

PRODUCT MONOGRAPH

Prpms-CLINDAMYCIN

clindamycin hydrochloride capsules, USP

clindamycin 150 mg, 300 mg

Antibiotic

PHARMASCIENCE INC.
6111 Royalmount Ave., Suite 100
Montréal, Québec
H4P 2T4

www.pharmascience.com

Date of Revision:
July 13, 2016

Submission Control No.: 195698

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PRODUCT MONOGRAPH

^{Pr}pms-CLINDAMYCIN

Clindamycin Hydrochloride Capsules USP

Antibiotic

PART I: HEALTH PROFESSIONAL INFORMATION

SUMMARY PRODUCT INFORMATION

Route of Administration	Dosage Form / Strength	All Nonmedicinal Ingredients
oral	Capsules 150 mg, 300 mg	Lactose hydrous 100, magnesium stearate maize starch and talc

INDICATIONS AND CLINICAL USE

pms-CLINDAMYCIN (clindamycin hydrochloride) is indicated in the treatment of serious infections due to sensitive anaerobic bacteria, such as *Bacteroides* species, *Peptostreptococcus*, anaerobic streptococci, *Clostridium* species and microaerophilic streptococci.

pms-CLINDAMYCIN is also indicated in serious infections due to sensitive gram-positive aerobic organisms (staphylococci, including penicillinase-producing staphylococci, streptococci and pneumococci) when the patient is intolerant of, or the organism is resistant to other appropriate antibiotics.

pms-CLINDAMYCIN is indicated for the treatment of the *Pneumocystis jiroveci* pneumonia in patients with AIDS. Clindamycin in combination with primaquine may be used in patients who are intolerant to, or fail to respond to conventional therapy.

pms-CLINDAMYCIN is indicated for prophylaxis against alpha-hemolytic (viridans group) streptococci before dental, oral and upper respiratory tract surgery.

- a) The prophylaxis of bacterial endocarditis in patients allergic to penicillin with any of the following conditions: congenital cardiac malformations, rheumatic and other acquired valvular dysfunction, prosthetic heart valves, previous history of bacterial endocarditis, hypertrophic cardiomyopathy, surgically constructed systemic-pulmonary shunts, mitral valve prolapse with valvular regurgitation or mitral valve prolapse without regurgitation but associated with thickening and/or redundancy of the valve leaflets.

- b) Patients taking oral penicillin for prevention or recurrence of rheumatic fever should be given another agent such as clindamycin, for prevention of bacterial endocarditis.

Geriatrics (> 65 years of age):

Clinical studies of clindamycin did not include sufficient numbers of patients age 65 and over to determine whether they respond differently from younger patients.

Pediatrics (for children more or equal to 40 pounds *and* able to swallow):

It is not known if use of clindamycin in pediatric patients is associated with differences in safety or effectiveness compared with adult patients.

To reduce the development of drug-resistant bacteria and maintain the effectiveness of pms-CLINDAMYCIN and other antibacterial drugs, pms-CLINDAMYCIN should be used only to treat or prevent infections that are proven or strongly suspected to be caused by susceptible bacteria. When culture and susceptibility information are available, they should be considered in selecting or modifying antibacterial therapy. In the absence of such data, local epidemiology and susceptibility patterns may contribute to the empiric selection of therapy.

CONTRAINDICATIONS

pms-CLINDAMYCIN (clindamycin hydrochloride) is contraindicated in patients with a known hypersensitivity to clindamycin or lincomycin or to any ingredient in the formulation or component of the container.

Until further clinical experience is obtained Clindamycin is not indicated in the newborn (infant below 30 days of age). For a complete listing, see **DOSAGE FORMS, COMPOSITION AND PACKAGING**).

WARNINGS AND PRECAUTIONS

General

In patients with G-6-PD deficiency, the combination of clindamycin with primaquine may cause hemolytic reactions. Routine blood examinations should be done during therapy with primaquine to monitor potential hematologic toxicities. Reference should also be made to the primaquine product monograph for other possible risk groups for other hematologic reactions (see **ADVERSE REACTIONS**).

If patients should develop serious hematologic adverse effects, reducing the dosage regimen of primaquine and/or pms-CLINDAMYCIN capsule should be considered (see **DOSAGE and ADMINISTRATION**).

pms-CLINDAMYCIN (clindamycin hydrochloride) should be prescribed with caution in atopic individuals.

pms-CLINDAMYCIN does not diffuse adequately into cerebrospinal fluid and thus should not be used in the treatment of meningitis.

The use of antibiotics occasionally results in overgrowth of non-susceptible organisms - particularly yeasts. Should super-infections occur, appropriate measures should be taken as dictated by the clinical situation.

Care should be exercised when treating patients with multiple medications (see **DRUG INTERACTIONS**).

Gastrointestinal

pms-CLINDAMYCIN should be prescribed with caution in patients with a history of gastrointestinal disease, particularly colitis, inflammatory bowel disease (including regional enteritis and ulcerative colitis), or a history of antibiotic-associated colitis (including pseudomembranous colitis).

Clostridium difficile-associated disease (CDAD)

Clostridium difficile-associated disease (CDAD) has been reported with use of many antibacterial agents, including clindamycin hydrochloride capsules. CDAD may range in severity from mild diarrhea to fatal colitis. It is important to consider this diagnosis in patients who present with diarrhea, or symptoms of colitis, pseudomembranous colitis, toxic megacolon, or perforation of colon subsequent to the administration of any antibacterial agent. CDAD has been reported to occur over 2 months after the administration of antibacterial agents.

Treatment with antibacterial agents may alter the normal flora of the colon and may permit overgrowth of *Clostridium difficile*. *C. difficile* produces toxins A and B, which contribute to the development of CDAD. CDAD may cause significant morbidity and mortality. CDAD can be refractory to antimicrobial therapy.

If the diagnosis of CDAD is suspected or confirmed, appropriate therapeutic measures should be initiated. Mild cases of CDAD usually respond to discontinuation of antibacterial agents not directed against *Clostridium difficile*. In moderate to severe cases, consideration should be given to management with fluids and electrolytes, protein supplementation, and treatment with an antibacterial agent clinically effective against *Clostridium difficile*. Surgical evaluation should be instituted as clinically indicated; as surgical intervention may be required in certain severe cases (see **ADVERSE REACTIONS**).

Hepatic/Biliary/Pancreatic

In patients with moderate to severe liver disease, prolongation of the half-life of clindamycin has been found. However, it was postulated from studies that when given every eight hours, accumulation of clindamycin should rarely occur. Therefore, dosage reduction in liver disease is not generally considered necessary. Periodic liver enzyme determinations should be made when treating patients with severe liver disease.

