

## **NEW ZEALAND DATA SHEET**

### **1. PRODUCT NAME**

Ilevro<sup>®</sup> nepafenac 0.3% Eye Drops Suspension Once Daily

### **2. QUALITATIVE AND QUANTITATIVE COMPOSITION**

Ilevro Eye Drops contains nepafenac 3 mg in 1mL

#### Excipient with known effect

Benzalkonium chloride 0.05 mg in 1 mL as a preservative.

For the full list of excipients, see section 6.1.

### **3. PHARMACEUTICAL FORM**

Eye drops, suspension.

pH approximately 6.8.

### **4. CLINICAL PARTICULARS**

#### **4.1. Therapeutic indications**

Ilevro is indicated for the prevention and treatment of postoperative pain and inflammation associated with cataract surgery.

#### **4.2. Dose and method of administration**

For ophthalmic use only.

For individual patient use only.

Shake the bottle well before use. After cap is removed, if tamper evident snap collar is loose, remove before using Ilevro.

If more than one topical ophthalmic medicinal product is being used, the medicinal products must be administered at least 5 minutes apart. Eye ointments should be administered last.

To prevent contamination of the dropper tip and solution, care must be taken not to touch the eyelids, surrounding areas or other surfaces with the dropper tip of the bottle.

Instruct patients to keep the bottle tightly closed when not in use.

For the prevention and treatment of pain and inflammation, the dose is 1 drop of Ilevro in the conjunctival sac of the affected eye(s) once a day beginning 1 day prior to cataract surgery and continued on the day of surgery. In clinical studies, the effectiveness of Ilevro was demonstrated for up to 14 days of the postoperative period. Treatment durations greater than two weeks and a dosing frequency of more than once daily have not been assessed. An additional drop should be administered 30 to 120 minutes prior to surgery.

Nasolacrimal occlusion and gently closing the eyelid after instillation are recommended. This may reduce the systemic absorption of eye drops and result in a decrease in systemic adverse reactions.

If a dose is missed, one drop should be administered as soon as possible before reverting to the regular dosage routine. Do not use double the amount to make up for the dose that was missed. Using multiple doses may cause unwanted side effects.

### **4.3. Contraindications**

Hypersensitivity to the active substance nepafenac or to any of the excipients in Ilevro (refer to 6.1. List of excipients).

Hypersensitivity to other nonsteroidal anti-inflammatory drugs (NSAIDs).

Patients in whom attacks of asthma, urticaria or acute rhinitis are precipitated by acetylsalicylic acid or other NSAIDs.

Soft contact lenses should not be used with Ilevro because the benzalkonium chloride preservative may be absorbed by these lenses.

### **4.4. Special warnings and precautions for use**

FOR OPHTHALMIC USE – not for oral ingestion.

Ilevro should not be used for the reduction in the risk of postoperative macular oedema associated with cataract surgery as efficacy and safety of this strength for this indication has not been studied.

Patients should be instructed to avoid sunlight during treatment with Ilevro.

#### **Ocular effects**

Use of topical NSAIDs may result in keratitis. In some susceptible patients, continued use of topical NSAIDs may result in epithelial breakdown, corneal thinning, corneal erosion, corneal ulceration or corneal perforation. These events may be sight threatening. Patients with evidence of corneal epithelial breakdown should immediately discontinue use of Ilevro and should be monitored closely for corneal health.

Post-marketing experience with topical NSAIDs suggests that patients with complicated ocular surgeries, corneal denervation, corneal epithelial defects, diabetes mellitus, ocular surface diseases (e.g. dry eye syndrome), rheumatoid arthritis or repeat ocular surgeries within a short period of time may be at increased risk for corneal adverse reactions which may become sight threatening. Topical NSAIDs should be used with caution in these patients. Post-marketing experience with topical NSAIDs also suggest that use more than 24 hours prior to surgery or use beyond 14 days post- surgery may increase patient risk and severity of corneal adverse events.

