in Specific Populations (8.1)*].

### **5.6 Opioid Analgesic Risk Evaluation and Mitigation Strategy (REMS)**

To ensure that the benefits of opioid analgesics outweigh the risks of addiction, abuse, and misuse, the Food and Drug Administration (FDA) has required a Risk Evaluation and Mitigation Strategy (REMS) for these products. Under the requirements of the REMS, drug companies with approved opioid analgesic products must make REMS-compliant education programs available to healthcare providers. Healthcare providers are strongly encouraged to do all of the following:

- Complete a REMS-compliant education program offered by an accredited provider of continuing education (CE) or another education program that includes all the elements of the FDA Education Blueprint for Health Care Providers Involved in the Management or Support of Patients with Pain.
- Discuss the safe use, serious risks, and proper storage and disposal of opioid analgesics with patients and/or their caregivers every time these medicines are prescribed. The Patient Counseling Guide (PCG) can be obtained at this link: [www.fda.gov/OpioidAnalgesicREMSPCG](http://www.fda.gov/OpioidAnalgesicREMSPCG).
- Emphasize to patients and their caregivers the importance of reading the Medication Guide that they will receive from their pharmacist every time an opioid analgesic is dispensed to them.
- Consider using other tools to improve patient, household, and community safety, such as patient-prescriber agreements that reinforce patient-prescriber responsibilities.

To obtain further information on the opioid analgesic REMS and for a list of accredited REMS CME/CE, call 1-800-503-0784, or log on to [www.opioidanalgesicrems.com](http://www.opioidanalgesicrems.com). FDA Blueprint can be found at [www.fda.gov/OpioidAnalgesicREMSBlueprint](http://www.fda.gov/OpioidAnalgesicREMSBlueprint).

## 5.7 Ultra-Rapid Metabolism of Tramadol and Other Risk Factors for Life-threatening Respiratory Depression in Children

Life-threatening respiratory depression and death have occurred in children who received tramadol. Tramadol and codeine are subject to variability in metabolism based upon CYP2D6 genotype (described below), which can lead to increased exposure to an active metabolite. Based upon postmarketing reports with tramadol or with codeine, children younger than 12 years of age may be more susceptible to the respiratory depressant effects of tramadol. Furthermore, children with obstructive sleep apnea who are treated with opioids for post-tonsillectomy and/or adenoidectomy pain may be particularly sensitive to their respiratory depressant effect. Because of the risk of life-threatening respiratory depression and death:

- QDOLO is contraindicated for all children younger than 12 years of age [see *Contraindications (4)*].
- QDOLO is contraindicated for postoperative management in pediatric patients younger than 18 years of age following tonsillectomy and/or adenoidectomy [see *Contraindications (4)*].
- Avoid the use of QDOLO in adolescents 12 to 18 years of age who have other risk factors that may increase their sensitivity to the respiratory depressant effects of tramadol unless the benefits outweigh the risks. Risk factors include conditions associated with hypoventilation such as postoperative status, obstructive sleep apnea, obesity, severe pulmonary disease, neuromuscular disease, and concomitant use of other medications that cause respiratory depression.
- As with adults, when prescribing opioids for adolescents, healthcare providers should choose the lowest effective dose for the shortest period of time and inform patients and caregivers about these risks and the signs of opioid overdose [see *Use in Specific Populations (8.4)*, *Overdosage (10)*].

### Nursing Mothers

Tramadol is subject to the same polymorphic metabolism as codeine, with ultra-rapid metabolizers of CYP2D6 substrates being potentially exposed to life-threatening levels of the active metabolite *O*-desmethyltramadol (M1). At least one death was reported in a nursing infant who was exposed to high levels of morphine in breast milk because the mother was an ultra-rapid metabolizer of codeine. A baby nursing from an ultra-rapid metabolizer mother taking QDOLO could potentially be exposed to high levels of M1, and experience life-threatening respiratory depression. For this reason, breastfeeding is not recommended during treatment with QDOLO [see *Use in Specific Populations (8.2)*].

### CYP2D6 Genetic Variability: Ultra-rapid Metabolizer

Some individuals may be ultra-rapid metabolizers because of a specific CYP2D6 genotype (e.g., gene duplications denoted as \*1/\*1×N or \*1/\*2×N). The prevalence of this CYP2D6 phenotype varies widely and has been estimated at 1 to 10% for Whites (European, North American), 3 to 4% for Blacks (African Americans), 1 to 2% for East Asians (Chinese, Japanese, Korean), and may be greater than 10% in certain racial/ethnic groups (i.e., Oceanian, Northern African, Middle Eastern, Ashkenazi Jews, Puerto Rican). These individuals convert tramadol into its active metabolite, *O*-desmethyltramadol (M1), more rapidly and completely than other people. This rapid conversion results in higher than expected serum M1 levels. Even at labeled dosage regimens, individuals who are ultra-rapid metabolizers may have life-threatening or fatal respiratory depression or experience signs of overdose (such as extreme sleepiness, confusion, or shallow breathing) [see *Overdosage (10)*]. Therefore, individuals who are ultra-rapid metabolizers should not use QDOLO.

## 5.8 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 QDOLO are complex. Use of cytochrome P450 3A4 inducers, 3A4 inhibitors, or 2D6 inhibitors with QDOLO 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 QDOLO 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.

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



## Cytochrome P450 3A4 Interaction

The concomitant use of QDOLO 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 QDOLO 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.

