

# ALPROSTADIL (prostaglandin E<sub>1</sub>)

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| <b>Indication</b>             | <ul style="list-style-type: none"> <li>Temporarily maintain patency of ductus arteriosus<sup>1</sup> <ul style="list-style-type: none"> <li>Use with ductal dependent congenital heart defects<sup>1</sup></li> <li>Can be considered for reducing right ventricular afterload in persistent pulmonary hypertension<sup>2,3</sup></li> </ul> </li> </ul>  |  |
| <b>INTRAVENOUS</b>            | <b>Presentation</b>   | <ul style="list-style-type: none"> <li>Ampoule: 500 microgram in 1 mL (500,000 nanogram in 1 mL)</li> </ul>  |
|                               | <b>Dosage (initial)</b>   | <ul style="list-style-type: none"> <li>0.01–0.02 microgram/kg/minute (10–20 nanogram/kg/minute) <ul style="list-style-type: none"> <li>Titrate according to response in consultation with paediatric cardiologist</li> </ul> </li> </ul>   |
|                               | <b>Dosage (maintenance)</b>   | <ul style="list-style-type: none"> <li>Usual range 0.01–0.02 microgram/kg/minute (10–20 nanogram/kg/minute) <ul style="list-style-type: none"> <li>Can be given at range of 0.005–0.1 microgram/kg/minute (5–100 nanogram/kg/minute)<sup>4</sup></li> </ul> </li> </ul>  |
|                               | <b>Preparation</b>  | <ul style="list-style-type: none"> <li>Minimise contact time of undiluted alprostadil with the plastic syringe <ul style="list-style-type: none"> <li>Refer to stability</li> </ul> </li> <li>Draw up 9 mL of 0.9% sodium chloride</li> <li>Draw up 500 microgram (1 mL) alprostadil and immediately add to the 9 mL 0.9% sodium chloride (10 mL total volume) <ul style="list-style-type: none"> <li>Concentration now equal to 50 microgram/mL</li> </ul> </li> <li>From the 50 microgram/mL solution, draw up 18 microgram/kg and make up to 30 mL total volume with 0.9% sodium chloride <ul style="list-style-type: none"> <li>Concentration now equal to 18 microgram/kg in 30 mL</li> </ul> </li> </ul> |
| <b>Administration</b>         | <ul style="list-style-type: none"> <li>Infuse using a medication infusion pump at prescribed rate <ul style="list-style-type: none"> <li>18 microgram/kg in 30 mL infusion at 1 mL/hour is equivalent to 0.01 microgram/kg/minute (10 nanogram/kg/minute)</li> </ul> </li> </ul>  |  |
| <b>Special considerations</b> | <ul style="list-style-type: none"> <li>For dosages greater than 0.02 microgram/kg/minute (20 nanograms/kg/minute) <ul style="list-style-type: none"> <li>Consult with paediatric cardiologist first</li> <li>Apnoea is common and intubation may be required</li> </ul> </li> <li>Caution <ul style="list-style-type: none"> <li>If bleeding disorders<sup>1</sup></li> <li>If respiratory distress syndrome<sup>1</sup></li> <li>Preferentially, continuous infusion via large vein<sup>1</sup> and dedicated IV line</li> </ul> </li> </ul> |  |
| <b>Monitoring</b>             | <ul style="list-style-type: none"> <li>Continuous cardio-respiratory monitoring (apnoea frequent side-effect)<sup>1</sup></li> <li>BP<sup>1</sup>, temperature, pulse oximetry</li> <li>Improvement in blood oxygenation, systemic BP and blood pH demonstrates efficacy<sup>1</sup></li> <li>Extravasation risk: can cause tissue sloughing and necrosis<sup>5</sup></li> </ul>  |  |
| <b>Compatibility</b>          | <ul style="list-style-type: none"> <li>Fluids <ul style="list-style-type: none"> <li>5% glucose<sup>5</sup>, 0.9% sodium chloride<sup>5</sup></li> </ul> </li> <li>Y-site <ul style="list-style-type: none"> <li>Do not give other drugs via same line</li> </ul> </li> </ul>   |  |
| <b>Incompatibility</b>        | <ul style="list-style-type: none"> <li>No information<sup>5</sup></li> </ul>  |  |
| <b>Interactions</b>           | <ul style="list-style-type: none"> <li>Concurrent use with heparin may result in increased risk of bleeding<sup>6</sup></li> </ul>  |  |
| <b>Stability</b>              | <ul style="list-style-type: none"> <li>Undiluted solution <ul style="list-style-type: none"> <li>Store in refrigerator at 2–8 °C<sup>1</sup></li> <li>If undiluted alprostadil comes into contact with plastic, the solution may turn hazy and must then be discarded<sup>1</sup></li> </ul> </li> <li>Diluted solution <ul style="list-style-type: none"> <li>Stable for 24 hours at 25 °C, then discard<sup>1</sup></li> </ul> </li> </ul>  |  |



