

NEW ZEALAND DATA SHEET

1. PRODUCT NAME

Arrow – Tramadol, capsules, 50 mg

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Each capsule contains 50 mg of tramadol hydrochloride.

Excipient with known effect: gelatin, methyl hydroxybenzoate, propyl hydroxybenzoate.

For the full list of excipients, see section 6.1.

3. PHARMACEUTICAL FORM

Green/yellow coloured hard gelatin capsules, size 3 filled with homogeneous white to off-white powder which contains 50 mg tramadol hydrochloride.

4. CLINICAL PARTICULARS

4.1 Therapeutic indications

Relief of moderate to severe pain.

4.2 Dose and method of administration

The dose of Arrow-Tramadol should be titrated to the severity of the pain and the clinical response of the individual patient.

Adults

Arrow-Tramadol is approved for use in adults, adolescents, and children over the age of 12 years.

For the treatment of moderate pain tramadol 50 to 100 mg administered two or three times daily may be sufficient. Arrow-Tramadol 50 mg may be adequate as the initial dose for moderate pain.

For moderate to severe pain, 50 to 100 mg as needed for relief, every four to six hours may be administered. Arrow-Tramadol 100mg is usually more effective as the initial dose for more severe pain.

The maximum daily dose should not exceed 400mg per day.

Paediatric Population

Arrow-Tramadol is approved for use in children 12 years old and over.

Special Populations

Elderly

In subjects over the age of 75 years, serum concentrations are slightly elevated and the elimination half-life is slightly prolonged. Subjects in this age group are also expected to vary more widely in their ability to tolerate adverse drug effects. Daily doses in excess of 300 mg are not recommended in patients over 75 years.

Renal insufficiency

In patients with renal and/or hepatic insufficiency the elimination of tramadol is delayed. In these patients prolongation of the dosage intervals should be carefully considered according to the patient's requirements.

Hepatic insufficiency

In hepatic impairment, the initial oral dose of tramadol is 50 mg of the immediate release formulation. Depending on the severity of the impairment and individual clinical response, the recommended dosage interval (4 to 6 hours) may require to be extended, and/or the dose level titrated as required.

4.3 Contraindications

Arrow-Tramadol is contraindicated in:

- children aged less than 12 years
- postoperative management of children younger than 18 years of age following tonsillectomy and/or adenoidectomy
- individuals with known hypersensitivity to tramadol or any excipients
- acute intoxication with alcohol, hypnotics, analgesics, opioids or psychotropic drugs
- patients with severe respiratory disease, acute respiratory disease and respiratory depression
- patients who are taking MAO inhibitors or who have taken them within the last 14 days
- known hypersensitivity to opioids
- patients with uncontrolled epilepsy or epilepsy not adequately controlled by treatment.

Arrow-Tramadol must not be used for narcotic withdrawal treatment.

4.4 Special warnings and precautions for use

Hazardous and harmful use

Arrow-Tramadol contains the opioid tramadol hydrochloride and is a potential drug of abuse, misuse and addiction. Addiction can occur in patients appropriately prescribed Arrow-Tramadol at recommended doses.

The risk of addiction is increased in patients with a personal or family history of substance abuse (including alcohol and prescription and illicit drugs) or mental illness. The risk also increases the longer the drug is used and with higher doses. Patients should be assessed for their risks for opioid abuse or addiction prior to being prescribed Arrow-Tramadol.

All patients receiving opioids should be routinely monitored for signs of misuse and abuse. Opioids are sought by people with addiction and may be subject to diversion. Strategies to reduce these risks include prescribing the drug in the smallest appropriate quantity and advising the patient on the safe storage and proper disposal of any unused drug (see Section 6.4 Special precautions for storage and Section 6.6 Special precautions for disposal). Caution patients that abuse of oral or transdermal forms of opioids by parenteral administration can result in serious adverse events, which may be fatal.

Patients should be advised not to share Arrow-Tramadol with anyone else.

Respiratory depression

Serious, life-threatening or fatal respiratory depression can occur with the use of opioids even when used as recommended. It can occur at any time during the use of Arrow-Tramadol but the risk is greatest during initiation of therapy or following an increase in dose. Patients should be monitored closely for respiratory depression at these times.

The risk of life-threatening respiratory depression is also higher in elderly, frail, or debilitated patients and in patients with existing impairment of respiratory function (e.g. chronic obstructive pulmonary disease; asthma). Opioids should be used with caution and with close monitoring in these patients (see Section 4.2 Dose and method of administration). The use of opioids is contraindicated in patients with severe respiratory disease, acute respiratory disease and respiratory depression (see Section 4.3 Contraindications).