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

### **5.9 Opioid-Induced Hyperalgesia and Allodynia**

Opioid-Induced Hyperalgesia and Allodynia Opioid-Induced Hyperalgesia (OIH) occurs when an opioid analgesic paradoxically causes an increase in pain, or an increase in sensitivity to pain. This condition differs from tolerance, which is the need for increasing doses of opioids to maintain a defined effect [see *Dependence (9.3)*]. Symptoms of OIH include (but may not be limited to) increased levels of pain upon opioid dosage increase, decreased levels of pain upon opioid dosage decrease, or pain from ordinarily non-painful stimuli (allodynia). These symptoms may suggest OIH only if there is no evidence of underlying disease progression, opioid tolerance, opioid withdrawal, or addictive behavior.

Cases of OIH have been reported, both with short-term and longer-term use of opioid analgesics. Though the mechanism of OIH is not fully understood, multiple biochemical pathways have been implicated. Medical literature suggests a strong biologic plausibility between opioid analgesics and OIH and allodynia. If a patient is suspected to be experiencing OIH, carefully consider appropriately decreasing the dose of the current opioid analgesic or opioid rotation (safely switching the patient to a different opioid moiety) [see *Dosage and Administration (2.5)*, *Warnings and Precautions (5.19)*]

### **5.10 Serotonin Syndrome Risk**

Cases of serotonin syndrome, a potentially life-threatening condition, have been reported with the use of tramadol products, including QDOLO, 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), certain muscle relaxants (i.e., cyclobenzaprine, metaxalone), and drugs that impair metabolism of serotonin (including monoamine oxidase 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) and can be fatal. The onset of symptoms generally occurs within several hours to a few days of concomitant use but may occur later than that. Discontinue QDOLO if serotonin syndrome is suspected.

### **5.11 Increased Risk of Seizures**

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

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

- Selective serotonin re-uptake inhibitors (SSRI antidepressants or anorectics),
- Tricyclic antidepressants (TCAs), and other tricyclic compounds (e.g., cyclobenzaprine, promethazine, etc.),
- Other opioids,
- Monoamine oxidase inhibitors (MAOI) [see *Warnings and Precautions (5.10)*, *Drug Interactions (7)*].
- Neuroleptics, or
- Other drugs that reduce the seizure threshold.

Risk of seizure 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 QDOLO overdose, naloxone administration may increase the risk of seizure [see *Overdosage (10)*].

















administration of tramadol to nursing mothers in the early post-partum period. Women who are ultra-rapid metabolizers of tramadol may have higher than expected serum levels of M1, potentially leading to higher levels of M1 in breast milk that can be dangerous in their breastfed infants. In women with normal tramadol metabolism, the amount of tramadol secreted into human milk is low and dose-dependent. 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 QDOLO [see *Warnings and Precautions (5.3, 5.5)*].

#### Clinical Considerations

If infants are exposed to QDOLO through breast milk, they should be monitored for excess sedation and respiratory depression. Withdrawal symptoms can occur in breastfed infants when maternal administration of an opioid analgesic is stopped, or when breastfeeding is stopped.

#### Data

Following a single IV 100 mg dose of tramadol, the cumulative excretion in breast milk within 16 hours post dose was 100 mcg of tramadol (0.1% of the maternal dose) and 27 mcg of M1.

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

#### Infertility

Use of opioids for an extended period of time 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)*].

Published studies in adult male rodents report that tramadol, at clinically relevant doses, can produce adverse effects on male reproductive hormones and tissues [See *Nonclinical Toxicology (13.1)*].

### **8.4 Pediatric Use**

The safety and effectiveness of tramadol in pediatric patients have not been established.

Life-threatening respiratory depression and death have occurred in children who received tramadol [see *Warnings and Precautions (5.3)*]. In some of the reported cases, these events followed tonsillectomy and/or adenoidectomy, and one of the children had evidence of being an ultra-rapid metabolizer of tramadol (i.e., multiple copies of the gene for cytochrome P450 isoenzyme 2D6). Children with sleep apnea may be particularly sensitive to the respiratory depressant effects of tramadol. Because of the risk of life-threatening respiratory depression and death:

- QDOLO is contraindicated for all children younger than 12 years of age [see *Contraindications (4)*].
- QDOLO is contraindicated for postoperative management in pediatric patients younger than 18 years of age following tonsillectomy and/or adenoidectomy [see *Contraindications (4)*].
- Avoid the use of QDOLO in adolescents 12 to 18 years of age who have other risk factors that may increase their sensitivity to the respiratory depressant effects of tramadol unless the benefits outweigh the risks. Risk factors include conditions associated with hypoventilation such as postoperative status, obstructive sleep apnea, obesity, severe pulmonary disease, neuromuscular disease, and concomitant use of other medications that cause respiratory depression.

### **8.5 Geriatric Use**

A total of 455 elderly (65 years of age or older) subjects were exposed to tramadol hydrochloride in controlled clinical trials. Of those, 145 subjects were 75 years of age and older.

In studies including geriatric patients, treatment-limiting adverse events were higher in subjects over 75 years of age compared to those under 65 years of age. Specifically, 30% of those over 75 years of age had gastrointestinal treatment-limiting adverse events compared to 17% of those under 65 years of age. Constipation resulted in discontinuation of treatment in 10% of those over 75.

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 QDOLO slowly in geriatric patients starting at the low end of the dosing range and frequently reevaluate the patient for signs of central nervous system and respiratory depression [see *Warnings and Precautions (5.13)*].

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 regularly evaluate renal function.

### **8.6 Renal and Hepatic Impairment**

Impaired renal function results in a decreased rate and extent of excretion of tramadol and its active metabolite, M1. In patients with creatinine clearances of less than 30 mL/min, dosing reduction is recommended [see *Dosage and Administration (2.3)*]. Metabolism of tramadol and M1 is reduced in patients with severe hepatic impairment based on a study in patients with advanced cirrhosis of the liver. In patients with severe hepatic impairment, dosing reduction is recommended [see *Dosage and Administration (2.3)*].

