NORADRENALINE DRUG PROTOCOL

This drug protocol is developed to guide clinical practice at the Royal Hospital for Women. Individual patient circumstances may mean that practice diverges from this recommendation.
For additional information, please refer to the Prince of Wales Hospital (POWH) Critical Care Services Intravenous Drug Protocols for Noradrenaline (norepinephrine):
http://seslhnweb/powh/documents/cpm/Section04/Protocols/Noradrenaline.pdf

1. AIM

- To provide guidance on the safe administration of noradrenaline.

2. PATIENT

- Adult woman

3. STAFF

- Medical, midwifery and nursing staff
- Pharmacy staff

4. EQUIPMENT

- Infusion pump

5. CLINICAL PRACTICE

Preparation

- Review precautions and relative contraindications as outlined in educational notes
- Prepare noradrenaline infusion as a single strength concentration as described below. Higher strength concentrations are not to be used outside of the Intensive Care Unit (ICU) setting.
- Draw up 6mg (6mL) of noradrenaline from ampoule of noradrenaline acid tartrate. This ampoule contains 8mg/4mL of noradrenaline acid tartrate, equivalent to **4mg/4mL (1:1000) of noradrenaline (norepinephrine) base**
- Withdraw 6mLs of glucose 5% from the 100mL bag of glucose 5%.
- Add 6mg (6mL) of noradrenaline to 94mL to glucose 5% to give a final concentration of 60mcg/mL.

Administration

- Prescribe the noradrenaline infusion, along with titration and target parameters on the NSW Health Fluid Order Chart. All orders must be prescribed in full without abbreviations.
- Correct hypovolaemia prior to, or concurrent with, administration of noradrenaline
- Infuse through a central line and infusion pump to **avoid extravasation and tissue necrosis**. A large peripheral vein (e.g. antecubital) may be used in an emergency, pending the insertion of a peripherally inserted central catheter (PICC) or central line
- Administer infusion in the Acute Care Unit only by:
  - a Registered Nurse
  - a Certified Midwife who has completed Central Venous Access Device (CVAD) competency assessment

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- Commence at 0.02 microg/kg/min through a dedicated lumen and titrate in increments of 0.02 microg/kg/min to response and prescribed parameters
- Ensure adequate time for loading and priming a new bag is allowed. The half-life of noradrenaline is 1-2 minutes so therefore caution must be taken with line and bag changes.
- Escalate and source a Central Venous Catheter if ongoing noradrenaline is required (>2hours of use).
- Maintain awareness that noradrenaline interacts with many other medications. Do not mix with other infusions without gaining advice from Pharmacy. If given into a peripheral vein, monitor the infusion site for signs of extravasation or blanching of the vein.
- **Do not cease abruptly**. Infusion should be weaned gradually..

Monitoring

- Monitor the woman's Blood Pressure (BP) and Mean Arterial Pressure (MAP) continuously via an arterial catheter.
- Perform continuous cardiac monitoring. This is mandatory.
- Document BP/MAP at 2 minutes following dosage increases, then 5 minutely once desired BP has been achieved. Once desired BP has been achieved observations can be documented hourly unless woman's condition indicates more frequent observations.
- Review the woman every 15 minutes for extravasation if peripheral line being used.
- Refer the woman to POWH ICU on commencement of noradrenaline.
- Conduct daily electrocardiogram (ECG) to monitor for ischaemic changes
- Check serum glucose levels every 6 hours

Discontinuation

- Aspirate line post cessation of infusion
- Wean infusion slowly as abrupt withdrawal may lead to severe hypotension

6. DOCUMENTATION

- Medical records
- Observation Chart
- NSW Health IV fluid order chart
- NSW Health Fluid Balance Chart
- NSW Health Central Venous Access Device (CVAD) Management chart

7. EDUCATIONAL NOTES

Actions:

- Acts predominantly on beta-1 and alpha receptors; little effect on beta-2 receptors.
- Peripheral vasoconstriction (alpha-adrenergic effect)
- Positive inotrope (beta-1 adrenergic effect). Reflex bradycardia usually prevents increase in heart rate.
- At lower doses, beta-1 effects predominate. Alpha effects occur at higher doses.
- Minor dilatation of coronary arteries (beta-adrenergic effect)

NORADRENALINE DRUG PROTOCOL cont'd

Indications:

- Acute hypotension, especially in vasodilated states e.g. spinal or septic shock
- Therapeutic hypertension e.g. to support cerebral perfusion after subarachnoid haemorrhage

Relative Contraindications:

- Left heart failure - may be given if, in the opinion of the treating doctor, administration is lifesaving.
- Mesenteric or peripheral vascular thrombosis due to risk of increasing ischaemia and extending area of infarction. May be given if, in the opinion of the treating doctor, administration is life-saving

Precautions:

- Use with extreme caution in woman receiving monoamine oxidase inhibitors (MAOI's), triptyline or imipramine type antidepressants within 14 days of treatment, or concurrently with other vasoconstrictors or entacapone due to risk of severe, prolonged hypertension
- Avoid in woman with hyperthyroidism as hypersensitivity to noradrenaline can cause severe hypertension
- Use with caution in woman with hypersensitivity to sulphites, particularly those with asthma
- Avoid hypertension
- Prolonged administration of any potent vasopressor may result in plasma volume depletion which should be continuously corrected by appropriate fluid and electrolyte replacement therapy.
- Higher doses may exacerbate myocardial ischaemia
- Pregnancy - should be given only if clearly indicated
- All inotropes may enhance arrhythmias.
- Reflex bradycardia may occur secondary to rise in blood pressure.

Adverse Reactions:

- Cardiovascular - tachycardia, bradycardia, angina, hypertension, and arrhythmias
- Tissue necrosis at site of extravasation. Check site frequently for signs of extravasation or blanching.
- Peripheral vasoconstriction - ischaemic injury due to potent vasoconstrictor action and tissue hypoxia
- Headache - may be a symptom of hypertension due to overdosage

8. RELATED POLICIES / PROCEDURES / CLINICAL PRACTICE LOP

- Acute Care Centre - Admission Criteria, Process, Management and Escalation
- POWH Critical Care Services Intravenous Drug Protocols Noradrenaline (norepinephrine)

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NORADRENALINE DRUG PROTOCOL cont'd

9. RISK RATING

- High

10. NATIONAL STANDARD

- Medication Safety

11. REFERENCES

1. Prince of Wales Critical Care Services Intravenous Drug Protocols Noradrenaline (norepinephrine) September 2017: http://seslhnweb/powh/documents/cpm/Section04/Protocols/Noradrenaline.pdf
2. Australian injectable drug handbook NORADRENALINE (NOREPINEPHRINE) https://aidh.hcn.com.au/browse/n/noradrenaline_(norepinephrine) accessed on 04/08/2020
3. MIMS Online Noradrenaline (Norepinephrine) https://www.mimsonline.com.au.acs.hcn.com.au/Search/FullPI.aspx?ModuleName=Product Info&searchKeyword=norepinephrine&PreviousPage=~/Search/QuickSearch.aspx&SearchType=&ID=2500001_2 accessed on 28/07/2020
4. Society of Hospital Pharmacists of Australia. 2015. Noradrenaline. Australian Injectable Drug Handbook (6th Ed).

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