

**Vadis® Ibuprofen (Ibuprofen Tablets BP 400 mg)**

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**Module 1- Administrative information and prescribing information**

**1.3 Product Information**

**1.3.1 Summary of Product Characteristics (SmPC)**

Enclosed

## Vadis® Ibuprofen (Ibuprofen Tablets BP 400 mg)

### Summary Product Characteristics (SPC)

#### 1. NAME OF THE FINISHED PHARMACEUTICAL PRODUCT

Vadis® Ibuprofen

(Ibuprofen Tablets BP 400 mg)

##### Strength

Each Enteric coated tablet contains:

Ibuprofen BP 400 mg

Excipients q.s.

Colour: Erythrosine & Titanium Dioxide

#### 2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Description: Brownish red colored, round shape, biconvex, plain on both side, enteric coated tablet.

Sr. No.	Name of raw material	Spec	Label Claim (mg)	Qty/tab (mg)	Purpose of use
<b>Dry Mixing</b>					
1.	Ibuprofen	BP	400.000	400.000	API
2.	Microcrystalline Cellulose pH-101	BP	-	26.000	Disintegrant
3.	Maize Starch*	BP	-	12.100	Disintegrant
4.	Colloidal Silicon Dioxide	BP	-	2.850	Filler
<b>Wet Mixing</b>					
5.	Maize Starch	BP	-	12.150	Binder
6.	Povidone (PVPK-30)	BP	-	4.000	Binder
7.	Purified Water#	BP	-	120.000	Solvent
<b>Lubrication</b>					
8.	Cross Carmellose Sodium	BP	-	5.700	Disintegrant
9.	Colloidal Silicon Dioxide	BP	-	4.000	Glidant
10.	Sodium Starch Glycolate Type A	BP	-	10.300	Binder
11.	Purified Talc	BP	-	6.350	Lubricant
12.	Magnesium Stearate	BP	-	6.550	Lubricant

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Sr. No.	Name of raw material	Spec	Label Claim (mg)	Qty/tab (mg)	Purpose of use
<b>Coating</b>					
13.	Ready colour Mix film coat Titanium Dioxide	In-house	-	5.000	Colouring agent
14.	Ready colour mix film coat Erythrosine	In-house	-	5.000	Colouring agent
15.	Isopropyl alcohol #	BP	-	200.000	Solvent
16.	Methylene Dichloride #	BP	-	200.000	Solvent

BP: British Pharmacopeia

- 1) \*Compensate the required quantity of API with Maize Starch.
- 2) #Quantity evaporated during drying

### 3. PHARMACEUTICAL FORM

Brownish red colored, round shape, biconvex, plain on both side, enteric coated tablet.

### 4. CLINICAL PARTICULARS

#### 4.1 Therapeutic indications

Symptomatic treatment of pain and inflammation in arthritic diseases (e.g. rheumatoid arthritis) degenerative arthritic conditions (e.g. osteoarthritis), and in painful swelling and inflammation after soft tissue injuries.

#### 4.2 Posology and method of administration

Undesirable effects may be minimised by using the lowest effective dose for the shortest duration necessary to control symptoms.

The treating physician decides on the duration of treatment.

In rheumatic diseases the use of ibuprofen can be required for a longer period.

Ibuprofen is contraindicated in children and adolescents younger than 15 years of age.

The ibuprofen dose depends on the patient's age and body weight. The maximum single dose for adults should not exceed 800 mg of ibuprofen.

The tablet should be swallowed with a glass of water preferably after a meal. It is recommended, that patients with a sensitive stomach take Ibuprofen during a meal.

Rheumatic diseases

#### Adults:

The recommended dose is 1200 – 1800 mg daily in divided doses. Maintenance doses of 600 mg-1200 mg daily may be effective in some patients. In acute and severe conditions the dose may be (temporarily) increased to a maximum of 2400 mg in 3 or 4 divided doses.

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### **Adolescents 15 to 17 years of age:**

The recommended dose should be adjusted by weight: 20 mg/kg to a maximum of 40 mg/kg body weight daily (max 2400 mg daily) in 3 to 4 divided doses.

### **Elderly**

NSAIDs should be used with particular caution in elderly patients who are more prone to adverse events and are at increased risk of potentially fatal gastrointestinal haemorrhage, ulceration or perforation. If treatment is considered necessary, the lowest dose for the shortest duration necessary to control symptoms should be used. Treatment should be reviewed at regular intervals and discontinued if no benefit is seen or intolerance occurs.

