

# Summary of Product Characteristics

## 1 NAME OF THE MEDICINAL PRODUCT

Ibuprofen Pinewood 200 mg Film-coated Tablets

## 2 QUALITATIVE AND QUANTITATIVE COMPOSITION

Each tablet contains 200 mg of Ibuprofen.

### Excipient(s) with known effect

Each tablet contains 0.546 mg of sodium.

For the full list of excipients, see section 6.1.

## 3 PHARMACEUTICAL FORM

Film-coated Tablet (Tablet).

Pink, circular, film-coated tablets with the markings 'IBU 200' on one side and plain on reverse.

## 4 CLINICAL PARTICULARS

### 4.1 Therapeutic indications

Ibuprofen Pinewood tablets are indicated in the management of various arthroses such as rheumatoid arthritis including Stills disease and osteoarthritis, fibrositis, and ankylosing spondylitis and other muscular syndromes, such as low back pain, soft tissue trauma and various inflammations of the tendon, joint capsules and ligaments.

Ibuprofen Pinewood tablets are also indicated for the treatment of mild to moderate pain (such as dysmenorrhoea, dental and post-operative pain).

### 4.2 Posology and method of administration

#### Posology

For oral administration.

In general, NSAIDS should only be used when an anti-inflammatory effect is required. NSAIDs should be used with particular caution in the elderly who are more prone to adverse events. Undesirable effects may be minimized by using the lowest effective dose for the shortest duration necessary to control symptoms (*see section 4.4, Special warnings and precautions for use*). Treatment should be reviewed at regular intervals and discontinued if no benefit is seen or intolerance occurs.

#### Adults:

The usual dose is 1200 to 1600 mg daily in divided doses. Some patients may be maintained on 600-1200 mg daily. The maximum daily dose should not exceed 2400 mg.

#### Elderly:

The recommended adult dose is appropriate. No specific dosage modifications are required unless renal or hepatic function is impaired, in which case dosage should be assessed individually.

Care should be taken in elderly patients in whom increased tissue levels may result from the normal processes of ageing, with an attendant increase in the risk of adverse reactions (which are more likely to be masked by concurrent therapy or disease in the elderly).

#### Children:

Over 30 kg body weight: 20 mg/kg in divided doses

20-30 kg body weight: The maximum daily dose is 400 mg.

Under 20 kg body weight: Not recommended.

If in children and adolescents this medicinal product is required for more than 3 days, or if symptoms worsen a doctor should be consulted.

#### 4.3 Contraindications

- Known hypersensitivity to the active substance or to any of the excipients listed in section 6.1.
- Ibuprofen should not be given to patients who have experienced asthma, urticaria or allergic-type reactions after taking acetylsalicylic acid/aspirin or other NSAIDs.
- Severe heart failure (NYHA IV).
- Severe liver failure.
- Severe renal failure (glomerular filtration below 30 ml/min).
- Conditions involving an increased tendency or active bleeding.
- History of gastrointestinal bleeding or perforation, related to previous NSAID therapy.
- Active, or history of recurrent peptic ulceration or gastrointestinal haemorrhage (defined as two or more distinct episodes of proven ulceration or bleeding).
- During the third trimester of pregnancy (see section 4.6).

#### 4.4 Special warnings and precautions for use

##### General

Undesirable effects may be minimised by using the lowest effective dose for the shortest duration necessary to control symptoms (see section 4.2, and GI and cardiovascular risks below).

Patients treated with NSAIDs long-term should undergo regular medical supervision to monitor for adverse events.

Caution is required in patients with renal, hepatic or cardiac impairment since the use of NSAIDs may result in deterioration of renal function. The habitual concomitant intake of similar painkillers further increases this risk. For patients with renal, hepatic or cardiac impairment, use the lowest effective dose, for the shortest possible duration (see Section 4.3).

The use of ibuprofen may impair female fertility and is not recommended in women attempting to conceive. In women who have difficulties conceiving or who are undergoing investigation of infertility, withdrawal of ibuprofen should be considered.

The use of Ibuprofen Pinewood tablets with concomitant NSAIDs including cyclooxygenase-2 selective inhibitors should be avoided due to the potential for additive effects.

On prolonged use of any painkillers, headache may occur that must not be treated with increased doses of the medicinal product.

