

**HEPARIN SODIUM- heparin sodium injection, solution**  
**HF Acquisition Co LLC, DBA HealthFirst**

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**HEPARIN SODIUM IN 0.45% SODIUM CHLORIDE INJECTION (100 USP UNITS/mL) 250 mL**

**HIGHLIGHTS OF PRESCRIBING INFORMATION**

These highlights do not include all the information needed to use HEPARIN SODIUM IN 0.45% SODIUM CHLORIDE INJECTION safely and effectively. See full prescribing information for HEPARIN SODIUM IN 0.45% SODIUM CHLORIDE INJECTION. HEPARIN SODIUM IN 0.45% SODIUM CHLORIDE INJECTION, for intravenous use Initial U.S. Approval: 1939

**INDICATIONS AND USAGE**

Heparin sodium is indicated for: ( 1)

- Prophylaxis and treatment of venous thromboembolism
- Prophylaxis and treatment of the thromboembolic complications associated with atrial fibrillation
- Treatment of acute and chronic consumption coagulopathies
- Prevention of clotting in arterial and cardiac surgery
- Prophylaxis and treatment of peripheral arterial embolism
- Anticoagulant use in extracorporeal circulation and dialysis procedure

**DOSAGE AND ADMINISTRATION**

Recommended Adult Dosages:

- Therapeutic Anticoagulant Effect with Full-Dose Heparin\* ( 2-2.3)

Intermittent IV injection	Initial Dose	10,000 units
	Every 4 to 6 hours	5,000 to 10,000 units
Continuous IV infusion	Initial Dose	5,000 units
	Continuous	20,000 to 40,000 units/24 hours
*Based on 150 lb. (68 kg) patient.		

- Surgery of the Heart and Blood Vessels ( 2-2.5)

Intravascular via Total Body Perfusion	Initial Dose	≥ 150 units/kg; adjust for longer procedures
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Extracorporeal Dialysis ( 2-2.8)

Intravascular via Extracorporeal Dialysis	Follow equipment manufacturer's operating directions carefully.
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DOSAGE FORMS AND STRENGTHS

- Heparin sodium is available as: ( 3)
- Injection: 100 USP Units/mL in 0.45% Sodium Chloride clear solution (25,000 USP Units/250 mL) in single-dose plastic container
- Injection: 50 USP Units/mL in 0.45% Sodium Chloride clear solution (12,500 USP Units/250 mL) in single-dose plastic container
- Injection: 50 USP Units/mL in 0.45% Sodium Chloride clear solution (25,000 USP Units/500 mL) in single-dose plastic container

CONTRAINDICATIONS

- History of Heparin-induced Thrombocytopenia (HIT) (With or Without Thrombosis) ( 4)
- Known hypersensitivity to heparin or pork products ( 4)
-

In whom suitable blood coagulation tests cannot be performed at appropriate intervals ( 4)

## WARNINGS AND PRECAUTIONS

- Fatal Medication Errors: Confirm choice of correct strength prior to administration. ( 5-5.1)
- Hemorrhage: Fatal cases have occurred. Use caution in conditions with increased risk of hemorrhage. 5-(5.2)
- HIT (With or Without Thrombosis): Monitor for signs and symptoms and discontinue if indicative of HIT (With or Without Thrombosis). ( 5-5.3)
- Monitoring: Blood coagulation tests guide therapy for full-dose heparin. Monitor platelet count and hematocrit in all patients receiving heparin. ( 5-5.5)

## ADVERSE REACTIONS

Most common adverse reactions are hemorrhage, thrombocytopenia, HIT (With or Without Thrombosis), injection site irritation, general hypersensitivity reactions, and elevations of aminotransferase levels ( 6-6.1)

To report SUSPECTED ADVERSE REACTIONS, contact Hospira, Inc. at 1-800-441-4100, or FDA at 1-800-FDA-1088 or [www.fda.gov/medwatch](http://www.fda.gov/medwatch).

## DRUG INTERACTIONS

- Drugs that interfere with platelet aggregation: May induce bleeding. ( 7-7.2)

See 17 for PATIENT COUNSELING INFORMATION.

Revised: 3/2016

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Sections or subsections omitted from the full prescribing information are not listed.

## **1 INDICATIONS & USAGE**

Heparin sodium is indicated for:

- Prophylaxis and treatment of venous thrombosis and pulmonary embolism;
- Prophylaxis and treatment of thromboembolic complications associated with atrial fibrillation;
- Treatment of acute and chronic consumption coagulopathies (disseminated intravascular coagulation);
- Prevention of clotting in arterial and cardiac surgery;
- Prophylaxis and treatment of peripheral arterial embolism;
- Anticoagulant use in blood transfusions, extracorporeal circulation, and dialysis procedures.

## **2 DOSAGE & ADMINISTRATION**

### **2.1 Preparation for Administration**

Confirm the selection of the correct formulation and strength prior to administration of the drug. Do not use Heparin Sodium in 0.45% Sodium Chloride Injection as a "catheter lock flush" product.

Administer this product by intravenous infusion.

Do not admix with other drugs.