There have been reports that ophthalmic NSAIDs may cause increased bleeding of ocular tissues (including hyphaemas) in conjunction with ocular surgery. Use Ilevro with caution in patients with known bleeding tendencies or who are receiving other medicinal products which may prolong bleeding time.

An acute ocular infection may be masked by the topical use of anti-inflammatory medicines. NSAIDs do not have any antimicrobial properties. In case of ocular infection, their use with anti-infectives should be undertaken with care.

#### **Hepatic / Renal Impairment**

Ilevro has not been studied in patients with hepatic disease or renal impairment. Nepafenac is eliminated primarily through biotransformation and the systemic exposure is very low following topical ocular administration. No dose adjustment is warranted in these patients.

#### **Concomitant therapy**

There are very limited data on the concomitant use of prostaglandin analogues and Ilevro. Considering their mechanisms of action, the concomitant use of these medicinal products is not recommended.

### **Delayed healing**

Topical NSAIDs may slow or delay healing. Topical corticosteroids are also known to slow or delay healing. Concomitant use of topical NSAIDs and topical steroids may increase the potential for healing problems. Therefore, it is recommended that caution should be exercised if Ilevro is administered concomitantly with corticosteroids, particularly in patients at high risk for corneal adverse reactions described below.

### **Benzalkonium chloride**

Ilevro contains benzalkonium chloride which may cause eye irritation and is known to discolour soft contact lenses. Soft contact lenses should not be used with Ilevro because the benzalkonium chloride preservative may be absorbed by these lenses. Benzalkonium chloride has been reported to cause punctate keratopathy and/or toxic ulcerative keratopathy. Since Ilevro contains benzalkonium chloride, close monitoring is required with frequent or prolonged use.

### **Cross-sensitivity**

There is a potential for cross-sensitivity of nepafenac to acetylsalicylic acid, phenylacetic acid derivatives and other NSAIDs.

### **Paediatric population**

The safety and efficacy of Ilevro in children and adolescents has not been established and its use is not recommended for use in patients under 18 years of age.

## **4.5 Interactions with other medicinal products and other forms of interactions**

*In vitro* studies have demonstrated a very low potential for interaction with other medicinal products and protein binding interactions.

Neither nepafenac nor amfenac inhibit any of the major human cytochrome P450 (CYP1A2, 2C9, 2C19, 2D6, 2E1 and 3A4) metabolic activities *in vitro* at concentrations up to 3000 ng/mL. Therefore, interactions involving CYP-mediated metabolism of concomitantly administered medicinal products are unlikely. Interactions mediated by protein binding are also unlikely.

There are very limited data on the concomitant use of prostaglandin analogues and Ilevro. Considering their mechanisms of action, the concomitant use of these medicinal products is not recommended.

Concomitant use of topical NSAIDs and topical steroids may increase the potential for healing problems. Concomitant use of Ilevro with medications that prolong bleeding time may increase the risk of haemorrhage.

## **4.6 Fertility, pregnancy and lactation**

### **Use in pregnancy**

#### **Category C**

Ilevro should not be used by women of child bearing potential not using contraception.

There are no adequate data regarding the use of nepafenac in pregnant women.

Since the systemic exposure in non-pregnant women is negligible after treatment with Ilevro, the risk during pregnancy could be considered low. Nevertheless, as inhibition of prostaglandin synthesis may negatively affect pregnancy and/or embryonal/fetal development and/or parturition and/or postnatal development, Ilevro is not recommended during pregnancy. For preclinical studies in pregnancy are included in section 5.3 Preclinical safety data, pregnancy.

## Breast-feeding

It is unknown whether nepafenac is excreted in human milk. The use of nepafenac or Ilevro is not recommended during breast-feeding (also refer to pregnancy above).

Preclinical data in breast-feeding is included in section 5.3 Preclinical safety data, Lactation.

## Effect on fertility

There are no data on the effect of Ilevro on human fertility. Preclinical data in fertility is included in section 5.3 Preclinical safety data, fertility.