The risk of respiratory depression is greater with the use of high doses of opioids, especially high potency and modified release formulations, and in opioid naïve patients. Initiation of opioid treatment should be at the lower end of the dosage recommendations with careful titration of doses to achieve effective pain relief. Careful calculation of equianalgesic doses is required when changing opioids or switching from immediate release to modified release formulations, (see Section 4.2 Dose and method of administration).

Opioids can cause sleep-related breathing disorders including central sleep apnoea (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.

Risk from concomitant use of benzodiazepines or other CNS depressants, including alcohol

Concomitant use of opioids and benzodiazepines or other CNS depressants, including alcohol, may result in sedation, respiratory depression, coma, and death. Because of these risks, concomitant prescribing of Arrow-Tramadol with CNS depressant medicines, such as other opioid analgesics, benzodiazepines, gabapentinoids, cannabis, sedatives, hypnotics, tricyclic antidepressants, antipsychotics, antihistamines, centrally-active anti-emetics and other CNS depressants, should be reserved for patients for whom other treatment options are not possible. If a decision is made to prescribe Arrow-Tramadol concomitantly with any of the medicines, the lowest effective dose should be used, and the duration of treatment should be as short as possible. Patients should be followed closely for signs and symptoms of respiratory depression and sedation. Patients and their caregivers should be made aware of these symptoms. Patients and their caregivers should also be informed of the potential harms of consuming alcohol while taking Arrow-Tramadol.

Observational studies have demonstrated that concomitant use of opioid analgesics and benzodiazepines increases the risk of medicine-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 Section 4.5 Interactions with other medicines and other forms of interaction).

Use of opioids in chronic (long-term) non-cancer pain (CNCP)

Opioid analgesics have an established role in the treatment of acute pain, cancer pain and palliative and end-of-life care. Current evidence does not generally support opioid analgesics in improving pain and function for most patients with chronic non-cancer pain. The development of tolerance and physical dependence and risks of adverse effects, including hazardous and harmful use, increase with the length of time a patient takes an opioid. The use of opioids for long-term treatment of CNCP is not recommended.

The use of an opioid to treat CNCP should only be considered after maximised non-pharmacological and non-opioid treatments have been tried and found ineffective, not tolerated or otherwise inadequate to provide sufficient management of pain. Opioids should only be prescribed as a component of comprehensive multidisciplinary and multimodal pain management.

Opioid therapy for CNCP should be initiated as a trial in accordance with clinical guidelines and after a comprehensive biopsychosocial assessment has established a cause for the pain and the appropriateness of opioid therapy for the patient (see Hazardous and harmful use, above). The expected outcome of therapy (pain reduction rather than complete abolition of pain, improved function and quality of life) should be discussed with the patient before commencing opioid treatment, with agreement to discontinue treatment if these objectives are not met.

Owing to the varied response to opioids between individuals, it is recommended that all patients be started at the lowest appropriate dose and titrated to achieve an adequate level of analgesia and functional improvement with minimum adverse reactions. Immediate-release products should not be used to treat chronic pain, but may be used for a short period in opioid-naïve patients to develop a level of tolerance before switching to a modified-release formulation. Careful and regular assessment and monitoring is required to establish the clinical need for ongoing treatment. Discontinue opioid therapy if there is no improvement of pain and/or function during the trial period or if there is any evidence of misuse or abuse. Treatment should only continue if the trial has demonstrated that the pain is opioid responsive and there has been functional improvement. The patient's condition should be reviewed

regularly and the dose tapered off slowly if opioid treatment is no longer appropriate (see Ceasing Opioids).

Tolerance, dependence and withdrawal

Neuroadaptation of the opioid receptors to repeated administration of opioids can produce tolerance and physical dependence. Tolerance is the need for increasing doses to maintain analgesia. Tolerance may occur to both the desired and undesired effects of the opioid.

Physical dependence, which can occur after several days to weeks of continued opioid usage, results in withdrawal symptoms if the opioid is ceased abruptly or the dose is significantly reduced.

Withdrawal symptoms can also occur following the administration of an opioid antagonist (e.g. naloxone) or partial agonist (e.g. buprenorphine). Withdrawal can result in some or all of the following symptoms: dysphoria, restlessness/agitation, lacrimation, rhinorrhoea, yawning, sweating, chills, myalgia, mydriasis, irritability, anxiety, increasing pain, backache, joint pain, weakness, abdominal cramps, insomnia, nausea, anorexia, vomiting, diarrhoea, increased blood pressure, increased respiratory rate and increased heart rate.

When discontinuing Arrow-Tramadol in a person who may be physically-dependent, the drug should not be ceased abruptly but withdrawn by tapering the dose gradually (see Ceasing opioids and Section 4.2 Dose and Method of Administration).