Do not use flexible container in series connections.

Parenteral drug products should be inspected visually for particulate matter and discoloration prior to administration, whenever solution and container permit.

### **2.2 Laboratory Monitoring for Efficacy and Safety**

Adjust the dosage of heparin sodium according to the patient's coagulation test results. When heparin is given by continuous intravenous infusion, determine the coagulation time approximately every 4 hours in the early stages of treatment. When the drug is administered intermittently by intravenous injection, perform coagulation tests before each injection during the early stages of treatment and at appropriate intervals thereafter. Dosage is considered adequate when the activated partial thromboplastin time (APTT) is 1.5 to 2 times the normal or when the whole blood clotting time is elevated approximately 2.5 to 3 times the control value.

Periodic platelet counts, hematocrits, and tests for occult blood in stool are recommended during the entire course of heparin therapy.

### **2.3 Therapeutic Anticoagulant Effect with Full-Dose Heparin**

The dosing recommendations in Table 1 are based on clinical experience. Although dosage must be adjusted for the individual patient according to the results of suitable laboratory tests, the following dosage schedules may be used as guidelines:

Table 1: Recommended Adult Full-Dose Heparin Regimens for Therapeutic Anticoagulant Effect

### **2.4 Pediatric Use**

There are no adequate and well controlled studies on heparin use in pediatric patients. Pediatric dosing recommendations are based on clinical experience. In general, the following dosage schedule may be used as a guideline in pediatric patients:

Initial Dose 75 to 100 units/kg (IV bolus over 10 minutes)

Maintenance Dose Infants: 25 to 30 units/kg/hour;

Infants < 2 months have the highest requirements (average 28 units/kg/hour)

Children > 1 year of age: 18 to 20 units/kg/hour;

Older children may require less heparin, similar to weight-adjusted adult dosage

Monitoring Adjust heparin to maintain a PTT of 60 to 85 seconds, assuming this reflects an

anti-Factor Xa level of 0.35 to 0.70.

### **2.5 Cardiovascular Surgery**

Patients undergoing total body perfusion for open-heart surgery should receive an initial dose of not less than 150 units of heparin sodium per kilogram of body weight. Frequently, a dose of 300 units per kilogram is used for procedures estimated to last less than 60 minutes or 400 units per kilogram for those estimated to last longer than 60 minutes.

## 2.6 Converting to Warfarin

To ensure continuous anticoagulation when converting from HEPARIN SODIUM to warfarin, continue full heparin therapy for several days until the INR (prothrombin time) has reached a stable therapeutic range. Heparin therapy may then be discontinued without tapering [see Drug Interactions (7.4)].

## 2.7 Converting to Oral Anticoagulants other than Warfarin

For patients currently receiving intravenous heparin, stop intravenous infusion of heparin sodium immediately after administering the first dose of oral anticoagulant; or for intermittent intravenous administration of heparin sodium, start oral anticoagulant 0 to 2 hours before the time that the next dose of heparin was to have been administered.

## 2.8 Extracorporeal Dialysis

Follow equipment manufacturer's operating directions carefully. A dose of 25 to 30 units/kg followed by an infusion rate of 1,500 to 2,000

**Table 1: Recommended Adult Full-Dose Heparin Regimens for Therapeutic Anticoagulant Effect**

Method of Administration	Frequency	Recommended Dose*
Intermittent Intravenous Injection	Initial Dose	10,000 Units
	Every 4 to 6 hours	5,000 – 10,000 Units
Continuous Intravenous Infusion	Initial Dose	5,000 Units by IV injection
	Continuous	20,000 – 40,000 Units/24 hours

\* Based on 150 lb. (68 kg) patient.

## 2.4 Pediatric Use

There are no adequate and well controlled studies on heparin use in pediatric patients. Pediatric dosing recommendations are based on clinical experience. In general, the following dosage schedule may be used as a guideline in pediatric patients:

Initial Dose 75 to 100 units/kg (IV bolus over 10 minutes)

Maintenance Dose Infants: 25 to 30 units/kg/hour;

Infants < 2 months have the highest requirements (average 28 units/kg/hour)

Children > 1 year of age: 18 to 20 units/kg/hour;

Older children may require less heparin, similar to weight-adjusted adult dosage  
Monitoring Adjust heparin to maintain a PTT of 60 to 85 seconds, assuming this reflects an anti-Factor Xa level of 0.35 to 0.70.

## 2.5 Cardiovascular Surgery

Patients undergoing total body perfusion for open-heart surgery should receive an initial dose of not less than 150 units of heparin sodium per kilogram of body weight. Frequently, a dose of 300 units per kilogram is used for procedures estimated to last less than 60 minutes or 400 units per kilogram for those estimated to last longer than 60 minutes.

## 2.6 Converting to Warfarin

To ensure continuous anticoagulation when converting from HEPARIN SODIUM to warfarin, continue full heparin therapy for several days until the INR (prothrombin time) has reached a stable therapeutic range. Heparin therapy may then be discontinued without tapering [see Drug Interactions ( 7-7.4)].