Immune

Serious allergic reactions including anaphylactoid reactions, drug reaction with eosinophilia and systemic symptoms (DRESS), and dermatological reactions including Stevens-Johnson

syndrome (SJS), toxic epidermal necrolysis (TEN) and acute generalized exanthematous pustulosis (AGEP) have been reported in patients on clindamycin therapy. If a hypersensitivity reaction occurs pms-CLINDAMYCIN should be discontinued and appropriate therapy should be initiated (see **CONTRAINDICATIONS, ADVERSE REACTIONS**).

Renal

pms-CLINDAMYCIN dose modification may not be necessary in patients with renal disease. The serum half-life of clindamycin is increased slightly in patients with markedly reduced renal function.

Special Populations

Pregnant Women: There are no adequate and well-controlled studies in pregnant women. Safety for use in pregnancy has not been established.

Clindamycin should not be used in pregnancy unless clearly needed and unless the expected benefits to the mother outweigh any potential risks to the fetus.

Clindamycin crosses the placenta in humans. After multiple doses, amniotic fluid concentrations were approximately 30% of maternal blood concentrations. Clindamycin was widely distributed in fetal tissues with the highest concentration found in liver.

Reproduction studies have been performed in rats and mice using subcutaneous and oral doses of clindamycin ranging from 20 to 600 mg/kg/day and have revealed no evidence of impaired fertility or harm to the fetus due to clindamycin except at doses that caused maternal toxicity. In one mouse strain, cleft palates were observed in treated fetuses; this response was not produced in other mouse strains or in other species, and therefore may be a strain specific effect. Oral and subcutaneous reproductive toxicity studies in rats and rabbits revealed no evidence of impaired fertility or harm to the fetus due to clindamycin, except at doses that caused maternal toxicity. Animal reproduction studies are not always predictive of human response.

Nursing Women:

Clindamycin has been reported to appear in human breast milk in the range of 0.7 to 3.8 mcg/mL at doses of 150 mg orally to 600 mg intravenously. Because of the potential for serious adverse reactions in nursing infants, pms-CLINDAMYCIN should not be taken by nursing mothers.

Geriatrics (> 60 years of age):

Experience has demonstrated that antibiotic-associated colitis may occur more frequently and with increased severity among elderly and debilitated patients. These patients should be carefully monitored for the development of diarrhea.

Pediatrics

Pediatric patients should be assessed for their ability to swallow pms-CLINDAMYCIN capsule. If a child is unable to reliably swallow a capsule, pms-CLINDAMYCIN capsule should not be used and a suitable dosage formulation should be used.

Monitoring and Laboratory Tests

Routine blood examinations should be done during concomitant therapy with primaquine to monitor potential hematologic toxicities.

Periodic liver and kidney function tests and blood counts should be performed during prolonged therapy when treating patients with severe liver disease.

As with all antibiotics, perform culture and sensitivity studies in conjunction with drug therapy.

ADVERSE REACTIONS

Clinical Trial Adverse Drug Reactions

Because clinical trials are conducted under very specific conditions the adverse reaction rates observed in the clinical trials may not reflect the rates observed in practice and should not be compared to the rates in the clinical trials of another drug. Adverse drug reaction information from clinical trials is useful for identifying drug-related adverse events and for approximating rates.

Adverse drug reaction frequencies for the three clindamycin formulations (clindamycin capsules, clindamycin granules for oral solution and clindamycin injection) are based on the clinical data sources from the original drug submission and on the total number of patients enrolled in the clinical trials (N=1787).

Adverse drug reactions that were considered causally related to clindamycin and observed in $\geq 1\%$ of patients are presented below in Table 1. They are listed according to MedDRA system organ class.

Table 1. Adverse Drug Reactions Occurring in $\geq 1\%$ of Patients treated with clindamycin within the Original Clinical Trials

Adverse Reaction System Organ Class / Preferred Term	clindamycin Total N=1787 ¹ n (%)
Gastrointestinal disorders	
Diarrhea	26 (1.45)
Investigations	
Liver function test abnormal	66 (3.7)
Skin and subcutaneous tissue disorders	
Rash maculopapular	21 (1.18)

¹clindamycin hydrochloride capsules N=851; clindamycin granules for oral solution N=340; clindamycin phosphate injection N=596

Less common adverse drug reactions that were considered causally related to clindamycin and observed in $< 1\%$ of patients are listed below

Blood and lymphatic system disorders: Eosinophilia

Gastrointestinal disorders: Nausea, abdominal pain and vomiting.

General disorders and administration site conditions: Local irritation, pain, abscess formation have been seen with IM injection.

Nervous system disorders: Dysgeusia

Skin and subcutaneous tissue disorders: Urticaria, erythema multiforme and pruritus.

Post-Market Adverse Drug Reactions

Additional adverse events which have been reported in temporal association with pms-CLINDAMYCIN formulations (clindamycin capsules, clindamycin granules for oral solution and clindamycin injection) since market introduction are listed below. Because they are reported voluntarily from a population of unknown size, estimates of frequency cannot be established.

Blood and lymphatic system disorders: Agranulocytosis, leucopenia, neutropenia and thrombocytopenia. In clindamycin/primaquine combination studies, serious hematologic toxicities (grade III, grade IV neutropenia or anemia, platelet counts < 50 x 10⁹/L, or methemoglobin levels of 15% or greater) have been observed.

Cardiac disorders: Cardio-respiratory arrest and hypotension have been seen with rapid intravenous administration.

Gastrointestinal disorders: Colitis and pseudomembranous colitis. Clostridium difficile-associated disease (CDAD) has been observed and may manifest as a range of symptoms varying from watery diarrhea to fatal colitis, the onset of which may occur during or after antibacterial treatment (see **WARNINGS and PRECAUTIONS**). Esophagitis and esophageal ulcer have been reported with the oral formulations.

General disorders and administration site conditions: Injection site irritation and thrombophlebitis. These reactions can be minimized by deep IM injection and avoidance of indwelling intravenous catheters.

Hepatobiliary disorders: Jaundice

Immune system disorders: Generalized mild to moderate morbilliform-like skin rashes, anaphylactoid reactions and drug reaction with eosinophilia and systemic symptoms (DRESS).

Musculoskeletal: Polyarthrititis

Renal and urinary disorders: Renal dysfunction as evidenced by azotemia, oliguria and/or proteinuria

Skin and subcutaneous tissue disorders: Toxic epidermal necrolysis (TEN), Stevens-Johnson syndrome (SJS), erythema multiforme, dermatitis exfoliative, dermatitis bullous, dermatitis vesiculobullous, rash morbilliform, vaginal infection, vaginitis, acute generalized exanthematous pustulosis (AGEP).

