nesiritide (nes-i-rí-tide)

Classification
Therapeutic: vasodilators (human B-type natriuretic peptide)
Pharmacologic: vasodilators

Pregnancy Category C

Indications
Acutely decompensated HF in hospitalized patients who have dyspnea at rest or with minimal activity; has been used with digoxin, diuretics, and ACE inhibitors. Should not be used for intermittent outpatient infusion, scheduled repetitive use, or as a diuretic or to improve renal function.

Action
Binds to guanyl cyclase receptors in vascular smooth muscle and endothelial cells, producing increased intracellular guanosine 3'-5'-cyclic monophosphate (cGMP) and smooth muscle cell relaxation. cGMP acts as a "second messenger" to dilate veins and arteries. Therapeutic Effects: Dose-dependent reduction in pulmonary capillary wedge pressure (PCWP) and systemic arterial pressure in patients with heart failure with resultant decrease in dyspnea.

Pharmacokinetics
Absorption: IV administration results in complete bioavailability.
Distribution: Unknown.
Metabolism and Excretion: Cleared from circulation by binding to cell surface clearance receptors resulting in cellular internalization and proteolytic breakdown by endopeptidases, and renal filtration.
Half-life: 18 min.

TIME/ACTION PROFILE (effects on cardiovascular parameters)

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
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<tr>
<td>IV</td>
<td>15 min</td>
<td>1 hr</td>
<td>60 min†</td>
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†Longer with higher than recommended doses

Contraindications/Precautions
Contraindicated in: Hypersensitivity; Cardiogenic shock; Systolic BP < 100 mm Hg; Low cardiac filling pressure; significant valvular stenosis, restrictive/subtractive cardiomyopathy, constitutive preeclampsia/uterine torsion, or other conditions in which cardiac output is dependent on venous return. Use Cautiously in: Heart failure where renal function is dependent on activity of the renin/angiotensin/aldosterone system (may cause azotemia) Cardiogenic shock (should not be used as primary therapy). GL: Lactation: Pediatric: Renal impairment; OB: Pregnancy, lactation, or children (safety not established); Geri: May have ↑ sensitivity to effects.

Adverse Reactions/Side Effects

Interactions
Drug-Drug: None reported.

Route/Dosage
IV (Adults): 2 mcg/kg bolus followed by 0.01 mcg/kg/min as a continuous infusion. May ↑ by 0.005 mcg/kg/min every 3 hr up to a maximum infusion rate of 0.03 mcg/kg/min (based on response).

NURSING IMPLICATIONS
Assessment
● Monitor BP, pulse, ECG, respiratory rate, cardiac indices, PCWP, and central venous pressure frequently during administration. May cause hypotension, especially in patients with a BP < 100 mm Hg. Reduce dose or discontinue nesiritide if patient develops hypotension. Hypotension may cause renal compromise. Use IV fluids and changes in body position to support BP if symptomatic hypotension occurs. Nesiritide may be restarted at a dose reduced by 30% with no bolus administration once patient is stabilized. Hypotension may be prolonged for hours, requiring a period of monitoring prior to restarting administration.

Nursing Considerations
● Cardiac: Monitor for arrhythmias. Tachycardia may cause hypotension.

Dosage

<table>
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<tr>
<th>DRUG</th>
<th>STATUS</th>
<th>DOSE</th>
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<tr>
<td></td>
<td>Cardiac</td>
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<td>Tachycardia</td>
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Adverse effects are indicated by bold type. Underline = Discontinued.
Monitor intake and output and weigh daily. Assess for decrease in signs of HF (dyspnea, rales/crackles, peripheral edema, weight gain).

Obtain history for reactions to recombinant peptides; may increase risk of allergic reaction. Observe patient for signs and symptoms of allergic reactions (rash, pruritus, laryngeal edema, wheezing). Discontinue the drug and notify health care professional immediately if these occur.

Keep epinephrine, an antihistamine, IV fluids, pressure amines, and resuscitation equipment close by in the event of an anaphylactic reaction.

**Potential Nursing Diagnoses**

- Decreased cardiac output (Indications)
- Activity intolerance (Indications)
- Excess fluid volume (Indications)

**Implementation**

- **High alert:** Intravenous vasoactive medications have an increased potential for causing harm. Have second practitioner independently check original order, dose calculations, and infusion pump settings. Administer only in settings where BP can be closely monitored.

- Prime the IV tubing with an infusion of 25 mL prior to connecting to the patient’s vascular access port and prior to administering bolus or infusion. Flush catheter between administration of nesiritide and other medications. Do not administer through a central heparin-coated catheter as nesiritide binds to heparin. Concurrent administration of a heparin infusion through a separate catheter is acceptable.

**IV Administration**

- **pH:** 4.0–6.0
- **Direct IV:** Recombinant: 1.5 mg of nesiritide is reconstituted in 25 mL of diluent removed from 250 mL of IV fluid bag containing 0.9% NaCl. Do not shake; each vial contains 1.5 mg of nesiritide. Withdraw entire content of reconstituted vial and add back to 250 mL of IV fluid bag. Infuse IV bag several times to ensure complete mixing of solution. Infusion stable for 24 hr. After preparation of infusion bag, withdraw bolus volume from infusion bag. To calculate amount of bolus volume: 0.33 mL/kg = patient weight (kg). **Concentration:** 6 mcg/mL. **Rate:** Administer bolus over 60 seconds through a port in the IV tubing.
- **Intermittent Infusion:** Diluent: See Direct IV section under Direct IV section above for preparation instructions for infusion bag. Immediately follow bolus with infusion. **Concentration:** 6 mcg/mL. **Rate:** Based on patient’s weight (see Route/Dosage section).
- **Y-Site Compatibility:** acyclovir, aminocaproic acid, amiodarone, amlodipine, amphotericin B liposome, amphotericin B colloidal, amphotericin C lipid complex, amphotericin B liposome, anidulafungin, amsacrine, amifostine, anisomycin, bivalirudin, bleomycin, buprenorphine, busulfan, butorphanol, calcium acetate, calcium chloride, calcium gluconate, carboplatin, carmustine, cephalothin, cefazolin, cefotaxime, ceftriaxone, ceftizoxime, cefuroxime, ceftepime, ceftobiprole, ceftazidime, cefepime, cefoxitin, cephalaxin, cefuroxime, cefprozil, ceftriaxone, cefpirome, cefepime, ceftepime, cefazolin, cefotaxime, cefuroxime, cefuroxime, cefdinir, cefpodoxime, cefuroxime, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, ceftepime, cefazolin, ceftriaxone, cefepime, cef tepi
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nesiritide

● Y-Site Incompatibility: aminophylline, aztreonam, cefepime, cefotaxime, clindamycin, cimetidine, doxorubicin, epinephrine, heparin, hydrocortisone, insulin, lidocaine, nitroglycerin, pancuronium, phenylephrine, propofol, ranitidine, thiopental, vancomycin.

Patient/Family Teaching

● Explain purpose of medication to patient and family.

● Advise patient to contact health care professional immediately if signs and symptoms of allergic reaction occur.

Evaluation/Desired Outcomes

● Improvement in dyspnea and reduction in mean PCWP in patients with decompensated HF.

Why was this drug prescribed for your patient?