### **Impaired renal function**

In patients with mild or moderate reduction of renal function, the dose should be kept as low as possible for the shortest duration necessary to control symptoms and renal function monitored.

### **Impaired liver function**

In patients with mild or moderate reduction of liver function the dose should be kept as low as possible for the shortest duration necessary to control symptoms and renal function monitored.

### **Method of administration**

For oral use.

## **4.3 Contraindications**

Ibuprofen is contraindicated in patients with:

- previous hypersensitivity reactions (e.g. asthma, rhinitis, urticaria or angioedema) in response to acetylsalicylic acid or other NSAIDs
- history of gastrointestinal bleeding or perforation, related to previous NSAIDs therapy
- active, or history of recurrent peptic ulcer/haemorrhage (two or more distinct episodes of proven ulceration or bleeding)
- severe renal failure or severe hepatic failure.
- severe heart failure (NYHA Class IV)
- last trimester of pregnancy
- significant dehydration (caused by vomiting, diarrhoea or insufficient fluid intake)
- cerebrovascular or other active bleeding
- unclarified blood-formation disturbances

Ibuprofen is contraindicated in children and adolescents younger than 15 years of age.

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

The use of Ibuprofen with concomitant NSAIDs including cyclooxygenase-2 selective inhibitors should be avoided due to the increased risk of ulceration or bleeding.

Undesirable effects may be minimised by using the lowest effective dose for the shortest duration necessary to control symptoms (GI and cardiovascular risks below). Patients treated with NSAIDs long term should undergo regular medical supervision to monitor for adverse events.

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**Ibuprofen should only be administered under strict consideration of the benefit-risk ratio in the following conditions:**

- Systemic Lupus Erythematosus (SLE) or mixed connective tissue diseases.
- Congenital disturbance of porphyrin metabolism (e.g. acute intermittent porphyria)
- The first and second trimester of pregnancy
- Lactation

Special care has to be taken in the following cases:

- Gastrointestinal diseases including chronic inflammatory intestinal disease (ulcerative colitis, Crohn's disease)
- Cardiac insufficiency and hypertension
- Reduced renal function
- Hepatic dysfunction
- Disturbed haematopoiesis
- Blood coagulation defects
- Allergies, hay fever, chronic swelling of nasal mucosa, adenoids, chronic obstructive airway disease or bronchial asthma
- Immediately after major surgical interventions

### **Gastrointestinal bleeding, ulceration and perforation**

GI bleeding, ulceration or perforation, which can be fatal, has been reported with all NSAIDs at anytime 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 ulcer, particularly if complicated with haemorrhage or perforation, 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, or other medicinal products likely to increase gastrointestinal risk. 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 or heparin, selective serotonin reuptake inhibitors or anti-platelet agents such as acetylsalicylic acid.

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

NSAIDs should be given with care to patients with a history of gastrointestinal disease (ulcerative colitis, Crohn's disease) as their condition may be exacerbated.

### **Elderly**

The elderly have an increased frequency of adverse reactions to NSAIDs, especially gastrointestinal bleeding and perforation which may be fatal.

### **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, hypertension and oedema have been reported in association with NSAID therapy.

Clinical studies suggest that use of ibuprofen, particularly at a high doses (2400 mg/day) may be associated with a small increased risk of arterial thrombotic events (for example myocardial

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infarction or stroke). Overall, epidemiological studies do not suggest that low-dose ibuprofen (e.g.  $\leq 1200$  mg daily) 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.

### **Severe 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. 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 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.

### **Renal effect**

Ibuprofen may cause the retention of sodium, potassium and fluid in patients who have not previously suffered from renal disorders because of its effect on renal perfusion. This may cause oedema or even lead to cardiac insufficiency or hypertension in predisposed patients.

As with other NSAIDs, the prolonged administration of ibuprofen to animals has resulted in renal papillary necrosis and other pathological renal changes. In humans, there have been reports of acute interstitial nephritis with haematuria, proteinuria and occasionally nephrotic syndrome. Cases of renal toxicity have also been observed in patients in whom prostaglandins play a compensatory role in the maintenance of renal perfusion. In these patients, administration of NSAIDs may cause a dose-dependent reduction in prostaglandin formation and, secondarily, in renal blood flow, which may precipitate overt renal decompensation. Patients at greatest risk of suffering this reaction are those with renal dysfunction, heart failure, hepatic dysfunction, those taking diuretics and ACE inhibitors and the elderly. Discontinuation of NSAID treatment is generally followed by recovery to the pre-treatment state.

