

NICU: Morphine

Presentation:	10mg/ml solution for injection																									
Indication:	Sedation in ventilated babies on NICU																									
Dose:	<p>Loading dose: Single dose 50-100 micrograms per kg, given as a slow IV bolus over 5-10 minutes</p> <p>IV infusion: Recommended dose range 5-20 micrograms/kg/hour. Maintenance dose is determined by the clinical response of the baby; doses in excess of 40micrograms/kg/hour may be required but must be confirmed with Registrar or Consultant</p>																									
Route of administration:	<p>Intravenous bolus and continuous infusion.</p> <p>Morphine sulphate has a low pH and may cause venous irritation and tissue damage in cases of extravasation. If a central venous access device is unavailable administer via as large a peripheral vein as possible monitoring insertion site closely.</p>																									
Instructions for preparation and administration:	<table border="1"> <tr> <td colspan="2">Preparation type:</td> </tr> <tr> <td>Standard strength</td> <td> <p>Total number of mg of morphine = 2 x baby's weight (kg) – rounded to the nearest 0.1mg</p> <p>Dilute the morphine with glucose 5%, glucose 10% or sodium chloride 0.9% to a final volume of 50ml</p> <p>This will provide 10-20 micrograms/kg/hour if infused at 0.25-0.5ml/hour</p> <p>Loading dose of 100micrograms/kg (contained in 2.5ml of syringe prepared as above) can be given as slow IV bolus over 5-10 minutes via SMART pump followed by continuous IV infusion via SMART pump</p> </td> </tr> <tr> <td colspan="2">FOR FLUID RESTRICTED BABIES:</td> </tr> <tr> <td>Double strength</td> <td> <p>Number of mg of morphine = 4 x baby's weight (kg) made up to 50ml</p> <p>A rate of 0.5ml/hr will provide 40micrograms/kg/hr</p> <p>Loading dose of 100micrograms/kg (contained in 1.25 ml of syringe prepared as above) can be given as slow IV bolus over 5-10 minutes via SMART pump followed by continuous IV infusion via SMART pump</p> </td> </tr> <tr> <td>Quadruple strength</td> <td> <p>Number of mg of morphine = 8 x baby's weight (kg) made up to 50ml</p> <p>A rate of 0.25ml/hr will provide 40micrograms/kg/hr</p> <p>Loading dose of 100micrograms/kg (contained in 0.625 ml of syringe prepared as above) can be given as slow IV bolus over 5-10 minutes via SMART pump followed by continuous IV infusion via SMART pump</p> </td> </tr> </table>	Preparation type:		Standard strength	<p>Total number of mg of morphine = 2 x baby's weight (kg) – rounded to the nearest 0.1mg</p> <p>Dilute the morphine with glucose 5%, glucose 10% or sodium chloride 0.9% to a final volume of 50ml</p> <p>This will provide 10-20 micrograms/kg/hour if infused at 0.25-0.5ml/hour</p> <p>Loading dose of 100micrograms/kg (contained in 2.5ml of syringe prepared as above) can be given as slow IV bolus over 5-10 minutes via SMART pump followed by continuous IV infusion via SMART pump</p>	FOR FLUID RESTRICTED BABIES:		Double strength	<p>Number of mg of morphine = 4 x baby's weight (kg) made up to 50ml</p> <p>A rate of 0.5ml/hr will provide 40micrograms/kg/hr</p> <p>Loading dose of 100micrograms/kg (contained in 1.25 ml of syringe prepared as above) can be given as slow IV bolus over 5-10 minutes via SMART pump followed by continuous IV infusion via SMART pump</p>	Quadruple strength	<p>Number of mg of morphine = 8 x baby's weight (kg) made up to 50ml</p> <p>A rate of 0.25ml/hr will provide 40micrograms/kg/hr</p> <p>Loading dose of 100micrograms/kg (contained in 0.625 ml of syringe prepared as above) can be given as slow IV bolus over 5-10 minutes via SMART pump followed by continuous IV infusion via SMART pump</p>															
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<u>Prescribing</u>	<p>Prescribe on paper drug chart</p> <p>**Please ensure concentration (in micrograms/ml) is completed to enable use of SMART pumps**</p> <p>To calculate concentration of infusion for SMART pumps (in micrograms/ml) divide total mg in infusion by total volume of infusion (mls) and multiply by 1000: e.g. 4mg in 50mls = $\frac{4\text{mg}}{50\text{mls}} = 0.08\text{mg/ml} \times 1000 = 80\text{micrograms/ml}$</p> <p>Example for a 2kg baby, standard strength preparation:</p> <table border="1"> <thead> <tr> <th>Drug</th> <th>Drug amount in syringe</th> <th>Diluent</th> <th>Total volume (ml)</th> <th>Route</th> </tr> </thead> <tbody> <tr> <td>Morphine</td> <td>4mg</td> <td>Sodium Chloride 0.9%</td> <td>50mL</td> <td>IV</td> </tr> <tr> <th>Start date</th> <th>Drug concentration per ml</th> <th>Infusion range</th> <th>Min</th> <th>Max</th> </tr> <tr> <td>12/12/19</td> <td>80micrograms/mL</td> <td>Dose/kg/time</td> <td>5micrograms/kg/hour</td> <td>20micrograms/kg/hour</td> </tr> <tr> <td>Pharm</td> <td></td> <td>ml/hr</td> <td>0.125</td> <td>0.5</td> </tr> </tbody> </table>	Drug	Drug amount in syringe	Diluent	Total volume (ml)	Route	Morphine	4mg	Sodium Chloride 0.9%	50mL	IV	Start date	Drug concentration per ml	Infusion range	Min	Max	12/12/19	80micrograms/mL	Dose/kg/time	5micrograms/kg/hour	20micrograms/kg/hour	Pharm		ml/hr	0.125	0.5
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Known compatibility issues	See separate compatibility chart																									

