



Mupirocin

Bactroban® 2% 20 mg/g Ointment

PRODUCT DESCRIPTION

Mupirocin (*Bactroban*®) 2% Ointment is a 2% w/w mupirocin free acid in a white, translucent, water soluble, polyethylene glycol base for topical administration. Each gram contains 20 mg mupirocin.

PHARMACOLOGIC PROPERTIES

Pharmacodynamics

Mechanism of Action

Mupirocin is a novel antibiotic produced through fermentation of *Pseudomonas fluorescens*. Mupirocin inhibits isoleucyl transfer-RNA synthetase, thereby arresting bacterial protein synthesis.

Due to this particular mode of action, and its unique chemical structure, mupirocin does not show any cross-resistance with other clinically available antibiotics.

Mupirocin has bacteriostatic properties at minimum inhibitory concentrations and bactericidal properties at the higher concentrations reached when applied locally.

Pharmacodynamic Effects

Activity

Mupirocin is a topical antibacterial agent showing *in vivo* activity against *Staphylococcus aureus* (including methicillin-resistant strains), *S. epidermidis* and beta-haemolytic *Streptococcus* species.

The *in vitro* spectrum of activity includes the following bacteria:

Commonly Susceptible Species:

Staphylococcus aureus^{1,2}

Staphylococcus epidermidis^{1,2}

Coagulase-negative *staphylococci*^{1,2}

Streptococcus species¹

Haemophilus influenza

Neisseria gonorrhoeae

Neisseria meningitidis

Moraxella catarrhalis

Pasteurella multocida.

¹Clinical efficacy has been demonstrated for susceptible isolates in approved clinical indications.

²Including beta-lactamase producing strains and methicillin-resistant strains

Resistant Species:

Corynebacterium species

Enterobacteriaceae

Gram negative non-fermenting rods

Micrococcus species

Anaerobes.

Mupirocin susceptibility (MIC) breakpoints for *Staphylococcus spp.*

Ointment and Cream:

Susceptible: less than or equal to 1 microgram/ml

Intermediate: 2 to 256 micrograms/ml

Resistant: greater than 256 micrograms/ml

Resistance mechanisms:

Low-level resistance in staphylococci (MICs 8 to 256 micrograms/ml) has been shown to be due to changes in the native isoleucyl tRNA synthetase enzyme. High-level resistance in staphylococci (MICs greater than or equal to 512 micrograms/ml) has been shown to be due to a distinct, plasmid encoded isoleucyl tRNA synthetase enzyme. Intrinsic resistance in Gram-negative organisms such as the *Enterobacteriaceae* could be due to poor penetration into the bacterial cell.

Pharmacokinetics

Absorption

Mupirocin is poorly absorbed through intact human skin.

Metabolism

Mupirocin is suitable only for topical application. Following i.v. or oral administration, or if mupirocin is absorbed (e.g. through broken/diseased skin) mupirocin is rapidly metabolised to inactive monic acid.

Elimination

Mupirocin is rapidly eliminated from the body by metabolism to its inactive metabolite monic acid which is rapidly excreted by the kidney.

Special Patient Population

Elderly patients: No restrictions unless there is evidence of moderate or severe renal impairment (see Warning and Precautions).

NON-CLINICAL INFORMATION

Carcinogenesis/Mutagenesis

Carcinogenesis

Carcinogenicity studies with mupirocin have not been conducted.

Genotoxicity

Mupirocin was not mutagenic in *Salmonella typhimurium* or *Escherichia coli* (Ames assay). In a Yahagi assay, small increases in *Salmonella typhimurium* TA98 were observed at highly cytotoxic concentrations. In an *in vitro* mammalian gene mutation assay (MLA), no increase in mutation frequency was observed in the absence of metabolic activation. In the presence of metabolic activation, small increases in mutation frequency were observed at highly cytotoxic concentrations. However, no effects were observed in yeast cell assays for gene conversion/mutation, an *in vitro* human lymphocyte assay or in an *in vitro* unscheduled DNA synthesis (UDS) assay. Furthermore, an *in vivo* mouse micronucleus assay (chromosome damage) and a rat Comet assay (DNA strand breakage) were negative, indicating the small increases observed at highly cytotoxic concentrations *in vitro* do not translate to the *in vivo* situation.

Reproductive Toxicology

Fertility

Mupirocin administered subcutaneously to male rats 10 weeks prior to mating and to female rats 15 days prior to mating until 20 days post coitum at doses up to 100 mg/kg/day had no effect on fertility.

Pregnancy

In embryo-foetal development studies in rats there was no evidence of developmental toxicity at subcutaneous doses up to 375 mg/kg/day.

In an embryo-foetal development study in rabbits at subcutaneous doses up to 160 mg/kg/day, maternal toxicity (impaired weight gain and severe injection site irritation) at the high dose resulted in abortion or poor litter performance. However, there was no evidence of developmental toxicity in foetuses of rabbits maintaining pregnancy to term.

INDICATIONS

Mupirocin (*Bactroban*[®]) 2% Ointment is indicated for the topical treatment of primary and secondary bacterial skin infections.

