Waikato District Health Board

Guideline

Neonatal pain and sedation: Assessment and nursing management in Newborn Intensive Care Unit (NICU)

Guideline Responsibilities and Authorisation

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Guideline Review History

Version	Updated by	Date Updated	Summary of Changes
1	Aira Javier	Oct 2015	First version
2	Aira Javier	Sept 2018	Modified NPASS and NICU Guideline for Management of Pain and Sedation Scores, frequency of monitoring pain and sedation scores, annually audits on Pain and Sedation Scoring

Neonatal pain and sedation: Assessment and nursing management in Newborn Intensive Care Unit (NICU)

Contents

Neonatal pain and sedation: Assessment and nursing management in Newborn Intensive Care Unit (NICU)

1 Overview

1.1 Purpose

To provide a clear structured pathway for nurses to implement pain and sedation assessment and nursing management of infants.

1.2 Scope

Waikato District Health Board staff working in NICU

1.3 Patient / client group

Neonates and infants in NICU

1.4 Definitions

Modified Neonatal Pain Agitation and Sedation Scale (N-PASS)	A tool used to assess pain and sedation in neonates. It has 5 assessment criteria: crying/irritability, behavior/state, facial expression, extremities/tone and vital signs.
NICU Guideline for Management of Pain and Sedation Scores	A guideline that includes well-defined strategies for both non-pharmacologic and pharmacologic interventions based on regular assessment of the N-PASS and titration of analgesic and sedative therapy according to aim scores.
Pain	An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.
Sedation	A state of calm or reduced nervous activity.
CPAP	Continuous positive airway pressure

2 Clinical Management

2.1 Competency required

- Registered nurse who has completed Level 2 orientation.
- Enrolled nurse who has completed Level 2 orientation and under the direction and delegation of a registered nurse.

2.2 Equipment

- Modified Neonatal Pain, Agitation and Sedation Scale (N-PASS) guideline and scoring criteria
- NICU Guideline for Management of Pain and Sedation Scores

2.3 Procedure:

2.3.1 Pain management

1. Identify sources of pain

Identify actual or potential sources of pain and agitation for the neonate:

- surgical procedures
- invasive/indwelling tubes, including continuous positive airway pressure (CPAP)
- heel sticks
- suctioning
- noxious stimuli, e.g. noise, light, touch
- neurological irritability
- other causes, e.g. peritonitis, fractures, renal stones

2. Pain assessment tool

- Use Modified N-PASS to assess pain (refer to Appendix A) to provide a standardised and measurable scale to direct interventions individualised to infant needs.
- Score and record pain and sedation separately.

3. Frequency of assessment

- Perform pain assessment at regular intervals on all NICU patients: 4 hourly in Level 3 nurseries and 8 hourly in Level 1 & Level 2 nurseries.
- Document two pain scores: one at rest, and one with handling.
- Assess pain more frequently in the following situations:
  - 2 hourly for infants with invasive tubes or lines, e.g. chest drain, other than intravenous (IV) or feeding tubes.
  - 2 hourly for infants receiving analgesics and/or sedatives.
  - 30-60mins after medication is given for pain behaviour to assess response to medication: this includes analgesics, sedatives and dextrose gel.
  - 2 hourly for post-operative infants during the first 72 hours.

4. Pain management

Calculate pain and sedation scores using the standardized scales (Appendix A)

Based on the sum of the scores:

5. Manage mild pain (NPASS score +4 to +7),

- Implement comfort measures as a first line where appropriate because pharmacologic interventions often have side effects in neonates.

- Provide developmental supportive care
  - knees flexed, arms close to body, hands to mouth
  - swaddling
  - nesting
  - providing pacifier (after obtaining parental consent)
  - reducing environmental stressors such as light, noise and handling
- Older babies may respond to rocking and holding/cuddling
- Optimise respiratory support because babies become agitated when they are not being adequately ventilated:
  - suctioning
  - adjusting ventilator/CPAP/nasal flow settings

6. Manage moderate pain

If after performing 2 comfort measures and the pain score is still +4 to +7, discuss initiation or escalation of sedative and/or analgesic therapy with medical team.

