

PRODUCT MONOGRAPH

STERILE

Pr DEFEROXAMINE MESYLATE FOR INJECTION

500 mg deferoxamine mesylate /vial

2 g deferoxamine mesylate /vial

Lyophilized powder

Pfizer Standard

THERAPEUTIC CLASSIFICATION

Iron and Aluminum Chelating Agent

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PART I: HEALTH PROFESSIONAL INFORMATION

SUMMARY PRODUCT INFORMATION

Route of Administration	Dosage Form / Strength	All Nonmedicinal Ingredients
Parenteral	Sterile lyophilized powder in vials, 500 mg/vial and 2 g/vial	None. <i>For a complete listing, see DOSAGE FORMS, COMPOSITION AND PACKAGING.</i>

INDICATIONS AND CLINICAL USES

Deferoxamine Mesylate for Injection is indicated for:

- Acute iron intoxication.
- Chronic iron overload due to transfusion-dependent anemias.
- Diagnosis of aluminum overload (deferoxamine infusion test).
- Chronic aluminum overload in patients with End-Stage Renal Failure (ESRF) under maintenance dialysis.

In cases of acute iron intoxication, Deferoxamine Mesylate for Injection is an adjunct to, and not a substitute for, standard therapeutic measures which may include:

- Induction of emesis.
- Gastric lavage.
- Maintenance of clear airways.
- Control of peripheral vascular failure.
- Correction of acidosis.

Geriatrics (> 65 years of age):

Clinical studies of Deferoxamine Mesylate for Injection did not include sufficient numbers of subjects aged 65 years and over to determine whether they respond differently compared to

younger subjects. Post-marketing reports suggest a possible trend for an increased risk of eye disorders in the geriatric population, specifically the occurrence of colour blindness, maculopathy, and scotoma. However, it is unclear if these eye disorders were dose-related. Although the number of reports was very small, certain elderly patients may be predisposed to eye disorders when taking Deferoxamine Mesylate for Injection. Post-marketing reports also suggest that there may be an increased risk of deafness and hearing loss in the geriatric population (see **ADVERSE REACTIONS**). In general, dose selection for an elderly patient should be cautious, usually starting at the low end of the dosing range, reflecting the greater frequency of decreased hepatic, renal, or cardiac function, and of concomitant disease or other drug therapy.

Pediatrics (< 16 years of age):

High doses of Deferoxamine Mesylate for Injection and concomitant low ferritin levels during the treatment of chronic iron overload in children, have been associated with growth retardation. After reduction of the Deferoxamine Mesylate for Injection dose, growth velocity may resume to pre-treatment levels in some patients.

Pediatric patients receiving Deferoxamine Mesylate for Injection should be monitored for body weight and longitudinal growth every three months.

CONTRAINDICATIONS

Patients who are hypersensitive to deferoxamine mesylate or any component of the container, except where desensitization is successful. For a complete listing, see **DOSAGE FORMS, COMPOSITION AND PACKAGING**.

WARNINGS AND PRECAUTIONS

General

Therapy with Deferoxamine Mesylate for Injection should be initiated and maintained by physicians experienced in the treatment of chronic iron overload due to blood transfusions.

It should be noted that some of the signs and symptoms reported as adverse effects may in fact be manifestations of the underlying disease (iron and/or aluminum overload).

As with all medicines, Deferoxamine Mesylate for Injection should be kept out of reach of children.

Rapid intravenous injection of Deferoxamine Mesylate for Injection exceeding 15 mg/kg/h has produced flushing of the skin, urticaria, hypotension and shock (see **DOSAGE AND ADMINISTRATION**).

Vitamin C supplements should not be given to patients with cardiac failure because impairment of cardiac function may be experienced in patients with severe chronic iron overload receiving

combined treatment of Deferoxamine Mesylate for Injection with high doses of vitamin C (more than 500 mg daily) (see **DRUG INTERACTIONS**).

Ear/Nose/Throat

There have been reports of hearing loss and audiometric abnormalities occurring in patients receiving Deferoxamine Mesylate for Injection treatment, particularly where the doses used were higher than those recommended and/or where the serum ferritin levels were low. The hearing loss returned to normal in several cases when the drug was discontinued. However in some cases, a residual effect remained. Renal failure patients receiving maintenance dialysis having low ferritin levels may be particularly prone to adverse reactions.

When low-dose therapy is used, the risk of adverse reactions is reduced. If disturbances of hearing occur, treatment with Deferoxamine Mesylate for Injection should be discontinued in order to further the chances that disturbances of hearing will prove reversible. If treatment with Deferoxamine Mesylate for Injection is subsequently resumed using a reduced dosage, auditory examination/testing should be performed at more frequent intervals. It is always important to reconsider the benefit/risk ratio when Deferoxamine Mesilate for Injection treatment is resumed after the occurrence of an adverse reaction.

Endocrine and Metabolism

Deferoxamine Mesylate for Injection may lower blood sugar, serum calcium and serum sodium, and increase blood coagulability. Therefore, these parameters should be monitored during therapy, if possible.

In addition, aluminum overload treatment may result in hypocalcemia, decrease serum calcium and aggravate hyperparathyroidism.

Infections and Infestations

In patients with iron overload it has been reported that infections (including septicemia), especially with *Yersinia enterocolitica* and *Yersinia pseudotuberculosis*, may be promoted by Deferoxamine Mesylate for Injection. If a patient under treatment with Deferoxamine Mesylate for Injection develops fever accompanied by acute enteritis/enterocolitis, diffuse abdominal pain or pharyngitis, the treatment should be temporarily withdrawn, appropriate bacteriological tests performed and suitable antibiotic therapy instituted at once. THIS THERAPY SHOULD INCLUDE SPECIAL COVERAGE FOR *YERSINIA* ORGANISMS. Treatment with Deferoxamine Mesylate for Injection can be resumed after the infection has cleared.

In patients undergoing maintenance hemodialysis while receiving Deferoxamine Mesylate for Injection for aluminum and/or iron overload, rare cases of mucormycosis, some with a fatal outcome have been reported. Deferoxamine Mesylate for Injection abolishes the fungistatic effect of serum and increases the *in vitro* growth of the fungus by potentiating iron uptake by the fungus. If any of the suspected signs or symptoms are observed, Deferoxamine Mesylate for Injection treatment should be discontinued, mycological tests performed and appropriate treatment instituted immediately. Mucormycosis may also occur in dialysis patients who are not receiving Deferoxamine Mesylate for Injection therapy, indicating that other factors, e.g. a compromised immune system, may play a role in the development of this infection.

