Newborn Critical Care Center Guidelines

Opioid Weaning and Conversion Guidelines

BACKGROUND

Preventing and minimizing pain for infants in the neonatal critical care center is achieved by providing analgesia and sedation using pharmacologic and non-pharmacologic approaches. Pharmacologic measures often include opioids, the administration of which can lead to the development of physical dependence. This subsequently results in treatment of children for actual or potential withdrawal symptoms as a comorbidity of hospitalization.[1]

Neonatal withdrawal is a generalized multisystem disorder, which predominantly results in neurologic and gastrointestinal signs and symptoms (Table 1). Infants who require prolonged intensive care, undergo complex surgery, or are supported with extracorporeal membrane oxygenation (ECMO) are among those at the highest risk of acquired drug dependency.

Table 1: Signs and symptoms of neonatal withdrawal

Neurological	Gastrointestinal	Autonomic
• Irritability • Increased wakefulness • High-pitched cry • Tremor • Increased muscle tone • Hyperactive deep tendon reflexes • Frequent yawning and sneezing • Seizures (2-11%)	• Vomiting/diarrhea • Dehydration • Poor weight gain • Poor feeding • Uncoordinated and constant sucking	• Diaphoresis • Nasal stuffiness • Fever • Mottling • Temperature instability • Piloerection • Mild elevations in respiratory rate and blood pressure

PURPOSE

- To aid in the weaning of opioids in infants at risk of developing neonatal withdrawal
- To use a standardized scoring and weaning protocol for the following groups of infants:
    1. Infants who have received > 3 days of continuous or scheduled opioids
    2. Infants who have received > 3 opioid doses per day for > 5 days

NOTES:

- Infants with cumulative exposure to opioids below the above threshold can undergo a rapid taper over a 24 – 48 hour period.
- Signs and symptoms of withdrawal may develop within 24 hours of discontinuation or during a rapid taper of an opioid. If this happens, the infant may require rescue dosing, and a weaning strategy must be implemented.
- Preterm infants have been reported as having a lower risk of drug withdrawal with less severe symptomatology, and/or less prolonged weaning courses. This may be related to developmental immaturity of the CNS or in-utero exposure period; however, the clinical evaluation of the severity of symptoms may be complicated by the fact that scoring tools (Finnegan) were developed in term infants.

SCORING INTERPRETATION FOR WITHDRAWAL

The Neonatal Abstinence Syndrome (NAS) Scoring and the Withdrawal Assessment Tool (WAT-1) are validated scoring tools that can be used for evaluation of iatrogenic withdrawal in infants and are available in EPIC.

Preterm Infants: Utilize **both** NAS and WAT-1

Term Infants (≥ 37 weeks): Utilize WAT-1

NEONATAL ABSTINENCE SYNDROME (NAS) SCORING	
LOW SCORE (0-4) *No or mild withdrawal*	• Continue monitoring patient • Consider medication wean
MODERATE SCORE (5-7) *Moderate withdrawal*	• Consider slowing the speed of or pausing the wean and providing PRN medications • Consider adding an adjunct medication to alleviate symptoms and facilitate weaning
HIGH SCORE **(≥ 8 for 3 intervals or ≥ 12 for 2 intervals)** *Severe withdrawal*	• Significant intervention is needed • Consider increasing dose by 10% of the original dose or provide PRN medications, and consider adding an adjunct medication to alleviate symptoms and facilitate weaning • Provide supportive care - the patient may require more intensive monitoring

WITHDRAWAL ASSESSMENT TOOL (WAT-1)	
LOW SCORE (0-4) *No or mild withdrawal*	• Continue monitoring patient • Consider medication wean
MODERATE SCORE (5-7) *Moderate withdrawal*	• Consider slowing the speed of or pausing the wean and providing PRN medications • Consider adding an adjunct medication to alleviate symptoms and facilitate weaning
HIGH SCORE **(8 and above)** *Severe withdrawal*	• Significant intervention is needed • Consider increasing dose by 10% of the original dose or provide PRN medications, and consider adding an adjunct medication to alleviate symptoms and facilitate weaning • Provide supportive care - the patient may require more intensive monitoring

