MORPHINE

Analgesia and Sedation

Read in conjunction with Disclaimer

HIGH RISK Medication

1 mg = 1000 micrograms

Formulary: Restricted

Presentation	**Syringe (morphine sulfate):** 1000 microgram/mL **Oral solution (morphine hydrochloride):** 1000 microgram/mL
Classification	Opioid analgesic
Indication	• Analgesia • Sedation • Neonatal Abstinence Syndrome (NAS) – see Morphine NAS protocol
Special Considerations	• Opioid-naïve infants are at risk of cardiorespiratory depression, particularly if they are breathing spontaneously. • Use with caution in patients with hypersensitivity reactions to other opioids. • Tolerance may develop after prolonged use - wean slowly.
Monitoring	• Cardiac and respiratory status, urine output, abdominal distension or delay in passage of stool. • Monitor NAS scores in opioid-dependent infants.
Compatibility	**Fluids:** Glucose 5%, Glucose 10%, Sodium chloride 0.45%, Sodium chloride 0.9%

Compatibility with Heparin

	Sodium chloride 0.9%	Glucose 5%	Glucose 10%	Sodium chloride 0.45%
With Heparin	Stable for 24 hours at room temperature	No stability information (avoid use)	No stability information (avoid use)	No stability information (avoid use)
Without Heparin	Stable for 48 hours at room temperature	Stable for 48 hours at room temperature	Stable for 24 hours at room temperature	Stable for 24 hours at room temperature

	Y-site: Refer to KEMH Neonatal Medication Guideline Y-Site IV Compatibility in Neonates
Interactions	Combination use with other CNS depressants can increase the opioid effect - increasing the risk of respiratory depression and sedation.

Side Effects	Respiratory depression, decreased gastrointestinal motility, hypotension, bradycardia, urinary retention.
Storage & Stability	**Schedule 8 Medication** **Syringe:** Store at room temperature, below 25°C **Oral solution:** Store at room temperature, below 25°C
Comments	• Withdraw/wean slowly following prolonged use. • Respiratory depression / apnoea can be reversed with naloxone. Naloxone is contraindicated in opioid dependent infants.

ORAL

Presentation (for oral use)	**Oral solution**: 1000 microgram/mL morphine hydrochloride
Dosage	**Analgesia / Sedation** ** **For oral doses less than 100 microg** – prescriber to annotate medication order with **"dilution required"** in 'additional information' section on medication chart. See Preparation section below for dilution instructions. ** 100 to 200 microg/kg/dose every 4 to 6 hours • Oral doses recommended to be rounded to nearest 50 micrograms.
	Neonatal Abstinence Syndrome (NAS) See Neonatal Morphine NAS Protocol
	Dose adjustment • Adjust dose according to response and adverse effects. • **Renal and/or hepatic impairment:** No specific dosage adjustments provided. May affect metabolism and excretion.
Preparation	**Dilution required for doses less than 100 microg:** **WARNING: error prone dilution –** take extra care **Dilution:** • Draw up 1 mL (1000 microg) of morphine oral solution and dilute to a final volume of 10 mL with sterile water. • *Concentration now equal to* **100 microg/mL.** • Measure required dose and discard any unused solution.
Administration	• Draw prescribed dose into oral/enteral syringe • Can be given Oral/OGT/NGT • May be given anytime in relation to feeds

CONTINUOUS INTRAVENOUS INFUSION

ANALGESIA / SEDATION – CONTINUOUS INFUSION

Presentation (for IV use)	**Syringe:** 1000 microg/mL morphine sulfate
Dosage	**Analgesia / Sedation – Continuous IV infusion** 10 to 40 microg/kg/hour • See Preparation section below and *Appendix 1* and *Appendix 2* for information on how to prescribe morphine.
	Dose adjustment • Adjust dose according to response and adverse effects. • **Renal and/or hepatic impairment:** No specific dosage adjustments provided. May affect metabolism and excretion.
Preparation	**Continuous IV infusion** See *Appendix 1* for prescribing examples using the Variable Rate Infusion Chart. See *Appendix 2* for a prescribing example using the APS IV Analgesia Continuous Opioid Infusion Chart. Use IV Infusion prepared by CIVAS Pharmacy where available. **Sodium chloride 0.9% is the only fluid that has stability data when combined with both heparin and morphine. See compatibility table on page 1 for more information.** **Dilution:** • Draw up 500 microg (0.5 mL) per kilogram of baby's weight and make up to a final volume of 50 mL with a compatible fluid. *Concentration* = **10 microg/kg/hour = 1 mL/hour.**
	Example: To prepare an infusion for a 780 g infant Weight = 0.78 kg Dose in Infusion = 500 microg x 0.78 kg = 390 microg Dilute 390 microg morphine to 50mL with compatible fluid.
	Fluid restricted infants • Continuous infusions can be made double, quadruple, etc strength if required for fluid restricted infants. • Ensure medication order is clearly annotated with the strength of the infusion. See *Appendix 1*. • Pay close attention to the change in infusion rate when changing strength.
Administration	**IV infusion:** Infuse at the prescribed rate via syringe driver pump.

