Noradrenaline (Norepinephrine) 2019

Newborn use only

<table>
<tr><td>Alert</td><td>Prescribe as noradrenaline base. Noradrenaline acid tartrate 2 mg/mL is equivalent to noradrenaline base 1 mg/mL (1:1,000)</td></tr>
<tr><td>Indication</td><td>Treatment of hyperdynamic shock secondary to sepsis. [1]
Second line inotrope for treatment of fluid-refractory hypotensive shock in the setting of low systemic vascular resistance (SVR).[1]
Circulatory failure in the setting of pulmonary hypertension refractory to nitric oxide.[2]</td></tr>
<tr><td>Action</td><td>Catecholamine with strong vascular alpha and cardiac beta-adrenergic action, moderate cardiac alpha-adrenergic actions.[3]
Noradrenaline increases blood pressure, urine output and reduces lactate in newborns with septic shock refractory to volume expansion and other inotropes.[4]
Noradrenaline increases systemic and pulmonary pressures, increases pulmonary blood flow and improves systemic oxygen saturation in newborn infants with pulmonary hypertension and circulatory failure. [2]</td></tr>
<tr><td>Drug Type</td><td>Inotrope and vasopressor.</td></tr>
<tr><td>Trade Name</td><td>Hospira Levophed Noradrenaline 1:1,000, Noradrenaline BNM 1:1000, Noradrenaline MYX 1:1000. All contain Noradrenaline acid tartrate.</td></tr>
<tr><td>Presentation</td><td>Noradrenaline acid tartrate 8 mg/4 mL is equivalent to noradrenaline base 4 mg/4 mL (1:1000)</td></tr>
<tr><td>Dosage / Interval</td><td>0.05-1.0 microgram/kg/minute of noradrenaline Base.

(a) Suggested starting dose of 0.1 microgram/kg/minute and titrate up to achieve not only normotensive range of blood pressure but also improved tissue perfusion manifested by good urine output, improved FiO2, and reduced lactate.
(b) Consider starting at higher dose particularly in term infants with respiratory failure and hypotension refractory to other treatments.</td></tr>
<tr><td>Route</td><td>Continuous IV infusion.</td></tr>
<tr><td>Preparation/Dilution</td><td>LOW CONCENTRATION IV infusion (for =>1kg)
<table>
<tr><th>Infusion dose</th><th>Prescribed amount</th></tr>
<tr><td>1 mL/hour = 0.05 microgram/kg/minute</td><td>150 microgram/kg noradrenaline base and make up to 50 mL</td></tr>
</table>
Draw up 150 micrograms/kg (0.15 mL/kg) with 5% glucose or sodium chloride 0.9%[6] to make a 50 mL solution [i.e., 3 micrograms/kg/mL]. Infusing at a rate of 1 mL /hour = 0.05 microgram/kg/minute.

HIGH CONCENTRATION IV infusion
<table>
<tr><th>Infusion dose</th><th>Prescribed amount</th></tr>
<tr><td>1 mL/hour = 0.2 microgram/kg/minute</td><td>600 microgram/kg noradrenaline base and make up to 50 mL</td></tr>
</table>
Draw up 600 micrograms/kg (0.6 mL/kg) with 5% glucose or sodium chloride 0.9%[6] to make a 50 mL solution [i.e., 12 micrograms/kg/mL]. Infusing at a rate of 1 mL / hour =0.2 microgram/kg/minute.

For infants requiring fluid restriction consider:
VERY HIGH CONCENTRATION continuous IV infusion
<table>
<tr><th>Infusion dose</th><th>Prescribed amount</th></tr>
<tr><td>1 mL/hour = 0.4 microgram/kg/minute</td><td>1,200 microgram/kg noradrenaline base and make up to 50 mL</td></tr>
</table>
Draw up 1,200 microgram/kg (1.2 mL/kg) with 5% glucose or sodium chloride 0.9%[6] to make a 50 mL solution [i.e., 24 micrograms/kg/mL]. Infusing at a rate of 1 mL / hour = 0.4 microgram/kg/minute.</td></tr>
<tr><td>Administration</td><td>Noradrenaline should be given via a central venous catheter (UVC or PICC) using a continuous infusion. Infuse through a dedicated line where possible.</td></tr>
<tr><td>Monitoring</td><td>Continuous heart rate, ECG and blood pressure.
Assess urine output and peripheral perfusion frequently.
Observe IV site closely for blanching and extravasation.</td></tr>
<tr><td>Contraindications</td><td>Infants with hypovolaemia until blood volume replaced - may cause severe peripheral and visceral vasoconstriction.</td></tr>
</table>

	Infants with mesenteric or peripheral thrombosis. Known hypersensitivity to sodium metabisulfite.
Precautions	Use with caution in preterm infants and infants with poor myocardial contractility as a sole inotrope/vasopressor. Thyrotoxicosis – may cause severe hypertension. Ensure adequate circulating blood volume prior to commencement. Avoid in hypertension. Overdosage may result in severe hypertension, reflex bradycardia, marked increase in peripheral resistance and decreased cardiac output. The infusion site should be checked frequently for free flow. Care should be taken to avoid extravasation into the tissues which may cause local necrosis. Do not cease infusion abruptly.
Drug Interactions	Should be given with close monitoring to patients exposed to monoamine oxidase inhibitors because severe, prolonged hypertension may result.
Adverse Reactions	Systemic hypertension especially at higher doses. Reflex bradycardia and arrhythmia. Tissue necrosis at infusion site with extravasation. [see special comments] Renal and digital ischaemia may occur. Prolonged administration of any potent vasopressor may result in plasma volume depletion which should be continuously corrected by appropriate fluid and electrolyte replacement therapy.
Compatibility	Fluids: Glucose 5%, sodium chloride 0.9% with glucose 5%, sodium chloride 0.9%, lactated Ringer's solution. Y-site: Amiodarone, anidulafungin, bivalirudin, caspofungin, ceftaroline fosamil, cisatracurium, dexmedetomidine, dobutamine, dopamine, doripenem, esmolol, ethanol, haloperidol lactate, heparin sodium, hydrocortisone sodium succinate, labetalol, midazolam, milrinone, morphine sulfate, mycophenolate mofetil, potassium chloride, remifentanil, sodium nitroprusside, tigecycline.
Incompatibility	Fluids: No information. 10% Dextrose not tested. Y-site: aminophylline, azathioprine, benzylpenicillin, folic acid, foscarnet, ganciclovir, indomethacin, insulin (short-acting), iron salts, phenobarbitone, sodium bicarbonate, thiopentone. Incompatible with alkalis and oxidising agents. No information: Adrenaline HCL is compatible with noradrenaline bitartrate but no stability data is available for Adrenaline acid tartrate and noradrenaline acid tartrate.
Stability	Diluted solution stable for 24 hours.
Storage	Ampoule: Store below 25°C. Protect from light. Discard unused portion. Do not freeze.
Special Comments	Do not administer with blood products. Glucose solutions (10%, 5%) are protective against the oxidation of noradrenaline. Discard if exhibiting colour change (oxidation). The antidote for extravasation ischaemia is phentolamine. Phentolamine is only available via the Special Access Scheme.
Evidence summary	Refer to full version.
References	Refer to full version.

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