Section 11: Clinical Procedures

Department of Health Government of Nunavut	NURSING POLICY, PROCEDURE AND PROTOCOLS	
	Community Health Nursing	
TITLE:	**SECTION:**	**POLICY NUMBER:**
Central Venous Access Device: Care and Maintenance	Clinical Procedures	11-001-00
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APPLIES TO:		
Community Health Nurses		

Registered Nurses are required to be knowledgeable and skillful in the implementation of basic nursing procedures, as acquired through their formal nursing educational programs. It is the policy of the Department of Health and Social Services that the textbook *Clinical Nursing Skills and Techniques 7th edition* (Potter and Perry, 2010) shall be used to guide all basic nursing skill procedures, unless another policy and procedure is contained within this manual.

POLICY:

A Registered Nurse is responsible for the care and maintenance of Central Venous Access Devices. The nurse must complete additional training with the Nurse Educator or Delegate prior to assuming this responsibility.

DEFINITIONS:

Central Venous Access Devices (CVAD) is any intravenous device whose tip is resting in the superior vena cava. This includes percutaneously inserted subclavian and jugular catheter, tunnelled/cuffed catheters (e.g. Leonard®, Hickman®), implanted ports, peripherally inserted central catheters (PICC) and Hemodialysis/Plasmapheresis catheters (percutaneous or tunnelled/cuffed). These devices may have single or multiple lumens.

PRINCIPLES:

Clients may return to the community with a PICC line or implanted port in situ. It is unlikely that a client will return to the community with any other central venous access device.

Guidelines, from the referral site, for the care of the central venous access device shall accompany the client to the community. These guidelines shall become part of the client's health record.

RELATED POLICIES, GUIDELINES AND LEGISLATION:

Procedure 11-001-01	Care of PICC Lines
Procedure 11-001-02	Central Venous Access Device: Heparin Flush
Policy 11-002-00	PICC Removal
Procedure 11-002-01	PICC Removal
Policy 11-004-00	Central Venous Access Device: Blood Procurement
Procedure 11-004-01	Central Venous Access Device: Blood Procurement

REFERENCES:

Guidelines for the Prevention of Intravascular Catheter-Related Infections, 2002. MMWR Recommendations and Reports, Volume 51, Number RR-10

Potter, P.A. & Perry, A.G. (2010). Clinical Nursing Skills & Techniques, 7th edition, Mosby: Toronto.

Registered Nurse's Association of Ontario (2005). *Care and maintenance to reduce vascular access complications*. Toronto: Author.

NURSING CONSIDERATIONS:

1. If the Peripherally Inserted Central Catheter (PICC) migrated in/out as determined by measurement at dressing change, notify the appropriate physician. (This measurement should be documented on the discharge notes that accompany the client back to the community.)

2. High permeability transparent dressings over the PICC line are changed routinely every 7 days; and/or if fluid accumulated underneath the dressing; and/or if the dressing is no longer occlusive.

    - Sterile adhesive gauze dressings (e.g. Primapore®) are used if the client is sensitive to transparent dressings or if drainage is present.
    - Gauze dressings are changed every 2 days and as required.

3. The insertion site is assessed daily both visually and by palpation through the intact dressing. The client should be taught to do this if daily visits to the health centre are not warranted.

    - If the client has fever, tenderness, signs of infection and has a gauze dressing, remove the dressing to examine the site more closely.
    - A swab for culture and sensitivity is obtained if infection is suspected and drainage is present. The physician must be notified.

4. If catheter-related infection is suspected, notify the appropriate physician to discuss appropriate treatment. Do not administer antibiotics without prior consent with the physician.

    - While awaiting further direction from the physician, the dressing, solutions and tubings should be changed, but the catheter is to be left in place.

5. A mask is worn only if the nurse has an upper respiratory illness, allergic rhinitis or is a known staphylococcus aureus carrier.

6. Cuff pressure devices are not to be used to infuse blood components/fluids with PICC.

7. The turbulent injection technique should always be used when the intention is to thoroughly flush the PICC. Administering 0.9% sodium chloride via a gravity drip or infusion pump will not clear the catheter lumen effectively.

SECURING PICC LINES

1. Avoid placing tape on transparent dressings. This interferes with the product's ability to "breathe".

    - If loss of adherence is likely (e.g. diaphoresis, excessive hair), consider alternate methods of securement.

2. The proximal suture wing of the PICC is secured with a securement device such as "Statlock CV plus" at all times. If the exposed catheter is lengthy and the distal end suture wing/hub of the catheter needs securement, adhesive strips or a securement device such as "Statlock CV plus" can be used. The securement device is usually sent to the community with the client.

3. The securement device (e.g. StatLock CV Plus), if present, is replaced with each dressing change.

CLEANSING SOLUTION:

- Aqueous Chlorhexidine (CHG) gluconate 2%: Total contact time for cleansing solution will be 2 minutes, including the 30 seconds scrub.

- Cleansing solutions must be allowed to air dry prior to covering the site with the dressing. This ensures proper contact time. In addition, if the skin is covered while still moist, a reaction between cleansing solution and dressing adhesive can occur and may result in cutaneous reaction.

- In the event that the client is allergic to chlorhexidine (CHG), the following may be substituted: 10% providone iodine (PI) (contact time is 2 minutes).

- Do not use acetone or any solvent with PICC lines.

INTERLINK® INJECTION CAP:

- The injection cap is placed at the end of the PICC lumen. The caps are changed every 3 days, and whenever the cap has been removed or its integrity is suspect.

- Syringes and IV administration tubing may be connected directly to the cap/extension set. In these instances, the clamp on the extension set must be closed prior to removal of syringes and tubings. At the end of procedure, replace with new injection cap(s). The caps are changed every 3 days.

- A Groshong® PICC (the catheter itself) is not to be clamped, therefore, it is not necessary to keep a pair of clamp at the bedside.

INTRAVENOUS TUBING/ INTERLINK® THREADED LUER LOCK CANNULA:

- Extension tubings are not routinely changed unless defective or if direct catheter hub access is needed (i.e. use of restoring agent). If the original IV set is changed, extension tubing is then changed every 3 days and labelled with date.

- IV tubing and threaded luer lock cannula are changed routinely every 3 days and whenever the integrity of the tubing is in question.

- The Interlink® Threaded luer lock cannula is changed with each tubing change/disconnect.

- IV tubing is connected to the capped lumen of the PICC with an Interlink® Threaded luer lock cannula.

- Pre-priming of tubing is strongly discouraged: tubing is to be prepared as close as possible to the time required.

<table>
<tr><th colspan="2">EQUIPMENT</th></tr>
<tr><th>Changing Dressing and Interlink® injection caps:</th><th>Changing the Interlink® injection caps only:</th></tr>
<tr><td>✓ Non sterile gloves (as per routine practices)
✓ 2 pairs of sterile gloves
✓ Dressing tray
✓ 1” tape (regular or paper)
✓ Alcohol swab (if securement device such as Statlock CV Plus is in place)
✓ Disposable measuring tape</td><td rowspan="4">✓ For priming: 3mL syringe filled with 0.9% sodium chloride and Interlink ® blunt plastic cannula
✓ Interlink® injection cap
✓ Sterile gloves
✓ Alcohol free chlorhexidine (CHG) gluconate 2% swab sticks or swabs
✓ Dressing tray
✓ Prescribed IV solutions with new container, tubing , tubing and Interlink® threaded luer lock cannula if indicated
✓ If indicated: Extension set</td></tr>
<tr><td><u>Cleansing Solution:</u>

✓ Alcohol free chlorhexidine (CHG) gluconate 2% swab sticks OR
✓ Solution aqueous CHG gluconate 2% with 4% alcohol

If allergic to CHG:
10% Providone Iodine (PI) solution or swabsticks</td></tr>
<tr><td><u>Dressing:</u>

High permeable transparent dressing:
✓ 10x14 cm (e.g. IV3000) OR
✓ Sterile adhesive gauze dressing (e.g. Mepore®/ Primapore®) (15 cm x 8 cm), (25 cm x 10 cm)</td></tr>
<tr><td><u>Securement device:</u>

Securement device system (e.g. StatLock CV Plus)

If catheter lengthy may need 2nd securement device or Sterile adhesive strips (½” or ¼”)

Add the additional equipment if changing the injection caps in conjunction with the dressing.</td></tr>
</table>

PROCEDURE 1: DRESSING CHANGE / CHANGING THE INJECTION CAP

1. Position client comfortably.

2. Cleanse hands with alcohol gel or antimicrobial soap.

3. Aseptically prepare equipment.

4. If changing the caps in conjunction with the dressing:

    a. If indicated, assemble the IV solution and tubing as per Potter & Perry (2010).

    b. Attach the threaded luer lock cannula to the end of the IV tubing.

    c. Prime the tubing.

    d. If there is a continuous infusion, stop the infusion, clamp the catheter (if PICC with Groshong® valve, no clamping is necessary), disconnect IV tubing and flush lumens as per Potter & Perry (2010).

    e. Open the injection cap package(s) and prime the cap(s) using the syringe filled with 0.9% sodium chloride and the attached blunt plastic cannula without removing them from the package (to maintain sterility). Prime the extension set if indicated. Put items on sterile tray.

5. Measure and document the length of the catheter in centimetres. Measure from the insertion site down to where the hub begins (do not include the hub or extension set in the measurement). Measurement can be taken before the dressing is removed (if catheter is not curved or looped under the dressing), or after dressing removal. In this case, lay the measuring tape down on the skin beyond where the dressing edge will be.

6. Put on non sterile gloves to remove the old dressing:

    a. Remove the dressing from the bottom-up lifting each side and then stretching it in opposite directions to lift the dressing off, taking care not to dislodge the catheter and without disrupting the securement device (eg “Statlock CV Plus) if in place.

    b. Observe alignment of the catheter, condition of the insertion site, the surrounding skin and sutures (if applicable). Obtain swab for culture and sensitivity if there are signs of infection and/or drainage.