Through concomitant consumption of alcohol, active substance-related undesirable effects, particularly those that concern the gastrointestinal tract or the central nervous system, may be increased on use of NSAIDs.

Use with caution in patients with hepatic dysfunction (see section 4.3 and section 4.8)

##### Elderly

Elderly patients have an increased frequency of adverse reactions to NSAIDs especially gastrointestinal bleeding and perforation which may be fatal. Prolonged use of NSAIDs in the elderly is not recommended. Where prolonged therapy is required, patients should be reviewed regularly.

##### Gastrointestinal bleeding, ulceration and perforation

NSAIDs should be given with care to patients with a history of peptic ulceration and other gastrointestinal disease since their conditions may be exacerbated (see section 4.3).

Gastrointestinal bleeding, ulceration or perforation, which can be fatal, has been reported with all NSAIDs at any time during treatment, with or without warning symptoms or a previous history of serious gastrointestinal events.

The risk of GI bleeding, ulceration or perforation is higher with increasing NSAID doses, in patients with a history of ulcer, particularly if complicated with haemorrhage or perforation (see section 4.3), and in the elderly. These patients should commence treatment on the lowest dose available.

Combination therapy with protective agents (e.g. misoprostol or proton pump inhibitors) should be considered for these patients, and also for patients requiring concomitant low-dose acetylsalicylic acid/aspirin, or other drugs likely to increase gastrointestinal risk (see section 4.5).

The concomitant administration of Ibuprofen Pinewood tablets and other NSAIDs, including cyclooxygenase-2 (Cox-2) selective inhibitors, should be avoided due to the increased risk of ulceration or bleeding (see section 4.5).

Patients with a history of GI disease, particularly when elderly, should report any unusual abdominal symptoms (especially GI bleeding) particularly in the initial stages of the treatment.

NSAIDs should be used with care to patients with a history of gastrointestinal disease (ulcerative colitis or Crohn's disease) as their condition may be exacerbated (see section 4.8).

Caution should be advised in patients receiving concomitant medications which could increase the risk of ulceration or bleeding, such as oral corticosteroids, anticoagulants such as warfarin, selective serotonin-reuptake inhibitors or anti-platelet agents such as acetylsalicylic acid/aspirin (see section 4.5).

When GI bleeding or ulceration occurs in patients receiving Ibuprofen Pinewood Tablets, the treatment should be withdrawn.

#### Respiratory disorders

Caution is required if ibuprofen is administered to patients suffering from, or with a previous history of, bronchial asthma, chronic rhinitis or allergic diseases since ibuprofen has been reported to cause bronchospasm, urticaria or angioedema in such patients.

#### Cardiovascular and cerebrovascular effects

Appropriate monitoring and advice are required for patients with a history of hypertension and/or mild to moderate congestive heart failure as fluid retention and oedema have been reported in association with NSAID therapy. Clinical studies suggest that use of ibuprofen, particularly at a high dose (2400 mg/day) may be associated with a small increased risk of arterial thrombotic events (for example myocardial infarction or stroke). Overall, epidemiological studies do not suggest that low dose ibuprofen (e.g.  $\leq 1200$  mg/day) is associated with an increased risk of arterial thrombotic events.

Patients with uncontrolled hypertension, congestive heart failure (NYHA II-III), established ischaemic heart disease, peripheral arterial disease, and/or cerebrovascular disease should only be treated with ibuprofen after careful consideration and high doses (2400 mg/day) should be avoided. Careful consideration should also be exercised before initiating long-term treatment of patients with risk factors for cardiovascular events (e.g. hypertension, hyperlipidaemia, diabetes mellitus, smoking) particularly if high doses of ibuprofen (2400 mg/day) are required.

#### Renal effects

In patients with renal impairment caution is required as renal function may further deteriorate (see section 4.3 and section 4.8). Assessment of renal function should occur prior to the initiation of therapy and regularly thereafter. The dose should be kept as low as possible and renal function should be monitored.

Caution should be used when initiating treatment with Ibuprofen Pinewood tablets in patients with considerable dehydration. There is a risk of renal impairment especially in dehydrated children, adolescents and the elderly.