### **Hepatic:**

Hepatic dysfunction.

SLE and mixed connective tissue disease

In patients with systemic lupus erythematosus (SLE) and mixed connective tissue diseases there may be an increased risk of aseptic meningitis.

### **Aseptic meningitis**

Symptoms of aseptic meningitis, such as stiff neck, headache, nausea, vomiting, fever or disorientation have been observed.

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

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### **Other precautions**

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.

Bronchospasm, urticaria or angioedema may be precipitated in patients suffering from or with a previous history of bronchial asthma, chronic rhinitis, sinusitis, nasal polyps, adenoids or allergic diseases. Ibuprofen may mask the signs or symptoms of an infection (fever, pain and swelling).

During the long-term, high-dose use of analgesics headaches may occur which should not be treated with elevated doses of the medicinal product.

In general the habitual intake of analgesics, particularly the combination use of different analgesic substances, may cause permanent renal damage and a risk of renal failure (analgesics nephropathy). Ibuprofen may temporarily inhibit platelet aggregation and prolong the bleeding time. Therefore, patients with coagulation defects or on anticoagulant therapy should be observed carefully.

In case of long-term treatment with ibuprofen a periodical monitoring of hepatic and renal function as well as the blood count is necessary, especially in high risk patients.

Consumption of alcohol should be avoided since it may intensify side effects of NSAIDs, especially if 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.

### **Paediatric population**

There is a risk of renal impairment in dehydrated adolescents.

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

### **Concomitant use of ibuprofen and the following substances should be avoided:**

#### **Acetylsalicylic acid:**

“Concomitant administration of ibuprofen and acetylsalicylic acid 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 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 cardio protective effect of low-dose acetylsalicylic acid cannot be excluded.

No clinically relevant effect is considered to be likely for occasional ibuprofen use.

#### **Other NSAIDs including cyclooxygenase- 2 selective inhibitors:**

As a result of synergistic effects, the concurrent use of several NSAIDs can increase the risk of gastrointestinal ulcers and haemorrhage. Co-administration of ibuprofen with other NSAIDs should therefore be avoided.

#### **Anti-coagulants:**

NSAIDs may enhance the effects of anticoagulants, such as warfarin or heparin. In case of simultaneous treatment, monitoring of the coagulation state is recommended.

#### **Methotrexate:**

NSAID inhibits the tubular secretion of methotrexate and certain metabolic interactions can occur resulting in decreased clearance of methotrexate. The administration of Ibuprofen within



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24 hours before or after the administration of methotrexate can lead to an elevated concentration of methotrexate and an increase in its toxic effects. Therefore, concomitant use of NSAIDs and high doses of methotrexate should be avoided. Also, the potential risk of interactions in low dose treatment with methotrexate should be considered, especially in patients with impaired renal function. In combined treatment, renal function should be monitored.

**Ibuprofen (like other NSAIDs) should be taken only with caution in combination with the following substances:**

### **Digoxin, phenytoin and lithium:**

Co-administration of ibuprofen with digoxin phenytoin or lithium preparations can increase the serum level of these medicinal products. Checking the serum lithium level is necessary and it is recommended to check the serum digoxin and serum phenytoin levels.

### **Diuretics and antihypertensives:**

NSAIDs can reduce the effect of diuretics and antihypertensives, including ACE-inhibitors, beta-blockers and angiotensin-II antagonists. In patients with reduced kidney function (e.g. dehydrated patients or elderly patients with reduced kidney function), the concomitant use of an ACE inhibitor, beta blocker or angiotension II antagonist with a cyclooxygenase-inhibiting medicinal product can lead to further impairment of kidney function and through to acute renal failure. This is usually reversible. Such combination should therefore only be used with caution, especially in elderly patients. The patients have to be instructed to drink sufficient liquid and periodic monitoring of the kidney values should be considered for the time immediately after the start of the combination therapy.

The concomitant administration of ibuprofen and potassium-sparing diuretics or ACE-inhibitors can result in hyperkalaemia. Careful monitoring of potassium levels is necessary.

### **Captopril:**

Experimental studies indicate that ibuprofen counteracts the effect of captopril of increased sodium excretion.

### **Aminoglycosides:**

NSAIDs can slow down the elimination of aminoglycosides and increase their toxicity.

Selective serotonin reuptake inhibitors (SSRIs):

Increased risk of gastrointestinal bleeding (see section 4.4).