7. If securement such as “Statlock CV Plus”/adhesive strips in place, change to sterile gloves:

    a. Removal of adhesive strips:

        i. Secure catheter by applying gentle pressure at the insertion site with a sterile gauze, then carefully remove the sterile adhesive strips and suture wing (if present) using sterile forceps or directly with sterile gloved hands. Place the suture wing on the tray away from the other sterile supplies.

    b. Removal of securement device “Statlock CV Plus”:

        i. Apply one securement device sterile adhesive strip at or near the insertion site to secure the catheter. Disengage the catheter from the securement device by first opening the side doors, one at a time from the bottom corner, and then gently pulling the catheter off the posts.

        ii. Dissolve the pad by applying an alcohol swab to a corner of the pad. Wait a few seconds, lift the corner and gently rub the under surface while continuing to lift the pad. Discard the old pad.

        iii. Remove adhesive strip located at the insertion site, by lifting each end and stretching them in opposite directions, being careful not to pull the catheter out.

8. Change sterile gloves.

9. Sterile drapes:

    a. Place one sterile drape on top of the arm, just distal to the hub/extension set junction. Then if applicable, pick up the suture wing with gauze. Cleanse the suture wing with a swab stick. Allow to air dry.

10. Starting at the insertion site, scrub the skin and catheter with the antiseptic. Use a circular scrubbing motion and move from the insertion site, outwards. Ensure that the entire area that will be under the dressing is cleansed. Include the catheter in the cleansing process. Repeat as required, using a fresh swab stick/gauze each time. Allow the area to air dry.

    a. For a PICC catheter, when present, reposition the suture wing 1-2 cm away from the PICC insertion site. Ensure that the catheter is well positioned within the groove of the suture wing.

11. Securement device:

    a. Apply the remaining adhesive strip near the insertion site to secure the catheter during the new securement device application. Prepare the area of skin that will be covered by the securement device with the skin protectant prep pad. Allow to dry thoroughly.

    b. Secure the catheter by inserting the suture wings onto the securement device posts one at a time. Insert the first suture wing into the securement device post and close the side door, and then repeat for the other one. Peel off the paper backing from the adhesive pad and place on the prepared skin.

    c. If PICC in situ and the external catheter is lengthy (presence of a suture wing at the distal hub/bifurcation of the catheter) use adhesive strips or second securement device such as "Statlock CV Plus". If adhesive strips are used, fold over the ends of the adhesive strips before applying them to facilitate future removal. Place one adhesive strip horizontally over the suture wing, and one vertically on each side of the suture wing (in an "H"). Avoid placing adhesive strips on the catheter itself. Ensure that the adhesive strips do not extend beyond the edges of the dressing.

    d. Remove adhesive strip located at the insertion site, by lifting each end and stretching them in opposite directions, being careful not to pull the catheter out.

12. Apply the high permeable transparent (or sterile adhesive gauze) dressing, placing the upper edge at least 2.5 cm (1") above the insertion/exit site. The catheter and the catheter hub will be included in the dressing. Pinch the dressing around the catheter to expel as much air as possible, and then smooth it out over the skin.

    a. If a securement device is used, extend the dressing a minimum of 1 cm distal to the device. A second transparent dressing may be required to achieve this.

    b. Ensure that the catheter lies loosely on the arm, in the shape of an "S" or "C". Avoid coiling or twisting the catheter. Ensure that the hub of the lumen catheter is included under the dressing. PICC's inserted above the antecubital fossa may be looped up ("U"-shaped) the lateral side of the upper arm.

13. If changing the caps (if not go to step 14):

    a. Lift the catheter hub/cap connection using a 4x4 gauze sponge. Using a swab stick or swab, scrub the connection.

        - If extension set in place and needs to be changed, scrub at the junction of the catheter and extension set.

b. Allow to air dry.

c. Remove the scrubbed injection cap (extension set if applicable) with sterile gauze and discard. Cleanse lumen threads with a new swab stick or swab only if visibly soiled. Allow to air dry.

d. Attach a new injection cap (or extension set with attached injection cap if indicated).

e. Wipe caps with an alcohol swab and flush as per Guideline 11-001-02: *Central Venous Access Device: Heparin Flush* if indicated.

f. If there is a continuous infusion, restart the IV infusion, using the new container, tubing and interlink® threaded luer lock cannula.

    i. Cleanse the injection cap with an alcohol swab and allow to air dry. Attach the new IV tubing by pushing and twisting the threaded lock cannula or the tubing luer lock onto the Interlink® injection cap.

    ii. Re-establish flow and secure the tubing to the client using a piece of tape or special attachment device.

14. Seal the base of the dressing by pinching it around the catheter lumen. Obtain a strip of tape that is approximately the same length as the base of the dressing. Slit the centre of the tape approximately half way through its width. Apply it to the lower edge of the dressing, underneath the catheter. Bring each slit side up and alongside the catheter lumen(s). Place another piece of tape on top of this slit tape OR place a cross-over sterile adhesive strip around the catheter where it exits the dressing. Place a second adhesive strip over that strip.

15. Loop the catheter lumen and attached IV or extension tubings that lie below the dressing and secure it to the arm by using a piece of tape or other type of attachment device (e.g. Burn net).

16. Date the dressing.

17. The pigtail retainer may be used with the device to organize and secure the tails on multiple lumen central venous lines. If it will be used, place it below the securement device (eg.“StatLock CV Plus) after the application of the dressing. The catheter lumens are secured into the pigtail retainer by gently stretching them into place. The skin that will rest under the retainer may also be prepared using the protectant skin pad and benzoin solution if available with the securement device.

PROCEDURE 2: CHANGING THE INTERLINK® INJECTION CAP(S) ONLY

1. Cleanse hands with alcohol gel or antimicrobial soap.

2. If indicated, assemble the IV solution and tubing in the usual fashion

    a. Attach Threaded® luer lock cannula to the end of the IV tubing.

    b. Prime tubing.

3. Clamp catheter (if PICC with Groshong® valve, no clampling necessary).

    a. If there is a continuous infusion, stop the infusion, remove the IV tubing by twisting the Interlink® threaded lock cannula off the lumen's injection cap (avoid removing the injection cap itself) and flush as per Guideline 11-001-02: *Central Venous Access Device: Heparin Flush*.

4. Prepare dressing tray.

    a. Open the injection cap package(s) and prime the cap(s) with the pre-filled 0.9% sodium chloride syringe without removing them from the package (to maintain sterility). If indicated, prime extension set and put on tray

    b. Open the chlorhexidine swab sticks or swabs and aseptically put them in the dressing tray.

5. Put on gloves.

6. Lift the catheter hub/cap connection using a 10 cm x 10 cm gauze sponge. Using a swab stick or swab, scrub the connection. If extension set in place, scrub at the junction of the catheter and extension set. Allow to air dry.

7. Remove the scrubbed injection cap (extension set if applicable) with sterile gauze and discard. Cleanse lumen threads with a new swab stick or swab only if visibly soiled

8. Attach a new injection cap (or extension set with attached injection cap if applicable).

9. Wipe caps with an alcohol swab, allow to air dry and flush as per Guideline 11-001-02: *Central Venous Access Device: Heparin Flush* if indicated.

10. If there is a continuous infusion, restart the IV infusion, using the new container, tubing and interlink® treaded luer lock cannula.

    a. Cleanse the injection cap with an alcohol swab and allow to air dry.

    b. Attach the new IV tubing by pushing and twisting the Interlink® threaded luer lock cannula or the tubing luer lock onto the injection cap.

    c. Re-establish flow and secure the tubing to the client using a piece of tape or special attachment device.

DOCUMENTATION:

Document procedure and findings in the progress notes.

CLIENT TEACHING:

1. Care schedule.

2. Signs of local complications: localised pain, swelling, redness, heat and drainage at site of insertion.

3. Protection of site during bathing.

REFERENCES

Guidelines for the Prevention of Intravascular Catheter-Related Infections, 2002. MMWR Recommendations and Reports, Volume 51, Number RR-10

Infection Control Guidelines (1997). Preventing Infections Associated with Indwelling Intravascular Access Devices.

O'Neil, B., Schneider, J., Pederson, C. & Mirtallo, J. (2002). Compliance with Safe Practices for Preparing Parenteral Nutrition Formulations. *American Journal Health System Pharm*, 59.

The Ottawa Hospital Policy and Procedure. *Central Venous Access Device*

Potter, P.A. & Perry, A.G. (2010). Clinical Nursing Skills & Techniques, 7th edition, Mosby: Toronto.

Registered Nurse's Association of Ontario (2005). *Care and maintenance to reduce vascular access complications*. Toronto: Author.

Registered Nurse's Association of Ontario (2004). *Assessment and device selection for vascular access.* Toronto: Author.

Weinstein, S. (2001). *Plumer's Principles and Practice of Intravenous Therapy* (7th ed.). Philadelphia: Lippincott.

HEPARIN FLUSH TABLE		
Type of Catheter	**Amount & Type of Solution**	**Frequency**
Implanted Port	Intermittent access with Huber point needle left in situ: 20 mL 0.9% sodium chloride followed by 10 mL heparin flush solution (see procedure below to prepare heparin solution)	Every 24hrs and after each use
	Huber point needle is to be removed: 20 mL 0.9% sodium chloride followed by 5 mL heparin (100 units/mL)	Prior to removal then, Every 4 weeks when not in use
Close-Ended PICC (e.g. Groshong)	20 mL 0.9% sodium chloride	Every 6 days and after each use
Open-Ended PICC (e.g. Cook)	20 mL 0.9% sodium chloride followed by 10 mL heparin flush solution (see procedure below to prepare heparin solution)	Every 6 days and after each use

HEPARIN FLUSH SOLUTION, IF INDICATED:

- ✓ 10 mL syringe
- ✓ vial heparin (100 units/mL or 10 units/mL)
- ✓ vial 0.9% sodium chloride
- ✓ blunt plastic cannula
- ✓ Interlink® single dose plastic cannula
- ✓ Alcohol swabs

HOW TO PREPARE HEPARIN FLUSH SOLUTION:

The final concentration for the heparin flush solution should be 10 units/mL.

In a 10ml syringe, mix 1 mL of heparin 100 units/mL PLUS 9mL 0.9% sodium chloride
(final concentration will be 10 units/mL)

OR

Use Heparin 10 units/mL concentration if available.

