

# Summary of Product Characteristics

## 1 NAME OF THE MEDICINAL PRODUCT

Flagyl 0.5% w/v Solution for Infusion in Viaflex Container

## 2 QUALITATIVE AND QUANTITATIVE COMPOSITION

Each infusion bag contains 500mg/100ml of metronidazole. (5mg/ml).

Excipient(s) with known effect:

Sodium 310mg (see section 4.4)

For a full list of excipients, see section 6.1.

## 3 PHARMACEUTICAL FORM

Solution for infusion (Infusion).

A clear pale yellow sterile solution.

## 4 CLINICAL PARTICULARS

### 4.1 Therapeutic indications

Metronidazole is indicated in adults and children for the following indications:

In the treatment of severe infections due to anaerobic bacteria, particularly species of Bacteroides, anaerobic Streptococci, etc., and for prophylaxis against such infections, in patients for whom oral medication is not practical.

Consideration should be given to official guidance on the appropriate use of antibacterial agents.

### 4.2 Posology and method of administration

Intravenous.

*Recommended Dosage:*

#### Treatment

<i>Adults and children over 12 years:</i>	500 mg (100 ml) eight hourly.
<i>Children &gt;8 weeks to 12 years of age:</i>	The usual daily dose is 20 – 30 mg/kg/day as a single dose or divided into 7.5 mg/kg every 8 hours. The daily dose may be increased to 40 mg/kg, depending on the severity of the infection. Duration of treatment is usually 7 days.
<i>Children &lt;8 weeks of age:</i>	15 mg/kg as a single dose daily or divided into 7.5 mg/kg every 12 hours. In newborns with a gestation age <40 weeks, accumulation of metronidazole can occur during the first week of life, therefore the concentrations of metronidazole in serum should preferably be monitored after a few days therapy.

#### Prevention

*Prophylaxis against postoperative infections caused by anaerobic bacteria*

<i>Adults and children over 12 years:</i>	500 mg (100 ml) immediately before, during or after operation repeated eight hourly thereafter.
<i>Children &lt; 12 years of age:</i>	20 – 30 mg/kg as a single dose given 1 – 2 hours before surgery
<i>Newborns with a gestation age &lt;40 weeks:</i>	10 mg/kg body weight as a single dose before operation

#### Eradication of helicobacter pylori in paediatric patients:

As part of a combination therapy, 20 mg/kg/day not to exceed 500 mg twice daily for 7 – 14 days. Official guidelines should be consulted before initiating therapy.

Infusion should be at the rate of 5 ml per minute for treatment. The intravenous route should be discontinued as soon as feasible with substitution or oral medication, (in adults 400 mg twice daily – in children 7.5 mg/kg b.w. for treatment and 3.7 to 7.5 mg/kg b.w. for prevention).

In the case of children whose weights are below those usual for their age, or for infants below 10 kg in weight, dosage of metronidazole should be reduced proportionately.

Metronidazole is removed during haemodialysis and should be administered after the procedure is finished.

*Elderly:*

Caution is advised particularly at high doses. No information is available on modification of dose.

The preparations may be diluted if necessary, using only those solution stated in the manufacturer's literature. These include normal saline, dextrose/saline, dextrose 5% w/v or potassium chloride injections 20 mmol and 40 mmol.

#### **4.3 Contraindications**

Metronidazole should be used with caution in patients with active or chronic severe peripheral and central nervous system diseases due to the risk of neurological aggravation.

Use in patients with known hypersensitivity to metronidazole.

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

The use of Flagyl for prolonged treatment duration should be carefully weighed. If prolonged therapy is required, the physician should bear in mind the possibility of peripheral neuropathy or leucopenia. Both effects are usually reversible. It is recommended that haematological tests be carried out regularly and that patients should be monitored for adverse reactions such as peripheral or central neuropathy (such as paraesthesia, ataxia, dizziness, vertigo, convulsive seizures) (see section 4.8). High dosage regimens have been associated with transient epileptiform seizures. Caution is required in patients with active disease of the central nervous system except for brain abscess.

Metronidazole and a metabolite have been shown to be mutagenic in some tests with non mammalian cells.

Intensive or prolonged metronidazole therapy should be conducted only under conditions of close surveillance for clinical and biological effects and under specialist direction.

Metronidazole is removed during haemodialysis and should be administered after the procedure is finished.

Metronidazole is mainly metabolised by hepatic oxidation. Substantial impairment of metronidazole clearance may occur in the presence of advanced hepatic insufficiency. The risk/benefit using metronidazole to treat trichomoniasis in such patients should be carefully considered.

Flagyl should be administered in caution to people with hepatic encephalopathy.

