Medication: Fentanyl	PDN: 6956.05	Last Updated: July 20 2023	PMD: Andrew Travers*	PDC: Tanya Fraser*	

FENTANYL

1.0 Classification

- Synthetic opioid analgesic

2.0 Mechanism of Action

- Full agonist at mu receptor leading to analgesia and sedation.

3.0 Indications

- Moderate to severe pain
- Severe ischemic chest pain that is not lessened by nitrates
- Dyspnea (in the palliative care setting only)
- Pain associated with labour

4.0 Contraindications

- Known hypersensitivity (absolute)
- Severe hemorrhage or shock (relative)
- Systolic blood pressure less than 90 mmHg (relative)

5.0 Precautions

- Rapid administration can lead to chest wall rigidity in the pediatric population.
- Opioids should always be used with caution and in reduced doses in older adults or for people 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, IM, IN or Subcut
- IM/Subcut routes only to be used if IV unavailable or outside patient's goals of care.
- IN is particularly advantageous in the pediatric population.

7.0 Dosage

Adult

- 1.5 mcg/kg/dose; carefully titrate by administering 25-50 mcg IV at a time over at least 1 minute, or via nasal atomizer, q 5 minutes as needed to a max of 100 mcg q 1h. Consult CSP to exceed 100 mcg q 1h or 200 mcg total.

Pediatric

- 1.5 mcg/kg/dose (MAX 100 mcg/dose) IN; may repeat 0.5-1 mcg/kg/dose (MAX 50 mcg/dose) after 10 min if needed.
- 1 mcg/kg/dose (MAX 50 mcg/dose) IV; may repeat q 1-2h PRN.

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

8.0 Supplied

- 100 mcg in a 2 mL ampule; can be diluted to facilitate IV administration.

9.0 May Be Given By

- ACP/CCP

10.0 Adverse Effects

- Respiratory depression
- Chest wall rigidity (pediatrics)
- Sedation/neurotoxicity and seizures
- Euphoria
- Miosis
- Slow gastrointestinal motility and constipation

11.0 Special Notes

- Patients with allergy to morphine should not expect cross-reactivity as fentanyl is a synthetic opioid.
- Fentanyl doesn't have histamine-releasing properties like morphine; therefore, it may be preferred if hemodynamically unstable or bronchospasm. In addition, as a shorter-acting opioid, its effects may wear off quicker.
- 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 has a short duration of analgesia, approximately 30-60 min, however fentanyl is highly lipophilic, with rapid distribution to highly perfused tissues (e.g., brain, heart, kidney, and GI tract) and a slower redistribution to muscle and fat. This can result in prolonged sedation after it is discontinued.
- Fentanyl has inactive metabolites and therefore may be the preferred agent in renal failure.
- Fentanyl is often used in trauma due to its quick onset time and shorter duration of action allowing for more accurate neurological assessment when it wears off. If a major trauma patient has severe hemorrhage and/or systolic blood pressure below 90, judicious careful titration of fentanyl via IV may be used if the benefits (e.g., managing pain, decreasing agitation, and keeping a patient still) outweigh the risks.
- All opioids carry risk of addiction. It is unknown what effect a bolus dose of opioid has on long-term misuse. For patients with opioid use disorder on opioid agonist therapy (buprenorphine or methadone) experiencing acute pain, fentanyl may be preferred. Titrate as usual in these circumstances however higher doses than usual may be required.
- 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.
- The Medical Communications Centre Physician must be contacted prior to administering opioids in the palliative care setting, to develop the most appropriate care plan aligned with the patient's goals of care.
- Fentanyl is not generally the drug of choice in the palliative patient population due to its shorter duration of action (this doesn't apply to patients with a fentanyl patch).
- Due to its shorter duration of action, fentanyl is the preferred agent for managing pain during labour; be aware of potential opioid-induced respiratory depression in the newborn.
- 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)

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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 subcut 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 IM/Subcut: 15-30 min 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 IM: 10-30 min	---	2-4 hr (oral)
Oxycodone	Oral: 10-15 min	---	3-4 hr (oral)