### **Ciclosporine:**

The risk of kidney damage by ciclosporin is increased by the concomitant administration of certain NSAIDs. This effect cannot be ruled out for the combination of ciclosporine and ibuprofen, either.

### **Cholestyramine:**

Concomitant treatment with cholestyramine and ibuprofen results in prolonged and reduced (25%) absorption of ibuprofen. The medicinal products should be administered with at least one hour interval.

### **Tacrolimus:**

Elevated risk of nephrotoxicity.

### **Zidovudine:**

There is evidence of an increased risk of haemarthrosis and haematoma in HIV positive haemophilia patients receiving concurrent treatment with zidovudine and ibuprofen. There may be an increased risk of haematotoxicity during concomitant use of zidovudine and NSAIDs. Blood counts 1-2 weeks after starting use together are recommended.

### **Ritonavir:**



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May increase the plasma concentrations of NSAIDs.

### **Mifepristone:**

If NSAIDs are used within 8-12 days after mifepristone administration they can reduce the effect of mifepristone.

### **Probenecid or sulfinpyrazone:**

May cause a delay in the elimination of ibuprofen. The uricosuric action of these substances is decreased.

### **Herbal extracts:**

Ginkgo biloba may potentiate the risk of bleeding with NSAIDs.

### **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.

### **Quinolone antibiotics:**

Patients taking NSAIDs and quinolones may have an increased risk of developing convulsions.

### **Sulphonylureas:**

NSAIDs can increase the hypoglycemic effect of sulphonylureas. In the case of simultaneous treatment, monitoring of blood glucose levels is recommended.

### **Corticosteroids:**

Increased risk of gastrointestinal ulceration or bleeding.

### **Anti-platelet aggregation agents (e.g. clopidogrel and ticlopidine):**

Increase the risk of gastrointestinal bleeding.

### **Alcohol, bisphosphonates and oxpentifylline (pentoxifylline):**

May potentiate the GI side-effects and the risk of bleeding and 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 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. 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.

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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-hydramnios; 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 last trimester of pregnancy.

#### ***Breastfeeding***

Ibuprofen is excreted in breast milk, but with therapeutic doses during short term treatment the risk for influence on infant seems unlikely. If, however, longer treatment is prescribed, early weaning should be considered.

#### ***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**

Ibuprofen generally has no adverse effects on the ability to drive and use machinery. However since at high dosage side effects such as fatigue, somnolence, vertigo (reported as common) and visual disturbances (reported as uncommon) may be experienced, the ability to take part actively in road traffic or operate machinery may be impaired in individual cases. This effect is potentiated by simultaneous consumption of alcohol.

### **4.8 Undesirable effects**

With the following adverse drug reactions, it must be accounted for that they are predominantly dose- dependent and vary interindividually.

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 has been observed.

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).

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

Assessment of adverse reactions is normally based on the following occurrence frequency:

Very common ( $\geq 1/10$ )

Common ( $\geq 1/100$  to  $< 1/10$ )

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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).

***Blood and lymphatic system disorders***

**Very rare:** haematopoietic disorders (anaemia, leucopenia, thrombocytopenia, pancytopenia, agranulocytosis, neutropenia). The first symptoms or signs may include: fever, sore throat, surface mouth ulcers, flu-like symptoms, severe fatigue, nasal and skin bleeding

***Immune system disorders***

**Uncommon:** hypersensitivity reactions such as urticaria, pruritus, purpura and exanthema as well as asthma attacks (sometimes with hypotension)

**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.

***Psychiatric disorders***

**Rare:** depression, confusion, hallucinations

**Not known:** anxiety

***Nervous system disorders***

**Common:** headache, somnolence, vertigo, fatigue, agitation, dizziness, insomnia, irritability

**Very rare:** aseptic meningitis

**Not known:** optic neuritis, paraesthesia

***Eye disorders***

**Uncommon:** visual disturbances

**Rare:** toxic amblyopia

***Ear and labyrinth disorders***

**Very rare:** tinnitus

**Not known:** hearing impaired

***Cardiac disorders***

**Very rare:** palpitations, heart failure, myocardial infarction, acute pulmonary oedema, oedema,

***Vascular disorder***

**Very rare:** hypertension

***Respiratory, thoracic and mediastinal disorders***

**Uncommon:** rhinitis, bronchospasm

**4.9 Overdose*****Symptoms***

Most patients who have ingested clinically important amounts of NSAIDs will develop no more than nausea, vomiting, epigastric pain, or more rarely, diarrhoea. Nystagmus, blurred vision, tinnitus, headache and gastrointestinal bleeding may also occur. In more serious poisoning, toxicity is seen in the central nervous system, manifesting as vertigo, dizziness, drowsiness, occasionally excitation and disorientation, loss of consciousness or coma. Occasionally patients develop convulsions. Children may also develop myoclonic cramps. In serious poisoning metabolic acidosis may occur, hypothermia and hyperkalaemia may also occur and the prothrombin time/INR may be prolonged, probably due to interference with the actions of