Cases of severe bullous skin reactions, sometimes fatal, such as Stevens-Johnson syndrome (SJS), toxic epidermal necrolysis (TEN) or acute generalised exanthematous pustulosis have been reported with metronidazole (see section 4.8). The majority of cases of SJS reported occurred within 7 weeks of starting treatment with metronidazole. Patients should be advised of the signs and symptoms and monitored closely for skin reactions. If symptoms of SJS, TEN or AGEP (e.g. flu-like symptoms, progressive skin rash often with blisters or mucosal lesions) are present, treatment must be immediately discontinued (see section 4.8).

Patients should be warned that metronidazole may darken urine (due to metronidazole metabolite).

Patients should be advised not to take alcohol during metronidazole therapy and for at least 48 hours afterwards (see section 4.5).

Cases of severe hepatotoxicity/acute hepatic failure, including cases with a fatal outcome with very rapid onset after treatment initiation in patients with Cockayne syndrome have been reported with products containing metronidazole for systemic use. In this population, metronidazole should therefore be used after careful benefit-risk assessment and only if no alternative treatment is available. Liver function tests must be performed just prior to the start of therapy, throughout and after end of treatment until liver function is within normal ranges, or until the baseline values are reached. If the liver function tests become markedly elevated during treatment, the drug should be discontinued.

Patients with Cockayne syndrome should be advised to immediately report any symptoms of potential liver injury to their physician and stop taking metronidazole.

This medicinal product contains 310mg sodium per 100ml, equivalent to 16% of the WHO recommended maximum daily intake for sodium. The maximum daily dose of this product is equivalent to 48% of the WHO recommended maximum daily intake for sodium. Flagyl Solution for Infusion is considered high in sodium. This should be particularly taken into account for those on a low salt diet.

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

Potential of the anticoagulant effect and increased hemorrhagic risk caused by decreased hepatic catabolism. In case of coadministration, prothrombin time should be more frequently monitored and anticoagulant therapy adjusted during treatment with metronidazole.

Flagyl Injection should on no account be administered concurrently mixed with any other substances except: amikacin sulphate, ampicillin sodium, carbenicillin sodium, cephazolin sodium, cefotaxime sodium, cerfuroxime sodium, cephalothin sodium, chloramphenicol sodium succinate, clindamycin phosphate, gentamycin sulphate, hydrocortisone sodium succinate, latamoxef disodium netilmicin sulphate and tobramycin sulphate.

Ampicillin sodium, cephalothin sodium and hydrocortisone sodium succinate should be added cautiously to Flagyl solution. The following solutions are incompatible with Flagyl solution: Cefamandole nafate, cefoxitin sodium, dextrose 10% w/v, compound sodium lactate injection and penicillin G.potassium.

Patients should be advised not to take alcohol (or drugs containing alcohol) during metronidazole therapy and for at least 48 hours afterwards because of a disulfiram-like (antabuse effect) reaction (flushing, vomiting, tachycardia).

Disulfiram: psychotic reactions have been reported in patients who were using metronidazole and disulfiram concurrently.

Lithium retention observed by increased plasma lithium levels, accompanied by evidence of possible renal damage has been reported in patients treated simultaneously with lithium and metronidazole. Plasma levels of lithium may be increased by metronidazole. Lithium treatment should be tapered or withdrawn before administering metronidazole. Plasma concentration of lithium, creatinine and electrolytes should be monitored in patients under treatment with lithium while they receive metronidazole.

Phenytoin or Phenobarbital: increased elimination of metronidazole resulting in reduced plasma levels. A similar effect may occur with other drugs which induce hepatic microsomal enzymes.

Cyclosporin: risk of elevation of the cyclosporin serum levels. Serum cyclosporine and serum creatinine should be closely monitored when coadministration is necessary.

5 Fluorouracil: reduced clearance of 5 fluorouracil resulting in increased toxicity of 5 fluorouracil.

Busulfan: Plasma levels of busulfan may be increased by metronidazole, which may lead to severe busulfan toxicity.

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

Metronidazole should only be used during pregnancy or lactation following careful evaluation and only if considered essential by the physician. Its effects on foetal organogenesis are not known. If used, high dosage regimens should be avoided. The drug crosses the placenta and is excreted in breast milk in which concentrations equal those in serum. Unnecessary exposure to the drug should be avoided.

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

Patients should be warned about the potential for confusion, dizziness, vertigo, hallucinations, convulsions or eye disorders, (see section 4.8) and advised not to drive or operate machinery if these symptoms occur.

#### **4.8 Undesirable effects**

Frequency, type and severity of adverse reactions in children are the same as in adults.