Accidental ingestion/exposure

Accidental ingestion or exposure of Arrow-Tramadol, especially by children, can result in a fatal overdose of tramadol. Patients and their caregivers should be given information on safe storage and disposal of unused Arrow-Tramadol (see Section 6.4 Special precautions for storage and Section 6.6 Special precautions for disposal).

Hyperalgesia

Hyperalgesia may occur with the use of opioids, particularly at high doses. Hyperalgesia may manifest as an unexplained increase in pain, increased levels of pain with increasing opioid dosages or diffuse sensitivity not associated with the original pain. Hyperalgesia should not be confused with tolerance (see Tolerance, dependence and withdrawal). If opioid induced hyperalgesia is suspected, the dose should be reduced and tapered off if possible. A change to a different opioid may be required.

Ceasing opioids

Abrupt discontinuation or rapid decreasing of the dose in a person physically dependent on an opioid may result in serious withdrawal symptoms and uncontrolled pain (see Tolerance, dependence and withdrawal). Such symptoms may lead the patient to seek other sources of licit or illicit opioids. Opioids should not be ceased abruptly in a patient who is physically dependent but withdrawn by tapering the dose slowly. Factors to take into account when deciding how to discontinue or decrease therapy include the dose and duration of the opioid the patient has been taking, the type of pain being treated and the physical and psychological attributes of the patient. A multimodal approach to pain management should be in place before initiating an opioid analgesic taper. During tapering, patients require regular review and support to manage any increase in pain, psychological distress and withdrawal symptoms.

There are no standard tapering schedules suitable for all patients and an individualised plan is necessary. In general, tapering should involve a dose reduction of no more than 10 percent to 25 percent every 2 to 4 weeks (see Section 4.2 Dose and Method of Administration). If the patient is experiencing increased pain or serious withdrawal symptoms, it may be necessary to go back to the previous dose until stable before proceeding with a more gradual taper.

When ceasing opioids in a patient who has a suspected opioid use disorder, the need for medication assisted treatment and/or referral to a specialist should be considered.

Acute abdominal conditions

The administration of tramadol may complicate the clinical assessment of patients with acute abdominal conditions.

Increased intracranial pressure or head trauma

Tramadol should be used with caution in patients with increased intracranial pressure, head injury, shock or a reduced level of consciousness of uncertain origin. Pupillary changes (miosis) from tramadol may obscure the existence, extent, or course of intracranial pathology. Clinicians should also maintain a high index of suspicion for adverse drug reaction when evaluating altered mental status in these patients if they are receiving tramadol.

Serotonin syndrome (serotonin toxicity)

Tramadol is known to cause Serotonin syndrome when used concomitantly with other medicines that increase serotonin levels. The presence of another drug that increases serotonin by any mechanism should alert the treating physician to the possibility of an interaction. Signs of serotonin syndrome may be, for example, confusion, agitation, fever, sweating, ataxia, hyperreflexia, myoclonus and diarrhoea. Withdrawal of the serotonergic medicines usually brings about a rapid improvement. Drug treatment depends on the nature and severity of the symptoms (see Section 4.5 Interaction with other medicines and other forms of interaction).

Post-operative use in children

There have been reports in the published literature that tramadol given post-operatively in children after tonsillectomy and/or adenoidectomy for obstructive sleep apnoea, led to rare, but life threatening adverse events. Extreme caution should be exercised when tramadol is administered to children for post-operative pain relief and should be accompanied by close monitoring for symptoms of opioid toxicity including respiratory depression.

Renal and hepatic disease

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.

Renal disease

In patients with renal insufficiency the elimination of tramadol is delayed. In these patients prolongation of the dosage intervals should be carefully considered according to the patient's requirements. As tramadol is removed very slowly by haemodialysis or haemofiltration, post-dialysis administration to maintain analgesia is not usually necessary.

Hepatic disease

Metabolism of tramadol and M1 is reduced in patients with advanced cirrhosis of the liver. In cirrhotic patients, dosage reduction is recommended (see Section 4.2 Dose and method of administration).

Patients physically dependent on opioids

Tramadol is not recommended as a substitute in opioid-dependent patients. Although tramadol is an opiate-agonist, it cannot suppress opioid withdrawal symptoms. Animal experiments have shown that under certain circumstances the administration of tramadol may provoke a withdrawal syndrome in opioid-dependent monkeys. Because of the difficulty in assessing dependence in patients who have previously received substantial amounts of opioid medications, caution should be used in the administration of tramadol to such patients (see Hazardous and harmful use, above).

Seizure risk

Convulsions have been reported in patients receiving tramadol at the recommended dose levels. The risk may be increased when doses of tramadol exceed the recommended upper daily dose limit. In addition, tramadol may increase the seizure risk in patients taking other medication that lowers the

seizure threshold (see Section 4.5 Interaction with other medicines and other forms of interaction). Patients with epilepsy or those susceptible to seizures should only be treated with tramadol if there are compelling circumstances.

