 Department of Health Government of Nunavut		<b>NURSING POLICY, PROCEDURE AND PROTOCOLS</b>	
		<b>Community Health Nursing</b>	
<b>TITLE:</b>		<b>SECTION:</b>	<b>POLICY NUMBER:</b>
<b>Anesthesia: Topical, Local &amp; Digital Nerve Block</b>		Clinical Procedures	11-009-00
<b>EFFECTIVE DATE:</b>	<b>REVIEW DUE:</b>	<b>REPLACES NUMBER:</b>	<b>NUMBER OF PAGES:</b>
February 10, 2018	February 2021		10
<b>APPLIES TO:</b>			
Community Health Nurses			

#### POLICY 1:

Registered nurses, who receive additional instruction from the Nurse Educator / Delegate, may administer topical and local anaesthesia for the purpose of wound closure without a physician's order. Digital nerve blocks may be performed only after completion of a certification program. Nurses who have received additional instruction from the Nurse Educator / Delegate prior to the effective date of this policy may continue to perform digital nerve blocks.

#### POLICY 2:

Anesthesia agents containing vasoconstrictors, such as epinephrine, shall be administered only as directed by a physician for all infants and children.

#### DEFINITIONS:

**Topical anaesthesia** is a form of anaesthesia in which a chemical or chemical mixture is applied directly to the skin.

**Local anaesthesia** agents are injected into the plane between the dermis and subcutaneous layer at the site where anaesthesia is desired.

**Digital nerve blocks** involve the injection of an aesthetic agent at the base of a digit to anaesthetize the entire digit.

#### PRINCIPLES:

- Local or Regional (Nerve Block) anaesthesia is used for many dermatologic procedures. The choice of anaesthesia depends on the procedure, location, extent of the wound, length of time of the procedure, and the client's age and emotional status.
- Topical anaesthesia is useful for very simple lacerations and is especially helpful in the pediatric client or adults with needle phobia.
- Digital nerve blocks are useful for nail removal, paronychia drainage, and laceration repair of the fingers and toes

#### **RELATED POLICIES, GUIDELINES AND LEGISLATION:**

Procedure 11-009-01                      Application of Topical & Local Anaesthesia

#### **REFERENCES:**

- Armstrong, MJ (2004). Local Anesthesia. *Emergency Medicine Procedures*. New York, McGraw-Hill, pp 931-938.
- Edmunds, M. & Mayhew, M. (2003). *Procedures for Primary Care Practitioners, 2<sup>nd</sup> ed.*. St. Louis: Mosby.
- McGee, D. (2004). Local and Topical Anesthesia. *Clinical Procedures in Emergency Medicine*, 4th ed., pp 533-551. WB Saunders: Philadelphia
- Higginbotham, E. & Vissers, RJ. (2004). Local and Regional Anesthesia. *Emergency Medicine: A Comprehensive Study Guide, 6th ed.*, pp 264-275. McGraw-Hill: New York



## PROCEDURE 11-009-01

### NURSING CONSIDERATIONS:

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1. Pain receptors are easily blocked because they have no myelin sheath and are very small in diameter. Pressure receptors are larger and have a myelin sheath, therefore are not usually blocked with local anesthesia. Inform the client it is normal to feel pressure, but should not feel pain.
2. A digital nerve block is indicated when:
  - a. A larger area of anesthesia is necessary;
  - b. where local anesthesia is difficult to apply;
  - c. Local anesthesia may not be effective because of infection or edema.
3. A digital nerve block involves infiltrating the base of four nerves to each finger or toe:
  - a. Two palmar digital nerves (responsible for distal finger and fingertip sensation) Figure 2
  - b. Two dorsal digital nerves (responsible for proximal, dorsal digit sensation with some overlap with palmar digital nerves) Figure 1
4. Anesthesia agent containing epinephrine may be used to prolong the duration of action as well as to reduce bleeding. Physician to be consulted before use in infants and children.
  - a. These vasoconstrictor agents cannot be used in areas of terminal vasculature (e.g. distal digits and skin appendages).
  - b. Nurses should not administer vasoconstrictor agents in persons with peripheral vascular disease and those with exaggerated vasoconstrictor response (e.g. Reynaud's disease)
  - c. Indicated for use on scalp or facial laceration repair
  - d. Should not be used on lesions greater than 5cm.
5. May use topical anesthesia or ice application prior to administering a digital nerve block.
6. Topical anesthesia cream (e.g. EMLA) may only be used on intact skin
  - a. Do not use on mucous membranes
  - b. Do not use on infected areas
7. Personal protective equipment should be worn whenever the anaesthetic agent is injected.
8. Prevent injection into blood vessel by aspirating syringe before injection, otherwise, may cause:
  - a. Excitatory phenomena in the central nervous system
  - b. Cardiovascular reactions (e.g. hypotension, bradycardia)
9. Always use a fine (25- to 30-gauge) and long (2.5- to 3.75-cm) needle for the initial injection. Inject as slowly as possible, and use the smallest volume of anesthetic necessary.
10. For lacerations, infiltrate through wound edges instead of piercing the epidermis, and start new injections in already anesthetized areas.



