

Summary of Product Characteristics

1 NAME OF THE MEDICINAL PRODUCT

Tapimio 50 mg prolonged-release tablets

2 QUALITATIVE AND QUANTITATIVE COMPOSITION

Each prolonged-release tablet contains tapentadol phosphate equivalent to 50 mg tapentadol.

For the full list of excipients, see section 6.1.

3 PHARMACEUTICAL FORM

Prolonged-release tablet.

White, oblong, biconvex prolonged-release tablets (6 mm x 13 mm) with score lines on both sides.

The tablet can be divided into equal doses.

4 CLINICAL PARTICULARS

4.1 Therapeutic indications

Tapimio is indicated for the management of severe chronic pain in adults, which can be adequately managed only with opioid analgesics.

4.2 Posology and method of administration

Posology

The dosing regimen should be individualised according to the severity of pain being treated, the previous treatment experience and the ability to monitor the patient.

Tapimio should be taken twice daily, approximately every 12 hours.

Initiation of therapy

Initiation of therapy in patients currently not taking opioid analgesics

Patients should start treatment with single doses of 50 mg Tapimio administered twice daily.

Initiation of therapy in patients currently taking opioid analgesics

When switching from opioids to Tapimio and choosing the initial dose, the nature of the previous medicinal product, administration and the mean daily dose should be taken into account. This may require higher initial doses of Tapimio for patients currently taking opioids compared to those not having taken opioids before initiating therapy with Tapimio.

Titration and maintenance

After initiation of therapy the dose should be titrated individually to a level that provides adequate analgesia and minimises undesirable effects under the close supervision of the prescribing physician.

Experience from clinical trials has shown that a titration regimen in increments of 50 mg prolonged release tapentadol twice daily every 3 days was appropriate to achieve adequate pain control in most of the patients.

Total daily doses of more than 500 mg prolonged-release tapentadol have not yet been studied and are therefore not recommended.

Discontinuation of treatment

Withdrawal symptoms could occur after abrupt discontinuation of treatment with tapentadol (see section 4.8). When a patient no longer requires therapy with tapentadol, it is advisable to taper the dose gradually to prevent symptoms of withdrawal.

Special populations

Renal impairment

In patients with mild or moderate renal impairment a dose adjustment is not required (see section 5.2).

Prolonged-release tapentadol has not been studied in controlled efficacy trials in patients with severe renal impairment, therefore the use in this population is not recommended (see sections 4.4 and 5.2).

Hepatic impairment

In patients with mild hepatic impairment a dose adjustment is not required (see section 5.2).

Tapimio should be used with caution in patients with moderate hepatic impairment. Treatment in these patients should be initiated at the lowest available dose strength, i.e. Tapimio 25 mg, and not be administered more frequently than once every 24 hours. At initiation of therapy a daily dose greater than 50 mg prolonged-release tapentadol is not recommended. Further treatment should reflect maintenance of analgesia with acceptable tolerability (see sections 4.4 and 5.2).

Prolonged-release tapentadol has not been studied in patients with severe hepatic impairment and therefore, use in this population is not recommended (see sections 4.4 and 5.2).

Elderly patients (≥65 years)

In general, a dose adaptation in elderly patients is not required. However, as elderly patients are more likely to have decreased renal and hepatic function, care should be taken in dose selection as recommended (see sections 4.2 and 5.2).

Paediatric population

The safety and efficacy of Tapimio in children and adolescents below 18 years of age has not yet been established. Therefore Tapimio is not recommended for use in this population.

Method of administration

Tapimio is for oral use.

The prolonged-release tablet must not be crushed or chewed, to ensure that the prolonged-release mechanism is maintained.

Tapimio should be taken with sufficient liquid.

Tapimio can be taken with or without food.

The shell (matrix) of the tablet may not be digested completely and therefore it can be eliminated and seen in the patient's stool. However, this finding has no clinical relevance, since the active substance of the tablet will have already been absorbed.

