




MORPHINE SULFATE

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| | <ul style="list-style-type: none"> • Pre-medication for elective intubation • Analgesia¹ (e.g. procedural, post-operative, palliative care) • Relief of anxiety/restlessness • Sedation of ventilated baby • Management of symptoms at end of life (e.g. dyspnoea) | |
| INTRAVENOUS | Presentation <ul style="list-style-type: none"> • Ampoule 5 mg in 1 mL 10 mg in 1 mL • Morphine hydrochloride may be substituted at equivalent dosage |   |
| | Dosage (IV injection) <ul style="list-style-type: none"> • Premedication for elective intubation <ul style="list-style-type: none"> ◦ 0.1 mg/kg (100 microgram/kg) as a single dose • For analgesia <ul style="list-style-type: none"> ◦ 0.05 mg/kg (50 microgram/kg) every 4 hours¹ ◦ May commence at lower dose of 0.02 mg/kg (20 microgram/kg) ◦ If required, up-titrate to a maximum of 0.2 mg/kg (200 microgram/kg) every 4 hours | |
| | Dosage (IV infusion) <ul style="list-style-type: none"> • Standard infusion <ul style="list-style-type: none"> ◦ Start at 0.01 mg/kg/hour (10 microgram/kg/hour) • Titrate according to response between 0.005–0.02 mg/kg/hour (5–20 microgram/kg/hour)² | |
| | Preparation <ul style="list-style-type: none"> • IV injection for elective intubation <ul style="list-style-type: none"> ◦ Draw up 5 mg (5000 microgram) and make up to 10 mL total volume with 0.9% sodium chloride ◦ <i>Concentration now equal to 0.5 mg/mL (500 microgram/mL)</i> • Standard infusion <ul style="list-style-type: none"> ◦ Draw up 1 mg/kg (1000 microgram/kg) and make up to 50 mL total volume with 5% glucose or 10% glucose ◦ <i>Concentration now equal to 0.02 mg/kg/mL (20 microgram/kg/mL)</i> | |
| | Administration <ul style="list-style-type: none"> • IV injection for elective intubation <ul style="list-style-type: none"> ◦ Draw up prescribed dose ◦ IV injection as a bolus • IV infusion <ul style="list-style-type: none"> ◦ Prime the infusion line and administer at prescribed rate via syringe driver pump ◦ <i>Standard infusion of 0.02 mg/kg/mL (20 microgram/kg/mL) infused at 0.5 mL/hour delivers 0.01 mg/kg/hour (10 microgram/kg/hour)</i> | |

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| SUBCUT | Presentation <ul style="list-style-type: none"> • Ampoule 5 mg in 1 mL 10 mg in 1 mL • Morphine hydrochloride may be substituted at equivalent dosage |  |
| | Indication <ul style="list-style-type: none"> • Palliative care | |
| | Dosage <ul style="list-style-type: none"> • Subcutaneous injection <ul style="list-style-type: none"> ◦ 0.025–0.1 mg/kg (25–100 microgram/kg) every 6 hours³ ◦ Adjust according to response • Subcutaneous continuous infusion <ul style="list-style-type: none"> ◦ 0.005–0.01 mg/kg/hour (5–10 microgram/kg/hour)³ ◦ Adjust according to response | |
| | Preparation <ul style="list-style-type: none"> • Draw up 5 mg (5000 microgram) and make up to 10 mL total volume with 0.9% sodium chloride <ul style="list-style-type: none"> ◦ <i>Concentration now equal to 0.5 mg/mL (500 microgram/mL)</i> | |
| | Administration <ul style="list-style-type: none"> • Subcutaneous injection <ul style="list-style-type: none"> ◦ Draw up prescribed dose and administer into thigh or abdomen • Subcutaneous continuous infusion <ul style="list-style-type: none"> ◦ Prime the infusion line and administer at prescribed rate via syringe driver pump | |

