

Inclusion Criteria:

- Any postoperative patient in the NICU

Recommendations Based on History of Anticipated Degree of Pain Associated with Surgery and History of Previous Opioid Exposure(s)

Potential for Mild Pain Procedures

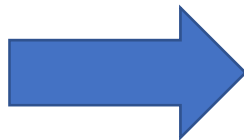
- PEG
- Laparoscopic procedures (G-tube, Ladd's, hernia repair)

Potential for Moderate Pain Procedures

- PDA Ligation
- Chest tube insertion and chest tube maintenance
- Gastrostomy tube with or without Nissen
- Abdominal drain insertion
- Gastroschisis silo placement
- Incarcerated hernia repair
- Anorectal malformation repair
- Hirschsprung's Disease Pull through
- VP shunt placement
- Myelomeningocele closure

Potential for Severe Pain Procedures

- Closure or reduction of abdominal wall defects
- CDH Repair
- TEF Repair
- Thoracotomy
- Exploratory laparotomy
- Critical airway procedure and/or tracheostomy
- Open/siloed abdomen
- Mandibular distraction



Discussion of airway security and effects of narcotics on respiratory depression necessary in preoperative huddle and with ongoing pain management decisions

Previous opioid exposure defined as greater than 7 days of opioid exposure within 1 month of present surgery

Approved by Evidence-Based Medicine Committee 9/18/19

Reassess the appropriateness of Care Guidelines as condition changes and 24 hrs after admission. This guideline is a tool to aid clinical decision making. It is not a standard of care. The physician should deviate from the guideline when clinical judgment so indicates.

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Guideline #1: Potential for MILD/MODERATE Post-Operative Pain

(see attached for listing of mild/moderate painful procedures)

Extubated or Intubated

Scheduled Acetaminophen IV 10 mg/kg/dose Q6 hrs for 48-72 hrs postoperative

and

Intermittent Morphine 0.05 mg/kg/dose IV PRN every 2 hours for breakthrough pain

*if experiencing pain with NPASS scores ≥ 4 upon *postoperative admission* to the NICU consider 1x dose of Fentanyl 1 mcg/kg/dose IV every 10 min PRN x1-2 doses *administered slowly*



NPASS Score -2 to -10
Heavy Sedation

- Consider reason for scores: planned sedation or was patient not reversed
- If unplanned sedation → wean infusion rate or transition to PRN doses
- Continue NPASS scoring per protocol
- Continue Non-pharmacological interventions

NPASS Score -1 to +3
Goal

- Adequate control of pain and sedation; no change recommended
- Continue NPASS scoring per protocol
- Continue Non-pharmacological interventions

NPASS Score ≥ 4
Danger Zone

- Utilize PRN Morphine IV dose
- Continue NPASS scoring per protocol
- Continue non-pharmacological interventions



≤ 3 PRN Doses in 12 hours

≥ 3 PRN Doses in 12 hours

- Utilize PRN Morphine IV dose as needed
- Continue NPASS scoring per protocol
- Continue non-pharmacological interventions



Extubated or Intubated

Administer prn dose and start low dose morphine continuous infusion

Opioid Naive

Utilize low dose Morphine infusion of 0.02 mg/kg/hr

Closely monitor patient respiratory status if extubated

Opioid Exposed

Utilize low dose Morphine infusion of 0.05 mg/kg/hr

- If on continuous infusion prior to procedure, then restart infusion and increase dose by 20%

Reassess NPASS and titrate up (scores remaining ≥ 4) by 0.01 mg/kg/hr every 6-12 hrs

Guideline #2: Potential for SEVERE Post-Operative Pain

(see attached for listing of mild/moderate painful procedures)

Extubated or Intubated- engage in preoperative discussion of sedation needs and potential plan to keep patient intubated

