FUROSEMIDE (frusemide)

Indication	• Cardiac, pulmonary, cerebral, peripheral or renal oedema[1]

ORAL

Presentation

- Oral solution 10 mg in 1 mL

Dosage

- 1–2 mg/kg (frequency according to current gestational age)

Current gest age (weeks)	Frequency
32+6 or less	every 24 hours[2]
33+0–term	every 24 hours[2] titrate to every 12 hours if required
Term more than 30 days	every 12–24 hours titrate to every 6–8 hours if required[2]

Preparation

- Not required

Administration

- Draw up prescribed dose in oral/enteral syringe
- Oral/OGT/NGT

INTRAVENOUS

Presentation

- Ampoule: 20 mg in 2 mL

Dosage

- IV injection 1–2 mg/kg (frequency according to current gestational age)

Current gest age (weeks)	Frequency
32+6 or less	every 24 hours[2]
33+0–term	every 24 hours[2] titrate to every 12 hours if required
Term more than 30 days	every 12–24 hours titrate to every 6–8 hours if required[2]

- IV infusion[3]
  - 0.1–1 mg/kg/hour

Preparation

- IV injection
  - If dose volume less than 0.2 mL, make up to 1 mL total volume with 0.9% sodium chloride[4]
- IV infusion
  - Draw up 25 mg/kg of furosemide (frusemide) and make up to 50 mL total volume with 0.9% sodium chloride
  - Concentration now equal to 0.5 mg/kg/mL

Administration

- IV injection
  - Draw up prescribed dose and administer over 20 minutes (maximum of 0.5 mg/kg/minute)[4]
- IV infusion via syringe driver infusion pump[4]
  - Protect infusion from light
  - *A 0.5 mg/kg/mL solution infused at a rate of 0.2 mL/hour delivers 0.1 mg/kg/hour*

Special considerations	• Infusion at greater than 4 mg/minute, or with severe renal impairment may cause ototoxicity[4,5] • Higher dosages may be appropriate in selected babies at consultant discretion • Caution if hyperbilirubinaemia as may cause bilirubin to be displaced from albumin binding sites[5] • Commercial oral solution contains 12.7% v/v ethanol[6]
Monitoring	• Electrolytes and renal function periodically during extended therapy[2] • Urine output[2]

Compatibility	• Fluids o 5% glucose[4], 10% glucose[7], 0.9% sodium chloride[4] • Y-site o Adrenaline (epinephrine)[4], amikacin[4], aztreonam[4], dexmedetomidine[4], foscarnet[4], granisetron[4], heparin[4], levosimendan[4], linezolid[4], metoprolol[4] piperacillin-tazobactam (EDTA-free)[4], potassium chloride[4], sodium nitroprusside[4], tobramycin[4]
Incompatibility	• Do not mix with acidic solutions (pH less than 5.5)[4] • Fluids o Nil known • Drugs o Atracurium[4], azithromycin[4], caffeine[4], caspofungin[4], ciprofloxacin[4], droperidol[4], erythromycin[4], esmolol[4], filgrastim[4], fluconazole[4], gentamicin[4], haloperidol[4], hydralazine[4], ketamine[4], metoclopramide[4], midazolam[4], milrinone[4], moxifloxacin[4], mycophenolate mofetil[4], phenylephrine[4], protamine[4], pyridoxine[4], rocuronium[4], thiamine[4], vancomycin[4], vecuronium[4]
Interactions	• Concurrent use of other ototoxic medications (e.g. aminoglycosides), increases risk of ototoxicity[4] • In combination with amphotericin may result in excessive loss of potassium[5]
Stability	• Oral preparation[8] o Follow manufacturer recommendations for storage • Undiluted solution[4] o Store ampoule at room temperature. Protect from light o Do not use if discoloured o May dissolve crystal deposits by gentle warming • Diluted solution o Stable at room temperature or at 2–8 °C for 24 hours[5]
Side effects	• Blood pathology: electrolyte disturbances from diuresis[2], thrombocytopaenia (infrequent)[8] • Circulatory: may increase risk of persistent patent ductus arteriosus in premature infants during first weeks of life[8] • Integumentary: allergic rashes (infrequent) • Nervous: irreversible disturbances in hearing usually associated with rapid injection, overdose, concomitant ototoxic drugs, hypoproteinemia or severe renal impairment[2], paraesthesia[8] • Urinary: deposition of calcium salts in renal tissue[2]
Actions	• Potent loop diuretic. Inhibits sodium and chloride reabsorption[5]
Abbreviations	IV: intravenous, OGT: oral gastric tube, NGT: nasogastric tube
Keywords	frusemide, lasix, furosemide, diuretic, loop diuretic,

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.

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