## 2.7 Converting to Oral Anticoagulants other than Warfarin

For patients currently receiving intravenous heparin, stop intravenous infusion of heparin sodium immediately after administering the first dose of oral anticoagulant; or for intermittent intravenous administration of heparin sodium, start oral anticoagulant 0 to 2 hours before the time that the next dose of heparin was to have been administered.

## 2.8 Extracorporeal Dialysis

Follow equipment manufacturer's operating directions carefully. A dose of 25 to 30 units/kg followed by an infusion rate of 1,500 to 2,000 units/hour is suggested based on pharmacodynamic data if specific manufacturers' recommendations are not available.

## 3 DOSAGE FORMS & STRENGTHS

HEPARIN SODIUM IN 0.45% SODIUM CHLORIDE INJECTION is available as:

- Injection: 100 USP Units/mL in 0.45% Sodium Chloride clear solution (25,000 USP Units/250 mL) in single-dose plastic container
- Injection: 50 USP Units/mL in 0.45% Sodium Chloride clear solution (12,500 USP Units/250 mL) in single-dose plastic container
- Injection: 50 USP Units/mL in 0.45% Sodium Chloride clear solution (25,000 USP Units/500 mL) in single-dose plastic container

## 4 CONTRAINDICATIONS

The use of HEPARIN SODIUM IN 0.45% SODIUM CHLORIDE INJECTION is contraindicated in patients:

- With history of heparin-induced thrombocytopenia (HIT) (With or Without Thrombosis)

[see WARNINGS AND PRECAUTIONS 5-(5.3)]

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With a known hypersensitivity to heparin or pork products (e.g., anaphylactoid reactions) [see ADVERSE REACTIONS 6-(6.1)]

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In whom suitable blood coagulation tests — e.g., the whole blood clotting time, partial thromboplastin time, etc., — cannot be performed at appropriate intervals (this contraindication refers to full-dose heparin; there is usually no need to monitor coagulation parameters in patients receiving low-dose heparin)

## **5 WARNINGS AND PRECAUTIONS**

### **5.1 Fatal Medication Errors**

Do not use this product as a "catheter lock flush" product. Heparin is supplied in various strengths. Fatal hemorrhages have occurred due to medication errors. Carefully examine all heparin products to confirm the correct container choice prior to administration of the drug.

### **5.2 Hemorrhage**

Hemorrhage, including fatal events, has occurred in patients receiving HEPARIN SODIUM. Avoid using heparin in the presence of major bleeding, except when the benefits of heparin therapy outweigh the potential risks.

Hemorrhage can occur at virtually any site in patients receiving heparin. Adrenal hemorrhage (with resultant acute adrenal insufficiency), ovarian hemorrhage, and retroperitoneal hemorrhage have occurred during anticoagulant therapy with heparin [see ADVERSE REACTIONS 6-(6.1)]. A higher incidence of bleeding has been reported in patients, particularly women, over 60 years of age [see CLINICAL PHARMACOLOGY 12-(12.3)]. An unexplained fall in hematocrit or fall in blood pressure should lead to serious consideration of a hemorrhagic event.

Use heparin sodium with caution in disease states in which there is increased risk of hemorrhage, including:

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Cardiovascular — Subacute bacterial endocarditis. Severe hypertension.

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Surgical — During and immediately following (a) spinal tap or spinal anesthesia or (b) major surgery, especially involving the brain, spinal cord or eye.

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Hematologic — Conditions associated with increased bleeding tendencies, such as hemophilia, thrombocytopenia and some vascular purpuras.

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Patients with hereditary antithrombin III deficiency receiving concurrent antithrombin III therapy - The anticoagulant effect of heparin is enhanced by concurrent treatment with antithrombin III (human) in patients with hereditary antithrombin III deficiency. To reduce the risk of bleeding, reduce the heparin dose during concomitant treatment with antithrombin III (human).

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Gastrointestinal — Ulcerative lesions and continuous tube drainage of the stomach or



small intestine.

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Other — Menstruation, liver disease with impaired hemostasis.

### 5.3 Heparin-induced Thrombocytopenia (HIT) (With or Without Thrombosis)

HIT is a serious antibody-mediated reaction resulting from irreversible aggregation of platelets. HIT may progress to the development of venous and arterial thromboses, a condition known as HIT with thrombosis. Thrombotic events may also be the initial presentation for HIT. These serious thromboembolic events include deep vein thrombosis, pulmonary embolism, cerebral vein thrombosis, limb ischemia, stroke, myocardial infarction, thrombus formation on a prosthetic cardiac valve, mesenteric thrombosis, renal arterial thrombosis, skin necrosis, gangrene of the extremities that may lead to amputation, and possibly death. Monitor thrombocytopenia of any degree closely. If the platelet count falls below 100,000/mm<sup>3</sup> or if recurrent thrombosis develops, promptly discontinue heparin, evaluate for HIT, and, if necessary, administer an alternative anticoagulant.

HIT can occur up to several weeks after the discontinuation of heparin therapy. Patients presenting with thrombocytopenia or thrombosis after discontinuation of heparin should be evaluated for HIT.