With the prolonged half-life in these conditions, achievement of steady-state is delayed, so that it may take several days for elevated plasma concentrations to develop.

## 9 DRUG ABUSE AND DEPENDENCE

### 9.1 Controlled Substance

QDOLO (tramadol hydrochloride) oral solution contains tramadol, a Schedule IV controlled substance.

### 9.2 Abuse

QDOLO contains tramadol, a substance with potential for misuse and abuse, which can lead to the development of substance use disorder, including addiction [see *Warnings and Precautions (5.2)*].

Misuse is the intentional use, for therapeutic purposes, of a drug by an individual in a way other than prescribed by a healthcare provider or for whom it was not prescribed.

Abuse is the intentional, non-therapeutic use of a drug, even once, for its desirable psychological or physiological effects.

Drug addiction is a cluster of behavioral, cognitive, and physiological phenomena that may include a strong desire to take the drug, difficulties in controlling drug use (e.g., continuing drug use despite harmful consequences, giving a higher priority to drug use than other activities and obligations), and possible tolerance or physical dependence.

Misuse and abuse of QDOLO increases risk of overdose, which may lead to central nervous system and respiratory depression, hypotension, seizures, and death. The risk is increased with concurrent abuse of QDOLO with alcohol and/or other CNS depressants. Abuse of and addiction to opioids in some individuals may not be accompanied by concurrent tolerance and symptoms of physical dependence. In addition, abuse of opioids can occur in the absence of addiction.

All patients treated with opioids require careful and frequent reevaluation for signs of misuse, abuse, and addiction, because use of opioid analgesic products carries the risk of addiction even under appropriate medical use. Patients at high risk of QDOLO abuse include those with a history of prolonged use of any opioid, including products containing tramadol, those with a history of drug or alcohol abuse, or those who use QDOLO in combination with other abused drugs.

“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 provider(s). “Doctor shopping” (visiting multiple prescribers to obtain additional prescriptions) is common among people who abuse drugs and people with substance use disorder. Preoccupation with achieving adequate pain relief can be appropriate behavior in a patient with inadequate pain control.

QDOLO, like other opioids, can be diverted for nonmedical 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 reevaluation of therapy, and proper dispensing and storage are appropriate measures that help to limit abuse of opioid drugs.

#### Risks Specific to Abuse of QDOLO

Abuse of QDOLO poses a risk of overdose and death. The risk is increased with concurrent use of QDOLO with alcohol and/or other CNS depressants.

QDOLO is approved for oral use only.

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 use of opioid therapy.

Tolerance is a physiological state characterized by a reduced response to a drug after repeated administration (i.e., a higher dose of a drug is required to produce the same effect that was once obtained at a lower dose).

Physical dependence is a state that develops as a result of a physiological adaptation in response to repeated drug use, manifested by withdrawal signs and symptoms after abrupt discontinuation or a significant dose reduction of a drug.

Withdrawal may be precipitated through the administration of drugs with opioid antagonist activity (e.g., naloxone), 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 use.

Do not abruptly discontinue QDOLO in a patient physically dependent on opioids. Rapid tapering of QDOLO in a patient physically dependent on opioids may lead to serious withdrawal symptoms, uncontrolled pain, and suicide. Rapid discontinuation has also been associated with attempts to find other sources of opioid analgesics, which may be confused with drug seeking for abuse.

When discontinuing QDOLO, gradually taper the dosage using a patient specific plan that considers the following: the dose of QDOLO the patient has been taking, the duration of treatment, and the physical and psychological attributes of the patient. To improve the likelihood of a successful taper and minimize withdrawal symptoms, it is important that the opioid tapering schedule is agreed upon by the patient. In patients taking opioids for an extended period of time at high doses, ensure that a multimodal approach to pain management, including mental health support (if needed), is in place prior to initiating an opioid analgesic taper [see *Dosage and Administration (2.5)*, and *Warnings and Precautions (5.19)*].

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 tramadol 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, QT prolongation, hypotension, partial or complete airway obstruction, atypical snoring, seizures, and death. Marked mydriasis rather than miosis may be seen with hypoxia in overdose situations.

Deaths due to overdose have been reported with abuse and misuse of tramadol [see *Warnings and Precautions (5.2)*, *Drug Abuse and Dependence (9.2)*]. Review of case reports has indicated that the risk of fatal overdose is further increased when tramadol is abused concurrently with alcohol or other CNS depressants, including other opioids.

### Treatment of Overdose

In case of overdose, priorities are the re-establishment 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 serious arrhythmias will require advanced life-supporting measures.

Opioid antagonists, such as naloxone, 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.

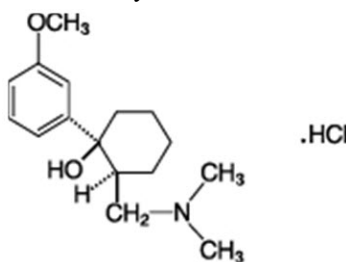
While naloxone will reverse some, but not all, symptoms caused by overdosage with tramadol, the risk of seizures is also increased with naloxone administration. In animals, convulsions following the administration of toxic doses of tramadol hydrochloride could be suppressed with barbiturates or benzodiazepines 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 QDOLO, carefully monitor the patient until spontaneous respiration is reliably re-established. 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 begun with care and by titration with smaller than usual doses of the antagonist.

