

# Data Sheet

## Flagyl and Flagyl-S

### NAME OF THE MEDICINE

Flagyl metronidazole B.P. 500 mg suppositories

Flagyl-S metronidazole benzoate oral suspension equivalent of 200 mg metronidazole/5 mL

### Presentation

Flagyl suppositories are creamy coloured and contain 500 mg metronidazole.

Flagyl-S suspension is buff-coloured, each 5 mL containing 320 mg metronidazole benzoate, equivalent to 200 mg metronidazole. Flagyl-S suspension contains 68% w/v sugars, ethanol, methyl and propyl hydroxy-benzoate.

### PHARMACOLOGY

#### Microbiology

Antiprotozoal agent; anaerobic antibacterial agent.

Flagyl is active against a wide range of pathogenic micro-organisms notably species of Bacteroides, Fusobacteria, Clostridia, Eubacteria, anaerobic cocci and *Gardnerella vaginalis*. It is also active against Trichomonas, *Entamoeba histolytica*, *Giardia lamblia* and *Balantidium coli*.

It is suggested that unchanged metronidazole penetrates the protozoan cell, where the nitro group is reduced to a hydroxyl or amine group which reacts with DNA and stops nucleic acid synthesis.

#### Pharmacokinetics

##### Absorption

The bioavailability of metronidazole in Flagyl suppositories is 60-80%. Effective blood concentrations are achieved 5-12 hours after the first suppository and are maintained by the recommended 8-hourly regimen.

##### Distribution

Metronidazole is widely distributed into most body tissues and fluids where it achieves concentrations similar to those in plasma. Metronidazole is not protein bound to any significant degree. Metronidazole is metabolised by oxidation in the liver to a number of metabolites, one of which (the hydroxy metabolite) has some antibacterial activity.

##### Elimination

The elimination half-life of metronidazole is 7-8 hours, and that of the hydroxyl metabolite slightly longer. About 55 to 80 percent of an administered dose is excreted in the urine as nitro-containing compounds, of which unchanged metronidazole and the hydroxymethyl homologue each comprise about one third. The fate of the remainder is unknown.

Metronidazole should be administered with caution to patients with advanced hepatic insufficiency. Metronidazole can be used in chronic renal failure; it is rapidly removed from the plasma by dialysis. Metronidazole is excreted in breast milk but the intake of a suckling infant of a mother receiving normal dosage would be considerably less than the therapeutic dosage for infants.

## INDICATIONS

1. The prevention of post-operative infections due to anaerobic bacteria, particularly species of bacteroides and anaerobic streptococci.
2. The treatment of septicaemia, bacteraemia, peritonitis, brain abscess, necrotising pneumonia, osteomyelitis, puerperal sepsis, pelvic abscess, pelvic cellulitis, and post-operative wound infections from which pathogenic anaerobes have been isolated.
3. Urogenital trichomoniasis in the female (trichomonal vaginitis) and in the male.
4. Bacterial vaginosis (also known as non-specific vaginitis, anaerobic vaginosis or *Gardnerella vaginitis*).
5. All forms of amoebiasis (intestinal and extra-intestinal disease and that of symptomless cyst passers).
6. Giardiasis.
7. Acute ulcerative gingivitis.
8. Anaerobically-infected leg ulcers and pressure sores.
9. Acute dental infections due to anaerobic organisms (eg. acute pericoronitis and acute apical infections).

## DOSAGE AND ADMINISTRATION

Flagyl suppositories are unsuitable for initiating treatment of serious conditions owing to slower absorption and lower plasma concentrations of metronidazole.

Flagyl suspension should be taken at least one hour before a meal.

### Anaerobic Infections

The duration of a course of Flagyl treatment is about 7 days but it will depend upon the seriousness of the patient's condition as assessed clinically and bacteriologically.

#### Prophylaxis (against anaerobic infection)

Chiefly in the context of abdominal (especially colorectal) and gynaecological surgery.

##### *Oral:*

Adults: 400 mg at 8-hourly intervals during the 24 hours preceding operation, followed by post-operative intravenous or rectal administration until the patient is able to take oral medication.

Children: 7.5 mg/kg 8-hourly.

##### *Rectal:*

Adults: 1g 8-hourly.

Children: One half or a quarter of a 500 mg suppository 8 hourly

##### *Elderly:*

Caution is advised in the elderly, particularly at high doses, although there is limited information available on modification of dosage.

