1.0 PURPOSE AND INTENT

1.1 To provide a process for prevention, assessment and management of pain, agitation and sedation in infants admitted to high risk newborn areas at the Health Sciences Centre and St. Boniface Hospital.

Note: All recommendations are approximate guidelines only and practitioners must take in to account individual patient characteristics and situation. Concerns regarding appropriate treatment must be discussed with the attending neonatologist.

2.0 PRACTICE OUTCOME

To prevent the potentially damaging effects to the newborn's brain from both the pain experience and the sequela of medications used to treat pain.

3.0 GUIDELINE FOR PAIN PREVENTION AND NON-PHARMACOLOGICAL PAIN MANAGEMENT

3.1 Reduce the number of painful procedures.
   3.1.1 Group infant’s laboratory tests together.
   3.1.2 Insert appropriate arterial and/or venous lines that reduce the need for repeated intravenous punctures, heel sticks or injections. (The benefits must be weighed against the risks associated with line placement).
   3.1.3 Use non-invasive monitoring techniques whenever clinically appropriate.
   3.1.4 Administer medications via the least painful route possible. Minimize all unnecessary handling of infant as touch can be interpreted as pain in some circumstances.

3.2 Anticipate and prevent procedural pain.
   3.2.1 Combine pharmacological and non-pharmacological pain interventions

3.3 Utilize non-pharmacological methods of pain management. These are most effective when used in combination. Review “Neonatal Comfort Checklist” found in Appendix A.
   3.3.1 Physiological positioning
   3.3.2 Swaddling, containment or facilitated tuck
   3.3.3 Non-nutritive suck (pacifier)
   3.3.4 Skin-to-skin contact with parent (when appropriate).
   3.3.5 Breastfeeding (when appropriate)
   3.3.6 Decrease environmental stimuli during procedures. Keep light and noise levels low.

3.4 Provide infant with oral sucrose before procedural pain unless contraindicated.

3.5 Topical anesthetics can be used to reduce pain associated with venipuncture, lumbar puncture and intravenous catheter insertion when time permits, but are ineffective for heel-stick blood draws. Repeated use should be avoided. Check with pharmacist for contraindications for use of specific agents in newborns.

3.6 Minimize handling of infant before a painful procedure.
   3.6.1 Handling can cause heightened activity in nociceptive pathways.
   3.6.2 Containment and positioning strategies help infants achieve self-regulation.

3.7 Optimize ventilation.
3.7.1 Infants may become agitated when they are not being optimally ventilated.

3.8 Do not perform non-emergent care-giving procedures immediately following a painful procedure.

3.8.1 Increased excitability of neurons may cause the infant to perceive pain from these activities.

4.0 GUIDELINE FOR PAIN ASSESSMENT

4.1 Identify actual or potential sources of pain/irritability.

4.1.1 These include indwelling tubes or lines, heel-sticks, surgical procedures, suctioning, peritonitis, otitis, other infectious processes, fractures, hunger, interstitial IV’s, and noxious environment.

4.1.2 Pain assessment is performed with each potentially painful clinical intervention to evaluate the efficacy of behavioral, environmental and pharmacological agents.

4.1.3 Non-pharmacologic measures are implemented first if the infant has no identifiable cause for pain.

4.2 Apply pain/agitation scale with each “hands on” vital sign measurement for all infants with actual or potential sources of pain.

4.2.1 Suggestions for frequency of assessment:
- Invasive tubes or lines: q2-4h.
- Receiving scheduled or infusion analgesics and/or sedatives: q2-4h.
- Analgesic/sedative prn: one hour after dose is given, to assess response.
- Post-op: q2h for 24-48 h then q4h until off medication.

4.2.2 Treatment is initiated based on assessment which includes an objective pain scale.

4.3 Apply pain/agitation scale with all painful procedures.

4.3.1 After providing pain management obtain pre-procedure pain assessment.

4.3.2 Re-assess pain during longer procedures.

5.0 GUIDELINE FOR SEDATION

5.1 Consider sedation whenever ongoing analgesics are necessary.

5.1.1 Sedatives do not provide pain relief but some may enhance the effects of opioids.

5.1.2 Some sedatives such as benzodiazepines, must be used with caution in preterm infants as they may cause seizure-like myoclonic movements and may cause potential adverse neurological outcomes.

