

PROTOCOL FOR: Norepinephrine (Levophed): IV Administration

POLICY: This drug is to be administered only in critical care areas where patient is on a cardiac monitor, and must be administered on an infusion pump, using drug guardrails.

INDICATION: Severe hypotension, shock (Norepinephrine is a potent vasoconstrictor.)

**DESIRED
PATIENT OUTCOMES:** Patient will experience an increase in blood pressure, and will not suffer any negative side effects of Norepinephrine.

**CLINICAL
ASSESSMENT AND**

CARE: A. Prior to Starting Infusion:

1. Suggested solution concentration:
 - a. **Single: 4 mg/250 ml D₅W = 16 mcg/ml**
 - b. **Double: 8 mg/250 ml D₅W = 32 mcg/ml**
 - c. **Quadruple: 16 mg/ 250 ml D₅W = 64 mcg/ml**
2. Assess IV access; Although the med may be infused peripherally, a central line is preferred.
3. Obtain baseline VS.
4. Assess peripheral circulation prior to starting infusion.
5. Utilize a NIBP monitoring device for frequent cuff pressures, or use arterial line for BP measurement, if available.
6. Infuse per MD/LIP order. Refer to dosage in **mcg/kg/min**.
7. Place patient in position of comfort. (Preferable to Keep HOB no higher than 30° & avoid frequent changes in HOB elevation.)

B. Beginning the Infusion:

1. Begin the infusion at **0.03 mcg/kg/min**, per MD/LIP order.
2. Increase the dose by **0.03 mcg/kg/min** every **2 minutes** until desired effect (specified increase in SBP/MAP) is achieved. A usual parameter is SBP 100-120 or MAP > 60.
3. Monitor and document VS and med dose with each adjustment on the unit flowsheet/frequent VS record.
3. **Maximum dose is 0.3 mcg/kg/min**, unless otherwise ordered by the MD/LIP.

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4. Stay at the bedside with the patient during the initial titration.

C. Care During Infusion:

1. Monitor BP, HR, RR, and urine output. Once desired effect is achieved, VS may be advanced to every $\frac{1}{2}$ hour x 2, then every 1-2 hours if stable.
2. Monitor IV site closely. If Norepinephrine (Levophed) extravasates into peripheral tissue, tissue damage can occur.
3. Notify MD/LIP if extravasation of peripheral infusion site occurs - infiltrate site with Phentolamine (5mg/9mls NS) per MD/LIP order, as soon as possible.
4. Notify the MD/LIP if any complications (see below), or if inadequate response at maximum dose, or undesired response is noted.

D. Potential Complications:

1. Cardiovascular:
 - a. Hypertension
 - b. Severe peripheral and visceral vasoconstriction
 - c. Decreased renal perfusion (decreased urine output)
 - d. Palpitations
 - e. Tachycardia
 - f. Ventricular arrhythmias
 - g. Increased myocardial oxygen consumption (may lead to chest pain)
2. CNS:
 - a. Headache
 - b. Weakness
 - c. Dizziness
 - d. Tremors
 - e. Restless
 - f. Anxiety
 - g. Insomnia
3. Others:
 - a. Tissue necrosis and sloughing at the site (care outlined in C #3 above).

E. Discontinuation of the infusion:

1. The infusion rate should be slowed incrementally and abrupt withdrawal avoided. Titrate off in same manner as was started.

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2. Assess VS and urine output. In some cases, additional administration of IV fluid may be necessary before norepinephrine can be discontinued. Consult with MD/LIP.

APPROVAL: ICU Standards Committee
ED Standards Committee
Nursing Standards Committee

EFFECTIVE DATE: 12/91

REVISION DATES: 1/93, 1/95, 10/95, 8/97, 10/99, 10/03, 9/08, 5/09