Neurologic

In patients with aluminum-related encephalopathy, high doses of Deferoxamine Mesylate for Injection may exacerbate neurological dysfunction (seizures), probably due to an increase in circulating aluminum. Deferoxamine Mesylate for Injection may also precipitate the onset of dialysis dementia. Pretreatment with clonazepam is reported to provide protection against such neurological deterioration.

Ophthalmologic

There have been reports of visual disturbances occurring in patients receiving Deferoxamine Mesylate for Injection treatment, particularly where the doses used were higher than those recommended and/or where the serum ferritin levels were low. The visual disturbances returned to normal in several cases when the drug was discontinued. However in some cases, a residual effect remained. Renal failure patients receiving maintenance dialysis having low ferritin levels may be particularly prone to adverse reactions.

Visual symptoms have been reported after single doses of Deferoxamine Mesylate for Injection.

During chronic toxicity tests in dogs, high doses of Deferoxamine Mesylate for Injection (> 200 mg/kg daily) were associated with cataracts. However, cataracts have rarely been observed in humans who receive Deferoxamine Mesylate for Injection over prolonged periods.

When low-dose therapy is used, the risk of adverse reactions is reduced. If disturbances of vision occur, treatment with Deferoxamine Mesylate for Injection should be discontinued in order to further the chances that disturbances of vision will prove reversible. If treatment with Deferoxamine Mesylate for Injection is subsequently resumed using a reduced dosage, ophthalmological examination/testing should be performed at more frequent intervals. It is always important to reconsider the benefit/risk ratio when Deferoxamine Mesylate for Injection treatment is resumed after the occurrence of an adverse reaction.

Renal

In patients with severe renal failure, caution is indicated as the deferoxamine-metal complexes are excreted mainly via the kidneys. Elimination of chelated iron and aluminum can be increased by dialysis.

Cases of acute renal failure, renal tubular disorder, and increased blood creatinine have been reported (see **ADVERSE REACTIONS**). Monitoring patients for changes in renal function (e.g. increased serum creatinine) should be considered.

Respiratory

Acute respiratory distress syndrome has been reported in patients with acute iron intoxication and also in thalassemic patients treated with excessively high doses of intravenous Deferoxamine Mesylate for Injection for more than one day. The daily dose should not exceed 80 mg/kg up to a maximum of 6.0 grams. Treatment should be terminated at the first signs of respiratory complications (see also **DOSAGE AND ADMINISTRATION**).

Sensitivity/Resistance

Patients may develop sensitivity reactions (see **CONTRAINDICATIONS**).

Skin

Flushing of the skin, urticaria, hypotension and shock have occurred in a few patients following the rapid intravenous injection of Deferoxamine Mesylate for Injection. Treatment by the intravenous route should not exceed 15 mg/kg/h.

Special Populations

Pregnant Women: There are no adequate and well-controlled studies in pregnant women. Studies in animals (rabbits) have shown reproductive toxicity/teratogenicity (see **TOXICOLOGY**). The risk to the fetus/mother is unknown. Women of childbearing potential with chronic iron and/or aluminum overload should not receive Deferoxamine Mesylate for Injection unless the use of an effective form of contraception, established before treatment, is continued throughout treatment and for at least the first month after treatment. During pregnancy, particularly in the first trimester, Deferoxamine Mesylate for Injection should only be used if the hazard of acute iron intoxication is considered to be greater than the potential teratogenic hazard of Deferoxamine Mesylate for Injection.

Nursing Women:

It is not known whether deferoxamine mesylate passes into the breast milk. Because many drugs are excreted in human milk, and because of the potential for serious adverse drug reactions in breast-fed newborns/infants, a decision should be made whether to abstain from breast-feeding or to abstain from using the medicinal product, taking into account the importance of the medicinal product to the mother.

Pediatrics (< 16 years of age):

Pediatric patients receiving Deferoxamine Mesylate for Injection should be monitored for body weight and longitudinal growth every three months.

High doses of Deferoxamine Mesylate for Injection and concomitant low ferritin levels during the treatment of chronic iron overload in children have been associated with growth retardation. After reduction of the Deferoxamine Mesylate for Injection dose, growth velocity may resume to pre-treatment levels in some patients.

Geriatrics (> 65 years of age):

Clinical studies of Deferoxamine Mesylate for Injection did not include sufficient numbers of subjects aged 65 years and over to determine whether they respond differently compared to younger subjects. Post-marketing reports suggest a possible trend for an increased risk of eye disorders in the geriatric population, specifically the occurrence of colour blindness, maculopathy, and scotoma. However, it is unclear if these eye disorders were dose-related. Although the number of reports was very small, certain elderly patients may be predisposed to eye disorders when taking Deferoxamine Mesylate for Injection. Post-marketing reports also suggest that there may be an increased risk of deafness and hearing loss in the geriatric population (see **ADVERSE REACTIONS**). In general, dose selection for an elderly patient

should be cautious, usually starting at the low end of the dosing range, reflecting the greater frequency of decreased hepatic, renal, or cardiac function, and of concomitant disease or other drug therapy.

Hepatic impairment

No studies have been performed in patients with hepatic impairment.

Monitoring and Laboratory Tests

Complete ophthalmological examination, audiological testing and studies of visual evoked potential should be carried out before the start of long-term Deferoxamine Mesylate for Injection treatment as well as at regular intervals, preferably every 3 months, during the time that Deferoxamine Mesylate for Injection treatment is continued.

The following parameters (blood sugar, serum calcium, serum sodium, and increased blood coagulability) should be monitored during therapy, if possible.

Pediatric patients receiving Deferoxamine Mesylate for Injection should be monitored for body weight and longitudinal growth every three months.

ADVERSE REACTIONS

Adverse Drug Reaction Overview

Some of the signs and symptoms reported as adverse effects may also be manifestations of the underlying disease (iron and/or aluminum overload).

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 reactions (Table 1 and **Less Common Clinical Trial Adverse Drug Reactions (<1%)**) are ranked under the heading of frequency estimate, the most frequent first, using the following convention: very common ($\geq 1/10$); common ($\geq 1/100$ to $< 1/10$); uncommon ($\geq 1/1000$ to $< 1/100$); rare ($\geq 1/10\ 000$ to $< 1/1000$); very rare ($< 1/10\ 000$) including isolated reports. Within each frequency grouping, adverse reactions are ranked in order of decreasing seriousness.

The following unwanted effects have been observed.