### 5.4 Thrombocytopenia

Thrombocytopenia has been reported to occur in patients receiving heparin with a reported incidence of up to 30%. It can occur 2 to 20 days (average 5 to 9) following the onset of heparin therapy. Obtain platelet counts before and periodically during heparin therapy. Monitor thrombocytopenia of any degree closely. If the count falls below 100,000/mm<sup>3</sup> or if recurrent thrombosis develops, promptly discontinue heparin, evaluate for HIT, and, if necessary, administer an alternative anticoagulant [see WARNINGS AND PRECAUTIONS 5-(5.3)].

### 5.5 Coagulation Testing and Monitoring

When using a full dose heparin regimen, adjust the heparin dose based on frequent blood coagulation tests. If the coagulation test is unduly prolonged or if hemorrhage occurs, heparin sodium should be discontinued promptly [see OVERDOSAGE 10]. Periodic platelet counts, hematocrits are recommended during the entire course of heparin therapy [see DOSAGE AND ADMINISTRATION 2-(2.2)].

### 5.6 Heparin Resistance

Increased resistance to heparin is frequently encountered in fever, thrombosis, thrombophlebitis, infections with thrombosing tendencies, myocardial infarction, cancer and in postsurgical patients, and patients with antithrombin III deficiency. Close monitoring of coagulation tests is recommended in these cases. Adjustment of heparin doses based on anti-Factor Xa levels may be warranted.

### 5.7 Hypersensitivity

Patients with documented hypersensitivity to heparin should be given the drug only in clearly life-threatening situations [see ADVERSE REACTIONS (6)]. Because heparin sodium is derived from animal tissue, monitor for signs and symptoms of hypersensitivity when it is used in patients with a history of allergy.

## 6 ADVERSE REACTIONS

The following serious adverse reactions are described elsewhere in the labeling:

- Fatal Medication Errors [see WARNINGS AND PRECAUTIONS 5-(5.1)]
- Hemorrhage [see WARNINGS AND PRECAUTIONS 5-(5.2)]
- Heparin-induced Thrombocytopenia (HIT) (With or Without Thrombosis) [see WARNINGS AND PRECAUTIONS 5-(5.3)]
- Thrombocytopenia [see WARNINGS AND PRECAUTIONS 5-(5.4)]
- Heparin Resistance [see WARNINGS AND PRECAUTIONS 5-(5.6)]
- Hypersensitivity [see WARNINGS AND PRECAUTIONS 5-(5.7)]

### 6.1 Postmarketing Experience

The following adverse reactions have been identified during post-approval use of heparin sodium. Because these reactions are reported voluntarily from a population of uncertain size, it is not always possible to reliably estimate their frequency.

- Hemorrhage – Hemorrhage is the chief complication that may result from heparin therapy [see WARNINGS AND PRECAUTIONS 5-(5.2)]. Gastrointestinal or urinary tract bleeding during anticoagulant therapy may indicate the presence of an underlying occult lesion. Bleeding can occur at any site but certain specific hemorrhagic complications may be difficult to detect:

– Adrenal hemorrhage, with resultant acute adrenal insufficiency, has occurred with heparin therapy, including fatal cases. Ovarian (corpus luteum) hemorrhage developed in a number of women of reproductive age receiving short- or long-term anticoagulant therapy.

– Retroperitoneal hemorrhage.

- Heparin-induced Thrombocytopenia (HIT) (With or Without Thrombosis) and Thrombocytopenia: [see WARNINGS AND PRECAUTIONS 5-(5.3 and 5.4)]

- Hypersensitivity – Generalized hypersensitivity reactions have been reported with chills, fever, and urticaria as the most usual manifestations, and asthma, rhinitis, lacrimation, headache, nausea and vomiting, and anaphylactoid reactions, including shock, occurring more rarely. Itching and burning, especially on the plantar site of the feet, may occur [see WARNINGS AND PRECAUTIONS 5-(5.7)].

- Elevations of serum aminotransferases – Significant elevations of aspartate aminotransferase (AST) and alanine aminotransferase (ALT) levels have occurred in patients who have received heparin.

Others - Osteoporosis following long-term administration of high-doses of heparin, cutaneous necrosis after systemic administration, suppression of aldosterone synthesis, delayed transient alopecia, priapism, and rebound hyperlipemia on discontinuation of heparin sodium have also been reported.

## **7 DRUG INTERACTIONS**

### **7.1 Oral Anticoagulants**

Heparin sodium may prolong the one-stage prothrombin time. Therefore, when heparin sodium is given with dicumarol or warfarin sodium, a period of at least 5 hours after the last intravenous dose or 24 hours after the last subcutaneous dose should elapse before blood is drawn if a valid prothrombin time is to be obtained.

### **7.2 Platelet Inhibitors**

Drugs such as acetylsalicylic acid, dextran, phenylbutazone, ibuprofen, indomethacin, dipyridamole, hydroxychloroquine and others that interfere with platelet-aggregation reactions (the main hemostatic defense of heparinized patients) may induce bleeding and should be used with caution in patients receiving heparin sodium.

