Whittington Health NHS

Adult Intravenous Aminophylline in Acute Severe Asthma Prescribing Guideline

Subject:	Adult Intravenous Aminophylline Prescribing Guideline
Policy Number	N/A
Ratified By:	Clinical Guidelines Committee (v1)
Date Ratified:	Reviewed March 2015
Version:	2.0
Policy Executive Owner:	ICAM Divisional Director
Designation of Author:	Dr Sara Lock (Consultant) Layla Siebert, Respiratory Pharmacist
Name of Assurance Committee:	As above
Date Issued:	March 2015
Review Date:	3 years hence
Target Audience:	Respiratory clinical staff, Pharmacists

➢ Background/ Introduction

Aminophylline consists of a mixture of theophylline and ethylenediamine. It is a bronchodilator and must be administered by **very slow intravenous injection** (it is too irritant for intramuscular use).

A plasma theophylline concentration of **10-20 mg/litre (55-110 micromol/litre)** is required for satisfactory bronchodilation. Adverse effects can however occur within the 10-20 mg/litre range, and severity increases at levels above 20 mg/litre. Monitoring of levels is therefore essential during IV aminophylline therapy.

➢ Inclusion

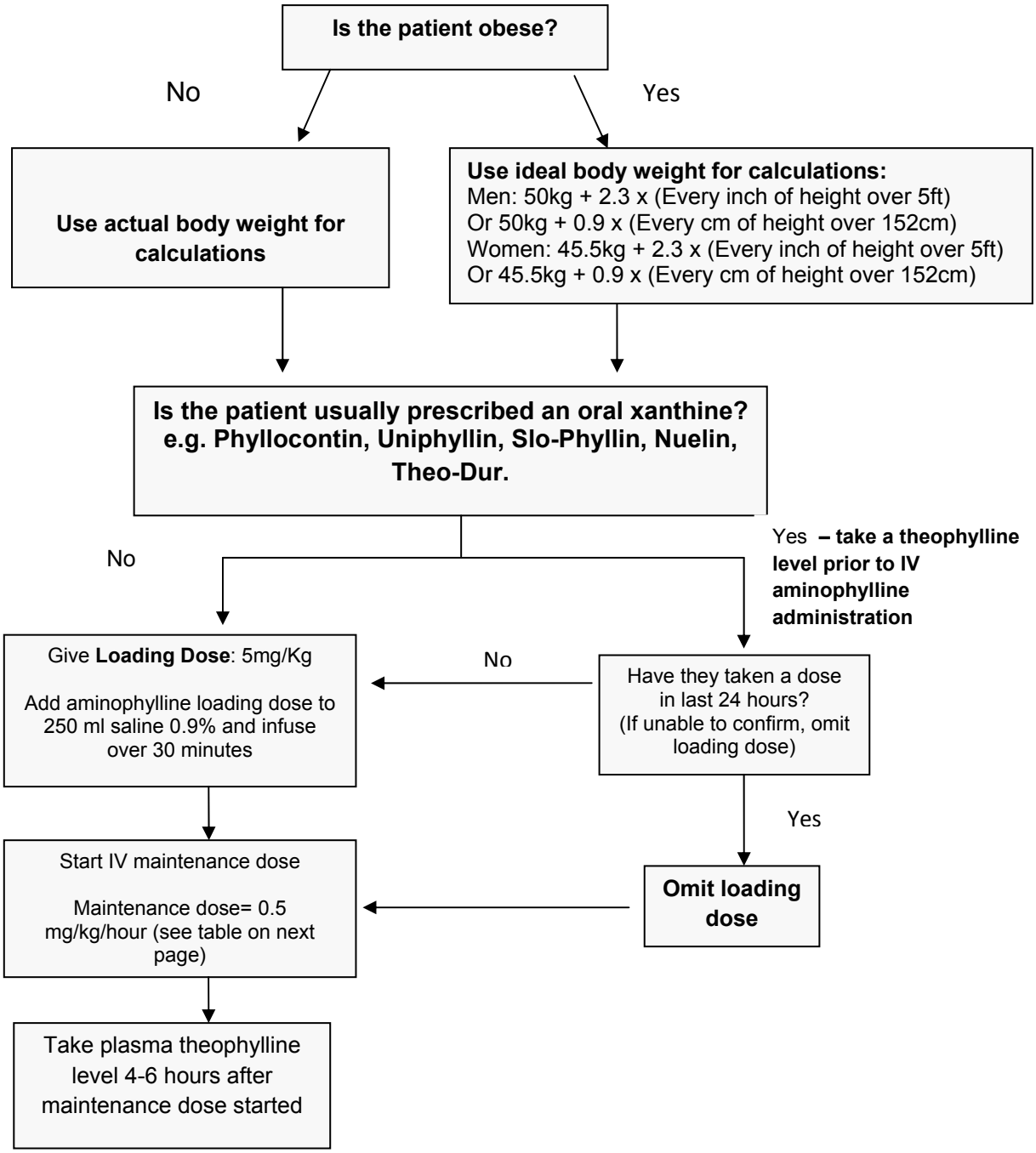
Adult patients with **severe acute asthma** not responding to treatment with bronchodilators, steroids and Magnesium as appropriate, according to BTS/Sign Asthma guidelines, and who have been assessed by a senior clinician (medical SpR or consultant) as requiring intravenous aminophylline, ideally **only after discussion with a respiratory SpR or consultant for the treatment of severe airway obstruction (as measured by Peak Expiratory Flow (PEF)) and/or respiratory failure due to asthma.**