As with other NSAIDs, long-term administration of Ibuprofen has resulted in renal papillary necrosis and other renal pathological changes. Renal toxicity has also been seen in patients in whom renal prostaglandins have a compensatory role in the maintenance of renal perfusion. In these patients, administration of an NSAID may cause a dose-dependent reduction in prostaglandins formation and, secondarily, in renal blood flow, which may cause renal failure. Patients at greatest risk of this reaction are those with impaired renal function, heart failure, liver dysfunction, those who are taking diuretics and ACE inhibitors and the elderly. Discontinuation of NSAID drug therapy is usually followed by recovery to the pre-treatment state.

Haematological effects

As NSAIDs can interfere with platelet function, and may prolong bleeding time, they should be used with caution in patients with intracranial haemorrhage and bleeding diathesis.

Dermatological effectsSevere skin reactions

Serious skin reactions, some of them fatal, including exfoliative dermatitis, Stevens-Johnson syndrome and toxic epidermal necrolysis, have been reported very rarely in association with the use of NSAIDs (see section 4.8). Patients appear to be at highest risk of these reactions early in the course of therapy, the onset of the reaction occurring in the majority of cases within the first month of treatment. Acute generalised exanthematous pustulosis (AGEP) has been reported in relation to ibuprofen-containing products. Ibuprofen Pinewood should be discontinued at the first appearance of skin rash, mucosal lesions or any other sign of hypersensitivity.

Exceptionally, varicella can be at the origin of serious cutaneous and soft tissues infectious complications. To date, the contributing role of NSAIDs in the worsening of these infections cannot be ruled out. Thus, it is advisable to avoid use of Ibuprofen in case of varicella.

Masking of symptoms of underlying infections

Ibuprofen can mask symptoms of infection, which may lead to delayed initiation of appropriate treatment and thereby worsening the outcome of the infection. This has been observed in bacterial community acquired pneumonia and bacterial complications to varicella. When ibuprofen is administered for fever or pain relief in relation to infection, monitoring of infection is advised. In non-hospital settings, the patient should consult a doctor if symptoms persist or worsen.

Aseptic Meningitis

Aseptic Meningitis has been observed on rare occasions in patients with Ibuprofen therapy. Although it is probably more likely to occur in patients with systematic lupus erythematosus and related connective tissue diseases, it has been reported in patients who do not have an underlying chronic disease.

This medicine contains less than 1 mmol sodium (23 mg) per tablet, that is to say essentially 'sodium free'.

**4.5 Interaction with other medicinal products and other forms of interaction**

It is considered unsafe to take NSAIDs in combination with warfarin or heparin unless under direct medical supervision.

Care should be taken in patients treated with any of the following drugs as interactions have been reported:

<b>Concomitant use of ibuprofen with:</b>	<b>Possible effects:</b>
Other NSAIDs including cyclooxygenase-2 selective inhibitors	Concomitant use with other NSAIDs including cyclooxygenase-2 selective inhibitors should be avoided due to the potential for additive effects
Cardiac glycosides	NSAIDs may exacerbate heart failure, reduce glomerular filtration rate and increase plasma levels of cardiac glycosides
Corticosteroids	Increased risk of gastrointestinal ulceration or bleeding with NSAIDs
Anticoagulants	NSAIDs may enhance the effects of anticoagulants, such as warfarin
Antiplatelet agents & selective serotonin-reuptake inhibitors (SSRIs), e.g. clopidogrel and ticlopidine	Increased risk of gastrointestinal bleeding with NSAIDs
Acetylsalicylic acid/aspirin	As with other products containing NSAIDs, concomitant administration of ibuprofen and acetylsalicylic acid/aspirin is not generally recommended because of the potential of increased adverse effects. Experimental data suggest that ibuprofen may competitively inhibit the effect of low dose acetylsalicylic acid/aspirin on platelet aggregation when they are dosed concomitantly. Although there are uncertainties regarding extrapolation of these data to the clinical situation, the possibility that regular long-term use of ibuprofen may reduce the cardioprotective effect of low-dose aspirin (acetylsalicylic acid) cannot be excluded. No clinically relevant effect is considered to be likely for occasional ibuprofen use (see section 5.1)
Lithium	NSAIDs may decrease elimination of lithium
Anti-hypertensive, beta-blockers and diuretics	NSAIDs may reduce the effect of anti-hypertensives, such as ACE inhibitors,