Approved by:	Effective Date:
11 FEB 2011 **Chief Nursing Officer** **Date**	April 1, 2011
February 11, 2011 **Deputy Minister of Health and Social Services** **Date**	

Department of Health Government of Nunavut	NURSING POLICY, PROCEDURE AND PROTOCOLS
	Community Health Nursing

TITLE:		**SECTION:**	**POLICY NUMBER:**
Picc Removal		Clinical Procedures	11-002-00
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APPLIES TO:			
Community Health Nurses			

POLICY:

Every attempt must be made for the client to have the peripherally inserted central catheter (PICC) removed in a designated referral site. If special circumstances arise and the client must have the PICC line removed in the community health centre, the Registered Nurse may remove the PICC when ordered by a physician. The nurse must receive additional training with the Nurse Educator or Delegate prior to performing this skill.

RELATED POLICIES, GUIDELINES AND LEGISLATION:

Infection Control Manual
Guidelines 10-002-01 Universal Precaution Guidelines
Procedure 11-002-01 PICC Removal

REFERENCES:

Macklin, D. (2000). Removing PICC. American Journal of Nursing (100) 1, 52-54
Potter, P.A. & Perry, A.G. (2010). Clinical Nursing Skills & Techniques, 7th edition, Mosby: Toronto.
Wall, J., Kierstead, V. (1995). Peripherally Inserted Central Catheters: Resistance to Removal: A Rare Complication. Journal of Intravenous Nursing (18)5, 251-254

NURSING CONSIDERATIONS:

1. Factors which may induce resistance to removal include: venous spasm, phlebitis, thrombosis, fibrin formation, kinking of catheter,
2. If resistance is encountered when attempting to remove the catheter, stop, reposition the arm and attempt removal again. If resistance continues, apply warm compress for 5-10 minutes, then re-attempt. If still unsuccessful, notify the physician.
3. If catheter breaks during removal, but is still long enough to be pulled (2-3 cm), clamp exposed end (if open-ended catheter) and continue removal.
4. If catheter breaks at insertion site or tip of catheter is missing, apply tourniquet around upper arm at axilla (tight enough to occlude venous flow) and position the client left lateral trendelenburg. Notify physician immediately. Retain external catheter.

CLEANSING SOLUTION:

1. Chlorhexidine (CHG) gluconate 2% in alcohol 70%

2. Total contact time for cleansing solution will be 30 seconds.

3. Cleansing solutions must be allowed to air dry prior to covering the catheter site with a dressing. This will ensure the proper contact time. In addition, if the skin is covered while still moist, a reaction between the cleansing solution and the dressing adhesive can occur and may result in cutaneous reaction.

4. In the event that the client is allergic to chlorhexidine (CHG):
    a. Isopropyl alcohol 70% (contact time 30 seconds)
    OR
    b. 10% providone iodine (PI contact time 2 minutes) may be substituted.

EQUIPMENT
✓ 1 pair non-sterile gloves ✓ Cleansing solution: chlorhexidine (CHG) gluconate 2% in alcohol 70% **If allergic to CHG:** ✓ 10% Providone Iodine (PI) solution or swabsticks OR isopropyl alcohol 70% ✓ 2 x 2 gauze ✓ Bandaid (optional) ✓ Sterile scissors and specimen container if infection suspected

PROCEDURE:

1. Apply warm compresses to upper arm of affected limb for 5 – 10 minutes prior to removal. (This will promote venous dilation).

2. Glove. Remove old dressing, steri-strips, and suture wing if present.

3. Clean the insertion site with antiseptic solution.

4. Position arm below the level of the heart with arm extended away from body at 45-90 degrees, while the catheter is being removed.

5. Grasp the catheter at the insertion site and gently pull it out at 2 – 3 cm intervals. Pause briefly in between (pausing will help prevent venous spasm). Continue removing the catheter in this manner. Always return to the insertion site to avoid stretching and breaking the catheter.

    a. Markings (black dots or a number) will be noted at different locations along the catheter, as it is removed. For example, 4 dots (number 40) indicate that there are 40 cm of catheter remaining in the client.
    b. When 1 dot (10 cm) is seen, grasp the gauze and hold it gently above the insertion site. Apply pressure to the site once the catheter comes out and until hemostasis is achieved.

6. Inspect the tip. If it is a Groshong® PICC, the end should be closed, with a rounded black tip on the end. All other PICC's are open-ended.

7. Place a Band-Aid over the site (optional).

8. Send catheter tip for C&S, if infection suspected.

DOCUMENTATION:

Document the following in the client's health record:

1. Site assessment
2. Difficulties encountered and interventions
3. Condition of catheter and catheter tip
4. Specimens obtained as applicable
5. Client response

CLIENT TEACHING:

Ensure client/family have been advised of the following:

1. Notify the nurse on call if increased redness, swelling, drainage or discomfort
2. May remove bandage after 24 hours
3. Apply warm compresses x 20 minutes, 4 times per day, if catheter removed due to mechanical phlebitis

REFERENCES

Macklin, D. (2000). Removing PICC. American Journal of Nursing (100) 1, 52-54

Potter, P.A. & Perry, A.G. (2010). Clinical Nursing Skills & Techniques, 7th edition, Mosby: Toronto.

Wall, J., Kierstead, V. (1995). Peripherally Inserted Central Catheters: Resistance to Removal: A Rare Complication. Journal of Intravenous Nursing (18)5, 251-254

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Chief Nursing Officer — Date: 11 FEB 2011	April 1, 2011
Deputy Minister of Health and Social Services — Date: February 11, 2011	

Department of Health Government of Nunavut	NURSING POLICY, PROCEDURE AND PROTOCOLS	
	Community Health Nursing	
TITLE:	**SECTION:**	**POLICY NUMBER:**
Central Venous Access Implanted Ports: Accessing and Discontinuing Infusion	Clinical Procedures	11-003-00
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APPLIES TO:		
Community Health Nurses		

POLICY:

Registered Nurses are responsible for accessing and de-accessing an implanted port. Only nurses who have received additional training with the Nurse Educator or delegate will assume this responsibility. A physician's order is required for the administration of a heparin flush.

The implanted port dressing is completed as per Procedure 11-001-01: *Care of PICC Lines*.

DEFINITIONS:

An **implanted port** is a small reservoir with a silicone septum (injection port) and an attached catheter that is implanted subcutaneously. The tip of the catheter rests in the superior vena cava and is therefore a central venous access device. The implanted port is accessed aseptically through the skin with a Huber point needle.

A **Huber point needle** is a non-coring needle. This permits the implanted port to be accessed approximately 1000 times with a 19-gauge needle before leaking from the septum becomes a possibility.

The **turbulent injection technique** is injecting fluid using a "push/stop/push/stop" motion on the syringe plunger. This technique ensures both laminar and turbulent flow through the Central Venous Access Device (CVAD) thereby optimizing the cleansing of the catheter lumen.

RELATED POLICIES, GUIDELINES AND LEGISLATION:

Procedure 11-001-01	Care of PICC Lines.
Procedure 11-003-01	Central Venous Access Implanted Ports: Accessing and Discontinuing Infusions
Procedure 11-003-02	Implanted Port: Access
Procedure 11-003-03	Implanted Port: De-Access
Procedure 11-003-04	Implanted Port: Changing Injection Caps
Procedure 11-003-05	Implanted Port: Discontinuing an IV Infusion
Policy 11-004-00	Central Venous Access Device: Blood Procurement
Procedure 11-004-01	Central Venous Access Device: Blood Procurement

NURSING CONSIDERATIONS:

1. Select the appropriate size of Huber point needle based on the viscosity of the fluid to be infused:

    - #19 gauge required to administer blood transfusions.
    - # 20 or 22 may be used to administer other intravenous fluids and medications.

2. Select the appropriate length of Huber point needle based on the amount of subcutaneous tissue present over the injection port. The needle hub should rest comfortably on top of the skin once the needle is in place (½", ¾" and 1" lengths are available).

3. Huber point needles are replaced every 7 days. It is important to heparinize the implanted port before the old needle is removed, even if re-needling is immediately imminent. This is to maintain a patent port should re-needling be difficult.

4. Interlink® injection caps are changed every 3 days.

5. Prior to accessing the implanted port, review the port history with the client (e.g. any difficulties encountered in the past). A lack of blood return may indicate:

    - Incorrect needle placement
    - Withdrawal occlusion due to the presence of fibrin at the catheter tip
    - Total occlusion

    Measures such as changing the client's position, lifting the arm, bearing down and coughing may facilitate blood return. If unsuccessful, call the physician for assistance.

6. Avoid placing tape on transparent dressings as this interferes with the product's ability to "breathe". Transparent dressings are changed every 7 days and as needed.

7. Once the Huber point needle is inserted, avoid tilting, rocking or rotating the needle as this may cause fluid leakage or septum damage.

8. Sterile adhesive gauze dressings (e.g. Primapore®) are used if the client is sensitive to transparent dressings or if drainage is present. Gauze dressings are changed every 2 days and as required.

9. Blood samples drawn for coagulation studies from the implanted port may yield erroneous results. This can be due to the heparin flush solution that may leech into the catheter material despite an adequate "discard" sample having been drawn.

10. The turbulent injection technique should always be used when the intention is to thoroughly flush the implanted port. Administering 0.9% sodium chloride via a gravity drip or infusion pump will not clear the catheter lumen effectively.

CLEANSING SOLUTION:

1. Chlorhexidine (CHG) 2% gluconate in alcohol 70%: Total contact time for the cleansing solution will be 30 seconds.

2. Cleansing solutions must be allowed to air dry prior to covering the catheter site with the dressing. This will ensure proper contact time. In addition, if the skin is covered while still moist, a reaction between the cleansing solution and the dressing adhesive can occur and may result in cutaneous reaction.

3. In the event that the client is allergic to chlorhexidine (CHG), the following may be substituted:
    a. Isopropyl alcohol 70% (contact time 30 seconds)

    OR

    b. 10% providone iodine (PI) (contact time 2 minutes).