7. Manage severe pain

- If the NPASS score is +8 to +10, discuss with medical team to initiate or escalate sedative and/or analgesic therapy.
- Refer to Appendix B NICU Guideline for Management of Pain and Sedation Scores for the suggested sedative or analgesic therapy.

8. Manage procedure-related pain

Treat anticipated procedure-related pain prophylactically:

- When appropriate one of the preferred pain management strategies, is to provide expressed breast milk, or breastfeeding when mother is present. . The sweet taste of breast milk has an analgesic effect and parental contact provides comfort.
- Use comfort measures for brief and less invasive procedures, e.g. CPAP cares.
- Swaddle or ask parents/other staff to help to hold baby in a flexed and contained position because this help all babies to have increased tolerance to procedures.
- Non-nutritive sucking dummy/pacifier may be used only when known to be a normal part of the infant's care and when the infant is able to suck.
- Calm the baby before and after the procedure.
- Administer analgesics, e.g. for invasive procedures such as insertion of chest tubes, abdominal drains, IV starts, heel sticks, etc.
- For babies ≥1000g, consider applying 40% dextrose gel 0.25ml to 1mL orally on anterior tongue as an adjunctive measure before and during any procedure as it attenuates the pain response. Administration of 40% dextrose gel requires documentation to prevent exceeding the maximum recommended dose in 24 hours.

9. Administer analgesics/sedatives

- Administer analgesics to provide relief of pain using the least painful route possible.
- Provide sedatives along with analgesics if needed to attain a restful state.
- Treat side effects of the medications.
- Evaluate effectiveness of analgesics/sedatives 30-60 minutes after administration.
- Special considerations:
  - Sedatives do not provide pain relief, but do enhance the effects of opioids. Therefore, sedatives should rarely be given alone since it is usually not possible to distinguish between pain and agitation in the neonate.
  - Sedatives are not recommended for routine use in preterm infants. Seizure-like myoclonic movements have been observed in preterm infants receiving sedatives. Adverse neurologic outcomes have been associated with sedative use in preterm infants.

10. Observations

- Monitor continuously cardiorespiratory status, pulse oximetry and blood pressure (BP) if arterial line is insitu or hourly BP when using opioids or sedatives for pain relief or sedation.
- If pain score is not falling as expected, institute additional medications and comfort measures and re-evaluate for additional causes for pain and agitation.

11. Parent / Caregiver education

- Educate parents in infant pain behaviors and include them in the assessment and treatment of the infant's pain and sedation.

2.3.2 Sedation management

1. Sedation assessment

- Perform assessment with handling and more frequently as needed e.g. on sedated or medically paralysed baby.
- Sedation assessment requires an assessment of response to stimuli; the baby should not be stimulated unnecessarily to accomplish this.
- Sedation does not need to be assessed with every pain score.

2. Sedation management

- Use Modified N-PASS to assess level of sedation
- Document sedation as negative scores; desired levels of sedation vary according to the situation.
  - Deep sedation: goal is -10 to -7
  - Moderate sedation: goal is - 6 to -4
  - Light sedation: goal is - 3 to - 1

Rationale:

The Modified N-PASS is useful when sedation of the infant is the goal. It can also be used to assess infants for over-sedation related to sedative/opioid administration. A negative

score without the administration of opioids/sedatives may indicate neurological depression, sepsis, or other pathology. A premature infant who has experienced prolonged untreated pain and/or stress may also appear sedated, as these infants have been observed to become lethargic and "shut down" in response to their unrelenting pain.

3. Sedation management

Refer to NICU Guideline for Management of Pain and Sedation Scores for management of sedation (Appendix B or C).

4. Mild to moderate sedation

If the baby is on sedative/ analgesic therapy and the goal is weaning, consider reduction of the sedative/ analgesic if the sedation score is -2 to -5.

5. Deep sedation

- For sedation scores of -6 to -10, reduce sedative and/or analgesic.
- Refer to NICU Guideline for Management of Pain and Sedation Scores for the recommended weaning of opiates and benzodiazepines (Refer to Appendix B).

