The Newcastle upon Tyne Hospitals NHS Foundation Trust

Newcastle Neonatal Services Guidelines: Peripheral administration of Adrenaline infusion for Transport

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1 Introduction

As a general rule, any inotropes should be administered to critically ill children or babies via central access. There are occasions where inotropic support is needed urgently but central access is not in place, or it is not immediately possible to place central access. In this case, emerging safety evidence for delivering inotropes via peripheral venous access in children supports the use of either dobutamine or adrenaline (depending on intended action in the clinical situation) in a carefully selected population of children[1]. It can be particularly useful in the initial phase of resuscitation after acute collapse before a child is ventilated and sedated. This approach allows central access to be placed later in a more optimal situation. It should be noted that children are more prone to extravasation injury due to the relatively small size of their peripheral veins and increased capillary leak rate[2]. Adrenaline (as opposed to dobutamine) is a potentially potent vasoconstrictor and so use via peripheral lines requires a more dilute solution to be used. Dobutamine can be given at the standard strength as used via central lines.

2 Guideline scope

This guideline is intended for use of Northern Neonatal Transport Service (NNeTS) medical, Advanced Neonatal Nurse Practitioner (ANNP) and nursing staff when on transport. It outlines the actions needed to prepare and administer adrenaline peripherally in the rare situations where central access is not available.

It is not intended for use on Wd35 NICU as central access should be available for any baby requiring inotropic support; **any decision to do so is at consultant discretion only**.

3 Guideline

All decisions to use peripheral inotropes should be discussed with the responsible NNeTS consultant

a. Clinical indications for considering using a peripheral inotrope infusion:

- Short-term for stabilisation prior to insertion of Central Venous Catheter (CVC)
- In patients where central access is problematic
- As an alternative to CVC insertion in patients unlikely to require a CVC for long – e.g. those with hypotension without other organ dysfunction

b. Management of patient and lines:

A CVC is always the first choice for inotropes. If using peripheral inotropes medications they should be administered via the “best peripheral” line, preferably in a large vein. The decision to use peripheral adrenaline or dobutamine should be discussed with the NNeTS consultant on call AND the rationale/reasons for use clearly documented in the transport documents.

As a general rule, inotropes should not be infused with any other drug but may be run alongside maintenance fluid (crystalloid).

Whenever running low flow-rate inotropes, an additional port (e.g. via 3-way tap or octopus) should be placed in the line to allow infusions to be changed over by ‘double pumping’ without interruption to flow if required.

Peripheral inotrope infusion lines should be labelled clearly at the patient end to ensure line is not used for other drugs or boluses.

The infusion (made up as noted below) should be commenced at a rate of 100ng/kg/minute (= 0.1microgram/kg/minute), then titrated to achieve the desired effect, discussing changes with NNeTS consultant on call.

Additional IV access MUST be present to ensure there is a dedicated line to give other infusions/ bolus drug

c. Monitoring of patients on peripheral inotropes:

Any baby receiving inotropes should have comprehensive intensive care monitoring and observations performed and recorded at least every 15 minutes.

Frequent non-invasive blood pressure measurements should be made during titration of inotrope (at least every 5 minutes until stability achieved), or preferably (if possible) consider placing an arterial line for continuous monitoring.

There needs to be **documented review of the cannula site every 15 minutes for first hour**, then at least hourly. Consider reviewing the pump pressure as an unexpected rise in pressures could indicate early a potential extravasation/disruption to infusion.

d. Making up a peripheral adrenaline infusion for use:

Target Drug Administration rate: Peripheral ADRENALINE	**Concentration**	**Diluent**	**Rate of Infusion**
20-300 nanograms/kg/min (= 0.02-0.3 micrograms/kg/min)	1mg of adrenaline in 50mL Diluent **NB Fixed concentration to allow for peripheral administration**	10% Glucose *or* 10% Glucose and 0.18% NaCl *or* 5% Glucose *or* 0.9% NaCl	**0.3ml/kg/hr** Then titrate **(0.3mL/kg/h = 100 ng/kg/min**)

The standard approach for neonatal patients should be to make the peripheral inotrope solution using 10% dextrose as diluent and the amount running during the transport episode should be included in the total daily fluid requirements of the baby.

4 Monitoring

The use of peripheral inotropes will be reviewed in the daily transport meeting. Where this technique has been used it will be cross referenced against the guideline to ensure it was done appropriately. If this was not the case, then the circumstances will be investigated.

5 References

1. Owen et al 2021 *Crit.Care.* PMID: 33863361
2. Paquette et al 2011 *Can.J.Hosp.Pharm.* PMID: 22479086
3. Medusa. Paediatric Adrenaline monograph. Accessed Online 7/2/23