Gloucestershire Hospitals NHS Foundation Trust

Clinical Guidance

Department of Critical Care: Peripheral Noradrenaline (Norepinephrine) infusion

Summary

This guidance relates to the management of peripheral noradrenaline (NA) infusions. It includes: safety profile, indications for peripheral NA, monitoring of patients on peripheral NA, practical advice and finally the management of extravasation

Glossary

CVC: central venous catheter, PVC: peripheral intravenous cannula, NA:noradrenaline

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Peripheral noradrenaline: Noradrenaline is a sympathetic agent with both α and β adrenergic activity, the former being predominant at the concentrations used in clinical practice. Its effect on blood pressure ceases 1-2 minutes after discontinuing the infusion

Safety profile: In 2020 a systematic review[1] looked at the safety profile of peripheral vasopressors in 1382 patients (noradrenaline was the most common agent used). The review suggests that the risk of extravasation events were uncommon and the risk is reduced further with a ≥20G cannula[2]. There was no documented tissue injury or any need for surgical intervention[3].

Indications for peripheral NA:

- Stabilisation of critically unwell patients prior to insertion of CVC
- Awaiting transfer to a critical care area
- As an alternative to CVC insertion in patients likely to require a CVC for <48hrs e.g. those with hypotension post op without other organ dysfunction
- In patients where central access is problematic
- Patient preference

Monitoring of patients on peripheral NA:

- **1st choice of BP monitoring**: arterial line
- **2nd choice**: Frequent non-invasive blood pressure measurements (every 3-5 minutes until stability achieved, thence every 10 minutes)
- Documented review of insertion site every 15 minutes for first hour, then at least hourly:
  - VIP score
  - Infiltration scale
  - Pump pressure – rise could indicate potential extravasation/ disruption to infusion

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Concentration and Diluent: 4mg of NA in 246mls of 0.9% sodium chloride **OR** 246mls 5% glucose					
Estimated weight	Starting dose of 0.05mcg/kg/min	Peripheral infusion rate	Estimated weight	Starting dose of 0.05mcg/kg/min	Peripheral infusion rate
40kg	120mcg / hour	7.5mls / hour	80kg	240mcg / hour	15mls / hour
50kg	150mcg / hour	9.4mls / hour	90kg	270mcg / hour	16.9mls / hour
60kg	180mcg / hour	11.2mls / hour	100kg	300mcg / hour	18.8mls / hour
70kg	210mcg / hour	13.1mls / hour	110kg	330mcg / hour	20.6mls / hour

Practical advice:

- Peripheral venous access should be ≥ 20G; sited proximal to the wrist in the arm; avoid sites of flexion in awake patients due to the risk of occlusion
- Avoid sites requiring more than 1 venepuncture
- Ensure there is a return of blood following insertion of the PVC and that the PVC flushes easily with 5-10mL of 0.9% sodium chloride
- Site a second PVC in case of failure of the primary site
- Dilute 4mg Noradrenaline (4mL of Noradrenaline 1mg/mL) with 246mL 0.9% sodium chloride to provide a concentration of 16microgram/mL
- The 4mg of NA in 246mls of 0.9% sodium chloride needs to be administered **via an infusion pump** set at the rates in the table above.
- Starting dose is 0.05 mcg/kg/min. Max dose is 0.15 mcg/kg/min
- Peripheral NA infusion should not be used for >48hrs
- The concomitant administration of noradrenaline and other medicines via a Y-site should be avoided to prevent inadvertent bolus administration of noradrenaline.
- After discontinuation, flush the peripheral cannula with sodium chloride 0.9% at the same rate the medicine was infused to avoid adverse haemodynamic effects.

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Management of extravasation:

- Stop the infusion immediately and disconnect the line from the PVC.
- Attempt to aspirate 3-5mL from the PVC if able.
- Remove the cannula and apply a dressing to the removal site.
- Mark the extravasation area if possible, in order to allow monitoring of any developing injury.
- Elevate the affected limb if able to do so to reduce swelling.
- Consider application of a topical vasoactive agent to encourage local blood flow (for example transdermal GTN patch).
- Administer analgesia if required.
- Seek advice from a plastic surgeon or your local tissue viability service if concerned.
- Document the incident and report via local incident reporting system.

References

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3. https://ics.ac.uk/resource/peripheral-vasopressor-guide.html
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