

# Summary of Product Characteristics

## 1 NAME OF THE MEDICINAL PRODUCT

Ibuprofen 400mg film-coated tablets

## 2 QUALITATIVE AND QUANTITATIVE COMPOSITION

Each tablet contains 400 mg of ibuprofen (as lysine)

For the full list of excipients, see section 6.1.

## 3 PHARMACEUTICAL FORM

Film-coated tablet.

White to off-white, film-coated, oval biconvex, bevelled edge tablet imprinted with "M IL2" in black ink on one side of the tablet and blank on the other side

Dimension: 17.9mm ± 0.3mm x 9.2mm ± 0.3mm.

## 4 CLINICAL PARTICULARS

### 4.1 Therapeutic Indications

For the symptomatic treatment of mild to moderate pain, such as headache, acute migraine headache with or without aura, dental pain, period pain and fever and pain in the common cold.

### 4.2 Posology and method of administration

Adults and adolescents ≥ 40 kg body weight (12 years of age and above):

Initial dose: 400 mg. If necessary, an additional dose of 400 mg may be taken. The corresponding dosing interval should be chosen based on the symptoms and the recommended daily maximum dose. It should not be less than 6 hours for a 400 mg dose. Do not exceed 1200 mg dose in any 24 hour period.

For treatment of migraine headache the dose should be one tablet of 400 mg as a single dose, if necessary 400 mg with intervals of 4 to 6 hours. Do not exceed 1200 mg dose in any 24 hour period.

#### *Paediatric population*

Ibuprofen is contraindicated in adolescents under 40 kg body weight or in children under 12 years.

If in children aged from 12 years and in adolescents this medicinal product is required for more than 3 days, or if symptoms worsen a doctor should be consulted.

Undesirable effects may be minimised by using the lowest effective dose for the shortest duration necessary to control symptoms (see section 4.4).

If this product is required for more than 3 days in the case of migraine headache or fever or for more than 4 days for the treatment of pain or if the symptoms worsen the patient is advised to consult a doctor.

#### *Elderly patients*

No special dose adjustment is necessary. Elderly patients should be monitored particularly carefully due to the possible undesirable effect profile (see section 4.4).

*Patients with sensitive stomachs*

Patients with sensitive stomachs should take ibuprofen during a meal.

Taking ibuprofen after a meal may delay the onset of its action. If this should occur, no additional ibuprofen should be taken than specified in section 4.2 (Posology), or until the corresponding dosage interval has expired.

*Patients with renal impairment*

No dose reduction is required in patients with mild to moderate impairment of renal function. For patients with severe renal insufficiency see section 4.3.

*Patients with hepatic impairment*

No dose reduction is required in patients with mild to moderate impairment of hepatic function. For patients with severe hepatic dysfunction see section 4.3.

Method of administration:

For oral administration and short-term use only. Ibuprofen tablets are swallowed whole with plenty of water. Do not chew the tablets.

**4.3 Contraindications**

Ibuprofen is contraindicated in patients:

- with hypersensitivity to the active substance or to any of the excipients listed in section 6.1,
- who have previously shown hypersensitivity reactions (e.g. bronchospasm, angioedema, rhinitis, urticaria or asthma) in response to acetylsalicylic acid (ASA) or other non-steroidal anti-inflammatory drugs (NSAIDs),
- with active or a history of recurrent peptic ulcer/haemorrhage (two or more distinct episodes of proven ulceration or bleeding),
- with history of gastrointestinal bleeding or perforation, related to previous NSAIDs therapy,
- with severe hepatic insufficiency, severe renal insufficiency or severe heart failure (NYHA Class IV) (see section 4.4),
- adolescents under 40 kg body weight or children below 12 years of age
- with cerebrovascular or other active bleeding,
- with unclarified blood-formation disturbances,
- with severe dehydration (caused by vomiting, diarrhoea or insufficient fluid intake),
- during the last trimester of pregnancy (see section 4.6).

