



Procedure # HC-PC-201-PRO	Title: Pharmacological Patient/Family Centered RN-Driven Pain Management for Minor Procedures	
Effective Date: 3/15/2018	Category: Provision of Care	
Origination Date: 5/30/2012	Next Review Date: 3/15/2021	Pages 1 of 15

PURPOSE:

This procedure describes pharmacological pain management techniques intended to be used in the care of pediatric patients undergoing minor procedures.

PERSONS AFFECTED:

All OHSU Healthcare workforce members providing patient care in DCH.

RESPONSIBILITIES:

It is the responsibility of Registered Nurses caring for pediatric patients undergoing minor procedures to understand the use of pharmacological pain management in order to determine appropriateness of its use.

PROCEDURES:

Nitrous Oxide Gas Inhalation for Anxiolysis

See procedure **RN Administered Nitrous Oxide in Doernbecher Children’s Hospital**

**Topical 4% Lidocaine Cream Application
RN (LIP order required)**

- a. Apply 4% lidocaine cream to diminish/relieve short term procedural pain for newborn infants (≥37 weeks gestation) and children.
 - i. Contraindicated in the following populations:
 - 1. Allergy to lidocaine and the “caine” groups
 - 2. Premature infants <28 weeks current or adjusted age.
 - 3. Broken skin
 - ii. Prepare the site
 - 1. Cleanse skin site with soap and water (do not use alcohol); dry.
 - iii. Application:
 - 1. 30-60 minutes prior to painful procedure apply 4% lidocaine cream.
Note: for infants <6 months of age, maximum application duration should not exceed 1 hour. For older children, maximum application duration should not exceed 2 hours.
 - 2. Wearing gloves, apply enough cream to completely cover the affected area so that no skin is visible beneath the cream.
 - 3. Cover with transparent dressing

4. Take dressing off after 30-60 minutes and remove the remaining cream.
5. Clean the site with chlorhexidine or alcohol as appropriate, immediately prior to procedure.

J-Tip Lidocaine 1%

RN (LIP order required)

- a. Inject lidocaine intradermally via this device which uses gas pressure to disperse the lidocaine in a spray-like fashion. Intradermal lidocaine will diminish/relieve short term pain during venipuncture for children ≥ 2 years of age who are able to understand and cooperate with this technique.
 - i. Contraindicated in the following populations:
 1. Allergy to lidocaine and the "caine" groups
 2. Premature infants <28 weeks current or adjusted age
 3. Neonates
 4. Patients currently receiving chemotherapeutic agents
 5. Patients currently receiving anticoagulant therapy
 6. Patients with blood disorders
 - ii. Preparation:
 1. Remove lidocaine 1% multi use vial from Omnicell. If a new vial needs to be open, please remember to label the new vial with a 28 day expiration date from the date of opening
 2. Flip the cap off the vial of the lidocaine 1% vial and swab with alcohol
 3. Enter 0.25 mL into Omnicell as the dose needed
 4. Omnicell will print out patient label to be placed on J-tip syringe
 5. Scan the lidocaine 1% vial to verify into Epic
 6. Replace the lidocaine 1% vial back into the Omnicell drawer after use
 7. Withdraw 0.25mL lidocaine 1% into a 1 or 3mL leuc lock syringe. Remove the needle and dispose in sharps container. Tap the syringe and expel any air bubbles
 8. Screw the 1 mL leuc lock syringe onto the J-Tip device. Push 0.25mL lidocaine into the J-Tip device. Unscrew the empty leuc lock syringe from the J-Tip device. If air bubbles form in the J-Tip, tap them out prior to use.
 - iii. Administer the lidocaine 1% to your patient. Administration/Use of the J-Tip device:

NOTE: provide anticipatory guidance for the patient and family regarding the loud pop and hiss sound the device will make

1. Ensure tourniquet is removed prior to administration of lidocaine via J-Tip device
2. Make sure that four colored parts are present prior to the use of J-Tip. Note that there are TWO WHITE and TWO ORANGE parts: White Activation Lever White End Cap Orange Luer Cap Orange Safety



3. Remove the Orange Leur Cap and Orange Safety
4. Ensure area to be injected is disinfected. Allow to completely evaporate as any disinfectant left on skin will be injected with the lidocaine
5. Apply light pressure between the J-Tip and the skin, creating no more than a little dimple. Ensure that the syringe tip isn't directly over a vein in order to prevent any vein rupture/trauma and to prevent medication from directly entering the blood stream.
6. Hold the syringe at a 90-degree angle to the site of injection
7. Activate the J-Tip by depressing the Activation Lever toward the back end of the device. Hold the J-Tip in place for 2-3 seconds.
8. When activated, an audible sound (pop and hiss) is made as the gas is released
9. Dispose of the empty syringe in a sharps container
10. Assess for possible reactions including a wheal or slight blood blister at the site of injection

