

# NICU: Dexamethasone

Presentation:	<p><b>Injection (Hospira brand):</b> 1ml vials of 3.3 mg/mL dexamethasone base <math>\equiv</math> <b>4.3 mg/mL dexamethasone sodium phosphate</b></p> <p><b>Oral solution (Thame brand):</b> product contains 2 mg/5ml of dexamethasone base <math>\equiv</math> <b>2.63 mg/5ml of dexamethasone sodium phosphate.</b></p> <p><b>Alert: different brands of injection or oral solution contain different amounts or salts of dexamethasone therefore they are not necessarily interchangeable. Dexamethasone is available as base, phosphate or sodium phosphate. Conversion factors:</b></p> <ul style="list-style-type: none"> <li>• 1.2 mg dexamethasone phosphate = 1 mg dexamethasone base</li> <li>• 1.3 mg dexamethasone sodium phosphate = 1 mg dexamethasone base</li> </ul>
Indication:	<p>Treatment of very severe established chronic lung disease (CLD) in neonates Treatment of post-intubation laryngeal oedema</p>
Dose:	<p><b>Treatment of severe CLD (See separate Management of Chronic Lung Disease of Prematurity - Paediatric Full Clinical Guideline NIC RC 14):</b></p> <p><b>Use minimum effective dose and shortest possible duration.</b></p> <p><b>Lower dose regimen (DART trial schedule) – preferred regimen:</b> <u>Doses are given as dexamethasone sodium phosphate</u> 150 micrograms/kg daily in 2 divided doses for 3 days, 100 micrograms/kg daily in 2 divided doses for 3 days, 50 micrograms/kg daily in 2 divided doses for 2 days 20 micrograms/kg daily in 2 divided doses for 2 days</p> <p><b>If no response, consider repeating above course or use the higher dose regime:</b></p> <p><b>Higher dose regime</b> <u>Doses are given as dexamethasone sodium phosphate</u> 500 micrograms/kg daily in 2 divided doses for 3 days 300 micrograms/kg daily in 2 divided doses for 3 days 200 micrograms/kg daily in 2 divided doses for 2 days 100 micrograms/kg daily in 2 divided doses for 2 days 50 micrograms/kg once daily for 4 days</p> <ul style="list-style-type: none"> <li>• Consider shortening course if there is a good early response</li> <li>• Consider a longer course if patient deteriorates as the dose is being weaned down.</li> </ul> <p><b>Treatment of post-intubation laryngeal oedema (dexamethasone sodium phosphate):</b> 250micrograms/kg every 8 hours for 3 doses, started at least 4 hours prior to extubation</p>
Route of administration:	<p><b>See below for example calculations</b> Oral or slow IV injection over 3-5 minutes. Give undiluted or dilute in sodium chloride 0.9% or glucose 5% to a volume appropriate for patient's fluid intake. <b>Rapid IV injection of large doses may cause cardiovascular collapse, so administer slowly.</b></p>
Instructions for preparation:	<p><b>Oral example:</b></p> <p>Baby, 1.5kg needs dexamethasone sodium phosphate 150 micrograms/kg daily in 2 divided doses for 3 days:</p> <ul style="list-style-type: none"> <li>• Prescribe <math>\frac{150 \times 1.5}{2} = 112.5</math> microgram twice daily for 3 days</li> <li>• Product (Thame oral liquid brand) contains 2.63mg/5ml (2630microgram/5ml) of dexamethasone sodium phosphate</li> </ul>

