

# Nursing Practice Committee

## Standard Operating Procedure for Administration Of Prostaglandin (PGE<sub>2</sub>)

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This Standard Operating Procedure applies to Nursing Staff caring for children requiring Prostaglandin E2

**Introduction:** Prostaglandin 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.

**Prostaglandin E<sub>2</sub> should be administered via a continuous infusion and should never be infused with any other drug. Infusion changes should be preformed promptly with minimum interruption.**

### Indications for use

- To maintain patency of ductus arteriosus in duct dependant congenital heart disease such as
  - Pulmonary Atresia
  - Severe Fallots Tetralogy
  - Tricuspid atresia
  - Interrupted aortic arch
  - Coarctation of the aorta
  - Hypoplastic Left Heart Syndrome
  - Critical Aortic Stenosis
  - Transposition of the Great Arteries

### Complications associated with use

- More common on low birth weight infants
- Doses greater than 0.01microgram /kg/minute

<ul style="list-style-type: none"> <li>• Apnoea/ respiratory depression</li> </ul>	<ul style="list-style-type: none"> <li>• If apnoea occurs, prostaglandin E2 should be weaned to the minimum effective dose. If persistent apnoea occurs intubation maybe considered</li> </ul>
<ul style="list-style-type: none"> <li>• Jitteriness</li> </ul>	<ul style="list-style-type: none"> <li>• Very common but monitor blood glucose</li> </ul>
<ul style="list-style-type: none"> <li>• Pyrexia</li> </ul>	<ul style="list-style-type: none"> <li>• Common, usually low grade, advise to culture patient to out rule sepsis</li> </ul>
<ul style="list-style-type: none"> <li>• Bradycardia/ Tachycardia</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor get ECG and holter with cardiology review</li> </ul>
<ul style="list-style-type: none"> <li>• Cutaneous vasodilation</li> </ul>	<ul style="list-style-type: none"> <li>• Flushing may be marked</li> </ul>
<ul style="list-style-type: none"> <li>• Hypotension</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce to min effective dose and inotropic support</li> </ul>
<ul style="list-style-type: none"> <li>• Diarrhoea</li> </ul>	<ul style="list-style-type: none"> <li>• Check stool sample in case of infection</li> </ul>
<ul style="list-style-type: none"> <li>• Seizures</li> </ul>	<ul style="list-style-type: none"> <li>• Treat as per hospital protocol</li> </ul>
<ul style="list-style-type: none"> <li>• Increased risk of necrotising enterocolitis</li> </ul>	<ul style="list-style-type: none"> <li>• Confirm with consultant re feed type and volume. Observe abdomen</li> </ul>

All adverse effects must be reported to medical staff. Most adverse effects are reversible once infusion is slowed or discontinued. This may only be done on written instruction from medical staff.

### **Specific Considerations:**

**The decision to commence Prostaglandin E<sub>2</sub> infusion in a newly presenting cardiac patient is to be taken at consultant level**

Patients who are receiving prostaglandin E<sub>2</sub> intravenously require the following throughout the course of their treatment

1. Nurse 1:2
2. Nurse beside Oxygen and suction. Keep bag valve mask and rebreather O<sub>2</sub> mask available at bedside
3. Any acute deterioration, facilities available for intubation and ventilation
4. Nurse in close proximity to the ward / nurses' station
5. Nurse in an incubator
6. Baseline observations prior to commencing infusion
7. Continuous HR and rhythm and SAO<sub>2</sub> monitoring via cardiac monitor/ telemetry
8. Apnoea monitor
9. 1 Hourly respiratory and BP monitoring
10. Monitor blood sugars six hourly
11. Central venous access device or at least I.V Cannula x 2 in situ
12. Daily prescription for prostaglandin to be written
13. New I.V. Infusion prepared at least every twenty four hours
14. I.V. Infusion including T piece changed from one peripheral IV site to another every 12 hours by 2 nurses
15. Dose titrated against response; minimum effect dose to be given
16. Daily Consultant Cardiologist review

### **Preparation of prostaglandin E<sub>2</sub> infusion**

- a) Prostaglandin E<sub>2</sub> infusion must be prescribed and fresh solution prepared every 24 hours
- b) Ensure dose and dilution on the prescription are correct.
- c) Draw up 0.5ml (0.5mg = 500microgram) of prostaglandin E<sub>2</sub> in a 1ml syringe. Add this solution into a 500ml bag of Glucose 5%w/v.
- d) **N.B. Invert bag at least 10 times to disperse the prostaglandin E<sub>2</sub> solution evenly.** If concentrated prostaglandin E<sub>2</sub> solution remains in the neck of the bag, there is a risk of the patient getting an incorrect dose.
- e) This bag now contains prostaglandin E<sub>2</sub> 500microgram / 500ml = 1microgram / ml = 50microgram / 50ml
- f) Draw up 50ml of diluted prostaglandin E<sub>2</sub> solution into a 50ml syringe that is compatible with syringe pump.
- g) Attach extension set / IV giving set (must feature an anti-siphon valve) and prime with prostaglandin E<sub>2</sub> solution
- h) Attach completed label detailing the drug name, concentration, diluent, patient name and chart number, date, time of preparation, and nurses' signatures
- i) Ensure pump is securely clamped in position on IV pole

