GUIDELINE FOR DOSING, PREPARATION AND ADMINISTRATION OF DINOPROSTONE INFUSION FOR NEONATES

Children's Health Ireland at Crumlin

1 Introduction

Dinoprostone is a vasodilator that can maintain patency of the arterial duct. Thus in infants with congenital cardio-pulmonary defects that restrict pulmonary or systemic blood flow, the drug may sustain pulmonary and systemic perfusion until corrective or palliative surgery can be performed.

Note: The decision to commence Dinoprostone infusion in a newly presenting cardiac patient should be taken after consultation with a consultant paediatric cardiologist or paediatric intensivist.

2 Dosing of Dinoprostone Infusion

A dose of 5 -10nanogram/kg/min (0.005 – 0.01microgram/kg/min) is usually sufficient. At a consultant paediatric cardiologist's discretion, a higher dose may be used.

3 Preparation of Dinoprostone Infusion 50microgram/ 50mL (using Prostin® E2 1mg/mLmg/ ampoule)

- Dinoprostone is prepared as a standard concentration infusion of ***50microgram/ 50mL***
- A fresh solution must be prepared every 24 hours
- Ensure dose and dilution on the prescription are correct

Method of Preparation:

1. Each 500mL bag of glucose 5%w/v contains an overage of 30mL, therefore the total bag volume is 530mL. Withdraw 30mL from the 500mL bag of glucose 5%w/v.
2. Draw up 0.5mL of Prostin ® E2 1mg/mL(dinoprostone) ampoule in a 1mL syringe (0.5mg = 500microgram).
3. Add this solution into the 500mL bag of Glucose 5%w/v (from step 1).
4. **NB** Invert bag at least 10 times to disperse the dinoprostone solution evenly. If concentrated dinoprostone solution remains in the neck of the bag, there is a risk of the patient getting an incorrect dose.
   - This bag now contains dinoprostone 500microgram/500mL = 1microgram/mL = 50microgram/50mL
5. Draw up 50ml of diluted dinoprostone solution into a 50mL syringe that is compatible with syringe pump.
6. Attach extension set/IV giving set and prime with diluted dinoprostone solution. NOTE: An anti-siphon valve is NOT required when using the B. Braun Perfusor® Infusion Pumps as they have an integrated piston brake.
7. Attach completed label detailing the drug details and patient details as per local policy.

Unit Conversion			
1 nanogram = 0.001microgram	**1000nanogram = 1microgram**	**1 microgram = 0.001mg**	**1000microgram = 1mg**

4 Administration of Dinoprostone

4.1 In centres ***with access*** to the National Neonatal and Paediatric Standard Concentration Infusion (SCI) Drug Library

The prepared Dinoprostone infusion should be programmed and administered via the drug library available on B.Braun Perfusor® Space pumps. Reference to the current SCI table should be made. Note: At the time of publication, the Neonatal Drug Library Version 1 and Paediatric Drug Library Version 4 are in use; please verify table below against current SCI tables:

Drug	Category	Weight Band	SCI (Normal)	Diluent	Usual Dose Range	Default Dose and Rate Calculator *All Weights in kg - rounding can occur*	
						Default Start Dose	Default Rate (mL/hr)
Dinoprostone	Cardio	All ≤5kg	50microgram/50mL	Glucose 5%w/v	5-10nanogram/kg/min	5nanogram/kg/min	0.3 x Wt

4.2 In centres ***without access*** to the National Neonatal and Paediatric Standard Concentration Infusion (SCI) Drug Library

The prepared Dinoprostone infusion should be programmed via a suitable rate-controlled syringe driver with reference to the table below. Most birth weights are accommodated; where an infant's weight falls in between two values on the table, round up to the nearest weight on the table. For infants weighing less than 1.3kg or greater than 4.7kg, please discuss with a cardiologist. **A manual calculation check should also be performed – see example below.**

DOSE	**WEIGHT & RATE**

Dose	**1.5kg**	**1.75kg**	**2kg**	**2.25kg**	**2.5kg**
5 nanogram/kg/min (0.005 microgram/ kg/min)	450 nanogram/hr (0.45microgram/hr) = **0.4 mL/hr**	500 nanogram/hr (0.5 microgram/hr) = **0.5 mL/hr**	600 nanogram/hr (0.6 microgram/hr) = **0.6 mL/hr**	700 nanogram/hr (0.7 microgram/hr) = **0.7 mL/hr**	750 nanogram/hr (0.75 microgram/hr) = **0.7 mL/hr**
10 nanogram/kg/min (0.01 microgram/ kg/min)	900 nanogram/hr (0.9 microgram/hr) = **0.9 mL/hr**	1000 nanogram/hr (1 microgram/hr) = **1 mL/hr**	1200 nanogram/hr (1.2 microgram/hr) = **1.2 mL/hr**	1300 nanogram/hr (1.3 microgram/hr) = **1.3 mL/hr**	1500 nanogram/hr (1.5 microgram/hr) = **1.5 mL/hr**

Dose	**2.75kg**	**3kg**	**3.25kg**	**3.5kg**	**3.75kg**
5 nanogram/kg/min (0.005 microgram/ kg/min)	800 nanogram/hr (0.8 microgram/hr) = **0.8 mL/hr**	900 nanogram/hr (0.9 microgram/hr) = **0.9 mL/hr**	1000 nanogram/hr (1 microgram/hr) = **1 mL/hr**	1000 nanogram/hr (1 microgram/hr) = **1 mL/hr**	1000 nanogram/hr (1 microgram/hr) = **1 mL/hr**
10 nanogram/kg/min (0.01 microgram/ kg/min)	1600 nanogram/hr (1.6 microgram/hr) = **1.6 mL/hr**	1800 nanogram/hr (1.8 microgram/hr) = **1.8 mL/hr**	1900 nanogram/hr (1.9 microgram/hr) = **1.9 mL/hr**	2100 nanogram/hr (2.1 microgram/hr) = **2.1 mL/hr**	2200 nanogram/hr (2.2 microgram/hr) = **2.2 mL/hr**

Dose	**4kg**	**4.25kg**	**4.5kg**
5 nanogram/kg/min (0.005 microgram/ kg/min)	1200 nanogram/hr (1.2 microgram/hr) = **1.2 mL/hr**	1300 nanogram/hr (1.3 microgram/hr) = **1.3 mL/hr**	1300 nanogram/hr (1.3 microgram/hr) = **1.3 mL/hr**
10 nanogram/kg/min (0.01 microgram/ kg/min)	2400 nanogram/hr (2.4 microgram/hr) = **2.4 mL/hr**	2500 nanogram/hr (2.5 microgram/hr) = **2.5 mL/hr**	2700 nanogram/hr (2.7 microgram/hr) = **2.7 mL/hr**

A manual calculation check should also be performed – see example below:

EXAMPLE: 3kg infant requiring Dinoprostone 10nanograms/kg/min

This should be prescribed as "Dinoprostone 50microgram in 50mL glucose 5%w/v".

To calculate what rate the infusion should be run at:

10nanograms/kg/min = 10nanogram x 3kg =30 nanogram per min
= (30 x 60) nanogram per hour = 1800 nanogram per hour

Infusion is 50microgram in 50 mLs = 1microgram / 1mL = 1000 nanogram / 1mL

Dose required 1800nanogram per hour, so rate should be 1800 ÷1000 = 1.8mL / hour

Thus infusion should be prescribed and run at *1.8 mLs per hour*