Primary skin infections:

Impetigo, folliculitis, furunculosis and ecthyma.

Secondary infections:

Infected dermatoses e.g., infected eczema. Infected traumatic lesions e.g., abrasions, insect bites, minor (not requiring hospitalisation) wounds and burns.

Prophylaxis: Mupirocin may be used to avoid bacterial contamination of small wounds, incisions and other clean lesions, and to prevent infection of abrasions and small cuts and wounds.

DOSAGE AND ADMINISTRATION

Method of Administration

A small quantity of mupirocin ointment should be applied to cover the affected area.

The treated area may be covered by a dressing.

Any product remaining at the end of treatment should be discarded.

Do not mix with other preparations as there is a risk of dilution, resulting in a reduction in the antibacterial activity and potential loss of stability of the mupirocin in the ointment.

Populations

- **Adults/Children/Elderly/Hepatically impaired**

2 to 3 times a day for up to 10 days, depending on the response.

- **Renally impaired**

See *Warnings and Precautions*.

CONTRAINDICATIONS

Mupirocin (*Bactroban*[®]) 2% Ointment should not be given to patients with a history of hypersensitivity to mupirocin or any of the constituents of the preparations.

WARNINGS AND PRECAUTIONS

In the rare event of a possible sensitisation reaction or severe local irritation occurring with the use of the product, treatment should be discontinued, the product should be wiped off and appropriate alternative therapy for the infection instituted.

As with other antibacterial products, prolonged use may result in overgrowth of non-susceptible organisms.

Pseudomembranous colitis has been reported with the use of antibiotics and may range in severity from mild to life-threatening.

Therefore, it is important to consider its diagnosis in patients who develop diarrhoea during or after antibiotic use. Although this is less likely to occur with topically applied mupirocin, if prolonged or significant diarrhoea occurs or the patient experiences abdominal cramps, treatment should be discontinued immediately and the patient investigated further.

Renal impairment

Polyethylene glycol can be absorbed from open wounds and damaged skin and is excreted by the kidneys. Im common with other polyethylene glycol based ointments, mupirocin (*Bactroban*[®]) 2% ointment should not be used in conditions where absorption of large quantities of polyethylene glycol is possible, especially if there is evidence of moderate or severe renal impairment.

This mupirocin ointment formulation is not suitable for:

- ophthalmic use,
- intranasal use,
- use in conjunction with cannulae and
- at the site of central venous cannulation.

Avoid contact with the eyes. If contaminated, the eyes should be thoroughly irrigated with water until the ointment residues have been removed.

Ability to perform tasks that require judgement, motor or cognitive skills

No adverse effects on the ability to drive or operate machinery have been identified.

DRUG INTERACTIONS

No drug interactions have been identified.

PREGNANCY AND LACTATION

Fertility

There are no data on the effects of mupirocin on human fertility. Studies in rats showed no effects on fertility (see *Non-Clinical Information*).

Pregnancy

Adequate human data on use during pregnancy are not available. Studies in animals do not indicate reproductive toxicity (see *Non-Clinical Information*).

Lactation

Adequate human and animal data on use during lactation are not available.

If a cracked nipple is to be treated, it should be thoroughly washed prior to breast-feeding.

ADVERSE EFFECTS

Adverse reactions are listed below by system organ class and frequency. Frequencies are defined as: very common (greater than or equal to 1/10), common (greater than or equal to 1/100, less than 1/10), uncommon (greater than or equal to 1/1000, less than 1/100), rare (greater than or equal to 1/10,000, less than 1/1000), very rare (less than 1/10,000), including isolated reports.

Common and uncommon adverse reactions were determined from pooled safety data from a clinical trial population of 1573 treated patients encompassing 12 clinical studies. Very rare adverse reactions were primarily determined from post-marketing experience data and therefore refer to reporting rate rather than true frequency.

Immune system disorders:

Very rare: Systemic allergic reactions including anaphylaxis, generalised rash, urticaria and angioedema have been reported with mupirocin ointment.

Skin and subcutaneous tissue disorders:

Common: Burning localised to the area of application.

Uncommon: Itching, erythema, stinging and dryness localised to the area of application.
Cutaneous sensitisation reactions to mupirocin or the ointment base.

OVERDOSAGE

Symptoms and Signs

There is currently limited experience with overdosage of mupirocin.

Treatment

There is no specific treatment for an overdose of mupirocin. In the event of overdose, the patient should be treated supportively with appropriate monitoring as necessary. Further management should be as clinically indicated or as recommended by the national poisons centre, where available.

STORAGE CONDITIONS

Store at temperatures not exceeding 25°C.

INCOMPATIBILITIES

None reported.

INSTRUCTIONS FOR USE/HANDLING

Any product remaining at the end of treatment should be discarded.

Wash your hands after application.

AVAILABILITY

Mupirocin (*Bactroban*[®]) 2% Ointment: packaging of 2.5 g, 5 g and 15 g aluminum tubes with a screw cap (Box of 1's).

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