PROCEDURE 11-009-01

TABLE 1: TOPICAL ANAESTHESIA: LIDOCAINE		
Concentration (%)	Form	Tissue
2-4	Solution	Oropharynx Tracheobronchial tree Nose
2	Jelly	urethra
2.5-5	Ointment	Skin Mucous membrane Rectum
2	Viscous solution	Oropharynx
10	Suppository	Rectum
10	Aerosol	Gingival mucosa

Pfenninger, JL & Fowler, GC (1994). *Procedures for Primary Care Physicians*. St. Louis: Mosby.

TABLE 2: LOCAL ANAESTHESIA			
Local Anaesthesia Agent	Effects	Uses	Maximum Dose
Lidocaine (Xylocaine) without epinephrine	Can cause vasodilatation <u>Onset</u> : 1 min <u>Duration</u> : ½ to 1 hour (depending on site and vascularity)	<ul style="list-style-type: none"> <li>➤ Contaminated wounds;</li> <li>➤ Fingers, nose, penis, toes &amp; earlobes;</li> <li>➤ If vascular disease present or immunocompromised;</li> <li>➤ If cerebrovascular / cardiovascular risks</li> <li>➤ For nerve blocks</li> </ul>	For 1% Lidocaine: 4.5mg/kg not to exceed 300mg (30ml in adult)
Lidocaine (Xylocaine) with epinephrine	Causes vasoconstriction <u>Onset</u> : 1 min <u>Duration</u> : 2-6 hours	<ul style="list-style-type: none"> <li>➤ Highly vascular areas to improve visualization of field</li> <li>➤ Do not use on fingers, nose, penis, toes &amp; earlobes</li> </ul>	For 1% Lidocaine: 7mg/kg not to exceed 500mg (50ml in adult)
Bupivacaine (Marcaine)	<u>Onset</u> : 5 min <u>Duration</u> : 2-4 hours	<ul style="list-style-type: none"> <li>➤ Nerve blocks</li> </ul>	For 0.25%: 3mg/kg not to exceed 175mg (50ml per adult)

Edmunds, M. & Mayhew, M. (2003). *Procedures for Primary Care Practitioners*, 2<sup>nd</sup> ed.. St. Louis: Mosby.



## PROCEDURE 1: TOPICAL ANESTHESIA

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EQUIPMENT	
EMLA	Lidocaine & Epinephrine
<ul style="list-style-type: none"><li>✓ Non sterile gloves</li><li>✓ EMLA cream</li><li>✓ Occlusive dressing</li></ul>	<ul style="list-style-type: none"><li>✓ Non sterile gloves</li><li>✓ Sterile 2 X 2 gauze</li><li>✓ Topical hemostatic agents</li></ul>

### **EMLA:**

1. Assemble equipment, perform hand hygiene and apply clean gloves
2. Use alcohol or skin soap to remove oils from skin.
3. Apply EMLA cream to the intact skin followed by an occlusive dressing 30 to 90 minutes before the procedure. The depth of anesthesia should be 3mm after 1 hour.
4. Decrease application time on diseased skin to 5 to 30 minutes because penetration is more rapid.
5. Perform procedure and discard all used items.
6. Perform hand hygiene

### **Lidocaine and Epinephrine:**

1. Select appropriate agent
2. Assemble equipment, perform hand hygiene and apply clean gloves
3. Remove any visible debris from the wound
4. Apply gauze soaked in the topical anesthesia agent to the wound for 10 minutes.
5. Perform procedure and discard all used items.
6. Perform hand hygiene.