Table 1

<u>Nervous system:</u>	
Common:	Headache
<u>Gastrointestinal:</u>	
Common:	Nausea
<u>Skin and subcutaneous tissue:</u>	
Common:	Urticaria
<u>Musculo-skeletal and connective tissue:</u>	
Very common:	Arthralgia, myalgia
Common:	Growth retardation and bone disorders (e.g. metaphyseal dysplasia) in higher doses and young children (see WARNINGS AND PRECAUTIONS and Special Remarks below)
<u>General disorders and administration site:</u>	
Very common:	Injection site reaction including pain, swelling, infiltration, erythema, pruritis, eschar, crust (see Special Remarks below)
Common:	Pyrexia

Special Remarks

Musculo-skeletal and connective tissue disorders: Growth retardation and bone disorders (e.g. metaphyseal dysplasia) are common with doses above 60 mg/kg, especially in patients who begin iron chelation in the first three years of life. The risk is considerably reduced with doses of 40 mg/kg or less.

General disorders and administration site conditions:

At the injection site, reactions including pain, swelling, infiltration, erythema, pruritus, and eschar/crust are very common, while vesicles, local edema and burning are uncommon. Local manifestations may be accompanied by systemic reactions such as arthralgia/myalgia (very common), headache (common), urticaria (common), nausea (common), pyrexia (common), vomiting (uncommon), abdominal pain (uncommon) or asthma (uncommon).

Renal and urinary:

Excretion of the iron complex may cause reddish-brown discolouration of the urine.

Less Common Clinical Trial Adverse Drug Reactions (< 1%)

Blood and lymphatic system

Very rare: Blood disorder (including thrombocytopenia, leucopenia)

Ear and labyrinth

Uncommon: Deafness neurosensory, tinnitus (see **WARNINGS AND PRECAUTIONS** and **Special Remarks** below)

Eye

Rare: Loss of vision, scotoma, retinal degeneration, optic neuritis, cataract, visual acuity decreased, blurred vision, night blindness, visual field defects, chromatopsia (impairment of colour vision), corneal opacities (see **WARNINGS AND PRECAUTIONS** and **Special Remarks** below)

Gastrointestinal

Uncommon: Vomiting, abdominal pain

Very rare: Diarrhea

General and administration site

Uncommon: Injection site reaction including vesicles, edema, burning

Immune system

Very rare: Anaphylactic reaction, anaphylactic shock, angioneurotic edema

Infections and infestations

Rare: Mucormycosis (see **WARNINGS AND PRECAUTIONS**)

Very rare: Gastroenteritis *Yersinia* (see **WARNINGS AND PRECAUTIONS**)

Musculo-skeletal and connective tissue

Very rare: Bone pain

Unknown: Muscle spasms

Nervous system

Very rare: Neurological disturbances including dizziness, precipitation or exacerbation of aluminum-related dialysis encephalopathy, neuropathy peripheral, paresthesia (see **WARNINGS AND PRECAUTIONS**)

Unknown: Convulsion

Renal and urinary

Unknown: Acute renal failure, renal tubular disorder, increased blood creatinine

Respiratory, thoracic and mediastinal

Uncommon: Asthma

Very rare: Acute respiratory distress, lung infiltration (see **WARNINGS AND PRECAUTIONS**)

Skin and subcutaneous tissue

Very rare: Generalized rash

Vascular

Rare: Hypotension, tachycardia and shock (if precautions for administration are not adhered to)

Special Remarks**Ear and labyrinth disorders:**

Deafness neurosensory and tinnitus are uncommon if doses are kept within guidelines and if doses are reduced when ferritin levels fall (ratio of the mean daily dose of Deferoxamine Mesylate for Injection divided by serum ferritin should be below 0.025).

Eye disorders:

The various eye disorders are rare, except if high doses are given (see **WARNINGS AND PRECAUTIONS**).

Hepatic impairment:

Rare cases of hepatic impairment have been reported in patients who have been treated with Deferoxamine Mesylate for Injection, however a causality with the drug is not established.

Rare cases of increased transaminases have been reported in patients who have been treated with Deferoxamine Mesylate for Injection, however a causality with the drug is not established.

Nervous system disorders:

Convulsions have mainly been reported in dialyzed patients with aluminum overload.

DRUG INTERACTIONS**Drug-Drug Interactions****Concomitant use of Prochlorperazine**

Concurrent treatment with Deferoxamine Mesylate for Injection and prochlorperazine, a phenothiazine derivative, may lead to temporary impairment of consciousness.

Concomitant use of Vitamin C

Where an iron overload is associated with ascorbic acid deficiency, oral administration of Vitamin C in the standard dosage (150 to 250 mg daily) may serve to enhance excretion of the iron complex in the response to Deferoxamine Mesylate for Injection. Larger doses of Vitamin C fail to produce an additional effect.

In patients with severe chronic iron overload receiving combined treatment of Deferoxamine Mesylate for Injection with high doses of Vitamin C (more than 500 mg daily) impairment of cardiac function may be experienced; the impaired cardiac function proved reversible when the

Vitamin C was withdrawn. Cardiac impairment results from high doses of Vitamin C, which increases the labile iron within the tissues to toxic levels.

The following precautions should be taken when Deferoxamine Mesylate for Injection and Vitamin C are to be used concomitantly:

- Vitamin C supplements should not be given to patients with cardiac failure.
- Cardiac function should be monitored before commencing and during the combined therapy of Deferoxamine Mesylate for Injection and Vitamin C.
- Vitamin C therapy should be initiated only after an initial month of regular Deferoxamine Mesylate for Injection therapy.
- Vitamin C therapy should be given only if a patient is receiving Deferoxamine Mesylate for Injection regularly (ideally soon after setting up the pump).
- Daily doses of approximately 200 mg of Vitamin C in adults, 100 mg of Vitamin C in older children and 50 mg of Vitamin C in children under 10 years, should not be exceeded.

Concomitant use of Erythropoietin

There is evidence that aluminum intoxication causes reduced erythropoiesis. In dialysis patients with iron and/or aluminum overload receiving Deferoxamine Mesylate for Injection and erythropoietin, it is important to adjust the dosage of the latter when necessary. Regular monitoring of iron stores should also be conducted.

Gallium-67-imaging results may be distorted due to rapid urinary excretion of deferoxamine-bound gallium-67. Discontinuing Deferoxamine Mesylate for Injection treatment 48 hours prior to scintigraphy is recommended.

