

## Continuous Morphine Infusion - Full Clinical Guideline

Reference No: CG-PM/2011/006

### Introduction

Continuous infusion of morphine and morphine-like drugs can produce excellent pain relief after major surgery especially on the first post-operative night.

Because the drug is administered continuously there is a greater potential for an increased incidence of side effects and complications. Therefore, a higher intensity of monitoring is required. These guidelines set out a recommended method for Doctors and Registered Practitioners to manage this excellent mode of analgesia in post-operative surgical patients, or patients with severe pain which cannot be managed by other methods, e.g., PCA or epidural.

### Aim and Purpose

These guidelines will be implemented in areas for adults where **intensive monitoring** can be provided by appropriate levels of trained health care professionals such as Step Down, ICU, HDU and Recovery areas, for adult patients only. The aim is to maximise the potential for high quality pain relief and to minimise the occurrence of side effects and complications of the technique.

### Definitions

#### **Registered Practitioner:**

A nurse whose name appears on the **Nursing & Midwifery Council** Register and holds a current Personal Identification Number or an Allied Healthcare Professional registered with the **HPC** and is competent in the administration of IV medications

### Pain Assessment

The **0 - 10** pain assessment score should be used as it provides a more sensitive method of assessing and evaluating rapidly changing pain and analgesic requirements, i.e. where IV Morphine is required to titrate to the patient's level of pain.

## Implementation

- **THIS IS NOT SUITABLE FOR PATIENTS WITH END STAGE RENAL FAILURE OR REDUCED RENAL FUNCTION (i.e. eGFR<60)**
- Pre – prepared syringes of morphine sulphate 50mg/50ml NaCl 0.9% are available from pharmacy.
- Ensure that **Morphine 1mg in 1ml PCA** is prescribed on iCM with “frequency” set as CONTINUOUS and “route” set as INTRAVENOUS
- Ensure a suitable dose range in **mg/hr** has been prescribed in the “ADDITIONAL INFORMATION” box ensuring the minimum and maximum rates have been set by the prescriber (Table 1)
- A PCA paper chart should be completed using the “Other Prescription/Alteration” section to prescribe the continuous infusion limits.
- **No opiates by any other route to be administered whilst the morphine infusion is in progress.** (If the patient is on transdermal opioids e.g. fentanyl or buprenorphine contact the Acute Pain Team for advice)
- Before commencing the infusion check the patient has a low pain score, if not a pump bolus may be necessary.
- Respiratory rate, sedation score, oxygen saturation, heart rate, pain score, nausea and vomiting score should all be recorded every **15 minutes for the first hour** then **HOURLY** whilst the morphine infusion is in progress.
- If the patient is asleep, use discretion but ensure the respiratory rate is counted visually every hour and is greater than 8 breaths per minute. If less than 8, wake the patient. If sedation score 2 - refer to Treatment of Complications section further down
- Commence the infusion at the recommended starting rate. Suggested average dosages are shown below:

ENSURE NALOXONE IS EASILY AVAILABLE

Type of incision	Range mg/hour
Upper abdominal / Rooftop	3 - 5 mg/hour
Loin / full midline	3 - 4 mg/hour
Lower abdominal	2 - 3 mg/hour

Table 1

All these dosages should be reduced by approximately 50% in the elderly, i.e. greater than 70 years of age.

- Remember that elderly patients tend to have a lower morphine requirement after major surgery.
- Aim to keep the pain score at less than 4/10 (at rest) for the duration of the infusion. Note that pain will often transiently increase during exercise.
- Use the algorithm (Appendix 1) to regulate the infusion rate and achieve this aim.

**Breakthrough Pain** (see Appendix 1)

If the patient's pain score is greater than 5/10 (moderate), just increasing the infusion rate will result in a long delay before a new equilibrium is reached and improved analgesia is produced. In this situation a bolus dose is necessary in order to improve pain relief and decrease the pain score quickly.

