

Neonatal Drug Guideline

ALPROSTADIL (PROSTIN VR®)

(Prostaglandin E₁)

DESCRIPTION AND INDICATION FOR USE

Alprostadil is a synthetic prostaglandin used to relax the ductus arteriosus in early post-natal life, where a patent ductus is critical for survival in neonates with congenital heart defects (for example Tetralogy of Fallot, Pulmonary Atresia, Pulmonary Stenosis, Tricuspid Atresia, Transposition of the Great Vessels).

Alprostadil can preserve and restore ductal patency if administered before or soon after anatomical closure occurs. Over time, the ductus arteriosus rapidly loses its responsiveness to alprostadil, and consequently it is most effective when commenced within 96 hours of birth. Therefore, it is used as palliative therapy until surgery can be performed.

Alprostadil also causes vasodilation of all arterioles and inhibition of platelet aggregation.

DOSE

Note: (1000 nanogram = 1 microgram)

IV INFUSION:

To maintain patency of ductus arteriosus:

0.01 to 0.02 microgram/kg/minute (10-20 nanogram/kg/min)

To open a closed ductus arteriosus:

0.1 microgram/kg/minute (100 nanogram/kg/min) for a maximum of 30 minutes.

Doses > 0.1 microgram/kg/minute are rarely more effective and may cause serious adverse effects.

For persistent pulmonary hypertension of the newborn (PPHN):

0.01 to 0.05 microgram/kg/minute (10-50 nanogram/kg/min)

NB: Doses of up to 100 nanogram/kg/min have been used for PDA patency. Doses between 50 and 100 nanogram/kg/min should be weaned to the lowest possible dose after response is achieved. Dose should remain at the lowest possible dose to maintain patient response. Maximum dose no greater than 100 nanogram/kg/min.

RECONSTITUTION/DILUTION

Ampoule = 500 microgram in 1 mL

(NB: STORED IN REFRIGERATOR)

Note: (1000 nanogram = 1 microgram)

Use only sodium chloride 0.9% or glucose 5% as infusion fluids

For Maintenance Infusion:

Withdraw required amount of alprostadil and make up to ordered volume with infusion fluid.

If dose ordered is not measurable at 500 microgram/mL, the following **dilution** should be used:

1. Draw up 1 mL of 500 microgram/mL alprostadil solution
2. Add to 9mL sodium chloride 0.9% in a 10 mL syringe (total volume = 10 mL)
(Concentration = 50 microgram/mL)
3. Withdraw required dose of alprostadil and make to 50 mL (total volume) with infusion fluid

Usual order will be as follows:

DRUG	HOW TO MAKE UP	DOSE EQUIVALENT	DOSE RANGE
Alprostadil	60 microgram/kg in 50mL (total volume) NaCl 0.9%	1 mL/hr = 0.02 microg/kg/min (20 nanogram/kg/min)	0.01 – 0.05 microg/kg/min (10 – 50 nanogram/kg/min)

Ref: RWH: Continuous IV Infusion Chart

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For opening a closed ductus arteriosus:

Prepare maintenance infusion as above and give 2.5 mL over 30 minutes (5 mL/hr) to give 0.1 microg/kg/min (**set volume limit**).

Prepare fresh infusion solutions every 24 hours. Discard any solution more than 24 hours old.

ROUTE AND METHOD OF ADMINISTRATION

IV INFUSION: Given as a continuous infusion via a syringe pump

IV route is preferred, although infusions via an umbilical artery catheter placed at the ductal opening have been used.

COMPATIBILITY INFORMATION

Please contact your clinical pharmacist for information on drugs or fluids not appearing in the table below. Medications that are not routinely used in the Special Care Nursery have not been included in this table and may be incompatible.

	Compatible	Incompatible
Fluids	Glucose 5%, Sodium chloride 0.9%	DECOMPOSES RAPIDLY IN ACIDIC SOLUTIONS. ADMINISTER ALONE
Drugs		

SIDE EFFECTS

- Respiratory depression, apnoea - usually occurs in neonates < 2kg within the first hour of administration
- Fever
- Cutaneous flushing - secondary to vasodilatation
- Bradycardia, hypotension
- Infrequent: seizures, decreased platelet aggregation, thrombocytopenia
- Rare: hypoglycaemia, hypocalcaemia

SPECIAL PRECAUTIONS

- Caution in patients with bleeding tendencies and seizure disorders

CONTRAINDICATIONS

- Contraindicated in neonates with respiratory distress syndrome (excluding respiratory distress caused by the duct dependant cardiac lesion).
- Contraindicated in neonates with total anomalous pulmonary venous return with obstruction.

NURSING RESPONSIBILITIES

- Observations/Monitoring:
 - Monitor with cardio/respiratory monitor & oxygen saturation monitor
 - Monitor blood pressure preferably with an arterial line.
 - Monitor temperature
 - Monitor blood glucose levels
 - Observe IV site carefully - maintain patent IV at all times. It is preferable to have a central line or two peripheral venous lines available when using alprostadil.
- Ensure resuscitation/intubation equipment available
- Do not mix with any other medications or infusions in same line.
- **DO NOT BOLUS OTHER DRUGS VIA PROSTAGLANDIN INFUSION**
- Change IV syringe every 24 hours. When changing syringe, ensure line is clamped to prevent administering a bolus.
- Check that rate ordered corresponds with dose required (nanogram/kg/min).