

# Summary of Product Characteristics

## 1 NAME OF THE MEDICINAL PRODUCT

Rabeprazole 20 mg gastro-resistant tablets

## 2 QUALITATIVE AND QUANTITATIVE COMPOSITION

Each gastro-resistant tablet contains 20 mg rabeprazole sodium, equivalent to 18.85 mg rabeprazole.

For the full list of excipients, see section 6.1.

## 3 PHARMACEUTICAL FORM

Gastro-resistant tablet.

Rabeprazole 20 mg gastro-resistant tablets: Yellow, film-coated, biconvex tablet.

## 4 CLINICAL PARTICULARS

### 4.1 Therapeutic Indications

Rabeprazole is indicated in:

- Active duodenal ulcer
- Active benign gastric ulcer
- Symptomatic erosive or ulcerative gastro-oesophageal reflux disease (GORD).
- Gastro-oesophageal reflux disease, long-term management (GORD maintenance)
- Symptomatic treatment of moderate to very severe gastro-oesophageal reflux disease (symptomatic GORD)
- Zollinger-Ellison Syndrome
- In combination with appropriate antibacterial therapeutic regimens for the eradication of *Helicobacter pylori* in patients with peptic ulcer disease. See section 4.2.

### 4.2 Posology and method of administration

#### Posology

Adults/elderly:

*Active duodenal ulcer and active benign gastric ulcer:* The recommended oral dose for both active duodenal ulcer and active benign gastric ulcer is 20 mg to be taken once daily in the morning.

Most patients with active duodenal ulcer heal within four weeks. However, some patients may require an additional four weeks of treatment to achieve healing. Most patients with benign active gastric ulcer heal within six weeks. However again some patients may require an additional six weeks of treatment to achieve healing.

*Erosive or ulcerative gastro-oesophageal reflux disease (GORD):* The recommended oral dose for this condition is 20 mg to be taken once daily for four to eight weeks.

*Gastro-oesophageal reflux disease, long-term management (GORD maintenance therapy):* For long-term management, a maintenance dose is 20 mg or 10 mg once daily can be used, depending upon patient response.

*Symptomatic treatment of moderate to very severe gastro-oesophageal reflux disease (symptomatic GORD):* 10 mg once daily in patients without oesophagitis. If symptom control has not been achieved during 4 weeks, the patient should be further investigated. Once the symptoms have resolved, subsequent symptom control can be achieved using

an on-demand regimen taking 10 mg once daily when needed.

*Zollinger-Ellison Syndrome:*

The recommended adult starting dose is 60 mg once a day. The dose may be titrated upwards to 120 mg/day based on individual patient needs. Single daily doses up to 100 mg/day may be given. 120 mg dose may require divided doses, 60 mg twice daily. Treatment should continue for as long as clinically indicated.

*Eradication of *Helicobacter pylori*:*

Patients with *H. pylori* infection should be treated with eradication therapy. The following combination given for 7 days is recommended.

Rabeprazole sodium 20 mg twice daily + clarithromycin 500 mg twice daily and amoxicillin 1 g twice daily.

*Renal and hepatic impairment*

No dosage adjustment is necessary for patients with renal or hepatic impairment.

See section 4.4 Special warnings and precautions for use of rabeprazole sodium in the treatment of patients with severe hepatic impairment.

*Paediatric population*

Rabeprazole sodium is not recommended for use in children, as there is no experience of its use in this group.

Method of administration

For oral use

For indications requiring once daily treatment, Rabeprazole gastro-resistant tablets should be taken in the morning, before eating; and although neither the time of day nor food intake was shown to have any effect on rabeprazole sodium activity, this regimen will facilitate treatment compliance.

Patients should be cautioned that Rabeprazole gastro-resistant tablets should not be chewed or crushed, but should be swallowed whole.

### 4.3 Contraindications

Hypersensitivity to the active substance or to any of the excipients listed in section 6.1.

Rabeprazole is contra-indicated in pregnancy and during breast-feeding.

### 4.4 Special warnings and precautions for use

Symptomatic response to therapy with rabeprazole sodium does not preclude the presence of gastric or oesophageal malignancy, therefore, the possibility of malignancy should be excluded prior to commencing treatment with Rabeprazole.