## 11 DESCRIPTION

QDOLO (tramadol hydrochloride) oral solution is an opioid agonist. The chemical name for tramadol hydrochloride is ( $\pm$ )*cis*-2-[(dimethylamino)methyl]-1-(3-methoxyphenyl) cyclohexanol hydrochloride. The structural formula is:



The molecular formula of tramadol hydrochloride is  $C_{16}H_{25}NO_2 \cdot HCl$ , and the molecular weight is 299.8. Tramadol hydrochloride is a white, bitter, crystalline and odorless powder. It 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. QDOLO oral solution is a clear, grape flavored liquid containing 5 mg of tramadol hydrochloride per 1 mL (equivalent to tramadol 4.4 mg per 1 mL)

Inactive ingredients include: citric acid, glycerin, grape flavor, propylene glycol, purified water, sodium benzoate, sodium citrate dihydrate, and sucralose.

## 12 CLINICAL PHARMACOLOGY

### 12.1 Mechanism of Action

QDOLO contains tramadol, an opioid agonist and inhibitor of norepinephrine and serotonin re-uptake. Although the mode of action 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 re-uptake of norepinephrine and serotonin.

Opioid activity is due to both low affinity binding of the parent compound and higher affinity binding of the *O*-demethylated 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 [see *Clinical Pharmacology (12.2)*].

Analgesia in humans begins approximately within one hour after administration and reaches a peak in approximately two to three hours.

## 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 administration may produce a constellation of symptoms including nausea and vomiting, dizziness, and somnolence.

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 peripheral vasodilation may include pruritus, flushing, red eyes, sweating and/or orthostatic hypotension.

The effect of oral tramadol on the QTcF interval was evaluated in a double-blind, randomized, four-way crossover, placebo- and positive- (moxifloxacin) controlled study in 68 adult male and female healthy subjects. At a 600 mg/day dose (1.5-fold the maximum immediate-release daily dose), the study demonstrated no significant effect on the QTcF interval.

### Effects on the Endocrine System

Opioids inhibit the secretion of adrenocorticotropic hormone (ACTH), cortisol, and luteinizing hormone (LH) in humans. They also stimulate prolactin, growth hormone (GH) secretion, and pancreatic secretion of insulin and glucagon [see *Warnings and Precautions (5.14)*; *Adverse Reactions (6)*].

Use of opioids for an extended period of time 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)*].

### 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 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, 2.4)*].

### 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, 2.4)*].

## 12.3 Pharmacokinetics

The analgesic activity of QDOLO is due to both parent drug and the M1 metabolite [see *Clinical Pharmacology (12.1, 12.2)*].

Tramadol is administered as a racemate and both the [-] and [+] forms of both tramadol and M1 are detected in the circulation. Linear pharmacokinetics have been observed following multiple doses of 50 and 100 mg to steady-state.

### Absorption

Table 3 shows the mean plasma concentrations of tramadol and M1 pharmacokinetic parameters following a single-dose administration of 50 mg QDOLO and 50 mg immediate-release tramadol tablet under fasted conditions in healthy adult subjects.

**Table 3: Summary of Tramadol and M1 Pharmacokinetic Parameters Following Single Dose Administration Under Fasted Condition in Healthy Adult Subjects**

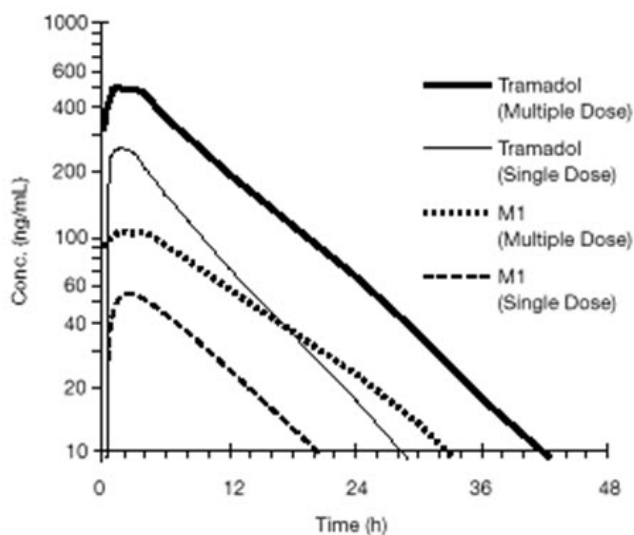
Parameters	QDOLO 50 mg Fasted	Immediate-release tramadol tablet 50 mg Fasted	QDOLO 50 mg Fasted	Immediate-release tramadol tablet 50 mg Fasted
	Tramadol		M1	
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
T <sub>max</sub> <sup>#</sup> (hr)	1.5 (0.50 – 2.50)	1.5 (0.75 – 3.0)	2.0 (0.50 – 5.00)	2.25 (1.25 – 10.00)
C <sub>max</sub> (ng/mL)	180.20 ± 33.81	173.51 ± 29.59	47.77 ± 19.06	46.14 ± 18.28
AUC <sub>0-t</sub> (hr*ng/mL)	1623.93 ± 502.43	1681.64 ± 578.06	624.12 ± 205.58	624.10 ± 199.82
AUC <sub>0-inf</sub> (hr*ng/mL)	1658.31 ± 525.97	1721.47 ± 624.72	638.95 ± 207.13	639.26 ± 198.04
t <sub>1/2</sub> (hr)	7.65 ± 1.63	7.61 ± 1.82	7.94 ± 1.65	8.06 ± 2.11

# median (min – max)

The mean absolute bioavailability of a 100 mg oral dose is approximately 75%. The mean peak plasma concentration of racemic tramadol and M1 occurs at two and three hours, respectively, after administration in healthy adults. In general, both enantiomers of tramadol and M1 follow a parallel time course in the body following single and multiple doses although small differences (~ 10%) exist in the absolute amount of each enantiomer present.