INTERMITTENT INTRAVENOUS PUSH

ANALGESIA / SEDATION – IV PUSH

Presentation (for IV use)	**Syringe:** 1000 microg/mL morphine sulfate
Dosage	**Analgesia / Sedation – Intermittent IV Push** 100 to 200 microg/kg/dose every 4 to 6 hours
	Dose adjustment • Adjust dose according to response and adverse effects • **Renal and/or hepatic impairment:** No specific dosage adjustments provided. May affect metabolism and excretion.
Preparation	**For doses 100 microg or greater:** Administer undiluted.
	For intermittent IV doses less than 100 micrograms the following dilution should be used: • Draw up 1000 micrograms (1 mL) of morphine sulfate and make up to 10 mL total volume with sodium chloride 0.9%. *Concentration now equal to* **100 microgram/mL.**
Administration	**IV push:** • IV Injection over 5 minutes. Rapid IV administration may increase adverse effects.

Related Policies, Procedures, and Guidelines

HDWA Mandatory Policies:

MP 0131/20: WA High Risk Medication Policy

Clinical Practice Guidelines:

CAHS Neonatology – Neonatal Abstinence Syndrome (NAS)

CAHS Neonatology – Intubation

CAHS Neonatology – Pain Assessment and Management

Pharmaceutical and Medicines Management Guidelines:

CAHS Neonatology – Medication Administration Guideline

High Risk Medicines

Schedule 4 Restricted (S4R) and Schedule 8 (S8) Medications

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Appendix 1

Morphine Continuous Infusion Chart Example

Child and Adolescent Health Service
Neonatology

NEONATAL VARIABLE RATE INFUSION CHART

Year: 20 24

ALLERGIES & ADVERSE DRUG REACTIONS
☒ Nil Known ☐ Unknown ☐ Yes – refer to NIMC (Tick appropriate box)

Patient Name: Baby A	Date: 04/11/2024
Gest Age 27 + 1	CGA 27 + 3
BW 1220g	Working Wt 1220g

Med Rec. No: .....
Surname: ..... UMRN Sticker
Forename: ..... AFFIX LABEL HERE
Gender: ..... D.O.B. .....

MEDICATION ORDER		RATE CHANGE								
Date: 04/11/2024	Medication: Morphine	Date:	04/11/24							
Route: IV		Time:	0915							
Dose in Infusion: 610 microg	Dose/kg/time (at 1mL/hr): 10 microg/kg/hour	Rate (mL/hr):	1mL/hr							
		Doctor:	A. Dr							
Diluent: Glucose 10%	Dose Calculation: 500 microg x 1.22 kg	Nurse:	AN / BN							
Final Volume: 50 mL	Doctor name: A. Dr Signature:	Volume Discarded:								
Date: 05/11/2024	Medication: DOUBLE STRENGTH Morphine with 25 units Heparin	Date:	05/11/24	Check compatibility with heparin and fluids.						
Route: IV		Time:	0800							
Dose in Infusion: 1220 microg	Dose/kg/time (at 1mL/hr): 20 microg/kg/hour	Rate (mL/hr):	0.5 mL/hr	Dose/kg/time will change if the concentration is adjusted.						
		Doctor:	A. Dr	Indicate the steps taken to calculate the dose in the infusion.						
Diluent: sodium chloride 0.9%	Dose Calculation: 500 microg x 1.22 kg x 2	Nurse:	AN / BN	Clearly label if increased concentration. i.e "DOUBLE STRENGTH"						
Final Volume: 50 mL	Doctor name: A. Dr Signature:	Volume Discarded:								
Date: 06/11/2024	Medication: QUADRUPLE STRENGTH Morphine	Date:	06/11/24							
Route: IV		Time:	1050							
Dose in Infusion: 2240 microg	Dose/kg/time (at 1mL/hr): 40 microg/kg/hour	Rate (mL/hr):	0.5mL/hr							
		Doctor:	A. Dr							
Diluent: Glucose 5%	Dose Calculation: 500 microg x 1.22 kg x 4	Nurse:	AN / BN							
Final Volume: 50mL	Doctor name: A. Dr Signature:	Volume Discarded:								

