**NORADRENALINE** This drug must be guardrailed

| Trade Name | Levophed ® 1:1000 Concentrate for IV Injection (Hospira)  
| Noradrenalin- BNM ® 4mg /4 mL (=1:1000) |
| Class | Vasoconstrictor sympathomimetic |
| Mechanism of Action | Increases blood pressure by stimulating alpha receptors in vascular smooth muscle resulting in peripheral vasoconstriction. Also stimulates cardiac beta receptors providing some inotropic effects including increased heart rate and vasodilatation of coronary arteries. |
| Indications | Refractory hypotension in the setting of pulmonary hypertension or septic shock with no response to fluid resuscitation, or high dose dopamine |
| Contraindications | Uncorrected hypovolaemia (absolute contraindication). History of hypersensitivity to noradrenaline or sulphites. Hypertension. Mesenteric or peripheral vascular thrombosis. Hypoxia or hypercapnia (may cause noradrenaline-induced cardiac arrhythmias) No central line access |
| Supplied As | 4mg/4mL |
| Dilution | See noradrenaline infusion sheet:  
Take 0.6 x wt (kg) in ml of noradrenaline 1mg/mL and make up to 50mL with 5% dextrose without heparin  
0.2 microgram/kg/min = 1 mL/hr  
Max concentration = 100 microgram/mL  
Must be infused through a central line |
| Dosage | 0.05 – 0.5 microgram/kg/minute  
Suggest starting at 0.1 microgram/kg/minute and titrate up or down every 30 minutes until control achieved  
Higher doses up to 1-2 microgram/kg/minute may be required to control blood pressure and are at the Consultant’s discretion |
| Guardrail | Conc: Min – 4 microgram/mL  
Max – 120 microgram/mL  
(to be updated in 2022 to 100 microgram/mL)  
Soft Min: 0.05 microgram/kg/min  
Hard Max: 2 microgram/kg/min  
Soft Max: 0.5 microgram/kg/min  
Default: 0.1 microgram/kg/min |
| Interval | Continuous iv infusion |
### Administration

Continuous IV infusion via a central venous line.  
**Not** to be given subcutaneously or intramuscularly due to risk of severe, rapid vasoconstriction, this may result in gangrene.  
Avoid extravasation as this will cause tissue necrosis.  
Antidote for noradrenaline extravasation is phentolamine. (Infiltrate affected area with 1-5 mg diluted in 5 mL sodium chloride 0.9%)⁶

### Compatible With

**Solutions:** Glucose 5% or glucose/saline is preferred because glucose protects noradrenaline from oxidative degradation.  
Infusion in solutions other than glucose is not recommended by the manufacturer however independent reference sources eg Neofax, ANMF, Micromedex site compatibility with sodium chloride 0.9% and lactated Ringer's.  
**Terminal Y-site:** adrenaline, amikacin, amiodarone, atropine, benzylpenicillin, calcium chloride, calcium gluconate, caspofungin, cefazolin, cefotaxime, cefoxitin, caftazidime, cefuroxime, dexamethasone, dexamethomidine, digoxin, dobutamine, dopamine, erythromycin, fentanyl, fluconazole, furosemide, gentamicin, glycopyrrolate, heparin, hydrocortisone, imipenem, insulin**, lidocaine, magnesium, meropenem, midazolam, milrinone, morphine, piperacillin, potassium chloride, ranitidine, ticarcillin, tobramycin, TPN, (no information re compatibility with lipid), vancomycin, vasopressin, voriconazole.  
* Variable reports on compatibility with insulin use separate line if possible

### Incompatible With

Alkaline solutions, chlorpheniramine, chlorothiazide, diazepam, diazoxide, indomethacin, iron salts, nitrofurantoin, phenobarbital, phenytoin, sodium bicarbonate, streptomycin, sulfadiazine trimethoprim/sulfamethoxazole.  
No information to confirm that prostaglandin (alprostadil) is compatible, use a separate line.

### Interactions

Concurrent treatment with betablockers, doxapram or monoamine oxidase inhibitors may cause hypertension.  
Concurrent treatment with halogenated anaesthetics or digoxin may precipitate arrhythmias

### Monitoring

Blood pressure, heart rate, urine output, peripheral perfusion.

### Stability

Readily oxidised do not use if solution is brown.  
Ampoules contain no preservative and are single use only.  
Discard any remaining contents immediately after use.  
Change iv infusion every 24 hours

### Storage

Protect from light.  
Store below 25°C

### Adverse Reactions

Bradycardia, arrhythmias, breathing difficulties, headache, extravasation necrosis at injection site.
| **Metabolism** | Rapidly and extensively metabolised. Plasma half life is approximately 2 minutes. Steady state concentrations are reached within 10 -15 minutes of commencing the infusion. Clearance is not influenced by renal function. |
| **Comments** | Not extensively studied in newborns but studies have shown improved systemic blood pressure, pulmonary blood flow and cardiac output in the setting of PPHN and septic shock |
| **References** | 1. [www.medsafe.govt.nz](http://www.medsafe.govt.nz)  
5. Trissell Handbook on Injectable Drugs in [www.micromedexsolutions.com](http://www.micromedexsolutions.com)  
| **Updated By** | A Lynn, B Robertshawe, N Austin Feb 2013  
A Lynn, B Robertshawe April 2017 (added TPN compatibility)  
A Lynn B Robertshawe October 2021 (update compatibility section and max concentration. Pump guardrail to be updated 2022) |