
MORPHINE ADMINISTRATION

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| <ul style="list-style-type: none">• Introduction• Individualised Administration• Drug of Choice• Route of Administration | <ul style="list-style-type: none">• Team Management• Responsibility• Morphine Protocol Flow Chart |
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Introduction

A standard for the administration of Intravenous Morphine should allow effective relief of pain with an acceptable nursing workload, while increasing patient safety.

Individualised Administration

In a children's hospital the need to individualise opioid therapy is particularly challenging because of the need to consider developmental issues in terms of both pharmacokinetics and pharmacodynamics. Of particular concern is the immaturity of elimination pathways and of ventilatory control in neonates.

Drug of Choice

Morphine is considered the 'gold standard' opioid analgesic for management of pain in children unless contraindicated.

A step-wise approach to managing pain should be considered for optimal pain management.

Route of Administration

- The preferred route for Morphine administration is oral. This route is convenient, administration is painless and a number of preparations are available.
- Many patients who have acute pain will initially require Morphine by injection because either the oral route is contraindicated (e.g. vomiting, fasting, oral ulceration, or because a rapid response is needed).
- IV injections are preferred over intramuscular (IM) or intermittent subcutaneous (SC) injections for management of acute pain. This is because the IV effect is rapid and thus easily titrateable. In addition respiratory depression, if it occurs, will occur rapidly. In contrast, IM and SC administration may result in drug absorption that varies according to peripheral perfusion and the effects may be considerably delayed after administration. Intermittent IM injections to manage pain are painful and children may deny they have pain to avoid the needle. Continuous SC infusions are useful in palliative pain management when the IV or oral route is not appropriate.

MORPHINE ADMINISTRATION

The IV route carries the risk of respiratory depression, but the use of a standardised protocol is expected to minimise the danger.

Morphine Bolus Administration

Administering small boluses of Morphine every five minutes makes it possible to carefully titrate pain relief while observing for the side effects of sedation and respiratory depression.

Usual Dose Range

- Infants < 6 months 0.02 mg/kg at 5 minute intervals
- Child over 6 months but < 50kg 0.04 mg/kg at 5 minute intervals
- Child over 50kg 2 mg at 5 minute intervals

Larger doses may be required at times, but they remove the safety offered by titration and are hazardous in the absence of immediate availability of artificial ventilation.

Initial Morphine Bolus Administration PICU/CED/OR

Larger doses may initially be administered to children over 6 months of age as prescribed by medical staff on an individual basis in the Paediatric Intensive Care Unit (PICU)/ Children's Emergency Department (CED)/ and Operating Rooms (OR) where there is the immediate availability of artificial ventilation.

- For children over 6 months and less than 50kg the initial administration dose may be 0.1mg/kg.
- For children over 50kg the initial administration dose may be a standard bolus of 5mg. Further doses may then be administered as per IV Morphine protocol.
- Smaller doses are advisable under some circumstances.

Frequent Morphine Bolus Administration Vs PCA/ Continuous Opioid Infusions

The disadvantage of repeated small doses is less adequate pain relief and the time demand upon nursing staff.

If a child requires more than five titrations of morphine within a 25 minute period as described in this protocol and who is likely to have/ has on going pain, then a patient controlled analgesia (PCA) pump or a continuous opioid infusion should be considered.

Usually Morphine is the drug of choice for PCA and continuous opioid infusions unless contraindicated. Alternative opioid analgesic modality prescriptions should be discussed with the Pain Service.

- PCA has a clear safety record provided it is programmed correctly and only the patient presses the button. The inherent safety of PCA arises because a patient will become sedated if the demand button is pressed too often and thus the patient will stop pressing it. PCA, using a non-return valve is the preferred device for children who understand the concept and are physically able to use it. This includes most school-aged children. At times a background infusion may be programmed using this modality. PCA prescription/ modality access is via the

MORPHINE ADMINISTRATION

Pain Service. These children will require observation monitoring as per PCA prescription chart and RBP.

A syringe driver, using a non-return valve is the preferred device for a continuous opioid infusion in children unsuitable for PCA use. Devices such as burettes and simple volumetric pumps are not used for this purpose. Continuous opioid prescription / modality access is via the Pain Service. These children will require observation monitoring as per continuous opioid infusion prescription chart and RBP.

Administration/Monitoring of Neonates and At Risk Patients

Neonates in particular and infants less than 6 months of age have an increased risk of opioid induced respiratory depression.

Infants less than 6 months of age must have continuous respiratory monitoring after opioid administration.

The preferred monitor is a pulse oximeter. An apnoea alarm is a suitable alternative. **There must be a nurse available to respond to the monitor.**

Monitoring must continue after the last opioid administration. The period of observation should be:

- Infants < 1 month = 9 hours
- Infants >1 month to 6 months of age = 4 hours
- Special consideration should be taken of ex-premature infants with a post conceptual age of less than 60 weeks. These infants will require continuous observation until they have a 24 hour "apnoea free" period.

Caution should also be taken in morphine administration in children with known **renal impairment**. Children with renal impairment have the potential to accumulate morphine metabolites and therefore have an increase risk of respiratory depression and sedation. It is advisable that consultation with Senior Medical Staff occurs prior to the administration of morphine.

Other children at high risk of respiratory depression that may require continuous monitoring while receiving opioids include:

- central neurological diseases
- sleep apnoea
- pre - existing respiratory failure
- renal impairment
- children receiving sedatives (i.e. diazepam)

MORPHINE ADMINISTRATION

Team Management

The primary team should manage patients receiving Morphine via the Morphine protocol. Patients who require consideration for a PCA/ Continuous Opioid Infusion should be referred to the Pain Service after consultation with the primary team.

Responsibility

All Registered Nursing Staff who have completed the competency for Intravenous administration of Morphine and who are currently assessed as competent for IV/medication administration.

Morphine Protocol Flow Chart

Prescribe in the patient's medication chart as '**Morphine as per IV Protocol**'

The medication will be administered by Registered Nursing Staff who have completed the competency for Intravenous administration of Morphine and who are currently assessed as competent for IV/medication administration.

The flow chart on the following page will enable safe administration of intravenous Morphine.

MORPHINE ADMINISTRATION