DOSAGE AND ADMINISTRATION

Dosing Considerations

DEFEROXAMINE MESYLATE FOR INJECTION SHOULD ONLY BE GIVEN PARENTERALLY. THE DOSE SHOULD NOT EXCEED 6.0 GRAMS IN A TWENTY-FOUR HOUR PERIOD. Although Deferoxamine Mesylate for Injection can be given by intramuscular injection, in most cases it exerts a considerably greater effect when administered by continuous infusion either intravenously (especially in cases of acute iron intoxication) or subcutaneously (especially in patients with chronic iron overload).

Rapid intravenous injection of Deferoxamine Mesylate for Injection exceeding 15 mg/kg/h has produced flushing of the skin, urticaria, hypotension and shock (see **WARNINGS AND PRECAUTIONS**).

Hepatic Impairment

No studies have been performed in patients with hepatic impairment.

Recommended Dose and Dosage Adjustment

Acute Iron Intoxication

Deferoxamine Mesylate for Injection is an adjunct to standard measures generally used in the treatment of acute iron intoxication, which may include induction of emesis, gastric lavage, maintenance of clear airways, control of peripheral vascular failure, and correction of acidosis.

Treatment should be adapted to the severity of the intoxication, with reference to serum iron (SI) and total iron-binding capacity (TIBC) which should be regularly monitored. In addition, the total amount of iron ingested and remaining in the gastrointestinal tract should be taken into account.

Deferoxamine Mesylate for Injection should be instituted intravenously or intramuscularly in:

- a) All patients with SI > TIBC (> 500 mcg/dL or 89.5 mcmmol/L),
- b) Any patient with SI > 350 mcg/dL or 62.6 mcmmol/L (if TIBC is unavailable) and evidence of free iron, or
- c) Any patient where SI is not readily available and the patient demonstrates the signs and symptoms of iron intoxication.

Note: Leukocytosis (WBC > 15 000/mm³), hyperglycemia (blood sugar > 150 mg/dL) or diarrhea strongly suggest SI will be in the toxic range.

INTRAVENOUS INFUSION: The intravenous route should be used when the patient is hypotensive, in shock or major clinical findings are present. In general, provided infusion lines can be readily established and maintained, and SI levels and TIBC can be readily monitored, intravenous infusion is the preferred route of administration. Infusion rates should be adapted to the severity of intoxication. The rate of infusion should not exceed 15 mg/kg/h and should be reduced as soon as the situation permits, usually after 4 to 6 hours such that the total intravenous dose does not exceed 80 mg/kg up to a maximum of 6.0 grams in 24 hours. Acute respiratory distress syndrome has been reported following intravenous administration of excessive doses of Deferoxamine Mesylate for Injection. Treatment should be interrupted if signs of toxicity occur.

INTRAMUSCULAR ROUTE: The intramuscular route may be used when the patient is normotensive. When administering Deferoxamine Mesylate for Injection in children by the intramuscular route, initially inject 90 mg/kg. This may be followed by 45 mg/kg every four to twelve hours, as necessary, up to a maximum of 6 grams per 24 hours. **IN CHILDREN, THE MAXIMUM SINGLE INJECTION SHOULD NOT EXCEED 1.0 GRAM (2.0 GRAMS IN ADULTS).** Attention should be given to volume of solution injected and in small children, two injection sites may be required.

Duration of treatment with Deferoxamine Mesylate for Injection by either route will depend on the patient's condition and should be based on the SI levels and TIBC.

The effectiveness of treatment is dependent on an adequate output of urine in order to ensure that the iron complex ferrioxamine is excreted from the body. If oliguria or anuria develop, peritoneal dialysis or hemodialysis may become necessary to remove the ferrioxamine.

Chronic Iron Overload

The daily dose of Deferoxamine Mesylate for Injection in children and adults should be tailored to the iron burden of the individual patient as reflected by serum ferritin levels and 24-hour urinary iron excretion. These levels should be monitored daily initially and thereafter at longer intervals (but not less than once every 2 weeks).

Intravenous infusions usually prove somewhat more effective than subcutaneous infusions, but the latter are particularly suitable for ambulant patients.

For subcutaneous infusions, a portable light-weight infusion pump is a practical, effective means of promoting sustained and substantial net urinary iron excretion. The usual needle used is 25-gauge or 27-gauge, butterfly type, placed in the subcutaneous tissues of the anterior abdominal wall.

The drug should not be given at concentrations higher than 95 mg/mL when given subcutaneously as this increases the risk of local reactions by the subcutaneous route.

For the purpose of infusion treatment, the average daily dose is 1.0 to 4.0 g (20 to 60 mg/kg depending on iron load) administered subcutaneously or intravenously over a period of approximately 12 hours. In some cases it is possible to achieve a further increase in iron excretion by infusing the same daily dose over a 24-hour period. When administered subcutaneously by pump, Deferoxamine Mesylate for Injection should normally be given 4 to 7 times per week depending on the severity of the iron overload. Patients with serum ferritin levels less than 2000 ng/mL require approximately 25 mg/kg/day. Doses of 35 mg/kg/day are required when serum ferritin levels are in the range of 2000 ng/mL to 3000 ng/mL. Higher doses should be administered only if the benefits outweigh the risks associated with repeated high daily doses.

For intramuscular treatment when more effective subcutaneous infusions are not feasible, the average initial dose is 0.5 to 1 g daily, given in 1 to 2 injections. The maintenance dose will depend on the patient's iron excretion rate.

Since the iron excretion rates obtained with the above-mentioned modes of administration vary from patient to patient, one should first determine which route and dosage will yield the best results for the individual.

Diagnosis of Aluminum Overload

Use in adults with ESRF: Serum aluminum levels should be determined before and after Deferoxamine Mesylate for Injection administration. The Deferoxamine Infusion Test is recommended in patients with serum aluminum levels exceeding 60 ng/mL (2.22 $\mu\text{mol/L}$) associated with serum ferritin levels above 100 ng/mL. A blood sample is taken just prior to a hemodialysis session to determine the baseline serum aluminum level. A 5.0 mg/kg dose of Deferoxamine Mesylate for Injection is given as a single, slow intravenous infusion at an

infusion rate not exceeding 15 mg/kg/h, ideally during post-dialysis to avoid loss of free drug. An acceptable compromise is during the last 60 minutes of the hemodialysis session. A continuous increase in serum aluminum during the 24- to 48-hour period following administration is suggestive of aluminum overload. The Test is considered positive if the serum aluminum levels increase above baseline by more than 150 ng/mL (5.55 $\mu\text{mol/L}$) when a second blood sample is taken at the start of the next hemodialysis session.

The diagnostic capability of the Deferoxamine Infusion Test is greatly enhanced if performed in conjunction with histological and biochemical examination of a bone biopsy.