**4.4 Special warnings and precautions for use**

Undesirable effects may be minimised by using the lowest effective dose for the shortest duration necessary to control symptoms (see effects on gastrointestinal tract and cardiovascular system).

Caution should be exercised during administration of ibuprofen in patients suffering from the following conditions, which may be made worse:

- congenital disorder of porphyrin metabolism (e.g. acute recurrent porphyria),
- blood clotting disorders (ibuprofen may prolong the duration of bleeding),
- directly after major surgery,
- systemic lupus erythematosus and mixed connective tissue disease (e.g. increased risk of aseptic meningitis) (see section 4.8),
- hypertension and/or cardiac impairment as renal function may deteriorate (see sections 4.3 and 4.8)
- in patients who suffer from hay fever, nasal polyps or chronic obstructive respiratory disorders as an increased risk of allergic reactions exists for them. These may present as asthma attacks (so-called analgesic asthma), Quincke's oedema or urticaria,
- in patients who react allergically to other substances, as an increased risk of hypersensitivity reactions occurring also exists for them on use of ibuprofen.

*Elderly:*

The elderly have an increased frequency of adverse reactions to NSAIDs especially gastrointestinal bleeding and

perforation, which may be fatal.

*Respiratory:*

Bronchospasm may be precipitated in patients suffering from or with a previous history of bronchial asthma or allergic disease.

*Other NSAIDs:*

The use of ibuprofen with concomitant NSAIDs including cyclooxygenase-2 selective inhibitors increases the risk of adverse reactions and should be avoided (see section 4.5).

*Renal:*

Renal impairment as renal function may further deteriorate (see sections 4.3 and 4.8).

In general terms, the habitual intake of painkillers particularly the combination of several pain-relieving active substances, may lead to permanent renal damage with the risk of renal failure (analgesic nephropathy). This risk may be increased under physical strain associated with loss of salt and dehydration. Therefore it should be avoided.

There is a risk of renal impairment in dehydrated children and adolescents.

*Hepatic:*

Hepatic dysfunction (see sections 4.3 and 4.8).

It is suitable to discontinue the therapy with ibuprofen when deterioration of the liver functions occurs in connection with its administration. After discontinuation of the treatment the health state usually normalises. Occasional monitoring of glycaemia is also suitable.

*Cardiovascular and cerebrovascular effects:*

Caution (discussion with doctor or pharmacist) is required prior to starting treatment in patients with a history of hypertension and/or heart failure as fluid retention, hypertension and oedema have been reported in association with NSAID therapy.

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 or smoking), particularly if high doses of ibuprofen (2400 mg/day) are required.

Clinical studies suggest that use of ibuprofen, particularly at a high dose (2400 mg/day) and in long-term treatment 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.

*Impaired female fertility:*

There is some evidence that drugs which inhibit cyclo-oxygenase/ prostaglandin synthesis may cause impairment of female fertility by an effect on ovulation. This is reversible upon withdrawal of treatment (see section 4.6).

*Gastrointestinal (GI):*

NSAIDs should be given with care to patients with a history of gastrointestinal disease (ulcerative colitis, Crohn's disease) as these conditions may be exacerbated (see section 4.8).

GI 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 GI events.

The risk of GI bleeding, ulceration or perforation is higher with increasing NSAID doses, in patients with a history of

ulcers, 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 ASA, or other active substances likely to increase gastrointestinal risk (see below and section 4.5).

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

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 ASA (see section 4.5).

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

#### *Dermatological:*

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 for 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. Ibuprofen should be discontinued at the first appearance of skin rash, mucosal lesions, or any other sign of hypersensitivity.

Exceptionally, varicella can cause serious cutaneous and soft tissue 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 the use of ibuprofen in case of varicella.

#### *Other notes*

Severe acute hypersensitivity reactions (for example anaphylactic shock) are observed very rarely. At the first signs of hypersensitivity reaction after taking/administering ibuprofen therapy must be stopped. Medically required measures, in line with the symptoms, must be initiated by specialist personnel.