### **7.3 Other Interactions**

Digitalis, tetracyclines, nicotine, or antihistamines, or intravenous (IV) nitroglycerin may partially counteract the anticoagulant action of heparin sodium.

### **7.4 Drug/Laboratory Test Interactions**

Prothrombin time - Heparin sodium may prolong the one-stage prothrombin time. Therefore, when heparin sodium is given with warfarin, allow a period of at least 5 hours after the last intravenous dose or 24 hours after the last subcutaneous dose of heparin to elapse before blood is drawn to obtain a valid prothrombin time.

## **8 USE IN SPECIFIC POPULATIONS**

### **8.1 Pregnancy**

#### **Risk Summary**

In published reports, heparin exposure during pregnancy did not show evidence of an increased risk of adverse maternal or fetal outcomes in humans. No teratogenicity was observed in animal reproduction studies with administration of heparin sodium to pregnant rats and rabbits during organogenesis at doses up to 10,000 units/kg/day, approximately 10 times the maximum recommended human dose (MRHD) of 40,000 units/24 hours infusion [see Data]. In pregnant animals, doses up to 10 times higher than the maximum human daily dose based on body weight resulted in increased resorptions. Consider the benefits and risks of HEPARIN SODIUM IN 0.45% SODIUM CHLORIDE INJECTION to a pregnant woman and possible risks to the fetus when prescribing HEPARIN SODIUM IN 0.45% SODIUM CHLORIDE INJECTION.

In the U.S. general population, the estimated background risk of major birth defects and miscarriage in clinically recognized pregnancies is 2-4% and 15-20%, respectively.

Data

## Human Data

The maternal and fetal outcomes associated with uses of heparin via various dosing methods and administration routes during pregnancy have been investigated in numerous studies. These studies generally reported normal deliveries with no maternal or fetal bleeding and no other complications.

## Animal Data

In a published study conducted in rats and rabbits, pregnant animals received heparin intravenously during organogenesis at a dose of 10,000 units/kg/day, approximately 10 times the maximum human daily dose based on body weight. The number of early resorptions increased in both species. There was no evidence of teratogenic effects.

## 8.2 Lactation

### Risk Summary

There is no information regarding the presence of HEPARIN SODIUM IN 0.45% SODIUM CHLORIDE INJECTION in human milk, the effects on the breastfed infant, or the effects on milk production. Due to its large molecular weight, heparin is not likely to be excreted in human milk, and any heparin in milk would not be orally absorbed by a nursing infant. The developmental and health benefits of breastfeeding should be considered along with the mother's clinical need for HEPARIN SODIUM IN 0.45% SODIUM CHLORIDE INJECTION and any potential adverse effects on the breastfed infant from HEPARIN SODIUM IN 0.45% SODIUM CHLORIDE INJECTION or from the underlying maternal condition [see USE IN SPECIFIC POPULATIONS 8-(8.4)].

## 8.4 Pediatric Use

There are no adequate and well controlled studies on heparin use in pediatric patients. Pediatric dosing recommendations are based on clinical experience [see DOSAGE AND ADMINISTRATION 2-(2.4)].

## 8.5 Geriatric Use

There are limited adequate and well-controlled studies in patients 65 years and older. However, a higher incidence of bleeding has been reported in patients over 60 years of age, especially women [see WARNINGS AND PRECAUTIONS 5-(5.2)]. Lower doses of heparin may be indicated in these patients [see CLINICAL PHARMACOLOGY 12-(12.3)].

## **10 OVERDOSAGE**

Bleeding is the chief sign of heparin overdose.

Neutralization of heparin effect.

When clinical circumstances (bleeding) require reversal of heparinization, protamine sulfate (1% solution) by slow infusion will neutralize heparin sodium. No more than 50 mg should be administered, very slowly in any 10 minute period. Each mg of protamine sulfate neutralizes approximately 100 USP Heparin Units. The amount of protamine required decreases over time as heparin is metabolized. Although the metabolism of heparin is complex, it may, for the purpose of choosing a protamine dose, be assumed to have a half-life of about ½ hour after intravenous injection.

Because fatal reactions often resembling anaphylaxis have been reported, the drug

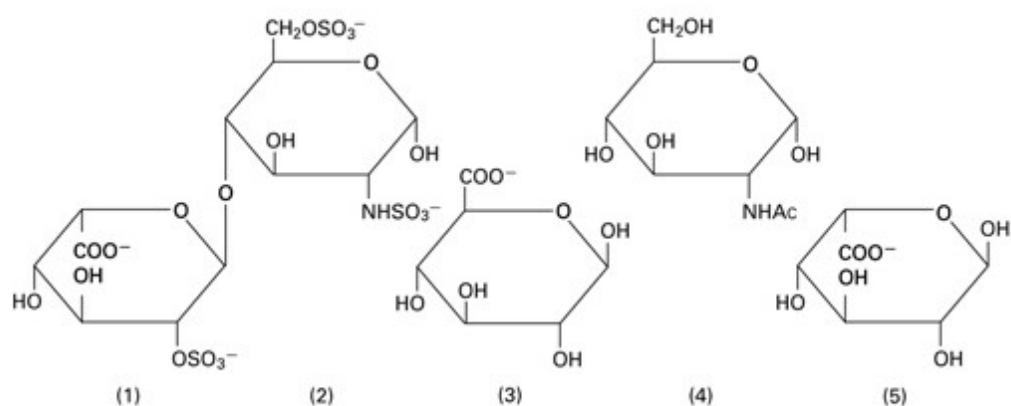
should be given only when resuscitation techniques and treatment of anaphylactoid shock are readily available.