Use in children with ESRF: Little clinical experience has been gained to date on use of Deferoxamine Mesylate for Injection in aluminum-overloaded children, the condition being rare in the very young. Dosage should be adapted from the adult dose at the discretion of the physician and adjusted for body-weight (15 to 20 mg/kg).

Chronic Aluminum Overload in Patients with ESRF

The precise dosage should be individually determined and adapted during the course of treatment.

Deferoxamine Mesylate for Injection should be used in the treatment of patients having symptoms or evidence of organ dysfunction due to aluminum overload. In addition, treatment should be considered in symptomatic patients if serum aluminum levels are consistently above 60 ng/mL (2.22 $\mu\text{mol/L}$) and are associated with a positive Deferoxamine Infusion Test (see above), particularly if bone biopsy findings present evidence of aluminum-related bone disease. Deferoxamine Mesylate for Injection should be given once weekly at a 5.0 mg/kg dose administered as a slow intravenous infusion not exceeding 15 mg/kg/h infusion rate, ideally during post-dialysis to avoid loss of free drug. An acceptable compromise is during the last 60 minutes of the hemodialysis session.

After completion of the first 3-month course of Deferoxamine Mesylate for Injection treatment, followed by a 4-week wash out period, the Deferoxamine Infusion Test should be performed. If two successive Deferoxamine Infusion Tests performed at 1-month intervals yield an increase in serum aluminum levels of less than 75 ng/mL (2.78 $\mu\text{mol/L}$) above baseline, further treatment is not recommended.

Patients on continuous ambulatory or cyclic peritoneal dialysis: A 5.0 mg/kg dose once per week prior to the final daily exchange. The intraperitoneal route is recommended in these patients, however, Deferoxamine Mesylate for Injection is equally effective when administered intramuscularly, by slow intravenous, or subcutaneous infusion. The mode of administration should be individually determined and the dosage adapted during the course of therapy.

Administration

Reconstitution of Lyophilized Vials:

The sterile lyophilized powder in each vial should be reconstituted under aseptic conditions just prior to dilution, only with sterile water for injection. The Deferoxamine Mesylate for Injection

solution is clear and colourless to slightly yellow at the recommended concentration of 95 mg/mL, and darker yellow at the recommended concentration of 213 mg/mL. This concentration may produce a stronger yellow-coloured solution. The drug should be completely dissolved before the solution is withdrawn.

The final volume (Approximate Available Volume) of the reconstituted Lyophilized Vial is greater than the specified volume of sterile water for injection.

a) Reconstitution of Lyophilized Vials for Subcutaneous Administration

Vial Size	Volume of Sterile Water for Injection to be Added to Vial	Approximate Available Volume	Nominal Concentration per mL
500 mg	5 mL	5.3 mL	95 mg/mL
2 g	20 mL	21.1 mL	95 mg/mL

b) Reconstitution of Lyophilized Vials for Intravenous Administration (may be further diluted)

Vial Size	Volume of Sterile Water for Injection to be Added to Vial	Approximate Available Volume	Nominal Concentration per mL
500 mg	5 mL	5.3 mL	95 mg/mL
2 g	20 mL	21.1 mL	95 mg/mL

c) Reconstitution of Lyophilized Vials for Intramuscular Administration

Vial Size	Volume of Sterile Water for Injection to be Added to Vial	Approximate Available Volume	Nominal Concentration per mL
500 mg	2 mL	2.3 mL	213 mg/mL
2 g	8 mL	9.4 mL	213 mg/mL

Dilution of Reconstituted Solution for Intravenous Infusion:

Reconstituted solutions that have been prepared with sterile water for injection can be further diluted with physiological saline (0.9%), glucose in water or Ringer's lactate for infusion prior to infusion. The use of freshly prepared diluted solutions is recommended. Reconstituted solutions and solutions further diluted for infusion should be used or discarded within 24 hours of reconstitution when protected from heat (i.e., store below 23°C) due to the possibility of microbial contamination during preparation. Discard any infusion solution found to have particulate matter or discolouration.

Incompatibilities:

Heparin injectable solution or physiological saline (0.9%) should not be used to reconstitute the vials of lyophilized powder.

OVERDOSAGE

Since Deferoxamine Mesylate for Injection is available only for parenteral administration, acute intoxication is unlikely to occur.

Tachycardia, hypotension and gastrointestinal symptoms have occasionally developed in patients who received overdoses of Deferoxamine Mesylate for Injection.

Inadvertent intravenous administration of an overdose of Deferoxamine Mesylate for Injection may be associated with acute but transient vision loss, aphasia, agitation, headache, nausea, bradycardia and hypotension.

Acute respiratory distress syndrome including death has been reported following treatment with excessively high intravenous doses of Deferoxamine Mesylate for Injection (see **WARNINGS AND PRECAUTIONS**).

High doses of Deferoxamine Mesylate for Injection for the treatment of chronic iron and/or aluminum overload have resulted in visual disturbances and hearing loss (see **WARNINGS AND PRECAUTIONS**).

Treatment:

There is no specific antidote.

Signs and symptoms of overdosage may be eliminated by reducing the dosage or interrupting treatment.

Deferoxamine Mesylate for Injection is dialyzable.

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

ACTION AND CLINICAL PHARMACOLOGY

Mechanism of Action

Deferoxamine Mesylate for Injection (deferoxamine mesylate) is a chelating agent which forms complexes predominantly with trivalent iron and aluminum ions; it is thus of value in the treatment of acute/chronic iron intoxication, and also chronic aluminum overload in dialysis patients with end-stage renal failure (ESRF).

Deferoxamine Mesylate for Injection complexes with iron to form ferrioxamine, a stable chelate, which cannot take part in further chemical reactions. It can also mobilize and chelate tissue-bound aluminum, forming an aluminoxamine complex. Both complexes - ferrioxamine and aluminoxamine - are freely soluble in water and are readily excreted through the kidneys. Excreted ferrioxamine gives the urine a characteristic reddish colour. Some of the deferoxamine-metal complexes are also excreted in feces.

Theoretically chelation occurs on a 1:1 molar basis, hence 100 parts by weight of Deferoxamine Mesylate for Injection can bind approximately 8.5 and 4.1 parts by weight of trivalent iron and aluminum, respectively.

Although primarily effective in raising iron and aluminum excretion, Deferoxamine Mesylate for Injection may also cause a slight increase in the excretion of sodium and calcium.

