Comer Children's Hospital
Pediatric Pain Management Reference Card

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****This card is only a guide and is not to substitute clinical judgment. Each patient must be considered on a case-by-case basis. Always review questions with your supervisor and/or a clinical pharmacist****

****Always consider non-pharmacologic methods of pain control! Examples: massage, heat/ice, PT/OT, guided imagery, meditation, distraction, music/ art therapy****

WHO Two-Step Approach:

1. Mild pain: Acetaminophen and ibuprofen are medicines of choice.
2. Moderate to severe pain: Opioids are indicated. Morphine is usually first choice.

Non-Opioid Analgesic PO Starting Doses

Medicine	Neonates (0-29d)	Infants (30d-6mo)	Infants and children (6mo–12y)	Adults	Maximum total daily dose
Acetaminophen	10 mg/kg q6-8h	10 -15 mg/kg q4-6h	10-15 mg/kg q4-6h	325-650 mg q4-6h	5 doses/day, or 3000 mg for adults (3000 mg is soft limit, 4000 mg is absolute maximum)
Ibuprofen	X	X	5-10 mg/kg q6h, max dose 400 mg	200-600 mg q6h	40 mg/kg/day or 2,400 mg
Ketorolac (PO or IV)	X	X	0.5 mg/kg q6h, max dose 15 mg	15 mg q6hr (30 mg if 15 mg dose ineffective)	4 doses/day, 120 mg/day, not to exceed 3-5 day duration

Opioid IV Starting Doses (PRN)*

Medicine	Neonate (0-29d)	Infant (1mo-1y)	Children (1-12y)	Adults
Morphine	0.025-0.03 mg/kg q2-4h	0.05-0.1 mg/kg q2-4h (max 2 mg/dose)	0.05-0.1 mg/kg q2-4h (max 2 mg/dose)	2-5 mg q2-6h
Hydromorphone	X	0.01-0.015 mg/kg q3-6h (max 0.2 mg)	0.01-0.015 mg/kg q3-6h (max 0.2 mg)	0.2-0.6 mg q2-4
Fentanyl	1-2 **mcg/kg** q2-4h	1-2 **mcg/kg** q2-4h	1-2 **mcg/kg** q1-2h (max 50 mcg)	50-100 **mcg** q1-2h

Opioid PO Starting Doses (PRN)*

Medicine	Neonate (0-29 days)	Infant (1 mo to 1 year)	Children (1-12 years)	Adults
Morphine	0.08-0.1 mg/kg q3-4h	0.1 mg/kg q4h	0.2-0.3 mg/kg q4h Max 15 mg/dose	10-30 mg q4h
Hydromorphone	X	Over 6 months: 0.03-0.05 mg/kg q4h (max 1 mg)	0.03-0.05 mg/kg q4 (max 1 mg)	1-2 mg q3-4h
Oxycodone	X	0.05-0.15 mg/kg q4-6h	0.1-0.15 mg/kg q4-6h (max 5 mg/dose)	5 – 10 mg q4-6h

***for opioid-naïve patients, doses can be escalated per provider discretion based on patient response to therapy. All medications should be dosed PRN.**

Opioid Equianalgesic Conversions

Drug	Equivalent Doses IV/IM	Equivalent Doses PO	Key Safety Data
Morphine (Oramorph)	10 mg IV/IM	30 mg PO	Avoid in renal impairment
HYDROmorphone (Dilaudid)	1.5 mg IV	7.5 mg PO	
HYDROcodone/APAP (Vicodin, Norco, Lortab)	-----	30 mg PO	Ensure acetaminophen dose is also appropriate
Oxycodone (OxyIR, Oxycontin)	-----	20 mg PO	
Fentanyl	100 ***mcg*** IV	See chart to right for transdermal dose conversions	See chart below for IV push (outside of ICU) and PCA restrictions
Codeine sulfate	-----	200 mg PO	Caution in renal impairment

Adjust for Incomplete Cross-tolerance

Pain severity	Empiric reduction
Moderate – severe pain	↓ 0 – 25%
Mild pain, organ dysfunction	↓ 25 – 50%

Sample calculation: Convert 0.4 mg IV hydromorphone to PO morphine.
Step 1) 0.4 mg IV hydromorphone X 10 mg IV morphine/1.5 mg IV hydromorphone X 30 mg PO morphine/10 mg IV morphine = 8 mg PO morphine
Step 2) Reduce by 25% for incomplete cross-tolerance: 0.75 X 8 mg PO morphine = 6 mg PO morphine

Fentanyl Patch Conversion

Fentanyl Transdermal Patch Dose (***mcg***/hr)	24-Hour PO Morphine Dose (mg)
12	30
25	50
50	100

Step 1) Calculate total daily dose of oral morphine.
Step 2) Reduce by 25-50% for incomplete cross tolerance.
Step 3) Use chart to determine equivalent dose of parenteral fentanyl (IV and transdermal are equivalent).