#### Gastrointestinal Disorders

- epigastric pain, nausea, vomiting, diarrhoea.
- oral mucositis, taste disorders, dry mouth, anorexia.
- reversible cases of pancreatitis.
- tongue discolouration/furry tongue

#### Immune system disorders

- angioedema, anaphylactic shock.

#### Nervous system disorders

- peripheral sensory neuropathy.
- headache, convulsions, dizziness.
- reports of encephalopathy (e.g. confusion) and subacute cerebellar syndrome (e.g. ataxia, dysarthria, gait impairment, nystagmus and tremor) which may resolve with discontinuation of the drug.
- aseptic meningitis, vertigo

#### Psychiatric disorders

- psychotic disorders including confusion, hallucinations.
- depressed mood

#### Eye disorders

- transient vision disorders such as diplopia, myopia, blurred vision, decreased visual acuity. Changes in color vision.
- Optic neuropathy/neuritis. Ear and labyrinth disorders
- hearing impaired/hearing loss (including sensorineural)
- tinnitus

#### Blood and lymphatic system disorders

- cases of agranulocytosis, neutropenia and thrombocytopenia have been reported.

#### Hepatobiliary disorders

- increase in liver enzymes (AST, ALT, alkaline phosphatase), cholestatic or mixed hepatitis and hepatocellular liver injury, sometimes with jaundice, have been reported.
- cases of liver failure requiring liver transplant have been reported in patients treated with metronidazole, mostly when used in combination with other antibiotic drugs.

#### Skin and subcutaneous tissue disorders

- rash, pruritus, flushing, urticaria
- pustular eruptions, acute generalised exanthematous pustulosis
- fixed drug eruption
- Stevens-Johnson syndrome, toxic epidermal necrolysis.

#### General disorders and administration site conditions

- fever

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, Website: [www.hpra.ie](http://www.hpra.ie)

**4.9 Overdose**

Single oral doses of metronidazole, up to 12g have been reported in suicide attempts and accidental overdoses. Symptoms were limited to vomiting, ataxia and slight disorientation. There is no specific antidote for metronidazole overdosage. In cases of suspected massive overdosage, a symptomatic and supportive treatment should be instituted.

## 5 PHARMACOLOGICAL PROPERTIES

### 5.1 Pharmacodynamic properties

Flagyl - the drug has antiprotozoal and antibacterial actions including activity against anaerobic bacteria and *entamoeba histolytica* etc.

### 5.2 Pharmacokinetic properties

A nitroimidazole derivative well absorbed and widely distributed in the body. It is metabolised by acid oxidation, hydroxylation and glucuronidation and excreted in urine and faeces with a  $T_{1/2}$  of about 8 hours. Metronidazole is excreted in milk but the intake of a suckling infant of a mother receiving normal dosage would be considerably less than the therapeutic dosage for infants.

### 5.3 Preclinical safety data

Metronidazole has been shown to be carcinogenic in the mouse and in the rat. However, similar studies in the hamster have given negative results and epidermiological studies in humans have provided no evidence of an increased carcinogenic risk in humans. Metronidazole has been shown to be mutagenic in bacteria *in vitro*. In studies conducted in mammalian cells *in vitro* as well as in rodent and in humans *in vivo*, there was inadequate evidence of mutagenic effects.

Therefore, the use of Flagyl for prolonged treatment duration should be carefully weighed (see section 4.4).

## 6 PHARMACEUTICAL PARTICULARS

### 6.1 List of excipients

Disodium phosphate dodecahydrate (E139) (For pH adjustment)  
Citric acid monohydrate (E330) (for pH adjustment)  
Sodium chloride  
Water for injections

### 6.2 Incompatibilities

This medicinal product must not be mixed within other medicinal products except those mentioned in *section 4.2, Posology and method of administration*.

### 6.3 Shelf life

Unopened: 2 years  
Once opened: The product should be used immediately after opening. Discard any unused solution.

### 6.4 Special precautions for storage

Do not store above 25°C. Store in the original container to protect from light.

### 6.5 Nature and contents of container

Flagyl Viaflex 100 ml is marked in boxes containing a clear, collapsible PVC infusion bag (viaflex) which may contain an integral combination device, effectively sealed.

### 6.6 Special precautions for disposal of a used medicinal product or waste materials derived from such medicinal product and other handling of the product

This is a single dose container, discard any unused solution.

**7 MARKETING AUTHORISATION HOLDER**

Sanofi-Aventis Ireland Limited T/A SANOFI  
Citywest Business Campus  
Dublin 24  
Ireland

**8 MARKETING AUTHORISATION NUMBER**

PA0540/100/003

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

Date of first authorisation: 19 April 1982

Date of last renewal: 19 April 2007

**10 DATE OF REVISION OF THE TEXT**

August 2022