Patients on long-term treatment (particularly those treated for more than a year) should be kept under regular surveillance.

A risk of cross-hypersensitivity reactions with other proton pump inhibitor or substituted benzimidazoles cannot be excluded.

Patients should be cautioned that Rabeprazole gastro-resistant tablets should not be chewed or crushed, but should be swallowed whole.

There have been post marketing reports of blood dyscrasias (thrombocytopenia and neutropenia). In the majority of cases where an alternative aetiology cannot be identified, the events were uncomplicated and resolved on discontinuation of rabeprazole.

Hepatic enzyme abnormalities have been seen in clinical trials and have also been reported since market authorisation. In the majority of cases where an alternative aetiology cannot be identified, the events were uncomplicated and resolved on discontinuation of rabeprazole.

No evidence of significant drug related safety problems was seen in a study of patients with mild to moderate hepatic impairment versus normal age and sex matched controls. However because there are no clinical data on the use of rabeprazole sodium in the treatment of patients with severe hepatic dysfunction the prescriber is advised to exercise caution when treatment with Rabeprazole is first initiated in such patients.

Co-administration of atazanavir with rabeprazole sodium is not recommended (see section 4.5).

Treatment with proton pump inhibitors, including rabeprazole, may possibly increase the risk of gastrointestinal infections such as *Salmonella*, *Campylobacter* and *Clostridium difficile* (see section 5.1).

Proton pump inhibitors, especially if used in high doses and over long durations (>1 year), may modestly increase the risk of hip, wrist and spine fracture, predominantly in the elderly or in presence of other recognised risk factors. Observational studies suggest that proton pump inhibitors may increase the overall risk of fracture by 10–40%. Some of this increase may be due to other risk factors. Patients at risk of osteoporosis should receive care according to current clinical guidelines and they should have an adequate intake of vitamin D and calcium.

### **Interference with laboratory tests**

Increased Chromogranin A (CgA) level may interfere with investigations for neuroendocrine tumours. To avoid this interference, rabeprazole treatment should be stopped for at least 5 days before CgA measurements (see section 5.1). If CgA and gastrin levels have not returned to reference range after initial measurement, measurements should be repeated 14 days after cessation of proton pump inhibitor treatment.

### **Hypomagnesaemia**

Severe hypomagnesaemia has been reported in patients treated with proton pump inhibitors (PPIs) like rabeprazole for at least three months, and in most cases for a year. Serious manifestations of hypomagnesaemia such as fatigue, tetany, delirium, convulsions, dizziness and ventricular arrhythmia can occur but they may begin insidiously and be overlooked. In most affected patients, hypomagnesaemia improved after magnesium replacement and discontinuation of the PPI.

For patients expected to be on prolonged treatment or who take PPIs with digoxin or drugs that may cause hypomagnesaemia (e.g. diuretics), health care professionals should consider measuring magnesium levels before starting PPI treatment and periodically during treatment.

### **Concomitant use of rabeprazole with methotrexate**

Literature suggests that concomitant use of PPIs with methotrexate (primarily at high dose; see methotrexate prescribing information) may elevate and prolong serum levels of methotrexate and/or its metabolite, possibly leading to methotrexate toxicities. In high-dose methotrexate administration, a temporary withdrawal of the PPI may be considered in some patients.

### **Influence on vitamin B<sub>12</sub> absorption**

Rabeprazole sodium, as all acid-blocking medicines, may reduce the absorption of vitamin B<sub>12</sub> (cyanocobalamin) due to hypo- or a- chlorhydria. This should be considered in patients with reduced body stores or risk factors for reduced vitamin B<sub>12</sub> absorption on long-term therapy or if respective clinical symptoms are observed.

**Subacute cutaneous lupus erythematosus (SCLE)** Proton pump inhibitors are associated with very infrequent cases of SCLE. If lesions occur, especially in sun-exposed areas of the skin, and if accompanied by arthralgia, the patient should seek medical help promptly and the health care professional should consider stopping rabeprazole. SCLE after previous treatment with a proton pump inhibitor may increase the risk of SCLE with other proton pump inhibitors.