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circulating clotting factors. Acute renal failure, liver damage, hypotension, respiratory depression and cyanosis may occur. Exacerbation of asthma is possible in asthmatics.

### ***Treatment***

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 the acid 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 derivatives. **ATC code:** M01AE01

Ibuprofen is a NSAID that possesses anti-inflammatory, analgesic and antipyretic activity. Animal models for pain and inflammation indicate that ibuprofen effectively inhibits the synthesis of prostaglandins. In humans, ibuprofen reduces pain possibly caused by inflammation or connected with it, swelling and fever. Ibuprofen exerts an inhibitory effect on prostaglandin synthesis by inhibiting the activity of cyclo-oxygenase. In addition ibuprofen has an inhibitory effect on ADP (adenosine diphosphate) or collagen stimulated platelet aggregation.

Experimental data suggest that ibuprofen may competitively inhibit the effect of low dose acetylsalicylic acid 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.

Ibuprofen inhibits prostaglandin synthesis in the uterus, thereby reducing intrauterine rest and active pressure, the periodic uterine contractions and the amount of prostaglandins released into the circulation. These changes are assumed to explain the alleviation of menstrual pain. Ibuprofen inhibits renal prostaglandin synthesis which can lead to renal insufficiency, fluid retention and heart failure in risk patients.

Prostaglandins are connected with ovulation and the use of medicinal products inhibiting prostaglandin synthesis may therefore affect the fertility of women.

### 5.2 Pharmacokinetic properties

#### **Absorption**

Ibuprofen is rapidly absorbed from the gastrointestinal tract, peak serum concentrations occurring 1-2 hours after administration.

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### **Distribution**

Ibuprofen is rapidly distributed throughout the whole body. The plasma protein binding is approximately 99%.

### **Biotransformation**

Ibuprofen is metabolised in the liver (hydroxylation, carboxylation).

### **Elimination**

The elimination half-life is approximately 2.5 hours in healthy individuals. Pharmacologically inactive metabolites are mainly excreted (90%) by the kidneys but also in bile.

### **5.3 Preclinical safety data**

As a well-established and widely used product, the pre-clinical safety of ibuprofen is well documented.

Ibuprofen's sub chronic and chronic toxicity was mainly shown by animal tests as gastric tract damage and ulcers.

The vitro and in vivo tests have not shown any clinically significant signs about ibuprofen's mutagenicity. Furthermore no carcinogenic effects have been observed in mice and rats.

Ibuprofen inhibits ovulation in rabbits and impairs implantation in various animal species (rabbit, rat and mouse). In reproduction tests undertaken with rats and rabbits, ibuprofen passed across the placenta. When using doses toxic to the mother, malformations occur more frequently (i.e. ventricular septum defects).

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**6. PHARMACEUTICAL PARTICULARS****6.1 List of Excipients**

Microcrystalline Cellulose pH-101	BP
Maize Starch	BP
Colloidal Silicon Dioxide	BP
Povidone (PVPK-30)	BP
Cross Carmellose Sodium	BP
Colloidal Silicon Dioxide	BP
Sodium Starch Glycolate Type A	BP
Purified Talc	BP
Magnesium Stearate	BP
Ready colour Mix film coat Titanium Dioxide	In-house
Ready colour mix film coat Erythrosine	In-house
Isopropyl alcohol	BP
Methylene Dichloride	BP

**6.2 Incompatibilities**

Not applicable

**6.3 Shelf life**

36 months

**6.4 Special precautions for storage**

Store below 30°C. Protect from light.

**6.5 Nature and contents of container**

1 X 15 Alu-PVC Blister Pack

**6.6 Special precautions for disposal and other handling**

KEEP OUT OF THE REACH AND SIGHT OF CHILDREN.



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**7. APPLICANT/MANUFACTURER**

**MANUFACTURED**

First Vadis Pharmaceutical Industries Limited  
Plot IN/2 Phase 2 Extension, Emene  
Industrial Layout Enugu State