#### Treatment of established anaerobic infection

Oral dosage is given in terms of metronidazole or metronidazole equivalent

##### *Oral:*

Adults: 800 mg followed by 400 mg 8-hourly.

Children: 7.5 mg/kg 8-hourly

*Rectal:*

Adults: 1g 8-hourly. Substitute oral medication as early as possible. If rectal administration is prolonged beyond 3 days, reduce dose to 1g 12-hourly for remainder of course.

### Treatment of Protozoal and other Infections

See table

	Duration of dosage in days	Adults and children over 10 years‡	Children† - 7 to 10 years	Children† - 3 to 7 years	Children † - 1 to 3 years
<b>Urogenital trichomoniasis (where re-infection is likely, the consort should receive a similar course of treatment concurrently)</b>	7	200 mg 3 x daily	100 mg 3 x daily	100 mg twice daily	50 mg 3 x daily
	2	800 mg in the am. and 1200 mg in the pm.	-	-	-
	1	2.0 g as a single dose	-	-	-
<b>Non-specific vaginitis</b>	7	400 mg twice daily	-	-	-
	1	2.0 g as a single dose	-	-	-
<b>Amoebiasis</b>					
<b>(a) Invasive intestinal disease in susceptible subjects</b>	5	800 mg 3 x daily	400 mg 3 x daily	200 mg 4 x daily	200 mg 3 x daily
<b>(b) Intestinal disease in susceptible subjects and chronic amoebic hepatitis</b>	5-10	400 mg 3 x daily	200 mg 3 x daily	100 mg 4 x daily	100 mg 3 x daily
<b>(c) Symptomless cyst passers</b>	5-10	400-800 mg 3 x daily	200-400 mg 3 x daily	100-200 mg 4 x daily	100-200 mg 3 x daily
<b>Giardiasis</b>	3	2.0 g once daily	1.0 g once daily	600-800 mg once daily	500 mg once daily
<b>Acute ulcerative gingivitis</b>	3	200 mg 3 x daily	100 mg 3 x daily	100 mg 2 x daily	50 mg 3 x daily
<b>Acute dental infections</b>	3 - 7	200 mg 3 x daily	-	-	-

	Duration of dosage in days	Adults and children over 10 years‡	Children† - 7 to 10 years	Children† - 3 to 7 years	Children † - 1 to 3 years
Leg ulcers & pressure sores	7	400 mg 3 x daily	-	-	-
Anaerobic infections (general)	See Data Sheet Text				

† Children (and infants weighing less than 10 kg) should receive proportionately smaller dosages.

‡ Flagyl is well tolerated by the elderly, but a pharmacokinetic study suggests cautious use of high dosage regimens in this age group.

## CONTRAINDICATIONS

1. Patients with evidence of or a history of blood dyscrasias should not receive the drug since upon occasion a mild leucopenia has been observed during its administration. However, no persistent haematological abnormalities have been observed in animals or clinical studies.
2. Active organic disease of the central nervous system.
3. Hypersensitivity to metronidazole and other imidazoles.

## PRECAUTIONS

### Alcohol

Alcoholic beverages and drugs containing alcohol, should not be consumed by patients being treated with metronidazole and for at least a day after treatment as nausea, vomiting, abdominal cramps, headaches, tachycardia and flushing may occur. There is the possibility of a disulfiram-like (Antabuse) effect reaction.

### Long term therapy

If, for compelling reasons, metronidazole must be administered for longer than the usually recommended duration it is recommended that haematological tests, especially leucocyte count, should be carried out regularly, and that patients should be monitored for adverse reactions such as peripheral or central neuropathy (paraesthesia, ataxia, dizziness, convulsive seizures). If leucopenia or abnormal neurological signs occur, the drug should be discontinued immediately.

### Surgical drainage

Use of metronidazole does not obviate the need for aspiration of pus whenever indicated.

### Impaired renal function

The elimination half-life of metronidazole remains unchanged in the presence of renal failure. The dosage of metronidazole therefore needs no reduction. Such patients, however, retain the metabolites of metronidazole. The clinical significance of this is not known at present. In patients undergoing haemodialysis metronidazole and metabolites are removed during an eight hour period of dialysis. Metronidazole should therefore be administered immediately after haemodialysis. No routine adjustment in the dosage of Flagyl need be

made in patients with renal failure undergoing intermittent peritoneal dialysis (IPD) or continuous ambulatory peritoneal dialysis (CAPD).

