Noradrenaline (Norepinephrine)

**APPLICABLE AREAS**

This section will be left blank for each hospital to complete in accordance with local practice. Examples: ICU, ED, OR, Ward 2B

**MECHANISM OF ACTION/PHARMACOLOGY**

Noradrenaline is a vasoconstrictor that predominantly stimulates $\alpha_1$ receptors to cause peripheral vasoconstriction and increase blood pressure.

It also has some $\beta_1$ receptor agonist activity that results in a positive inotropic effect on the heart at higher doses.\(^1\,^2\)

Onset of action: 1–2 minutes.\(^2\)

Duration of action: 5–10 minutes.\(^2\)

Half-life: 3 minutes.\(^2\)

**INDICATIONS**

To increase blood pressure in acute, severe, hypotensive states when low systemic vascular resistance persists despite adequate fluid resuscitation.\(^2\)

Noradrenaline is the vasopressor of choice for managing septic shock.\(^3\)

**PRECAUTIONS**

- Hypersensitivity to noradrenaline or sulfites (some brands contain sodium metabisulfite)\(^4\)
- Hypotension due to uncorrected hypovolaemia.\(^4\)

**MEDICATION PRESENTATION**

4 mg/4 mL (1:1000) of noradrenaline base per vial.

**MEDICATION STORAGE**

Store vials below 25°C. Do not freeze. Protect from light.\(^5\)

Infusion solutions are stable for up to 24 hours.\(^6\)
**PREPARATION**

<table>
<thead>
<tr>
<th></th>
<th>Infusion pump</th>
<th>Syringe driver</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prescribe</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 mg in 66 mL</td>
<td>6 mg in 100 mL</td>
<td>32 mg in 532 mL</td>
</tr>
<tr>
<td>6 mg in 100 mL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 mg in 266 mL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>32 mg in 532 mL</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Make up infusion in</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 mL bag of glucose 5%*</td>
<td>100 mL bag of glucose 5%*</td>
<td>500 mL bag of glucose 5%*</td>
</tr>
<tr>
<td>250 mL bag of glucose 5%*</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Volume to be removed from IV bag</strong></td>
<td>38 mL</td>
<td>6 mL</td>
</tr>
<tr>
<td><strong>Drug dose to be added</strong></td>
<td>4 mg (4 mL)</td>
<td>6 mg (6 mL)</td>
</tr>
<tr>
<td><strong>Final volume</strong></td>
<td>66 mL</td>
<td>100 mL</td>
</tr>
<tr>
<td><strong>Final concentration</strong></td>
<td>60 microg/mL</td>
<td>60 microg/mL</td>
</tr>
<tr>
<td>1 mL/hr =</td>
<td>1 microg/min</td>
<td>1 microg/min</td>
</tr>
</tbody>
</table>

*Glucose 5% can protect against excessive oxidation and consequent loss of potency.®

However, noradrenaline is also compatible with glucose in sodium chloride solutions, Hartmann’s and sodium chloride 0.9%.²

**ADMINISTRATION – THIS GUIDELINE IS INTENDED FOR CENTRAL ACCESS ONLY**

Administer continuous intravenous infusion through a central access line.

Infusions should be administered via a syringe driver or infusion pump, preferably with medication error reduction software enabled.

Avoid administration in lines where other drugs or fluids may be bolused or flushed.

**DOSING**

Starting dose: 2 to 10microg/min.

Titrate in accordance with prescribed blood pressure parameters – for example, by increments of 0.5 to 2microg/min.

Usual dose range: 0.5 to 30microg/min.

Maximum dose: up to 100microg/min in extreme cases.⁷

Noradrenaline should not be ceased abruptly.

**MONITORING**

- Continuous blood pressure and cardiac monitoring for the duration of the infusion⁵
- Monitor fluid balance
- Assess for organ ischaemia (including myocardium, kidneys, gastrointestinal tract and peripheral extremities) – see ‘Side effects’ for more information.
SIDE EFFECTS

- Bradycardia – as a reflex to the increase in blood pressure
- Arrhythmias
- Myocardial, mesenteric, renal or peripheral (digital) ischaemia – can manifest as acute myocardial infarction, gastrointestinal infarction, decreased urine output/creatinine clearance or gangrene.

COMPATIBILITIES

Consult the following references, which are available online through the Clinicians Health Channel:

- Australian injectable drugs handbook
- Trissel’s™ in IV compatibility (Micromedex) – from the site’s homepage, select the ‘IV Compatibility’ tab.

IMPORTANT DRUG INTERACTIONS

- **Monoamine oxidase inhibitors (MAOIs)** (including reversible, non-selective agents such as linezolid) inhibit the metabolism of noradrenaline. Dose noradrenaline conservatively.
- **Tricyclic antidepressants (TCAs)** potentiate the effects of noradrenaline by inhibiting its uptake into adrenergic nerve endings, resulting in high levels of circulating noradrenaline. Dose noradrenaline conservatively.
- **Entacapone** is a catechol-O-methyltransferase (COMT) inhibitor, which may inhibit the metabolism of noradrenaline, increasing the risk of side effects. Dose noradrenaline conservatively.
REFERENCES


4. MIMS [online] (accessed 9 January 2018)

5. Australian injectable drugs handbook (AIDH) [online] (accessed 9 January 2018)


8. Australian medicines handbook (AMH) [online] (accessed 9 January 2018)


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