Safer Care Victoria

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 α_1 receptors to cause peripheral vasoconstriction and increase blood pressure.

It also has some β_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

	Infusion pump				Syringe driver
Prescribe	4 mg in 66 mL	6 mg in 100 mL	16 mg in 266 mL	32 mg in 532 mL	3 mg in 50 mL
Make up infusion in	100 mL bag of glucose 5%*	100 mL bag of glucose 5%*	250 mL bag of glucose 5%*	500 mL bag of glucose 5%*	Glucose 5% (to a total of 50 mL in the syringe)
Volume to be removed from IV bag	38 mL	6 mL	Nil	Nil	Not applicable
Drug dose to be added	4 mg (4 mL)	6 mg (6 mL)	16 mg (16 mL)	32 mg (32 mL)	3 mg (3 mL)
Final volume	66 mL	100 mL	266 mL	532 mL	50 mL
Final concentration	60 microg/mL	60 microg/mL	60 microg/mL	60 microg/mL	60 microg/mL
1 mL/hr =	1 microg/min	1 microg/min	1 microg/min	1 microg/min	1 microg/min

*Glucose 5% can protect against excessive oxidation and consequent loss of potency.[6]

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 infusion[5]
- 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[4]
- Arrhythmias[4]
- Myocardial, mesenteric, renal or peripheral (digital) ischaemia – can manifest as acute myocardial infarction, gastrointestinal infarction, decreased urine output/creatinine clearance or gangrene.[2]

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.[4,6,8]
- **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.[4,6,8]
- **Entacapone** is a catechol-O-methyltransferase (COMT) inhibitor, which may inhibit the metabolism of noradrenaline, increasing the risk of side effects. Dose noradrenaline conservatively.[9]

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