Notes about fentanyl:

- *Not for acute pain management*
- *Transdermal therapy is difficult to titrate due to prolonged onset and onset of action*
- *Fentanyl patches require at least a 24 hour post-initiation assessment prior to dose titration*
- *Fentanyl patch doses > 50 mcg/hr should be used cautiously; consider a pharmacy/pain/palliative care consult*

Managing chronic pain:

- Chronic pain management: Determine daily opioid requirement and convert to sustained release formulation BID-TID with immediate release used PRN for breakthrough pain
- Breakthrough dosages – typically 10-15% of the 24-hour opioid requirement, available as often as every 2 hr PRN
  - For uncontrolled pain, can increase by 25-50% for moderate pain, 50-75% for severe pain
  - If more than 3-4 doses of breakthrough medication are used daily, increase the sustained-release opioid by ~50% of the total amount of breakthrough medication used in 24 hours

Managing Opioid Side Effects:

- Constipation: Schedule senna-docusate for patients on opioids to prevent constipation. Can add miralax as needed. Consider enemas if no stool in 4 days.
- Nausea: Ondansetron 0.1 mg/kg IV/PO q8h (max dose 8 mg), Metoclopramide 0.2 mg/kg IV/PO (max dose 10 mg). Consider dose reduction or opioid rotation.
- Itching: Naloxone drip at 1 mcg/kg/hr is effective at reducing itching. Diphenhydramine or ondansetron may also be effective.
- Sedation/Respiratory Depression: Hold sedatives and opioids. Naloxone 0.1 mg/kg/dose q2-3 minutes. If >20 kg or >5 yo, can give 0.4-2 mg/dose. Caution in opioid dependent patients, give in small increments of 0.1-0.2 mg.

Neuropathic Pain:

Amitriptyline

Start at 0.1 mg/kg PO qhs. May advance as tolerated every 4 days to 0.5 to 2 mg/kg at bedtime.

Nortriptyline

Day 1-4: 0.2 mg/kg (max 10mg) PO qhs
Day 5-8: 0.4 mg/kg PO qhs
Increase every 5th day by 0.2 mg/kg/day until effective analgesia . Typical max of 1 mg/kg/day (max 50 mg/day), higher doses are safe, but typically used for depression.

Gabapentin

Day 1-3: 5 mg/kg/dose (max 250mg) qhs
Day 4-6: 2.5 mg/kg/dose am and midday and 5 mg/kg qhs (alternative: 5 mg/kg BID)
Day 7-9: 2.5 mg/kg/dose am and midday and 10 mg/kg qhs (alternative: 5 mg/kg TID)
Day 10-12: 5 mg/kg/dose am and midday and 10 mg/kg qhs
Continue to increase every 3 days by 5 mg/kg/day until effective analgesia or to minimum total dose of 40-60 mg/kg/day if <5yo and 30 mg/kg/day if >5yo. Usual adult daily dose: 1800-2400 mg/day, max dose of 3600 mg/day.

Initiating PCA:

- Consider use for patients 7 years old and above.
- Assess prior PCA use and dosage for patients who have used a PCA in the past.
- Always give an initial loading dose to attain adequate control of pain prior to initiating PCA.

Hydromorphone (Dilaudid)

Demand – Usual initial dose for hydromorphone is 0.003-0.004 mg/kg/dose q6-10 minutes. In patients > 50 kg, can start at 0.1-0.2 mg q6-10 minutes

Continuous – 0 to 0.004 mg/kg/hour (equivalent to 0 to 4 mcg/kg/hour) (not recommended in opioid-naïve patients)

Morphine

Demand – Usual initial 0.01-0.03 mg/kg/dose q6-10 minutes. In patients >50kg, usual initial is 0.5-2.5 mg q6-10 minutes
Continuous – 0-0.04 mg/kg/hour (not recommended in opioid-naïve patients)

Sources:
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