Intradermal Lidocaine 1% Injection

RN (LIP order required)

- a. Inject lidocaine 1% intradermally to diminish/relieve short term pain during venipuncture for children ≥ 2 years of age who able to understand and cooperate with this technique.
 - i. Contraindicated in the following populations:
 1. Allergy to lidocaine and the "caine" groups
 2. Premature infants <28 weeks current or adjusted age
 - ii. Preparation:
 1. Draw up 0.1-0.2 mL of buffered lidocaine for injection.
 2. Change needle to smallest available for injection.
 3. Prepare venipuncture supplies
 - iii. Administration
 1. Apply tourniquet to distend vein
 2. Cleanse site with chlorhexidine or alcohol as appropriate.
 3. Hold syringe with bevel side up at a 5 degree angle to the skin, approximately 0.5 cm to either side of planned venipuncture site.
 4. Insert needle until the bevel is completely in the tissue
 5. Slowly inject the lidocaine 1% until a small wheal forms at the site.

6. Swab site with Chlorhexidine if site became contaminated.
7. Wait 30-60 seconds to allow anesthetic effect to occur.
8. Proceed with venipuncture.

**Urojet Sterile Lidocaine Jelly for Urinary Catheterization
RN (LIP order required)**

- a. Apply lidocaine jelly topically to decrease discomfort associated with urinary catheterization.
 - i. Contraindicated in the following populations:
 1. Allergy to lidocaine and the "caine" groups
 2. Premature infants <28 weeks current or adjusted age
 - ii. Application
 - i. Empty sterile lidocaine jelly into sterile packet and onto cotton ball.
 - ii. Apply small amount of sterile lidocaine jelly via cotton ball to head of penis or vaginal area approximately 1-2 minutes prior to start of catheter insertion.
Note: maximum dose: 3mg/kg/dose; do not repeat within 2 hours.
 - iii. May lubricate catheter with sterile lidocaine jelly rather than another lubricant.
 - iv. Proceed with catheter insertion

**Cetacaine Spray for NGT Insertion
RN (LIP patient evaluation and separate order required)**

- a. Apply cetacaine spray to the back of the throat immediately prior to nasogastric/nasojejunal insertion to minimize discomfort.
 - i. Contraindicated in the following populations:
 1. Allergy to lidocaine, tetracaine and the "caine" groups
 2. Compromised respiratory status
 3. Compromised airway
 - ii. Application
 - i. Spray back of throat for one second with Cetacaine spray.
 - ii. Proceed with nasogastric/nasojejunal tube insertion.

**Atomized/Intranasal Midazolam for Reduced Anxiety
RN – for whom competency validation has been completed
(LIP patient evaluation and separate order required)**

This is a High Risk Medication as designated by the ISMP

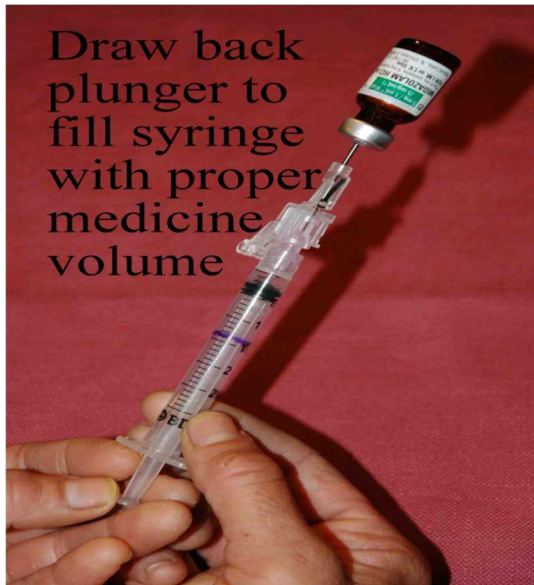
- a. Administer intranasal versed to reduce anxiety in children for whom other non-pharmacologic interventions are insufficient.
 - i. Contraindicated in the following populations:
 1. Hypersensitivity to midazolam, CNS depression, shock, narrow-angle glaucoma, heart failure, renal impairment, pulmonary disease, liver dysfunction, neonates.
 2. Monitor patient for respiratory depression, especially when used in conjunction with other benzodiazepines.
- b. Preparation- Items needed
 - i. Syringe and needle/needleless device to draw up the medication
 - ii. Atomizer