Vascular disorders: Thrombophlebitis has been seen with rapid intravenous administration.

DRUG INTERACTIONS

Overview

Clindamycin is metabolized predominantly by CYP3A4, and to a lesser extent CYP3A5, to the major metabolite clindamycin sulfoxide and minor metabolite, N-desmethyleclindamycin. Therefore inhibitors of CYP3A4 and CYP3A5 may reduce clindamycin clearance and inducers of these isoenzymes may increase clindamycin clearance.

In vitro studies indicate that clindamycin does not inhibit CYP1A2, CYP2C9, CYP2C19, CYP2E1, or CYP2D6 and only moderately inhibits CYP3A4. Therefore, clinically important interactions between clindamycin and coadministered drugs metabolized by these CYP enzymes are unlikely.

Clindamycin has been shown to have neuromuscular blocking properties and potential antagonism with erythromycin and aminoglycosides (see **Table 2**).

In a clindamycin/primaquine combination study, serious hematologic toxicities have been observed, but the contribution of clindamycin, if any, is unknown (see **ADVERSE REACTIONS**).

Drug-Drug Interactions

The drugs listed in this table are based on either drug interaction case reports or studies, or potential interactions due to the expected magnitude and seriousness of the interaction.

Table 2 - Established or Potential Drug-Drug Interactions

Proper name	Ref	Effect	Clinical comment
Neuromuscular blocking agents Examples include: atracurium, doxacurium, pancuronium, vecuronium	CS	Clindamycin has been shown to have neuromuscular blocking properties that may enhance the action of other neuromuscular blocking agents	Use with caution in patients receiving these agents concurrently.
aminoglycosides	T	Clindamycin is reported to antagonize bactericidal activity of aminoglycosides in vitro. In vivo antagonism has not been demonstrated.	
erythromycin	T	Antagonism has been demonstrated between clindamycin and erythromycin in vitro. Clindamycin and erythromycin may compete for the same protein binding site in bacteria.	Due to possible clinical significance the two drugs should not be administered concurrently.

Inhibitors of CYP3A4, CYP3A5	T	Clearance of clindamycin may be reduced.	
Inducers of CYP3A4, CYP3A5	T	Clearance of clindamycin may be increased.	Monitor for loss of effectiveness.

Legend: C = Case Study; CT = Clinical Trial; T = Theoretical

Drug-Food Interactions

Interactions with food have not been established.

Drug-Herb Interactions

Efficacy of clindamycin should be closely monitored in patients using concomitant St. John's wort, a CYP3A4 inducer.

Drug-Laboratory Interactions

Interactions with laboratory tests have not been established.

DOSAGE AND ADMINISTRATION

Dosing Considerations

pms-CLINDAMYCIN dose modification may not be necessary in patients with renal disease. pms-CLINDAMYCIN dosage modification is not necessary in patients with hepatic insufficiency. Dosage adjustments are not necessary in the elderly with normal hepatic function and normal (age-adjusted) renal function.

Recommended Dose and Dosage Adjustment

Adults: 150 mg every 6 hours.
Moderately severe infections: 300 mg every 6 hours.
Severe infections: 450 mg every 6 hours.

Children (for children weighing ≥ 40 pounds (18.2 Kg) *and* able to swallow):

One of the following three dosage ranges should be selected depending on the severity of the infection:

- 8-12 mg/kg/day (4-6 mg/lb/day).
- 13-16 mg/kg/day (6.5-8.0 mg/lb/day).
- 17-25 mg/kg/day (8.5-12.5 mg/lb/day).

Severity of the Infection	Mild	Moderate	Severe
Weight in pounds (weight in Kg)	4-6 mg/lb/day (8-12 mg/kg/day)	6.5-8.0 mg/lb/day (13-16 mg/kg/day)	8.5-12.5 mg/lb/day (17-25 mg/kg/day)
22-40 (10-18.2 Kg)	*	*	*
>40-55 (> 18.2-25 Kg)	*	*	150 mg q. 8h
>55-75 (>25-34 Kg)	*	150 mg q. 8h	150 mg q. 6h.
>75-100 (>34-45.5 Kg)	150 mg q. 8h	150 mg q. 6h.	300 mg q. 8h
>100 (>45.5 Kg) use adult dosage	150 mg q. 6h.	300 mg q. 6h	450 mg q. 6h

*other appropriate dosage form may be used

Pneumocystis jiroveci pneumonia in patients with AIDS

pms-CLINDAMYCIN (clindamycin hydrochloride) 300-450 mg may be given orally every 6 hours in combination with 15-30 mg of primaquine for 21 days.
If patients should develop serious hematologic adverse effects, reducing the dosage regimen of primaquine and/or pms-CLINDAMYCIN capsule should be considered.

For prevention of endocarditis

Adults: 300 mg orally 1 hour before procedure; then 150 mg 6 hours after initial dose.
Children: Refer to other dosage form, because the capsules may not be suitable. Use of the appropriate dosage form may be necessary.

Note: With β -hemolytic streptococcal infections, treatment should continue for at least 10 days to diminish the likelihood of subsequent rheumatic fever or glomerulonephritis.

Missed Dose

If a dose is missed, it should be taken as soon as remembered unless it is almost time for the next dose. The dose should not be doubled to make up for a missed dose.

Administration

Absorption of pms-CLINDAMYCIN (clindamycin hydrochloride) is not appreciably modified by ingestion of food and the capsules may be taken with meals.

To avoid the possibility of esophageal irritation, pms-CLINDAMYCIN capsules should be taken with a full glass of water.

OVERDOSAGE

Activated charcoal may be administered to aid in the removal of unabsorbed drug. General supportive measures are recommended.

No cases of overdosage have been reported. It would be expected however, that should overdosage occur, gastrointestinal side effects including abdominal pain, nausea, vomiting and diarrhea might be seen. During clinical trials one 3-year old child was given 100 mg/kg of pms-CLINDAMYCIN (clindamycin hydrochloride) for five days and showed mild abdominal pain and diarrhea. One 13-year old patient was given 75 mg/kg for five days with no side effects. In both cases laboratory values remained normal.

Hemodialysis and peritoneal dialysis are not effective means of removing the compound from the blood. No specific antidote is known.

The average biological half-life of clindamycin is 2.4 hours.

For management of a suspected drug overdose, contact your regional Poison Control Centre immediately.