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| Special considerations | <ul style="list-style-type: none"> • S8 high risk medication. Errors may result in significant harm <ul style="list-style-type: none"> ○ Consider drawing IV injection dose from standard infusion solution to avoid accidental overdose from decimal point related errors (standard solution: 1 mL=20 microgram/kg) • Cautions: HIE and hypothermia (may affect drug metabolism)^{1,4} • If prescribed for palliative care: <ul style="list-style-type: none"> ○ Consult with Paediatric Palliative Care Team (1800 249 648) ○ Other subcutaneous delivery devices requiring different preparation may be appropriate (e.g. Niki T34) • Infusions may be prescribed as standard, double, quadruple or greater strength. Refer to Quick guide below • UAC route: discuss with neonatologist/paediatrician prior to use |
| Monitoring | <ul style="list-style-type: none"> • Level of sedation • Respiratory⁵ and cardiovascular status¹ • Abdominal distention and loss of bowel sounds¹ • If decreased urinary output, consider retention¹ |
| Compatibility | <ul style="list-style-type: none"> • Fluids <ul style="list-style-type: none"> ○ 5%glucose⁵, 10% glucose⁵, 0.9% sodium chloride⁵, 0.45% sodium chloride⁵ • Y site <ul style="list-style-type: none"> ○ Adrenaline (epinephrine)⁵, amikacin⁵, amiodarone⁵, ampicillin⁵, atracurium⁵, atropine⁵, aztreonam⁵, caspofungin⁵, cefazolin⁵, cefotaxime⁵, cefoxitin⁵, ceftazidime⁵, ceftriaxone⁵, cisatracurium⁵, clindamycin⁵, dexamethasone⁵, digoxin⁵, dopamine⁵, erythromycin⁵, esmolol⁵, filgrastim⁵, fluconazole⁵, foscarnet⁵, gentamicin⁵, granisetron⁵, haloperidol⁵, heparin sodium⁵, hyoscine hydrobromide⁵, insulin (short-acting)⁵, lidocaine (lignocaine)⁵, linezolid⁵, magnesium sulfate⁵, methylprednisolone⁵, metronidazole⁵, midazolam⁵, milrinone⁵, noradrenaline (norepinephrine)⁵, paracetamol⁵, piperacillin-tazobactam (EDTA-free)⁵, potassium chloride⁵, sodium nitroprusside⁵, tobramycin⁵, trimethoprim-sulfamethoxazole (co-trimoxazole)⁵, vancomycin⁵, vecuronium⁵, zidovudine⁵ |
| Incompatibility | <ul style="list-style-type: none"> • PN and fat emulsion: co-infusion with morphine not recommended (evidence limited). If unavoidable, seek pharmacist advice first, filter infusion and flush before and after • Fluids <ul style="list-style-type: none"> ○ Morphine may precipitate out of solution when mixed with alkaline drugs or solutions³ • Drugs <ul style="list-style-type: none"> ○ Azathioprine⁵, azithromycin⁵, flucloxacillin⁵, folic acid⁵, ganciclovir⁵, indometacin⁵, pethidine⁵, sodium nitrite⁵ |
| Interactions | <ul style="list-style-type: none"> • Concomitant use with other CNS depressants potentiates effects of opioids⁶ • May alter metabolism of zidovudine⁶ |
| Stability | <ul style="list-style-type: none"> • Ampoule <ul style="list-style-type: none"> ○ Store below 25 °C⁵. Protect from light⁵ ○ Solutions that change to dark yellow are suitable to use⁵ ○ Single patient use. Discard remainder as per S8 legislation • Reconstituted solution <ul style="list-style-type: none"> ○ Stable for 24 hours⁵ |
| Side effects | <ul style="list-style-type: none"> • Circulatory: hypotension¹, bradycardia¹ • Digestive: decreased gut motility¹ • Urinary: urinary retention¹ • Nervous: restlessness², opioid dependence⁶, sedation⁶ • Respiratory: respiratory depression with larger doses² |
| Actions | <ul style="list-style-type: none"> • Opioid analgesic that stimulates brain opioid receptors¹ • Naloxone is an opioid antagonist for reversal of overdose in the non-opioid dependent newborn <ul style="list-style-type: none"> ○ Naloxone not for use in neonatal abstinence syndrome (NAS) ○ Avoid naloxone use in palliative care |
| Abbreviations | CNS: central nervous system, HIE: hypoxic-ischaemic encephalopathy, IV: intravenous, NAS: neonatal abstinence syndrome, PN: parenteral nutrition |
| Keywords | morphine, intubation, neonatal pain relief, opioid, palliative care, narcotic |

Quick guide: morphine sulfate IV BOLUS dose

| Morphine dose is 100 microgram/kg | Round weight to nearest 0.5 kg | | | | | | | |
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| | 0.5 kg | 1 kg | 1.5 kg | 2 kg | 2.5 kg | 3 kg | 3.5 kg | 4 kg |
| Use the IV injection reconstituted concentration of 500 microgram/mL | | | | | | | | |
| Dose (microgram) for approximate weight | 50 microgram | 100 microgram | 150 microgram | 200 microgram | 250 microgram | 300 microgram | 350 microgram | 400 microgram |
| Administration volume (mL) | 0.1 mL | 0.2 mL | 0.3 mL | 0.4 mL | 0.5 mL | 0.6 mL | 0.7 mL | 0.8 mL |

Quick guide: morphine sulfate IV INFUSION concentrations

| Draw up morphine dose | Make up to total volume (mL) | Concentration (microgram/kg/mL) | Infusion rate (mL/hour) | Delivers (microgram/kg/hour) |
|--------------------------------|------------------------------|---------------------------------|-------------------------|------------------------------|
| 1 mg/kg (1000 microgram/kg) | 50 mL | 20 microgram/kg/mL | @ 0.5 mL/hour | 10 microgram/kg/hour |
| 2 mg/kg (2000 microgram/kg) | 50 mL | 40 microgram/kg/mL | @ 0.5 mL/hour | 20 microgram/kg/hour |
| 4 mg/kg (4000 microgram/kg) | 50 mL | 80 microgram/kg/mL | @ 0.5 mL/hour | 40 microgram/kg/hour |

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

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