Ibuprofen may mask the signs or symptoms of an infection (fever, pain and swelling).

Ibuprofen may temporarily inhibit the blood-platelet function (thrombocyte aggregation). Therefore, it is recommended to monitor patients with coagulation disturbances carefully.

In prolonged administration of ibuprofen regular checking of the liver values, the kidney function, as well as of the blood count, is required.

Prolonged use of any type of painkiller for headaches can make them worse. If this situation is experienced or suspected, medical advice should be obtained and treatment should be discontinued. The diagnosis of medication overuse headache (MOH) should be suspected in patients who have frequent or daily headaches despite (or because of) the regular use of headache medications. MOH must not be treated by increasing the dosage of the medicinal product.

During treatment with ibuprofen, some cases with symptoms of aseptic meningitis, such as stiff neck, headache, nausea, vomiting, fever or disorientation have been observed in patients with existing auto-immune disorders (such as systemic lupus erythematosus, mixed connective tissue disease).

Consumption of alcohol should be avoided since it may intensify side effects of NSAIDs, especially those affecting the gastrointestinal tract or the central nervous system.

Patients on ibuprofen should report to their doctor signs or symptoms of gastro-intestinal ulceration or bleeding, blurred vision or other eye symptoms, skin rash, weight gain or oedema.

If vision problems, blurred vision, scotomata or malfunctions of colour perception appear, interruption of the treatment

is necessary.

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

Ibuprofen should be avoided in combination with:

*Acetylsalicylic acid*

Concomitant administration of ibuprofen and acetylsalicylic acid is not generally recommended because of the potential for increased adverse effects.

Experimental data suggest that ibuprofen may competitively inhibit the effect of low dose acetylsalicylic acid 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 acetylsalicylic acid cannot be excluded. No clinically relevant effect is considered to be likely for occasional ibuprofen use (see section 5.1).

*Other NSAIDs including salicylates and cyclooxygenase-2 selective inhibitors:* Avoid concomitant use of two or more NSAIDs as this may increase the risk of gastrointestinal ulcers and bleeding due to a synergistic effect. (see section 4.4).

*Anticoagulants:* NSAIDs may enhance the effects of anticoagulants, such as warfarin (see section 4.4).

*Diuretics, ACE inhibitors, beta-receptor blockers and angiotensin-II antagonists:*

NSAIDs may reduce the effect of diuretics and other antihypertensive medicinal products. In some patients with compromised renal function (e.g. dehydrated patients or elderly patients with compromised renal function) the co-administration of ACE inhibitors, beta-receptor blockers or angiotensin-II antagonists and agents that inhibit cyclo-oxygenase may result in further deterioration of renal function, including possible acute renal failure, which is usually reversible. Therefore, the combination should be administered with caution, especially in the elderly. Patients should be adequately hydrated and consideration should be given to monitoring of renal function after initiation of concomitant therapy, and periodically thereafter.

*Potassium sparing diuretics:* The concomitant administration of ibuprofen and potassium-sparing diuretics may lead to hyperkalaemia (a check of serum potassium is recommended).

*Corticosteroids:* Increased risk of adverse reactions, especially of the gastrointestinal tract (gastrointestinal ulceration or bleeding (see section 4.4)).

*Anti-platelet agents and selective serotonin reuptake inhibitors (SSRIs):* increased risk of gastrointestinal bleeding (see section 4.4)

*Digoxin:* NSAIDs may exacerbate cardiac failure, reduce GFR and increase plasma digoxin levels. A check of serum-digoxin is not as a rule required on correct use (maximum over 4 days).

*Phenytoin:* The concomitant use of ibuprofen with phenytoin preparations may increase serum levels of phenytoin. A check of serum-phenytoin levels is not as a rule required on correct use (maximum over 4 days).