ACTION AND CLINICAL PHARMACOLOGY

Mechanism of Action

Clindamycin exerts its antibacterial effect by causing cessation of protein synthesis and also causing a reduction in the rate of synthesis of nucleic acids.

The mechanism of action of clindamycin in combination with primaquine on *Pneumocystis jiroveci* is not known.

Pharmacodynamics

(see MICROBIOLOGY)

Pharmacokinetics

Absorption:

Clindamycin is rapidly and almost completely absorbed from the gastrointestinal tract in man and peak serum levels are seen in about 45 minutes. The average peak serum level following a single 150 mg dose in adults is 2.74 mcg/mL. Therapeutically effective average levels of 0.73 mcg/mL are found at 6 hours after a 150 mg dose.

The absorption of clindamycin is not appreciably affected by food intake. Peak serum levels following a single 250 mg oral dose of clindamycin with the patient in the fasting state were 3.1 mcg/mL at 45 minutes whereas the same dose administered with food gave a peak level of 2.4 mcg/mL. A 250 mg dose administered one hour after food gave a peak level of 2.8 mcg/mL but this peak did not occur until two hours after administration of the medication. A 250 mg dose with the patient in a fasting state and with food administered one hour after the medication resulted in peak levels of 3.1 mcg/mL at 12 hours.

Distribution:

Clindamycin binds primarily to alpha-1-acid glycoprotein. Protein binding is concentration dependent, ranging from 60% to 94% at therapeutic serum concentrations.

In three patients following the administration of 150 mg of clindamycin serum levels reached 2.25 mcg/mL in 2 hours and declined to 1.5 mcg/mL at 4 hours. During this period antibiotic synovial fluid levels were 1 mcg/mL at 2 hours and remained unchanged for the next and last 2 hours of observation.

Clindamycin is widely distributed in body fluids and tissues. Serum levels are rapidly attained as noted above. Tissue levels of clindamycin have been determined in various tissues in adult patients undergoing surgical procedures as noted in Table 3.

Clindamycin does not cross the blood-brain-barrier even in the presence of inflamed meninges.

Table 3

Specimen	No. of Specimens	Average Serum Level	Average Fluid Level mcg/mL	Tissue Level mcg/gm
Pancreatic fluid (C6-264)	4	1.15	45.1	
Bile (C6-264)	19	3.35	52.45	

Gall Bladder (C6-24)	16	0.81		4.33
Liver (C6-265)	1	42.35		3.80
Kidney (C6-265)	1	1.50		9.07
Bone (C4-390)	2	2.44		9.91

Metabolism:

In vitro studies in human liver and intestinal microsomes indicated clindamycin is predominantly oxidized by CYP3A4, with minor contribution from CYP3A5, to form clindamycin sulfoxide and a minor metabolite, N-desmethyclindamycin.

Excretion:

The average elimination half-life is 2.4 hours. After oral administration of clindamycin hydrochloride, elimination half-life is increased to approximately 4.0 hours (range 3.4 –5.1 h) in the elderly compared to 3.2 hours (range 2.1 - 4.2 h) in younger adults.

The 48 hour urinary excretion of clindamycin in adults following a single dose of 150 mg represented 10.9% of the administered dose (range 4.8% to 12.8%). These measurements were made by bio-assay and both the percent recovered and the urinary concentration are quite variable. The urinary concentration following a single 50 mg dose of clindamycin in the first 24 hours ranged from 8 to 25 mcg/mL of urine.

Fecal excretion of clindamycin has also been determined. Patients on a three week study when administered 1 gram of clindamycin per day had an average of 283 mcg/gm of stool. Patients on lincomycin 2 grams per day under the same conditions showed 3980 mcg/gm of stool. In single dose studies following administration of 250 mg of clindamycin, only 2.7% of the dose was excreted in the feces in 48-96 hours.

Special Populations and Conditions

Geriatrics: Pharmacokinetic studies with clindamycin have shown no clinically important differences between young and elderly subjects with normal hepatic function and normal (age-adjusted) renal function after oral or intravenous administration.

STORAGE AND STABILITY

Store at controlled room temperature (15-30°C).

DOSAGE FORMS, COMPOSITION AND PACKAGING

pms-CLINDAMYCIN 150 mg: Capsule with purple opaque body and deep scarlet opaque cap. The body has "CLIN 150" and the cap has "CLIN 150" both printed in white.

pms-CLINDAMYCIN 300 mg: Capsule with light blue opaque body and light blue opaque cap. The body has "CLIN 300" and the cap has "CLIN 300" both printed in white.

Each 150 mg capsule contains 150 mg clindamycin (as clindamycin hydrochloride). Each 300 mg capsule contains 300 mg clindamycin (as clindamycin hydrochloride). Non-medicinal ingredients include maize starch, lactose hydrous 100, talc, and magnesium stearate. Composition of the 150 mg capsule: Capsule Purple OP Body, Scarlet OP Cap Size 1 (Body composition: Acid Red 27, FD&C Blue#1, Titanium Dioxide, Gelatin). Cap composition: FD&C Blue #1, FD&C Red #3, Titanium Dioxide, Gelatin). Composition of the 300 mg capsule: Capsule Light Blue OP Body, Light Blue OP Cap Size 0 (Body & Cap Composition: FD&C Blue#1, Titanium Dioxide, Gelatin). Printing Ink is composed of Opacode White S-1-7085 (Pharmaceutical glaze modified, titanium dioxide, isopropyl alcohol, ammonium hydroxide, propylene glycol, n-butyl alcohol, and dimethylpolysiloxane).

Each pms-CLINDAMYCIN capsule contains clindamycin hydrochloride equivalent to 150 mg or 300 mg clindamycin base. Supplied in bottles of 100 capsules.

