

## Neonatal Drug Guideline

# CAFFEINE CITRATE

## DESCRIPTION AND INDICATION FOR USE

Caffeine is a trimethylxanthine that can be used for the prevention or treatment of apnoea of prematurity or apnoea associated with respiratory infection or anaesthesia. Caffeine can also be used to aid extubation of ventilated babies. The pharmacological actions of caffeine in apnoea include bronchial smooth muscle relaxation, stimulation of the medullary respiratory center, increased sensitivity to carbon dioxide, and enhanced diaphragmatic contractility.

## DOSE

**Doses expressed as caffeine citrate (NB: 1mg caffeine base = 2 mg caffeine citrate)**

### IV/ORAL:

Loading dose: 20 mg/kg/dose

Maintenance dose: 5 mg/kg/dose ONCE daily. May be increased by 5 mg/kg/dose every 24 hours to a maximum of 20 mg/kg/dose if apnoeas persist, unless side effects develop.<sup>1</sup>

NOTE: standard maintenance dosing does not usually exceed 10 mg/kg/dose at BHS.

### TIMING OF DOSE:

Loading doses are to be given when clinically indicated, regardless of time of day.

Maintenance doses are to be given at **2000 hours**, and should commence at least 24 hours after a loading dose (see table).

	Loading dose given <b>PRIOR</b> to 1200 hours (midday)	Loading dose given <b>AFTER</b> 1200 hours (midday)
Commence maintenance dosing:	The same evening	The next evening

## RECONSTITUTION/DILUTION

IV ampoules = 20mg/mL (caffeine citrate)

Babies weighing  $\geq 1.5$  kg: Can be given undiluted

Babies weighing  $< 1.5$  kg: Withdraw 1 mL of 20 mg caffeine citrate from ampoule  
Add to 4 mL of 0.9% sodium chloride in a 10 mL syringe (total volume = 5 mL)  
(concentration = 20 mg in 5 mL = **4 mg/mL**)  
Shake well to ensure thorough mixing and withdraw required dose

## ROUTE AND METHOD OF ADMINISTRATION

IV: Infuse slowly over 30 minutes\*

\* Doses  $\leq 5$ mg/kg caffeine citrate may be infused over 10 minutes

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### COMPATIBILITY INFORMATION

Please contact your ward 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
<b>Fluids</b>	Glucose 5%, Glucose 10%, Sodium chloride 0.9%	
<b>Drugs</b>	Morphine sulphate	Aminoglycoside antibiotics, Amphotericin B, Sodium bicarbonate, Phenytoin sodium, Vancomycin

### SIDE EFFECTS

- Gastric irritation (feed intolerance, vomiting)
- Hypotension, tachycardia, agitation, irritability, restlessness
- Hypo/hyperglycaemia (rare)

### SPECIAL PRECAUTIONS

#### PRECAUTIONS

- Caution in patients with tachycardia (HR > 180 bpm)
- Seizure disorders
- Renal and/or hepatic impairment
- Gastro-oesophageal disease – relaxation of lower oesophageal sphincter may lead to gastro-oesophageal reflux

### DRUG INTERACTIONS

- Inhibitors or inducers for the Cytochrome P450 1A2 enzyme
  - Inhibitors include: amiodarone, erythromycin, fluoroquinolone antibiotics
  - Inducers include: carbamazepine, omeprazole, phenobarbitone, phenytoin, rifampicin
- Pancuronium – reduced effectiveness of pancuronium

### NURSING RESPONSIBILITIES

- Observations/Monitoring:
- Cardio/respiratory monitoring
- Monitor heart rate - withhold dose and notify prescriber if heart rate exceeds 180 beats/minute
- The IV solution is usually clear and colourless – inspect for signs of discolouration, cloudiness, turbidity or particular matter prior to use. DO NOT use unless solution is clear and colourless.

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### References:

1. Steer PS, Flenday V, et al. High dose caffeine citrate for extubation of preterm infants: a randomised controlled trial. Arch Dis Child Fetal Neonatal Ed 2004; 89: F499-F503
2. Paediatric Pharmacopoeia, RCH, 13 ed. 2002
3. Neonatal Pharmacopoeia 2<sup>nd</sup> Ed. 2005, Pharmacy Department, The Royal Women's Hospital, Carlton 2003
4. Natarajan G, Lulic-Botica M, Aranda JV Clinical Pharmacology of Caffeine in the Newborn NeoReviews. May 2007, Vol. 8 No.5
5. Lawrence Trissel, Handbook on Injectable Drugs, 14 ed. 2007
6. Caffeine Citrate Sterile Injection Product Information, PharmaLab, August 2005