*Lithium:* There is evidence for potential increases in plasma levels of lithium. A check of serum lithium is not as a rule required on correct use (maximum over 4 days).

*Methotrexate:* The administration of ibuprofen within 24 hours before or after administration of methotrexate may lead to elevated concentrations of methotrexate and an increase in its toxic effect..

*Ciclosporin:* The risk of a kidney-damaging effect due to ciclosporin is increased through the concomitant administration of certain nonsteroidal antiinflammatory drugs. This effect also cannot be ruled out for a combination of ciclosporin with ibuprofen.

*Mifepristone:* NSAIDs should not be used for 8-12 days after mifepristone administration as NSAIDs can reduce the

effect of mifepristone.

*Sulfinpyrazone*: Medicinal products that contain sulfinpyrazone may delay the excretion of ibuprofen.

*Probenecid*: Medicinal products that contain probenecid may reduce the clearance of NSAIDs and may increase their serum concentration.

*Tacrolimus*: Possible increased risk of nephrotoxicity when NSAIDs are given with tacrolimus.

*Zidovudine*: Increased risk of haematological toxicity when NSAIDs are given with zidovudine. Blood counts 1–2 weeks after starting use together are recommended.

There is evidence of an increased risk of haemarthroses and haematoma in HIV (+) haemophiliacs receiving concurrent treatment with zidovudine and ibuprofen.

*Sulfonylureas*: NSAIDs can either increase or decrease the hypoglycemic effect of sulphonylureas. Caution is advised in case of simultaneous treatment.

*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.

*Alcohol, bisphosphonates, oxpentifylline (pentoxifylline) and sulfinpyrazone*: May potentiate the GI side-effects and the risk of bleeding or ulceration.

*Baclofen*: Elevated baclofen toxicity.

## 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 raise concern about an increased risk of miscarriage and of cardiac malformation and gastroschisis after use of a prostaglandin synthesis inhibitor in early pregnancy. 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.

During the first and second trimester of pregnancy, ibuprofen should not be given unless clearly necessary. If ibuprofen is 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.

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

- cardiopulmonary toxicity (with premature closure of the ductus arteriosus and pulmonary hypertension);
- renal dysfunction, which may progress to renal failure with oligo-hydroamniosis;
- 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 is contraindicated during the third trimester of pregnancy.

### *Breast-feeding*

Ibuprofen and its metabolites can pass in low concentrations into the breast milk. No harmful effects to infants are known to date. Therefore, ibuprofen may be used during breast-feeding for short-term treatment of pain and fever at the recommended dose. Safety after long term use has not been established.

### *Fertility*

There is some evidence that medicinal products which inhibit cyclo-oxygenase/prostaglandin synthesis may cause impairment of female fertility by an effect on ovulation. This is reversible on withdrawal of treatment.

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

Ibuprofen has no or negligible influence on the ability to drive and use machines. However, since at high dosage side effects such as fatigue, somnolence, vertigo and visual disturbances (reported as uncommon) may be experienced, the ability to drive a car or operate machinery may be impaired in individual cases. This effect is potentiated by simultaneous consumption of alcohol.

## **4.8 Undesirable effects**

Possible side effects are those experienced with ibuprofen acid.

The most commonly observed adverse events are gastrointestinal in nature. Peptic ulcers, perforation or gastrointestinal 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 has been observed.

Undesirable effects are mostly dose-dependent and vary interindividually. Especially the risk for the occurrence of gastrointestinal bleeding depends on the dosage range and duration of the treatment. Other known risk factors, see section 4.4.

Clinical studies suggest that use of ibuprofen, particularly at a high dose (2400 mg/day) and in long term treatment, may be associated with a small increased risk of arterial thrombotic events (for example myocardial infarction or stroke) (see section 4.4).

Oedema, hypertension and cardiac failure have been reported in association with NSAID treatment.

Some of the undermentioned undesirable effects are less frequent when the maximum daily dose is 1200 mg compared to high-dose therapy in rheumatism patients.

