University Hospitals of Derby and Burton NHS Foundation Trust

Paediatric Aminophylline

Presentation:	250mg in 10ml glass ampoules (25mg/ml)
Indication:	**Severe asthma attack and reversible airways obstruction.**
Dose:	***To avoid excessive dosing in obese children, calculate dose using ideal body weight for height*** **Loading dose:** **(Do not give a loading dose to patients who usually take oral aminophylline/theophylline – for these patients take a theophylline level and discuss results with Pharmacy before starting on aminophylline)** 1 month – 18 years: 5mg/kg (max 500mg) by IV infusion over at least 20 minutes with close monitoring **Maintenance dose:** 1 month – 11 years: 1mg/kg/hour 12 – 18 years: 500-700micrograms/kg/hour Aminophylline is a soluble derivative of theophylline and is given for its theophylline activity. Rate should be adjusted according to plasma theophylline levels, therapeutic range is 10-20mg/litre although a lower plasma-theophylline concentration of 5–15mg/litre may be effective.
Route of administration:	Intravenous infusion using an infusion pump
Instructions for preparation and administration:	**Prepare a 1mg/1ml solution (see below) and use this to administer the loading dose and maintenance infusion:** • Remove 20ml from a 500ml bag of glucose 5% or sodium chloride 0.9% and discard • Draw up 20ml of aminophylline 250mg/10ml injection and add to the fluid bag using a filter needle • Invert the bag several times to ensure thorough mixing • Discard the bag after 24 hours Administer the IV loading dose over **<u>at least 20 minutes</u>** then reduce the rate to that required for the continuous infusion.
Prescribing	**<u>QHB-</u>** Prescribe on Meditech **<u>RDH</u>**- Prescribe on paper chart. Example prescriptions for a 12-year-old child weighing 40kg: **Loading dose:** Aminophylline load 200mg in 200ml 0.9% sodium chloride - infuse over 20 minutes **Maintenance dose:**

Drug		Drug amount in bag	Diluent	Total volume (ml)	Route
Aminophylline		*500mg*	*0.9% sodium chloride*	*500ml*	*IV*
Start date	Drug concentration per ml	Infusion range	Min	Max	Name, Sig, Bleep
24/2/23	*1mg/1ml*	Dose/kg/time	*0.5mg/kg/hour*	*0.7mg/kg/hour*	*A.Doctor*
Pharm		ml/hr	*20ml/hour*	*28ml/hour*	

This prescription may then be altered based on plasma theophylline levels (see below)

Compatibility	See Medusa for information on compatibility
Additional Comments:	• Aminophylline has a narrow therapeutic index. Consider taking theophylline levels 30 minutes after end of loading dose and 12-24 hours after initiating infusion • Theophylline metabolism is increased in patients who smoke; current smokers may need a higher maintenance dose. • Severe theophylline toxicity is not necessarily preceded by symptoms of mild toxicity.

	• Monitor the following during infusions: heart rate; ECG; blood pressure; respiratory rate and U+Es particularly potassium as potentially serious hypokalaemia may occur. • Plasma-theophylline levels are increased in heart failure; hepatic impairment; and in patients with viral infections. • Aminophylline has a high pH and extravasation may cause tissue damage. Central access is preferred but infusions may be given peripherally. • Elimination in children < 6 months old is reduced, therefore its use is not recommended

N.B. This monograph should be read in conjunction with information available in the BNFc and Medusa

References:

British National Formulary for Children, 2019-2020, accessed online at www.medicinescomplete.com accessed 07/12/23
Evelina London Paediatric Formulary: accessed online at http://cms.ubqo.com/public/d2595446-ce3c-47ff-9dcc-63167d9f4b80 accessed 07/12/23
Medusa Injectable Medicines Paediatric Guide: accessed online at https://medusa.wales.nhs.uk/ accessed 07/12/23
Paediatric and neonatal dosage handbook 22nd edition, Lexicomp drug reference handbook pp.124 Aminophylline
Summary of Product Characteristics: Aminophylline Injection BP: accessed online at https://www.medicines.org.uk/emc accessed 07/12/23
Nottingham Children's Hospital guideline kindly provided by Andrew Wignell, Specialist Clinical Pharmacist (PICU) Accessed 07/12/23

Document control sheet

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DIVISIONAL AUTHORISATION	
GROUP	**DATE**
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If review:

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Checked by: Sharon Conroy	Advanced Pharmacist, Paediatrics	24/02/2020
Reviewed by Ellie Cheale	Womens and Childrens pharmacist	December 2023
Checked by:	Lamia Ahmed, Advanced Women's and Children's Pharmacist	December 2023

Change history:

Changes Reference	Change details	Date
	Added an example prescription Removed N.B. about infusion discoloration from directions for administration section Added note about increased theophylline metabolism in patients who smoke Updated additional comments sections and removed sections containing: cautions; contraindications and common side effects. Refer to BNFc, Paediatric Medusa and separate Y-site compatibility chart for this information. Information regarding taking levels aligned with practice in Leicester and Nottingham Children's hospitals	07/01/2020
	Addition of not recommended for children younger than 6 months because of reduced metabolism. Edited time for levels to be taken as per Evalina and Nottingham clinical guideline. Removal of Y site compatibility and replaced with refer to Medusa	December 2023