4.3 Contraindications

- Hypersensitivity to the active substance or to any of the excipients listed in section 6.1
- Situations where active substances with mu-opioid receptor agonist activity are contraindicated, i.e. patients with significant respiratory depression (in unmonitored settings or the absence of resuscitative equipment), and patients with acute or severe bronchial asthma or hypercapnia
- Any patient who has or is suspected of having paralytic ileus
- Patients with acute intoxication with alcohol, hypnotics, centrally acting analgesics, or psychotropic active substances (see section 4.5)

4.4 Special warnings and precautions for use*Tolerance and Opioid Use Disorder (abuse and dependence)*

Tolerance, physical and psychological dependence, and opioid use disorder (OUD) may develop upon repeated administration of opioids. Abuse or intentional misuse of opioids may result in overdose and/or death. The risk of developing OUD is increased in patients with a personal or a family history (parents or siblings) of substance use disorders (including alcohol use disorder), in current tobacco users or in patients with a personal history of other mental health disorders (e.g. major depression, anxiety and personality disorders).

Patients will require monitoring for signs of drug-seeking behaviour (e.g. too early requests for refills). This includes the review of concomitant opioids and psycho-active drugs (like benzodiazepines). For patients with signs and symptoms of OUD, consultation with an addiction specialist should be considered.

Risk from concomitant use of sedating medicinal products such as benzodiazepines or related substances

Concomitant use of Tapimio and sedating medicinal products such as benzodiazepines or related substances may result in sedation, respiratory depression, coma and death. Because of these risks, concomitant prescribing with these sedating medicinal products should be reserved for patients for whom alternative treatment options are not possible. If a decision is made to prescribe Tapimio concomitantly with sedating medicinal products, the reduction of dose of one or both medicinal products should be considered and the duration of the concomitant treatment should be as short as possible.

The patients should be followed closely for signs and symptoms of respiratory depression and sedation. In this respect, it is strongly recommended to inform patients and their caregivers to be aware of these symptoms (see section 4.5).

Respiratory depression

At high doses or in mu-opioid receptor agonist sensitive patients, Tapimio may produce dose-related respiratory depression. Therefore, Tapimio should be administered with caution to patients with impaired respiratory functions. Alternative non-mu-opioid receptor agonist analgesics should be considered and Tapimio should be employed only under careful medical supervision at the lowest effective dose in such patients. If respiratory depression occurs, it should be treated as any mu-opioid receptor agonist-induced respiratory depression (see section 4.9).

Head injury and increased intracranial pressure

Tapimio should not be used in patients who may be particularly susceptible to the intracranial effects of carbon dioxide retention such as those with evidence of increased intracranial pressure, impaired consciousness, or coma. Analgesics with mu-opioid receptor agonist activity may obscure the clinical course of patients with head injury. Tapimio should be used with caution in patients with head injury and brain tumours.

Seizures

Prolonged-release tapentadol has not been systematically evaluated in patients with a seizure disorder, and such patients were excluded from clinical trials. However, like other analgesics with mu-opioid receptor agonist activity Tapimio is not recommended in patients with a history of a seizure disorder or any condition that would put the patient at risk of seizures. In addition, tapentadol may increase the seizure risk in patients taking other medicinal products that lower the seizure threshold (see section 4.5).

Renal impairment

Prolonged-release tapentadol has not been studied in controlled efficacy trials in patients with severe renal impairment, therefore the use in this population is not recommended (see sections 4.2 and 5.2).

Hepatic impairment

Subjects with mild and moderate hepatic impairment showed a 2-fold and 4.5-fold increase in systemic exposure, respectively, compared with subjects with normal hepatic function. Tapimio should be used with caution in patients with moderate hepatic impairment (see sections 4.2 and 5.2), especially upon initiation of treatment.

Prolonged-release tapentadol has not been studied in patients with severe hepatic impairment and therefore, use in this population is not recommended (see sections 4.2 and 5.2).

Use in pancreatic/biliary tract disease

Active substances with mu-opioid receptor agonist activity may cause spasm of the sphincter of Oddi. Tapimio should be used with caution in patients with biliary tract disease, including acute pancreatitis.