INSTRUCTIONS FOR CONTINUOUS INFUSION WEANING

GENERAL WEANING GUIDELINES	
Cumulative dosing for ≤ 2 weeks:	Wean by 20% of **original dose** every 24-48 hours
Cumulative dosing for > 2 weeks:	Wean by 10% of **original dose** every 24-48 hours

INSTRUCTIONS FOR CONVERTING *IV* FENTANYL GTT TO *PO* MORPHINE

- When transitioning from fentanyl gtt to PO morphine please do the following:
    1. 30 minutes after 1st dose of PO morphine decrease fentanyl infusion rate by half
    2. 30 minutes after the 2nd dose of PO morphine discontinue fentanyl infusion
- See Appendix A for worksheet with instructions

INSTRUCTIONS FOR WEANING PO MORPHINE

- Decrease dose by 10-20% of the original (converted) dose **every 24 hours (if NAS <8 or WAT-1 <4)**
    1. Use 20% of the original dose if total opioid exposure is 2 weeks or less
    2. Use 10% of the original dose if total opioid exposure is > 2 weeks
    3. Continue the same frequency (**consistent weaning**)
- Once the morphine dose is between 0.03 - 0.05 mg/kg/dose, it may be discontinued

PEARLS

- Please consult with the NCCC pharmacists for any questions related to medication conversion, dosing, and adjunct agents.
- Narcotic conversion is an inherently inexact process and requires careful monitoring of the infant to determine if adjustments in dosage are needed. Monitor clinical exam, vital signs, NAS/WAT-1 scores, and assess clinical response.
- Excess narcotic administration or narcotic withdrawal can complicate the infant's clinical course and lengthen hospitalization.
- Do not attempt to convert narcotics and wean on the same day.
- For calculations use the weight on the fentanyl order **NOT** current weight.
- IV morphine and PO morphine are **NOT** equivalent.

    IV morphine dose x 3 = PO morphine dose
- When converting to oral morphine, you may calculate a dose that is significantly higher than the normal dosing range. This may be due to the infant receiving higher doses of fentanyl than typical. Monitor clinical status closely.
- Morphine may decrease GI motility to a greater extent than fentanyl.

PRIOR TO DISCHARGE

- Infant should be free of withdrawal signs and symptoms for a period of 24 to 48 hours after complete cessation of opioids

References:

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APPENDIX A

WORKSHEET FOR CONVERTING *IV* FENTANYL GTT TO *PO* MORPHINE

STEP 1: Determine hourly fentanyl dose

Multiply fentanyl dose (mcg/kg/hr) by fentanyl infusion ORDER weight (kg)

_____mcg/kg/hr X _____kg = _____mcg/hr IV fentanyl

STEP 2: Determine Q4 hr IV morphine dose in mcg

Multiply hourly fentanyl dose (mcg/hr) by 50

- *IV fentanyl is 50-100 times more potent than IV morphine*

_____mcg/hr X 50 = _____mcg IV morphine Q4 hr

STEP 3: Convert mcg to mg of IV morphine

Divide by 1000

_____mcg IV morphine Q4 hr ÷ 1000 = _____ mg IV morphine Q4 hr

STEP 4: Convert Q4 hr mg dose of IV morphine to Q4 hr mg dose of PO morphine

Multiply IV morphine dose by 3

- *PO morphine is 1/6-1/3 as potent as IV morphine*

_____mg IV morphine Q4 hr X 3 = _____ mg PO morphine Q4 hr

STEP 5: Adjust for incomplete cross-tolerance between narcotics

Multiply Q4 hr PO morphine dose by 0.75

- *Tolerance developed to one narcotic is not the same as a different drug*

_____mg PO morphine Q4 hr x 0.75 = _____mg PO morphine Q4 hr

STEP 6 (if needed): Adjust Q4 hr dose to Q3 hr to match care time.

Multiply final Q4 hr PO morphine dose by 6 for total daily dose. Then divide it by 8 for Q3 hr dosing.

- *REMINDER - This is a total dose, not a weight-based dose!*

_____ mg PO morphine Q4 hr X 6 = _____mg PO morphine per day

_____ mg PO morphine per day ÷ 8 = _____ mg PO morphine Q3 hr