

**Panhematin<sup>®</sup>**  
**Hemin For Injection**

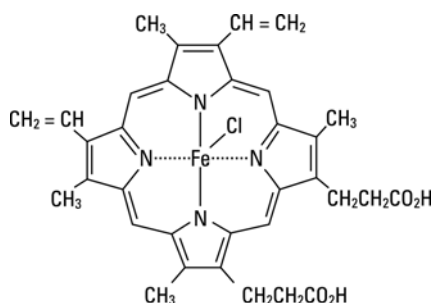
**Rx only**  
**For intravenous infusion only.**

PANHEMATIN (hemin for injection) should only be used by physicians experienced in the management of porphyrias in hospitals where the recommended clinical and laboratory diagnostic and monitoring techniques are available.

PANHEMATIN therapy should be considered after an appropriate period of alternate therapy (i.e., 400 g glucose/day for 1 to 2 days). (See "WARNINGS", "PRECAUTIONS" and "DOSAGE AND ADMINISTRATION" sections.)

**DESCRIPTION**

PANHEMATIN (hemin for injection) is an enzyme inhibitor derived from processed red blood cells. Hemin for injection was known previously as hematin. The term hematin has been used to describe the chemical reaction product of hemin and sodium carbonate solution. Hemin is an iron containing metalloporphyrin. Chemically hemin is represented as chloro [7,12-diethenyl-3,8,13,17-tetramethyl-21H,23H-porphine-2,18-dipropanoato(2-)-N<sup>21</sup>,N<sup>22</sup>,N<sup>23</sup>,N<sup>24</sup>] iron. The structural formula for hemin is:



PANHEMATIN is a sterile, lyophilized powder suitable for intravenous administration after reconstitution. Each dispensing vial of PANHEMATIN contains the equivalent of 313 mg hemin, 215 mg sodium carbonate and 300 mg of sorbitol. The pH may have been adjusted with hydrochloric acid; the product contains no preservatives. When mixed as directed with Sterile Water for Injection, USP, each 43 mL provides the equivalent of approximately 301 mg hematin (7 mg/mL).

**CLINICAL PHARMACOLOGY**

Heme acts to limit the hepatic and/or marrow synthesis of porphyrin. This action is likely due to the inhibition of  $\delta$ -aminolevulinic acid synthetase, the enzyme which

limits the rate of the porphyrin/heme biosynthetic pathway. The exact mechanism by which hematin produces symptomatic improvement in patients with acute episodes of the hepatic porphyrias has not been elucidated.<sup>1,9</sup>

Following intravenous administration of hematin in non-jaundiced human patients, an increase in fecal urobilinogen can be observed which is roughly proportional to the amount of hematin administered. This suggests an enterohepatic pathway as at least one route of elimination. Bilirubin metabolites are also excreted in the urine following hematin injections.<sup>2</sup>

PANHEMATIN (hemin for injection) therapy for the acute porphyrias is not curative. After discontinuation of PANHEMATIN treatment, symptoms generally return although in some cases remission is prolonged. Some neurological symptoms have improved weeks to months after therapy although little or no response was noted at the time of treatment.

Other aspects of human pharmacokinetics have not been defined.

## **INDICATIONS AND USAGE**

PANHEMATIN (hemin for injection) is indicated for the amelioration of recurrent attacks of acute intermittent porphyria temporally related to the menstrual cycle in susceptible women.

Manifestations such as pain, hypertension, tachycardia, abnormal mental status and mild to progressive neurologic signs may be controlled in selected patients with this disorder.

Similar findings have been reported in other patients with acute intermittent porphyria, porphyria variegata and hereditary coproporphyria. PANHEMATIN is not indicated in porphyria cutanea tarda.

## **CONTRAINDICATIONS**

PANHEMATIN is contraindicated in patients with known hypersensitivity to this drug.