6. Documentation

- Document N-PASS pain and sedation scores in the observation sheet.
- If management is changed in response to a score, i.e. pain medication, comfort measures, increase or decrease in medication, document response to this intervention 30-60 minutes after the intervention.
- Include a progress note on the Comments/Events/Procedure column of the observation sheet to explain the scoring and treatment, particularly if the scores remain high or in other unusual situations.

3 Audit

Assessment and documentation of pain and sedation scores: audit annually. Target compliance ≥90%

4 Evidence base

4.1 References

1. Berger A., Czaba C., & Deindl P. (2013). Successful Implementation of a Neonatal Pain and Sedation Protocol at 2 NICUs. *Pediatrics,*132, e211-218.

2. International Association for the Study of Pain. (2014). *IASP Taxonomy*. Retrieved from http://www.iasp-pain.org/Education/Content.aspx?ItemNumber=1698&&navItemNumber=576

3. Hummel, P. (2010). *NICU pain and sedation assessment and nursing management guidelines.* Chicago, USA: Children's Hospital Loyola University Medical Center.

4. Hummel P, Puchalski M, Creech SD, Weiss MG. (2008). Clinical reliability and validity of the N-PASS: neonatal pain, agitation and sedation scale with prolonged pain. *J Perinatology*, 28,1,55-60.

5. The Royal Children's Hospital Melbourne. Sucrose (oral) for procedural pain management in infants. (2015). Retrieved from https:/www.rch.org.au/rchcpg/hospital_guideline_index/Sucrose_oral_for_procedural_pain_management_in_infants/

4.2 Associated Waikato DHB Documents

- Waikato DHB NICU Drug Manual
- Waikato DHB NICU Nursing Procedure: Epidural care and management in NICU (2835)
- Waikato DHB NICU Medical Procedure: Pain Management (3712)
- Waikato DHB NICU Nursing Procedure: Ventilated baby, management of ventilated baby (0432)
- Waikato DHB NICU Nursing Procedure: End of life care for neonate: care of baby having treatment withdrawn/dying baby (4948)
- Lippincott Procedures: Post-operative care, neonatal
- Lippincott Procedures: Developmental support care, neonatal

Appendix A: Modified N-PASS: Neonatal Pain, Agitation Assessment Scale

Modified N-PASS:

Neonatal Pain, Agitation Assessment Scale

Assessment Criteria	Pain	Pain/Agitation	
	0	**1**	**2**
Crying/ Irritability	No pain signs	Irritable or crying **at intervals** **Consolable**	High-pitched or silent- **continuous cry** **Inconsolable**
Behaviour State	No pain signs	Restless, squirming Awakens frequently	Arching, kicking Constantly awake or Arouses minimally/ no movement (not sedated)
Facial Expression	No pain signs	Any pain expression, **intermittent**	Any pain expression **continual**
Extremities Tone	No pain signs	**Intermittent** (<30 seconds duration) observation of clenched toes, fists or finger splay **Body is not tense**	Continual, frequent (≥30 seconds duration) clenched toes, fists or finger splay **Body is tense/stiff**
Vital Signs **HR, RR, BP, SaO2**	No pain signs	↑ 10-20% from baseline SaO_2 76-85% with stimulation, quick recovery (within 2 minutes)	↑≥20% from baseline $SaO_2 \leq 75\%$ with stimulation- slow recovery (> 2 minutes) Out of sync/fighting vent

Based from P. Hummel's Neonatal Pain, Agitation and Sedation Scale (N-PASS)

- Score each criteria from 0 to 2 for each physiological criteria, then sum to provide total score
- Add +1 to total score if baby is <30 weeks gestation/ corrected age to compensate for the limited ability to behaviourally communicate pain
- Frequency of pain scores:
  -Minimum 8 hourly in Level 2
  -Minimum 4 hourly for all babies in Level 3
  -Minimum 2 hourly for ventilated, post-op or babies on analgesia/sedatives
  -30-60mins after an analgesic is given
- Separate pain scores can be done during handling & at rest. Please indicate under "comments" section of NICU observation sheet.