### **Unit Conversion:**

**1000nanogram = 1microgram**  
**1 nanogram = 0.001microgram**

**1000microgram = 1mg**  
**1 microgram = 0.001mg**

## Prescribing

The order for prostaglandin E<sub>2</sub> should be prescribed as:

“Prostaglandin E<sub>2</sub> 50microgram in 50ml glucose 5%w/v  
Run at ..... ml/hr = ..... microgram/kg/min”

A dose of 0.005 – 0.01microgram / kg / min is usually sufficient. At a consultant cardiologist's discretion, a higher dose may sometimes be used. If an infant is receiving a dose greater than 0.02microgram/kg/min, please discuss intubation for transfer with a cardiologist.

The table below accommodates most birth weights. If 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 cardiologist.

Dose	1.5kg	1.75kg	2kg	2.25kg	2.5kg
0.005 microgram/kg/min	0.45microgram/hr = 0.4ml/hr	0.5microgram/hr = 0.5ml/hr	0.6microgram/hr = 0.6ml/hr	0.7microgram/hr = 0.7ml/hr	0.75microgram/hr = 0.7ml/hr
0.01 microgram/kg/min	0.9microgram/hr = 0.9ml/hr	1microgram/hr = 1ml/hr	1.2microgram/hr = 1.2ml/hr	1.3microgram/hr = 1.3ml/hr	1.5microgram/hr = 1.5ml/hr
	2.75kg	3kg	3.25kg	3.5kg	3.75kg
0.005 microgram/kg/min	0.8microgram/hr = 0.8ml/hr	0.9microgram/hr = 0.9ml/hr	1microgram/hr = 1ml/hr	1microgram/hr = 1ml/hr	1microgram/hr = 1ml/hr
0.01microgram/kg/min	1.6microgram/hr = 1.6ml/hr	1.8microgram/hr = 1.8ml/hr	1.9microgram/hr = 1.9ml/hr	2.1microgram/hr = 2.1ml/hr	2.2microgram/hr = 2.2ml/hr
	4kg	4.25kg	4.5kg		
0.005 microgram/kg/min	1.2microgram/hr = 1.2ml	1.3microgram/hr = 1.3ml/hr	1.3microgram/hr = 1.3ml/hr		
0.01microgram/kg/min	2.4microgram/hr = 2.4ml/hr	2.5microgram/hr = 2.5ml/hr	2.7microgram/hr = 2.7ml/hr		

### EXAMPLE:

For a 3kg infant requiring Prostaglandin E<sub>2</sub> 0.01micrograms/kg/min

This should be prescribed as “Prostaglandin E<sub>2</sub> 50microgram in 50ml glucose 5%w/v”.

To calculate what rate the infusion should be run at:

0.01micrograms / kg / min = 0.01microgram x 3kg = 0.03microgram per min  
= (0.03 x 60) microgram per hour = 1.8microgram per hour

Infusion is 50microgram in 50 mls = 1microgram / 1ml

Dose required 1.8microgram per hour, so rate should be 1.8ml / hour

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

- Continue Prostaglandin E<sub>2</sub> until palliative or corrective surgery carried out
- Wean prostaglandin E<sub>2</sub> as per consultant's instructions
- Once infusion completed, attach a new T-piece with saline flush and document same. If via a CVC, withdraw and discard to prevent accidental bolus later.

## References

- Cardiac Unit, Great Ormond Street, Prostaglandin E2 (Dinoprostone) Therapy in Congenital Cardiac Disease 2006
- Hazinski, M.F. (1992) Nursing care of the critically ill child. 2ed. Mosby: USA.
- Horrox, Fiona. (2002) Manual of neonatal & paediatric heart disease. Whurr: London.
- Kramer HH et.al Evaluation of low dose prostaglandin E1 for ductus dependent congenital heart disease. European Journal of Paediatrics. 154 (9):700-7, 1995 Sep
- OLHSC (2004) Prostaglandin Protocol. OLHSC
- OLCHC (2005) The hospital formulary. OLCHC
- Royal College of Paediatrics & Child Health. (RCPCH) (2003) Medicines for children. RCPCH: London.

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