<p>SMART pump directions:</p>	<p>Load Syringe, prime line using the pump for accurate dosing.</p> <ul style="list-style-type: none"> • Open 'NICU' folder then open 'Morphine' programme. • Using DATA chevrons enter concentration in microgram/ml and confirm • Enter the Baby's weight in kg and confirm • Enter loading dose in microgram/kg (zero if not required) • Confirm bolus time (To be given over minimum 5mins) • Enter/confirm the dose in micrograms/kg/h • Visually confirm the rate (ml/h) against the prescribed dose (microgram/kg/h) • Perform STOP moment with medical team (Pump against prescription) • Connect to Baby • Press start button
<p>Additional Comments:</p>	<p>Monitor closely for pain relief and side-effects especially respiratory depression. Monitor blood pressure, heart and respiratory rate.</p> <p>Naloxone, a specific opioid-antagonist, can be used to reverse respiratory depression. It has a short duration of action - repeated doses or an infusion may be necessary.</p> <ul style="list-style-type: none"> • Dose: initially 100 micrograms/kg (IV/IM/SC), if no response, repeat at intervals of 1 minute to a total maximum of 2 mg, then review diagnosis; further doses may be required if respiratory function deteriorates. • If repeated doses are required, a continuous infusion of 60% of the initial resuscitative IV dose per hour may be required – adjust rate according to response. Contact pharmacy for advice and preparation of the infusion. <p>NB. Use caution if giving naloxone to infants born to opioid-dependent mothers, as this can precipitate acute withdrawal, leading to extreme distress.</p>

Note: The contents of this monograph should be read in conjunction with information available in the BNFC and Medusa

References:

BNFc, Accessed via medicinescomplete.com on 12/12/19

SPC for Morphine Sulphate 10mg/mL, Accessed via www.medicines.org.uk/emc/product/5008 on 12/12/19

Evelina London Paediatric Formulary Accessed via <http://cms.ubqo.com/public/d2595446-ce3c-47ff-9dcc-63167d9f4b80> on 12/12/19

Leeds Formulary, accessed via www.leedsformulary.nhs.uk on 12/12/19

Medusa Injectable Medicines Paediatric Guide: accessed online at <https://medusa.wales.nhs.uk/> (published 1/10/19) accessed 6/2/20

Document control sheet

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AUTHORS		
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If review:

	Position	Date
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