#### Paediatric population

Rabeprazole sodium gastro-resistant tablets is not recommended for use in children, as there is no experience of its use in this group.

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

Rabeprazole sodium produces a profound and long lasting inhibition of gastric acid secretion. An interaction with compounds whose absorption is pH dependent may occur. Co-administration of rabeprazole sodium with ketoconazole or itraconazole may result in a significant decrease in antifungal plasma levels. Therefore individual patients may need to be monitored to determine if a dosage adjustment is necessary when ketoconazole or itraconazole are taken concomitantly with Rabeprazole.

In clinical trials, antacids were used concomitantly with the administration of rabeprazole sodium and, in a specific drug-drug interaction study no interaction with liquid antacids was observed.

Co-administration of atazanavir 300 mg/ritonavir 100 mg with omeprazole (40 mg once daily) or atazanavir 400 mg with lansoprazole (60 mg once daily) to healthy volunteers resulted in a substantial reduction in atazanavir exposure. The absorption of atazanavir is pH dependent. Although not studied, similar results are expected with other proton pump inhibitors. Therefore PPIs, including rabeprazole, should not be co-administered with atazanavir (see section 4.4).

#### Methotrexate

Case reports, published population pharmacokinetic studies, and retrospective analyses suggest that concomitant administration of PPIs and methotrexate (primarily at high dose; see methotrexate prescribing information) may elevate and prolong serum levels of methotrexate and/or its metabolite hydroxymethotrexate. However, no formal drug interaction studies of methotrexate with PPIs have been conducted.

### 4.6 Fertility, pregnancy and lactation

#### Pregnancy

There are no data on the safety of rabeprazole in human pregnancy. Reproduction studies performed in rats and rabbits have revealed no evidence of impaired fertility or harm to the foetus due to rabeprazole sodium, although low foeto-placental transfer occurs in rats. Rabeprazole is contraindicated during pregnancy (see section 4.3).

Breast-feeding It is not known whether rabeprazole sodium is excreted in human breast milk. No studies in breast-feeding women have been performed. Rabeprazole sodium is however excreted in rat mammary secretions. Therefore Rabeprazole should not be used during breast feeding (see section 4.3).

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

Based on the pharmacodynamic properties and the adverse events profile, it is unlikely that rabeprazole sodium would cause an impairment of driving performance or compromise the ability to use machinery. If however, alertness is impaired due to somnolence, it is recommended that driving and operating complex machinery be avoided.

### 4.8 Undesirable effects

#### Summary of the safety profile

The most commonly reported adverse drug reactions, during controlled clinical trials with rabeprazole were headache, diarrhoea, abdominal pain, asthenia, flatulence, rash and dry mouth. The majority of adverse events experienced during clinical studies were mild or moderate in severity, and transient in nature.

#### Tabulated list of adverse reactions

The following adverse reactions have been reported from clinical trial and post-marketing experience.

Frequencies are defined as: very common ( $\geq 1/10$ ), common ( $\geq 1/100$  to  $< 1/10$ ), uncommon ( $\geq 1/1,000$  to  $< 1/100$ ), rare ( $\geq 1/10,000$  to  $< 1/1,000$ ), very rare ( $< 1/10,000$ ), not known (cannot be estimated from the available data)

System Organ Class	Common	Uncommon	Rare	Very rare	Not known
Infections and infestations	Infection				
Blood and lymphatic system disorders			Neutropenia, Leucopenia, Thrombocytopenia, Leucocytosis		
Immune system disorders			Hypersensitivity <sup>1,2</sup>		
Metabolism and nutrition disorders			Anorexia		Hyponatremia Hypomagnesaemia. (see section 4.4)
Psychiatric disorders	Insomnia	Nervousness	Depression		Confusion
Nervous system disorders	Headache, Dizziness	Somnolence			
Eye disorders			Visual disturbance		
Vascular disorders					Peripheral oedema
Respiratory, thoracic and mediastinal disorders	Cough, Pharyngitis, Rhinitis	Bronchitis, Sinusitis			
Gastrointestinal disorders	Diarrhoea, Vomiting, Nausea, Abdominal pain, Constipation, Flatulence	Dyspepsia, Dry mouth, Eructation	Gastritis, Stomatitis, Taste disturbance		
Hepatobiliary disorders			Hepatitis, Jaundice, Hepatic encephalopathy <sup>3</sup>		
Skin and subcutaneous tissue disorders		Rash, Erythema <sup>2</sup>	Pruritus, Sweating, Bullous reactions <sup>2</sup>	Erythema multiforme, Toxic epidermal necrolysis (TEN), Stevens-	Subacute cutaneous lupus erythematosus (see section 4.4).