Steady-state plasma concentrations of both tramadol and M1 are achieved within two days with four-times-per-day dosing. There is no evidence of self-induction (see Figure 1 and Table 4 below).

**Figure 1: Mean Tramadol and M1 Plasma Concentration Profiles after a Single 100 mg Oral Dose and after Twenty-Nine 100 mg Oral Doses of Tramadol HCl given four times per day.**



**Table 4: Mean (%CV) Pharmacokinetic Parameters for Racemic Tramadol and M1 Metabolite**

Population/Dosage Regimen <sup>a</sup>	Parent Drug/ Metabolite	Peak Conc.(ng/mL)	Time to Peak (hrs)	Clearance/F <sup>b</sup> (mL/min/Kg)	t <sub>1/2</sub> (hrs)
Healthy Adults, 100 mg qid, MD p.o.	Tramadol	592 (30)	2.3 (61)	5.90 (25) <sup>c</sup>	6.7 (15)
	M1	110 (29)	2.4 (46)		7.0 (14)
Healthy Adults, 100 mg SD p.o.	Tramadol	308 (25)	1.6 (63)	8.50 (31) <sup>c</sup>	5.6 (20)
	M1	55.0 (36)	3.0 (51)		6.7 (16)
Geriatric, (>75 yrs) 50 mg SD p.o.	Tramadol M1	208 (31) <sup>d</sup>	2.1 (19) <sup>d</sup>	6.89 (25) <sup>c</sup>	7.0 (23) <sup>d</sup>
Hepatic Impaired, 50 mg SD p.o.	Tramadol	217 (11)	1.9 (16)	4.23 (56) <sup>c</sup>	13.3 (11)
	M1	19.4 (12)	9.8 (20)		18.5 (15)
Renal Impaired, CLcr10-30 mL/min 100 mg SD i.v.	Tramadol	c	c	4.23 (54) <sup>c</sup>	10.6 (31)
	M1	c	c		11.5 (40)
Renal Impaired, CLcr<5 mL/min 100 mg SD i.v.	Tramadol	c	c	3.73 (17) <sup>c</sup>	11.0 (29)
	M1	c	c		16.9 (18)

<sup>a</sup> SD = Single dose, MD = Multiple dose, p.o.= Oral administration, i.v.= Intravenous administration, q.i.d. = Four times daily

<sup>b</sup> F represents the oral bioavailability of tramadol

<sup>c</sup> Not applicable

<sup>d</sup> Not measured

### Food Effects

Oral administration of QDOLO with food does not significantly affect its rate or extent of absorption, therefore, QDOLO can be administered without regard to food.

### Distribution

The volume of distribution of tramadol was 2.6 and 2.9 liters/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 (%CV) apparent total clearance of tramadol after a single 100 mg oral dose is 8.50 (31) mL/min/kg. The mean terminal plasma elimination half-lives of racemic tramadol and racemic M1 are 6.3 ± 1.4 and 7.4 ± 1.4 hours, respectively. The plasma elimination half-life of racemic tramadol increased from approximately six hours to seven hours upon multiple dosing.

### Metabolism

Tramadol is extensively metabolized after oral administration by a number of pathways, including CYP2D6 and CYP3A4, as well as by conjugation of parent and metabolites. 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. The major metabolic pathways appear to be *N*- and *O*-demethylation and glucuronidation or sulfation in the liver. One metabolite (*O*-desmethyltramadol, denoted M1) is pharmacologically active in animal models. Formation of M1 is dependent on CYP2D6 and as such is subject to inhibition, which may affect the therapeutic response [*Warnings and Precautions (5.7); Drug Interactions (7)*].

Approximately 7% of the population has reduced activity of the CYP2D6 isoenzyme of cytochrome P- 450. These individuals are "poor metabolizers" of debrisoquine, dextromethorphan, tricyclic antidepressants, among other drugs. Based on a population PK analysis of Phase I studies in healthy subjects, concentrations of tramadol were approximately 20% higher in "poor metabolizers" versus "extensive metabolizers", while M1 concentrations were 40% lower. Concomitant therapy with inhibitors of CYP2D6 such as fluoxetine, paroxetine and quinidine could result in significant drug interactions. *In vitro* drug interaction studies in human liver microsomes indicate that inhibitors of CYP2D6 such as fluoxetine and its metabolite norfluoxetine, amitriptyline and quinidine inhibit the metabolism of tramadol to various degrees, suggesting that concomitant administration of these compounds could result in increases in tramadol concentrations and decreased concentrations of M1. The full pharmacological impact of these alterations in terms of either efficacy or safety is unknown. Concomitant use of serotonin re-uptake inhibitors and MAO inhibitors may enhance the risk of adverse events, including seizure and serotonin syndrome [*see Warnings and Precautions (5.10) and Drug Interactions (7)*].

### Excretion

Tramadol metabolites are eliminated primarily by the kidneys. 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*

Metabolism of tramadol and M1 is reduced in patients with severe hepatic impairment based on a study in patients with advanced cirrhosis of the liver, resulting in both a larger area under the concentration time curve for tramadol and longer tramadol and M1 elimination half-lives (13 hrs. for tramadol and 19 hrs. for M1). In patients with severe hepatic impairment, adjustment of the dosing regimen is recommended [see *Dosage and Administration (2)*].

#### *Renal Impairment*

Impaired renal function results in a decreased rate and extent of excretion of tramadol and its active metabolite, M1. In patients with creatinine clearances of less than 30 mL/min, adjustment of the dosing regimen is recommended [see *Dosage and Administration (2)*]. The total amount of tramadol and M1 removed during a 4-hour dialysis period is less than 7% of the administered dose.