### 4.7 Effects on ability to drive or use machines

Temporary blurred vision or other visual disturbances may affect the ability to drive or use machines. If blurred vision occurs at instillation, the patient must wait until the vision clears before driving or using machinery.

### 4.8 Undesirable effects

#### Adverse events in clinical trials

The most common treatment-emergent adverse events, independent of a causal association, occurring at rates  $\geq 1.0\%$  included headache and intraocular pressure increased. Headache was observed in 27 (2.0%) patients treated with Ilevro compared with 13 (1.6%) patients treated with nepafenac 1 mg/mL and 5 (1.1%) patients treated with nepafenac vehicle 0.3%. Intraocular pressure increase was observed in 15 (1.1%) patients treated with Ilevro compared with 7 (0.9%) patients treated with nepafenac 1 mg/mL and 1 (0.2%) patients treated with nepafenac vehicle 0.3%. Intraocular pressure increases typically resolved within 5 days following treatment initiation (3 days following surgery). All adverse events of headache or intraocular pressure increase were considered mild to moderate in intensity.

<b>Coded Adverse Event</b>	<b>Nepafenac 3 mg/mL (N = 1339) N (%)</b>	<b>Nepafenac Vehicle 3 mg/mL (N=455) N (%)</b>
<b>Eye disorders</b>		
Posterior capsule rupture	8 (0.6)	1 (0.2)
Corneal oedema	6 (0.4)	6 (1.3)
Cystoid macular oedema	4 (0.3)	3 (0.7)
Conjunctival haemorrhage	5 (0.4)	1 (0.2)
Iritis	1 (0.1)	3 (0.7)
<b>Gastrointestinal disorders</b>		
Toothache	5 (0.4)	--

<b>General disorders and administration site conditions</b>		
Pain	4 (0.3)	--
<b>Injury, poisoning and procedural complications</b>		
Injury	9 (0.7)	3 (0.7)
Cataract operation complication	3 (0.2)	3 (0.7)
Corneal abrasion	6 (0.4)	1 (0.2)
<b>Investigations</b>		
Intraocular pressure	15 (1.1)	1 (0.2)
<b>Musculoskeletal and connective tissue disorders</b>		
Back pain	4 (0.3)	1 (0.2)
<b>Nervous system disorders</b>		
Headache	27 (2.0)	5 (1.1)
<b>Vascular disorders</b>		
Hypertension	5 (0.4)	1 (0.2)
Frequent AEs = Treatment-emergent AEs (related and unrelated, combined).		

The adverse events hypersensitivity, punctate keratitis and eye pain were reported less frequently.

Additional adverse events have been observed with the use of nepafenac 1 mg/mL eye drops, suspension and may also be observed with the use of Ilevro. In clinical studies involving patients receiving nepafenac 1 mg/mL eye drops, suspension, the most common adverse reactions were punctate keratitis, foreign body sensation and eyelid margin crusting which occurred in between 0.4% and 0.2% of patients.

Adverse events are classified according to the following convention: 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 ( $< 1/10,000$ ) or not known (cannot be estimated from available data). Within each frequency grouping, adverse reactions are presented in order of decreasing seriousness.

<b>System organ classification</b>	<b>Adverse reactions</b>
Immune system disorders	<i>Rare</i> : hypersensitivity
Nervous system disorders	<i>Rare</i> : dizziness
Eye disorders	<i>Uncommon</i> : keratitis, punctate keratitis, corneal epithelium defect, foreign body sensation in eyes, eyelid margin crusting. <i>Rare</i> : iritis, choroidal effusion, corneal deposits, eye pain, ocular discomfort, blepharitis, eye pruritus, eye discharge, allergic conjunctivitis, increased lacrimation, conjunctival hyperaemia.
Vascular disorders	<i>Uncommon</i> : hypertension.
Gastrointestinal disorders	<i>Rare</i> : nausea.
Skin and subcutaneous tissue disorders	<i>Rare</i> : cutis laxa (dermatochalasis), allergic dermatitis.