5.1.3 Sedation must not be used in place of analgesics for pain control.

5.1.4 There is no evidence to show that infants can be safely sedated for several weeks or months.

5.2 Assess level of sedation based on the infant’s response to stimuli only when “hands-on” vital signs are measured.

5.2.1 Do not stimulate the infant unnecessarily to accomplish this.

5.2.2 Sedation need not be assessed with every pain assessment.

5.3 Assess sedation prn even on infants not receiving pharmacological sedation.

5.3.1 Evidence of sedation without administration of sedatives may indicate neurologic depression, sepsis or other pathology.

5.3.2 Premature infants who have experienced prolonged untreated pain and/or stress, may become lethargic and “shut down” in response.

5.4 Provide analgesia and sedation to all infants receiving medications for paralysis.

5.4.1 These infants cannot be evaluated behaviorally for pain.

5.4.2 Medication doses should be assessed every day and when paralysis is discontinued.

5.4.3 Higher more frequent doses of analgesics may be required if infant is post-op, has a chest tube or other pathology that would normally cause pain.

5.4.4 Increases in heart rate and blood pressure may be the only indicator of a need for more...
analgesia.

5.4.5 Tolerance to sedation may occur without symptoms of inadequate pain relief.

6.0 GUIDELINE FOR PAIN MANAGEMENT

*See Appendix B for specific medication options in various clinical situations. See the Micromedex Drug Index for more information on specific pharmacologic measures. Access at: http://www.micromedexsolutions.com/home/dispatch

6.1 Recognize the contextual circumstances underlying the individual infant’s pain and tailor therapy accordingly. For specific procedures and situations consider the following suggestions:

6.2 Percutaneous or peripheral arterial or venous catheter insertion:
6.2.1 Consider applying topical anesthetic cream.
6.2.2 Give oral sucrase.
6.2.3 Consider giving a sedative.

6.3 Arterial/venous cutdown or chest tube insertion:
6.3.1 Subcutaneous infiltration of lidocaine to site (using smallest possible needle gauge available).
6.3.2 Give sedative / analgesic.

6.4 Endotracheal intubation:
6.4.1 Consider sedative if procedure is not emergent. See Neonatal Intubation clinical practice guideline for suggested premedication.

6.5 Intramuscular or subcutaneous injection:
6.5.1 Consider giving acetaminophen 30-60 minutes before intramuscular injection, especially if medication causes tissue irritation.

6.6 Lumbar Puncture:
6.6.1 Give oral sucrase and/or sedative.

5.7 Eye exam:
5.7.1 Give oral sucrase.
5.7.2 Consider sedative if patient intubated or does not tolerate handling well.

6.8 Nasogastric tube insertion:
6.8.1 Give oral sucrase.

6.9 Ongoing analgesia:
6.9.1 Consider intravenous infusion or periodic boluses of analgesic and/or sedative. When using opioids for pain use co-analgesia unless contraindicated.
6.9.2 Doses may need to be increased periodically based on patient and pain scale assessment, as tolerance will occur. Assess daily. To help prevent tolerance, consider alternating between opioids every 5-7 days.
6.9.3 When increasing an infusion dose for pain always give a bolus dose first unless the patient has a specific contraindication. If there is no response to an increased dose, decrease dose and discuss further options.
6.9.4 Promptly treat pain that occurs between regular doses of analgesic (breakthrough pain). It is most effective to use the same opioid as that given in scheduled doses.
6.9.5 When patients’ receiving continuous opioid infusions become intolerant to handling, assess for the possibility of hyperalgesia or allodynia. Treatment options include rapid de-escalation of opioid doses.
6.10 Post-operative

6.10.1 Sufficient anesthesia should be provided to prevent intraoperative pain and stress responses to decrease postoperative analgesic requirements.