Pharmacodynamics

Deferoxamine is a chelating agent which forms complexes predominantly with trivalent iron and aluminum ions: the complex formation constants are 10^{31} and 10^{25} respectively. Affinity for divalent ions such as iron, copper, zinc and calcium is substantially lower (complex formation constants $\leq 10^{14}$). It has little influence on the excretion of trace elements.

Following parenteral administration of Deferoxamine Mesylate for Injection, tissue iron and aluminum are mobilized resulting in a sharp rise in serum iron and/or aluminum concentration(s).

Deferoxamine chelates iron, either free or bound in ferritin and hemosiderin, forming the complex ferrioxamine. Deferoxamine Mesylate for Injection can also mobilize and chelate tissue-bound aluminum forming an aluminoxamine complex. Since both ferrioxamine and aluminoxamine are completely excreted, Deferoxamine Mesylate for Injection promotes iron and aluminum excretion in the urine and feces, thereby reducing pathological iron and/or aluminum deposits in the organs.

Clinical studies have shown that ascorbic acid, when taken orally at least 3 days before Deferoxamine Mesylate for Injection is given, considerably enhances (by an average of 96%) the iron excretion. This action of ascorbic acid is probably due to its reducing property which facilitates the mobilization of iron from ferritin by producing a dissociable pool of ferrous ions that are then available for binding to transferrin or a chelating agent such as deferoxamine. Deferoxamine Mesylate for Injection is not capable of removing iron from the bone marrow or from the erythrocytes.

Pharmacokinetics

Absorption: Deferoxamine Mesylate for Injection is very poorly absorbed orally but well absorbed by the intramuscular and subcutaneous routes.

Distribution: The serum protein-binding rate is less than 10%. It is distributed throughout all body fluids.

Metabolism: Metabolites were isolated and identified from the urine of patients being treated for iron overload. The metabolism reactions to occur were transamination and oxidation yielding an acid metabolite, beta-oxidation also yielding an acid metabolite, decarboxylation and N-hydroxylation yielding natural metabolites.

Excretion: It is excreted through the kidneys by glomerular filtration and tubular secretion.

In healthy subjects and in patients with transfusion-induced iron overload, plasma concentrations of between 80 and 130 $\mu\text{mol/L}$ were recorded 3 minutes after an intravenous injection of deferoxamine (10 mg/kg); these concentrations falling to one-half within 5 to 10 minutes and

thereafter declining more slowly. This rapid fall in the concentration is due not only to distribution and excretion of the active substance but also both to formation of the iron complex ferrioxamine (which commences within a few minutes and the extent of which depends on the individual's iron status) and to metabolic transformation.

During continuous subcutaneous or intravenous infusion of deferoxamine (100 mg/kg in 24 mL sterile water at a rate of 1 mL per hour), the plasma concentrations of deferoxamine and ferrioxamine in healthy subjects rose - depending on the subject's individual iron status (serum ferritin concentration) - to a plateau after 6 or, more frequently, after 12 hours, i.e. to maximum levels of 20 $\mu\text{mol/L}$ for desferrioxamine and 2.75 $\mu\text{mol/L}$ for ferrioxamine. The corresponding values in patients were 8.3 $\mu\text{mol/L}$ for desferrioxamine and 12.9 $\mu\text{mol/L}$ for ferrioxamine. The 48-hour urinary excretion averaged 118 μmol in the healthy subjects and 836 μmol in the patients. In patients with hemochromatosis, the increase in iron excretion occurring in response to desferrioxamine was roughly just as high in the feces as in the urine.

Within 12 hours after deferoxamine had been administered to 20 volunteers, 33.1% of the dose was excreted in the urine (the bulk of it in the first 3 hours) in the form of deferoxamine and ferrioxamine and the remainder in the form of metabolites; the corresponding figure in a patient with hemochromatosis was 60.5% of the dose. There are reported cases where deferoxamine was diluted with water and given by mouth or stomach tube after gastric aspiration and lavage in the treatment of acute iron overload. The aqueous deferoxamine solution was left in the stomach to bind unabsorbed iron in the gastrointestinal tract to prevent further absorption. Note however, that the efficacy of oral deferoxamine for this purpose is not clearly established.

In ESRF dialysis patients who received 40 mg/kg Deferoxamine Mesylate for Injection infused intravenously over 1 hour, plasma concentration at the end of infusion was 152 $\mu\text{mol/L}$ (85.2 $\mu\text{g/L}$) when the infusion was given between dialysis sessions. Plasma concentrations of Deferoxamine Mesylate for Injection were between 13 and 27% lower when the infusion was administered during dialysis. In all cases, concentrations of ferrioxamine were approximately 7.0 $\mu\text{mol/L}$ (4.3 $\mu\text{g/mL}$); and for aluminoxamine 2.0 to 3.0 $\mu\text{mol/L}$ (1.2 to 1.8 $\mu\text{g/mL}$). After infusion was discontinued, plasma concentration of Deferoxamine Mesylate for Injection decreased rapidly with a half-life of 20 minutes. A smaller fraction of the dose was eliminated with a longer half-life of 14 hours. The plasma concentrations of aluminoxamine continued to increase for up to 48 hours after infusion and reached values of approximately 7.0 $\mu\text{mol/L}$ (4.0 $\mu\text{g/mL}$). Following dialysis, the plasma concentration of aluminoxamine dropped to 2.2 $\mu\text{mol/L}$ (1.3 $\mu\text{g/mL}$).

During peritoneal dialysis, Deferoxamine Mesylate for Injection is absorbed if administered in the dialysis fluid.

STORAGE AND STABILITY

Store vials between 15°C and 25°C. Protect from light.

DOSAGE FORMS, COMPOSITION AND PACKAGING

Deferoxamine Mesylate for Injection is available in:

- 10 mL vials containing 500 mg of deferoxamine mesylate in sterile lyophilized powder form without non-medicinal ingredients. Supplied in cartons of 10 single-use vials.
- 50 mL vials containing 2 g of deferoxamine mesylate in sterile lyophilized powder form without non-medicinal ingredients. Supplied in cartons of 1 single-use vial.

Deferoxamine Mesylate for Injection is latex-free.

