hetastarch (het-a-starch)

**Biopharmaceutical Classification**: Therapeutic - volume expanders

**Pharmacologic Class**: colloids

**Pregnancy Category**: C

### Indications

Administered for fluid replacement and volume expansion in the early management of shock or impending shock caused by: Burns, Hemorrhage, Surgery, Sepsis, Trauma. Administer in leukapheresis (improves collection of granulocytes).

### Action

A synthetic molecule that acts as a colloidal osmotic agent similar to albumin. Therapeutic Effects: Plasma volume expansion.

### Pharmacokinetics

**Absorption**: Administered IV only, resulting in complete bioavailability.

**Distribution**: Distributes into intravascular space.

**Metabolism and Excretion**: Molecules with a molecular weight of 50,000 or less are excreted unchanged by the kidneys. Larger molecules are slowly degraded before excretion.

**Half-life**: 90% has half-life of 17 days; remaining 10% has half-life of 48 days.

### Contraindications/Precautions

Contraindicated in: Hypersensitivity; Severe bleeding disorders; HF; Pulmonary edema; Oliguric or anuric renal failure; OB: Early pregnancy.

Use Cautiously in: Thrombocytopenia; Severe renal impairment (if CCr < 10 mL/min, initial dose may be the same; subsequent doses should be 25–50% of usual dose); Ger: Geriatric patients; Lactation: Pedi: Safety not established.

**Drug Interactions**: No known interactions.

### Route/Dosage

**IV (Adults)**: Plasma volume expansion — 10–60 g (500–1000 mL of 6% solution) may be repeated; not to exceed 90 g (1500 mL/day). In acute hemorrhagic shock, up to 20 mL/kg/hr may be used; leukapheresis — 250–700 mL infused at a constant fixed rate of 1 to 1.5 L over whole blood.

### Adverse Reactions/Side Effects

- CNS: headache
- CV: HF, pulmonary edema
- GI: vomiting
- Derm: pruritus, urticaria
- **F and E**: fluid overload, peripheral edema of the lower extremities
- **Hemat**: hematuria, thrombocytopenia, prolonged bleeding time, prolongation of prothrombin and partial thromboplastin time, and clotting times
- **Misc**: hypersensitivity reactions including ANAPHYLACTOID REACTIONS, chills, fever, parotid and submaxillary gland enlargement.

### Nursing Implications

#### Assessment

- Monitor vital signs, urinary output, central venous pressure, and peripheral edema during and after administration.
- Assess for signs of UFH-induced platelet function and clotting factors (large volumes only).
- Lab Test Considerations: Monitor CBC with differential, hemoglobin, hematocrit, platelet count, prothrombin time (PT), partial thromboplastin time (PTT), and clotting time throughout therapy. Large volumes of hetastarch may cause hemodilution, which may be monitored by changes in hematocrit; do not allow hematocrit to drop below 30% by volume. May cause increased bleeding, prolongation of clotting time, and prolongation of prothrombin and partial thromboplastin times.

### Contraindications

Hetastarch is contraindicated in patients with known hypersensitivity to the drug or its components.

### Precautions

Use with caution in patients with renal impairment, hepatic disease, or conditions associated with impaired wound healing.

### Drug Interactions

Hetastarch does not have known drug interactions.

### Route/Dosage

**IV (Adults)**: Plasma volume expansion — 10–60 g (500–1000 mL of 6% solution) may be repeated; not to exceed 90 g (1500 mL/day). In acute hemorrhagic shock, up to 20 mL/kg/hr may be used; leukapheresis — 250–700 mL infused at a constant fixed rate of 1 to 1.5 L over whole blood.
Potential Nursing Diagnoses

Ineffective tissue perfusion (Indications)
Deficient fluid volume (Indications)
Excess fluid volume (Side effects)

Implementation

● Do not confuse Hespan with heparin.

● Available in a 6% solution diluted with 0.9% NaCl. Solution should be clear pale yellow to amber; do not administer solution that is cloudy or that contains a precipitate. Store at room temperature. Discard unused solution.

● There is no danger of serum hepatitis or HIV from hetastarch. Crossmatching is not required.

IV Administration

Intermittent Infusion: For leukapheresis, 250–700 mL are infused at a constant ratio of 1:1–1:3 to remove whole blood.

Continuous Infusion: Administer hetastarch undiluted by IV infusion. Rate:

Rate of administration is determined by blood volume, indication, and patient response.

In acute hemorrhagic shock, hetastarch may be administered up to 1.2 g/kg (20 mL/kg) per hr. Slower rates are generally used with burns and septic shock.

Patient/Family Teaching

● Explain to patient the rationale for use of this solution.

● Instruct patient to notify health care professional if dyspnea, itching, or flu-like symptoms occur.

Evaluation/Desired Outcomes

● Increase in BP, circulating volume, and urinary output when used to treat shock and burns.

● Improved harvesting and increased yield of granulocytes during leukapheresis.

Why was this drug prescribed for your patient?