### **Ice:**

1. Rub the skin with ice for 10 seconds. Anesthesia lasts 2 seconds.



## PROCEDURE 2: LOCAL ANESTHESIA

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EQUIPMENT	
✓	Non sterile gloves
✓	Local anesthetic agent (e.g. Lidocaine)
✓	18 Gauge needle to draw up solution
✓	27 to 30 gauge needle for injection
✓	Alcohol swabs
✓	Appropriate syringe (1 to 3 ml)
✓	Antiseptic solution (chlorhexidine or providone-iodine)

1. Explain procedure to the client. Ensure the client understands there may be some discomfort on injection and that the anesthetic should eliminate pain but will not eliminate all sensation, and pressure.
2. Position the client in supine or sitting comfortably in bed. Vasovagal reactions are not uncommon.
3. Select the appropriate anesthetic agent
4. Assemble equipment, perform hand hygiene and apply gloves.
5. Prepare the skin with antiseptic solution. Do not apply directly in a wound or mucosal surfaces, as it should only be used on intact skin.
6. Wipe the top of vials with alcohol swab and draw up the anesthetic agent with an 18 G needle (usually 1 to 3 ml is sufficient)
7. Remove the needle and choose an appropriate needle for injection (usually a 27 to 30 G needle with ½ to 1 ½ inch needle length).
8. Inject the anesthetic agent subdermally with bevel up (create a skin wheal). Injection is made during advance and withdrawal of needle.
9. Aspirate the syringe before infiltration.
  - If there is blood return, do not infiltrate. Reposition needle and aspirate again to ensure it is not in a blood vessel.



10. Repeat the above procedure until an adequate area is anesthetized for the procedure to be done.
11. Blanching of the skin is observed with the use of an anesthetic agent containing vasoconstrictors.
12. Test area for pain sensation before proceeding with procedure. Lidocaine takes approximately 1 minute to take effect.
13. Safely dispose of used items and perform hand hygiene.

### PROCEDURE 3: DIGITAL NERVE BLOCK

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EQUIPMENT
<ul style="list-style-type: none"> <li>✓ Sterile gloves</li> <li>✓ Local anesthetic agent (<i>without</i> epinephrine)</li> <li>✓ 18 Gauge needle to draw up solution</li> <li>✓ 27 to 30 gauge needle for injection</li> <li>✓ Sterile field</li> <li>✓ Agent for skin preparation (10% povidone-iodine solution or chlorhexidine gluconate solution)</li> <li>✓ Appropriate syringe (3 to 5 ml)</li> </ul>

1. Perform a neurologic examination of the area to be anesthetized and document this in the health record. Note any abnormalities in the examination before inducing anesthesia.
2. Explain procedure to the client. Ensure the client understands there may be some discomfort on injection and that the anesthetic should eliminate pain but will not eliminate all sensation, and pressure.
3. Position the client in supine or sitting comfortably in bed. Vasovagal reactions are not uncommon.
4. Select the appropriate anesthetic agent
5. Assemble equipment, perform hand hygiene and apply gloves.
6. Prepare the skin with antiseptic solution. Do not apply directly in a wound or mucosal surfaces, as it should only be used on intact skin.
7. Apply topical anesthesia to injection site (optional).



8. Wipe the top of vials with an alcohol swab and draw up the anesthetic agent with an 18-Gauge needle. (4 ml of 1% or 2% Lidocaine *without* epinephrine)
9. Remove the needle and choose an appropriate needle for injection (usually 27 to 30-Gauge with a needle 1 to 1 ½ inches in length).
10. Clean and prepare the skin over the injection site in a sterile manner.
11. Insert the needle into the finger web space distal to the metacarpalphalangeal joint .
  - a. Angle needle toward dorsal nerve and inject about 0.5 ml of anesthetic agent (after aspiration) near bone
  - b. Partially withdraw needle to tip
  - c. Redirect needle toward palmar nerve and inject about 1 ml of anesthetic agent (after aspiration)
  - d. Repeat for opposite side of digit.
12. Repeat the procedure on the opposite side of the digit.
13. Allow 5 to 15 minutes for anesthesia to take full effect. Test for sensation before performing procedure.
14. After procedure, dispose of used items and perform hand hygiene.

Figure 1: Innervation of the Hand, dorsal digital nerves.



Drake, R. Vogl, AW, Mitchell, AW, Tibbitts, RM, and Richardson, PE (2008) Gray's Atlas of Anatomy. Elsevier: Philadelphia.

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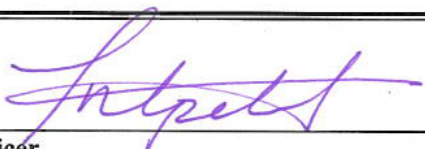

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- Armstrong, MJ (2004). Local Anesthesia. *Emergency Medicine Procedures*. New York, McGraw-Hill, pp 931-938.
- Edmunds, M. & Mayhew, M. (2003). *Procedures for Primary Care Practitioners, 2<sup>nd</sup> ed.*. St. Louis: Mosby.
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Figure 2: Palmar digital nerves.



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