The Use of Fentanyl in a Syringe Pump in Palliative Medicine

Subcutaneous Fentanyl IS NOT ROUTINELY USED IN OLH&CS
Warning: Fentanyl should not be confused with Alfentanil
To ensure safety, Fentanyl must be prescribed in micrograms

Indications for Use	For the management of pain in patients with severe renal failure and/or severe hepatic impairment, or in cases of intolerance to other strong opioids.
Preparations	Fentanyl (as fentanyl citrate) 50micrograms/mL solution for injection (Brands include: Sublimaze®) 2mL ampoule (**contains 100 micrograms)** 10mL ampoule **(contains 500 micrograms)** **Note: Fentanyl 1000 micrograms = Fentanyl 1 mg**
Conversion ratios	Selection of a single conversion ratio is made difficult by fentanyl's complex pharmacokinetics, particularly when considering single doses versus prolonged use. In general, the literature suggests conversion ratios from parenteral morphine to parenteral fentanyl of between 50: 1 and 75:1 .
Dose Conversion	In OLH&CS, a conversion ratio of **50:1** between parenteral morphine and parenteral fentanyl is used. S**ubcutaneous (SC)** fentanyl is considered to be approximately 50 times more potent than **SC** morphine. Refer to OLH&CS Opioid Conversion Chart for further information. **Conversions involving Transdermal Fentanyl Patches: Medication Safety Alert:** Note that fentanyl patches are prescribed in micrograms per hour and hence the total daily dose in 24 hours needs to be considered. e.g. Fentanyl 600micrograms via CSCI over 24 hours is equivalent to Fentanyl 25micrograms/hour [600 ÷ 24 = 25] every 72 hours. **Timing of conversions:** The pharmacokinetics of fentanyl differ significantly to that of other opioids. Specialist palliative care advice should be sought when converting between fentanyl and other opioids or between different fentanyl routes of administration. Please contact pharmacy for more information.
Breakthrough Doses	The use of fentanyl 'as required' for breakthrough pain should only be prescribed by a specialist experienced in its use, with close clinical monitoring. In OLH&CS, alternative opioids are routinely used for breakthrough pain e.g. morphine, oxycodone. **Why is this?** Whether as a subcutaneous injection or a transmucosal preparation, the use of fentanyl 'as required' for breakthrough pain is complex due to the pharmacokinetics of fentanyl. The duration of action of fentanyl is reported to be short after single doses in fentanyl-naïve patients (30-60minutes), likely due to rapid redistribution into the tissues. However, with high or repeated doses it becomes longer acting due to a lengthening elimination half-life, reflecting slower release from tissue depots. **Transmucosal Fentanyl Preparations** are not routinely used with parenteral fentanyl unless specifically indicated in the treatment of episodic pain. These require individual dose titration independently of the background opioid dose. Transmucosal fentanyl should only be used in patients who are tolerant of an oral morphine equivalent to 60mg or more daily.
Hepatic Impairment	Dose reductions are not usually required, however lower doses may be sufficient and cautious dose titration is advised. Although fentanyl undergoes hepatic metabolism, the plasma clearance of fentanyl is mostly affected by changes in hepatic blood flow rather than reduced metabolism. Empirical dose adjustment may be required. The metabolites of fentanyl are non-toxic and inactive.
Renal Failure	Because it does not have active metabolites, fentanyl is a reasonable option for patients with renal impairment or failure. Dose reductions are not usually required, however lower doses may be sufficient. Accumulation in renal impairment has been reported, particularly with chronic dosing. Empirical dose adjustment may be required.
Pharmaco-kinetics	Fentanyl is a strong μ-opioid receptor agonist. It has a relatively low molecular weight and is lipophilic (unlike morphine) which allows for easy transfer across the blood brain barrier. It is sequestrated in body fats, including epidural fat and the white matter of the CNS. Accumulation with prolonged use has been reported. When converting morphine to fentanyl, there is a decrease in opioid molecules outside the CNS. This explains why peripherally-mediated adverse effects (including constipation) can be less pronounced in patients on fentanyl.
Diluents	Sodium Chloride 0.9% , Water for Injection or Glucose 5% may be used.
Compatibility Information	Compatibility information is limited. Please consult with pharmacy. Please report any incompatibilities to the Palliative Meds Info Service: (01) 4912578
Drug Interactions	Fentanyl is metabolised by CYP3A4 and is susceptible to drug interactions. Co-administration of fentanyl with a serotonergic agent may increase the risk of serotonin syndrome. Please consult with pharmacy and with product information on www.hpra.ie or www.medicines.ie.
Issues for Discharge	Fentanyl 50 micrograms/1 mL ampoules are not currently reimbursable on the medical card or Drug Payment Scheme. Therefore, patients in the community may have to incur the full cost. Application to the Hardship scheme may be considered where appropriate, please consult with pharmacy for more information.

MORPHINE PO MG	MORPHINE SC MG	FENTANYL SC MG	FENTANYL SC MICROGRAMS
10 mg	5mg	0.1 mg	**100 micrograms**