For additional information, consult the prescribing information for Protamine Sulfate Injection, USP.

## 11 DESCRIPTION

Heparin is a heterogeneous group of straight-chain anionic mucopolysaccharides, called glycosaminoglycans possessing anticoagulant properties. It is composed of polymers of alternating derivations of  $\alpha$ -D-glucosamido (N-Sulfated O-Sulfated or N-acetylated) and O-sulfated uronic acid ( $\alpha$ -L-iduronic acid or  $\beta$ -D-glucuronic acid).

Structure of Heparin Sodium (representative subunits):



HEPARIN SODIUM IN 0.45% SODIUM CHLORIDE INJECTION is a sterile preparation of heparin sodium (derived from porcine intestinal mucosa) for intravenous administration. It contains no bacteriostatic or antimicrobial agent or added buffer. The solution may contain sodium hydroxide and/or hydrochloric acid for pH adjustment. The pH range is 6.1 (5.0 - 7.5) and the osmolarity mOsmol/L (calc.) is 155. The potency is determined by

a biological assay using a USP reference standard based on units of heparin activity per milligram.

Each mL of the 50 USP units per mL preparations contains: 50 USP units of heparin sodium, 4.5 mg sodium chloride and 0.1 mg edetate disodium, anhydrous added as a stabilizer.

Each mL of the 100 USP units per mL preparations contains: 100 USP units of heparin sodium, 4.5 mg sodium chloride and 0.1 mg edetate disodium, anhydrous added as a stabilizer

## **12 CLINICAL PHARMACOLOGY**

### **12.1 Mechanism of Action**

Heparin inhibits reactions that lead to the clotting of blood and the formation of fibrin clots both in vitro and in vivo. Heparin acts at multiple sites in the normal coagulation system. Small amounts of heparin in combination with antithrombin III (heparin cofactor) can inhibit thrombosis by inactivating activated Factor X and inhibiting the conversion of prothrombin to thrombin. Once active thrombosis has developed, larger amounts of heparin can inhibit further coagulation by inactivating thrombin and preventing the conversion of fibrinogen to fibrin. Heparin also prevents the formation of a stable fibrin clot by inhibiting the activation of the fibrin stabilizing factor. Heparin does not have fibrinolytic activity; therefore, it will not lyse existing clots.

### **12.2 Pharmacodynamics**

Bleeding time is usually unaffected by heparin. Clotting time is prolonged by full therapeutic doses of heparin; in most cases it is not measurably affected by low doses of heparin.

### **12.3 Pharmacokinetics**

Peak plasma levels of heparin are achieved 2 to 4 hours following subcutaneous administration, although there are considerable individual variations. Loglinear plots of heparin plasma concentrations with time for a wide range of dose levels are linear which suggests the absence of zero order processes. Liver and the reticuloendothelial system are the sites of biotransformation. The biphasic elimination curve, a rapidly declining alpha phase ( $t^{1/2} = 10$  minutes) and after the age of 40 a slower beta phase, indicates uptake in organs. The absence of a relationship between anticoagulant half-life and concentration half-life may reflect factors such as protein binding of heparin.

Patients over 60 years of age, following similar doses of heparin, may have higher plasma levels of heparin and longer activated partial thromboplastin times (APTTs) compared with patients under 60 years of age [see USE IN SPECIFIC POPULATIONS 8-(8.5)].

## **13 NONCLINICAL TOXICOLOGY**

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

Long term studies in animals to evaluate the carcinogenic potential, reproduction studies in animals to determine effects on fertility of males and females, and studies to

determine mutagenic potential have not been conducted.

## 16 HOW SUPPLIED/STORAGE AND HANDLING

HEPARIN SODIUM IN 0.45% SODIUM CHLORIDE is supplied in the following dosage forms.

NDC 51662-1411-1

HEPARIN SODIUM IN 0.45% SODIUM CHLORIDE INJECTION (100 USP UNITS/mL) 250 mL

HF Acquisition Co LLC, DBA HealthFirst  
Mukilteo, WA 98275

Also supplied in the following manufacture supplied dosage forms

Intravenous solutions with heparin sodium are supplied in single-dose flexible plastic containers in varied sizes and concentrations as shown in the accompanying Table.

Unit of Sale	Concentration	Each
<b>NDC 0409-7650-62</b> Case containing 24	25,000 USP units/250 mL (100 USP units/mL)	0409-7650-52 250 mL flexible plastic container
<b>NDC 0409-7651-62</b> Case containing 24	12,500 USP units/250 mL (50 USP units/mL)	0409-7651-52 250 mL flexible plastic container
<b>NDC 0409-7651-03</b> Case containing 24	25,000 USP units/500 mL (50 USP units/mL)	0409-7651-13 500 mL flexible plastic container

Store at 20 to 25°C (68 to 77°F). [See USP Controlled Room Temperature.] Protect from freezing.