PROCEDURE 11-003-02

ACCESSING THE IMPLANTED PORT
CLEANSING SOLUTION
✓ Chlorhexidine (CHG) gluconate 2% in 70% alcohol **If allergic to CHG:** ✓ 10% Povidone Iodine (PI) solution or swabsticks **OR** 70% Isopropyl alcohol
EQUIPMENT
✓ Huber point needle with attached extension tubing. (Determine appropriate size) 19GA x ¾"; 19GA x 1"; or 20GA x ¾"; or 20GA x 1"; or 22GA x ¾" (also available in ½" size Huber needle) ✓ Package sterile adhesive strips ½" or ¼" ✓ 20 mL syringe filled with 0.9% sodium chloride and an Interlink® blunt plastic cannula ✓ Dressing tray ✓ (2) Interlink® Injection caps ✓ Tape ✓ Sterile gloves **Dressing:** ✓ High permeable transparent dressing: 10x14 cm (IV3000) **OR** ✓ Sterile adhesive gauze dressing (eg. Mepore/Primapore) (15 cm x 8 cm or 25 cm x 10 cm)
Additional equipment if an IV infusion is to be initiated:
✓ Prescribed IV solution ✓ IV administration tubing and IV tubing label ✓ Interlink® Threaded luer lock cannula ✓ Alcohol swab
Additional Equipment for Heparin Flush / Heparin Lock:
Refer to Procedure 11-003-06 *Heparin Flush & Heparin Lock for Implanted Ports*

PROCEDURE:

1. Cleanse hands with alcohol gel or antimicrobial soap.

2. Open the dressing tray and aseptically add the equipment.

3. Glove.

4. Attach the injection cap to the end of the extension set. Replace the injection cap already present on the extension set, if not "needleless", with another injection cap.

5. Prime the Huber point needle and extension set with the sterile syringe filled with 0.9 % sodium chloride. Leave the syringe attached and clamp the extension tubing.

6. Starting at the centre of the implanted port, scrub the skin with antiseptic solution. Use a circular scrubbing motion and move from the centre, outwards. Ensure that the entire area that will be under the dressing is cleansed. Repeat as required, using a fresh gauze/swab stick each time. Contact time for cleansing solution is 30 seconds. If using providone iodine (PI), contact time is 2 minutes. Allow the area to air dry.

7. Drape the area around the implanted port.

8. Palpate the area of the port with one hand, locating the septum (injection port).

9. Immobilize the septum by holding it in a "V" formed by two fingers of the non-dominant hand. With the other hand, firmly push the Huber point needle perpendicular (90 degrees) through the skin into the centre of the device until the needle meets the base of the reservoir. The syringe and extension set may be placed on the sterile field to allow optimal handling of the needle.

10. Open the extension tubing clamp and slowly aspirate blood to confirm correct needle placement. If blood cannot be aspirated, gently inject some of the 0.9% sodium chloride and assess the site for fluid infiltration.

11. Flush the implanted port with the 0.9% sodium chloride remaining in the syringe. Use the turbulent injection technique.

12. If a "Gripper" brand Huber point needle is used, remove the "clothespin" device by pinching and lifting it up while immobilizing the needle.

13. If necessary, sterile 2x2 gauze may be used to protect fragile skin and/or fill any space between the skin and needle hub.

14. Apply sterile adhesive strips to secure the needle.

15. Apply the transparent dressing.

16. Seal the base of the dressing by pinching it around the extension tubing OR obtain a strip of tape that is approximately the same length as the base of the dressing. Slit the centre of the tape approximately half way through its width. Apply it to the lower edge of the dressing, under the extension set. Bring each slit side up and alongside the extension set. Place another piece of tape on top of this slit tape.

17. Date the dressing.

18. If an intravenous infusion is to be administered, prime the IV tubing and attach an Interlink® threaded luer lock cannula to the end. Cleanse the injection cap at the end of the extension set with an alcohol swab and allow to air dry. Attach the intravenous tubing by twisting the Interlink® threaded luer lock cannula securely in place onto the injection cap. Open all clamps and regulate the infusion rate.

19. If the accessed port will not be used immediately, flush it with heparin lock or heparinized flush solution (See Procedure 11-003-006: *Heparin Flush & Heparin Lock for Implanted Ports*). To ensure that positive pressure remains within the system, close the clamp on the extension tubing as the last millilitre is injected.

PROCEDURE 11-003-03

DE-ACCESSING THE IMPLANTED PORT

Cleansing Solution

Cleansing solution:

Chlorhexidine (CHG) gluconate 2% in 70% alcohol

If allergic to CHG:

10% Povidone Iodine (PI) solution or swabsticks **OR** 70% Isopropyl alcohol

Equipment

- ✓ 20 mL syringe filled with 0.9% sodium chloride and interlink® blunt plastic cannula
- ✓ Non-sterile gloves
- ✓ Alcohol swabs
- ✓ Bandaid

Additional Equipment for Heparin Flush/Lock Solution:

For Heparin flush preparation, add:

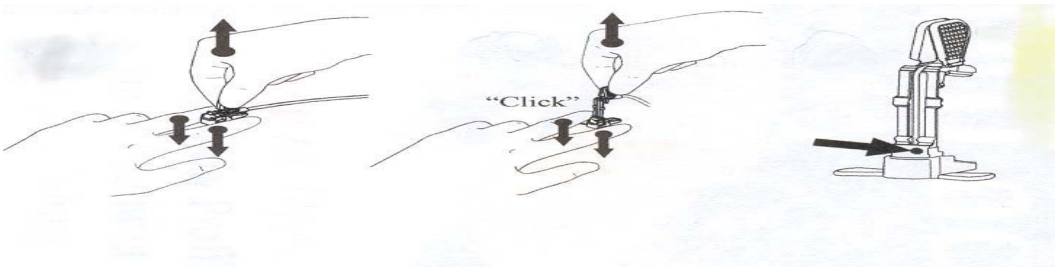
- ✓ 10 mL syringe
- ✓ (1) vial heparin 100 units/mL or 10 units/mL
- ✓ (1) vial of 0.9% sodium chloride and an Interlink® single dose vial access cannula (use needle if access cannula not available) if using the 100 units/mL concentration
- ✓ Interlink® blunt plastic cannula
- ✓ Interlink® single dose vial access cannula
- ✓ Alcohol swab

For Heparin lock preparation, add:

- ✓ 10 mL syringe
- ✓ (1) vial heparin 100 units/mL concentration
- ✓ Interlink® blunt plastic cannula
- ✓ Interlink® single dose vial access cannula
- ✓ alcohol swab

PROCEDURE:

1. Cleanse hands with alcohol gel or antimicrobial soap.
2. Attach an Interlink® blunt plastic cannula to the 20mL syringe filled with 0.9% sodium chloride.
3. Draw 5mL (500 units) heparin into a 10mL syringe.
4. Glove.
5. Shut off the intravenous infusion (if present) and close the clamp on the Huber point needle extension tubing.
6. Cleanse the Interlink® injection port that is found on the extension tubing with an alcohol swab. Allow to air dry.
7. Inject the syringe filled with 0.9% sodium chloride using a turbulent injection technique. Repeat with the heparin. To ensure that positive pressure remains within the system, close the clamp on the extension tubing as the last mL of heparin is injected.
8. Remove the transparent dressing and adhesive strips.
9. Clean the insertion site with the antiseptic. Allow the area to air dry.
10. To de-access:
    a. GripperPlus®; approach the GRIPPER PLUS from behind. Place one or two fingers on the base to stabilize it. Place a finger of your other hand on the tip of the safety arm. Lift the safety arm straight back to the lock position until it clicks.
    b. MiniLoc®: stabilize the port by securely holding the tabs down with 2 fingers; with the other hand, firmly pull the wings up until you hear or feel a “click” and visually observe the orange dot.



11. Apply a band-aid.

PROCEDURE 11-003-04

CHANGING INTERLINK® INJECTION CAP ONLY
Equipment
✓ For priming**:** 3mL syringe filled with 0.9% sodium chloride and Interlink ® blunt plastic cannula ✓ Interlink® injection cap (one for each lumen) ✓ Sterile gloves ✓ Alcohol free 2% chlorhexidine (CHG) swab sticks or swabs ✓ Dressing tray
Additional equipment if an IV infusion is also to be initiated:
✓ Prescribed IV solution ✓ IV administration tubing and IV tubing label ✓ Interlink® Threaded luer lock cannula ✓ Alcohol swab
Additional Equipment for Heparin Flush/Lock Solution:
For Heparin flush preparation, add: ✓ 10 mL syringe ✓ (1) vial heparin 100 units/mL or 10 units/mL ✓ (1) vial of 0.9% sodium chloride and an Interlink® single dose vial access cannula (use needle if access cannula not available) if using the 100 units/mL concentration ✓ Interlink® blunt plastic cannula ✓ Interlink® single dose vial access cannula ✓ Alcohol swab **For Heparin lock preparation, add:** ✓ 10 mL syringe ✓ (1) vial heparin 100 units/mL concentration ✓ Interlink® blunt plastic cannula ✓ Interlink® single dose vial access cannula ✓ alcohol swab

PROCEDURE:

1. Assemble the IV solution and tubing in the usual fashion if indicated.
   - Attach the Interlink® Threaded luer lock cannula to the end of the IV tubing.
   - Prime tubing.

2. Prepare dressing tray.

3. If there is a continuous infusion, stop the infusion, clamp the Huber needle tubing, remove the IV tubing by twisting the threaded luer lock cannula off the lumen's injection cap (avoid removing the injection cap itself) and flush as per 11-003-006: *Heparin Flush & Heparin Lock for Implanted Ports*.

4. Prime caps with the prefilled 0.9% sodium chloride syringe with attached Interlink® blunt plastic cannula.
   - Open the injection cap package(s) and prime the cap(s) without removing them from the package (to maintain sterility).

5. Open the chlorhexidine swabsticks and aseptically place them in the dressing tray.

6. Put on gloves.

7. Lift the Huber needle tubing/cap connection using a 10 cm x 10 cm gauze sponge. Using a swabstick, scrub the junction of the connection. Allow to air dry.

8. Remove the scrubbed injection cap with sterile gauze and discard. Cleanse Huber needle lumen threads if visibly soiled. Allow to air dry.

9. Attach a new injection cap.

10. Repeat with any remaining cap.

11. Wipe caps with an alcohol swab, allow to air dry and flush as per procedure 11-003-006: *Heparin Flush & Heparin Lock for Implanted Ports* if indicated.