Sleep-related breathing disorders

Opioids can cause sleep-related breathing disorders including central sleep apnea (CSA) and sleep-related hypoxaemia. Opioid use increases the risk of CSA in a dose-dependent fashion. In patients who present with CSA, consider decreasing the total opioid dose.

Mixed opioid agonists/antagonists

Care should be taken when combining Tapimio with mixed mu-opioid agonist/antagonists (like pentazocine, nalbuphine) or partial mu-opioid agonists (like buprenorphine). In patients maintained on buprenorphine for the treatment of opioid dependence, alternative treatment options (like e.g. temporary buprenorphine discontinuation) should be considered, if administration of full mu-agonists (like tapentadol) becomes necessary in acute pain situations. On combined use with buprenorphine, higher dose requirements for full mu-receptor agonists have been reported and close monitoring of adverse events such as respiratory depression is required in such circumstances.

4.5 Interaction with other medicinal products and other forms of interaction

Centrally-acting medicinal products/central nervous system (CNS) depressants, including alcohol and CNS depressant narcotic drugs

The concomitant use of Tapimio with sedating medicinal products such as benzodiazepines or other respiratory or CNS depressants (other opioids, antitussives or substitution treatments, barbiturates, antipsychotics, H1-antihistamines, alcohol) increases the risk of sedation, respiratory depression, coma and death because of additive CNS depressant effect. Therefore,

when a combined therapy of Tapimio with a respiratory or CNS depressant is contemplated, the reduction of dose of one or both medicinal products should be considered and the duration of the concomitant use should be limited (see section 4.4). The concomitant use of opioids and gabapentinoids (gabapentin and pregabalin) increases the risk of opioid overdose, respiratory depression and death.

Mixed opioid agonists/antagonists

Care should be taken when combining Tapimio with mixed mu-opioid agonist/antagonists (like pentazocine, nalbuphine) or partial mu-opioid agonists (like buprenorphine) (see also section 4.4).

Tapimio can induce convulsions and increase the potential for selective serotonin reuptake inhibitors (SSRIs), serotonin-norepinephrine reuptake inhibitors (SNRIs), tricyclic antidepressants, antipsychotics and other medicinal products that lower the seizure threshold to cause convulsions.

There have been reports of serotonin syndrome in a temporal connection with the therapeutic use of tapentadol in combination with serotonergic medicinal products such as selective serotonin re-uptake inhibitors (SSRIs), serotonin-norepinephrine reuptake inhibitors (SNRIs) and tricyclic antidepressants.

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 °C and inducible ocular clonus.

Withdrawal of the serotonergic medicinal products usually brings about a rapid improvement. Treatment depends on the nature and severity of the symptoms.

The major elimination pathway for tapentadol is conjugation with glucuronic acid mediated via uridine diphosphate transferase (UGT) mainly UGT1A6, UGT1A9 and UGT2B7 isoforms. Thus, concomitant administration with strong inhibitors of these isoenzymes (e.g. ketoconazole, fluconazole, meclofenamic acid) may lead to increased systemic exposure of tapentadol (see section 5.2).

For patients on tapentadol treatment, caution should be exercised if concomitant administration of strong enzyme inducing substances (e.g. rifampicin, phenobarbital, St John's Wort (*Hypericum perforatum*)) starts or stops, since this may lead to decreased efficacy or risk for adverse effects, respectively.

Treatment with Tapimio should be avoided in patients who are receiving monoamine oxidase (MAO) inhibitors or who have taken them within the last 14 days due to potential additive effects on synaptic noradrenaline concentrations which may result in adverse cardiovascular events, such as hypertensive crisis.

4.6 Fertility, pregnancy and lactation

Pregnancy

There is very limited amount of data from the use in pregnant women.

Studies in animals have not shown teratogenic effects. However, delayed development and embryotoxicity were observed at doses resulting in exaggerated pharmacology (mu-opioid-related CNS effects related to dosing above the therapeutic range). Effects on the postnatal development were already observed at the maternal NOAEL (see section 5.3).