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| <b>Side effects</b>  | <ul style="list-style-type: none"> <li>• Blood pathology: disseminated intravascular coagulation (DIC)<sup>1</sup></li> <li>• Circulatory: hypotension<sup>1</sup>, bradycardia<sup>1</sup>, tachycardia<sup>1</sup>, cardiac arrest<sup>1</sup>, oedema<sup>1</sup></li> <li>• Digestive: diarrhoea<sup>1</sup>, gastric outlet obstruction secondary to antral hyperplasia<sup>1</sup> (prolonged treatment)</li> <li>• Musculo-skeletal: widened fontanels, pretibial and soft tissue swelling (associated with prolonged duration)<sup>1</sup></li> <li>• Nervous: cutaneous flushing (related to infusion rate)<sup>1</sup>, fever<sup>1</sup>, urticaria<sup>7</sup>, seizures<sup>7</sup></li> <li>• Respiratory: apnoea appearing during first hour of infusion (more common in babies weighing less than 2 kg)<sup>1</sup></li> </ul> |
| <b>Actions</b>       | <ul style="list-style-type: none"> <li>• Causes vasodilation of all arterioles (i.e. ductus arteriosus as well as ductal tissue surrounding the duct)<sup>7</sup></li> <li>• Inhibits platelet aggregation<sup>7</sup></li> <li>• Short half-life of 5–10 minutes necessitates infusion rather than bolus administration<sup>1</sup></li> <li>• Maximum effect observed within 96 hours after birth<sup>1</sup></li> </ul>   |
| <b>Abbreviations</b> | BP: blood pressure, DIC: disseminated intravascular coagulation  |
| <b>Keywords</b>      | Prostaglandin E1, Prostin VR, alprostadi, PDA, patent ductus arteriosus, duct dependent congenital heart defect, PGE1  |

The Queensland Clinical Guideline *Neonatal Medicines* is integral to and should be read in conjunction with this monograph. Refer to the disclaimer. Destroy all printed copies of this monograph after use.

## References

1. Therapeutic Goods Administration (TGA). Prostin VR (alprostadi): product information. [Internet]. Canberra: Australian Government; October 2019 [cited 2019 December 18]. Available from: [www.tga.gov.au](http://www.tga.gov.au).
2. Divekar A, Seshia M, Kesselman M. Non-restrictive ductal patency in management of cardiac failure in congenital diaphragmatic hernia – non-invasive biventricular assist. *Journal of Neonatal Biology* 2015;4(2).
3. Lakshminrusimha S, Mathew B, Leach C. Pharmacologic strategies in neonatal pulmonary hypertension other than nitric oxide. *Seminars in Perinatology* 2016;40(3):160-73.
4. British National Formulary for Children (BNFC) online. Aprostadi. [Internet]: Royal Pharmaceutical Society; July 2020 [cited 2020 September 22]. Available from: [www.medicinescomplete.com](http://www.medicinescomplete.com).
5. Australian Injectable Drugs Handbook. Nicolette Burrige, Keli Symons, editors. Aprostadi. 8th ed. [Internet]. New South Wales: Society of Hospital Pharmacists of Australia (SHPA); September 2020 [cited 2020 September 22]. Available from: <https://aidh.hcn.com.au>.
6. Trissels™ 2 Clinical Pharmacology Database. IV Compatibility Module. [online database] 2019 [cited 2020 July 02]. Available from: <https://www.micromedexsolutions.com>.
7. IBM Micromedex® Neofax®. Aprostadi. In: IBM Micromedex® NeoFax®/Pediatrics (electronic version). IBM Watson Health, Greenwood Village, Colorado, USA. 2020 [cited 2020 September 22]. Available from: <https://www.micromedexsolutions.com>.

## Document history

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