Anaphylactoid reactions

Serious and rarely fatal anaphylactoid reactions have been reported in patients receiving tramadol. These reactions often occur following the first dose. Other reported reactions include pruritus, hives, bronchospasm and angioedema.

Intra-operative use

In one study using nitrous oxide/tramadol anaesthetic technique (with only intermittent administration of enflurane "as required"), tramadol was reported to enhance intra-operative recall. Hence its use during potentially very light levels of general anaesthesia should be avoided. Two recent studies of tramadol administration during anaesthesia comprising continuous administration of isoflurane did not show clinically significant lightening of anaesthetic depth or intra-operative recall. Therefore, providing the current practice of administering continuous, potent (volatile or intravenous) anaesthetic agent is followed, tramadol may be used intra-operatively in the same way as other analgesic agents are routinely used.

Long-term use

Tramadol has been studied in controlled clinical trials for periods of up to three months. In one small uncontrolled study, patients with cancer pain received a dose of 150 mg tramadol per day for up to six months. Beyond six months no clinical studies investigating the safety and efficacy of tramadol are available.

When tramadol treatment of pain is required long-term, careful and regular monitoring should be carried out to establish whether, and to what extent, ongoing treatment is necessary.

CYP2D6 metabolism:

Tramadol is metabolised by the liver enzyme CYP2D6. If a patient has a deficiency or is completely lacking this enzyme an adequate analgesic effect may not be obtained. Estimates indicate that up to 7% of the Caucasian population may have this deficiency. However, if the patient is an ultra-rapid metaboliser there is a risk of developing side effects of opioid toxicity even at commonly prescribed doses.

General symptoms of opioid toxicity include confusion, somnolence, shallow breathing, small pupils, nausea, vomiting, constipation and lack of appetite. In severe cases this may include symptoms of circulatory and respiratory depression, which may be life threatening and very rarely fatal. Estimates of prevalence of ultra-rapid metabolisers in different populations are summarised below:

Population	Prevalence %
African/Ethiopian	29%
African American	3.4% to 6.5%
Asian	1.2% to 2%
Caucasian	3.6% to 6.5%
Greek	6.0%
Hungarian	1.9%
Northern European	1% to 2%

Adrenal insufficiency

Opioid analgesics may occasionally cause reversible adrenal insufficiency requiring monitoring and glucocorticoid replacement therapy. Symptoms of acute or chronic adrenal insufficiency may include e.g. severe abdominal pain, nausea and vomiting, low blood pressure, extreme fatigue, decreased appetite, and weight loss.

4.5 Interaction with other medicines and other forms of interaction

Use with CNS depressants

Tramadol should be used with caution and in reduced dosages when administered to patients receiving CNS depressants (including benzodiazepines and other sedatives/hypnotics, anxiolytics, tranquilizers, muscle relaxants, general anesthetics, drugs with antihistamine-sedating actions such as antipsychotics, other opioids and alcohol).

Due to additive pharmacologic effect, the concomitant use of benzodiazepines or other CNS depressants including alcohol, increases the risk of respiratory depression, profound sedation, coma and death.

Reserve concomitant prescribing of these drugs for use in patients for whom alternative treatment options are inadequate. Limit dosages and durations to the minimum required. Follow patients closely for signs of respiratory depression and sedation (see Section 4.4 Special warnings and precautions for use).

The combination of tramadol with mixed opiate agonists/antagonists (eg. buprenorphine, pentazocine) is not advisable because the analgesic effect of a pure agonist may be theoretically reduced in such circumstances.

Use with other serotonergic agents

The presence of another drug that increases serotonin by any mechanism should alert the treating physician to the possibility of an interaction. Concomitant therapeutic use of tramadol and serotonergic medicines such as selective serotonin re-uptake inhibitors (SSRIs), serotonin-norepinephrine reuptake inhibitors (SNRIs), MAO inhibitors (see Section 4.3 Contraindications), tricyclic antidepressants and mirtazapine may cause serotonin toxicity.

Serotonin syndrome is likely when one of the following is observed:

- Spontaneous clonus
- Inducible or ocular clonus with agitation or diaphoresis
- Tremor and hyperreflexia
- Hypertonia and body temperature $>38^{\circ}\text{C}$ and inducible or ocular clonus

Withdrawal of the serotonergic medicines usually brings about a rapid improvement. Drug treatment depends on the nature and severity of the symptoms.

Use with coumarin derivatives

Caution should be exercised during concomitant treatment with tramadol and coumarin derivatives (eg. warfarin) due to reports of increased international normalised ratio (INR) with major bleeding and ecchymoses in some patients.