Assessment of adverse reactions is normally based on the following frequencies:

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)

# See 'Description of selected adverse reactions' below.

### ***Blood and lymphatic system disorders***

*Very rare:* haematopoietic disorders (anaemia, leucopenia, thrombocytopenia, pancytopenia, agranulocytosis).#

### ***Immune system disorders***

*Uncommon:* Hypersensitivity reactions such as urticaria, pruritus, purpura and exanthema, as well as asthma attacks (sometimes with hypotension) (see section 4.4).

*Rare:* Lupus erythematosus syndrome

*Very rare:* Severe hypersensitivity reactions. The symptoms may include: facial oedema, swelling of the tongue, internal laryngeal swelling with constriction of the airways, dyspnoea, tachycardia, fall of blood pressure to the point of life threatening shock (see section 4.4). Exacerbation of infection-related inflammations (e.g. development of necrotising fasciitis) coinciding with the use of nonsteroidal anti-inflammatory drugs. #

**Psychiatric disorders**

*Rare:* Depression, confusion, hallucinations, psychotic reactions.

**Nervous system disorders**

*Common:* Headache (see section 4.4), somnolence, vertigo, fatigue, agitation, dizziness, insomnia, irritability.

*Very rare:* Aseptic meningitis. #

**Eye disorders**

*Uncommon:* Visual disturbances. #

*Rare:* Toxic amblyopia.

**Ear and labyrinth disorders**

*Rare:* Tinnitus.

**Cardiac disorders**

*Very rare:* palpitations, heart failure (see section 4.4), myocardial infarction, acute pulmonary oedema, oedema (see section 4.4).

**Vascular disorders**

*Very rare:* Arterial hypertension (see section 4.4).

**Respiratory, thoracic and mediastinal disorders**

*Uncommon:* Rhinitis, bronchospasm.

**Gastrointestinal disorders**

*Very common:* Gastrointestinal disorders, such as heartburn, dyspepsia, abdominal pain and nausea, vomiting, flatulence, diarrhoea, constipation.

*Common:* Gastrointestinal ulcers, sometimes with bleeding and perforation (see section 4.4), occult blood loss which may lead to anaemia, melaena, haematemesis, ulcerative stomatitis, colitis, exacerbation of inflammatory bowel disease, complications of colonic diverticula (perforation, fistula).

*Uncommon:* Gastritis.

*Very rare:* Oesophagitis, pancreatitis, intestinal strictures.

**Hepatobiliary disorders:**

*Very rare:* Liver dysfunction, liver damage especially in long-term use, liver failure, acute hepatitis, jaundice.

**Skin and subcutaneous tissue disorders**

*Uncommon:* Photosensitivity.

*Very rare:* Severe forms of skin reactions (erythema multiforme, exfoliative dermatitis, bullous reactions including Stevens-Johnson syndrome and toxic epidermal necrolysis, alopecia, necrotising fasciitis (see section 4.4.)). Severe skin infections with soft tissue complications may occur during varicella infections.

**Renal and urinary disorders**

*Uncommon:* Development of oedema, especially in patients with arterial hypertension or renal insufficiency, nephrotic syndrome, interstitial nephritis which can be associated with renal failure. #

*Rare:* Renal papillary necrosis. #

**Pregnancy, puerperium and perinatal conditions**

*Very rare:* Menstrual disorders.

**Investigations**

*Rare:* Increase of blood urea nitrogen, serum transaminases and alkaline phosphatase, decrease in haemoglobin and haematocrit values, inhibition of platelet aggregation, prolonged bleeding time, decrease of serum calcium, increase in serum uric acid.

## **Description of selected adverse reactions**

### ***Blood and lymphatic system disorders***

The first symptoms or signs may include: fever, sore throat, surface mouth ulcers, flu-like symptoms, severe fatigue, nasal and skin bleeding. These blood dyscrasias may particularly occur after long term use of high doses. In long-term therapy, examination of the blood should be performed regularly.(see section 4.4).