Appendix A: Modified N-PASS Sedation Assessment Scale

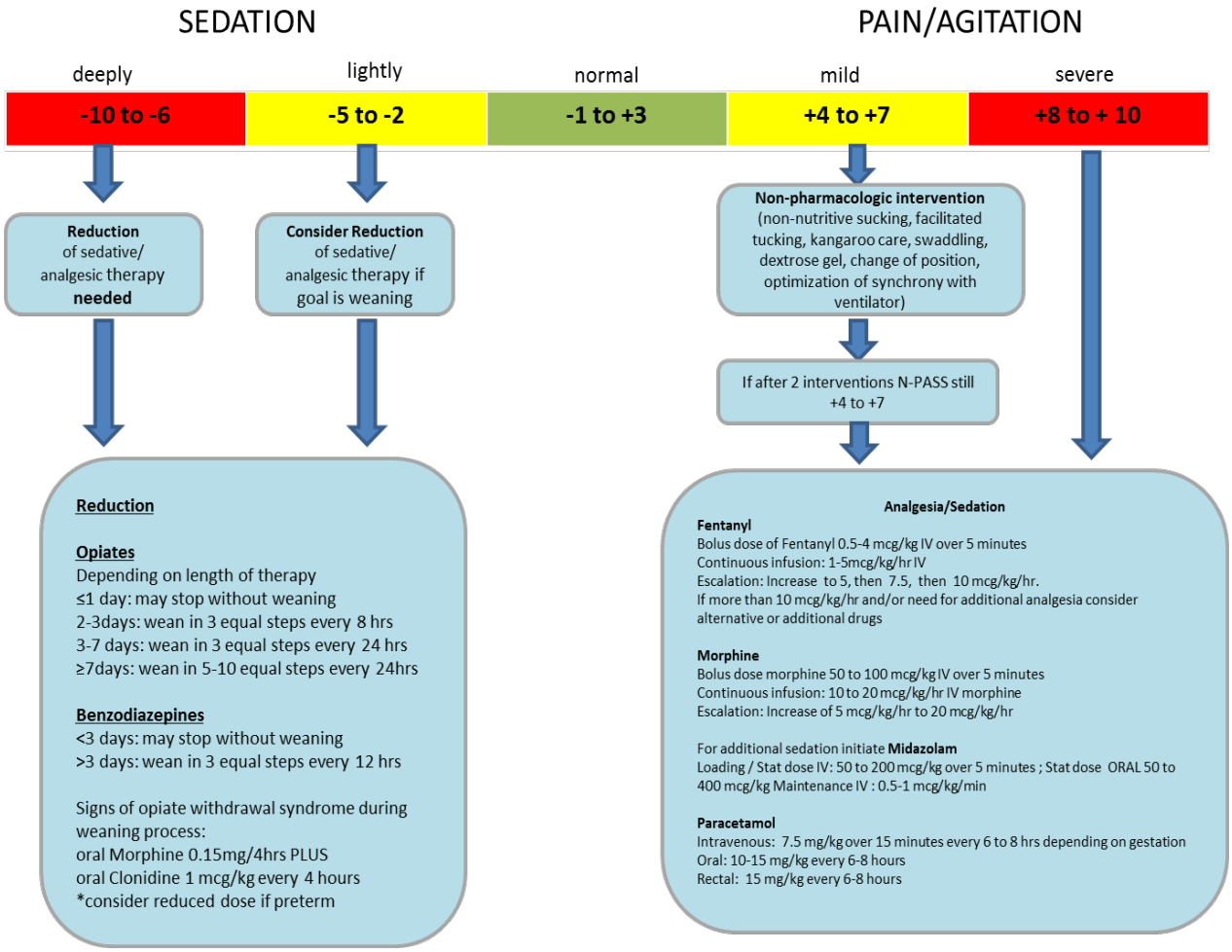
Modified N-PASS: **Sedation** Assessment Scale

Assessment Criteria	Sedation		
	0	**-1**	**-2**
Crying/ Irritability	No sedation signs	Moans or cries minimally with painful stimuli (needle sticks, suctioning)	No cry with painful stimuli
Behaviour State	No sedation signs	Arouses minimally with stimuli Little spontaneous movement	No arousal to any stimuli No spontaneous movement
Facial Expression	No sedation signs	Minimal expression with stimuli	Mouth is lax No expression
Extremities Tone	No sedation signs	Weak grasp reflex ↓muscle tone	No grasp reflex Flaccid tone
Vital Signs **HR, RR, BP, SaO2**	No sedation signs	<10% variability from baseline with stimuli	No variability with stimuli Hypoventilation, or apnoea, no respiratory effort