PART II: SCIENTIFIC INFORMATION

PHARMACEUTICAL INFORMATION

Drug Substance: Deferoxamine mesylate (USP, BP)

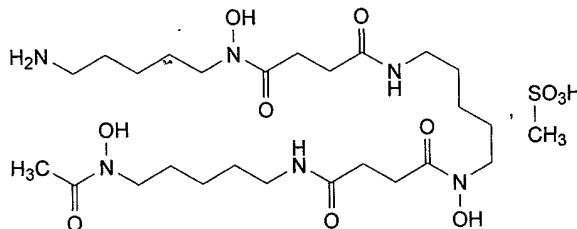
Butanediamide, N'-[5-[[4-[[5-(acetylhydroxyamino)pentyl]amino]-1,4-dioxobutyl]hydroxyamino]pentyl]-N-(5-aminopentyl)-N-hydroxy-, monomethanesulfonate

Chemical name:

or

N-[5-(3-[(5-Aminopentyl)hydroxycarbonyl]propionamido)pentyl]-3-[(5-(N-hydroxyacetamido)pentyl)carbonyl]propionohydroxamic acid monomethanesulfonate (salt).

Chemical Structure:



Molecular Formula: C₂₅H₄₈N₆O₈ • CH₄O₃S

Molecular Weight: 656.79

Description: Deferoxamine mesylate is a trihydroxamic acid derivative. It is a white or almost white powder; odourless or almost odourless. It is soluble in 5 parts water and in 20 parts of ethanol (96%), and it is insoluble in absolute ethanol, chloroform and ether. The pH of a 10% w/v solution ranges from 3.7 to 5.5. The melting point from diluted crystals is 148 to 149°C.

Composition: Deferoxamine Mesylate for Injection is a sterile lyophilized powder for injection. Vials contain either 500 mg or 2 g of deferoxamine mesylate. The pH of a 10% w/v solution is in the range of 3.5 to 5.5.

DETAILED PHARMACOLOGY

See ACTION AND CLINICAL PHARMACOLOGY.

TOXICOLOGY

Acute Toxicity Studies

	IV	SUBCUTANEOUS	ORAL
Mouse	340 mg/kg	1600 mg/kg	> 3000 mg/kg
Rat	520 mg/kg	>1000 mg/kg	> 1000 mg/kg
Rabbit	600 mg/kg	-	-

The signs of acute intoxication in the animal species tested were non-specific paralysis, ataxia and acute respiratory failure.

Subacute Toxicity Studies

500 mg/kg of deferoxamine was given to rats for 28 days by the subcutaneous route. There was a slight reduction in the white blood cell count and some inhibition of growth. There was no evidence of any damage to parenchymal organs or to bone marrow.

Chronic Toxicity Studies

Subcutaneous doses of up to 400 mg/kg of deferoxamine were given to rats for three months. There was no alteration in growth rate, renal function, blood picture, or resistance to intercurrent disease in the animals so treated.

In rabbit, cat and dog, intravenous injection of doses of 10 to 30 mg/kg produced an acute fall in blood pressure. If smaller doses were given previously the reaction was attenuated or abolished.

Reproduction Studies

Skeletal anomalies have been observed in the fetuses of two animal species at doses just above those recommended for human use. Deferoxamine Mesylate for Injection should therefore not be used in women of childbearing potential unless the use of an effective form of contraception, established before treatment, is continued throughout treatment and for at least the first month after treatment.

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PART III: CONSUMER INFORMATION

^{Pr}Deferoxamine Mesylate for Injection (deferoxamine mesylate for injection)

This leaflet is part III of a three-part “Product Monograph” published when Deferoxamine Mesylate for Injection was approved for sale in Canada and is designed specifically for Consumers. This leaflet is a summary and will not tell you everything about Deferoxamine Mesylate for Injection. Contact your doctor or pharmacist if you have any questions about the drug.

ABOUT THIS MEDICATION

What the medication is used for:

Deferoxamine Mesylate for Injection is used in the treatment of the following conditions:

- acute iron poisoning as an adjunct to the standard treatments,
- chronic iron overload due to frequent blood transfusion,
- chronic aluminum overload in patients with end-stage kidney failure requiring dialysis.

Deferoxamine Mesylate for Injection is also used to test for aluminum overload.

What it does:

Deferoxamine Mesylate for Injection contains the active substance deferoxamine, which is a so-called “chelator”. It works by binding to excess iron or aluminum in the blood and removing them from the body (through the urine and feces).

When it should not be used:

- If you are allergic (hypersensitive) to deferoxamine.

What the medicinal ingredient is:

Deferoxamine mesylate.

What the nonmedicinal ingredients are:

None. Vials of Deferoxamine Mesylate for Injection contain the medicinal ingredient deferoxamine mesylate without non-medicinal ingredients.

What dosage forms it comes in:

Deferoxamine Mesylate for Injection is available as 500 mg and 2 g sterile lyophilized powder for injection in vials.

WARNINGS AND PRECAUTIONS

The treatment with Deferoxamine Mesylate for Injection should be started and followed up by a doctor experienced in the treatment of chronic iron or aluminum overload.

BEFORE you use Deferoxamine Mesylate for Injection, talk to your doctor or pharmacist if you:

- have any hearing or eyesight problems. Deferoxamine Mesylate for Injection may cause hearing problems and eyesight problems;
- have high blood sugar (diabetes);
- have blood clotting problems;
- have any neurological problems (convulsion, dementia);
- have a severe kidney problem that does not require dialysis;
- have a lung disease or problem breathing;
- are pregnant or planning to become pregnant. Deferoxamine Mesylate for Injection can harm the unborn child, especially if it is used during the first 3 months of pregnancy. If the treatment with Deferoxamine Mesylate for Injection is needed, female patients who can get pregnant should use an effective birth control method before starting, while taking, and for at least one month after the last treatment with Deferoxamine Mesylate for Injection
- are breast-feeding.

Deferoxamine Mesylate for Injection may reduce growth rate. Patients under 16 years of age should be monitored for body weight and height every three months.

Increased risk of eye disorders have been reported in patients older than 65 years of age.

Effects on ability to drive or use machines:

Deferoxamine Mesylate for Injection may affect your sight or hearing, make you feel dizzy, or cause other disturbances of nervous function. If you experience such effects, you should not drive or use machines.

INTERACTIONS WITH THIS MEDICATION

Tell your doctor or pharmacist if you are taking or have recently taken any other medicines in addition to Deferoxamine Mesylate for Injection, including medicines obtained without a prescription. You may need to change the dosage or stop taking one of the medicines.

Drugs that may interact with Deferoxamine Mesylate for Injection include:

- medicines containing prochlorperazine, a neuroleptic drug used to treat neurological disorders
- vitamin C
- erythropoietin
- gallium-67, a medicine given before imaging (scanning, which is used in diagnosis of certain diseases)

In patients without heart failure, their doctor may tell them to take vitamin C one month before and during regular treatment with Deferoxamine Mesylate for Injection. The maximum daily dose of vitamin C should not exceed 200 mg for adult patients, 100 mg in older children and 50 mg for children under 10 years of age. However, their doctor also needs to monitor their heart function.