Drugs which reduce the seizure threshold

Tramadol can induce convulsions and increase the potential for selective serotonin re-uptake inhibitors, norepinephrine reuptake inhibitors (SNRIs), tricyclic antidepressants, antipsychotics and other seizure threshold lowering agents (such as bupropion, mirtazapine, tetrahydrocannabinol) to cause convulsions.

Use with MAO inhibitors

Tramadol should not be used in patients who are taking MAO inhibitors or who have taken them within the last fourteen days, as tramadol inhibits the uptake of noradrenaline and serotonin (see Section 4.3 Contraindications).

Other interactions

Tramadol does not appear to induce its own metabolism in humans, since observed maximal plasma concentrations after multiple oral doses are higher than expected based on single-dose data. Tramadol is a mild inducer of selected drug metabolism pathways measured in animals.

Concomitant administration of tramadol with carbamazepine causes a significant increase in tramadol metabolism, presumably through metabolic induction by carbamazepine. Patients receiving chronic carbamazepine doses of up to 800 mg daily may require up to twice the recommended dose of tramadol.

Tramadol is metabolised to M1 by the CYP2D6 P450 isoenzyme. Drugs that selectively inhibit that isoenzyme (quinidine, phenothiazines, antipsychotic agents) may cause increased concentrations of tramadol and decreased concentrations of M1. The clinical consequences of these potential effects have not been fully investigated.

Concomitant administration of tramadol with cimetidine does not result in clinically significant changes in tramadol pharmacokinetics. Therefore no alteration of the tramadol dosage regimen is recommended.

Other drugs known to inhibit the CYP3A4 isoenzyme of cytochrome P450, such as ketoconazole and erythromycin, may inhibit the metabolism of tramadol (via N-demethylation) and probably the metabolism of the active O-demethylated metabolite (M1). The clinical importance of such an interaction has not been studied.

In a limited number of studies, the pre- or post-operative application of the antiemetic 5-HT₃ antagonist ondansetron increased the requirement of tramadol in patients with postoperative pain.

4.6 Fertility, pregnancy and lactation

Pregnancy – Category C

There are no adequate and well-controlled studies with tramadol in pregnant women, therefore, tramadol should not be used during pregnancy. Studies in animals using IV or IM routes of administration have not been conducted. Tramadol has been shown to be embryotoxic and foetotoxic in mice, rats and rabbits in maternally toxic doses of 120 mg/kg in mice, or higher in rats and 75 mg/kg in rabbits, but was not teratogenic at these dose levels. No harm to the foetus due to tramadol was seen at doses that were not maternally toxic. No drug-related teratogenic effects were observed in progeny of mice, rats or rabbits treated with tramadol (75 mg/kg for rats or 175 mg/kg for rabbits). Embryo and foetal toxicity consisted primarily of decreased foetal weights, skeletal ossification and increased supernumerary ribs at maternally toxic dose levels. Transient delays in development or behavioural parameters were also seen in pups from rat dams allowed to deliver. Embryo and foetal lethality were reported only in one rabbit study at 300 mg/kg, a dose that would cause extreme maternal toxicity in the rabbit.

In peri- and post-natal studies in rats, progeny of dams receiving oral (gavage) dose levels of 50 mg/kg or greater had decreased weights and pup survival was decreased early in lactation at 80 mg/kg (6-10 times the maximum human dose). No toxicity was observed for progeny of dams receiving 8, 10, 20, 25 or 40 mg/kg. Maternal toxicity was observed at all dose levels.

Labour and Delivery

Tramadol should not be used in pregnant women prior to or during labour unless the potential benefits outweigh the potential risks, because safe use in pregnancy has not been established. Chronic use during

pregnancy may lead to neonatal withdrawal symptoms. If tramadol were to be used during labour, it may cause respiratory depression in the newborn. Tramadol has been shown to cross the placenta. The mean ratio of serum tramadol in the umbilical veins compared to maternal veins was 0.83 for 40 women given tramadol during labour.

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

Use in lactation

Tramadol is not recommended during breast feeding, because its safety in infants and newborns has not been studied. Low levels of tramadol have been detected in breast milk. Following a single intravenous 100 mg dose of tramadol, the cumulative excretion in breast milk within 16 hours post-dose was 100 µg of tramadol (0.1% of the maternal dose) and 27 µg of M1.

Carcinogenesis, Mutagenesis and Impairment of Fertility

Tramadol was not mutagenic in the following assays: Ames Salmonella microsomal activation test, CHO/HPRT mammalian cell assay, mouse lymphoma assay (in the presence of metabolic activation), dominant lethal mutation tests in mice, chromosome aberration test in Chinese hamster cells, and bone marrow micronucleus tests in mice and Chinese hamster cells. Weakly mutagenic results occurred in the presence of metabolic activation in the mouse lymphoma assay and micronucleus tests in rat cells. Overall, the weight of evidence from these tests indicates tramadol does not possess a genotoxic risk to humans.