				Johnson syndrome (SJS)	
Musculoskeletal and connective tissue disorders	Non-specific pain, Back pain	Myalgia, leg cramps, Arthralgia Fracture of the hip, wrist or spine (see section 4.4)			
Renal and urinary disorders		Urinary tract infection	Interstitial nephritis		
Reproductive system and breast disorders					Gynaecomastia
General disorders and administration site conditions	Asthenia, Influenza like illness	Chest pain, Chills, Pyrexia			
Investigations		Increased Hepatic enzymes <sup>3</sup>	Weight increased		

<sup>1</sup> Includes facial swelling, hypotension and dyspnoea

<sup>2</sup> Erythema, bullous reactions and hypersensitivity reactions have usually resolved after discontinuation of therapy.

<sup>3</sup> Rare reports of hepatic encephalopathy have been received in patients with underlying cirrhosis.

In treatment of patients with severe hepatic dysfunction the prescriber is advised to exercise caution when treatment with Rabeprazole is first initiated in such patients (see section 4.4).

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: [www.hpra.ie](http://www.hpra.ie); E-mail: [medsafety@hpra.ie](mailto:medsafety@hpra.ie).

**4.9 Overdose**

Experience to date with deliberate or accidental overdose is limited. The established exposure has not exceeded 60 mg twice daily, or 160 mg once daily. Effects are generally minimal, representative of the known adverse event profile and reversible without further medical intervention. No specific antidote is known. Rabeprazole sodium is extensively protein bound and is therefore not easy to dialyse. As in any case of overdose, treatment should be symptomatic and general supportive measures should be utilised.

**5 PHARMACOLOGICAL PROPERTIES**

**5.1 Pharmacodynamic properties**

Pharmacotherapeutic group: Alimentary tract and metabolism, Drugs for peptic ulcer and gastro-oesophageal reflux

disease (GORD), proton pump inhibitors, ATC code: A02BC04.

### Mechanism of action

Rabeprazole sodium belongs to the class of anti-secretory compounds, the substituted benzimidazoles, that do not exhibit anticholinergic or  $H_2$ -histamine-antagonist properties, but suppress gastric acid secretion by the specific inhibition of  $H^+/K^+$ -ATPase enzyme (the acid or proton pump).

### Pharmacodynamic effects

The effect is dose-related and leads to inhibition of both basal and stimulated acid secretion irrespective of the stimulus. Animal studies indicate that after administration, rabeprazole sodium rapidly disappear from both plasma and the gastric mucosa. As a weak base, rabeprazole is rapidly absorbed following all doses and is concentrated in the acid environment of parietal cells. Rabeprazole is converted to the active sulphenamide form through protonation, and subsequently reacts with the available cysteines on the proton pump.

*Anti-secretory activity:* After oral administration of a 20mg dose of rabeprazole sodium the onset of the anti-secretory effect occurs within one hour, with the maximum effect occurring within two to four hours. Inhibition of basal and food-stimulated acid secretion 23 hours after the first dose of rabeprazole sodium are 69% and 82% respectively and inhibition lasts up to 48 hours. The inhibitory effect of rabeprazole sodium on acid secretion increases slightly with repeated once-daily dosing, achieving steady-state inhibition after three days. When the drug is discontinued, secretory activity normalises over 2 to 3 days.

