Heparin Sodium Injection, USP

DESCRIPTION
Heparin sodium is a substance composed of uronic acid disaccharide residues joined by a 1,4-β-D-galactosyl bond. Each disaccharide residue is linked to a 1-O-sulfate on the C-6 position of the D-glucuronic acid residue and to a 4-O-sulfate on the C-2 position of the L-iduronic acid residue. Heparin sodium is a sodium salt of the water-soluble acid heparin. The primary components of heparin are uronic acids, sugars occurring in heparin are: (1) \(\text{COO}^-\) (2) \(\text{OH}\) \(\text{COO}^-\) (3) \(\text{OH}\) \(\text{COO}^-\) (4) \(\text{OAc}\) (5) \(\text{OH}\) \(\text{COO}^-\). These sugars are present in decreasing amounts, usually in the order (2)>(1)>(4)>(3)>(5), and are joined together by 1,4-β-D-galactosyl bonds.

**Therapeutic Properties**
- Inhibits blood coagulation and prevents thrombosis.
- Acts on the blood platelets and inhibits aggregation.
- Exhibits anti-inflammatory and antiphlogistic properties.
- Has antiviral and antitumor activities.
- Exhibits anticoagulant properties.
- Has a wide range of therapeutic applications.

**Indications**
- Prevention and treatment of thrombosis and embolism.
- Management of anticoagulation in the treatment of cardiac disease, including atrial fibrillation and atrial flutter.
- Prevention and treatment of deep vein thrombosis and pulmonary embolism.
- Management of anticoagulation in the treatment of cardiac surgery.

**Pharmacokinetics**
- Absorption: Extensive absorption from the gastrointestinal tract.
- Distribution: Widely distributed throughout the body.
- Metabolism: Metabolized in the liver.
- Excretion: Excreted primarily by the kidneys.

**Contraindications**
- Known hypersensitivity to heparin or any components of the formulation.
- Active internal bleeding.

**Warnings**
- Use cautiously in patients with cardiovascular disease.
- Use cautiously in patients with obstructive lung disease.
- Use cautiously in patients with severe hepatic or renal disease.
- Use cautiously in patients with history of stroke or transient ischemic attack.
- Use cautiously in patients with history of bleeding disorders.

**Precautions**
- Monitor laboratory values, such as platelet counts, prothrombin time, and partial thromboplastin time.
- Avoid use in patients with coagulopathies.
- Use cautiously in patients with history of gastrointestinal bleeding.
- Use cautiously in patients with history of urologic bleeding.

**Adverse Reactions**
- Hemorrhagic: Epistaxis, gingival bleeding, intracranial hemorrhage, hematemesis, melena, hematuria.
- Hematologic: Thrombocytopenia, hemolytic anemia.
- Respiratory: Hypoxemia.
- Skin: Erythema, rash, urticaria.

**Overdosage**
- Bleeding is the chief sign of heparin overdosage. Nosebleeds, blood in urine or tarry stools may be noted as the first sign of bleeding. Easy bruising or petechial formations may precede frank bleeding.

**Dosage and Administration**
- **Therapeutic Anticoagulant Effect With Full-Dose Heparin**
  - **Adult Dosage**: A different dose should be used for initial anticoagulation or therapeutic anticoagulation.
  - **Therapeutic Anticoagulant Effect With Full-Dose Heparin**
    - ** Adults**: 5,000 USP units 7 mg Heparin sodium 1,000 USP units 1 mg Heparin sodium

**Stability**
- Heparin Sodium Injection, USP is available as:
  - 1000 USP units (1 mg) vials
  - 5000 USP units (7 mg) vials

**Storage**
- Store at controlled room temperature (15°-30°C).
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**Legal Information**
- Heparin Sodium Injection, USP is available as:
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**Further Information**
- For more information, please visit the manufacturer’s website.
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**References**