- iii. Midazolam of appropriate concentration for nasal medication delivery
 - 1. High concentration - Low volume
 - 2. 10 mg/2mL or 5mg/mL preservative-free midazolam

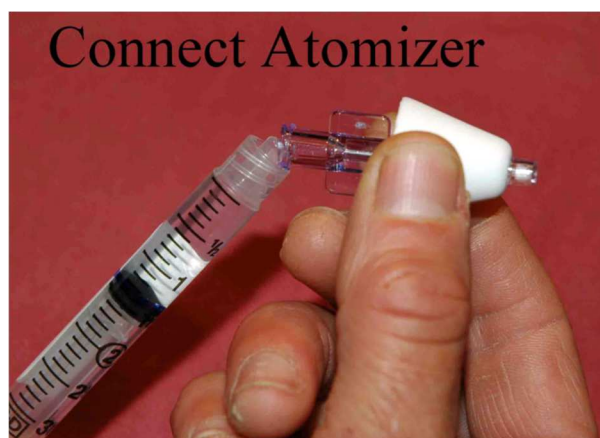
- iv. Oral Sucrose

c. Administration using atomizer

- i. Monitor and record patient's vital signs immediately prior to midazolam administration.



- ii. Aspirate the proper volume of midazolam required to treat the patient (0.2-0.3 mg/kg for anxiolysis. Max dose for pediatric patients is 2mL.)
- iii. Twist off/remove the syringe from the needle/needleless device.
- iv. Attach the atomizer tip via Luer lock mechanism – it twists into place.
 - 1. Slip Luer is also effective as long as the tip is firmly seated on the syringe tip and you hold it against the patients nose while delivering.



- v. Administer oral sucrose to patient prior to administration of midazolam (midazolam can sting the nasal mucosa)
- vi. Using your free hand to hold the crown of the head stable, place the tip of the atomizer snugly against the nostril aiming slightly up and outward (towards the top of the ear on the same side).



- vii. Using your free hand to hold the crown of the head stable, place the tip of the atomizer snugly against the nostril aiming slightly up and outward (towards the top of the ear on the same side).
- viii. Briskly compress the syringe plunger to deliver half of the medication into the nostril.
- ix. Move the device over to the opposite nostril and administer the remaining medication into that nostril.



- x. Monitor and record vital signs for 15 minutes after completion of the procedure and VS return to baseline stability.

d. For children who cannot be still long enough for administration with an atomizer:

i. Intranasal administration without atomizer:

1. Monitor and record vital signs immediately prior to administration of midazolam
2. Instill 2 drops of midazolam into each nare
3. Pinch end of nose gently for several seconds to enhance absorption.
4. Proceed with procedure.
5. Monitor and record vital signs for 15 minutes after completion of procedure and VS return to baseline stability

**Viscous Lidocaine for NGT insertion
RN (LIP order required)**

- a. Lubricate the tip of the nasogastric tube with lidocaine jelly to decrease discomfort associated with insertion.
 - i. Contraindicated in the following populations:
 1. Allergy to lidocaine and the "caine" groups
 2. Premature infants <28 weeks current or adjusted age

3. Patients with known vocal cord dysfunction
 4. Patients with high risk airways
- ii. Application
1. Apply small amount of viscous lidocaine jelly to external tip of nasogastric/nasojejunal tube.
Note: maximum dose: 3mg/kg/dose; do not repeat within 2 hours.
 2. Proceed with NG/NJ tube insertion

**Atomized Intranasal Lidocaine for NGT insertion
RN (LIP patient evaluation and separate order required)**

- a. For use when other non-pharmacologic interventions are insufficient. Administer atomized or nebulized lidocaine to children who are overly anxious prior to nasogastric tube insertion and when other methods to decrease anxiety have been unsuccessful.

- i. Contraindicated in the following populations:
1. Allergy to lidocaine and the “caine” groups
 2. Patients with known vocal cord dysfunction
 3. Patients with tracheomalacia or other high risk airway.
- Note: Max dose 3mg/kg; do not repeat within 2 hours.**

- ii. Administration:

1. Atomized method for pediatric patients 2-14 years of age:

- a. Using 2mL of 1% lidocaine, follow procedure for Atomized Intranasal Midazolam (above).
- b. Proceed with procedure.
- c. Monitor airway for 15 minutes post-procedure.