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

### **Impaired hepatic function**

Metronidazole is mainly metabolised by hepatic oxidation. Substantial impairment of metronidazole clearance may occur in the presence of advanced hepatic insufficiency. Significant cumulation may occur in patients with hepatic encephalopathy and the resulting high plasma concentrations of metronidazole may contribute to the symptoms of the encephalopathy. Flagyl should, therefore, be administered with caution to patients with impaired liver function or hepatic encephalopathy. The daily dosage should be reduced to one-third and may be administered once a day. Metronidazole may interfere with certain chemical analyses of serum aspartate transaminase (AST), alanine transaminase (ALT), lactate dehydrogenase (LDH), triglycerides and hexokinase glucose to give abnormally low values.

### **Nervous system**

Caution is advised in patients with active disease of the central nervous system other than brain abscess. 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. Treatment should be immediately discontinued if signs of neuropathy or encephalopathy are noticed.

### **Use of condoms and diaphragms**

The simultaneous use of Flagyl suppositories with condoms or diaphragms may increase the risk of rupture of the latex.

### **Infections**

There is a possibility that after *Trichomonas vaginalis* has been eliminated a gonococcal infection might persist.

*Candida* overgrowth in the gastrointestinal or genital tract may occur during metronidazole therapy and require treatment with a candidicidal drug.

### **Use in Pregnancy**

Category B2

There is inadequate evidence of the safety of metronidazole in pregnancy. However, as Flagyl crosses the placental barrier it, like other medicines, should not be given during pregnancy or during lactation unless the physician considers it essential; in these circumstances the short high-dosage regimes are not recommended.

### **Use in Lactation**

As metronidazole is excreted in human milk, unnecessary exposure to the drug should be avoided.

### **Carcinogenicity/Mutagenicity**

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 extensive human epidemiological studies have provided no evidence of 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 or humans *in vivo*, there was inadequate evidence of a mutagenic effect of metronidazole.

### **Effects on Ability to Drive and Use Machines**

Patients should be warned about the potential for confusion, dizziness, hallucinations, convulsions or transient visual disorders and advised not to drive or operate machinery if these symptoms occur.

## **ADVERSE EFFECTS**

Serious adverse reactions occur very rarely with standard recommended regimens.

### **Gastrointestinal disorders**

When given orally, metronidazole is well tolerated. The most common adverse reactions refer to the gastrointestinal tract, particularly nausea, sometimes accompanied by headache, anorexia and occasionally vomiting, diarrhoea, epigastric pain or distress and abdominal cramping; constipation, taste disorders and oral mucositis have also been reported. A metallic, sharp, unpleasant taste is not unusual. Cases of pancreatitis which abated on withdrawal of the drug, have been reported. Crohn's disease patients are known to have an increased incidence of gastrointestinal and certain extraintestinal cancers. If patients receiving metronidazole drink alcoholic beverages, they may experience abdominal distress, nausea, vomiting, flushing or headache. A modification of the taste of alcoholic beverages has also been reported.

Furry tongue, glossitis and stomatitis have occurred; these may be associated with a sudden overgrowth of *Candida* which may occur during effective therapy.

### **Body as a whole**

Hypersensitivity reactions include urticaria, fever, rash, pruritus, flushing, angioedema and anaphylactic shocks. Nasal congestion and dryness of the mouth have been reported. Mild erythematous eruptions have been experienced, as have fleeting joint pains sometimes resembling serum sickness. Pustular eruptions have been reported.

### **Peripheral and Central Nervous System**

Drowsiness, dizziness, headache and uncoordinated movements have been reported. During intensive and/or prolonged metronidazole therapy, a few instances of peripheral neuropathy (characterised mainly by numbness or paraesthesia of an extremity) or convulsions have been reported. There have been reports of encephalopathy (e.g. confusion) and subacute cerebellar syndrome (e.g. ataxia, dysarthria, gait impairment, nystagmus and tremor). In most cases neuropathy disappeared after treatment was stopped or when dosage was reduced. Since persistent peripheral neuropathy has been reported in some patients receiving prolonged administration of metronidazole, such subjects should be specifically warned about these reports and should be told to stop the drug and report immediately if any neurological symptoms occur. Aseptic meningitis has been reported.

### **Psychiatric Disorders**

Psychotic disorders, such as confusion and hallucinations have been reported. Depression, depressed mood, insomnia, irritability and weakness have also been reported.