Tapimio should be used during pregnancy only if the potential benefit justifies the potential risk to the foetus. Long-term maternal use of opioids during pregnancy coexposes the foetus. The newborn may experience subsequent neonatal withdrawal syndrome (NOWS). Neonatal opioid withdrawal syndrome can be life-threatening if not recognised and treated. An antidote for the newborn should be readily available.

Labour and delivery

The effect of tapentadol on labour and delivery in humans is unknown. Tapimio is not recommended for use in women during and immediately before labour and delivery. Due to the mu-opioid receptor agonist activity of tapentadol, new-born infants whose mothers have been taking tapentadol should be monitored for respiratory depression.

Breastfeeding

There is no information on the excretion of tapentadol in human milk. From a study in rat pups suckled by dams dosed with tapentadol it was concluded that tapentadol is excreted in milk (see section 5.3). Therefore, a risk to the suckling child cannot be excluded. Tapimio should not be used during breastfeeding.

Fertility

No human data on the effect of Tapimio on fertility are available. In a fertility and early embryonic development study, no effects on reproductive parameters were observed in male or female rats (see section 5.3).

4.7 Effects on ability to drive and use machines

Tapimio may have major influence on the ability to drive and use machines, because it may adversely affect central nervous system functions (see section 4.8). This has to be expected especially at the beginning of treatment, when any change of dose occurs as well as in connection with the use of alcohol or tranquilisers (see section 4.4). Patients should be cautioned as to whether driving or use of machines is permitted.

4.8 Undesirable effects

The adverse drug reactions that were experienced by patients in the placebo-controlled trials performed with tapentadol prolonged-release were predominantly of mild and moderate severity. The most frequent adverse drug reactions were in the gastrointestinal and central nervous system (nausea, dizziness, constipation, headache and somnolence).

The table below lists adverse drug reactions that were identified from clinical trials performed with tapentadol prolonged-release and from post-marketing environment. They are listed by class and frequency. Frequencies are defined as very common ($\geq 1/10$); common ($\geq 1/100$ to $< 1/10$); uncommon ($\geq 1/1,000$ to $< 1/100$); rare ($\geq 1/10,000$ to $< 1/1,000$); very rare ($< 1/10,000$), not known (cannot be estimated from the available data).

ADVERSE DRUG REACTIONS					
System Organ Class	Frequency				
	Very common	Common	Uncommon	Rare	Not known
Immune system disorders			Drug hypersensitivity*		
Metabolism and nutrition disorders		Decreased appetite	Weight decreased		
Psychiatric disorders		Anxiety, Depressed mood, Sleep disorder, Nervousness, Restlessness	Disorientation, Confusional state, Agitation, Perception disturbances, Abnormal dreams, Euphoric mood	Drug dependence, Thinking abnormal	Delirium**
Nervous system disorders	Dizziness, Somnolence, Headache	Disturbance in attention, Tremor, Muscle contractions involuntary	Depressed level of consciousness, Memory impairment, Mental impairment, Syncope, Sedation, Balance disorder, Dysarthria, Hypoaesthesia,	Convulsion, Presyncope, Coordination abnormal	

			Paraesthesia		
Eye disorders			Visual disturbance		
Cardiac disorders			Heart rate increased, Heart rate decreased, Palpitations		
Vascular disorders		Flushing	Blood pressure decreased		
Respiratory, thoracic and mediastinal disorders		Dyspnoea		Respiratory depression	
Gastrointestinal disorders	Nausea, Constipation	Vomiting, Diarrhoea, Dyspepsia	Abdominal discomfort	Impaired gastric emptying	
Skin and subcutaneous tissue disorders		Pruritus, Hyperhidrosis, Rash	Urticaria		
Renal and urinary disorders			Urinary hesitation, Pollakiuria		
Reproductive system and breast disorders			Sexual dysfunction		
General disorders and administration site conditions		Asthenia, Fatigue, Feeling of body temperature change, Mucosal dryness, Oedema	Drug withdrawal syndrome, Feeling abnormal, Irritability	Feeling drunk, Feeling of relaxation	
* Post-marketing rare events of angioedema, anaphylaxis and anaphylactic shock have been reported.					
** Post-marketing cases of delirium were observed in patients with additional risk factors such as cancer and advanced age.					

