

UNC MEDICAL CENTER GUIDELINE

Dosing Guideline for Intravenous Patient Controlled Analgesia in Patients with Limited Opioid Exposure (Age 6 Years or Above)

This should be used as a guide for the initiation and management of intravenous patient controlled analgesia (PCA-IV) therapy for patients who are *opioid naïve*. Patients who are considered *opioid-tolerant* are those who have been taking, for a week or longer, at least 60 mg of oral morphine daily or 30 mg of oral oxycodone daily or an equianalgesic dose of another opioid. Patients who do not meet the definition of *opioid-tolerant*, are considered *opioid naïve*. PCA doses for patients with chronic pain or cancer pain should be based on prior narcotic requirements and response to therapy; consider consulting the Chronic Pain Service for assistance. PCA use by caregivers is in accordance with the [Caregiver and Nurse Controlled Analgesia \(CNCA\) for Pediatric Patients Policy](#). **HYDRomorphone is the preferred agent for PCA-IV at UNC Medical Center.** Morphine or fentaNYL are alternatives when certain conditions are present (see dosing charts below).

Initial Dosing Adjustments

Dosing adjustments are recommended if patients meet one or more of the following criteria:

- Age > 60 years
- Obesity (BMI > 30 kg/m²)
- Pulmonary Impairment
- Hepatic Impairment
- Renal Impairment
- Obstructive Sleep Apnea

Recommended dose adjustment guidelines include the following:

- Reduce loading dose by 50%, and reduce intermittent dose by 25%.
- Avoid use of continuous infusions.
- If a continuous infusion is prescribed, monitor closely for acute changes in functional status and vital signs.

Patient Assessment During PCA-IV Therapy

- Patients should be assessed for pain relief within 60 minutes of starting therapy or dosage changes.
 - See [Pain Management](#) (nursing) and [Patient Controlled Analgesia](#) Policies
- If dose needs to be adjusted use the following guideline:
 - Too much drug, decrease dose by 25%.
 - Too little drug, increase intermittent dose by 50%.

Morphine

- Morphine should be dosed based on lean body weight (see appendix 1)

TABLE 1: INITIAL MORPHINE PCA-IV DOSING GUIDANCE

Lean Body Weight	Morphine Loading Dose (mg)		Morphine Intermittent Dose (mg)	Morphine Usual Lockout Interval* (min)	Morphine Continuous Infusion Rate (mg/hour) Only if needed
	Initial Dose	Max Initial Dose			
Usual weight-based	0.05 mg/kg	0.1 mg/kg	0.02 mg/kg	--	0.02 – 0.04 mg/kg/h
14 – 17 kg	0.7 mg – 0.9 mg	1.4 mg – 1.7 mg	0.3 mg	10 minutes	0.3 mg – 0.6 mg
17.1 – 22 kg	0.8 mg – 1.1 mg	1.7 mg – 2.2 mg	0.4 mg	10 minutes	0.4 mg – 0.8 mg
22.1 – 27 kg	1.1 mg – 1.3 mg	2.2 mg – 2.7 mg	0.5 mg	10 minutes	0.5 mg – 1 mg
27.1 – 32 kg	1.3 mg – 1.6 mg	2.7 mg – 3.2 mg	0.6 mg	10 minutes	0.6 mg – 1.2 mg
32.1 – 37 kg	1.6 mg – 1.8 mg	3.2 mg – 3.7 mg	0.7 mg	10 minutes	0.7 mg – 1.4 mg
37.1 – 42 kg	1.8 mg – 2.1 mg	3.7 mg – 4 mg	0.8 mg	10 minutes	0.8 mg – 1.6 mg
42.1 – 47 kg	2.1 mg – 2.3 mg	4 mg	0.9 mg	10 minutes	0.9 mg – 1.8 mg
> 47 kg	2 mg	4 mg	1 mg	10 minutes	1 mg – 2 mg

*may use lockout as low as 6 minutes for extreme cases of pain; 4h Lockout Limits should be considered for patients with impaired pulmonary, renal or liver function or who are receiving continuous infusion and PCA bolus dosing

HYDRORPHONE

- HYDRORPHONE should be dosed based on lean body weight (see appendix 1)