A slight, but statistically significant increase in two common murine tumours (pulmonary and hepatic) was observed in a mouse carcinogenicity study, particularly in aged mice dosed orally up to 30 mg/kg for approximately two years. Although the study was not conducted using the Maximum Tolerated Dose, or at exposure levels expected in clinical use, this finding is not believed to suggest risk in humans. No such findings occurred in a rat carcinogenicity study.

Post marketing surveillance does not suggest an adverse effect of tramadol on fertility. In rats tramadol dosages from 50 mg/kg/day upwards caused toxic effects. Published data suggest an adverse influence of tramadol in rodents on male sexual and testicular function, potentially resulting in impaired fertility.

4.7 Effects on ability to drive and use machines

Due to its sedative effect, patients should be advised to avoid driving or operating machinery whilst taking Arrow-Tramadol.

4.8 Undesirable effects

Adverse reactions that may occur after administration of tramadol resemble those known to occur with opioids. Adverse reactions were recorded in 13,802 patients from trials with different formulations of tramadol. The nature and incidence of reactions (in CIOMS format where very common $\geq 1/10$; common $\geq 1/100$ and $<1/10$; uncommon $\geq 1/1000$ and $<1/100$; rare $\geq 1/10,000$ and $<1/1000$; and very rare $\leq 1/10,000$) were as follows:

Cardiovascular

Uncommon: tachycardia, flushing

Rare: bradycardia

Investigations

Rare: increase in blood pressure

Vascular disorders

Uncommon: orthostatic dysregulation (tendency to collapse and cardiovascular collapse)

Respiratory, thoracic and mediastinal disorders

- Rare:* dyspnoea, respiratory depression (when recommended doses are considerably exceeded and other respiratory depressant substances are administered concomitantly)
- Very rare:* worsening of asthma (causality not established)
- Not known:* Hiccups, Central sleep apnoea syndrome

Gastrointestinal

- Very common:* nausea
- Common:* vomiting, constipation
- Uncommon:* dyspepsia, diarrhoea, abdominal pain, flatulence, urge to vomit

Metabolism and nutrition disorders

- Rare:* changes in appetite

Cases of hyponatremia have been reported in literature, though a causal relationship for tramadol has not been established.

Hepatobiliary disorders:

- Very rare:* elevated liver enzymes

Nervous system disorders

- Very common:* dizziness
- Common:* autonomic nervous effects (mainly dry mouth, perspiration), headache sedation, asthenia
- Uncommon:* trembling
- Rare:* speech disorders, paraesthesia, coordination disturbance, tremor, seizures, involuntary muscle contractions, syncope

Psychiatric disorders

- Rare:* hallucinations, confusional state, sleep disturbance, delirium, anxiety, nightmares, changes in mood (usually euphoric mood, occasionally dysphoria), changes in activity (usually suppression, occasionally increase), changes in cognitive and sensorial capacity (eg. decision behaviour, perception disorders)

Musculoskeletal and connective tissue disorders

- Rare:* motor system weakness

General disorders and administration site conditions:

- Common:* fatigue

Endocrine

- Very rare:* Syndrome of inappropriate antidiuretic hormone secretion characterised by hyponatraemia secondary to decreased free-water excretion

Cases of SIADH (syndrome of inappropriate antidiuretic hormone secretion) have been reported in literature, though a causal relationship for tramadol has not been established.

Skin and subcutaneous tissue disorders

- Common:* sweating
- Uncommon:* skin reactions, pruritus, rash

Immune system disorders

- Rare:* shock reactions, anaphylaxis, allergic reactions

Renal and urinary disorders

Rare: micturition disorders (difficulty in passing urine and urinary retention), dysuria

Eye disorders

Rare: miosis, mydriasis, visual disturbance (blurred vision)

The incidence of "non-specific CNS irritation" (dizziness), "autonomic nervous effects" (perspiration), "orthostatic dysregulation (tendency to collapse and cardiovascular collapse) and tachycardia and "nausea/urge to vomit/vomiting" can be increased with rapid intravenous administration and also tends to be dose dependent. No tests of significance have been performed.

Drug withdrawal reactions

Prolonged administration of tramadol may lead to dependence. In very rare cases (<0.1%) typical opiate withdrawal reactions include symptoms as follows: agitation, anxiety, nervousness, insomnia, hyperkinesia, tremor, pyrexia, myalgia, chills and gastrointestinal symptoms. Other symptoms that have very rarely been seen with tramadol discontinuation include panic attacks, severe anxiety, hallucinations, paraesthesias, tinnitus and unusual CNS symptoms (ie. confusion, delusions, personalization, derealisation, paranoia).