### ***Immune system disorders***

This may be connected to the mechanism of action of NSAIDs. If, during the administration of ibuprofen, signs of an infection occur or become aggravated, patients are recommended to see a physician immediately. It should be tested whether an indication for anti-infection/antibiotic therapy is present.

### ***Nervous system disorders***

During treatment with ibuprofen, symptoms of aseptic meningitis have been observed, such as neck stiffness, headache, nausea, vomiting, fever or consciousness clouding. Patients with autoimmune collagen disorders (SLE, mixed connective-tissue disease) appear to be predisposed.

### ***Eye disorders***

Reversible eye disorders such as toxic amblyopia, blurred vision and changes in colour perception have been observed. In case of such reactions ibuprofen use should be discontinued.

### ***Renal and urinary disorders***

Various degrees of renal function impairment can occur, particularly during long-term use of higher doses. A sudden worsening of renal function can also be associated with a generalised hypersensitivity reaction.

### **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:

HPRA Pharmacovigilance, Earlsfort Terrace, IRL - Dublin 2; Tel: +353 1 6764971; Fax: +353 1 6762517; website: <http://www.hpra.ie>; e-mail: [medsafety@hpra.ie](mailto:medsafety@hpra.ie).

## **4.9 Overdose**

In children ingestion of more than 400 mg/kg may cause symptoms. In adults the dose response effect is less clear-cut. The half-life in overdose is 1.5-3 hours.

### **Symptoms**

Most patients who have ingested clinically important amounts of NSAIDs will develop no more than nausea, vomiting, epigastric pain, or more rarely diarrhoea. Tinnitus, headache and gastrointestinal bleeding are also possible. In more serious poisoning, toxicity is seen in the central nervous system, manifesting as dizziness, drowsiness, occasionally excitation and disorientation, loss of consciousness (in children also myoclonic seizures) or coma. Occasionally patients develop convulsions. In serious poisoning metabolic acidosis may occur and the prothrombin time/ INR may be prolonged, probably due to interference with the actions of circulating clotting factors. Acute renal failure and liver damage may occur. Exacerbation of asthma is possible in asthmatics. Furthermore, hypotension, respiratory depression and cyanosis are also possible.

## Management

Treatment should be symptomatic and supportive and include the maintenance of a clear airway and monitoring of cardiac and vital signs until stable. Gastric emptying or oral administration of activated charcoal is indicated if the patient presents within one hour of ingestion of more than 400 mg per kg of body weight. If ibuprofen has already been absorbed, alkaline substances should be administered to promote the excretion of ibuprofen in the urine. If frequent or prolonged, convulsions should be treated with intravenous diazepam or lorazepam. Bronchodilators should be given for asthma. No specific antidote is available.

## 5 PHARMACOLOGICAL PROPERTIES

### 5.1 Pharmacodynamic properties

Pharmacotherapeutic group: anti-inflammatory and antirheumatic products, non-steroids, propionic acid derivative.  
ATC code: M01A E01

#### Mechanism of action

Ibuprofen lysine is the lysine salt of ibuprofen, a propionic acid derivative. Ibuprofen is a non-steroidal anti-inflammatory drug (NSAID) that in the conventional animal-experiment inflammation models has proven to be effective via prostaglandin-synthesis inhibition. In humans, ibuprofen reduces inflammatory-related pain, swellings and fever. Furthermore, ibuprofen reversibly inhibits ADP- and collagen-induced platelet aggregation.

Following oral administration, ibuprofen lysine dissociates to ibuprofen acid and lysine. Lysine has no recognised pharmacological activity. The pharmacological properties of ibuprofen lysine, therefore, are the same as those of ibuprofen acid.