Decreased gastric acidity due to any means, including proton pump inhibitors such as rabeprazole, increases counts of bacteria normally present in the gastrointestinal tract. Treatment with proton pump inhibitors may possibly increase the risk of gastrointestinal infections such as *Salmonella*, *Campylobacter* and *Clostridium difficile* (see section 4.4).

*Serum gastrin effects:* In clinical studies patients were treated once daily with 10 mg or 20 mg rabeprazole sodium, for up to 43 months. Serum gastrin levels increased during the first 2 to 8 weeks reflecting the inhibitory effects on acid secretion and remained stable while treatment was continued. Gastrin values returned to pre-treatment levels, usually 1 to 2 weeks after discontinuation of therapy.

Human gastric biopsy specimens from the antrum and the fundus from over 500 patients receiving rabeprazole or comparator treatment for up to 8 weeks have not detected changes in ECL cell histology, degree of gastritis, incidence of atrophic gastritis, intestinal metaplasia or distribution of *H. pylori* infection. In over 250 patients followed for 36 months of continuous therapy, no significant change in findings present at baseline was observed.

*Other effects:* Systemic effects of rabeprazole sodium in the CNS, cardiovascular and respiratory systems have not been found to date. Rabeprazole sodium, given in oral doses of 20-mg for 2 weeks, had no effect on thyroid function, carbohydrate metabolism or circulating levels of parathyroid hormone, cortisol, oestrogen, testosterone, prolactin, cholecystokinin, secretin, glucagon, follicle stimulating hormone (FSH), luteinising hormone (LH), renin, aldosterone or somatotrophic hormone.

Studies in healthy volunteers have shown that rabeprazole sodium does not have clinically significant interactions with amoxicillin. Rabeprazole does not adversely influence plasma concentrations of amoxicillin or clarithromycin when co-administered for the purpose of eradicating upper gastrointestinal *H. pylori* infection.

During treatment with antisecretory medicinal products, serum gastrin increases in response to the decreased acid secretion. Also CgA increases due to decreased gastric acidity. The increased CgA level may interfere with investigations for neuroendocrine tumours.

Available published evidence suggests that proton pump inhibitors should be discontinued between 5 days and 2 weeks prior to CgA measurements. This is to allow CgA levels that might be spuriously elevated following PPI treatment to return to reference range.

## **5.2 Pharmacokinetic properties**

### Absorption

Rabeprazole gastro-resistant tablets is an enteric-coated (gastro-resistant) tablet formulation of rabeprazole sodium. This presentation is necessary because rabeprazole is acid-labile. Absorption of rabeprazole therefore begins after the

tablet leaves the stomach. Absorption is rapid with peak plasma levels of rabeprazole occurring approximately 3.5 hours after a 20-mg dose. Peak plasma concentrations ( $C_{\max}$ ) of rabeprazole and AUC are linear over a dose range of 10 mg to 40 mg. Absolute bioavailability of an oral 20-mg dose (compared to intravenous administration) is about 52% due to in large part to pre-systemic metabolism. Additionally the bioavailability does not appear to increase with repeat administration. In healthy subjects the plasma half-life is approximately one hour (from 0.7 to 1.5 hours), and the total body clearance is estimated to be  $283 \pm 98$  ml/min. There was no clinically relevant interaction with food. Neither food nor the time of day of administration of the treatment affect the absorption of rabeprazole sodium.

#### Distribution

Rabeprazole is approximately 97% bound to human plasma proteins.

#### Biotransformation

Rabeprazole sodium, as is the case with other members of the of proton pump inhibitors, is metabolised through the cytochrome P450 (CYP450) hepatic drug metabolising system. *In vitro* studies with human liver microsomes indicated that rabeprazole sodium is metabolised by isoenzymes of CYP450 (CYP2C19 and CYP3A4). In these studies, at expected human plasma concentrations rabeprazole neither induces nor inhibits CYP3A4; and although *in vitro* studies may not always be predictive of *in vivo* status these findings indicate that no interaction is expected between rabeprazole and cyclosporin. In humans, thioether (M1) and carboxylic acid (M6) are the main plasma metabolites with the sulphone (M2), desmethyl-thioether (M4) and mercapturic acid conjugate (M5) minor metabolite observed at lower levels. Only the desmethyl metabolite (M3) has a small amount of anti-secretory activity, but it is not present in plasma.