Reporting of suspected adverse reactions

Reporting suspected adverse reactions after authorisation of the medicine is important. It allows continued monitoring of the benefit/risk balance of the medicine. Healthcare professionals are asked to report any suspected adverse reactions (<https://nzphvc.otago.ac.nz/reporting/>).

4.9 Overdose

Few cases of overdose with tramadol have been reported.

Symptoms

Symptoms of overdosage with tramadol are similar to those of other centrally acting analgesics (opioids) and include miosis, vomiting, cardiovascular collapse, consciousness disorders including coma, convulsions, respiratory depression and respiratory arrest.

Treatment

Should overdosage occur, general emergency measures should be implemented. Keep the respiratory airways open, and maintain respiration and circulation.

Activated charcoal may reduce absorption of the drug if given within 1 to 2 hours after ingestion. In patients who are not fully conscious or have impaired gag reflex, considerations should be given to administering activated charcoal via a nasogastric tube, once the airway is protected.

Naloxone will reverse respiratory depression, but not all symptoms caused by overdosage with tramadol. Convulsions occurring in mice following the administration of toxic doses of tramadol could be suppressed with barbiturates or benzodiazepines, but were increased with naloxone. If convulsions are observed, diazepam should be given intravenously. Naloxone did not change the lethality of an overdose in mice.

Tramadol is minimally eliminated from the serum by haemodialysis or haemofiltration. Therefore treatment of overdosage with tramadol with haemodialysis or haemofiltration alone is not suitable for detoxification.

For advice on the management of overdose please contact the National Poisons Centre on 0800 POISON (0800 764766).

5. PHARMACOLOGICAL PROPERTIES

5.1 Pharmacodynamic properties

Pharmacotherapeutic group: Analgesics, other opioids, ATC code: N02AX02

Tramadol is a centrally-acting synthetic analgesic of the aminocyclohexanol group with opioid-like effects. It is not derived from natural sources, nor is it chemically related to opiates. Although pre-clinical testing has not completely explained the mode of action, at least two complementary mechanisms appear applicable: binding to μ -opioid receptors and inhibition of re-uptake of noradrenaline and serotonin. The opioid-like activity of tramadol derives from low affinity binding of the parent compound to μ -opioid receptors and higher affinity binding of the principal active metabolite, O-desmethyltramadol, denoted M1, to μ -opioid receptors. In animal models, M1 is up to 6 times more potent than tramadol in producing analgesia and 200 times more potent in μ -opioid binding. The contribution to human analgesia of tramadol relative to M1 is unknown.

Both animal and human studies have shown that antinociception induced by tramadol is only partially antagonised by the opiate antagonist naloxone. In addition, tramadol has been shown to inhibit re-uptake of noradrenaline and serotonin in vitro, as have some other opioid analgesics. These latter mechanisms may contribute independently to the overall analgesic profile of tramadol.

The analgesic effect is dose-dependant, but the relationship between serum concentrations and analgesic effect varies considerably between individuals. In one study, the median serum concentration of tramadol required for effective post-operative analgesia was 300 ng/mL, with individual values ranging from 20 to 990 ng/mL.

Apart from analgesia, tramadol may produce other symptoms similar to that of opioids including: dizziness, somnolence, nausea, constipation, sweating and pruritus. However, tramadol causes significantly less respiratory depression than morphine. In contrast to morphine, tramadol has not been shown to cause histamine release. At therapeutic doses, tramadol has no clinically significant effect on heart rate, left ventricular function or cardiac index. Orthostatic changes in blood pressure have been observed.

5.2 Pharmacokinetic properties

Tramadol is administered as a mixture of two stereoisomers; the following information refers to the combined concentration of both isomers. Tramadol has a linear pharmacokinetic profile within the therapeutic dosage range.

Absorption

Tramadol is rapidly and almost completely absorbed after oral administration of 50 mg capsules following a mean absorption delay (t_0) of approximately thirty minutes. The absorption half-life ($t_{1/2}$) is 23 ± 11 minutes. After oral administration of two 50 mg capsules, the mean absolute bioavailability (f_{abs}) is 68-72%, and the peak serum level (C_{max}) is reached two hours (range one to three) after administration. The mean peak plasma concentration (C_{max}) is approximately 280 ng/mL after oral administration of two capsules. At this time, the mean serum concentration after intravenous injection is 1.46 times higher, amounting to approximately 410 ng/mL.

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

After repeated oral administration of 50 mg and 100 mg tramadol capsules at six hourly intervals, steady state is reached 30 to 36 hours after the first administration and the bioavailability is greater than 90%. The plasma concentrations at steady state exceeded by 52% and 36% those extrapolated from the single dose administration studies with 50 mg and 100 mg capsules, respectively. This can be explained by first pass metabolic saturation.