12. If there is a continuous infusion, restart the IV infusion, using the new container, tubing and Interlink® Threaded luer lock cannula.

    i. Cleanse the injection cap with an alcohol swab and allow to air dry. Attach the new IV tubing by pushing and twisting the threaded luer lock cannula or the tubing luer lock onto the injection cap.

    ii. Re-establish flow and secure the tubing to the client using a piece of tape or special attachment device.

PROCEDURE 11-003-05

DISCONTINUING AN IV INFUSION
Equipment
✓ 20 mL syringe filled with 0.9% sodium chloride and interlink® blunt plastic cannula ✓ non-sterile gloves ✓ alcohol swabs ✓ tape
Additional Equipment for Heparin Flush / Lock Solution:
For Heparin flush preparation, add: ✓ 10 mL syringe ✓ (1) vial heparin 100 units/mL or 10 units/mL ✓ (1) vial of 0.9% sodium chloride and an Interlink® single dose vial access cannula (use needle if access cannula not available) if using the 100 units/mL concentration ✓ Interlink® blunt plastic cannula ✓ Interlink® single dose vial access cannula ✓ Alcohol swab **For Heparin lock preparation, add:** ✓ 10 mL syringe ✓ (1) vial heparin 100 units/mL concentration ✓ Interlink® blunt plastic cannula ✓ Interlink® single dose vial access cannula ✓ alcohol swab

PROCEDURE:

1. Cleanse hands with alcohol gel or antimicrobial soap.

2. Attach an Interlink® blunt plastic cannula to the syringe filled with 0.9% sodium chloride.

3. Prepare heparin flush or lock solution, as appropriate (See Procedure 11-003-006: *Heparin Flush & Heparin Lock for Implanted Ports*). Equip syringe with a blunt plastic cannula.

4. Glove.

5. Shut off the intravenous infusion.

6. Remove the IV administration tubing by grasping the threaded lock cannula and twisting it off the injection cap located at the end of the extension set.

7. Cleanse this injection cap with an alcohol swab. Allow to air dry.

8. Inject the 0.9% sodium chloride solution using the turbulent injection technique. Repeat with the prepared heparin flush or lock solution. To ensure that positive pressure remains within the system, close the clamp on the extension tubing as the last mL is injected.

9. Secure the end of the extension set to the client's chest with a piece of tape.

PROCEDURE 11-003-06

HEPARIN FLUSH AND HEPARIN LOCK PROTOCOL:

Use of a heparin "lock" versus a heparin "flush" solution is dictated by the following two clinical situations:	
HEPARIN "LOCK" Course of IV therapy/blood sampling has been completed and the Huber point needle is to be removed (or immediately replaced).	**HEPARIN "FLUSH"** IV therapy/blood sampling is carried out intermittently (e.g. Q12hr or Q24hr) with the Huber point needle remaining in situ.
FREQUENCY "Lock" the implanted port every 4 weeks (monthly) when the port is not being used and just prior to de-accessing	**FREQUENCY** "Flush" the implanted port after each use
PROCEDURE "Lock" the implanted port by: 1. Injecting 20ml of 0.9% sodium chloride 2. Followed by an injection of 5 mL heparin (100 units/mL) into the port.	**PROCEDURE** "Flush" the implanted port by: 1. Injecting 20ml of 0.9% sodium chloride 2. Followed by an injection of 10 mL heparinized saline (10 units/mL) into port **<u>If using Heparin 100 Units/ml:</u>** ▪ Draw 1 mL heparin (100 units) into 10mL syringe ▪ Add 9 ml 0.9% sodium chloride into same syringe (final concentration is 10 units/ml)
	<u>If using Heparin 10 Units/ml:</u> ▪ Draw 10 ml into a syringe. Additional mixing is not required.

Approved by:	Effective Date:
11 FEB 2011 **Chief Nursing Officer** **Date**	April 1, 2011
February 11, 2011 **Deputy Minister of Health and Social Services** **Date**	

Department of Health Government of Nunavut	NURSING POLICY, PROCEDURE AND PROTOCOLS		
	Community Health Nursing		
TITLE:		**SECTION:**	**POLICY NUMBER:**
Central Venous Access Device: Blood Procurement		Clinical Procedures	11-004-00
EFFECTIVE DATE:	**REVIEW DUE:**	**REPLACES NUMBER:**	**NUMBER OF PAGES:**
February 10, 2018	February 2021		5
APPLIES TO:			
Community Health Nurses			

POLICY:

A Registered Nurse may procure blood samples from a central venous access device (CVAD). Only nurses who have received additional training with the Nurse Educator or delegate will assume this responsibility. A physician order is necessary for a heparin flush.

DEFINITIONS:

Central Venous Access Devices (CVAD) is any intravenous device whose tip is resting in the superior vena cava. This includes percutaneously inserted subclavian and jugular catheter, tunnelled/cuffed catheters (eg. Leonard®, Hickman®**)**, implanted ports, peripherally inserted central catheters (PICC) and Hemodialysis/Plasmapheresis catheters (percutaneous or tunelled/cuffed). These devices may have single or multiple lumens.

The **turbulent injection technique** is injecting fluid using a "push/stop/push/stop" motion on the syringe plunger. This technique ensures both laminar and turbulent flows through the CVAD thereby optimizing the cleansing of the catheter lumen.

Withdrawal occlusion: Ability to flush a CVAD and infuse fluids and medications but an inability to withdraw blood.

RELATED POLICIES, GUIDELINES AND LEGISLATION:

Policy 11-001-00 Central Venous Access Device: Care & Maintenance
Procedure 11-004-01 Central Venous Access Device: Blood Procurement

REFERENCES:

Potter, P.A. & Perry, A.G. (2010). Clinical Nursing Skills & Techniques, 7th edition, Mosby: Toronto.

Sims Medical Systems. (1998). Port-a-cath and Port-a-Cath II. St. Paul, MN: Deltec Sims Deltec, Inc.

Weinstein, S. (2001). Plumer's Principles and Practice of Intravenous Therapy (7th ed.). Philadelphia: Lippincott.

PROCEDURE 11-004-01

NURSING CONSIDERATIONS:

1. An injection cap is placed at the end of each lumen of a CVAD. It is not to be removed for blood procurement.

2. All infusions into the CVAD must be clamped off before withdrawing blood; this includes those infusing through multiple lumens.

3. The first tube of 5 to 7mL of blood withdrawn is always used as a discard sample.

4. Recommended lumen to use for blood procurement in multi-lumen catheters:

    a. Tunnelled and cuffed catheters – red lumen
    b. Triple lumen catheter – proximal lumen
    c. PICC catheters – 4 and 5 French dual (red lumen).

5. The ability to infuse through a CVAD but an absence of blood return may indicate a withdrawal occlusion. If unable to obtain a blood return/blood sample, perform one or more of the following:

    a. Ensure that the catheter clamp is open

    b. Ask the client to cough

    c. Change the client's position; raise / lower the head of the bed, shift the shoulders, raise the arms and/or have the client perform the Valsalva manoeuvre.

    d. Flush gently with saline and then use the same syringe to aspirate the discard sample.

    e. Chest x-ray may be indicated to verify that the catheter tip is still in correct position.

    f. The instillation of catheter restoring agent may be necessary (not currently available in Nunavut health centres).

6. Avoid applying excessive negative pressure when aspirating samples. It may cause hemolysis of the blood; traumatize the vein wall and/or promote thrombosis.

7. Procuring blood through the Interlink® injection cap on a CVAD eliminates the need to clamp and unclamp the catheter; it is a closed system.

8. Use only 10 mL and larger syringes to flush CVAD. Smaller syringes generate excessive pressure and may burst the catheter.

9. For implanted ports, the injection cap located on the "Y" of the Huber point needle extension set, may be used for blood procurement (change this "Y" injection cap to an Interlink® injection cap on insertion and with each Huber point needle change).

10. The turbulent injection technique should always be used when the intention is to thoroughly flush the CVAD. Administering 0.9% sodium chloride via a gravity drip or infusion pump will not clear the catheter lumen effectively.

<table>
<tr><th colspan="3">Equipment</th></tr>
<tr><td colspan="3">✓ Non-sterile gloves
OR
✓ Personal Protective Equipment (PPE): under pad, double pair of nitrile gloves, impervious gown and sharps container (use if body fluid is considered cytotoxic following administration of cytotoxic agent)
✓ 20 mL syringe filled with 0.9% sodium chloride and an interlink® blunt plastic cannula
✓ Alcohol swabs</td></tr>
<tr><th>Additional Equipment for Vacutainer Method</th><th colspan="2">Additional Equipment for Syringe Method</th></tr>
<tr><td>✓ Multiple sample luer adaptor
✓ Blood tube holder
✓ Collection tube identified for discard
✓ Collection tube (s) as needed
✓ Blunt plastic cannula</td><td><u>PICC</u>
✓ 10 mL syringe filled with 0.9% sodium chloride & Interlink® blunt plastic cannula (N.B. saline used to open valve)
✓ 18 gauge needle(s)
✓ Syringe(s) large enough to hold blood volume required for sampling</td><td><u>Other CVAD</u>
✓ 10mL syringe and Interlink® blunt plastic cannula (N.B. used for waste)
✓ 18 gauge needle(s)
✓ Syringe(s) large enough to hold blood volume required for sampling</td></tr>
<tr><th colspan="3">Additional Equipment for Heparin Flush (if indicated)</th></tr>
<tr><td colspan="3">✓ 10 mL syringe
✓ vial heparin (100 units/mL or 10 units/mL)
✓ vial 0.9% sodium chloride
✓ blunt plastic cannula
✓ Interlink® single dose plastic cannula
✓ Alcohol swabs</td></tr>
</table>

PROCEDURE 1: VACUTAINER METHOD TO OBTAIN BLOOD SAMPLE

1. Pick up the catheter end and scrub the Interlink® injection cap with an alcohol swab for 30 seconds. Allow to air dry.

2. Place sterile 4x4 gauze appropriately and lay the cleansed injection cap on it.

3. Clamp all other infusions.

4. Ensure the catheter clamp is open and pierce the injection port with the assembled blood tube holder. Push the blood collecting tube identified for discard onto the holder. Allow the tube to fill and discard OR pierce the injection port with a saline filled syringe, inject the saline and then use the same syringe to aspirate 5-7 mL of blood for discard.