#### Elimination

Following a single 20-mg  $^{14}\text{C}$  labelled oral dose of rabeprazole sodium, no unchanged drug was excreted in urine. Approximately 90% of the dose was eliminated in urine mainly as the two metabolites: a mercapturic acid conjugate (M5) and carboxylic acid (M6), plus two unknown metabolites. The remainder of the dose was recovered in faeces.

#### Gender

Adjusted for body mass and height, there are no significant gender difference in pharmacokinetic parameters following a single 20-mg dose of rabeprazole.

#### Renal impairment

In patients with stable, end-stage, renal failure requiring haemodialysis (creatinine clearance  $\leq 5$  ml/min/1.73 m<sup>2</sup>), the metabolism and elimination of rabeprazole was very similar to that in healthy volunteers. AUC and  $C_{\max}$  in these patients was about 35% lower than in corresponding parameters in healthy volunteers. The mean half-life for rabeprazole was 0.82 hour in healthy volunteers, 0.95 hours in patients during haemodialysis and 3.6 hours post-dialysis. The clearance of the drug in patients with renal disease requiring maintenance haemodialysis was approximately twice that in healthy volunteers.

#### Hepatic impairment

Following a single 20-mg dose of rabeprazole to patients with chronic mild to moderate hepatic impairment the AUC doubled and there was a 2-3-fold increase in half-life of rabeprazole compared to healthy volunteers. However, following a 20-mg daily dose for 7 days the AUC had increased by only 1.5-fold and  $C_{\max}$  by only 1.2-fold. The half-life of rabeprazole in patients with hepatic impairment was 12.3 hours compared to 2.1 hours in healthy volunteers. The pharmacodynamic response (gastric pH control) in the two groups was clinically comparable.

#### Elderly

Elimination of rabeprazole was somewhat lower in the elderly. Following 7 days of daily dosing with 20-mg of rabeprazole sodium, the AUC approximately doubled, the  $C_{\max}$  increased by 60% and half-life increased by approximately 30% as compared to young healthy volunteers. However, there was no evidence of rabeprazole accumulation.

#### CYP2C19 polymorphism:

Following a 20-mg daily dose of rabeprazole for 7 days, CYP2C19 slow metabolisers, had the AUC and  $t_{1/2}$  which were approximately 1.9 and 1.6 times the corresponding parameters in extensive metabolisers whilst  $C_{\max}$  had increased by only 40%.



### 5.3 Preclinical safety data

Non-clinical effects were observed only at exposures sufficiently in excess of the maximum human exposure that make concerns for human safety negligible in respect to animal data.

Studies on mutagenicity gave equivocal results. Tests in mouse lymphoma cell lines were positive, but *in vivo* micronucleolus and *in vivo* and *in vitro* DNA repair tests were negative. Carcinogenicity studies revealed no special hazard for humans.

## 6 PHARMACEUTICAL PARTICULARS

### 6.1 List of excipients

**Tablet core:**

Mannitol  
Heavy magnesium oxide  
Hydroxypropyl cellulose  
Magnesium stearate

**Intermediate Layer:**

Ethylcellulose  
Heavy magnesium oxide

**Tablet coating:**

Hypromellose phthalate  
Dibutyl sebacate  
Yellow iron oxide (E172)  
Titanium dioxide (E171)  
Talc

### 6.2 Incompatibilities

Not applicable.

### 6.3 Shelf life

2 years

### 6.4 Special precautions for storage

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

### 6.5 Nature and contents of container

Aluminium/aluminium blisters in a cardboard carton.  
1, 5, 7, 14, 15, 25, 28, 30, 50, 56, 75, 98 or 120 gastro-resistant tablets.

Not all pack sizes may be marketed.

### 6.6 Special precautions for disposal

No special requirements.

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

## **7 MARKETING AUTHORISATION HOLDER**

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

## **8 MARKETING AUTHORISATION NUMBER**

PA0577/179/002

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

Date of first authorisation: 11th September 2009

Date of last renewal: 11th September 2014

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

November 2016