TABLE 2: INITIAL HYDRORPHONE PCA-IV DOSING GUIDANCE

Lean Body Weight	HYDRORPHONE Loading Dose (mg)	HYDRORPHONE Intermittent Dose (mg)	HYDRORPHONE Usual Lockout Interval* (min)	HYDRORPHONE Continuous Infusion Rate (mg/hour) <u>Only if needed</u>
Usual weight-based	Max = 0.02 mg/kg	0.003 – 0.004 mg/kg	--	0.003 – 0.005 mg/kg/h
14 – 17 kg	0.3 mg (max)	0.06 mg	10 minutes	0.04 mg – 0.08 mg
17.1 – 22 kg	0.4 mg (max)	0.08 mg	10 minutes	0.05 mg – 0.11 mg
22.1 – 27 kg	0.5 mg (max)	0.1 mg	10 minutes	0.06 mg – 0.13 mg
27.1 – 32 kg	0.6 mg (max)	0.12 mg	10 minutes	0.08 mg – 0.16 mg
32.1 – 37 kg	0.7 mg (max)	0.14 mg	10 minutes	0.1 mg – 0.18 mg
37.1 – 42 kg	0.8 mg (max)	0.16 mg	10 minutes	0.11 mg – 0.2 mg
42.1 – 47 kg	0.9 mg (max)	0.18 mg	10 minutes	0.12 mg – 0.23 mg
> 47 kg	0.5 mg usual (1 mg max)	0.2 mg	10 minutes	0.2 mg – 0.4 mg

*may use lockout as low as 6 minutes for extreme cases of pain; 4h Lockout Limits should be considered for patients with impaired pulmonary, renal or liver function or who are receiving continuous infusion and PCA bolus dosing

FENTA NYL

- fentaNYL should be dosed based on lean body weight (see appendix 1)

TABLE 3: INITIAL fentaNYL PCA-IV DOSING GUIDANCE

Lean Body Weight	fentaNYL Loading Dose (mcg)	fentaNYL Intermittent Dose (mcg)	fentaNYL Usual Lockout Interval* (min)	fentaNYL Continuous Infusion Rate (mcg/hour) <u>Only if needed</u>
Usual weight-based	Max = 1 mcg/kg	0.2 mcg/kg	--	0.2 – 0.4 mcg/kg/h
14 – 17 kg	17 mcg (max)	3 mcg	8 minutes	3 mcg – 6 mcg
17.1 – 22 kg	22 mcg (max)	4 mcg	8 minutes	4 mcg – 8 mcg
22.1 – 27 kg	27 mcg (max)	5 mcg	8 minutes	5 mcg – 10 mcg
27.1 – 32 kg	32 mcg (max)	6 mcg	8 minutes	6 mcg – 12 mcg
32.1 – 37 kg	37 mcg (max)	7 mcg	8 minutes	7 mcg – 14 mcg
37.1 – 42 kg	42 mcg (max)	8 mcg	8 minutes	8 mcg – 16 mcg
42.1 – 47 kg	47 mcg (max)	9 mcg	8 minutes	9 mcg – 18 mcg
> 47 kg	50 mcg usual (100 mcg max)	10 mcg	8 minutes	10 mcg – 20 mcg

*may use lockout as low as 6 minutes for extreme cases of pain; 4h Lockout Limits should be considered for patients with impaired pulmonary, renal or liver function or who are receiving continuous infusion and PCA bolus dosing

APPENDIX 1: LEAN BODY WEIGHT CALCUALTIONS

Males: $(0.73 \times \text{Height in cm}) - 59.42$

Females: $(0.65 \times \text{Height in cm}) - 50.74$

Note: To convert inches to cm: inches x 2.54 = centimeters

R E F E R E N C E S

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3. Murtagh FE, et al. The use of opioid analgesia in end-stage renal disease patients managed without dialysis: recommendations for practice. *J Pain Palliat Care Pharmacother.* 2007;21(2):5-16.
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5. Practice guidelines for acute pain management in the perioperative setting: an updated report by the American Society of Anesthesiologists Task Force on Acute Pain Management. *Anesthesiology.* 2012 Feb;116(2):248-73.