Distribution

Tramadol is rapidly distributed in the body, with a volume of distribution of 2 - 3 L/kg in young adults. The volume of distribution is reduced by about 25% in those aged over 75 years. Plasma protein binding is about 20% and is independent of concentration up to 10 µg/mL. Saturation of plasma protein binding occurs only at concentrations outside the clinically relevant range.

Tramadol crosses the placental and blood-brain barriers. Very small amounts of tramadol and M1 are found in breast milk (0.1% and 0.02% respectively of the administered dose).

Metabolism

Tramadol is extensively metabolised after oral administration. The major metabolic pathways appear to be N - and O -demethylation and glucuronidation or sulfation in the liver. Only O -desmethyltramadol (M1) is pharmacologically active. Production of M1 is dependent on the CYP2D6 isoenzyme of cytochrome P450. Patients who metabolise drugs poorly via CYP2D6 may obtain reduced benefit from tramadol, due to reduced formation of M1. N-demethylation is catalysed by the CYP3A4 isoenzyme of cytochrome P450. The inhibition of one or both types of the isoenzymes CYP3A4 and CYP2D6 involved in the biotransformation of tramadol may affect the plasma concentration of tramadol or its active metabolite.

Excretion

Tramadol and its metabolites are excreted mainly by the kidneys, with a cumulative renal excretion (tramadol and metabolites) of approximately 95%. In young adults approximately 15 - 19% of an administered dose of tramadol is excreted in the urine as unmetabolised drug. In the elderly, this increases to about 35%. Biliary excretion is of little importance. In young adults, the half-life of tramadol is 5 - 7 h and the half-life of M1 is 6 - 8 h. Total clearance is approximately 430 - 610 mL/min.

Pharmacokinetics in patients with hepatic or renal impairment

Elimination of tramadol and M1 is impaired in patients with hepatic or renal impairment (see Section 4.4 Special warnings and precautions for use). In patients with hepatic impairment, the mean half-life of tramadol was found to be 13 h (range up to 19 h), and the mean half-life of M1 was 19 h (range up to 36 h). In patients with severe renal impairment (creatinine clearance < 5mL/min) the mean half-life of tramadol was 11 h (range up to 20 h), and the mean half life of M1 was 17 h (range up to 43 h).

Pharmacokinetics in the elderly

In the elderly (age over 75 years), the volume of distribution of tramadol is decreased by 25% and clearance is decreased by 40%. As a result, tramadol C_{max} and total exposure are increased by 30% and 50%, respectively, but the half-life of tramadol is only slightly prolonged (by 15%).

5.3 Preclinical safety data

None.

6. PHARMACEUTICAL PARTICULARS

6.1 List of excipients

Microcrystalline cellulose, sodium starch glycolate, colloidal anhydrous silica, magnesium stearate and purified water. Excipients in the capsule shell are: Yellow ferric oxide (E172), Indigo carmine (E132), Titanium dioxide (E171), Sodium lauryl sulfate, Methyl parahydroxybenzoate (E218), Propyl parahydroxybenzoate (E216) & Gelatin.

6.2 Incompatibilities

Not applicable.

6.3 Shelf life

36 months

6.4 Special precautions for storage

Store below 25°C. Store in original package.

6.5 Nature and contents of container

PVC/PVdC/Aluminium foil blister strips. Pack size of 10, 20, 100, 1000 capsules.

Not all pack sizes or pack types may be marketed.

6.6 Special precautions for disposal

No special requirements for disposal.

7. MEDICINE SCHEDULE

Prescription Medicine

8. SPONSOR

Teva Pharma (New Zealand) Limited

PO Box 128 244

Remuera

Auckland 1541

Telephone: 0800 800 097

9. DATE OF FIRST APPROVAL

26 November 2009

10. DATE OF REVISION OF THE TEXT

20 August 2021

SUMMARY TABLE OF CHANGES

Section changed	Summary of new information
4.3	Patients with severe respiratory disease, acute respiratory disease and respiratory depression added as a Contraindication.
4.4	Warning and Precautions added/ revised: <ul style="list-style-type: none">- Hazardous and harmful use- Respiratory depression (addition of central sleep apnoea)- Risks from concomitant use of benzodiazepines or other CNS depressants, including alcohol- Use of opioids in chronic (long-term) non-cancer pain (CNCP)- Tolerance, dependence and withdrawal- Accidental ingestion/exposure- Hyperalgesia- Ceasing opioids- Patients physically dependent on opioids- Adrenal insufficiency
4.6	Information on postmarket fertility included.
4.8	Information on hiccups, SIADH, hyponatraemia and central sleep apnoea included.