➢ Exclusions

Intravenous aminophylline is NOT indicated as a treatment for wheeze without evidence of severe airway obstruction (as measured by PEF) or respiratory failure due to asthma.

Intravenous aminophylline is NOT indicated for patients with breathlessness and/or respiratory failure due to COPD in the absence of asthma.

➢ Clinical management



Maintenance infusion table

Preparation: Dilute 500mg aminophylline in 500 mL sodium chloride 0.9% or glucose 5% to give a 1 mg/ml solution

Administration: Rate = 0.5 mg/kg/hour (rate is half patients weight – see table below)

Dose and rate of aminophylline 1 mg/ml infusion

Patient weight - kg (use IBW if patient obese)	Dose (mg/hr)	Infusion rate (ml/hr)
40	20	20
45	22.5	22.5
50	25	25
55	27.5	27.5
60	30	30
65	32.5	32.5
70	35	35
75	37.5	37.5
80	40	40
85	42.5	42.5
90	45	45
95	47.5	47.5
100	50	50
105	52.5	52.5
110	55	55
115	57.5	57.5
120	60	60

Theophylline levels

The therapeutic range for theophylline is 10-20 mg/litre.

A plasma-theophylline level should be planned and taken 4-6 hours after the start of the maintenance intravenous infusion, using a red top serum sample bottle.

The infusion dosage should be adjusted accordingly once the level result is known.

Theophylline assays are carried out each afternoon, Monday to Friday. Out-of-hours levels are available only if URGENT, by paging the senior person on-call for Chemical
Pathology.

Levels should be checked and the result acted on every 24 hours for all patients on aminophylline infusions.

➢ Further information

The plasma theophylline concentration is increased in heart failure, cirrhosis, viral infections, in the elderly, and by drugs that inhibit its metabolism e.g. clarithromycin/ erythromycin/ ciprofloxacin.

Plasma theophylline concentration is decreased in smokers, in chronic alcoholism and by drugs that induce its metabolism e.g. rifampicin.

A list of drug interactions can be consulted in Appendix A BNF

Out-of-hours contacts

- For clinical discussion: Respiratory consultant/respiratory SpR via switchboard
- For drug specific information: On-call pharmacist via switch board

➢ References (evidence upon which the guideline is based)

1. SIGN/ BTS Asthma Guidelines 2014. Accessed November 2014.
2. BNF 68

3. Injectable Medicines Administration Guide Third Edition. Pharmacy Department. University College London

- **Compliance with this guideline (how and when the guideline will be monitored e.g. audit and which committee the results will be reported to) Please use the tool provided at the end of this template**

To be completed and attached to any procedural document when submitted to the appropriate committee for consideration and approval