#### Post marketing

Additional adverse reactions identified from post-marketing surveillance with Ilevro and nepafenac 1 mg/mL eye drops, suspension include the following.

Frequencies cannot be estimated from the available data. Within each System Organ Class adverse reactions are presented in order of decreasing seriousness.

System organ classification	Adverse reactions
Nervous system disorders	Not known: headache.
Eye disorders	Not known: impaired healing (cornea), corneal opacity, corneal scar, reduced visual acuity, eye irritation, eye swelling, ulcerative keratitis, corneal thinning, blurred vision.
Gastrointestinal disorders	Not known: vomiting

#### *Diabetic patients*

In the two clinical studies involving 209 patients, diabetic patients were exposed to nepafenac 1 mg/mL eye drops, suspension treatment for 60 days or greater for the prevention of macular oedema post cataract surgery. The most frequently reported adverse reaction was punctate keratitis which occurred in 3% of patients, resulting in a frequency category of common. The other reported adverse reactions were corneal epithelium defect and allergic dermatitis which occurred in 1% and 0.5% of patients, respectively both adverse reactions with a frequency category of uncommon.

From post-marketing experience with nepafenac 1 mg/mL eye drops, suspension, cases reporting corneal epithelium defect/disorder have been identified. Severity of these cases vary from non-serious effects on the epithelial integrity of the corneal

epithelium to more serious events where surgical interventions and/or medical therapy are required to regain clear vision.

Post-marketing experience with topical NSAIDs suggests that patients with complicated ocular surgeries, corneal denervation, corneal epithelial defects, diabetes mellitus, ocular surface diseases (e.g., dry eye syndrome), rheumatoid arthritis or repeat ocular surgeries within a short period of time may be at increased risk for corneal adverse reactions which may become sight threatening.

### **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**

A topical overdose of Ilevro may be flushed from the eye(s) with warm tap water.

There is no experience of overdose by the ophthalmic route. The application of more than one drop per eye is unlikely to lead to unwanted side-effects.

A bottle of Ilevro contains 9 mg of nepafenac (3 mg/mL). In a clinical study in which subjects received a single 10 mg oral administration of <sup>14</sup>C-nepafenac, no safety concerns based upon a review of adverse events and an assessment of clinical laboratory, cardiovascular and general physical examination parameters were evident. In an acute toxicity study in mice no signs of toxicity were observed after oral administration of nepafenac up to 2000 mg/kg dose (~4400, and ~13,000 times the potential full bottle dose in a child and adult respectively) and in an acute toxicity study in rats animals administered orally with nepafenac at a dose of 100 mg/kg, kg (~220, and ~660 times the potential full bottle dose in a child and adult respectively), survived the observation period of 7 days, swollen abdomens, red exudates on face, little or no stool and less active behavior was seen. Therefore, an oral overdose of Ilevro is unlikely to result in significant toxicity. However there is no data of the effects of oral overdose in young children or the elderly.

For advice on the management of overdose please contact the National Poisons Centre on 0800 POISON or 0800 764 766.

## **5. PHARMACOLOGICAL PROPERTIES**

### **5.1 Pharmacodynamic properties**

Pharmacotherapeutic group: Sensory organ; ophthalmologicals; mydriatics and cycloplegics ATC Code S01FA06.

#### Mechanism of action

Nepafenac is a non-steroidal, anti-inflammatory and analgesic drug. After topical ocular dosing, nepafenac penetrates the cornea and is converted by ocular tissue hydrolases to amfenac, which is a non-steroidal, anti-inflammatory metabolite. Nepafenac and amfenac inhibit the action of prostaglandin H synthase (cyclooxygenase), an enzyme required for prostaglandin production.