2. Atomized method for pediatric patients >14 years of age:

- a. Using 3-4mL of 1% lidocaine, follow procedure for Atomized Intranasal Midazolam (above).
- b. Proceed with procedure.
- c. Monitor airway for 15 minutes post-procedure

1. A multi-modal approach to pain management shall be provided before, during and after procedures that may cause pain or anxiety for the child and family. A team huddle should be performed prior to each procedure to determine the appropriate pain management approach. In addition, nurses may temporarily stop a procedure to provide additional comfort measures as necessary.
2. As the patients’ primary source of strength and support, family members are an important component in the alleviation of a child’s pain and anxiety. “Family” means any person(s) who plays a significant role in an individual’s life. For the purposes of this policy, the concept of parenthood is to be liberally construed as encompassing legal parents, foster parents, same-sex parents, step-parents, and other persons operating in caretaker roles, including friends.
3. A patient/family-driven pain management protocol for children undergoing minor procedures is provided below. **This protocol is pharmacological in nature; each medication requires an LIP order prior to RN administration.**
4. *A combination of physical/psychological AND pharmacologic interventions is preferred. Emergent procedures do not negate use of some combination of pain and anxiety relief interventions; many interventions may be employed without time delay.*
5. **In addition to physical/psychological interventions, pharmacologic intervention shall be provided for any procedure that is anticipated to cause more than minimal pain or anxiety for the patient. Pre-procedural dosing with an appropriate NSAID is recommended to mitigate post-procedural pain.**

6. If anxiety is not responsive to nonpharmacological interventions and a barrier for the patient to tolerate the procedure, the RN is encouraged to request medication for procedural anxiolysis. This is typically midazolam or other short acting anxiolytic. If any level of sedation is required this can only be done by those providers with documented privileges to do so.

Anxiolysis	Moderate Sedation/Analgesia SPECIAL PRIVILEGES REQUIRED
<p>Anxiolysis is provided with a single medication.</p> <ol style="list-style-type: none"> 1. A medication-induced state during which patients respond normally to verbal commands. 2. Cognitive function and coordination may be impaired 3. Ventilatory and cardiovascular functions are unaffected 	<p>Moderate Sedation generally involves two medications.</p> <ol style="list-style-type: none"> 1. A medication-induced depression of consciousness during which <ol style="list-style-type: none"> a. Patients respond purposefully to verbal commands, either alone or accompanied by light tactile stimulation b. Reflex withdrawal from a painful stimulus is NOT considered a purposeful response 2. No interventions are required to maintain a patent airway, and spontaneous ventilation is adequate. 3. Cardiovascular function is usually maintained.

7. Summary of possible interventions (see below for directions and restrictions for each intervention)
- Examples of minor procedures that may cause pain or anxiety include: heel stick, IV insertion, IM and SQ injection, port-a-cath access, tape removal, lumbar puncture, arterial, venous or capillary blood draw, urinary catheterization, dressing change, wound care, NGT insertion, suture placement and removal, tube/drain placement and removal, cast- application, occupational or physical therapy consultations. This list is not all-inclusive*
 - Precautions:** Do not use lidocaine for infants <12 months who are receiving other methemoglobinemia-inducing medications, if patient is allergic to lidocaine, has liver disease or pseudocholinesterase deficiency.
 - Maximum lidocaine dose: 3mg/kg/dose. Do not repeat within 2 hours.**

Age	Examples of minor procedures	<u>Additional Interventions Requiring LIP order</u> RN-initiated Pharmacologic Pain Protocol	Onset
Preterm neonate	<ul style="list-style-type: none"> heel stick, tape removal IV insertion, IM and SQ injection lumbar puncture, arterial, venous or capillary blood draw urinary catheterization, dressing change, wound care, NGT insertion, 	<ul style="list-style-type: none"> Acetaminophen if appropriate Atomized/Intranasal Lidocaine for NGT insertion (<u>LIP pt eval & separate order required</u>) Topical 4% lidocaine cream (for infants >28 weeks gestation; <i>maximum application duration 1 hour</i>) 	<ul style="list-style-type: none"> 30 minutes Immediate <p>30 mintues</p>