	<ul style="list-style-type: none"> <li>Measure <math>\frac{112.5}{2630} \times 5 = 0.21\text{ml}</math> in a 1ml oral syringe and give with feeds if possible</li> </ul> <p><b>IV example:</b></p> <p>Baby, 1.5kg needs dexamethasone sodium phosphate 150 micrograms/kg daily in 2 divided doses for 3 days:</p> <ul style="list-style-type: none"> <li>Prescribe <math>\frac{150 \times 1.5}{2} = 112.5</math> microgram twice daily for 3 days</li> <li>Product (Hospira injection brand) is 1ml vials of 4.3mg/mL (4300 microgram/mL) dexamethasone sodium phosphate</li> <li>Draw up 1ml and dilute to a total 10ml with sodium chloride 0.9% or glucose 5% to give a solution of 4300 microgram in 10ml</li> <li>Measure <math>\frac{112.5}{4300} \times 10 = 0.26\text{ml}</math> in a 1ml syringe and give slowly</li> </ul>
<u>Prescribing</u>	Prescribe on Lorenzo or white NICU paper drug chart as per Trust Medicines Code
Known compatibility issues	See separate compatibility chart
Additional Comments:	<p>Please note that when using the oral liquid for the DART regimen babies will be given up to 10 times the EMA recommended daily limit of propylene glycol of 1mg/kg/day. If the high dose regimen is used this will be even higher. Propylene glycol accumulation is widely reported to potentially result in hyperosmolarity, lactic acidosis or hepato-renal toxicity though a Belgian study concluded that a median exposure of 34 mg/kg/day propylene glycol was associated with renal, metabolic and hepatic tolerance in neonates.</p> <p>Exposure of neonates to potentially toxic excipients is widely documented in the literature and no safe alternative to this has yet been identified for dexamethasone.</p> <p>GI cover with ranitidine or omeprazole should be considered for all patients.</p>

Note: The contents of this monograph should be read in conjunction with information available in the BNFC and Medusa

**References:**

Doyle LW, Davis PG, Morley C et al. Low dose dexamethasone facilitated extubation among chronically ventilator dependent infants: A Multicentre, International, Randomised, Controlled trial. Pediatrics 2006; 117:75-83

Medusa Injectable medicines guide, accessed via <https://medusa.wales.nhs.uk/IVGuideDisplay.asp> on 7.5.20

Leeds Teaching Hospitals NHS Trust Neonatal Unit Administration Guide Dexamethasone, accessed via <http://www.leedsformulary.nhs.uk/docs/NNU%20Dexamethasone%20monograph.pdf?UNLID=1019378343201972416151> on 7.5.20

Australasian Neonatal Medicines Formulary (ANMF) Dexamethasone. The State of New South Wales (NSW Health) 2019 accessed via [https://www.seslhd.health.nsw.gov.au/sites/default/files/groups/Royal\\_Hospital\\_for\\_Women/Neonatal/Neomed/neo20dexamethasonefull.pdf](https://www.seslhd.health.nsw.gov.au/sites/default/files/groups/Royal_Hospital_for_Women/Neonatal/Neomed/neo20dexamethasonefull.pdf) on 3.6.20

West of Scotland Neonatal Parenteral Drug Monographs Dexamethasone, accessed via <http://www.knowledge.scot.nhs.uk/media/CLT/ResourceUploads/4092237/c3ceb319-3c8b-4551-a819-2ca89c965410.pdf> on 7.5.2020

Valeur et al. Excipients in Neonatal Medicinal Products: Never Prescribed, Commonly Administered. Pharmaceutical Medicine 2018:32:251-8

Wiley Blackwell. Neonatal Formulary, Drug Use in Pregnancy and the First Year of Life 7<sup>th</sup> Edition 2015. BMJ books.

## Document control sheet

<b>GUIDELINE NUMBER</b>	CH PH N 34
<b>AREA IN WHICH THIS MONOGRAPH APPLIES</b>	NICU

<b>DIVISIONAL AUTHORISATION</b>	
<b>GROUP</b>	<b>DATE</b>
Paediatric monograph review group	27.11.20
Clinical Director – Paediatric BU	23/02/2021
Divisional Clinical Governance Committee – Integrated care	23/02/2021

<b>AUTHORS</b>		
Author	Position	Date
Written by:	Lisa Taylor, Paediatric Pharmacist	September 2017
Checked by:	Kevin Inglesant, Paediatric Pharmacist	September 2017

If review:

	Position	Date
Reviewed, updated and transferred to new template by:	Sharon Conroy, Advanced Pharmacist, Paediatrics	July 2020
Checked by:	Naomi Gladwell, Specialist pharmacist for Women's and Children's.	August 2020

Change history:

Changes Reference	Change details	Date
1	Higher dose regimen added to mirror separate Management of Chronic Lung Disease of Prematurity - Paediatric Full Clinical Guideline. Clarification of doses in terms of dexamethasone salt and calculation examples added. Review of products used vs excipients.	July 2020