Scheduled Acetaminophen IV 10 mg/kg/dose Q 6 hrs for 48-72 hrs postoperative and

Start low dose continuous morphine infusion

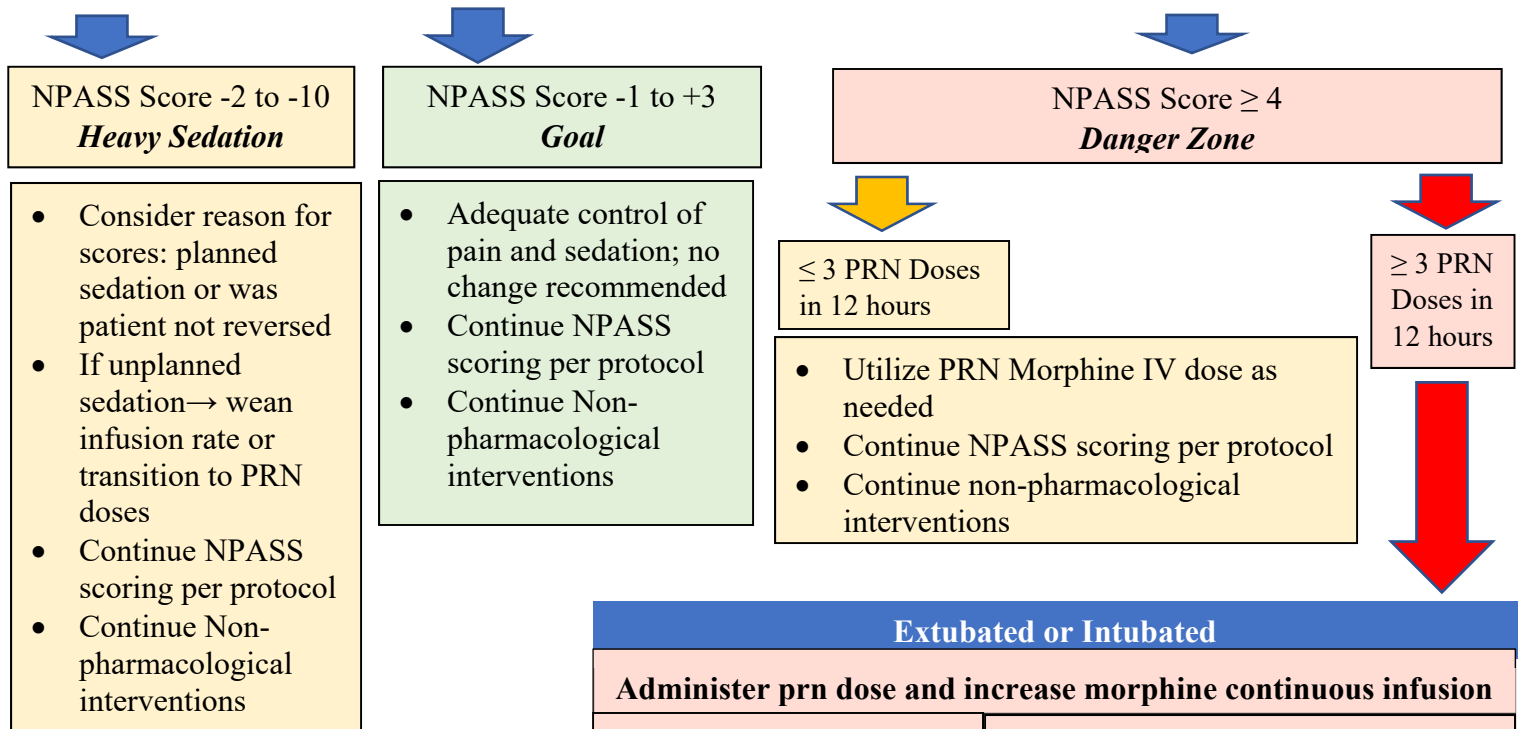
*if experiencing pain with NPASS scores ≥ 4 upon *postoperative admission* to the NICU consider 1x dose of Fentanyl 1-2 mcg/kg/dose IV every 10 min PRN x1-2 doses *administered slowly*

**consider potential need for sedation (see below recommendations)

<i>Opioid Naive</i>	<i>Opioid Exposed</i>
Utilize low dose Morphine infusion of 0.03-0.05 mg/kg/hr Closely monitor patient respiratory status if extubated	Utilize low dose Morphine infusion of 0.05- 0.1 mg/kg/hr <i>or</i> increase current opioid infusion by 20% Reassess NPASS and titrate up (scores remaining ≥ 4) by 0.01 mg/kg/hr every 6-12 hrs Closely monitor patient respiratory status if extubated

Intermittent Morphine 0.05 mg/kg/dose IV PRN every 2 hours for breakthrough pain to start

- if increasing morphine infusion, the PRN dose and infusion hourly dose should be the same



****Sedation Recommendations:** If morphine infusion requires > 2 rate/dose increases and ≥ 4 PRN doses are given within a 12 hr period after infusion started, consider the addition of *dexmedetomidine 0.2- 1 mcg/kg/hr*. If experiencing continued agitation, consider addition of midazolam or Ativan

Extubated or Intubated	
Administer prn dose and increase morphine continuous infusion	
<p style="text-align: center;"><i>Opioid Naive</i></p> Increase Morphine infusion by 20% Closely monitor patient respiratory status if extubated	<p style="text-align: center;"><i>Opioid Exposed</i></p> Increase Morphine infusion by 20% Consider Pain Team consult Closely monitor patient respiratory status if extubated

References

- Aukes D, Roofthoof D, Simons WE, et al. (2015) Pain management in neonatal intensive care: evaluation of the compliance with guidelines. *Clinical Journal of Pain*, 9, 830-835
- Bucea, O. & Pillai Riddell, R. (2019). Non-pharmacological pain management in the neonatal intensive care unit: Managing neonatal pain without drugs. *Seminars Fetal Neonatal Medicine*, 24 (4).
- Walter-Nicolet, E., Calvel, L., Gazzo, G., Poisbeau, P., Kuhn, P. (2017). *Current Pharmaceutical Design*, 23 (38), 5861-5878.