Experimental data suggest that ibuprofen may competitively inhibit the effect of low dose acetylsalicylic acid on platelet aggregation when they are dosed concomitantly. Some pharmacodynamics 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

Most pharmacokinetic data obtained following the administration of ibuprofen acid also apply to ibuprofen lysine.

On oral application, ibuprofen is partly absorbed in the stomach and then completely in the small intestine.

Following hepatic metabolism (hydroxylation, carboxylation), the pharmacologically inactive metabolites are completely eliminated, mainly renally (90 %), but also with the bile. The elimination half-life in healthy individuals and those with liver and kidney diseases is 1.8 - 3.5 hours, plasma-protein binding about 99 %.

Peak plasma concentrations occur 1-2 hours after oral administration of a normal-release pharmaceutical form of ibuprofen acid. However, ibuprofen is more rapidly absorbed from the gastrointestinal tract following the oral administration of ibuprofen lysine tablets.

No specific difference in pharmacokinetic profile is observed in the elderly.

## 5.3 Preclinical safety data

The subchronic and chronic toxicity of ibuprofen in animal experiments was observed principally as lesions and ulcerations in the gastrointestinal tract. *In vitro* and *in vivo* studies gave no clinically relevant evidence of a mutagenic potential of ibuprofen. In studies in rats and mice no evidence of carcinogenic effects of ibuprofen was found. Ibuprofen led to inhibition of ovulation in rabbits as well as disturbance of implantation in various animal species (rabbit, rat, mouse). Experimental studies have demonstrated that ibuprofen crosses the placenta, for maternally toxic doses, an increased incidence of malformations (e.g. ventricular septal defects) was observed.

## 6 PHARMACEUTICAL PARTICULARS

### 6.1 List of excipients

#### Core tablet

Cellulose, microcrystalline (E460)

Silica colloidal anhydrous (E551)

Crospovidone (E1202)

Povidone (E1201)

Magnesium stearate (E572)

Talc (E553b)

#### Tablet coating

Polyvinyl alcohol hydrolysed (E1203)

Titanium dioxide (E171)

Macrogol (E1521)

Talc (E553b)

#### Printing ink

Shellac (E904)

Iron oxide black (E172)

Ammonium hydroxide (E527).

### 6.2 Incompatibilities

Not applicable

### 6.3 Shelf life

3 years

Bottles: Use within 60 days of opening. Once open, keep bottle tightly closed.

### 6.4 Special precautions for storage

This medicinal product does not require any special storage conditions.

### 6.5 Nature and contents of container

HDPE bottle pack comprises of white opaque HDPE bottle with white opaque cap with aluminium induction sealing liner wad and desiccant (silica gel).

Note: The HDPE bottle pack may be placed in an outer cardboard carton based on commercial requirement.

Dispensing pack: HDPE bottle pack comprises of white opaque HDPE bottle with white opaque cap with aluminium induction sealing liner wad and desiccant (silica gel).

Note: The HDPE bottle pack may be placed in an outer cardboard carton based on commercial requirement.

Blister pack comprises of white opaque PVC laminated with Aclar on one side and hard tempered aluminium foil coated with VMCH heat seal lacquer on the other side.

Cold form blister pack comprises of cold form laminate (aluminium foil laminated to oriented polyamide on one side and laminated to PVC on the other side i.e. OPA / Al / PVC) on one side and hard tempered aluminium foil coated with VMCH heat seal lacquer on the other side.

Pack sizes:

Blisters: 2, 4, 6, 10, 12, 16, 20, 24.

Not all pack sizes may be marketed.

## **6.6 Special precautions for disposal**

Not applicable

## **7 MARKETING AUTHORISATION HOLDER**

McDermott Laboratories Ltd  
t/a Gerard Laboratories  
35/36 Baldoyle Industrial Estate  
Grange Road  
Dublin 13  
Ireland

## **8 MARKETING AUTHORISATION NUMBER**

PA0577/177/002

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

Date of first authorisation: 8<sup>th</sup> November 2013

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

April 2016