PART II: SCIENTIFIC INFORMATION

PHARMACEUTICAL INFORMATION

Drug Substance

Proper name: Clindamycin Hydrochloride USP

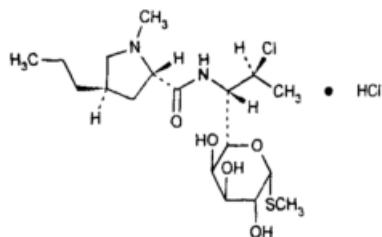
Chemical name:

1. *L-threo-α-D-galacto*-Octopyranoside, methyl 7-chloro-6,7,8-trideoxy-6-[[[(1-methyl 4-propyl-2-pyrrolidinyl)carbonyl]amino]-1-thio-,(2*S-trans*)monohydrochloride
2. Methyl 7-chloro-6,7,8-trideoxy-6-(1-methyl-*trans*-4-propyl-L-2-pyrrolidinecarboxamino)-1-thio-L-*threo*-D-*galacto*-octopyranoside monohydrochloride

Molecular formula: C₁₈H₃₃ClN₂O₅S. HCl (anhydrous)

Molecular weight: 461.44 g/mol (anhydrous), 479.46 g/mol (monohydrate)

Structural Formula:



Description:

Clindamycin hydrochloride is the hydrated hydrochloride salt of clindamycin, a substance produced by the chlorination of lincomycin and is a yellow, amorphous solid. It is soluble in water, pyridine, ethanol and DMF (N,N-dimethylformamide).

pH : 4.4

pKa : 7.6

Partition coefficient: 185

Melting Point: 141-143°C

CLINICAL TRIALS

Comparative Bioavailability Studies

A comparative, randomized, single-dose, crossover, bioequivalence study of pms-CLINDAMYCIN 300 mg capsules (Pharmascience Inc.) and Dalacin[®] 300 mg (clindamycin hydrochloride) capsules (Pfizer Canada Inc.) was performed in normal healthy male subjects (n=24) was performed under fasting conditions. A summary of the results is presented in the following table.

TABLE 4: SUMMARY TABLE OF THE COMPARATIVE BIOAVAILABILITY DATA

Clindamycin (1 x 300 mg capsule) From measured and log transformed data Geometric LS Mean Arithmetic Mean (CV %)				
PARAMETER	Test ¹	Reference ²	% RATIO OF GEOMETRIC LS MEANS	90 % CONFIDENCE INTERVAL
AUC _T (ng.h/mL)	11842.0 13050.7 (47.0)	12000.4 13167.7 (46.5)	98.68	90.34 - 107.79
AUC _∞ (ng.h/mL)	12494.2 13937.4 (51.6)	12589.8 13943.4 (50.3)	99.24	90.85 - 108.41
C _{MAX} (ng/mL)	3215.0 3349.2 (29.4)	3173.9 3313.9 (29.4)	101.30	94.03 - 109.13
T _{MAX} [*] (h)	0.67 (0.33-1.33)	0.67 (0.33-1.33)	--	--
T _{1/2} [†] (h)	3.32 (35.4)	3.03 (53.0)	--	--

¹ pms-CLINDAMYCIN 300 mg Capsules are manufactured by Pharmascience Inc.

² Dalacin[®] C 300 mg Capsules are manufactured by Pharmacia & Upjohn Inc.

* expressed as median (range) only.

† expressed as arithmetic mean (CV%) only.

DETAILED PHARMACOLOGY

Three large multiple dose tolerance studies were conducted in normal volunteers.

One group of 216 volunteers took 1 gram per day or 2 grams per day of clindamycin for 4 weeks. The most frequent side effect noted was diarrhea in some volunteers, particularly at the 2 gram per day dose which is more than 3 times the recommended daily dose. With the exception of one patient who developed infectious hepatitis during the study, laboratory tests showed no significant aberrations considered drug related. Occasional patients developed elevated serum transaminase and serum alkaline phosphatase.

A second group of 150 volunteers was similarly treated and laboratory determinations were essentially normal. Audiograms were performed before, during and up to 90 days after treatment and showed no drug related changes.

A third group of 172 volunteers was evaluated in a comparison of lincomycin 500 mg q.i.d., ampicillin 250 mg q.i.d., clindamycin 150 mg q.i.d., and placebo. Subjects receiving ampicillin showed a peak incidence of moderate to mild diarrhea second only to lincomycin and greater than clindamycin during the first week of therapy, then demonstrated a drop in the incidence to placebo levels or below during the second and third week. Meanwhile, the incidence of diarrhea in both the lincomycin and the clindamycin groups remained slightly above that reported for the placebo group during the second and third weeks of therapy. One patient on lincomycin and one on clindamycin developed a rash. No drug related laboratory test abnormalities were noted.

Five volunteers were evaluated before and after treatment with clindamycin 500 mg q.i.d., for 10 days with reference to true or pseudo-cholinesterase levels. No abnormalities in these levels were noted.

MICROBIOLOGY

In order to assess the significance of *in vitro* antibiotic activity against bacterial species, it is necessary to compare the organism's minimum inhibitory concentration (MIC) to the defined susceptibility interpretive breakpoints for the antibiotic. **Table 5** identifies the currently-accepted MIC interpretative breakpoints for clindamycin.

The *in vitro* activity of clindamycin in combination with primaquine has not been determined.

Table 5: Susceptibility Interpretive Criteria for Clindamycin

Pathogen	Susceptibility Interpretive Criteria					
	Minimal Inhibitory Concentrations (MIC in mcg/mL)			Disk Diffusion (Zone Diameters in mm)		
<i>Staphylococcus</i> spp.	S ≤ 0.5	I 1–2	R ≥4	S ≥21	I 15–20	R ≤14
<i>Streptococcus pneumoniae</i> and other <i>Streptococcus</i> spp.	≤0.25	0.5	≥1	≥19	16–18	≤15
Anaerobic Bacteria	≤2	4	≥8	NA	NA	NA

N/A = Not Applicable

The reported clindamycin MIC₉₀ value (i.e., the concentration of clindamycin that inhibits 90% of test isolates) was utilized as the most descriptive measure of clindamycin activity. Where the data from more than one study are summarized, the weighted average MIC₉₀ value was calculated to account for differences in the number of strains in each study.

The *in vitro* susceptibility of clinical isolates to clindamycin is presented in **Table 6** (gram-positive aerobic bacteria), **Table 7** (gram-negative aerobic bacteria), **Table 8** (gram-positive anaerobic bacteria), **Table 9** (gram-negative anaerobic bacteria) and **Table 10** (*Chlamydia* spp and *Mycoplasma* spp).

