

MORPHINE**This drug must be guardrailed**

Trade Name	IV: Morphine Sulphate injection B.P (DBL) Oral: RA – Morph® (Pfizer) currently unavailable from March 2024 Morphine Sulphate Oral Liquid (Wockhardt) (section 29)																										
Class	Opiate analgesic																										
Mechanism of Action	Stimulates brain opiate receptors. Releases histamine and centrally suppresses adrenergic tone, increasing venous capacitance. Alters perception of, and response to pain.																										
Indications	Indication 1: Analgesia Indication 2: Sedation Indication 3: Dependence following long term infusion Indication 4: Treatment of opiate withdrawal Indication 5: Palliative care																										
Contraindications	Hypersensitivity to morphine. Use with caution in patients with raised intracranial pressure, hepatic or renal impairment, hypotension or breathing difficulties.																										
Supplied As Caution: see comments section	IV: Morphine sulphate 10mg in 1 mL for injection. Oral: Morphine Sulphate solution 10 mg/ 5 mL (= 2 mg/ mL) (Wockhardt brand)																										
Dilution... *TWO dilution steps required for IV infusion*	<ul style="list-style-type: none"> IV Infusion: See morphine iv infusion sheet <table border="1"> <thead> <tr> <th>Drug</th> <th>Add Diluent</th> <th>Total Volume</th> <th>Concentration</th> </tr> </thead> <tbody> <tr> <td></td> <td>0.9% sodium chloride</td> <td></td> <td></td> </tr> <tr> <td>10mg = 1mL</td> <td>9 mL</td> <td>10 mL</td> <td>1 mg / mL</td> </tr> </tbody> </table> <p>Step 2. Further dilute the 1 mg/mL solution in step 1</p> <table border="1"> <thead> <tr> <th>Drug</th> <th>Add Diluent</th> <th>Total Volume</th> <th>FINAL CONCENTRATION</th> </tr> </thead> <tbody> <tr> <td></td> <td>0.9% sodium chloride, 5% or 10% dextrose</td> <td></td> <td></td> </tr> <tr> <td>Wt (kg) in mL</td> <td>Make up to 50mL</td> <td>50 mL</td> <td>Varies depending on weight</td> </tr> </tbody> </table> <p>1mL/hr = 20 microgram/kg/hr . Maximum concentration to be ≤ 200 microgram/mL 1mL/hr = 40 microgram/kg/hr if double strength the infusion for babies <1kg</p>			Drug	Add Diluent	Total Volume	Concentration		0.9% sodium chloride			10mg = 1mL	9 mL	10 mL	1 mg / mL	Drug	Add Diluent	Total Volume	FINAL CONCENTRATION		0.9% sodium chloride, 5% or 10% dextrose			Wt (kg) in mL	Make up to 50mL	50 mL	Varies depending on weight
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<p>... Dilution</p>	<ul style="list-style-type: none"> ▪ Bolus Dose (if not bolusing from an existing infusion) <table border="1" data-bbox="512 203 1433 481"> <thead> <tr> <th data-bbox="512 203 730 277">Drug</th> <th data-bbox="730 203 957 277">Add Diluent</th> <th data-bbox="957 203 1110 277">Total Volume</th> <th data-bbox="1110 203 1433 277">Concentration</th> </tr> </thead> <tbody> <tr> <td data-bbox="512 277 730 374"></td> <td data-bbox="730 277 957 374">0.9% sodium chloride</td> <td data-bbox="957 277 1110 374"></td> <td data-bbox="1110 277 1433 374"></td> </tr> <tr> <td data-bbox="512 374 730 481">10mg = 1mL</td> <td data-bbox="730 374 957 481">9 mL</td> <td data-bbox="957 374 1110 481">10 mL</td> <td data-bbox="1110 374 1433 481">1 mg / mL</td> </tr> </tbody> </table> ▪ Subcutaneous Infusion: see separate subcutaneous infusion sheet 	Drug	Add Diluent	Total Volume	Concentration		0.9% sodium chloride			10mg = 1mL	9 mL	10 mL	1 mg / mL
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<p>Dosage</p> <p>*Must chart guardrail and use Alaris pump for IV infusions*</p>	<p>IV Bolus: 25 or 50 microgram/kg/dose Can be given as a bolus from the continuous infusion on the guardrailed pumps or from a separately drawn up 1mg/mL solution If give >2 boluses in 24hrs consider increasing the infusion dose Monitor the fluid volume received from the boluses (1.25ml - 2.5mL at standard infusion concentration)</p> <p>100 microgram/kg/dose Use if immediate analgesia/ sedation is required Draw up a 1mg/mL solution to give this dose as the volume is too high if given directly from the infusion</p> <p>IV Infusion: 5-30 microgram/kg/hour Start at 10microgram/kg/hr for sedation while on mechanical ventilation. Higher rates in surgical cases</p> <p>Oral Dosing: 50 – 200 mcg/kg/dose every 4-6 hours 100mcg/kg/dose equates to about 5mcg/kg/hr iv and is a good starting option for most babies. Dose can be titrated up if needed. Lower starting dose of 50mcg/kg/dose may be better if there are concerns about respiratory state and sedation</p> <p>If Converting from IV: Daily dose is 4 times the daily iv dose $\text{Oral mcg/dose} = \frac{\text{iv dose (mcg/kg/hr)} \times \text{Wt (kg)} \times 24\text{hrs} \times 4}{\text{Number of oral doses per day (4 or 6 hourly)}}$</p> <p>Narcotic Abstinence Syndrome: See separate protocol</p>												
<p>Guardrails</p>	<p>Conc: Min – 3 microgram/mL Max – 200 microgram/mL Soft Min: 2 microgram/kg/hr Hard Max: 60 microgram/kg/hr Soft Max: 30 microgram/kg/hr Default: 10 microgram/kg/hr</p>												
<p>Guardrails Boluses</p>	<p>Default Rate: 50mL/hr – bolus will be given over 1.5-3 minutes at standard infusion concentration</p> <p>Soft Min: 10 microgram/kg Hard Max: 50 microgram/kg Soft Max: 50 microgram/kg Default: 25 microgram/kg</p>												