## **WARNINGS**

**PANHEMATIN is made from human blood. Products made from human blood may contain infectious agents, such as viruses, that can cause disease. The risk that such products will transmit an infectious agent has been reduced by screening blood donors for prior exposure to certain viruses, by testing for the presence of certain current virus infections, and by inactivating certain**

**viruses. Despite these measures, such products can still potentially transmit disease. There is also the possibility that unknown infectious agents may be present in such products. ALL infections thought by a physician possibly to have been transmitted by this product should be reported by the physician or other healthcare provider to Lundbeck Inc., (1-800-455-1141). The physician should discuss the risks and benefits of this product with the patient.**

Because this product is made from human blood, it may carry a risk of transmitting infectious agents, e.g., viruses, and theoretically, the Creutzfeldt-Jakob disease (CJD) agent.

PANHEMATIN therapy is intended to limit the rate of porphyria/heme biosynthesis possibly by inhibiting the enzyme  $\delta$ -aminolevulinic acid synthetase. For this reason, drugs such as estrogens, barbituric acid derivatives and steroid metabolites which increase the activity of  $\delta$ -aminolevulinic acid synthetase should be avoided.

Also, because hemin for injection has exhibited transient, mild anticoagulant effects during clinical studies, concurrent anticoagulant therapy should be avoided.<sup>9</sup> The extent and duration of the hypocoagulable state induced by PANHEMATIN has not been established.

## **PRECAUTIONS**

### **General**

Clinical benefit from PANHEMATIN depends on prompt administration. Attacks of porphyria may progress to a point where irreversible neuronal damage has occurred. PANHEMATIN therapy is intended to prevent an attack from reaching the critical stage of neuronal degeneration. PANHEMATIN is not effective in repairing neuronal damage.<sup>9</sup>

Recommended dosage guidelines should be strictly followed. Reversible renal shutdown has been observed in a case where an excessive hematin dose (12.2 mg/kg) was administered in a single infusion. Oliguria and increased nitrogen retention occurred although the patient remained asymptomatic.<sup>4</sup> No worsening of renal function has been seen with administration of recommended dosages of hematin.<sup>9</sup>

A large arm vein or a central venous catheter should be utilized for the administration of PANHEMATIN to avoid the possibility of phlebitis.

Since reconstituted PANHEMATIN is not transparent, any undissolved particulate matter is difficult to see when inspected visually. Therefore, terminal filtration through a sterile 0.45 micron or smaller filter is recommended.

### **Tests for Diagnosis and Monitoring of Therapy**

Before PANHEMATIN therapy is begun, the presence of acute porphyria must be diagnosed using the following criteria:<sup>9</sup>

- a. Presence of clinical symptoms.
- b. Positive Watson-Schwartz or Hoesch test. (A negative Watson-Schwartz or Hoesch test indicates a porphyric attack is highly unlikely. When in doubt quantitative measures of  $\delta$ -aminolevulinic acid and porphobilinogen in serum or urine may aid in diagnosis.)

Urinary concentrations of the following compounds may be *monitored* during PANHEMATIN therapy. Drug effect will be demonstrated by a decrease in one or more of the following compounds.<sup>3-6</sup>

ALA –  $\delta$ -aminolevulinic acid

UPG – uroporphyrinogen

PBG – porphobilinogen

    coproporphyrin

### **Carcinogenesis, Mutagenesis, Impairment of Fertility**

No data are available on potential for carcinogenicity, mutagenicity or impairment of fertility in animals or humans.

### **Pregnancy**

*Teratogenic effects-Pregnancy Category C:* Animal reproduction studies have not been conducted with hematin. It is also not known whether hematin can cause fetal harm when administered to a pregnant woman or can affect reproduction capacity. For this reason PANHEMATIN should not be given to a pregnant woman unless the expected benefits are sufficiently important to the health and welfare of the patient to outweigh the unknown hazard to the fetus.

### **Nursing Mothers**

It is not known whether this drug is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when PANHEMATIN is administered to a nursing woman.

### **Pediatric Use**

Safety and effectiveness in pediatric patients under 16 years of age have not been established.