	angiotensin-II receptor antagonists, beta-blockers and diuretics. Diuretics can also increase the risk of nephrotoxicity of NSAIDs
Methotrexate	NSAIDs may inhibit the tubular secretion of methotrexate and reduce clearance of methotrexate.
Ciclosporine	Increased risk of nephrotoxicity with NSAIDs
Tacrolimus	Possible increased risk of nephrotoxicity when NSAIDs are given with tacrolimus
Zidovudine	Increased risk of haematological toxicity with NSAIDs are given with zidovudine. There is evidence of an increased risk of hemarthrosis and hematoma in HIV(+) haemophiliacs receiving concurrent treatment with zidovudine and ibuprofen
Quinolone antibiotics	Animal data indicate that NSAIDs can increase the risk of convulsions associated with quinolone antibiotics. Patients taking NSAIDs and quinolones may have an increased risk of developing convulsions.
CYP2C9 inhibitors	Concomitant administration of ibuprofen with CYP2C9 inhibitors may increase the exposure to ibuprofen (CYP2C9 substrate). In a study with voriconazole and fluconazole (CYP2C9 inhibitors), an increased S(+)-ibuprofen exposure by approximately 80 to 100% has been shown. Reduction of the ibuprofen dose should be considered when potent CYP2C9 inhibitors are administered concomitantly, particularly when high-dose ibuprofen is administered with either voriconazole or fluconazole.
Sulfonylureas	NSAIDs may potentiate the effects of sulfonylurea medications. There have been rare reports of hypoglycaemia in patients on sulfonylurea medications receiving ibuprofen.
Cholestyramine	The concomitant administration of ibuprofen and cholestyramine may reduce the absorption of ibuprofen in the gastrointestinal tract. However, the clinical significance is unknown.
Aminoglycosides	NSAIDs may decrease the excretion of aminoglycosides.
Herbal extracts	Ginkgo biloba may potentiate the risk of bleeding with NSAIDs.
Mifepristone	A decrease in the efficacy of the medicinal product can theoretically occur due to the antiprostaglandin properties of NSAIDs including acetylsalicylic acid. Limited evidence suggests that coadministration of NSAIDs on the day of prostaglandin administration does not adversely influence the effects of mifepristone or the prostaglandin on cervical ripening or uterine contractility and does not reduce the clinical efficacy of medicinal termination of pregnancy.
Probenecid	There have been no reports of interactions between probenecid and ibuprofen. However, probenecid produces a reduction in metabolism and elimination of some NSAIDs and metabolites.
Other protein binding drugs	Care should be taken in the concomitant use of other protein binding drugs e.g. sulphonamides and hydantoins.

#### 4.6 Fertility, pregnancy and lactation

##### Pregnancy

Inhibition of prostaglandin synthesis may adversely affect the pregnancy and/or the embryo/foetal development. Data from epidemiological studies suggest an increased risk of miscarriage and of cardiac malformation and gastroschisis after use of a prostaglandin synthesis inhibitor in early pregnancy. The absolute risk for cardiovascular malformation was increased from less than 1%, up to approximately 1.5%. The risk is believed to increase with dose and duration of therapy.

In animals, administration of a prostaglandin synthesis inhibitor has been shown to result in increased pre- and post-implantation loss and embryo-foetal lethality. In addition, increased incidences of various malformations, including cardiovascular, have been reported in animals given a prostaglandin synthesis inhibitor during the organogenetic period.

From the 20th week of pregnancy onward, Ibuprofen Pinewood tablets may cause oligohydramnios resulting from foetal renal dysfunction. This may occur shortly after treatment initiation and is usually reversible upon discontinuation. In addition, there have been reports of ductus arteriosus constriction following treatment in the second trimester, most of which resolved after treatment cessation. Therefore, during the first and second trimester of pregnancy, Ibuprofen Pinewood tablets should not be given unless clearly necessary. If Ibuprofen Pinewood tablets are used by a woman attempting to conceive, or during the first and second trimester of pregnancy, the dose should be kept as low and duration of treatment as short as possible. Antenatal

monitoring for oligohydramnios and ductus arteriosus constriction should be considered after exposure to Ibuprofen Pinewood tablets for several days from gestational week 20 onward. Ibuprofen Pinewood tablets should be discontinued if oligohydramnios or ductus arteriosus constriction are found.