**Bolus - how much?**

- Give 3 - 5mg stat from the pump. The dose obviously depends on the age and weight of the patient and also the type of surgery – if unsure seek Acute Pain Team / senior anaesthetic advice.
- Observe respiratory rate, pulse rate, oxygen saturation, blood pressure and sedation score **EVERY 5 MINUTES FOR 15 MINUTES**. This enables side effects and complications to be detected, as these will occur early after IV bolus administration of morphine.
- Simultaneously, increase the background infusion rate by 1 - 2mgs/hour if appropriate.
- Reassess pain after 15 minutes. If pain score is still greater than 5/10, then a further bolus dose is necessary provided observations are within acceptable parameters.
- Continue 5-minute observations for a further 15 minutes. If pain score still greater than 5/10 then ensure a medical review is undertaken

Also, remember to –

- Check patency of IVI.
- Check syringe pump function.
- Check for full bladder.
- Check drains.
- Reposition patient
- Give adjuvant analgesia.
- Call senior help / on call anaesthetist.
- Surgical reassessment may be necessary.

Treatment of Complications

If the respiratory rate falls below **8** or the sedation score = 2, **NALOXONE** may be required and should be given as prescribed, in increments of 100microgrammes by suitably trained staff.

**NB** The ½ life of Naloxone is shorter than Morphine therefore the patient must be monitored in case of further fall in sedation and/or respiratory rates.

### **Respiratory depression**

If respiratory rate less than 8:

- Stop infusion.
- Check oxygen saturation.
- Administer oxygen or increase oxygen if saturation is less than 90%.
- Ensure Naloxone is available.
- Call doctor.

If oxygen saturation and all observations remain satisfactory, there is no need to administer Naloxone, which will reverse pain relief as well as respiratory depression. Discontinue the infusion until the respiratory rate is greater than 8, and then consider restarting at a reduced rate.

### **Over-sedation**

An increased sedation score correlates well with respiratory depression.

If sedation score is 2:

- Stop infusion immediately.
- Check for respiratory depression (see above).
- Administer Naloxone in doses of 100mcg until sedation score is 1 or below
- Recommence infusion at a reduced rate when patient is easily roused, i.e. a sedation score of 1 and respiratory rate >8 breaths per minute.

### **Hypotension**

- A bolus of morphine may cause hypotension because of its vasodilating properties. If BP <90 systolic – ensure no surgical cause, e.g. haemorrhage. Commence 500ml IV fluid bolus stat. Stop when systolic blood pressure greater than 100mmHg.

### **Nausea and Vomiting**

- Refer to the ward guidelines for nausea and vomiting.

### **Decreasing the infusion**

- The severity of post-operative pain gradually decreases as the post-operative period passes until strong analgesics are no longer necessary. Generally the first post-operative night is the most painful. Day 1 post op the patient can possibly transfer to PCA during the day and then revert back to an infusion overnight.
- If the infusion is for major surgery / trauma the patient may require the infusion continuously for several days
- If pain scores have been consistently low, especially on deep breathing and coughing for 6 consecutive hours, then the infusion may be reduced by 0.5mgs/hour. Reassess after a further 6 hours and decrease the infusion by a further 0.5mgs/hour. Continue hourly observations and ensure that pain relief remains satisfactory.

### **Discontinuing the infusion**

- Suitable alternative analgesia should be prescribed, which will provide adequate analgesia when the continuous morphine is stopped, e.g. PCA or Subcutaneous opioids (refer to appropriate guidelines) +/- regular oral analgesia if absorbing.
- Hourly observations should be continued for four hours following discontinuation – unless on PCA

### **NSAIDs**

The regular administration of NSAIDs (provided there are no contra-indications) in conjunction with paracetamol can reduce morphine requirements by up to 30%. This in turn reduces the incidence of morphine related side effects. Ensure a PPI is prescribed for the duration of the NSAID prescription

Regular Paracetamol also reduces Morphine requirements and should be given IV / PO even if NSAIDs are contraindicated.

**References**

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**Guidelines for Patient Controlled Analgesia (adults)**

Derby Teaching Hospitals NHS Foundation Trust  
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**Documentation Controls**

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**Appendix 1**

**BREAKTHROUGH PAIN**