HEPARIN SODIUM IN 0.45% SODIUM CHLORIDE is supplied in the following dosage forms.

NDC 51662-1411-2

HEPARIN SODIUM IN 0.45% SODIUM CHLORIDE INJECTION (100 USP UNITS/mL) 250 mL

HF Acquisition Co LLC, DBA HealthFirst  
Mukilteo, WA 98275

Also supplied in the following manufacture supplied dosage forms

Intravenous solutions with heparin sodium are supplied in single-dose flexible plastic containers in varied sizes and concentrations.

Store at 20 to 25°C (68 to 77°F). [See USP Controlled Room Temperature.] Protect from freezing.

HEPARIN SODIUM IN 0.45% SODIUM CHLORIDE is supplied in the following dosage forms.

NDC 51662-1411-3

HEPARIN SODIUM IN 0.45% SODIUM CHLORIDE INJECTION (100 USP UNITS/mL) 250 mL

HF Acquisition Co LLC, DBA HealthFirst  
Mukilteo, WA 98275

Also supplied in the following manufacture supplied dosage forms

Intravenous solutions with heparin sodium are supplied in single-dose flexible plastic containers in varied sizes and concentrations.

Store at 20 to 25°C (68 to 77°F). [See USP Controlled Room Temperature.] Protect from freezing.

## **17 PATIENT COUNSELING INFORMATION**

### Hemorrhage

Inform patients that it may take them longer than usual to stop bleeding, that they may bruise and/or bleed more easily when they are treated with heparin, and that they should report any unusual bleeding or bruising to their physician. Hemorrhage can occur at virtually any site in patients receiving heparin. Fatal hemorrhages have occurred [see WARNINGS AND PRECAUTIONS 5-(5.2)].

### Prior to Surgery

Advise patients to inform physicians and dentists that they are receiving heparin before any surgery is scheduled [see WARNINGS AND PRECAUTIONS 5-(5.2)].

### Heparin-Induced Thrombocytopenia

Inform patients of the risk of heparin-induced thrombocytopenia (HIT). HIT may progress to the development of venous and arterial thromboses, a condition known as heparin-induced thrombocytopenia and thrombosis. HIT (With or Without Thrombosis) can occur up to several weeks after the discontinuation of heparin therapy [see WARNINGS AND PRECAUTIONS 5-(5.3 and 5.4)].

### Hypersensitivity

Inform patients that generalized hypersensitivity reactions have been reported. Necrosis of the skin has been reported at the site of subcutaneous injection of heparin [see WARNINGS AND PRECAUTIONS 5-(5.7), ADVERSE REACTIONS (6)].

### Other Medications

Because of the risk of hemorrhage, advise patients to inform their physicians and dentists of all medications they are taking, including non-prescription medications, and



before starting any new medication [see DRUG INTERACTIONS 7-(7.2)].

EN-4244



Hospira, Inc., Lake Forest, IL 60045 USA

**PRINCIPAL DISPLAY PANEL - BAG LABELING**

250 mL

NDC 0409-7650-52

# HEPARIN SODIUM

**25,000 USP Units  
per 250 mL  
(100 USP Units/mL)**

**in 0.45% Sodium Chloride Injection**

50

EACH 100 mL CONTAINS HEPARIN SODIUM 10,000 USP UNITS (PORCINE INTESTINAL MUCOSA); SODIUM CHLORIDE 0.45 g; EDETATE DISODIUM, ANHYDROUS 10 mg ADDED AS STABILIZER. MAY CONTAIN SODIUM HYDROXIDE AND/OR HYDROCHLORIC ACID FOR pH ADJUSTMENT. STERILE. NOT MADE WITH NATURAL RUBBER LATEX.  
**USUAL DOSAGE: SEE INSERT.**

100

150

ADDITIVES SHOULD NOT BE MADE TO THIS SOLUTION.

SINGLE DOSE CONTAINER. DISCARD UNUSED PORTION. FOR INTRAVENOUS USE ONLY.