5. Fill each required blood collecting tube following the order of draw specified on each requisition. When all specimens have been obtained, remove the blood tube holder.

PROCEDURE 2: SYRINGE METHOD TO OBTAIN BLOOD SAMPLE

1. Pick up the catheter end and scrub the Interlink® injection cap with an alcohol swab for 30 seconds. Allow to air dry.

2. Place sterile 4x4 gauze appropriately and lay the cleansed injection cap on it.

3. Clamp all other infusions.

4. Ensure the clamp on the catheter is open. Flush with 10 mL 0.9% sodium chloride briskly. At this point, if a PICC, pull back on the empty syringe plunger to the 1 mL mark and stop (but maintain suction). This allows the Groshong® valve to open.

5. When blood return is visible, continue to aspirate 5-7 mL as the “discard” sample.

6. Draw blood sample into a fresh syringe using the same aspiration technique.

7. Remove Interlink® blunt plastic cannula from syringe and attach an 18 gauge needle. Transfer the blood into the blood collecting tubes according to the order of draw as outlined in the *Laboratory Manual*.

DOCUMENTATION:

- Document laboratory tests ordered and the Heparin Flush Solution in the progress notes.
- Nursing flow sheet or chronic disease sheet if available.

CLIENT TEACHING:

- Follow up appointment required for maintenance flushing.

REFERENCES:

Arrow International. *Arrow Multi-Lumen Central Venous Catheter-Nursing Care Guidelines*.

Farr, B.M. (200). Preventing vascular catheter-related infections: current controversies. *Clinical Infectious Disease, 33*(10), 1733-8.

O'Neil, B., Schneider, J., Pederson, C. & Mirtallo, J. (2002). Compliance with safe practices for preparing parenteral nutrition formulations. *American Journal Health System Pharm,* 59.

The Ottawa Hospital Policy and Procedure. *Central Venous Access Device: Blood procurement*

Potter, P.A. & Perry, A.G. (2010). Clinical Nursing Skills & Techniques, 7th edition, Mosby: Toronto.

Sims Medical Systems. (1998). Port-a-cath and Port-a-Cath II. St. Paul, MN: Deltec Sims Deltec, Inc.

Weinstein, S. (2001). Plumer's Principles and Practice of Intravenous Therapy (7th ed.). Philadelphia: Lippincott.

Approved by:	Effective Date:
11 FEB 2011 Chief Nursing Officer — Date	April 1, 2011
February 11, 2011 Deputy Minister of Health and Social Services — Date	

Department of Health Government of Nunavut	NURSING POLICY, PROCEDURE AND PROTOCOLS
	Community Health Nursing

TITLE:		**SECTION:**	**POLICY NUMBER:**
Therapeutic Phlebotomy		Clinical Procedures	11-005-00
EFFECTIVE DATE:	**REVIEW DUE:**	**REPLACES NUMBER:**	**NUMBER OF PAGES:**
February 10, 2018	February 2021		4
APPLIES TO:			
Community Health Nurses			

POLICY:

Registered Nurses may perform therapeutic phlebotomy, as ordered by a physician. Only nurses who have received additional training with the Nurse educator or delegate will assume this responsibility.

DEFINITIONS:
Therapeutic Phlebotomy is a procedure performed to remove a prescribed amount of blood from an accessed vein. It is often used to treat disorders such as hemochromatosis and polycythemia vera.

RELATED POLICIES, GUIDELINES AND LEGISLATION:

Procedure 11-005-01 Therapeutic Phlebotomy

REFERENCES:

Parker, D. M., Deel, P.C., & Arner, S.S. (2004). Iron out the details of Therapeutic Phlebotomy. *Nursing,* 34(3), 46-47.

Potter, P.A. & Perry, A.G. (2010). Clinical Nursing Skills & Techniques, 7th edition, Mosby: Toronto.

Wright, S., Finical, J. (2000). Beyond Leeches: Therapeutic phlebotomy today. *American Journal of Nursing*. 100(7), 55-61.

NURSING CONSIDERATIONS:

1. Hypotension is the most common adverse effect of phlebotomy, but tachycardia, increased respiratory rate, loss of consciousness, dizziness, weakness, or fatigue may also occur.

2. A physician's order is required specifying the volume of blood to be removed (usually 500mls).

3. Assess the client prior to the procedure, obtaining baseline vital signs, laboratory results (HGB and Ferritin levels) and ensure client has taken in a minimum of 500 ml of fluids prior to the procedure. Ensure the client has eaten prior to the procedure. If not provide a light meal or snack.

4. Place the client on a bed or a stretcher for a first time procedure, not on a chair.

5. Assess the client during and post procedure for such adverse reactions as hypotension, hypovolemia and vasovagal response.

6. Some clients may require IV hydration either pre, during or post procedure as indicated by physician's order.

7. Never attempt venipuncture: in the arm where an arteriovenous fistula/graft is present, on the side affected by a cerebral vascular accident (CVA), or in the arm on the same side that a mastectomy has been performed. In the event the client has had a bilateral mastectomy, the physician will specify which side is to be used.

8. Hand hygiene: perform hand hygiene according Policy 10-004-00: *Hand Hygiene* and Guidelines 10-004-01: *Hand Hygiene Guidelines*.

9. Antiseptic use: contact time includes scrubbing and drying time. For products containing 70% alcohol e.g., alcohol swab: contact time 30 seconds.

10. Personal Protective Equipment Use: Follow Universal Precautions and include additional precautions as required (Refer to Policy 10-005-00: *Personal Protective Equipment*).

EQUIPMENT	
✓ Phlebotomy set with 17 Gauge needle **OR** ✓ Phlebotomy holder 19G winged needle 500 ML evacuation bottle Thoracentesis set	✓ Tourniquet ✓ Alcohol swabs ✓ 2 x 2 Gauze pads ✓ Tape ✓ Non-sterile gloves

PROCEDURE:

1. Assemble equipment.

2. Obtain baseline BP, pulse and respirations prior to phlebotomy to allow for comparison during and after the procedure.

3. Position the client comfortably and ensure that the arm is supported.

4. Place a tourniquet around the upper arm and assess the veins as they distend. The chosen vein needs to be large enough to accommodate a 17-gauge needle.

5. Select the vein to be accessed: Determine whether the median cubital vein in the antecubital space is accessible. Basilic, cephalic, and accessory cephalic may also accommodate a large bore needle.

6. Cleanse the site with an alcohol swab and access the site. Secure the needle and tubing with tape.

7. Once flow is established, take the client's BP, pulse, respirations and ensure the adequacy of peripheral circulation by checking pulse, warmth and color in the limb.

8. When the prescribed volume is obtained, release the tourniquet if this hasn't already been done.

9. Remove the needle/catheter, apply direct pressure for 3-5 minutes with a 2x2 gauze and instruct client to elevate arm as tolerable to decrease bruising and support the achievement of hemostasis.

10. Take BP, pulse, and respirations after the procedure to assess for signs of hypotension.

11. Dispose of phlebotomy set into the appropriate biohazard /cytotoxic container, as per Guideline 10-006-02: *Infectious Waste Disposal Guidelines*.

12. Encourage a minimum oral fluid intake of 500ml to assist with fluid volume replacement.

13. Administer intravenous fluids if ordered (may be ordered post or concurrently with phlebotomy)

14. Assist the client when standing or ambulating for the first time post phlebotomy.

15. Notify physician if client has any of the following symptoms post- phlebotomy:
    a. Complaints of feeling faint, dizzy, clammy or light-headed.
    b. Significant change in vital signs.

16. The client may be discharged if no dizziness/light-headedness when ambulating or standing, vital signs are stable, and no bleeding at site post procedure.

DOCUMENTATION:

Document the following on the progress notes in the client's health record:

1. Phlebotomy site
2. Vital signs
3. Amount of blood withdrawn
4. Length of procedure and client's tolerance
5. Any adverse side effects
6. Client education

CLIENT TEACHING:

1. Instruct the client to move slowly when changing position or standing to prevent light-headedness, faintness, or a rapid drop in blood pressure.

2. Advise the client to drink plenty of liquids over the next 24 hours to replace lost fluid.

3. Apply pressure to site if bleeding occurs. Apply cold compresses to minimize bruising. If bruising is severe, advise client to contact their health care provider.

4. Advise the client to avoid heavy lifting or strenuous activity for 6-8 hours post procedure.

5. Provide follow-up appointment for phlebotomy if required.

REFERENCES:

Parker, D. M., Deel, P.C., & Arner, S.S. (2004). Iron out the details of Therapeutic Phlebotomy. *Nursing,* 34(3), 46-47.

Potter, P.A. & Perry, A.G. (2010). Clinical Nursing Skills & Techniques, 7th edition, Mosby: Toronto.

Wright, S., Finical, J. (2000). Beyond Leeches: Therapeutic phlebotomy today. *American Journal of Nursing*. 100(7), 55-61.

Approved by:	Effective Date:
11 FEB 2011 **Chief Nursing Officer** **Date**	April 1, 2011
February 11, 2011 **Deputy Minister of Health and Social Services** **Date**	

Department of Health Government of Nunavut	NURSING POLICY, PROCEDURE AND PROTOCOLS		
	Community Health Nursing		
TITLE:		**SECTION:**	**POLICY NUMBER:**
Enteral Nutrition		Clinical Procedures	11-006-00
EFFECTIVE DATE:	**REVIEW DUE:**	**REPLACES NUMBER:**	**NUMBER OF PAGES:**
February 10, 2018	February 2021		22
APPLIES TO:			
Community Health Nurses			

POLICY 1:

Enteral feeding involves the provision of supplemental nutrition via a tube inserted into the gastro-intestinal tract. It is the registered nurses responsibility for the care and maintenance of enteral feeding tubes.

POLICY 2:

Insertion and removal of enteral tubes requires a physician order. Registered nurses are only permitted to insert and remove Nasoenteric (NE) tubes in populations not at high risk for misplacement.

The Percutaneous Endoscopic Gastrostomy tube; Percutaneous Endoscopic Jejunostomy tube; Jejunostomy tube; Genie" Low Profile Gastrostomy Devices and the Tracheo-Esophageal tube shall only be removed by a physician.

POLICY 3:

All NE tubes must have placement verified prior to use.