		Yes/No	Comments
1.	**Does the procedural document affect one group less or more favourably than another on the basis of:**		
	• Race	No	
	• Ethnic origins (including gypsies and travellers)	No	
	• Nationality	No	
	• Gender	No	
	• Culture	No	
	• Religion or belief	No	
	• Sexual orientation including lesbian, gay and bisexual people	No	
	• Age	No	
	• Disability - learning disabilities, physical disability, sensory impairment and mental health problems	No	
2.	**Is there any evidence that some groups are affected differently?**	No	
3.	**If you have identified potential discrimination, are any exceptions valid, legal and/or justifiable?**	No	
4.	**Is the impact of the procedural document likely to be negative?**	No	
5.	**If so can the impact be avoided?**	N/A	
6.	**What alternatives are there to achieving the procedural document without the impact?**	N/A	
7.	**Can we reduce the impact by taking different action?**	N/A	

If you have identified a potential discriminatory impact of this procedural document, please refer it to the Director of Human Resources, together with any suggestions as to the action required to avoid/reduce this impact.

For advice in respect of answering the above questions, please contact the Director of Human Resources.

Checklist for the Review and Approval of Procedural Document

To be completed and attached to any procedural document when submitted to the relevant committee for consideration and approval.

	Title of document being reviewed:	Yes/No	Comments
1.	**Title**		
	Is the title clear and unambiguous?	Yes	
	Is it clear whether the document is a guideline, policy, protocol or standard?	Yes	
2.	**Rationale**		
	Are reasons for development of the document stated?	Yes	
3.	**Development Process**		
	Is it clear that the relevant people/groups have been involved in the development of the document?	Yes	
	Are people involved in the development?	Yes	
	Is there evidence of consultation with stakeholders and users?	Yes	
4.	**Content**		
	Is the objective of the document clear?	Yes	
	Is the target population clear and unambiguous?	Yes	
	Are the intended outcomes described?	Yes	
5.	**Evidence Base**		

	Title of document being reviewed:	Yes/No	Comments
	Are key references cited in full?	N/A	
	Are supporting documents referenced?	N/A	
6.	**Approval**		
	Does the document identify which committee/ group will approve it?	Yes	
7.	**Dissemination and Implementation**		
	Is there an outline/plan to identify how this will be done?	Yes	
8.	**Document Control**		
	Does the document identify where it will be held?	Yes	
9.	**Process to Monitor Compliance and Effectiveness**		
	Are there measurable standards or KPIs to support the monitoring of compliance with and effectiveness of the document?	Yes	
	Is there a plan to review or audit compliance with the document?	Yes	
10.	**Review Date**		
	Is the review date identified?	Yes	
	Is the frequency of review identified? If so is it acceptable?	Yes	
11.	**Overall Responsibility for the Document**		
	Is it clear who will be responsible for co-ordinating the dissemination, implementation and review of the document?	Yes	

Executive Sponsor Approval			
If you approve the document, please sign and date it and forward to the author. Procedural documents will not be forwarded for ratification without Executive Sponsor Approval			
Name		Date	
Signature			
Relevant Committee Approval			
The Director of Nursing and Patient Experience's signature below confirms that this procedural document was ratified by the appropriate Governance Committee.			

Name		Date	
Signature			
Responsible Committee Approval – only applies to reviewed procedural documents with minor changes			
The Committee Chair's signature below confirms that this procedural document was ratified by the responsible Committee			
Name		Date	
Name of Committee		Name & role of Committee Chair	
Signature			

Tool to Develop Monitoring Arrangements for Policies and guidelines

What key element(s) need(s) monitoring as per local approved policy or guidance?	Who will lead on this aspect of monitoring? Name the lead and what is the role of the multidisciplinary team or others if any.	What tool will be used to monitor/check/observe/ Assess/inspect/ authenticate that everything is working according to this key element from the approved policy?	How often is the need to monitor each element? How often is the need complete a report ? How often is the need to share the report?	What committee will the completed report go to?
Element to be monitored	**Lead**	**Tool**		
All elements of the guideline	Respiratory Pharmacist	Monitoring of DATIX reports relating to oxygen therapy in adults	Ongoing monitoring of reported incidents	Patient Safety Committee and with responsible Departments, as appropriate