Organism	N ^b	MIC ₉₀ Range ^c	MIC ₉₀ ^d
<i>Bacillus cereus</i>	46	1	1
<i>Corynebacterium diphtheriae</i>	192	0.1	0.1
<i>Listeria monocytogenes</i>	218	1-8	2.22
<i>Staphylococcus aureus</i> (methicillin-susceptible)	286	0.12-2	0.50
<i>Staphylococcus saprophyticus</i>	57	0.12-0.25	0.16
<i>Streptococcus agalactia</i>	59	≤ 0.06-0.50	0.15
<i>Streptococcus bovis</i>	22	0.04	0.04
<i>Streptococcus pneumoniae</i> (penicillin-susceptible)	660	0.03-0.25	0.23
<i>Streptococcus pyogenes</i>	141	0.13-0.25	0.08
<i>Streptococcus</i> spp, Group B	38	≤ 0.12-0.25	0.15
<i>Streptococcus</i> spp, Group C	30	≤ 0.12-0.50	0.22
<i>Streptococcus</i> spp, Group G	34	0.06-0.50	0.31
<i>Streptococcus</i> spp, viridans Group (penicillin-susceptible)	67	≤ 0.06-1.6	0.53

^a clinical efficacy has not been established for some of these species

^b N, total number of isolates

^c Range of reported MIC₉₀ values

^d MIC₉₀ for single study or weighted average MIC₉₀ for two or more studies

Organism	N^b	MIC₉₀ Range^c	MIC₉₀^d
<i>Campylobacter jejuni</i>	449	0.39-8	1.7
<i>Campylobacter fetus</i>	41	1-1.6	1.2
<i>Campylobacter coli</i>	31	0.50	0.50
<i>Gardnerella vaginalis</i>	156	≤ 0.06-0.39	0.3
<i>Helicobacter pylori</i>	47	2-3.1	2.6
<i>Neisseria gonorrhoeae</i> (β-lactamase-negative)	77	4	4
<i>Neisseria gonorrhoeae</i> (β-lactamase-positive)	54	2	2

^a clinical efficacy has not been established for some of these species

^b N, total number of isolates

^c Range of reported MIC₉₀ values

^d MIC₉₀ for single study or weighted average MIC₉₀ for two or more studies

Organism	N^b	MIC₉₀ Range^c	MIC₉₀^d
<i>Actinomyces israelii</i>	46	0.12	0.12
<i>Actinomyces</i> spp	38	0.50-1	0.8
<i>Clostridium botulinum</i>	224	4	4
<i>Clostridium difficile</i>	191	4 - >256	57.7
<i>Clostridium novyi</i>	18	2	2
<i>Clostridium perfringens</i>	386	0.25-8	3.4
<i>Clostridium ramosum</i>	98	4-12.5	8.3
<i>Eubacterium</i> spp	45	0.4-2	1.1
<i>Lactobacillus</i> spp	88	0.50-1	0.8
<i>Peptostreptococcus anaerobes</i>	283	0.25-0.50	0.4
<i>Peptostreptococcus asaccharolyticus</i>	268	0.25-2	1.5
<i>Peptostreptococcus magnus</i>	90	2	2
<i>Peptostreptococcus prevotii</i>	87	0.12-4	2.9
<i>Peptostreptococcus tetradius</i>	28	0.5	0.5
Anaerobic gram-positive cocci	247	0.5-1	0.9
<i>Propionibacterium acnes</i>	267	0.10-0.25	0.2
<i>Propionibacterium</i> spp	71	0.12-0.20	0.16

^a clinical efficacy has not been established for some of these species

^b N, total number of isolates

^c Range of reported MIC₉₀ values

^d MIC₉₀ for single study or weighted average MIC₉₀ for two or more studies

Organism	N ^b	MIC ₉₀ Range ^c	MIC ₉₀ ^d
<i>Bacteroides fragilis</i> group	4,284	0.5-8	2.45
<i>Bacteroides fragilis</i>	2,002	≤ 0.20-4	2.22
<i>Bacteroides melaninogenicus</i>	224	≤ 0.03-0.50	0.07
<i>Bacteroides</i> spp	141	≤ 0.06-0.50	0.31
<i>Bacteroides bivius</i>	155	≤ 0.03-≤0.05	≤ 0.11
<i>Bacteroides disiens</i>	33	≤ 0.03-≤0.06	≤ 0.05
<i>Fusobacterium</i> spp	330	≤ 0.10-2	0.85
<i>Mobiluncus mulieris</i>	10	0.06	0.06
<i>Mobiluncus curtisii</i>	12	0.12	0.12
<i>Veillonella</i> spp	38	0.06-0.25	0.20

^a clinical efficacy has not been established for some of these species

^b N, total number of isolates

^c Range of reported MIC₉₀ values

^d MIC₉₀ for single study or weighted average MIC₉₀ for two or more studies

Clindamycin has demonstrated *in vitro* activity against *Chlamydia trachomatis* and *Mycoplasma* spp (see **Table 10**). For *Chlamydia trachomatis*, the MIC₉₀ for clindamycin is reached at 2.3 µg/mL; *in vitro* synergism with gentamicin has also been demonstrated.

Organism	N ^b	MIC ₉₀ Range ^c	MIC ₉₀ ^d
<i>Chlamydia trachomatis</i>	84	0.5-5.9	2.3
<i>Mycoplasma hominis</i>	106	0.25-0.8	0.58
<i>Mycoplasma pneumoniae</i>	9	4	4

^a clinical efficacy has not been established for some of these species

^b N, total number of isolates

^c Range of reported MIC₉₀ values

^d MIC₉₀ for single study or weighted average MIC₉₀ for two or more studies

Development of resistance to clindamycin by staphylococci is slow and stepwise rather than rapid and streptomycin-like. Clindamycin, like lincomycin, participates in the dissociated cross-resistance phenomenon with erythromycin. Clindamycin is not cross-resistant with penicillin, ampicillin, tetracycline or streptomycin. It is, however, cross-resistant with lincomycin.

Resistance to clindamycin may occur by one of several mechanisms. Resistance does not appear to be caused by reduced drug uptake but rather is generally due to alterations in the bacterial target site (50S ribosomal subunit). Resistance can result from either changes in a ribosomal protein at the receptor site or a change in the 23S ribosomal RNA by methylation of adenine. Rare isolates of staphylococci and some veterinary isolates of streptococci may enzymatically inactivate clindamycin by adenylation. Plasmid-mediated transferable resistance to clindamycin (and erythromycin) in *B. fragilis* was reported in 1979.

Despite the existence of multiple resistance mechanisms, the reported incidence of clindamycin resistance in the *B. fragilis* group has remained relatively low (averaging 5.3% from 1970-1987 in over 7,600 isolates). Susceptibility of isolates to clindamycin should be assessed by individual MIC determinations.

TOXICOLOGY

Animal

The results of acute toxicity studies are shown in Table 11:

Table 11

Animal LD ₅₀ Results		
Species	Route	LD ₅₀ (mg/kg)
Adult mouse	IP	262
Adult mouse	IV	143
Adult rat	Oral	2714
Adult rat	SC	2618
Newborn rat	SC	245

The following subacute and chronic animal toxicology was performed:

5 Day Oral Tolerance Study in Rats

500 mg/kg was administered to rats with no drug related toxicity noted except that all rats developed diarrhea at this dose level.