Clinical trials performed with tapentadol prolonged-release with patient exposure up to 1 year have shown little evidence of withdrawal symptoms upon abrupt discontinuations and these were generally classified as mild, when they occurred. Nevertheless, physicians should be vigilant for symptoms of withdrawal (see section 4.2) and treat patients accordingly should they occur.

The risk of suicidal ideation and suicides committed is known to be higher in patients suffering from chronic pain. In addition, substances with a pronounced influence on the monoaminergic system have been associated with an increased risk of suicidality in patients suffering from depression, especially at the beginning of treatment. For tapentadol data from clinical trials and post-marketing reports do not provide evidence for an increased risk.

Reporting of suspected adverse reactions

Reporting suspected adverse reactions after authorisation of the medicinal product is important. It allows continued monitoring of the benefit/risk balance of the medicinal product. Healthcare professionals are asked to report any suspected adverse reactions via [the HPRA Pharmacovigilance Website: www.hpra.ie](http://www.hpra.ie).

4.9 Overdose

Symptoms

Human experience with overdose of tapentadol is very limited. Preclinical data suggest that symptoms similar to those of other centrally acting analgesics with mu-opioid receptor agonist activity are to be expected upon intoxication with tapentadol. In principle, these symptoms include, referring to the clinical setting, in particular miosis, vomiting, cardiovascular collapse, consciousness disorders up to coma, convulsions and respiratory depression up to respiratory arrest.

Management

Management of overdose should be focused on treating symptoms of mu-opioid agonism. Primary attention should be given to re-establishment of a patent airway and institution of assisted or controlled ventilation when overdose of tapentadol is suspected.

Pure opioid receptor antagonists such as naloxone are specific antidotes to respiratory depression resulting from opioid overdose. Respiratory depression following an overdose may outlast the duration of action of the opioid receptor antagonist. Administration of an opioid receptor antagonist is not a substitute for continuous monitoring of airway, breathing, and circulation following an opioid overdose. If the response to opioid receptor antagonists is suboptimal or only brief in nature, an additional dose of antagonist (e.g. naloxone) should be administered as directed by the manufacturer of the medicinal product. Gastrointestinal decontamination may be considered in order to eliminate unabsorbed active substance. Gastrointestinal decontamination with activated charcoal or by gastric lavage may be considered within 2 hours after intake. Before attempting gastrointestinal decontamination, care should be taken to secure the airway.

5 PHARMACOLOGICAL PROPERTIES

5.1 Pharmacodynamic properties

Pharmacotherapeutic group: Analgesics; opioids; other opioids, ATC code: N02AX06.

Tapentadol is a strong analgesic with μ -agonistic opioid and additional noradrenaline reuptake inhibition properties. Tapentadol exerts its analgesic effects directly without a pharmacologically active metabolite.

Tapentadol demonstrated efficacy in preclinical models of nociceptive, neuropathic and visceral pain; efficacy has been verified in clinical trials with tapentadol prolonged-release formulations in non-malignant nociceptive and neuropathic chronic pain conditions as well as chronic tumour-related pain. The trials in pain due to osteoarthritis and chronic low back pain showed similar analgesic efficacy of tapentadol to a strong opioid used as a comparator.

Effects on the cardiovascular system

In a thorough human QT trial, no effect of multiple therapeutic and suprathreshold doses of tapentadol on the QT interval was shown. Similarly, tapentadol had no relevant effect on other ECG parameters (heart rate, PR interval, QRS duration, T-wave or U-wave morphology).

Post-marketing data

Two post-marketing studies were performed to address the practical use of tapentadol.

The efficacy of a tapentadol prolonged-release formulation has been verified in a multicentre, randomised, double blind parallel-group trial with patients suffering from low back pain with a neuropathic component (KF5503/58). Reductions in average pain intensity were similar in the tapentadol treatment group and the comparator treatment group i.e. receiving a combination of a tapentadol prolonged-release formulation and pregabalin immediate-release tablets.