Appendix 2

Morphine APS IV Analgesia Continuous Opioid Infusion Chart Example

Child and Adolescent Health Service
Perth Children's Hospital

ACUTE PAIN SERVICE
INTRAVENOUS ANALGESIA
CONTINUOUS OPIOID INFUSION

Med Rec. No: .....
Surname: Patient
Forename: Addressograph
Gender: ..... D.O.B. .....

Ward	Height	Weight 3.2kg	Ideal Body Weight

Opioid Order

Date	Drug	Dose	Diluent (up to 50mLs)	Concentration (per mL)	Rate Range mLs/hr	Start Rate mL	Rate Rise mL	Bolus Dose mL
Date	Morphine	1600	0.9% Sodium	32microg/mL	0 - 4	1	0.5	
		microg	Chloride 50mL	(1mL = 10 microg/kg/hr)				

Naloxone

(IF OPIOID TOXICITY SUSPECTED PLEASE SEE OVER FOR MANAGEMENT INFORMATION)

IV Preparation: Dilute 400 microgram Naloxone up to 20mL with 0.9% Soduim Chloride (concentration 20micrograms/ml)
Note: If intravenous access is lost please administer Naloxone undiluted for intramuscular injection

	Pruritus 1 micrograms/kg **Dose:**	**Excess Sedation** 2 micrograms/kg (max 400mcg/dose) **Dose:**	**Resuscitation** 10 micrograms/kg (max 400mcg/dose) **Dose:**
Prescriber	Sig / Print	Sig / Print	Sig / Print
Date			
Time			
Initials			**Pharmacist Initials**

Additional Orders:

Supplemental Oxygen to maintain SaO_2 >	%	Face Mask L/min		Nasal Prongs L/min	

Pulse Oximetry	Date:	Date:	Date:	Date:	Date:	Date:	Date:	Date:
Please Circle:	C H A	C H A	C H A	C H A	C H A	C H A	C H A	C H A

C = Continuous; H = Hourly; A = When Asleep

Anti-emetic prescribed on (please tick)	Medication Chart		PONV chart	

Prescriber Signature	Dr Signature	**Prescriber Print Name**	Dr Name	**Date**	Date	**Pharmacist Initials**	

Infusion Start & Loading Dose

A Registered Nurse may prepare, program and commence the infusion (in accordance with S8 policy checking procedures) as prescribed. A loading dose may be necessary to achieve an adequate therapeutic opioid level. This should be administered by the APS (Anaesthetist/NP/CNC) or the DA.

Bolus Assessment and Administration (All bolus doses are to be checked as per S8 policy):

1. Pre bolus: assess patient:
   - **Pain Assessment:** Moderate to severe
   - **Sedation Level:** Awake; easily roused to voice or tactile stimuli UMSS ≤ 2 (see over for scale)
   - **Respiratory Rate:**
     - 30 neonates infants <6months
     - 20 infants 6-12 months
     - 15 1-4 yrs
     - 12 5 – 11 yrs
     - 10 children >12 yrs
   - **Oxygen Saturation:** > 94% (or as specified according to pt condition/history)
   - **Opioid Bolus:** Dose available to be administered
2. Give bolus dose as prescribed above (ONLY ADMINISTER BOLUS IF PATIENT MEETS ALL CRITERIA)
3. Post bolus: continue assessment as per protocol.
4. If pain persists after 15 minutes, repeat steps 1 – 3 and increase the rate as prescribed above.
5. Repeat steps 1 – 4 until the maximum rate is reached.
6. Where pain remains uncontrolled following increase to the maximum infusion rate contact the Acute Pain Service or the Duty Anaesthetist.

DO NOT WRITE IN BINDING MARGIN

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