Age	Examples of minor procedures	<u>Additional Interventions Requiring LIP order</u> RN-initiated Pharmacologic Pain Protocol	Onset
	<ul style="list-style-type: none"> • suture placement and removal, • tube/drain placement and removal, • occupational or physical therapy consultations. 		
Newborn -- (≥37 weeks gestation) 3 months	<ul style="list-style-type: none"> • heel stick, tape removal • IV insertion, IM and SQ injection • lumbar puncture, arterial, venous or capillary blood draw • urinary catheterization, • dressing change, wound care, • NGT insertion, • suture placement and removal, • tube/drain placement and removal, • occupational or physical therapy consultations. 	<ul style="list-style-type: none"> • Topical 4% lidocaine cream (maximum application duration 1 hour) • Nitrous Oxide Gas for anxiolysis • Acetaminophen if appropriate • Urojet (sterile) lidocaine jelly for urinary catheterization • Atomized/Intranasal Lidocaine for NGT insertion (<u>LIP pt eval & separate order required</u>) • For patients > 6 weeks old: Atomized/intranasal midazolam for sedation during procedures (<u>LIP pt eval & separate order required</u>) High alert medication. 	<ul style="list-style-type: none"> • 30 minutes • 2-3 minutes • 30 minutes • 1-2 minutes • Immediate • Immediate
3-6 months	<ul style="list-style-type: none"> • heel stick, tape removal • IV insertion, IM and SQ injection • lumbar puncture, arterial, venous or capillary blood draw • urinary catheterization, • dressing change, wound care, 	<ul style="list-style-type: none"> • Topical 4% lidocaine cream • Nitrous Oxide Gas for anxiolysis • Acetaminophen if appropriate 	<ul style="list-style-type: none"> • 30 minutes • 2-3 minutes • 30 minutes • 1-2 minutes

Age	Examples of minor procedures	<u>Additional Interventions Requiring LIP order</u> RN-initiated Pharmacologic Pain Protocol	Onset
	<ul style="list-style-type: none"> • NGT insertion, • suture placement and removal, • tube/drain placement and removal, • occupational or physical therapy consultations. 	<ul style="list-style-type: none"> • Urojet (sterile) lidocaine jelly for urinary catheterization Viscous Lidocaine for NGT insertion <ul style="list-style-type: none"> • Atomized/Intranasal Lidocaine for NGT insertion (<u>LIP pt eval & separate order required</u>) 	<ul style="list-style-type: none"> • Use to lubricate tip of tube • Immediate
7-12 months	<ul style="list-style-type: none"> • heel stick, IV insertion, • IM and SQ injection, port-a-cath access • tape removal, lumbar puncture • arterial, venous or capillary blood draw • urinary catheterization, dressing change • wound care, NGT insertion • suture placement and removal • tube/drain placement and removal • cast- application • occupational or physical therapy consultations. 	<ul style="list-style-type: none"> • Topical 4% lidocaine cream • Nitrous Oxide Gas for anxiolysis • Acetaminophen or NSAID if appropriate • Urojet (sterile) lidocaine jelly for urinary catheterization • Viscous Lidocaine for NGT insertion • Atomized/Intranasal lidocaine for NGT insertion (<u>LIP pt eval & separate order required</u>) • Atomized/Intranasal midazolam for anxiety (<u>LIP pt eval & separate order required</u>) ISMP High Alert Medication 	<ul style="list-style-type: none"> • 30 minutes • 2-3 minutes • 30 minutes • 1-2 minutes • Use to lubricate tip of tube • Immediate • Onset: 5 min; Max effect: 10 min
1-2 years	<ul style="list-style-type: none"> • IV insertion, • IM and SQ injection, port-a-cath access • tape removal, lumbar puncture 	<ul style="list-style-type: none"> • Topical 4% lidocaine cream • Nitrous Oxide Gas for anxiolysis • Acetaminophen or NSAID if appropriate 	<ul style="list-style-type: none"> • 30 minutes • 2-3 minutes • 30 minutes