6.10.2 Opioids should be the basis for postoperative analgesia after major surgery in the absence of regional anesthesia.

6.10.3 Non-intubated infant: Consider scheduled analgesics for the first 24-48 hrs.

6.10.4 Intubated infant: Consider intravenous infusion or scheduled boluses of opioid analgesic for 24-48 hr.

6.10.5 Acetaminophen can be used after surgery as an adjunct to regional anesthetics or opioids.

6.10.6 Analgesia should be used as long as pain assessment scales document that it is required.

7.0 OPIOID WEANING

7.1 A weaning process for opioids should be considered if:
- there is continued need for analgesia, or
- high doses were used, or
- they were used for a long duration, and especially if
- there was a combination of high dose for long duration (longer than 5-7 days)

7.2 Weaning schedules should be individualized to each patient as tolerated depending on duration of treatment and medication involved.

7.3 Considerations for weaning protocol:
- 7.3.1 Plan for approximately one week wean for every week of opioids
- 7.3.2 Wean only one drug at a time.
- 7.3.3 Titrate based on pain scores.

7.4 May require intermittent bolus of the drug to facilitate wean of the infusion.

7.5 Consider substituting other medications of the same class with a longer half-life. Suggestions include:
- Clonidine
- Phenobarbital

7.6 Consider other comorbidities when adjusting opioids.

7.7 Monitor for signs and symptoms of withdrawal using the NAS protocol:
- 7.7.1 If symptoms occur:
  - Give one break-through dose
  - Go back up to the previous step
  - Leave dose there for 48-72 hours then continue to wean

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8.0 REFERENCES

8.21 Pediatric Parenteral Drug Manual; Health Sciences Centre; Winnipeg, Manitoba.
<table>
<thead>
<tr>
<th>Reference</th>
<th>Authors</th>
<th>Title and Details</th>
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APPENDIX A

Neonatal Comfort Checklist

Important Questions in the Assessment of Infant Comfort

WHAT — Is this pain or irritability?

WHY — Is there a reason that the infant is in pain or agitated?

☐ N-PASS score documented before using Neonatal Comfort Checklist
☐ Repeat N-PASS score after using Neonatal Comfort Checklist

ASSESS:

Comfort:
☐ is the infant in a flexed and midline position?
☐ is the infant contained appropriately?
☐ does the infant’s position need to be changed?
☐ can the infant be placed in kangaroo care?

Ventilation:
☐ is the infant being appropriately ventilated?
☐ if ventilated, can the infant be weaned or extubated?
☐ does the infant need a CXR or a blood gas?

GI:
☐ is the infant NPO or need to be fed?
☐ does the infant need to be changed to cue-based feeds?
☐ can feeds be safely increased?
☐ is the NG/OG in correct position?
☐ are there any signs of feeding intolerance?

Infusions:
☐ are all IV’s patent and infusing well?

Medications:
☐ are the current meds appropriate for gestational age and the patient’s weight?
☐ has the infant been on an opioid infusion for greater than 7 days?
☐ is a co-analgesic appropriate?

Potential strategies to increase infant comfort

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<thead>
<tr>
<th>Non-pharmacologic:</th>
<th>Pharmacologic:</th>
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<tbody>
<tr>
<td>kangaroo care</td>
<td>- if initiating or increasing an infusion, was a bolus given first?</td>
</tr>
<tr>
<td>cue-based care</td>
<td>- should current infusion be changed to a different med? (especially if &gt; 7 days due to potential tolerance and build up of metabolites)</td>
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<tr>
<td>breastfeeding</td>
<td>- should current infusion be increased?</td>
</tr>
<tr>
<td>sucking</td>
<td>- should current infusion be decreased? (due to build up of metabolites or if increase was ineffective)</td>
</tr>
<tr>
<td>positioning (use dandle wraps or snuggle ups)</td>
<td>- should an additional med be given for synergistic effect?</td>
</tr>
<tr>
<td>sucrose (for painful procedures only)</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Why would you give sucrose?</th>
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</thead>
<tbody>
<tr>
<td>For painful procedures only</td>
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