5 Day Oral Tolerance Study in the Dog

Doses of 113 mg/kg and 500 mg/kg were administered. The higher dose was vomited 1-2 hours after administration but otherwise no abnormalities of a drug related nature were noted.

6 Month Subacute Oral Toxicity in the Rat

Clindamycin, at doses of 30, 100 and 300 mg/kg, was given to groups of 20 rats daily for 6 months. Data obtained after one month were normal. Similarly, data at the end of 6 months showed no drug related effects. A fourth group of 20 rats received a dose of 600 mg/kg for 3 months and also showed the drug to be well tolerated by male and female rats without any drug related effects.

1 Month Subacute Oral Toxicity in the Dog

Clindamycin, at doses of 30, 100 and 300 mg/kg, was given to 3 groups of 6 dogs with a comparable group of 6 dogs as a control. All dogs were healthy and all dose levels well tolerated.

Fluctuations in the serum glutamic pyruvic transaminase values were seen in the 300 mg/kg group after 2 weeks therapy. Less fluctuation was seen in the SGOT levels and other tests of hepatic function did not reflect the adaptive metabolic change which these elevated transaminase values are believed to show. Two dogs in each group were sacrificed and no drug related lesions were found upon complete necropsy and microscopic observations on these dogs.

1 Year Chronic Oral Toxicity in the Rat

Doses of 0, 30, 100 and 300 mg/kg were administered daily to rats for one year and 600 mg/kg for 6 months. As expected, mortality did occur due to coincidental disease and the group at 600 mg/kg had a higher mortality rate although no definitive drug related findings were noted.

1 Year Chronic Oral Toxicity in the Dog

Dogs were administered clindamycin at doses of 0, 30, 100 and 300 mg/kg for 1 year. Some dose related elevations of serum glutamic pyruvic transaminase values were seen during the 7th to 9th month of this study, but periodic liver biopsies examined by light and electron microscopy did not disclose any hepatic cell damage. All other data noted no drug related changes.

Teratogenic and Reproductive Studies in the Rat and Rabbit

Teratology evaluation of 20-day fetuses was made and no evidence of teratogenic effect was noted. Treated rat dams gave birth to normal litters and no evidence was obtained that clindamycin affected the fecundity of the dam or the development of the offspring.

Oral and subcutaneous reproductive toxicity studies in rats and rabbits revealed no evidence of impaired fertility or harm to the fetus due to clindamycin, except at doses that caused maternal toxicity.

In oral embryo fetal development studies in rats and subcutaneous embryo fetal development studies in rats and rabbits, no developmental toxicity was observed except at doses that produced maternal toxicity.

Teratogenic and Reproductive Studies in the Mouse

Clindamycin, in doses of 20, 50 and 200 mg/kg, was administered to pregnant mice from day 6 through day 15 of gestation. At the 200 mg/kg level there was pronounced expected toxicity associated with a 40% mortality. Similarly, at this toxic level there was increased foetal loss. Litter size, litter weight and mean pup weight were significantly reduced. At the 200 mg/kg level there was an increased incidence of major malformations which is thought to be due to malnutrition of the dam as a result of this toxic dose of the drug.

Carcinogenesis

Long term studies in animals have not been performed with clindamycin to evaluate carcinogenic potential.

Mutagenesis

Genotoxicity tests performed included a rat micronucleus test and an Ames Salmonella reversion test. Both tests were negative.

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PART III: CONSUMER INFORMATION**Pr** **pms-CLINDAMYCIN****(Clindamycin Hydrochloride Capsules USP)
clindamycin 150 mg, 300 mg**

This leaflet is designed specifically for Consumers. This leaflet is a summary and will not tell you everything about pms-CLINDAMYCIN. Contact your doctor or pharmacist if you have any questions about the drug.

ABOUT THIS MEDICATION**What the medication is used for:**

pms-CLINDAMYCIN is used for:

- the treatment of serious bacterial infections, and
- the prevention of serious bacterial infections in some patients undergoing surgery

What it does:

pms-CLINDAMYCIN interferes with protein synthesis in bacteria, thereby preventing growth of the bacteria causing your infection.

When it should not be used:

Do not use **pms-CLINDAMYCIN** if:

- You have a history of hypersensitivity (allergies) to preparations including clindamycin or lincomycin or ingredient in the formulation or component of the container (see what the non-medicinal ingredients are).

What the medicinal ingredient is:

Clindamycin hydrochloride USP

What the important non-medicinal ingredients are:

Maize starch, lactose hydrous 100, talc, and magnesium stearate.

What dosage forms it comes in:

150 mg and 300 mg capsules

WARNINGS AND PRECAUTIONS

BEFORE you use pms-CLINDAMYCIN talk to your doctor or pharmacist if:

- You have a history of intestinal disorders such as colitis (inflammation of the colon), or inflammatory bowel disease.
- You have diarrhea or usually get diarrhea when you take antibiotics or have ever suffered from problems with your stomach or intestines (e.g. bowel disease, colitis).
- You suffer from problems with your kidneys or liver.

- You have glucose-6-phosphate dehydrogenase (G-6-PD) deficiency and taking primaquine. You need to have routine blood tests while taking pms-CLINDAMYCIN with primaquine to monitor for potential blood cell changes.
- You are pregnant or planning to become pregnant. Clindamycin passes to the human fetus.
- You are breastfeeding or planning to breastfeed. Clindamycin is passed to the infant through human breast milk. Because of the potential for serious adverse reactions in nursing infants, clindamycin should not be taken by nursing mothers.
- You have intolerance to some milk sugars. pms-CLINDAMYCIN capsules contain lactose.
- You are a pediatric patient. You should be assessed for your ability to swallow pms-CLINDAMYCIN capsules. If the child is unable to reliably swallow a capsule, pms-CLINDAMYCIN capsule should not be used and a suitable dosage formulation should be used.

INTERACTIONS WITH THIS MEDICATION**Drugs that may interact with pms-CLINDAMYCIN include:**

Some medicines can affect the way this medicine works, or the medicine itself can reduce the effectiveness of other medicines taken at the same time. These include:

- Erythromycin (an antibiotic).
- Muscle relaxants used for operations.
- Aminoglycosides (a class of antibiotics)
- Primaquine (antimalarial)
- St. John's wort

Tell your doctor if you are taking or being administered any other topical or oral medication, including erythromycin or neuromuscular blocking agents.

PROPER USE OF THIS MEDICATION

Take your medicine (or give the medicine to your child) as your doctor has told you. If you are not sure, ask your doctor or pharmacist.

Treatment of infection:

Adult dose:

150 mg to 450 mg by mouth every 6 hours depending on the severity of infection.