#### Pharmacodynamic effects

In rabbits, nepafenac has been shown to inhibit blood-retinal-barrier breakdown, concomitant with suppression of PGE2 synthesis. In rabbits, a single topical ocular dose of nepafenac was shown to inhibit prostaglandin synthesis in the iris/ciliary body

by up to 89% with inhibition of 36% still present after 30 hours. *Ex vivo*, PGE2 synthesis in the retina/choroid was inhibited by 38 – 50% for up to 80 minutes post-dose.

In rabbits, the rate of hydrolytic conversion of nepafenac to amfenac was highest in the retina/choroid followed by the iris/ciliary body and cornea. In human ocular tissues, the highest rate of hydrolytic conversion was in the iris/ciliary body, with lower conversion rates observed in retina/choroid and cornea.

Results from clinical studies indicate that Ilevro has no significant effect on intraocular pressure.

### Clinical efficacy and safety

The efficacy and safety of Ilevro in the prevention and treatment of postoperative pain and inflammation associated with cataract surgery has been demonstrated in two masked, double blind, placebo-controlled clinical trials in which a total of 3462 patients were randomized. Of these, 1339 patients received at least one dose of nepafenac 0.3%. In these studies in which patients were dosed daily beginning one day prior to cataract surgery, continued on the day of surgery and for the first 14 days of the postoperative period, Ilevro demonstrated superior clinical efficacy compared to its vehicle in treating postoperative pain and inflammation.

Both studies enrolled patients requiring cataract surgery by phacoemulsification and implantation of a posterior chamber intraocular lens. Patients had no baseline inflammation and did not receive any anti-inflammatory medication other than the assigned therapy. Patients with a history of chronic or recurrent inflammatory eye diseases and patients at increased risk of developing postoperative macular oedema (e.g. diabetic retinopathy patients) in the operative eye were excluded from the study.

Patients treated with Ilevro were less likely to have ocular pain and measurable signs of inflammation (aqueous cells and flare) in the early postoperative period through to the end of treatment than those treated with its vehicle. In the two studies, Ilevro cleared inflammation at day 14 post operation in 65% and 68% of patients compared to 25% and 35% of patients on vehicle. Pain free rates in the Ilevro group were 89% and 91% compared to 40% and 50% of patients on vehicle. The Day 14 results for reduction of both pain and inflammation were statistically significantly superior to the vehicle.

## **5.2 Pharmacokinetic properties**

### Absorption

Following one drop of Ilevro in both eyes once daily for four days, low but quantifiable plasma concentrations of nepafenac and amfenac were observed in the majority of subjects 2 and 3 hours post-dose, respectively. The mean steady-state plasma C<sub>max</sub> for nepafenac and for amfenac were  $0.847 \pm 0.269$  ng/mL and  $1.13 \pm 0.491$  ng/mL, respectively, following ocular administration.

### Distribution

Amfenac has a high affinity towards serum albumin proteins. *In vitro*, the percentages of amfenac bound to rat albumin, human albumin and human serum are 98.4%, 95.4% and 99.1%, respectively. The binding percentages of nepafenac to plasma proteins for rat, monkey and human are 72.8%, 79.8% and 83.5%, respectively.

Studies in rats have shown that radioactive labelled active substance-related materials distribute widely in the body following single and multiple oral doses of <sup>14</sup>C-



nepafenac.

#### Biotransformation

Nepafenac undergoes relatively rapid bioactivation to amfenac via intraocular hydrolases. Subsequently, amfenac undergoes extensive metabolism to more polar metabolites involving hydroxylation of the aromatic ring leading to glucuronide conjugate formation.

Radiochromatographic analyses before and after  $\beta$ -glucuronidase hydrolysis indicated that all metabolites were in the form of glucuronide conjugates, with the exception of amfenac. Amfenac was the major metabolite in plasma, representing approximately 13% of total plasma radioactivity. The second most abundant plasma metabolite was identified as 5-hydroxy nepafenac, representing approximately 9% of total radioactivity at C<sub>max</sub>.

Metabolite profiles of radioactivity in rabbit ocular tissues following a topical dose of 0.3% <sup>14</sup>C-AL- 6516 showed only AL-6516, AL-6295 and a minor unidentified metabolite.