During the third trimester of pregnancy, all prostaglandin synthesis inhibitors may expose the foetus to:

- cardiopulmonary toxicity (premature constriction/closure of the ductus arteriosus and pulmonary hypertension);
- renal dysfunction (see above);

the mother and the neonate, at the end of pregnancy, to:

- possible prolongation of bleeding time, an anti-aggregating effect which may occur even at very low doses;
- inhibition of uterine contractions resulting in delayed or prolonged labour.

Consequently, Ibuprofen Pinewood tablets are contraindicated during the third trimester of pregnancy (see section 4.3).

#### Breastfeeding

In the limited studies so far available, ibuprofen appears in the breast milk in very low concentrations. Ibuprofen Pinewood is not recommended for use in nursing mothers.

#### Fertility

The use of ibuprofen may impair fertility and is not recommended in women attempting to conceive. In women who have difficulties conceiving or who are undergoing investigation of infertility, withdrawal of ibuprofen should be considered.

### **4.7 Effects on ability to drive and use machines**

Undesirable effects such as dizziness, drowsiness, fatigue and visual disturbances are possible after taking NSAIDs. Following treatment with ibuprofen, the reaction time of patients may be affected. This should be taken into account where increased vigilance is required e.g. when driving a car or operating machinery. This applies to a greater extent in combination with alcohol.

### **4.8 Undesirable effects**

#### Gastrointestinal disorders

The most commonly observed adverse events are gastrointestinal in nature. Peptic ulcers, perforation or GI bleeding, sometimes fatal, particularly in the elderly, may occur (see section 4.4). Nausea, vomiting, diarrhoea, flatulence, constipation, dyspepsia, abdominal pain, melaena, haematemesis, ulcerative stomatitis, exacerbation of colitis and Crohn's disease (see section 4.4) have been reported following administration. Less frequently, gastritis, duodenal ulcer and gastric ulcer and gastrointestinal perforation have been observed.

#### Immune system disorders

Hypersensitivity reactions have been reported following treatment with ibuprofen. These may consist of (a) non-specific allergic reaction and anaphylaxis, (b) respiratory tract reactivity comprising asthma, aggravated asthma, bronchospasm or dyspnoea, or (c) assorted skin disorders, including rashes of various types, pruritus, urticaria, purpura, angioedema and, very rarely, erythema multiforme, bullous dermatoses (including Stevens-Johnson syndrome and toxic epidermal necrolysis).

#### Infections and infestations

Exacerbation of skin infection-related inflammations (e.g. development of necrotising fasciitis) coinciding with the use of NSAIDs has been described. If signs of an infection occur or get worse during the use of ibuprofen, the patient is therefore recommended to go to a doctor without delay.

#### Skin and subcutaneous tissue disorders

In exceptional cases, severe skin infections and soft-tissue complications may occur during a varicella infection (see also Infections and infestations and section 4.4).

#### Cardiovascular disorders and vascular disorders

Oedema, hypertension and cardiac failure have been reported in association with NSAID treatment. Clinical studies suggest that use of Ibuprofen, particularly at a high dose (2400 mg/day) may be associated with a small increased risk of arterial thrombotic events (for example myocardial infarction or stroke) (see section 4.4).

The following are adverse reactions possibly related to ibuprofen, displayed by MedDRA frequency convention and system organ classification. Frequency groupings are classified according to the subsequent conventions: 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  $< 1/1000$ ), Very Rare ( $< 1/10,000$ ) and Not known (cannot be estimated from the available data).