Age	Examples of minor procedures	<u>Additional Interventions Requiring LIP order</u> RN-initiated Pharmacologic Pain Protocol	Onset
	<ul style="list-style-type: none"> • <i>arterial, venous or capillary blood draw</i> • <i>urinary catheterization, dressing change</i> • <i>wound care, NGT insertion</i> • <i>suture placement and removal</i> • <i>tube/drain placement and removal</i> • <i>cast- application</i> • <i>occupational or physical therapy consultations.</i> 	<ul style="list-style-type: none"> • Urojet (sterile) lidocaine jelly for urinary catheterization • Viscous Lidocaine for NGT insertion • Atomized/Intranasal lidocaine for NGT insertion (<u>LIP pt eval & separate order required</u>) • Atomized/Intranasal midazolam for anxiety (<u>LIP pt eval & separate order required</u>) <i>ISMP High Alert Medication</i> 	<ul style="list-style-type: none"> • 1-2 minutes • Use to lubricate tip of tube • Immediate <p>Onset: 5 min; Max effect: 10 min</p>
Toddler/Pre school 2yr - 5yr	<ul style="list-style-type: none"> • <i>IV insertion,</i> • <i>IM and SQ injection, port-a-cath access</i> • <i>tape removal, lumbar puncture</i> • <i>arterial, venous or capillary blood draw</i> • <i>urinary catheterization, dressing change</i> • <i>wound care, NGT insertion</i> • <i>suture placement and removal</i> • <i>tube/drain placement and removal</i> • <i>cast- application</i> • <i>occupational or physical therapy consultations</i> • <i>lumbar punctures</i> 	<ul style="list-style-type: none"> • Topical 4% lidocaine cream <i>or</i> • 1% lidocaine via J-Tip device <i>or</i> • 1% lidocaine intradermal injection • Nitrous Oxide Gas for anxiolysis • Acetaminophen or NSAID if appropriate • Urojet (sterile) lidocaine jelly for urinary catheterization • Cetacaine spray for NGT placement (<u>LIP pt eval & separate order required</u>) • Viscous Lidocaine for NGT insertion 	<ul style="list-style-type: none"> • 30 minutes • 30-60 seconds • 2-3 minutes • 30 minutes • 1-2 minutes • Immediate • Immediate • Immediate

Age	Examples of minor procedures	<u>Additional Interventions Requiring LIP order</u> RN-initiated Pharmacologic Pain Protocol	Onset
		<ul style="list-style-type: none"> Atomized/Intranasal Lidocaine for NGT insertion (<u>LIP pt eval & separate order required</u>) Atomized/Intranasal midazolam for anxiety (<u>LIP pt eval & separate order required</u>) <i>ISMP High Alert Medication</i> 	<ul style="list-style-type: none"> Onset: 5 min; Max effect: 10 min
School Aged 6yrs and older	<ul style="list-style-type: none"> <i>IV insertion,</i> <i>IM and SQ injection, port-a-cath access</i> <i>tape removal, lumbar puncture</i> <i>arterial, venous or capillary blood draw</i> <i>urinary catheterization, dressing change</i> <i>wound care, NGT insertion</i> <i>suture placement and removal</i> <i>tube/drain placement and removal</i> <i>cast- application</i> <i>occupational or physical therapy consultations</i> <i>lumbar punctures</i> 	<ul style="list-style-type: none"> Topical 4% lidocaine cream <i>or</i> 1% lidocaine via J-Tip device <i>or</i> <ul style="list-style-type: none"> 1% lidocaine intradermal injection Nitrous Oxide Gas for anxiolysis Acetaminophen or NSAID if appropriate Urojet (sterile) lidocaine jelly for urinary catheterization Cetacaine spray for NGT placement (<u>LIP pt eval & separate order required</u>) Viscous Lidocaine for NGT insertion Atomized/Intranasal Lidocaine for NGT insertion (<u>LIP pt eval & separate order required</u>) Atomized/Intranasal midazolam for anxiety (<u>LIP pt eval & separate order required</u>) 	<ul style="list-style-type: none"> 30 minutes 30-60 seconds 2-3 minutes 30 minutes 1-2 minutes Immediate Use to lubricate tip of tube Immediate Onset: 5 min; Max effect: 10 min

Age	Examples of minor procedures	<u>Additional Interventions Requiring LIP order</u> RN-initiated Pharmacologic Pain Protocol	Onset
		required) ISMP High Alert Medication	
<p>In addition to the above, the following are also used in the Emergency Department:</p> <ul style="list-style-type: none"> • Intranasal Fentanyl • Nebulized Lidocaine for NGT placement 			

RELEVANT REFERENCES:

- Albani, F. (2010). The effect of programmed distraction on the pain caused by venipuncture among adolescents on hemodialysis. *Pain Management Nursing, 11*(2), 85-91.
- Allred, K. D., Byers, J. F., & Sole, M. L. (2010). The effect of music on postoperative pain and anxiety. *Pain Management Nursing, 11*(1), 15-25
- American Academy of Pediatrics /American Pain Society [APP/APS]. (2001). The assessment and management of acute pain in infants, children, and adolescents. *Pediatrics, 108*(3), 793-797.
- American Academy of Pediatrics/Canadian Paediatric Society Policy Statement [AAP/CPS] (2006). Prevention and management of pain in the neonate: An update. *Pediatrics, 118*(5), 2231-2241.
- American Academy of Pediatrics Committee on Hospital Care (2000). Child Life Services. *Pediatrics, 106*(5), 1156-1159.
- American Nurses Association. (2001). *Code of ethics for nurses with interpretive statements*. Silver Spring, Maryland.: Nursesbooks.org.
- American Nurses Association. (2004). *Nursing scope and standards of practice*. Silver Spring, Maryland: Nursesbooks.org.
- Auerbach M, Tunik M, Mojica M. (2009). *A randomized, double-blind controlled study of jet lidocaine compared to jet placebo for pain relief in children undergoing needle insertion in the emergency department*. *Acad Emerg Med;16*(5):388.
- Brennan, F., Carr, D., & Cousins, M. (2007). Pain management: A fundamental human right. *Anesthesia & Analgesia, 105*(1) 205-221.
- Brown, M. & Bennett, P. (2010). Social, political, and ethical forces influencing nursing practice. In St. Marie, (ed.), *Core curriculum for pain management nursing* (pp. 181-213). Dubuque: Kendall Hunt Publishing.
- Cignacco, E., Hamers, J. P. H., Stoffel, L., van Lingen, R. A., Gessler, P., McDougall, J., et al. (2007). The efficacy of nonpharmacologic interventions in the management of procedural pain in preterm and term neonates: A systematic literature review. *European Journal of Pain, 11*(2), 139-152.
- Clark, M. & Brunick, A. (2003). *Handbook of Nitrous Oxide and Oxygen Sedation, 2nd ed.* Mosby Inc.
- Cong, X., Ludington-Hoe, S. M., McCain, G., & Pingfu, F. (2009). Kangaroo Care modifies preterm infant heart rate variability in response to heel stick pain: Pilot study. *Early Human Development, 85*, 561-567.
- Cregin, R., Rappaport, A., Montagnino, G., Sabogal, G., Moreau, H., & Abularrage, J. (2008). Improving pain management for pediatric patients undergoing nonurgent painful procedures. *American Journal of Health-System Pharmacists, 65*, 723-727.