Interval	Bolus dose: as required , dose can last 1-4 hours Infusion: continuous Oral: 4-6 hourly
Administration	IV, oral, subcutaneous
Compatible With	Solution: 5% and 10% dextrose, sodium chloride 0.9% Terminal Y-site: Acyclovir, adrenaline, alprostadil, amikacin, aminophylline, amiodarone, ampicillin, atropine, benzylpenicillin, calcium chloride, caspofungin, cefazolin, cefotaxime, ceftazidime, ceftriaxone, chloramphenicol, clindamycin, dexmedetomidine, dexamethasone, digoxin, dobutamine, dopamine, enalapril, erythromycin, fentanyl, fluconazole, furosemide, gentamicin, glycopyrrolate, heparin, insulin, hydrocortisone, hyoscine hydrobromide, lidocaine, linezolid, lorazepam, magnesium, meropenem, methylprednisolone, metoclopramide, metronidazole, midazolam, milrinone, naloxone, noradrenaline, pancuronium, paracetamol, phenobarbital, piperacillin/tazocactam, potassium chloride, propranolol, ranitidine, sodium bicarbonate, sodium nitroprusside, ticarcillin/clavulanate, tobramycin, TPN, trimethoprim/sulphamethoxazole, vancomycin, vecuronium, voriconazole, zidovudine.
Incompatible With	Aminophylline, azathioprine, azithromycin, flucloxacillin, folic acid, ganciclovir, indomethacin, phenytoin, thiopental. There is no information on compatibility of morphine with lipid solutions
Interactions	Morphine decreases effects of diuretics by inducing release of ADH. Morphine may increase zidovudine levels by competitively inhibiting glucuronidation or directly inhibiting metabolism.
Monitoring	Respiratory and cardiovascular status. Bowel and urinary output (especially at higher doses).
Stability	IV/Subcut: Discard opened vial immediately after use Use a new vial for each dose. Continuous infusions need to be changed after 24 hours Unused reconstituted 1mg/mL solution may be kept if repeated boluses may be required. <ul style="list-style-type: none"> • May be kept for the length of the shift of the nurse who drew up the drug and is caring for the patient • The syringe must be labelled with the name of the drug and the name of the patient and may be stored in the controlled drug safe. • Any morphine remaining in the syringe at the end of that nurse's shift should be discarded and if ongoing treatment is required a new syringe should be prepared by nursing staff on the next shift.

	<p>Oral: Open bottles of morphine mixture may be kept for 6 months or the manufacturer's expiry whichever is shorter.</p>																		
Storage	Store below 25°C and in a controlled drug safe. Protect from light. Development of a yellow colour does not indicate toxicity, or loss of potency.																		
Adverse Reactions	<p>Respiratory depression, bradycardia, hypotension, ileus and delayed gastric emptying, urinary retention, sweating, nausea and vomiting, development of tolerance. Seizures (higher or more rapid doses).</p> <p>Naloxone reverses effects. Mechanical ventilation may be preferable if narcotic effects required.</p>																		
Comments	<p>In March 2024 medication shortage required a temporary switch from using RA Morph Morphine <u>Hydrochloride</u> Liquid 1 mg / mL to the Wockhardt brand of Morphine <u>Sulphate</u> Liquid 10 mg / 5 mL (equivalent to 2 mg/ mL) which is a section 29 medication.</p> <p>RA-Morph® and Morphine Sulphate (Wockhardt) are both presented as a clear colourless or pale-yellow solution.</p> <p>They are both sugar and alcohol free.</p> <p>Note: It is recommended that Oramorph® another alternative oral morphine liquid product should not be stocked in NICU because this product contains 10% alcohol. If writing an out patient prescription for morphine liquid please specify "Wockhart" brand.</p>																		
References	<p>Neofax 2000, 1999 Medicines for Children RCPCH. ADC 2000;83:F101-3</p>																		
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