#### *Age: Geriatric*

Healthy elderly subjects aged 65 to 75 years have plasma tramadol concentrations and elimination half-lives comparable to those observed in healthy subjects less than 65 years of age. In subjects over 75 years, maximum serum concentrations are elevated (208 vs. 162 ng/mL) and the 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)*].

#### *Sex*

The absolute bioavailability of tramadol was 73% in males and 79% in females. The plasma clearance was 6.4 mL/min/kg in males and 5.7 mL/min/kg in females following a 100 mg IV dose of tramadol. Following a single oral dose, and after adjusting for body weight, females had a 12% higher peak tramadol concentration and a 35% higher area under the concentration-time curve compared to males. The clinical significance of this difference is unknown.

#### *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.

## **13 NONCLINICAL TOXICOLOGY**

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

#### Carcinogenesis

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 (0.36 times the 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, 0.73 times the MRHD.

#### 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.

However, published studies report that treatment of adult male rats with tramadol (40 mg/kg, IP and SC for 30 and 60 days, respectively, 1.2x the MRHD based on BSA; or 4.5 to 135 mg/kg, SC for 18 weeks, 0.01x to 3.2x the MRHD based on BSA) produced adverse effects on male reproductive hormones and male reproductive tissues.

## **14 CLINICAL STUDIES**

Tramadol hydrochloride has been given in single oral doses of 50, 75 and 100 mg to patients with pain following surgical procedures and pain following oral surgery (extraction of impacted molars).

In single-dose models of pain following oral surgery, pain relief was demonstrated in some patients at doses of 50 mg and 75 mg. A dose of 100 mg tramadol hydrochloride tended to provide analgesia superior to codeine sulfate 60 mg, but it was not as effective as the combination of aspirin 650 mg with codeine phosphate 60 mg.

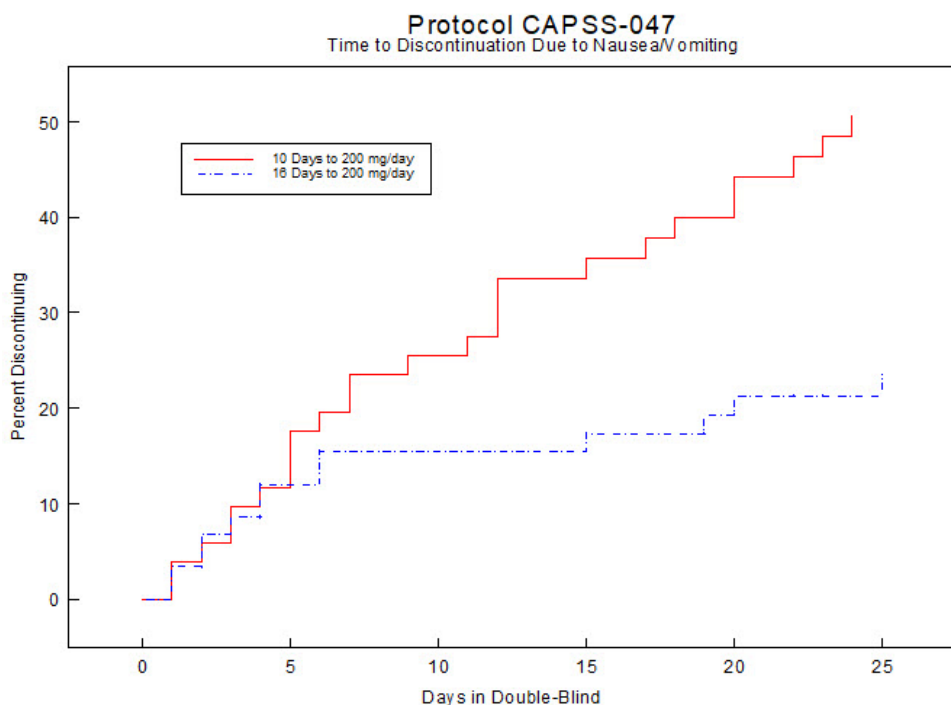
Tramadol hydrochloride has been studied in three long-term controlled trials involving a total of 820 patients, with 530 patients receiving tramadol hydrochloride. Patients with a variety of chronic painful conditions were studied in double-blind trials of one to three months duration. Average daily doses of approximately 250 mg of tramadol hydrochloride in divided doses were generally comparable to five doses of acetaminophen 300 mg with codeine phosphate 30 mg (TYLENOL with Codeine #3) daily, five doses of aspirin 325 mg with codeine phosphate 30 mg daily, or two to three doses of acetaminophen 500 mg with oxycodone hydrochloride 5 mg (TYLOX) daily.

### Titration Trials

In a randomized, blinded clinical study with 129 to 132 patients per group, a 10-day titration to a daily tramadol hydrochloride dose of 200 mg (50 mg four times per day), attained in 50 mg increments every 3 days, was found to result in fewer discontinuations due to dizziness or vertigo than titration over only 4 days or no titration. In a second study with 54 to 59 patients per group, patients who had nausea or vomiting when titrated over 4 days were randomized to re-initiate tramadol hydrochloride therapy using slower titration rates.

A 16-day titration schedule, starting with 25 mg every morning and using additional doses in 25 mg increments every third day to 100 mg/day (25 mg four times per day), followed by 50 mg increments in the total daily dose every third day to 200 mg/day (50 mg four times per day), resulted in fewer discontinuations due to nausea or vomiting and fewer discontinuations due to any cause than did a 10-day titration schedule (See Figure 2).

**Figure 2:**



## **16 HOW SUPPLIED/STORAGE AND HANDLING**

QDOLO (tramadol hydrochloride) oral solution is supplied as a clear, grape flavored liquid containing tramadol HCl, 5 mg/mL. Supplied in 16 oz (473 mL) white, opaque plastic bottles with a child-resistant cap, NDC 71511-301-16

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

Store QDOLO securely and dispose of properly [see *Patient Counseling Information (17)*].