System organ class	Frequency	Adverse reaction
Infections and infestations	Uncommon	Rhinitis
	Rare	Meningitis aseptic (see section 4.4)
Blood and lymphatic system disorders	Rare	Leukopenia, thrombocytopenia, neutropenia, agranulocytosis, aplastic anaemia and haemolytic anaemia
	Immune system disorders	Uncommon
Rare		Anaphylactic reaction
Psychiatric disorders	Uncommon	Insomnia, anxiety
	Rare	Depression, confusional state
Nervous system disorders	Common	Headache, dizziness
	Uncommon	Paraesthesia, somnolence
	Rare	Optic neuritis
Eye disorders	Uncommon	Visual impairment
	Rare	Toxic optic neuropathy
Ear and labyrinth disorders	Uncommon	Hearing impaired, tinnitus, vertigo
Cardiac disorders	Very Rare	Cardiac failure, myocardial infarction (see also section 4.4)
Vascular disorders	Very Rare	Hypertension
Respiratory, Thoracic and mediastinal disorders	Uncommon	Asthma, bronchospasm, dyspnea
Gastrointestinal disorders	Common	Dyspepsia, diarrhoea, nausea, vomiting, abdominal pain, flatulence, constipation, melena, hematemesis, gastrointestinal haemorrhage
	Uncommon	Gastritis, duodenal ulcer, gastric ulcer, mouth ulceration, gastrointestinal perforation
	Very Rare	Pancreatitis
	Not known	Exacerbation of Colitis and Crohn's disease
Hepatobiliary disorders	Uncommon	Hepatitis, jaundice, hepatic function abnormal
	Very Rare	Hepatic failure
Skin and subcutaneous tissue disorders	Common	Rash
	Uncommon	Urticaria, pruritus, purpura, angioedema, photosensitivity reaction
	Very Rare	Severe forms of skin reactions (e.g. Erythema multiforme, bullous reactions including Stevens-Johnson syndrome, and toxic epidermal necrolysis).
	Not known	Drug reaction with eosinophilia and systemic symptoms (DRESS syndrome) Acute generalised exanthematous pustulosis (AGEP)
Renal and urinary disorders	Uncommon	Impaired renal function, nephrotoxicity in various forms, e.g. Tubulointerstitial nephritis, nephrotic syndrome and renal failure
General disorders and administration site conditions	Common	Fatigue
	Rare	Edema

#### 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 HPRC Pharmacovigilance Website: [www.hpra.ie](http://www.hpra.ie).

#### 4.9 Overdose

### Toxicity

Signs and symptoms of toxicity have generally not been observed at doses below 100 mg/kg in children or adults. However, supportive care may be needed in some cases. Children have been observed to manifest signs and symptoms of toxicity after ingestion of 400 mg/kg or greater.

### Symptoms

Most patients who have ingested significant amounts of ibuprofen will manifest symptoms within 4 to 6 hours. The most frequently reported symptoms of overdose include nausea, vomiting, abdominal pain, lethargy and drowsiness. Central nervous system (CNS) effects include headache, tinnitus, dizziness, convulsion, and loss of consciousness. Nystagmus, hypothermia, renal effects, gastrointestinal bleeding, coma, apnea and depression of the CNS and respiratory system have also been rarely reported. Cardiovascular toxicity, including hypotension, bradycardia and tachycardia, has been reported. In cases of significant overdose, renal failure and liver damage are possible.

In serious poisoning, metabolic acidosis may occur.

Large overdoses are generally well tolerated when no other drugs are being taken.

### Management

There is no specific antidote for ibuprofen overdose. Patients should be treated symptomatically as required. Within one hour of ingestion of a potentially toxic amount, activated charcoal should be considered. If necessary, serum electrolyte balance should be corrected. For the most current information, contact the local poison control centre.

## **5 PHARMACOLOGICAL PROPERTIES**

### **5.1 Pharmacodynamic properties**

Pharmacotherapeutic group: Anti-inflammatory and anti-rheumatic products, non steroids.

ATC code: M01 AE01

#### Mechanism of action

Ibuprofen is a propionic acid derivative, non-steroidal anti-inflammatory drug (NSAID) with analgesic, anti-inflammatory and antipyretic effect. The drug's therapeutic effects as a NSAID are thought to result from its inhibitory effect on the enzyme cyclooxygenase, which results in a marked reduction in prostaglandin synthesis. These properties provide symptomatic relief of inflammation, pain and fever.

#### Pharmacodynamic effects

Experimental data suggest that ibuprofen may competitively inhibit the effect of low dose acetylsalicylic acid/ aspirin on platelet aggregation when they are dosed concomitantly. Some pharmacodynamic studies show that when single doses of ibuprofen 400 mg were taken within 8 h before or within 30 min after immediate release acetylsalicylic acid dosing (81 mg), a decreased effect of acetylsalicylic acid on the formation of thromboxane or platelet aggregation occurred. Although there are uncertainties regarding extrapolation of these data to the clinical situation, the possibility that regular, long-term use of ibuprofen may reduce the cardioprotective effect of low-dose acetylsalicylic acid cannot be excluded. No clinically relevant effect is considered to be likely for occasional ibuprofen use (see section 4.5).