PROPER USE OF THIS MEDICATION

Your doctor has chosen the right dose and method of administration for your particular condition. Follow your doctor's instructions carefully. Make sure you use the medication exactly as your doctor tells you.

Usual dose:

Acute iron poisoning

Deferoxamine Mesylate for Injection can be used in cases of poisoning with iron preparations. This treatment is carried out in hospital.

Chronic iron overload

Daily doses of 20 to 60 mg per kilogram bodyweight. Deferoxamine Mesylate for Injection can be given by slow infusion under the skin (subcutaneously), by infusion into a vein (intravenously), or by injection into a muscle (intramuscularly).

Chronic aluminum overload in patients with severe kidney disease

Deferoxamine Mesylate for Injection is usually given once a week by slow infusion into a vein during the last 60 minutes of a dialysis session, or 5 hours before a dialysis session, depending on the aluminum concentration in your blood.

The dose of Deferoxamine Mesylate for Injection is 5 mg per kilogram of bodyweight.

The duration of treatment and any change in your individual dose of Deferoxamine Mesylate for Injection will depend on the results of the tests carried out by your doctor.

Diagnosis of aluminum overload

If you are receiving dialysis, your doctor will want to test whether you have aluminum overload. You will be given 5 mg of deferoxamine mesylate per kilogram of bodyweight by slow infusion into a vein during the last 60 minutes of a dialysis session. The aluminum content of blood samples taken just before this dialysis session and the next one will be determined.

Overdose:

In case of drug overdose, contact a health care practitioner, hospital emergency department or regional Poison Control Centre immediately, even if there are no symptoms.

Missed Dose:

If you have missed a dose of Deferoxamine Mesylate for Injection, tell your doctor at once.

SIDE EFFECTS AND WHAT TO DO ABOUT THEM

As with all medicines, Deferoxamine Mesylate for Injection can cause side effects. The following are the possible side effects of Deferoxamine Mesylate for Injection:

Very common side effects: (affecting more than 10 in 100 patients)

- injection site reaction such as pain, swelling, reddening, itching of the skin, eschar (dead tissue that sheds from healthy skin), crust formation, small blisters, burning
- joint or muscle pain

Common side effects: (affecting more than 1 and less than 10 in 100 patients)

- nausea
- headache
- itchy rash
- fever
- reduced growth rate, bone disorders

Uncommon side effects: (affecting between 1 and 10 in 1000 patients)

- vomiting
- abdominal pain

Very rare side effects: (affecting less than 1 in 10 000 patients)

- diarrhea
- skin rash
- sensation of numbness or tingling in fingers and toes

Unknown frequency:

- muscle spasms
- abnormal liver or kidney function test results
- a low blood level of calcium, and worsening hyperparathyroidism in patients treated for aluminum overload
- reddish-brown urine
- low blood pressure, increased heart rate and shock

If any of the side effects gets serious or you experience any other side effects not listed in this leaflet, please tell your doctor or pharmacist.

SERIOUS SIDE EFFECTS, HOW OFTEN THEY HAPPEN AND WHAT TO DO ABOUT THEM

Symptom / effect	Talk with your doctor or pharmacist		Stop taking drug and call your doctor or pharmacist
	Only if severe	In all cases	
Uncommon			
Disturbances of hearing such as ringing or noise in the ears, hearing loss		√	
Rare			
Disturbances of vision such as blurred eyesight, abnormal colour vision, night blindness, black spots in the vision, loss of vision, clouding of the lens of the eye, visual field defects or decreased sharpness of vision		√	

SERIOUS SIDE EFFECTS, HOW OFTEN THEY HAPPEN AND WHAT TO DO ABOUT THEM

Symptom / effect	Talk with your doctor or pharmacist		Stop taking drug and call your doctor or pharmacist
	Only if severe	In all cases	
Fungal or bacterial infections leading to high fever, shortness of breath, acute diarrhea, abdominal pain, general discomfort or sore throat.		√	
Dizziness, light-headedness (signs of low blood pressure that can occur when the drug is given too rapidly)		√	
Very rare			
Breathlessness due to lung disorders		√	
Unusual bleeding/bruising (a sign that levels of blood platelets are low)	√		
Fever, sore throat or mouth ulcers due to infections (a sign that levels of white blood cells are low)	√		
Rash itching, hives, difficulty breathing or swallowing, feeling of tightness in the chest with wheezing or coughing, dizziness, swelling mainly of the face and throat (signs of a severe allergic reaction or asthma)		√	
Disturbances of the nervous systems		√	
Unknown			
Severely decreased output of urine (sign of a kidney problem)		√	
Convulsions (mainly in patients on dialysis)		√	

This is not a complete list of side effects. For any unexpected effects while taking Deferoxamine Mesylate for Injection, contact your doctor or pharmacist.

HOW TO STORE IT

- Keep out of reach and sight of children and pets.
- Do not use Deferoxamine Mesylate for Injection after the expiry date shown on the pack.
- Store Deferoxamine Mesylate for Injection vials containing the dry active substance between 15 and 25°C. Protect from light.
- One vial is for single-use only. The product should be used immediately after the solution has been made up (reconstituted), i.e. treatment should start within 3 hours.

When the solution has been prepared under recognized sterile conditions, it may be stored for a maximum period of 24 hours at room temperature before the start of treatment. Opaque or cloudy solutions should be discarded.

- Remember to return any unused vials to your pharmacist

REPORTING SUSPECTED SIDE EFFECTS

You can report any suspected adverse reactions associated with the use of health products to the Canada Vigilance Program by one of the following 3 ways:

- Report online at www.healthcanada.gc.ca/medeffect
- Call toll-free at 1-866-234-2345
- Complete a Canada Vigilance Reporting Form and:
 - Fax toll-free to 1-866-678-6789, or
 - Mail to:
 - Canada Vigilance Program
 - Health Canada
 - Postal Locator 1908C
 - Ottawa, Ontario
 - K1A 0K9

Postage-paid labels, Canada Vigilance Reporting Form and the adverse reaction reporting guidelines are available on the MedEffect™ Canada Web site at: www.healthcanada.gc.ca/medeffect

NOTE: Should you require information related to the management of side effects, contact your health professional. The Canada Vigilance Program does not provide medical advice.

MORE INFORMATION

This document, plus the full product monograph prepared for health professionals, can be obtained by contacting the sponsor, Pfizer Canada Inc., at 1-800-463-6001.

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