

## Tramadol (Trade Names: Ultram®, Ultracet®)

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### **Introduction:**

Tramadol was approved for marketing in the United States as a non-controlled analgesic in 1995 under the trade name of Ultram®. However, soon after its approval there have been reports of diversion and abuse of tramadol. This led to revisions to the product labeling and the addition of warnings about its abuse by the Food and Drug Administration (FDA). Tramadol is an opioid analgesic and opioid activity is the overriding contributor to its pharmacological effects. Abuse and adverse events of tramadol are similar to those of other opioid analgesics.

### **Licit Uses:**

Tramadol is approved for the treatment of moderate to moderately severe pain in adults. According to IQVIA National Prescription Audit™, total prescriptions for tramadol dispensed in the U.S. were approximately 43.7 million in 2016, 39.8 million in 2017, 36.5 million in 2018, 34.6 million in 2019, 32.0 million in 2020, and 30.5 million in 2021.

### **Chemistry and Pharmacology:**

Tramadol, named as 2-[(dimethylamino)methyl]-1-(3-methoxyphenyl)cyclohexanol, in the Code of Federal Regulations, is a novel analgesic having both opioid agonist activity and monoamine reuptake inhibition that contribute to its analgesic efficacy. Opioid activity is due to both the parent compound and the more active O-desmethylated metabolite. Tramadol also acts on the monoamine reuptake systems by inhibiting the reuptake into nerve terminals of both norepinephrine and serotonin.

Apart from analgesia, tramadol may produce a number of symptoms including dizziness, somnolence, nausea, and constipation similar to other opioids. High doses of tramadol, often in combination with monoamine oxidase (MAO) inhibitors or selective serotonin reuptake inhibitors (SSRIs), have been associated with a serotonin syndrome consisting of convulsions, hyperthermia, muscle rigidity and pain.

Tramadol is well absorbed orally. It can be administered in 50 to 100 mg tablets as needed for pain relief every 4 to 6 hours, not to exceed 400 mg/day. Seizures have occurred in patients taking recommended doses but are more likely at high doses associated with abuse of this medication. Tolerance, dependence and addiction to tramadol have been demonstrated. Abrupt cessation from tramadol has been associated with two types of withdrawal syndromes. One is typical of opioid drugs with flu-like symptoms, restlessness and drug craving. This type of withdrawal syndrome is encountered in about 90 percent of cases of withdrawal from tramadol. Another withdrawal syndrome (encountered in about 10 percent of cases of tramadol withdrawal) is atypical of opioids and is associated with hallucinations, paranoia, extreme anxiety, panic attacks, confusion, and numbness and tingling in the extremities.

The FDA-approved labeling for tramadol has been modified several times to include new information under the

“Drug Abuse and Dependence” section. This section of the labeling currently contains the following language:

Tramadol hydrochloride may induce psychic and physical dependence of the morphine-type ( $\mu$ -opioid). Dependence and abuse, including drug-seeking behavior and taking illicit actions to obtain the drug are not limited to those patients with prior history of opioid dependence. The risk in patients with substance abuse has been observed to be higher. Tramadol hydrochloride is associated with craving and tolerance development. Withdrawal symptoms may occur if tramadol hydrochloride is discontinued abruptly. These symptoms may include: anxiety, sweating, insomnia, rigors, pain, nausea, tremors, diarrhea, upper respiratory symptoms, piloerection and rarely hallucinations. Clinical experience suggests that withdrawal symptoms may be relieved by reinstatement of opioid therapy followed by gradual, tapered dose reduction of the medication combined with symptomatic support.

### **Abuse and Diversion:**

Tramadol is most commonly abused by narcotic addicts, chronic pain patients, and health professionals.

According to the American Association of Poison Control Centers, there were a total of 12,108 tramadol exposures in 2016. Of this total in 2016, there were 5,712 single substance exposures and 3 associated deaths. In 2020, there were a total of 6,974 tramadol exposures, of which there were 3,075 single substance exposures and 3 associated deaths.

According to DEA's National Forensic Laboratory Information System (NFLIS) Drug database, which collects scientifically verified data on drug items and cases submitted to and analyzed by federal, state, and local forensic laboratories, the annual number of identifications of tramadol have steadily increased since it was approved for medical use in 1997. Participating forensic drug laboratories submitted 1,165 reports of tramadol to NFLIS-Drug in 2008, 5,279 reports in 2015, 10,698 reports in 2018, and 15,955 reports in 2021. Since 1997, there have been over 91,000 reports of tramadol to NFLIS-Drug.

### **Controlled Status:**

Tramadol is controlled in Schedule IV of the Controlled Substances Act.

Comments and additional information are welcomed by the Drug and Chemical Evaluation Section; Fax 571-362-4250, Telephone 571-362-3249, or E-mail [DPE@dea.gov](mailto:DPE@dea.gov).