Child dose (for children weighing \geq 40 pounds (18.2 Kg) and able to swallow):

One of the following dosage ranges should be selected depending on the severity of the infection:

- 8-12 mg/kg/day (4-6 mg/lb/day)
- 13-16 mg/kg/day (6.5-8.0 mg/lb/day)

IMPORTANT: PLEASE READ

- 17-25 mg/kg/day (8.5-12.5 mg/lb/day)

Severity of the Infection	Mild	Moderate	Severe
Weight in pounds (weight in Kg)	4-6 mg/lb/day (8-12 mg/kg/day)	6.5-8.0 mg/lb/day (13-16 mg/kg/day)	8.5-12.5 mg/lb/day (17-25 mg/kg/day)
22-40 (10-18.2 Kg)	*	*	*
>40-55 (> 18.2-25 Kg)	*	*	150 mg q. 8h
>55-75 (>25-34 Kg)	*	150 mg q. 8h	150 mg q. 6h.
>75-100 (>34-45.5 Kg)	150 mg q. 8h	150 mg q. 6h.	300 mg q. 8h
>100 (>45.5 Kg) use adult dosage	150 mg q. 6h.	300 mg q. 6h	450 mg q. 6h

*other appropriate dosage form may be used.

Keep taking this medicine for the full time of treatment, even if you (or your child) begin to feel better after a few days.

For Prevention of Endocarditis:

Adult dose:

300 mg by mouth at 1 hour before procedure; then 150 mg at 6 hours after the first dose.

Child dose (for children weighing \geq 40 pounds (18.2 Kg) and able to swallow):

Refer to other dosage form, because the capsules may not be suitable. Use of the appropriate dosage form may be necessary.

The capsules should be taken with a full glass of water to avoid throat irritation. The capsules can be taken with or without food.

Long term use of pms-CLINDAMYCIN

If you have to take pms-CLINDAMYCIN for a long time, your doctor may arrange regular liver, kidney and blood tests. Do not miss these check-ups with your doctor. Long term use can also make you more likely to get other infections that do not respond to clindamycin treatment.

Taking pms-CLINDAMYCIN with primaquine

Patients with G-6-PD deficiency taking the combination of clindamycin and primaquine should have routine blood examinations during therapy with primaquine to monitor for potential blood cell changes.

Taking pms-CLINDAMYCIN with food and drink

The capsules may be taken either before or after a meal.

REMEMBER: This medication is for YOU. Never give it to others. It may harm them even if their symptoms are the same as yours.

Overdose:

In case of drug overdose, contact your doctor, hospital emergency department or regional Poison Control Centre immediately, even if there are no symptoms.

Missed Dose:

If you missed a dose of this medication, take it as soon as you remember. This will help to keep a constant amount of medication in your blood. But, if it is almost time for your next dose, skip the missed dose and continue with your next scheduled dose. Do not take two doses at the same time.

If you stop taking pms-CLINDAMYCIN

If you stop taking the medicine too soon your infection may come back again or get worse.

Do not stop taking **pms-CLINDAMYCIN** unless your doctor tells you to. If you have any further questions on how to take this product, ask your doctor or pharmacist.

SIDE EFFECTS AND WHAT TO DO ABOUT THEM

- Like all medicines, **pms-CLINDAMYCIN** can cause side effects, these include: Reddening of the skin, skin rash, itching, hives
- Throat ulcers, sore throat, feeling sick, being sick, stomach pain and diarrhea
- Reduced numbers of blood cells which may cause bruising or bleeding or weaken the immune system
- Vaginal infection of vaginitis (inflammation of the vagina)

Tell your doctor immediately if you develop:

- Signs of a severe allergic reaction such as sudden wheeziness, difficulty in breathing, swelling of eyelids, face or lips, rash or itching (especially affecting the whole body).
- Blistering and peeling of large areas of skin, fever, cough, feeling unwell and swelling of the gums, tongue or lips.
- Liver problem, yellowing of the skin and whites of the eyes (jaundice).

Severe or persistent diarrhea (watery or bloody) with or without abdominal pain, nausea, fever or vomiting. These may be symptoms of Clostridium difficile-associated disease (bowel inflammation). This may happen months after the last dose of medication. If this occurs, stop taking **pms-CLINDAMYCIN** and contact your doctor immediately.

If any of the side effects get serious, or if you notice any side effects not listed in this leaflet, please tell your doctor or pharmacist.

This is not a complete list of side effects. For any unexpected effects while taking pms-CLINDAMYCIN, contact your doctor or pharmacist.

IMPORTANT: PLEASE READ

SERIOUS SIDE EFFECTS, HOW OFTEN THEY HAPPEN AND WHAT TO DO ABOUT THEM			
Symptom / effect	Talk to your healthcare professional		Stop taking drug and get immediate medical help
	Only if severe	In all cases	
VERY COMMON Liver problem		√	√
COMMON Diarrhea Rash		√ √	
RARE Nausea, abdominal pain Vomiting Skin reactions : itching Signs of a severe allergic reaction such as sudden wheeziness, difficulty in breathing, swelling of eyelids, face or lips, rash or itching (especially affecting the whole body)	√	√ √	√

HOW TO STORE IT

Keep out of reach of children.

Store at room temperature (15°C to 30°C), away from heat and direct light.

Do not store in the fridge or freezer.

Do not store in the bathroom as moisture and heat can cause damage.

Reporting Side Effects

You can help improve the safe use of health products for Canadians by reporting serious and unexpected side effects to Health Canada. Your report may help to identify new side effects and change the product safety information.

3 ways to report:

- Online at MedEffect (<http://hc-sc.gc.ca/dhp-mps/medeff/index-eng.php>);
- By calling 1-866-234-2345 (toll-free);
- By completing a Consumer Side Effect Reporting Form and sending it by:
 - Fax to 1-866-678-6789 (toll-free), or
 - Mail to: Canada Vigilance Program
Health Canada, Postal Locator 0701E
Ottawa, ON
K1A 0K9

Postage paid labels and the Consumer Side Effect Reporting Form are available at MedEffect (<http://hc-sc.gc.ca/dhp-mps/medeff/index-eng.php>).

NOTE: Contact your health professional if you need information about how to manage your side effects. The Canada Vigilance Program does not provide medical advice.

MORE INFORMATION

The full product monograph prepared for health professionals can be obtained by contacting the sponsor, Pharmascience Inc. at: 1-888-550-6060.

This leaflet was prepared by
Pharmascience Inc.
Montreal Quebec
H4P 2T4

www.pharmascience.com

Last revised on: July 13, 2016