DEFINITIONS:

Nasoenteric Tubes (NE): Tubes placed into the gastric, duodenal or jejunal portion of the gastrointestinal tract through the oral/nasal orifice.

Percutaneous Endoscopic Gastrostomy Tube (PEG): Tube inserted percutaneously by endoscope into the stomach.

Percutaneous Endoscopic Jejunostomy (PEJ): Tube inserted percutaneously by endoscope into the stomach with a second tube inserted into the jejunum via the gastric tube. The tube allows dual access in to the stomach/jejunum. This tube has the capacity to simultaneously decompress the stomach and administer feeds into the jejunum.

Jejunostomy (JEJ): Tube inserted via a surgical opening of the jejunum.

"Genie" Low Profile Gastrostomy Devices (LPGD`s) commonly called **"buttons":** Designed for permanent feeding and placed into a mature (feeding tube in place for > 6 months) gastrostomy tract. It is anchored in the stomach and protrudes just above the skin. An antireflux valve keeps gastric contents from leaking. A special access adaptor is required to access port.

Tracheo-Esophageal (TE) Tube: The tracheo-esophageal fistula is an opening surgically created from the trachea to the esophagus. The fistula is created in conjunction with a permanent laryngectomy. The long-term purpose of this fistula is to insert a speaking prosthesis once the fistula is well established. This tube is often used for short term feeding post laryngectomy.

Gastric Residual: The amount of residual withdrawn from the stomach to confirm gastric placement and to assess the client's tolerance of feeds. The gastric residual is obtained from tubes inserted in the stomach. Gastric residual is assessed with PEJ tubes using the suction/ gastric port to determine gastric motility.

Tube Irrigation (Flushes): The amount of sterile water required to maintain tube patency. This must not be confused with the amount of water required to ensure nutritional requirements.

Gastric Intolerance: Client inability to tolerate the amount or type of feed being given as evidenced by an increase in gastric residuals, regurgitation or vomiting, or an acutely distended abdomen.

PRINCIPLES:

Removal of enteral feeding tubes requires special competence and certification, except for NE Tubes.

Registered Nurses are not authorized to insert nasoenteric tubes in high risk populations:

Nasocranial surgery or trauma, maxillofacial trauma, pharyngeal surgery or trauma, acute head injury, basal skull fracture, cerebrospinal fluid rhinorrhea, post-op esophageal and gastric surgery, recent radiation therapy to the mediastinal area, or known or suspected partial obstruction in the naso-pharyngeal or oro-pharyngeal areas.

Pulmonary aspiration is a common complication related to tube feedings. Appropriate verification of tube placement reduces the incidence of pulmonary aspiration.

RELATED POLICIES, GUIDELINES AND LEGISLATION:

Procedure 11-006-01 Enteral Nutrition: Nursing Considerations
Procedure 11-006-02 Enteral Nutrition: Care for Feeding Tubes

Perry & Potter (2010):

- Inserting nasogastric or nasoenteric tube for feeding tuber (p.829);
- Verifying Feeding Tube Placement (p. 834)
- Insertion of large bore nasogastric tubes (Levine) for short term enteral feeding (p. 914)
- Irrigating a feeding tube (p. 837)
- Administration of Enteral Feedings via Nasogastric, Gastrostomy and Jejunostomy tubes (p.840)
- Care of a Gastrostomy or Jejunostomy Tube (p. 846)

REFERENCES:

Methany, N. & Steward, B. (2002). Testing Feeding Tube Placement during Continuous Tube Feedings. *Applied Nursing Research 15(*4). Pp 254-258.

Metheny N.A., Titler M., (2001). Assessing placement of feeding tubes, *American Journal of Nursing 101*(15) p.36-45.

Methany, N.; Wehrle, M.; Wiersema, L & Clark, J. (1998) Testing feeding tube Placement: Auscultation vs. pH method. *American Journal of Nursing,* pg-37-43.

Methany, N. (2001). *Enteral Access Management*.

Potter, P.A. & Perry, A.G. (2010). *Clinical Nursing Skills & Techniques*, 7th edition, Mosby: Toronto.

PROCEDURE 11-006-01

Policy 11-006-00: *Enteral Nutrition* relates to the following interventions (refer to Potter & Perry (2010) for detailed procedures):

- Inserting nasogastric or nasoenteric tube for feeding tube (p.829);
- Verifying Feeding Tube Placement (p. 834)
- Insertion of large bore nasogastric tubes (Levine) for short term enteral feeding (p. 914)
- Irrigating a feeding tube (p. 837)
- Administration of Enteral Feedings via Nasogastric, Gastrostomy and Jejunostomy tubes (p.840)
- Care of a Gastrostomy or Jejunostomy Tube (p. 846)

NURSING CONSIDERATIONS:

1. Small-bore nasoenteral tubes create less discomfort and should be considered as first choice. The insertion of a rigid levine tube for feeding purpose is recommended only for very short term, immediate use.

    a. All small-bore nasoenteric tubes (stylet insertion) must be verified with a chest x-ray prior to initial administration of medications or feeding (see Procedure 11-006-02: *Care for Feeding Tubes*.
    b. Air auscultation will **not** be utilized to determine either initial or on-going placement as research has demonstrated that it is unreliable.
    c. Leave stylet (if used) in place until tube position verified by x-ray. Never attempt to reinsert a partially or fully removed stylet while feeding tube is in place. This can cause perforation of the tube and injure the client.

2. Blue food coloring dye is not to be added to enteral feeding solution as untoward client effects may occur.

3. Medication administration guidelines will be followed as per *Nunavut Formulary*, *Compendium of Pharmaceuticals and Specialties,* and Potter & Perry (2010).

    - Nurses will collaborate with Pharmacy in determining the best drug routes and regimes in a client who is receiving enteral feeding.
    - Not all oral medications are safe to give by nasoenteric tubes.

4. Rapid acting insulin (Humalog, Mix 25, or Novo rapid) must be given immediately prior to intermittent (bolus) feed. Rapid acting insulin starts to work within 10-15 minutes and the client could become hypoglycemic if bolus is delayed for 30 minutes.

5. Bolus feeding is not recommended for tubes placed in the jejunum.

6. With small bore feeding tubes, the use of syringes smaller than 50 ml can create pressures in excess of the bursting pressure of the tube, which is approximately 80 psi. Vigorous pressure should not be used during irrigation.

7. Otitis media and sinusitis are possible infectious complications of nasal tube placement. If these complications occur, enteric tube placement must be changed. PEG/PEJ are alternatives.

8. If the PEG falls out, replace with a Foley catheter # 18 or # 20 and notify physician to make arrangements for transportation and PEG replacement. Feeds should be held, as appropriate verification methods cannot be performed in the health centre setting.

Medication Administration:

1. Medications will be administered as per the Nunavut *Formulary,* the Compendium of Pharmaceuticals and Specialties, and physician's orders. The pharmacist should be consulted if the nurse is unsure whether a drug may be administered via Enteral feeding tube.

2. Order of administration of medication consistency will be as follows: liquid, dissolved, and crushed. Approximately 20% of medication is lost through crushing techniques.

3. All medications will be administered in liquid form whenever possible. If liquids unavailable, dissolve medication in syringe and administer. Crush drug only if necessary. Administer one drug at a time whenever feasible with appropriate irrigation in between medications.

4. For PEJ tubes, administer medications through the gastric lumen unless specifically ordered to be given via the jejunal lumen.

PROCEDURE 11-006-02

PROCEDURE 1: INSERTION OF NE TUBE

1. Nurses may insert nasoenteral tubes as outlined in Potter & Perry (2010, p.829), except in clients at risk for misplacement (see Policy 11-006-00: *Enteral Nutrition*).

2. Pediatric considerations:

    a. Premature infant and neonate: Estimate tube length by measuring from the nose or mouth to the earlobe then to the xiphoid process.

    b. Older child: Estimate tube length by either (1) measuring from the nose to the bottom of the earlobe then to the lower end of the xiphoid process or (2) measuring from the nose to the earlobe then to a point midway between the xiphoid process and the umbilicus

    c. Observe for vagal stimulation during insertion of feeding tube in an infant, which results in decreased heart rate.

3. Follow Procedure *Verification of Tube Placement* to verify placement of small bore tube prior to use.

PROCEDURE 2: VERIFICATION OF TUBE PLACEMENT

Nursing Considerations

1. It is possible for the tip of a feeding tube to move into a different location (e.g. from stomach to the intestine) without any external evidence that the tube has moved.

2. The risk for aspiration of regurgitated gastric contents into the respiratory tract increases when the tip of the tube accidentally dislocates upward into the esophagus.

3. Four methods of verification are used:

    i. Chest x-ray verification after initial insertion of small bore tube and for any tube suspected of migration
    ii. pH of aspirated fluid (see Procedure 11-006-03: *pH Testing*) → Do not use as initial method of verification
    iii. Appearance of aspirated fluid (see 11-006-05: *Interpreting Appearance and pH Results of Aspirate*) → Do not use as initial method of verification
    iv. Measurement of the external length of the tube → Do not use as initial method of verification

4. Current evidence-based practice indicates the most reliable method of feeding tube verification is chest radiograph (Rauen and others, 2008, as cited by Potter & Perry, 2010). The other methods are useful after radiological confirmation is determined.

Verification by Chest X-Ray

1. On initial insertion of small bore tubes, X-ray verification is required. PEG, PEJ, JEJ and TE tubes are inserted in the operating room or the GI unit where initial verification has been done.

2. An x-ray may also to be ordered when displacement of the tube is suspected.

3. Routine, on-going verification for all types of tubes will be done using external length measurement, pH and appearance of aspirated fluid.

4. Initiate the order of a chest x-ray (this is a transferred function to the registered nurse, therefore a medical order is not required)

5. Complete and sign the x-ray requisition indicating "chest x-ray" for test required and under clinical indication, nurse will write "Verify correct position of naso enteric tube"

6. Complete all x-ray related documentation as per Policy 08-011-00*: X-Ray Log*.

7. Perform x-ray in accordance with Policy 08-007-00: X-Ray.

8. Document initial x-ray findings in the client health record.

Frequency of Tube Placement Verification

1. After initial insertion and verification, the frequency of ongoing tube placement verification will be:

    a. Immediately prior to each intermittent (bolus) feeding and before medication administration;

    b. Daily and before medication administration in clients with continuous feedings.

    c. If there has been any migration of the tube and the correct placement is in question (for any type of tube), obtain abdominal x-ray for verification.

    d. After episodes of retching or vomiting or severe bouts of coughing.