### **Geriatric Use**

Clinical studies in PANHEMATIN did not include sufficient numbers of subjects aged 65 and over to determine whether they respond differently from younger subjects. Other reported clinical experience has not identified differences in response between the elderly and younger patients. 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.

## ADVERSE REACTIONS

Reversible renal shutdown has occurred with administration of excessive doses (See "PRECAUTIONS" section).

Phlebitis with or without leucocytosis and with or without mild pyrexia has occurred after administration of hematin through small arm veins.

There have been post-marketing and literature reports of thrombocytopenia and coagulopathy (including prolonged prothrombin time and prolonged partial thromboplastin time) in patients receiving PANHEMATIN. The initial literature report<sup>8</sup> described coagulopathy occurring in a patient receiving hematin therapy. This patient exhibited prolonged prothrombin time and partial thromboplastin time, thrombocytopenia, mild hypofibrinogenemia, mild elevation of fibrin split products, and a 10% fall in hematocrit.

**To report SUSPECTED ADVERSE REACTIONS, contact Lundbeck Inc. at 1-800-455-1141 or FDA at 1-800-FDA-1088 or [www.fda.gov/medwatch](http://www.fda.gov/medwatch).**

## OVERDOSAGE

Reversible renal shutdown has been observed in a case where an excessive hematin dose (12.2 mg/kg) was administered in a single infusion. Treatment of this case consisted of ethacrynic acid and mannitol.<sup>7</sup>

## DOSAGE AND ADMINISTRATION

Before administering PANHEMATIN, an appropriate period of alternate therapy (i.e., 400 g glucose/day for 1 to 2 days) must be considered. If improvement is unsatisfactory for the treatment of acute attacks of porphyria, an intravenous infusion of PANHEMATIN containing a dose of 1 to 4 mg/kg/day of hematin should be given over a period of 10 to 15 minutes for 3 to 14 days based on the clinical signs. In more severe cases this dose may be repeated no earlier than every 12 hours. No more than 6 mg/kg of hematin should be given in any 24 hour period.

After reconstitution each mL of PANHEMATIN contains the equivalent of approximately 7 mg of hematin. The drug may be administered directly from the vial.

### Dosage Calculation Table

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1 mg hematin equivalent = 0.14 mL PANHEMATIN
2 mg hematin equivalent = 0.28 mL PANHEMATIN
3 mg hematin equivalent = 0.42 mL PANHEMATIN
4 mg hematin equivalent = 0.56 mL PANHEMATIN

Since reconstituted PANHEMATIN is not transparent, any undissolved particulate matter is difficult to see when inspected visually. Therefore, terminal filtration through a sterile 0.45 micron or smaller filter is recommended.

#### **Preparation of Solution:**

Reconstitute PANHEMATIN by aseptically adding 43 mL of Sterile Water for Injection, USP, to the dispensing vial. Immediately after adding diluent, the product should be shaken well for a period of 2 to 3 minutes to aid dissolution. **NOTE: Because PANHEMATIN contains no preservative and because PANHEMATIN undergoes rapid chemical decomposition in solution, it should not be reconstituted until immediately before use. After the first withdrawal from the vial, any solution remaining must be discarded.**

No drug or chemical agent should be added to a PANHEMATIN fluid admixture unless its effect on the chemical and physical stability has first been determined.

#### **HOW SUPPLIED**

PANHEMATIN is supplied as a sterile, lyophilized black powder in single dose dispensing vials (NDC 67386-701-54). When mixed as directed with Sterile Water for Injection, USP, each 43 mL provides the equivalent of approximately 301 mg hematin (7 mg/mL). Store lyophilized powder in refrigerator at 2-8°C (36-46°F) until time of use.

Caution: The packaging (vial stopper) of this product contains natural rubber latex which may cause allergic reactions.

#### **REFERENCES**

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9. Pierach, C. A., Hematin Therapy for the Porphyric Attack, *Semin Liver Dis* 2(2):125-131, May, 1982.

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