# CAFFEINE CITRATE

## Indication
- Treatment of apnoea of prematurity\(^1,2\)
- Prevention of apnoea of prematurity (birthweight less than 1250 g)\(^3,4\)
- Facilitate extubation from mechanical ventilation\(^5,6\)

## Presentation
- Oral solution 20 mg/mL
- QH-Central Pharmacy product: 20 mg/mL

## Dosage
- Loading
  - 20–80 mg/kg once\(^1,2,6\)
- Maintenance (24 hours after loading dose)\(^2\)
  - 5–20 mg/kg daily\(^1,2,6\)
  - Start at 10 mg/kg daily

## Oral
- Nil required
- Draw up the prescribed dose
- Oral/OGT/NGT with feeds to reduce gastric irritation

## INTRAVENOUS
- Vial: 40 mg in 2 mL
- Loading
  - 20–80 mg/kg once\(^1,2,6\)
- Maintenance (24 hours after loading dose)\(^2\)
  - 5–20 mg/kg daily\(^1,2,6\)
  - Start at 10 mg/kg daily

## Preparation
- If the volume of the prescribed dose is less than 0.5 mL (10 mg)
  - Draw up 2 mL (40 mg) and make up to 8 mL total volume with water for injection
  - Concentration now equal to 5 mg/mL

## Administration
- Prime the infusion line and reduce total syringe volume to prescribed dose
- IV infusion via syringe driver pump
  - If dose is greater than 10 mg/kg then administer over 30 minutes\(^7\)
  - If dose is less than or equal to 10 mg/kg then administer over 10 minutes\(^7\)
- On completion, disconnect syringe and infusion line
- Flush access port at same rate as infusion

## Special considerations
- Contraindications:
  - Concurrent administration of other xanthine preparations\(^8\)
- Caution if:
  - Gastrointestinal bleeding, liver or renal impairment
  - Heart rate greater than 180 beats per minute, withhold until medical officer review\(^8,9\)
- Prescribe as caffeine citrate (not caffeine base)
  - 2 mg caffeine citrate=1 mg caffeine base\(^10\)
- Approximate time to reach steady state blood levels is 5–6 days\(^8\) (i.e. apnoea may occur until steady state is reached, despite loading dose)
- UAC route: discuss with neonatologist/paediatrician prior to use

## Monitoring
- Drug levels not routinely required\(^1\)
  - If collected, aim for 5–30 mg/L and take weekly (12 hours after dose administered)\(^11\)
- Cardiorespiratory monitoring (continue 5–7 days after cessation)
- Number and severity of apnoeic episodes, assess for agitation
- Blood glucose monitoring\(^2\)

## Compatibility
- Fluids\(^7\)
  - 5% glucose
- Y-site\(^7\)
  - Dopamine, fentanyl, heparin
### Incompatibility
- PN and fat emulsion: co-infusion with caffeine not recommended (evidence limited). If unavoidable, seek pharmacist advice first, filter infusion and flush before and after
- Minimal data: aciclovir\(^7\), furosemide (frusemide)\(^7\), ibuprofen\(^8\)

### Interactions
- Ciprofloxacin\(^9\), verapamil\(^9\), phenytoin\(^9\)

### Stability
- Vial
  - Store below 30 °C\(^7,9\)
  - Discard unused portion

### Side effects
- Gastrointestinal: vomiting and reduced weight gain
  - Suggested association (unproven) with necrotising enterocolitis (NEC)\(^2\)
  - CNS: agitation, tachycardia, increased or decreased blood glucose levels\(^8,10\)
  - Signs of toxicity: gastric irritation (e.g. feed intolerance/vomiting), agitation/irritability, tachycardia, hypotension, hyperglycaemia, seizures and diuresis\(^7,10\)
  - Serious toxicity is associated with serum levels greater than 50 micrograms/mL\(^8,10\)

### Actions
- Increases respiratory centre output, chemoreceptor sensitivity to carbon dioxide, smooth muscle relaxation and cardiac output\(^8\)
- Increases the respiratory rate (breaths/minute) in premature infants and reduces the number of short and prolonged attacks of apnoea
- In ventilator dependent preterm infants reduces pulmonary resistance and increases lung compliance with a concomitant reduction in the requirement for inspired oxygen\(^9\)

### Abbreviations
- CNS central nervous system, IV: intravenous, NEC: necrotising enterocolitis, OGT: oral gastric tube, NGT: nasogastric tube, PN: parenteral nutrition, UAC umbilical arterial catheter

### Keywords
- caffeine citrate, methylxanthines, apnoea of prematurity, extubation

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

### Document history

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