**NORADRENALINE (norepinephrine)***

### Indication
- Acute hypotension\(^1,2\) (e.g. secondary to sepsis, pulmonary hypertension)

### Presentation\(^3\)
- Ampoule 2 mg in 2 mL | 4 mg in 4 mL
  - Contains 1 mg/mL noradrenaline (norepinephrine) base\(^3\)
  - 1 mg of noradrenaline (norepinephrine) base is equivalent to 2 mg of noradrenaline acid tartrate monohydrate
  - Prescribe in terms of noradrenaline base to prevent ambiguity\(^2\)

### Dosage
- Starting dose range\(^2,4\)
  - 0.02–0.5 microgram/kg/minute
  - Titrate every 30 minutes to target BP\(^4\)
- Maximum dose range\(^5,6\)
  - 1.5–3.3 microgram/kg/minute

### Preparation
- Single strength:
  - Draw up 150 microgram/kg and make up to 50 mL total volume with 5% glucose (the preferred diluent)
  - Infused at 1 mL/hour delivers 0.05 microgram/kg/minute
- May use higher concentrations if fluid restricted\(^2\) (refer to Quick guide below)
- Maximum concentration\(^2\)
  - PVL\(^2\): up to 40 microgram/mL
  - CVL\(^6\): up to 100 microgram/mL

### Administration
- IV continuous infusion via syringe pump with medication safety software

### Special considerations
- Correct hypovolaemia before use\(^1\)
- Route
  - Administration via dedicated central line is preferred\(^1\)
  - Large peripheral vein may be used as temporary measure until CVL sited\(^3\)
  - Ensure, centrally placed catheters are well positioned (i.e. UVC is past ductus venosus)
  - Wean infusion gradually (don’t cease abruptly)\(^1\)
  - Levophed contains sodium metabisulfite which may cause allergic reactions in susceptible people\(^3\)

### Monitoring
- Continuous cardiorespiratory and invasive BP\(^4\)
- Extravasation risk of necrosis: monitor for blanching/extravasation\(^3\)
- Urine output and peripheral perfusion

### Fluids
- 5% glucose\(^3\) (preferred diluent because glucose protects against loss of potency due to oxidation\(^4\)), 0.9% sodium chloride\(^3\)
- 10% glucose: (limited references) use only if severe fluid restriction causes concern for BGL maintenance as per pharmacist advice for pragmatic management in complex situations. Seek SMO approval prior

### Y-site
- Giving drugs via Y-site may change the infusion rate of noradrenaline and is not recommended

### Compatibility
- At 60 microgram/mL or higher: Amikacin\(^3\), amiodarone\(^3\), atracurium\(^3\), aztreonam\(^3\), calcium chloride\(^3\), calcium gluconate\(^3\), captopril\(^3\), cefalotin\(^3\), cefazolin\(^3\), cephalothin\(^3\), cefotaxime\(^3\), cefoxitin\(^3\), ceftriaxone\(^3\), cefoxitin\(^3\), ceftriaxone\(^3\), clindamycin\(^3\), dexamethasone\(^3\), dobutamine\(^3\), dopamine\(^3\), ephedrine sulfate\(^3\), esmolol\(^3\), fentanyl\(^3\), fluconazole\(^3\), gentamicin\(^3\), glyceryl trinitrate\(^3\), haloperidol lactate (in glucose)\(^3\), heparin sodium\(^3\), hydrocortisone sodium succinate\(^3\), insulin (Novorapid)\(^3\), magnesium sulfate\(^3\), metoclopramide\(^3\), midazolam\(^3\), mirtazapine\(^3\), morphine sulfate\(^3\), mycophenolate mofetil\(^3\), phenylephrine\(^3\), posaconazole\(^3\), potassium chloride\(^3\), sodium nitroprusside\(^3\), suxamethonium\(^3\), tobramycin\(^3\), vancomycin\(^3\), verapamil\(^3\)
Incompatibility

- Lipids incompatible, however if access limited, some evidence supports infusion via 3-way tap. Seek SMO approval prior to administration
- Fluids
  - No information
- Drugs
  - Azathioprine, benzylpenicillin, folic acid, fosfarnet, ganciclovir, indomethacin, insulin, iron salts, phenobarbital, sodium bicarbonate, incompatible with alkalis and oxidising agents

Interactions

- Concurrent administration with esmolol predicted to increase the risk of hypertension and bradycardia

Stability

- Ampoule
  - Store below 25 °C. Do not refrigerate. Protect from light
  - Clear and colourless solution. Do not use if discoloured or contains precipitate
- Infusion
  - Stable for 24 hours between 20–25 °C

Side effects

- Blood pathology: plasma volume depletion with prolonged administration that needs to be corrected with fluid and electrolyte therapy
- Circulatory: hypertension with hyperthyroidism, ischaemic injury (renal and digital), cardiac disturbance from overdose including severe hypertension, increased peripheral resistance, reflex bradycardia and reduced cardiac output
- Integumentary: injection site necrosis–treat with phentolamine (in consultation with pharmacist)

Actions

- Acts predominantly on alpha-receptors and beta-receptors in the heart
- Causes peripheral vasoconstriction (α-adrenergic action) and a positive inotropic effect on the heart and dilation of coronary arteries (β-adrenergic action), resulting in an increase in systemic blood pressure and coronary artery blood flow
- Onset of action and duration of effect is 1–2 minutes and half-life is less than 3 minutes

Abbreviations

- BGL: blood glucose level
- BP: blood pressure
- CVL: central venous line
- SMO: most senior medical officer
- UVC: umbilical venous catheter

Keywords

- Noradrenaline, norepinephrine, hypotension, levophed, sympathomimetic, vasopressor

Quick guide: noradrenaline (norepinephrine) IV INFUSION concentrations

<table>
<thead>
<tr>
<th>Strength</th>
<th>Noradrenaline base 1 mg/mL</th>
<th>Total infusion volume (mL)</th>
<th>Infusion rate (mL/hour)</th>
<th>Delivers (microgram/kg/minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>150 microgram/kg</td>
<td>50 mL</td>
<td>@ 1 mL/hour</td>
<td>0.05 microgram/kg/minute</td>
</tr>
<tr>
<td>Double</td>
<td>300 microgram/kg</td>
<td>50 mL</td>
<td>@ 1 mL/hour</td>
<td>0.1 microgram/kg/minute</td>
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<tr>
<td>4 x</td>
<td>600 microgram/kg</td>
<td>50 mL</td>
<td>@ 1 mL/hour</td>
<td>0.2 microgram/kg/minute</td>
</tr>
<tr>
<td>8 x</td>
<td>1200 microgram/kg</td>
<td>50 mL</td>
<td>@ 1 mL/hour</td>
<td>0.4 microgram/kg/minute</td>
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</tbody>
</table>

If fluid restricted, concentrations higher than single strength may be indicated
A baby of 4.16 kg reaches maximum concentration of 100 microgram/mL at 8 x strength
A baby more than 4.16 kg needs 4 x strength or less to remain under 100 microgram/mL (maximum concentration)

The Queensland Clinical Guideline Neonatal Medicines is integral to and should be read in conjunction with this monograph. Refer to the disclaimer. Destroy all printed copies of this monograph after use.
## References


## Document history

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## QR code

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