- Czarnecki, M., Turner, H., Collins, P., Doellman, D., Wrona, S., & Reynolds, J. (2011). Procedural pain management: Position statement with clinical practice recommendations. *Pain Management Nursing*, 12(2), 95-111.
- Farrell, M., Drake, G., Rucker, D., Finkelstein, M., & Zier, J. (2008). Creation of a registered nurse-administered nitrous oxide sedation program for radiology and beyond. *Pediatric Nursing*. 34 (1): 29-35.
- Grunau, R. E., Holsti, L., & Peters, J. W. (2006). Long-term consequences of pain in human neonates. (Review). *Seminars in Fetal & Neonatal Medicine*, 11(4), 268-275.
- Hatfield, LA. (2008). Sucrose decreases infant biobehavioral pain response to immunizations: a randomized controlled trial. *Journal of Nursing Scholarship*. 40(3): 219-225.
- Henderson, J.M., Spence, D.G., Komocar, L.M., Bonn, G.E. & Stenstrom, R.J. (1990). Administration of nitrous oxide to pediatric patients provides analgesia for venous cannulation. *Anesthesiology*, 72:269-271.
- Jimenez N, Bradford H, Seidel KD, Sousa M, Lynn AM. (2006). *A comparison of a needle-free injection system for local anesthesia versus EMLA for intravenous catheter insertion in the pediatric patient*. *Anesth Analg*; 102(2):411.
- Klassen, J. A., Liang, Y., Tjosvold, L., Klassen, R. P., & Hartling, L. (2008). Music for pain and anxiety in children undergoing medical procedures: A systematic review of randomized controlled trials. *Ambulatory Pediatrics*, 8(2), 117-128.
- Liu, M; Lin, K., & Lee, T. (2010). Using non-nutritive sucking and oral glucose solution with neonates to relieve pain: a randomized controlled trial. *Journal of Clinical Nursing*. 19 (11-12):1604-11.
- Luhmann, J., Hurt, S., Shootman, M, & Kennedy, R. (2004). A comparison of buffered lidocaine versus EIA-Max before peripheral intravenous catheter insertions in children. *Pediatrics*, 113(3), 217-220. Retrieved 4/11/11 from <http://pediatrics.aappublications.org/cgi/content/full/113/3/e217>
- Marceau, J., Murray, H. & Nanan, R. (2010). Efficacy of oral sucrose in infants of methadone-maintained mothers. *Neonatology*, 97: 67-70.
- Matteucci, R. & Grose, S. (2010). Sucrose/glucose administration in newborns with pain. Evidence-Based Care Sheet. Cinahl Information Systems. Retrieved 4/13/11.
- Memorial Health System Policy/Guideline. (2010). *IV Therapy: Peripheral Intravenous Guidelines*.
- National Medical Products, Inc. J-Tip (Needle Free Injection System). <http://jtip.net/>.
- Oregon State Board of Nursing. (2008). *Nursing practice in oregon: What you need to know*.
- Oregon State Board of Nursing. (6/17/04). *Position statement for pain management*. Retrieved 1/17/11 from <http://www.oregon.gov/OSBN/>
- Pasek, T.; Thomas, D., Khimji, I., Schmitt, C., Spence, A., & Hanni, R. (2007). Implementation of a nurse-driven topical analgesic protocol: Two steps forward, one step back. *Pediatric Pain Letter*, 9(3), 26-30. Retrieved 1/12/11 from <http://www.pediatric-pain.ca/ppl>
- Petrack, E.M., Christopher, N.C. & Kriwinsky, J. (1997). Pain management in the emergency department: Patterns of analgesic utilization. *Pediatrics*. 99:711-714.
- Sarasota Memorial Hospital Nursing Department Policy (2009). *Pediatric pain management for needle sticks policy# 162.855*
- Sepulveda, C. (2007). New guide on palliative care services for people living with advanced cancer. Retrieved 1/17/11 from <http://www.who.int/mediacentre/news/notes/2007/np31/en/>
- Spanos S, Booth R, Koenig H, Sikes K, Gracely E, Kim IK. (2008). *Jet Injection of 1% buffered lidocaine versus topical ELA-Max for anesthesia before peripheral intravenous catheterization in children: a randomized controlled trial*. *Pediatr Emerg Care*; 24(8):511.
- Taddio, A., Appleton, M., Bortolussi, R., Chambers, C., Dubey, V., Halperin, S., Hanrahan, A., Ipp, M., Lockett, D., MacDonald, N., Midmer, D., Mousmanis, P., Palda, V., Pielak, K., Riddell, R., Eieder, M., Scott, J., & Shah, V., (2010). Reducing the pain of childhood vaccination: an evidence-based clinical practice guideline. *Canadian Medical Association Journal*, 182(18), E843-E855.
- Uman, L. S., Chambers, C. T., McGrath, P. J., & Kisely, S. R. (2008). A systematic review of randomized controlled trials examining psychological interventions for needle-related procedural pain and distress in children and adolescents: An abbreviated Cochrane Review. *Journal of Pediatric Psychology*, 33(8):824-854.

- Windich-Biermeier, A., Sjoberg, I., Dale, J. C., Eshelman, D., & Guzzetta, C. E. (2007). Effects of distraction on pain, fear and distress during venous port access and venipuncture in children and adolescents with cancer. *Journal of Pediatric Oncology Nursing*, 24(1), 8-19.
- Zempsky, Q., Cravero, J., & the Committee on Pediatric Emergency Medicine and Section on Anesthesiology and Pain Medicine. (2004). Relief of pain and anxiety in pediatric patients in emergency medical systems. Clinical Report of the American Academy of Pediatrics. *Pediatrics*, 114(5), 1348-1356.
- Zempsky WT, Robbins B, Richards PT, Leong MS, Schechter NL. (2008). *A novel needle-free powder lidocaine delivery system for rapid local analgesia*. J Pediatr; 152(3):405.

RELATED DOCUMENTS:

- Intractable Pain Treatment
- Medication Administration: Intravenous Patient Controlled Analgesia (PCA)
- Pain Management
- Continuous Epidural or Intrathecal Medication Administration
- Epidural Narcotic Administration
- Medication Safety Precautions- Peds
- NPEOC: Pediatric Patients In The Emergency Department
- NPEOC: Observation Patients In The Emergency Department
- NPEOC: Pediatrics
- Non-Pharmacologic Pain Management Procedure
- Pharmacologic Pain Management Procedure

TITLE, POLICY OWNER:

Women and Children's Division Director

APPROVING COMMITTEE(S):

- Pediatric Pain Leadership Committee
- Pediatric Cluster Council
- Nursing Practice Council

FINAL APPROVAL:

OHSU Healthcare Policy Steering Committee

Supersedes: 10/2013; updated 3/11/2015; 3/2018;