### **Eye disorders**

Optic neuropathy/neuritis and transient vision disorders such as diplopia, myopia, blurred vision, decreased visual acuity and changes in colour vision have been reported.

## **Blood and lymphatic system disorders**

Cases of agranulocytosis, neutropenia and thrombocytopenia have been reported. A moderate leucopenia has been reported in some patients. If this occurs, the total leucocyte count may be expected to return to normal after the course of medication is completed. One case of bone marrow depression has been reported. If profound bone marrow suppression occurs, use of metronidazole should be ceased and appropriate supportive therapy instituted.

## **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 in combination with other antibiotic drugs.

## **Genito-urinary Tract**

Proliferation of *Candida* also may occur in the vagina. Dryness of the vagina or vulva, pruritus, dysuria, cystitis and a sense of pelvic pressure have been reported. Very rarely dyspareunia, fever, polyuria, incontinence, decrease of libido, proctitis and pyuria have occurred in patients receiving the drug.

Instances of darkened urine have been reported and this manifestation has been the subject of special investigation. Although the pigment which is probably responsible for this phenomenon has not been positively identified, it is almost certainly a metabolite of metronidazole. It seems certain that it is of no clinical significance and may be encountered only when metronidazole is administered in higher than recommended doses.

## **Cardiovascular**

Flattening of the T wave may be seen in ECG tracings.

## **Interactions with other Medicines**

Some potentiation of anticoagulant effect (and increased haemorrhagic risk caused by decreased hepatic catabolism) has been reported when metronidazole has been used with the warfarin type oral anticoagulants. Dosage of the latter may require reducing. Prothrombin times should be more frequently monitored. No interactions have been reported with anticoagulants of the heparin type. However, anticoagulant activity should be routinely monitored with these products.

Plasma levels of lithium may be increased by metronidazole. Lithium retention accompanied by evidence of possible renal damage has been reported in patients treated simultaneously with lithium and 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.

Patients receiving phenobarbitone or phenytoin metabolise metronidazole at a much greater rate than normally, reducing the half life to approximately 3 hours.

Patients should be advised not to take alcohol during metronidazole therapy and for at least one day afterwards, because of the possibility of a disulfiram-like (antabuse) reaction.

Psychotic reactions have been reported in patients who were using metronidazole and disulfiram concurrently. Metronidazole should not be given to patients who have taken disulfiram within the last two weeks.

Metronidazole should be used with caution in patients receiving BCNU and/or cyclophosphamide.

Concomitant use of cyclosporin and metronidazole could result in increased serum levels of cyclosporin. When it is necessary to co-administer the two together close monitoring of serum cyclosporin and creatinine is advisable.

The clearance of 5-fluorouracil is reduced resulting in increased toxicity of 5-fluorouracil.

Aspartate amino transferase assays may give spuriously low values in patients taking metronidazole, depending on the method used.

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

The simultaneous administration of drugs that decrease microsomal liver enzyme activity, such as cimetidine, may prolong the half-life and decrease plasma clearance of metronidazole.

## **Overdosage**

Symptoms of overdosage are limited to vomiting, ataxia and slight disorientation. Uneventful recovery has followed attempts at suicide and accidental overdoses with quantities of 30 and 60 x 200 mg tablets, and single oral doses of metronidazole, up to 12 g. There is no specific treatment for gross overdosage of Flagyl. Treatment should be symptomatic and supportive.

## **Pharmaceutical Precautions**

### **Shelf Life**

Flagyl-S suspension contains 60% w/v sugars. Dilution of Flagyl-S suspension, if necessary, should be carried out with syrup B.P. The diluted suspension has a shelf life of 14 days.

### **Storage Conditions**

Flagyl suppositories	Store below 25°C. Protect from light.
Flagyl-S suspension	Store below 25°C. Protect from light.

## **Medicine Classification**

Prescription Medicine

## **Package Quantities**

Flagyl 500 mg suppositories	Containers of 10 x 500 mg suppositories.
Flagyl-S suspension	Bottles of 100 mL suspension.

## **Further Information**

Flagyl suppositories contain hard fat.

Flagyl-S suspension contains sodium dihydrogen phosphate, methyl hydroxybenzoate, propyl hydroxybenzoate, ethanol, and liquid sugar.

## **Name and Address**

sanofi-aventis new zealand limited  
Level 8, James and Wells Tower  
56 Cawley Street  
Eilerslie, Auckland

## **Date of Preparation**

20 January 2012