200

Rx only



CONTAINS DEHP

IM-3954

HOSPIRA, INC., LAKE FOREST, IL 60045 USA



**PRINCIPAL DISPLAY PANEL - SERIALIZED LABELING ON POUCH**

(01)00351662141113  
(17)230919  
(21)351662141212  
(10)HF1234TESTING

SEE MANUFACTURE'S INSERT  
DISTRIBUTED BY HF ACQUISITIONS CO., LLC  
MUKILTEO, WA 98275

RX ONLY



**PRINCIPAL DISPLAY PANEL, POUCH LABEL**

51662-1411-2 Pouch Label

HEPARIN SODIUM IN 0.45% SODIUM CHLORIDE  
INJECTION (100 USP UNITS/mL) 250 mL

NDC: 51662-1411-2  
LOT: 123456  
EXP: 2030-01-01

(01) 00351662141120  
(10) 123456  
(17) 300101  
(21) 27869517436

FOR INTRAVENOUS USE ONLY. EACH 100 mL CONTAINS HEPARIN SODIUM 10,000 USP UNITS (PORCINE INTESTINAL MUCOSA); SODIUM CHLORIDE 0.45 g; EDETATE DISODIUM ANHYDROUS 10 mg ADDED AS STABILIZER. MAY CONTAIN SODIUM HYDROXIDE AND/OR HYDROCHLORIC ACID FOR pH ADJUSTMENT. STERILE. NOT MADE WITH NATURAL RUBBER LATEX. USUAL DOSAGE: SEE INSERT. ADDITIVES SHOULD NOT BE MADE TO THIS SOLUTION. SINGLE DOSE CONTAINER. DISCARD UNUSED PORTION. RECOMMENDED STORAGE: ROOM TEMPERATURE (25°C). AVOID EXCESSIVE HEAT. PROTECT FROM FREEZING.

See manufacturer's package insert  
ORIGINAL MFG NDC: 0489-7650-62  
RX ONLY  
Manufactured by HF Acquisition Co., LLC  
Mukilteo, WA 98275



## PRINCIPAL DISPLAY PANEL, CASE LABEL

### 51662-1411-3 CASE LABEL

HEPARIN SODIUM IN 0.45% SODIUM CHLORIDE  
INJECTION (100 USP UNITS/mL) 250 mL (CASE  
OF 24)

NDC: 51662-1411-3  
LOT: 123456  
EXP: 2030-01-01

(01) 00351662141137  
(10) 123456  
(17) 300101  
(21) 14987710160

FOR INTRAVENOUS USE ONLY. EACH 100 mL CONTAINS HEPARIN SODIUM 10,000 USP UNITS (PORCINE INTESTINAL MUCOSA); SODIUM CHLORIDE 0.45 g; EDETATE DISODIUM ANHYDROUS 10 mg ADDED AS STABILIZER. MAY CONTAIN SODIUM HYDROXIDE AND/OR HYDROCHLORIC ACID FOR pH ADJUSTMENT. STERILE. NOT MADE WITH NATURAL RUBBER LATEX. USUAL DOSAGE: SEE INSERT. ADDITIVES SHOULD NOT BE MADE TO THIS SOLUTION. SINGLE DOSE CONTAINER. DISCARD UNUSED PORTION. RECOMMENDED STORAGE: ROOM TEMPERATURE (25°C). AVOID EXCESSIVE HEAT. PROTECT FROM FREEZING.

See manufacturer's package insert  
ORIGINAL MFG NDC: 0489-7650-62  
RX ONLY  
Manufactured by HF Acquisition Co., LLC  
Mukilteo, WA 98275



CASE

(01)00351662141137  
(17)230919  
(21)351662141212  
(10)HF1234TESTING

SEE MANUFACTURE'S INSERT  
DISTRIBUTED BY HF ACQUISITIONS CO., LLC  
MUKILTEO, WA 98275

RX ONLY



## HEPARIN SODIUM

heparin sodium injection, solution

### Product Information

<b>Product Type</b>	HUMAN PRESCRIPTION DRUG	<b>Item Code (Source)</b>	NDC:51662-1411(NDC:0409-7650)
<b>Route of Administration</b>	INTRAVENOUS		

### Active Ingredient/Active Moiety

Ingredient Name	Basis of Strength	Strength
<b>HEPARIN SODIUM</b> (UNII: ZZ45AB24CA) (HEPARIN - UNII:T2410KM04A)	HEPARIN	10000 [USP'U] in 100 mL

## Inactive Ingredients

Ingredient Name	Strength
<b>SODIUM HYDROXIDE</b> (UNII: 55X04QC32I)	
<b>HYDROCHLORIC ACID</b> (UNII: QTT17582CB)	
<b>WATER</b> (UNII: 059QF0KO0R)	
<b>SODIUM CHLORIDE</b> (UNII: 451W47IQ8X)	0.45 g in 100 mL
<b>EDETATE DISODIUM ANHYDROUS</b> (UNII: 8NLQ36F6MM)	10 mg in 100 mL

## Packaging

#	Item Code	Package Description	Marketing Start Date	Marketing End Date
1	NDC:51662-1411-3	24 in 1 CASE	09/22/2023	
1	NDC:51662-1411-2	1 in 1 POUCH		
1	NDC:51662-1411-1	1 in 1 POUCH		
1		250 mL in 1 BAG; Type 0: Not a Combination Product		

## Marketing Information

Marketing Category	Application Number or Monograph Citation	Marketing Start Date	Marketing End Date
NDA	NDA018916	11/11/2019	

**Labeler** - HF Acquisition Co LLC, DBA HealthFirst (045657305)

**Registrant** - HF Acquisition Co LLC, DBA HealthFirst (045657305)

## Establishment

Name	Address	ID/FEI	Business Operations
HF Acquisition Co LLC, DBA HealthFirst		045657305	relabel(51662-1411)

Revised: 1/2024

HF Acquisition Co LLC, DBA HealthFirst