## **17 PATIENT COUNSELING INFORMATION**

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

### Storage and Disposal

Because of the risks associated with accidental ingestion, misuse, and abuse, advise patients to store QDOLO securely, out of sight and reach of children, and in a location not accessible by others, including visitors to the home. Inform patients that leaving QDOLO unsecured can pose a deadly risk to others in the home [see *Warnings and Precautions (5.2, 5.3), Drug Abuse and Dependence (9.2)*].



Advise patients and caregivers that when medicines are no longer needed, they should be disposed of promptly. Inform patients that medicine take-back options are the preferred way to safely dispose of most types of unneeded medicines. If no take back programs or Drug Enforcement Administration (DEA)-registered collectors are available, instruct patients to dispose of QDOLO by following these four steps:

- Mix QDOLO with an unpalatable substance such as dirt, cat litter, or used coffee grounds;
- Place the mixture in a container such as a sealed plastic bag;
- Throw the container in the household trash;
- Remove all personal information on the prescription label of the empty bottle.

Inform patients that they can visit [www.fda.gov/drugdisposal](http://www.fda.gov/drugdisposal) for additional information on disposal of unused medicines.

#### Medication Errors

Strongly advise patients and caregivers to always use a graduated oral syringe or measuring cup, with metric units of measurements (i.e., mL), to correctly measure the prescribed amount of medication.

Inform patients that oral dosing devices may be obtained from their pharmacy and to never use household teaspoons or tablespoons to measure QDOLO [see *Dosage and Administration (2.1), Warnings and Precautions (5.1)*].

#### Addiction, Abuse, and Misuse

Inform patients that the use of QDOLO, even when taken as recommended, can result in addiction, abuse, and misuse, which can lead to overdose and death [see *Warnings and Precautions (5.2)*]. Instruct patients not to share QDOLO with others and to take steps to protect QDOLO 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 QDOLO or when the dosage is increased, and that it can occur even at recommended dosages. Educate patients and caregivers on how to recognize respiratory depression and emphasize the importance of calling 911 or getting emergency medical help right away in the event of a known or suspected overdose [see *Warnings and Precautions (5.3)*].

#### Accidental Ingestion

Inform patients that accidental ingestion, especially by children, may result in respiratory depression or death [see *Warnings and Precautions (5.3)*].

#### Interactions with Benzodiazepines and Other CNS Depressants

Inform patients and caregivers that potentially fatal additive effects may occur if QDOLO is used with benzodiazepines, CNS depressants, including alcohol, or some illicit drugs and not to use these concomitantly unless supervised by a healthcare provider [see *Warnings and Precautions (5.4), Drug Interactions (7)*].

#### Patient Access to Naloxone for the Emergency Treatment of Opioid Overdose

Discuss with the patient and caregiver the availability of naloxone for the emergency treatment of opioid overdose, both when initiating and renewing treatment with QDOLO. Inform patients and caregivers about the various ways to obtain naloxone as permitted by individual state naloxone dispensing and prescribing requirements or guidelines (e.g., by prescription, directly from a pharmacist, or as part of a community-based program) [see *Dosage and Administration (2.2), Warnings and Precautions (5.3)*].

Educate patients and caregivers on how to recognize the signs and symptoms of an overdose.

Explain to patients and caregivers that naloxone's effects are temporary, and that they must call 911 or get emergency medical help right away in all cases of known or suspected opioid overdose, even if naloxone is administered [see *Overdosage (10)*].

If naloxone is prescribed, also advise patients and caregivers:

- How to treat with naloxone in the event of an opioid overdose
- To tell family and friends about their naloxone and to keep it in a place where family and friends can access it in an emergency
- To read the Patient Information (or other educational material) that will come with their naloxone. Emphasize the importance of doing this before an opioid emergency happens, so the patient and caregiver will know what to do.

#### Ultra-Rapid Metabolism of Tramadol and Other Risk Factors for Life-threatening Respiratory Depression in Children

Advise caregivers that QDOLO is contraindicated in children younger than 12 years of age and in children younger than 18 years of age following tonsillectomy and/or adenoidectomy. Advise caregivers of children ages 12 to 18 years of age receiving QDOLO to monitor for signs of respiratory depression [see *Warnings and Precautions (5.7)*].

#### Hyperalgesia and Allodynia

Inform patients and caregivers not to increase opioid dosage without first consulting a clinician. Advise patients to seek medical attention if they experience symptoms of hyperalgesia, including worsening pain, increased sensitivity to pain, or new pain [see *Warnings and Precautions (5.9), Adverse Reactions (6.2)*].

#### Maximum single-dose and 24-hour dose

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 and death [see *Dosage and Administration (2), Warnings and Precautions (5.3)*].

#### Serotonin Syndrome

Inform patients that opioids could cause a rare but potentially life-threatening condition resulting from concomitant administration of 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 (5.10)*].

#### Seizures

Inform patients that QDOLO 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 (5.11)*].

#### MAOI Interaction

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

#### Important Administration Instructions

- Instruct patients and caregivers on how to measure and take or administer the correct dose of QDOLO.
- Strongly advise patients and caregivers to always use a graduated oral syringe or other oral dosing device, with metric units of measurements (i.e., mL), to correctly measure the prescribed amount of medication.
- Inform patients and caregivers that oral dosing devices may be obtained from their pharmacy and to never use household teaspoons or tablespoons to measure QDOLO [see *Dosage and Administration (2.1)*].
- Advise patients and caregivers not to adjust the dose of QDOLO without consulting with a physician or other healthcare professional.