In an open-label, multicentre, randomised trial with patients having severe chronic low back pain with a neuropathic component (KF5503/60), a tapentadol prolonged-release formulation was associated with significant reductions in average pain intensity.

Paediatric population

The European Medicines Agency has deferred the obligation to submit the results of studies with the reference medicinal product containing tapentadol in all subsets of the paediatric population in severe chronic pain (see section 4.2 for information on paediatric use).

5.2 Pharmacokinetic properties

Absorption

Mean absolute bioavailability after single-dose administration (fasting) of tapentadol prolonged-release tablets is approximately 32% due to extensive first-pass metabolism. Maximum serum concentrations of tapentadol are observed at between 3 and 6 hours after administration of prolonged-release tablets.

Dose proportional increases for AUC have been observed after administration of the prolonged-release tablets over the therapeutic dose range.

A multiple dose trial with twice daily dosing using 86 mg and 172 mg tapentadol administered as prolonged-release tablets showed an accumulation ratio of about 1.5 for the parent active substance which is primarily determined by the dosing interval

and apparent half-life of tapentadol. Steady state serum concentrations of tapentadol are reached on the second day of the treatment regimen.

Food effect

The AUC and C_{max} increased by 8% and 18%, respectively, when prolonged-release tablets were administered after a high-fat, high-calorie breakfast. This was judged to be without clinical relevance as it falls into the normal inter-subject variability of tapentadol PK parameters. Tapimio may be given with or without food.

Distribution

Tapentadol is widely distributed throughout the body. Following intravenous administration, the volume of distribution (V_z) for tapentadol is 540 +/- 98 l. The serum protein binding is low and amounts to approximately 20 %.

Biotransformation

In humans, the metabolism of tapentadol is extensive. About 97 % of the parent compound is metabolised. The major pathway of tapentadol metabolism is conjugation with glucuronic acid to produce glucuronides. After oral administration approximately 70 % of the dose is excreted in urine as conjugated forms (55 % glucuronide and 15 % sulfate of tapentadol). Uridine diphosphate glucuronyl transferase (UGT) is the primary enzyme involved in the glucuronidation (mainly UGT1A6, UGT1A9 and UGT2B7 isoforms). A total of 3 % of active substance is excreted in urine as unchanged active substance. Tapentadol is additionally metabolised to N-desmethyl tapentadol (13 %) by CYP2C9 and CYP2C19 and to hydroxy tapentadol (2 %) by CYP2D6, which are further metabolised by conjugation. Therefore, active substance metabolism mediated by cytochrome P450 system is of less importance than glucuronidation.

None of the metabolites contributes to the analgesic activity.

Elimination

Tapentadol and its metabolites are excreted almost exclusively (99 %) via the kidneys. The total clearance after intravenous administration is 1530 +/- 177 ml/min. Terminal half-life is on average 5-6 hours after oral administration.

Special populations

Elderly patients

The mean exposure (AUC) to tapentadol was similar in a trial with elderly subjects (65-78 years of age) compared to young adults (19-43 years of age), with a 16% lower mean C_{max} observed in the elderly subject group compared to young adult subjects.

Renal impairment

AUC and C_{max} of tapentadol were comparable in subjects with varying degrees of renal function (from normal to severely impaired). In contrast, increasing exposure (AUC) to tapentadol-O-glucuronide was observed with increasing degree of renal impairment. In subjects with mild, moderate, and severe renal impairment, the AUC of tapentadol-O-glucuronide are 1.5-, 2.5-, and 5.5-fold higher compared with normal renal function, respectively.

Hepatic impairment

Administration of tapentadol resulted in higher exposures and serum levels to tapentadol in subjects with impaired hepatic function compared to subjects with normal hepatic function. The ratio of tapentadol pharmacokinetic parameters for the mild and moderate hepatic impairment groups in comparison to the normal hepatic function group were 1.7 and 4.2, respectively, for AUC; 1.4 and 2.5, respectively, for C_{max} ; and 1.2 and 1.4, respectively, for $t_{1/2}$. The rate of formation of tapentadol-O-glucuronide was lower in subjects with increased liver impairment.