Based from P. Hummel's Neonatal Pain, Agitation and Sedation Scale (N-PASS)

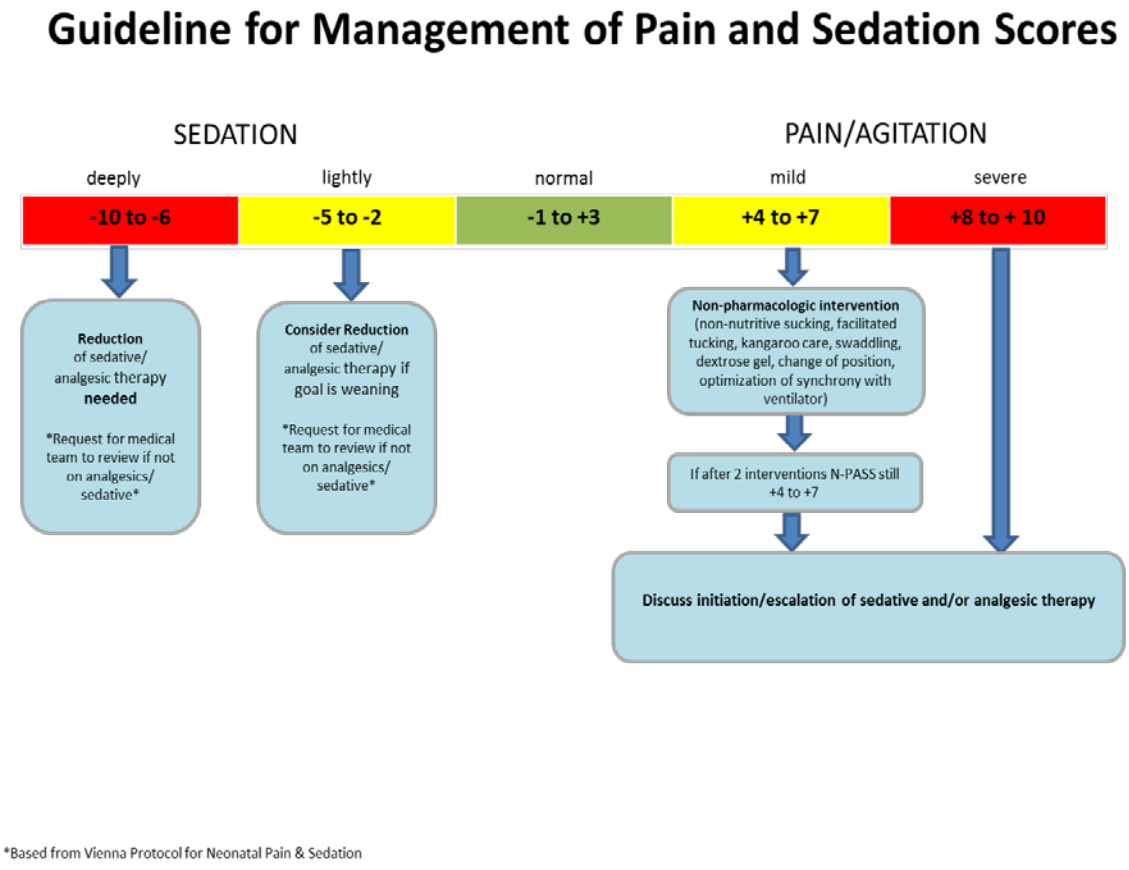
- Score each criteria from 0 to -2 for each behavioural and physiological criteria, then sum to provide a total score and note as a negative score (0 to -10)
- Sedation scoring can only be done with handling, minimum 8 hourly
- Sedation does not need to be assessed/scored with every pain assessment/score

Appendix B: Guideline for Medical Team - Management of Pain and Sedation Scores



Guideline for Management of Pain and Sedation Scores
(Medical)

Appendix C: Guideline for Nurses - Management of Pain and Sedation Scores



*Based from Vienna Protocol for Neonatal Pain & Sedation