### **5.2 Pharmacokinetic properties**

Ibuprofen is a racemic mixture of [ + ]S- and [ - ]R-enantiomers.

Studies including a standard meal, show that food does not markedly affect total bioavailability.

#### Absorption

Ibuprofen is rapidly absorbed from the gastrointestinal tract with a bioavailability of 80-90%. Peak serum concentrations occur one to two hours after administration of immediate release formulations.

#### Distribution

Ibuprofen is extensively bound to plasma proteins (99%). Ibuprofen has a small volume of distribution being about 0.12-0.2 L/kg in adults.

#### Biotransformation

Ibuprofen is rapidly metabolized in the liver through cytochrome P450, preferentially CYP2C9, to two primary inactive metabolites, 2-hydroxyibuprofen and 3-carboxyibuprofen. Following oral ingestion of the drug, slightly less than 90% of an oral

dose of ibuprofen can be accounted for in the urine as oxidative metabolites and their glucuronic conjugates. Very little ibuprofen is excreted unchanged in the urine.

### Elimination

Excretion by the kidney is both rapid and complete. The elimination half-life of immediate release formulations is approximately two hours. The excretion of ibuprofen is virtually complete 24 hours after the last dose.

### Special populations

#### Elderly

Given that no renal impairment exists, there are only small, clinically insignificant differences in the pharmacokinetic profile and urinary excretion between young and elderly.

#### Paediatric population

The systemic exposure of ibuprofen following weight adjusted therapeutic dosage (5mg/kg to 10mg/kg bodyweight) in children aged 1 year or over, appears similar to that in adults. Children 3 months to 2.5 years appeared to have a higher volume of distribution (L/kg) and clearance (l/kg/h) of ibuprofen than did children >2.5 to 12 years of age.

#### Renal impairment

For patients with mild renal impairment, increased plasma level of (S)-ibuprofen, higher AUC values for (S)-ibuprofen and increased enantiomeric AUC(S/R) ratios as compared with healthy controls have been reported. In end-stage renal disease patients receiving dialysis, the mean free fraction of ibuprofen was about 3% compared with about 1% in healthy volunteers. Severe impairment of renal function may result in accumulation of ibuprofen metabolites. The significance of this effect is unknown. The metabolites can be removed by haemodialysis (see sections 4.2, 4.3 and 4.4).

#### Hepatic impairment

Alcoholic liver disease with mild to moderate hepatic impairment did not result in substantially altered pharmacokinetic parameters.

In cirrhotic patients with moderate hepatic impairment (Child Pugh's score 6-10) treated with racemic ibuprofen, an average 2-fold prolongation of the half-life was observed and the enantiomeric AUC ratio (S,R) was significantly lower compared to healthy controls, suggesting an impairment of metabolic inversion of (R)-ibuprofen to the active (S)-enantiomer (see sections 4.2, 4.3 and 4.4).

## **5.3 Preclinical safety data**

Not applicable.

## **6 PHARMACEUTICAL PARTICULARS**

### **6.1 List of excipients**

Maize starch  
Pregelatinised maize starch  
Colloidal anhydrous silica  
Sodium Starch Glycolate (Type A)  
Stearic Acid (HPMC)  
Hypromellose (E464)  
Talc  
Titanium Dioxide (E171)  
Erythrosine Aluminium Lake (E127)

### **6.2 Incompatibilities**

Not applicable.

### **6.3 Shelf life**

3 years.

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

Do not store above 25°C.  
Store in the original container.

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

HDPE or Polypropylene containers with caps or child resistant closures in packs of 12, 24, 40, 50, 100, 250, 500 and 1000 tablets.

Blister packs of PVC - Aluminium foil in pack size of 96 tablets.

Not all pack sizes may be marketed.

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

No special requirements.

### **7 MARKETING AUTHORISATION HOLDER**

Pinewood Laboratories Ltd  
Ballymacarbry  
Clonmel  
Co. Tipperary  
Ireland

### **8 MARKETING AUTHORISATION NUMBER**

PA0281/088/001

### **9 DATE OF FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION**

Date of first authorisation: 22 December 1980  
Date of last renewal: 22 December 2005

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

January 2023