Norepinephrine (Levophed)

Therapeutic Effects:

- Stimulates alpha receptors in the peripheral vasculature, producing vasoconstriction-related increase in systemic blood pressure.
- Concurrent beta receptor stimulation may produce increases in heart rate and mild bronchodilation, though norepinephrine is a weaker beta stimulator than dopamine.

Indications:

- Post cardiac arrest (Cardiogenic Shock)
- Fever (Septic Shock)
- Dialysis-Related Issues
- For all listed situations, indication is hypotension (adult = systolic < 90 mmHg) due to cardiogenic, septic, or neurogenic shock either refractory to intravascular fluid boluses or in which intravascular fluid boluses are contraindicated (e.g. pulmonary edema)

Contraindications:

- Hypertension

Adverse Reactions:

Few, though at higher doses, symptoms may include:
- headache,
- palpitations
- tachycardia
- chest pain
- eventual hypertension
- Bradycardia can result reflexively from an increase in blood pressure

Precautions:

- In the setting of tachydysrhythmia-induced cardiogenic shock, treat per A-Fib/A-Flutter/RVR, SVT and VT protocols. Ensure that aggressive fluid resuscitation is accomplished (unless contraindicated) prior to norepinephrine use.
• Norepinephrine should be given into a large, patent vein. The vein of choice for EMS is the antecubital vein, as this will decrease the risk of overlying skin necrosis. Do not administer norepinephrine through an IV in the hand or leg. These veins are more likely to be affected by vaso-occlusive diseases and more prone to ischemic complications. Administration through IO in the leg is permitted.
• If local extravasation occurs, notify the receiving physician.
• Safety in pregnancy not firmly established, though when clinically indicated - the benefits outweigh risks.
• Safety in pediatrics not firmly established and medical control is to be consulted prior to pediatric usage.

Administration and Dosage:

• Adults:
  o Is available for IV/IO use
  o 4 mg from a 4 mg/4 mL ampules should be mixed in 250 mL of Normal Saline or 8mg from two 4mg/4 mL ampules should be mixed in 500 mL of Normal Saline depending on which Normal Saline bags are available. This yields a concentration of 16 mcg/mL. The initial rate of infusion is 8 - 12 mcg/min (maximum dose is 16 mcg/minute.) This rate may be increased until blood pressure and other parameters of organ perfusion improve. The lowest infusion rate that results in satisfaction hemodynamic performance should be used to minimize side effects.
  o ROSC after cardiac arrest: 8-12 mcg/minute (maximum dose is 16 mcg/minute) to keep SBP >140 or MAP 80-90
  o Cardiogenic shock: 8-12 mcg/ minute (maximum dose is 16 mcg/minute) for hypotension not corrected by fluid challenge
  o For hypotension (shock) refractory to fluids or fluids contraindicated - start at 8 – 12 mcg/minute - see dosage chart - titrated to a systolic B/P ≥ 100 mmHg. Maximum infusion rate is 16 mcg/minute Norepinephrine infusion adult dosage chart rates reflects using a microdrip (60 drops/mL) set:
Norepinephrine Drip

(Concentration is 4mg/4mL)

- **Pediatrics (> 5 years old):**
  - Only with physician's orders. Administer Norepinephrine 2-12 mcg/minute for neurogenic shock after volume replacement. Titrate norepinephrine to maintain SBP >90