#### Important Discontinuation Instructions

In order to avoid developing withdrawal symptoms, instruct patients not to discontinue QDOLO without first discussing a tapering plan with the prescriber [see *Dosage and Administration (2.5)*].

#### Driving or Operating Heavy Machinery

Inform patients that QDOLO 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 (5.20)*].

#### Constipation

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

#### 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 (5.14)*].

#### Hypotension

Inform patients that QDOLO 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 (5.15)*].

#### Anaphylaxis

Inform patients that anaphylaxis has been reported with ingredients contained in QDOLO. Advise patients how to recognize such a reaction and when to seek medical attention [see *Contraindications (4), Warnings and Precautions (5.18), Adverse Reactions (6)*].

## Pregnancy

### *Neonatal Opioid Withdrawal Syndrome*

Inform female patients of reproductive potential that use of QDOLO for an extended period of time during pregnancy can result in neonatal opioid withdrawal syndrome, which may be life-threatening if not recognized and treated and that the patient should inform their healthcare provider if they have used opioids at any time during their pregnancy, especially near the time of birth. *[see Warnings and Precautions (5.5), Use in Specific Populations (8.1)].*

### *Embryo-Fetal Toxicity*

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

## Lactation

Advise women that breastfeeding is not recommended during treatment with QDOLO *[see Warnings and Precautions (5.5), Use in Specific Populations (8.2)].*

## Infertility

Inform patients that use of opioids for an extended period of time may cause reduced fertility. It is not known whether these effects on fertility are reversible *[see Use in Specific Populations (8.3)].*

Manufactured for:

**Athena Bioscience, LLC**

Athens, GA 30601

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## MEDICATION GUIDE

### QDOLO [kew doe' loe] (tramadol hydrochloride) Oral Solution, CIV

#### QDOLO is:

- A strong prescription pain medicine that contains an opioid (narcotic) that is used for the management of pain in adults, when other pain treatments such as non-opioid pain medicines do not treat your pain well enough or you cannot tolerate them.
- An 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.

#### Important information about QDOLO:

- **Get emergency help right away if you take too much QDOLO (overdose).** When you first start taking QDOLO, 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 QDOLO 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 QDOLO. They could die from taking it. Selling or giving away QDOLO is against the law.
- Store QDOLO securely, out of sight and reach of children, and in a location not accessible by others, including visitors to the home.

#### Important Information Guiding Use in Pediatric Patients:

- Do not give QDOLO to a child younger than 12 years of age.
- Do not give QDOLO to anyone younger than 18 years of age after surgery to remove the tonsils, adenoids, or both.
- Avoid giving QDOLO to children between 12 to 18 years of age who have risk factors for breathing problems such as obstructive sleep apnea, obesity, or underlying lung problems.

#### Do not take QDOLO if you have:

- Severe asthma, trouble breathing, or other lung problems.
- A bowel blockage or have narrowing of the stomach or intestines.
- An allergy to tramadol
- Taken a Monoamine Oxidase Inhibitor, MAOI, (medicine used for depression) within the last 14 days.

Before taking QDOLO, tell your healthcare provider if you have a history of:

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

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

- **noticing your pain getting worse.** If your pain gets worse after you take QDOLO, do not take more of QDOLO without first talking to your healthcare provider. Talk to your healthcare provider if the pain that you have increases, if you feel more sensitive to pain, or if you have new pain after taking QDOLO.
- **pregnant or planning to become pregnant.** Use of QDOLO for an extended period of time 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 QDOLO; it may harm your baby.
- taking prescription or over-the-counter medicines, vitamins, or herbal supplements. Taking QDOLO with certain other medicines can cause serious side effects that could lead to death.
- 

#### When taking QDOLO:

- Do not change your dose. Take QDOLO exactly as prescribed by your healthcare provider. Use the lowest dose possible for the shortest time needed.
- For acute (short-term) pain, you may only need to take QDOLO for a few days. You may have some QDOLO left over that you did not use. See disposal information at the bottom of this section for directions on how to safely throw away (dispose of) your unused QDOLO.
- Always use a calibrated oral syringe or other oral dosing device obtained from your doctor or pharmacist to correctly measure your dose. Never use a household teaspoon or tablespoon to measure QDOLO.
- Take your prescribed dose as indicated by your healthcare provider. The maximum dosage is 10 mL to 20 mL every 4 to 6 hours, as needed for pain. Do not take more than your prescribed dose and do not take more than 80 mL per day. If you miss a dose, take your next dose at your usual time.
- Call your healthcare provider if the dose you are taking does not control your pain.
- If you have been taking QDOLO regularly, do not stop taking QDOLO without talking to your healthcare provider.
- Dispose of expired, unwanted, or unused QDOLO by taking your drug to an authorized Drug Enforcement Administration (DEA)-registered collector or drug take-back program. If one is not available, you can dispose of QDOLO by mixing QDOLO with dirt, cat litter, or used coffee grounds; placing the mixture in a container such as a

sealed plastic bag; and throwing the container in the household trash. Visit [www.fda.gov/drugdisposal](http://www.fda.gov/drugdisposal) for additional information on disposal of unused medicines.

**While taking QDOLO DO NOT:**

- Drive or operate heavy machinery, until you know how QDOLO affects you. QDOLO 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 QDOLO may cause you to overdose and die.

**The possible side effects of QDOLO:**

- constipation, nausea, sleepiness, vomiting, tiredness, headache, dizziness, abdominal pain. 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 QDOLO. Call your healthcare provider 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).**

Manufactured for: Athena Bioscience, LLC, Athens, GA 30601

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

Rev. 12/2023