#### Elimination

After oral administration of <sup>14</sup>C-nepafenac to healthy volunteers, urinary excretion was found to be the major route of radioactive excretions, accounting for approximately 85% while faecal excretion represented approximately 6% of the dose.

### **5.3 Preclinical safety data**

#### Carcinogenicity

Nepafenac has not been evaluated in long-term carcinogenicity studies.

#### Mutagenicity

Nepafenac was not mutagenic in bacteria or mammalian cells, but induced chromosomal aberrations *in-vitro* in Chinese Hamster Ovary cells at concentrations that had precipitate. Nepafenac was not clastogenic in mice *in-vivo*, even at very high oral doses (5000 mg/kg). The weight of evidence indicates a low genotoxic potential for nepafenac.

#### Pregnancy

Studies in animals have shown nepafenac and/or its metabolites cross the placenta and are associated with reproductive toxicity. In oral reproduction studies performed with nepafenac in rats, there was no evidence of teratogenicity but maternally toxic doses of 10 mg/kg/day or greater were associated with dystocia, increased post-implantation loss and reduced fetal weights, growth and survival (systemic exposure more than 800 times clinical exposure, based on total AUC for nepafenac and amfenac). Oral administration of 3 mg/kg/day or greater from early gestation to weaning was associated with maternal mortality around parturition (exposure about 170 times clinical exposure based on AUC), with higher, maternotoxic doses linked to reductions in live births and pup survival and growth. In pregnant rabbits, oral administration of 30 mg/kg/day during organogenesis produced slight maternotoxicity and a statistically significant increase in the incidence of litter malformations (exposure about 1000 times clinical exposure, based on AUC). The no-effect dose of 10 mg/kg/day was associated with AUC exposure 135 times clinical exposure. The potential risk for humans is unknown.

#### Breast-feeding

Animal studies have shown excretion of nepafenac and/or its metabolites in the milk of

rats. However, no effects on the suckling child are anticipated since the systemic exposure of the breastfeeding woman to nepafenac is negligible.

### Fertility

In male rats, oral dosing of nepafenac decreased sperm motility but did not impair reproductive performance at estimated systemic exposure more than 300 times clinical exposure, based on AUC for nepafenac and amfenac. At similar high exposures in female rats, oral dosing of nepafenac did not impair fertility but did not increase the rate of early resorptions. At the no-effect dose in rat fertility studies (3 mg/kg/day), estimated systemic exposure (AUC) was greater than 80 times clinical exposure.

## **6. PHARMACEUTICAL PARTICULARS**

### **6.1. List of excipients**

Benzalkonium chloride 0.05 mg in 1 mL as a preservative

Boric acid

Polypropylene glycol

Carbomer 974P

Sodium chloride

Guar galactomannan

Carmellose sodium

Disodium edetate

Hydrochloric acid and/or sodium hydroxide to adjust pH

Purified water.

### **6.2 Incompatibilities**

Unknown.

### **6.3 Shelf life**

### **6.4 Special precautions for storage**

Store Ilevro below 25°C. Protect from light.

Discard 4 weeks after opening.

### **6.5 Nature and contents of container**

4 mL round white (opaque) low density polyethylene (LDPE) bottles with a LDPE dispensing plug and white polypropylene screw cap (Drop-Tainer®) containing 3 mL eye drops suspension.

### **6.6 Special precautions for disposal**

No special requirements for disposal.

## **7. MEDICINE SCHEDULE**

Prescription Only Medicine.

## **8. SPONSOR**

Novartis New Zealand Limited

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Newmarket

Auckland 1149

New Zealand

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## **9. DATE OF FIRST APPROVAL**

9 March 2017

## **10. DATE OF REVISION OF THE TEXT**

30 September 2020

### **Summary Table of Changes**

Section changed	Summary of new information
8. Sponsor	Removed Sponsor's old address

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