# MORPHINE

## 1.0 Classification

- Opioid analgesic

## 2.0 Mechanism of Action

- Full agonist at mu receptor leading to analgesia and sedation.
- Causes histamine-mediated vasodilation, thereby reducing venous return and myocardial oxygen demand.

## 3.0 Indications

- Moderate to severe pain (particularly pain which is ongoing or expected to be of long duration e.g., abdominal pain secondary to appendicitis)
- Dyspnea (in the palliative care setting only)
- Severe ischemic chest pain that is not lessened by nitrates

## 4.0 Contraindications

- Known hypersensitivity
- Systolic blood pressure less than 100 mmHg (relative contraindication in palliative population)
- Decreased level of consciousness (relative contraindication in palliative population)
- Renal failure (relative contraindication due to neurotoxic metabolites, experts generally prefer other opioids such as fentanyl or hydromorphone as first-line however evidence shows that if the dose is appropriately reduced, morphine can be safe)

## 5.0 Precautions

- Fast administration is more often associated with adverse effects listed below and can also potentiate a local rash at the IV site. Such local reaction shouldn't be interpreted as allergy as this is a known effect.
- Opioids should always be used with caution and in reduced dose in older adults or patients with dementia due to the potential for drug accumulation and increased sensitivity to CNS active medications.
- Dose reduction is also required if comorbidities such as COPD, sleep apnea, obesity or any other condition which may increase risk of sedation or cardiorespiratory depression.
- Dose reduction is required for opioid naïve patients.

## 6.0 Route

- May be given IV/IO, IM, or subcut.
- Subcut is preferred in the palliative setting.
- Safest route for acute pain control is IV with careful titration.

## 7.0 Dosage

**Adult**

- 2.5-5.0 mg IV q 10 minutes as needed; ICPs/ACPs/CCPs may exceed a maximum of 15 mg with Clinical Support Paramedic approval.

**Pediatric**

- 0.05-0.1 mg/kg IV (max 2 mg/dose) administered slowly over 1 min q 10 min (max of 5 mg total)

- extreme caution in the very young, start with the lowest dose.

*Dosing in the palliative care setting will be determined in conjunction with the Medical Communications Centre Physician.

## 8.0 Supplied

- 1 mL vial of 10 mg; to administer, dilute with 9 mL of normal saline to a concentration of 1 mg/mL; if unable to establish an IV, same dosages as above can be given IM or subcut but do not dilute the morphine.

## 9.0 May Be Given By

- ACP/CCP
- ICPs can administer morphine for MS or flank pain OR as per physician's order on interfacility transfers for any pain OR as per MCCP orders in the palliative care setting.
    - No need to contact Clinical Support Paramedic to exceed 15 mg for physician order during interfacility transfers.

## 10.0 Adverse Effects

- Respiratory depression
- Sedation/neurotoxicity and seizures
- Histamine release leading to hypotension and pruritis
- Euphoria
- Miosis
- Slow gastrointestinal motility and constipation

## 11.0 Special Notes

- IN fentanyl is preferred for the pediatric population.
- Morphine lasts approximately 3-6 hours regardless of route. The subcutaneous route is reserved for palliative patients at end stage or patients where an IV is unobtainable. The subcut route has significant disadvantage of variable absorption. For acute pain careful IV titration of morphine or fentanyl is preferred as the absorption is predictable and rapid thereby leading to more rapid pain relief in a safer manner than the subcut route. For palliative patients who are actively dying and unable to take oral medication, the subcut route is preferred as its less painful than starting an IV. For palliative patients in acute pain who would still accept IVs within their goals of care, their pain should be managed via IV route.
- The effects of opioids can be accentuated by CNS depressants such as benzodiazepines, alcohol, or other sedating medications/drugs.
- Opioids should not be combined with benzodiazepines unless for the purpose of procedural sedation. In such circumstances, greatly reduced doses should be used as the sedating and respiratory depressant effects of each are exacerbated by the other. The Clinical Support Paramedic must be contacted prior to giving opioids in conjunction with benzodiazepines to the same patient. If considering procedural sedation, fentanyl is preferred due to its shorter duration of action.
- Fentanyl is preferred for the management of ischemic chest pain unresponsive to nitrates due to its decreased effects on hemodynamic stability.
- The Centers for Disease Control and Prevention (CDC) recommends non-opioid pain relievers such anti-inflammatories and acetaminophen be used as adjuncts to help reduce the amount of opioid required and thereby minimize their associated risks. Using non-opioid pain relievers such as ketorolac or acetaminophen and non-pharmacological techniques are important adjuncts which can be helpful in minimizing the amount of opioid required.
- In the palliative population the adverse effects and precautions are more acceptable due to the goals of care. MCCP must be contacted prior to administering opioids in the palliative care setting, in order to develop the most appropriate care plan aligned with the patient's goals of care.
- Fentanyl is the preferred agent to use for the management of pain during labour due to its shorter duration of action.
- Pregnancy category C [if the patient will benefit from a Category C drug, it is generally used]

## 12.0 References

- Pain Management Clinical Practice Guideline
- Chest Pain Clinical Practice Guideline
- Palliative Care Clinical Practice Guideline
- Compendium of Pharmaceuticals and Specialties (CPS)

*Electronically Signed


## Table 1. Conversion guide for comparing opioid potency.

| | Oral | Subcutaneous* | Morphine Equivalents** |
|---|---|---|---|
| Morphine | 10 mg | 5 mg | 1 |
| Fentanyl | --- | 50 mcg | 0.1 (100 mcg) |
| Hydromorphone | 2 mg | 1 mg | 4 |
| Codeine | 100 mg | --- | 0.15 |
| Oxycodone | 5 mg – 7.5 mg | --- | 1.5 |
| methadone | 1 mg | --- | 4 |

*Absorption time and bioavailability is variable by the subcutaneous route: the IV route is preferred when immediate control of pain is required for acute pain.
**CDC conversion guide for comparing opioid potency. If converting from one opioid to another, use the guide to convert dose but then also decrease the new opioid by half.

## Table 2. Opioid onset, peak effect, and duration table

| | Onset Time | Peak analgesic effect | Duration of analgesia |
|---|---|---|---|
| Morphine | IV: 1-2 min | IV: 15-20 min<br>IM/Subcut: 15-30 min<br>Oral: 30 min-1 hr | 3-4 hr |
| Fentanyl | IV: <1 min | IV: 2-5 min | 30-60 min |
| Hydromorphone | IV: 5-15 min | IV: 10-20 min | 2-4 hr |
| Codeine | Oral: 30-60 min<br>IM: 10-30 min | --- | 2-4 hr (oral) |
| Oxycodone | Oral: 10-15 min | --- | 3-4 hr (oral) |