Pharmacokinetic interactions

Tapentadol is mainly metabolised by glucuronidation, and only a small amount is metabolised by oxidative pathways. As glucuronidation is a high capacity/low affinity system, which is not easily saturated even in disease, and as therapeutic concentrations of active substances are generally well below the concentrations needed for potential inhibition of glucuronidation, any clinically relevant interactions caused by glucuronidation are unlikely to occur. In a set of drug-drug interaction trials using paracetamol, naproxen, acetylsalicylic acid and probenecid, a possible influence of these active substances on the glucuronidation of tapentadol was investigated. The trials with probe active substances naproxen (500 mg twice daily for 2 days) and probenecid (500 mg twice daily for 2 days) showed increases in AUC of tapentadol by 17 % and 57 %, respectively. Overall, no clinically relevant effects on the serum concentrations of tapentadol were observed in these trials.

Furthermore, interaction trials of tapentadol with metoclopramide and omeprazole were conducted to investigate a possible influence of these active substances on the absorption of tapentadol. These trials also showed no clinically relevant effects on tapentadol serum concentrations.

In vitro studies did not reveal any potential of tapentadol to either inhibit or induce cytochrome P450 enzymes. Thus, clinically relevant interactions mediated by the cytochrome P450 system are unlikely to occur.

Plasma protein binding of tapentadol is low (approximately 20%). Therefore, the likelihood of pharmacokinetic interactions by displacement from the protein binding site is low.

5.3 Preclinical safety data

Tapentadol was not genotoxic in bacteria in the Ames test. Equivocal findings were observed in an *in vitro* chromosomal aberration test, but when the test was repeated the results were clearly negative. Tapentadol was not genotoxic *in vivo*, using the two endpoints of chromosomal aberration and unscheduled DNA synthesis, when tested up to the maximum tolerated dose. Long-term animal studies did not identify a potential carcinogenic risk relevant to humans.

Tapentadol had no influence on male or female fertility in rats but there was reduced *in utero* survival at the high dose. It is not known whether this was mediated via the male or the female. Tapentadol showed no teratogenic effects in rats and rabbits following intravenous and subcutaneous exposure. However, delayed development and embryotoxicity were observed after administration of doses resulting in exaggerated pharmacology (mu-opioid related CNS effects related to dosing above the therapeutic range). After intravenous dosing in rats reduced *in utero* survival was seen. In rats tapentadol caused increased mortality of the F₁ pups that were directly exposed via milk between days 1 and 4 postpartum already at doses that did not provoke maternal toxicities. There were no effects on neurobehavioral parameters.

Excretion into breast milk was investigated in rat pups suckled by dams dosed with tapentadol. Pups were dose-dependently exposed to tapentadol and tapentadol O-glucuronide. It was concluded that tapentadol is excreted in milk.

6 PHARMACEUTICAL PARTICULARS

6.1 List of excipients

Tablet core

Microcrystalline cellulose (E460)

Hypromellose (E464)

Silica, colloidal anhydrous (E551)

Magnesium stearate

Tablet coating

Hypromellose (E464)

Glycerol (E422)

Talc (E553b)

Microcrystalline cellulose (E460)

Titanium dioxide (E171)

6.2 Incompatibilities

Not applicable.

6.3 Shelf life

2 years.

6.4 Special precautions for storage

This medicinal product does not require any special storage conditions.

6.5 Nature and contents of container

Child resistant aluminium PVC/PE/PVDC perforated unit dose blisters.

20x1, 24x1, 28x1, 30x1, 50x1, 54x1, 60x1 or 100x1 prolonged-release tablets.

Not all pack sizes may be marketed.

6.6 Special precautions for disposal

Any unused medicinal product or waste material should be disposed of in accordance with local requirements.

7 MARKETING AUTHORISATION HOLDER

Neuraxpharm Ireland Limited
4045 Kingswood Road
Citywest
Dublin 24
Ireland

8 MARKETING AUTHORISATION NUMBER

PA23229/005/002

9 DATE OF FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION

Date of first authorisation: 4th November 2022

10 DATE OF REVISION OF THE TEXT

November 2022