2. Must wait at least 1 hour after medication administration (by mouth or tube) to verify tube placement, as premature aspiration of contents will remove unabsorbed medication and thus reducing dose delivered to the client.

VERIFICATION OF TUBE PLACEMENT

Equipment

- ✓ 60ml Luer lock catheter tip syringe
- ✓ Stethescope
- ✓ Clean gloves
- ✓ pH indicator strip (scale of 0.0 to 14.0)
- ✓ small medicine cup
- ✓ If client has a Genie LPGD: special access adaptor

PROCEDURE

1. Assess for any signs and symptoms of inadvertent respiratory migration of the feeding tube: coughing, choking or cyanosis.

2. Identify conditions that increase the risk of spontaneous tube dislocation:
    a. Retching or vomiting
    b. Nasotracheal suctioning
    c. Severe bouts of coughing

3. Measure the external mark of the tube from nostril to distal end of catheter hub daily and compare to initial measurement recorded in the client's health record.

4. Review client's medications for any gastric acid inhibitor medications (e.g. cimetidine, ranitidine, etc) or a protein pump inhibitor (e.g. omeprazole). Reduced gastric acid secretion volume and acid content may cause the pH value to be higher and therefore poor indicator for placement.

5. Prepare equipment, perform hand hygiene and put on clean gloves

6. Draw up 30ml of air into a 60ml syringe and attach to the end of the feeding tube. Flush tube with 30ml of air before attempting to aspirate fluid.

7. May need to reposition the client from side to side and/or administer additional boluses of air in order to successfully aspirate fluid.

8. Draw back slowly on syringe (prevents collapse of the tube) to obtain 5 to 10 ml of gastric aspirate. Observe appearance of contents.

9. Gently mix aspirate in syringe. Expel a few drops into a clean medicine cup. Dip the pH strip into the fluid or apply a few drops to the strip to measure the pH. Compare to the colour on the chart, as directed by the manufacturer.

    a. Gastric fluid aspirated from a client who has fasted for at least 4 hours usually has a pH range of 1 to 4.
    b. Fluid aspirated from a tube in the small intestine from a client who has fasted usually has a pH greater than 6.
    c. Client with continuous feedings may have a pH of 5 or greater.
    d. The pH of pleural fluid from the tracheobronchial tree is generally greater than 6.

10. With PEJ tubes, the jejunal tube may migrate upwards into the stomach. To confirm correct placement, aspirate from the jejunal lumen. If the appearance and pH is keeping with gastric content versus jejunal content, stop the infusion, obtain abdominal x-ray and notify physician.

11. Following initial verification by chest x-ray:

    a. The stylet is to be removed and discarded.

    b. If the stylet is difficult to remove, re-instill 5 ml of sterile water to prevent the upward dislodgment of the tube. The stylet is never re-inserted into the tube while in the client.

12. If unsuccessful in aspirating fluid from a tube that was confirmed by x-ray to be in proper position and (1) there are no risk factors for tube dislocation, (2) tube has remained in original taped position, and (3) client is not experiencing respiratory distress, assume tube is correctly placed.

13. When the tube is determined to be properly positioned, irrigate to prevent blockage.

14. Remove gloves and perform hand hygiene.

PROCEDURE 3: IRRIGATING A FEEDING TUBE

Equipment
✓ 60ml Luer lock catheter tip syringe ✓ Water ✓ Towel ✓ Clean gloves ✓ If client has a Genie LPGD: special access adaptor

1. Irrigate only after verification of tube placement is confirmed (see Verification procedures contained within this Procedure)

2. Perform hand hygiene, prepare equipment and apply clean gloves

3. Draw up 30ml of water in a syringe. Do not use irrigation fluids from multidose bottles that are used on other clients. Each client should have individual bottles of solution.

4. Change irrigation bottle every 24 hours.

5. Position client in semi-Fowlers's position.

6. Kink feeding tube while disconnecting it from feeding-bag tubing or while removing plug at end of tube.

7. Insert tip of syringe into end of feeding tube. Release kink and slowly instil irrigating solution.

8. If unable to instil fluid, reposition client on left side and try again. If still unsuccessful, notify physician and discuss alternative interventions.

9. When water has been instilled, remove syringe. Reinstitute tube feeding, or administer medication as ordered. Irrigate before, between and after the final medication.

10. Remove and discard gloves and supplies. Perform hand hygiene.

11. Pediatric Considerations:

    - Irrigation of a tube requires a smaller volume of solution in children: 1 or 2 ml for small tubes to 5 to15 ml (or more) for larger ones.

12. Document amount and type of irrigation used; ease of irrigation; and any related interventions.

Nursing Considerations

1. Maximum hang time for formula is 8 hours.
2. All opened unused cans of formula to be covered, dated, refrigerated and used within 24 hours
3. Do not use IV pumps for administering Enteral feeds. Use only pumps designed for tube feedings.
4. Cold formula causes gastric cramping and discomfort, therefore formula should be at room temperature.
5. Gradual emptying of tube feeding by gravity from feeding bag reduces the risk for abdominal discomfort, vomiting or diarrhea induced by bolus or too-rapid infusion of tube feedings.
6. Gradually advance rate of concentration of tube feeding to prevent diarrhea and gastric intolerance to formula.

Procedure

INITIATION OF ENTERAL FEEDS
Equipment
✓ Disposable feeding bag and tubing ✓ Formula (as ordered by physician) ✓ 30ml (or larger) Luer lock catheter tip syringe ✓ Stethescope ✓ pH indicator strip ✓ Clean gloves ✓ If client has a Genie LPGD: special access adaptor ✓ Equipment for obtaining blood glucose, if ordered.

1. Verify tube placement as per Procedure 11-006-01: *Insertion, Verification & Irrigation of Feeding Tubes.*
2. Refer to Potter & Perry (2010, p. 840) for additional procedure details and the physician's orders for specific feeding instructions.
3. Perform hand hygiene, assemble equipment.
4. Put on gloves if you need to handle the feeding equipment.
5. For intermittent feeding have a syringe ready and be sure formula is at room temperature.
6. Formula (as ordered by physician):
    a. Check expiration date on formula and integrity of container
    b. Have tube feeding formula at room temperature

c. Shake formula container well, and fill feeding container bag with formula. Open roller clamp on tubing, and fill tubing (prime tubing) with formula. Close roller clamp, and cap end of tubing. Hang bag.

7. Place client in high-fowlers position, or elevate head of bed at least 30 degrees. For clients forced to remain supine, place in reverse trendelenburg position.

8. If not already applied, put on gloves.

9. Check gastric residual volume:

    a. Before each feeding for intermittent feedings; or

    b. Every 4-6 hours for continuous feedings.

10. Flush with 30ml of water.

11. Initiate feeding:

    a. Intermittent Feeding:
        i. Pinch proximal end of feeding tube and remove cap.
        ii. Attach end of administration set tubing to end of feeding tube.
        iii. Set rate by adjusting roller clamp on tubing or placing on a feeding pump. Allow bag to empty gradually over 30 to 60 minutes. Label bag with tube-feeding type, strength, and amount. Include date, time and initials.
        iv. Change bag every 24 hours.
    b. Continuous drip method:
        i. Connect distal end of administration set tubing to proximal end of feeding tube as described in step 11a.
        ii. Connect tubing through tube feeding pump, open roller clamp on tubing, set rate on pump and turn on.

12. Following intermittent infusion or at end of continuous infusion, flush feeding tube with 30ml of water. Repeat irrigation as per Procedure 3: *Irrigating a Feeding Tube.*

13. With intermittent infusions, cap or clamp the proximal end of feeding tube.

14. Rinse bag and tubing with warm water whenever feedings are interrupted. Use a new administration set every 24 hours.

15. Dispose of supplies and perform hand hygiene.

PEDIATRIC CONSIDERATIONS:

- Intermittent feeding is preferred in infants because of possible perforation of the stomach, nasal airway obstruction, ulceration and irritation to mucous membranes with continuous feedings.

- When giving intermittent feedings to a small child, administration usually takes 20 to 30 minutes, or as long as it takes to bottle feed the child. Hold the infant and offer a pacifier during the feeding to simulate a more natural bottle-feeding experience.

- Temporary small bore NG tubes are often placed in infants just before each feeding and removed afterwards.

Procedure 5: GASTRIC RESIDUALS (Verification of feeding tolerance)

1. Assess gastric residuals as per Reference Sheet 11-06-05: *Interpreting Appearance and pH Results of Aspirate.*

2. Withdraw gastric fluid from a small-bore tube slowly to prevent collapse of the tube. If no fluid obtained on first attempt, wait 5 minutes and repeat procedure.

3. When initiating the feeding schedule

    a. If gastric residual is > 50% of the amount infused over the last 4 hours and client is asymptomatic (no regurgitation, acutely distended abdomen) re-instil the gastric residual, hold the feeding for 1 hour then verify residual.

    b. Do not progress the client on the feeding schedule until gastric residuals are less than 50% of the amount given in the last 4 hours.

4. Client at maximum feeding rate (continuous or intermittent feeding)
    a. If gastric residual is >200 ml, re-instil the aspirate, hold feeding/bolus for 1 hour then verify residual.

    b. If residual is now >200 ml and the client remains asymptomatic, re-instill for a maximum of 500 ml and notify physician for new orders. Assess need for IV fluids to maintain fluid requirements

5. If client becomes symptomatic (If intolerance develops) with a residual greater than 200 ml for 4 hours, regurgitation or vomiting, and acutely distended abdomen, stop feed and notify physician immediately.

6. Monitor bowel function. If gastric residuals are consistently elevated, discuss need for motility agent with physician.

7. Client with a PEJ tube: The gastric residual should be negligible. There are 2 situations where the gastric residuals may require further action:

    i. **Upward migration** of the jejunal tube into the stomach.

        The pH will be similar to gastric pH (Usually ≤ 6) rather than jejunal pH (Usually ≥ 6). See Reference Sheet 11-06-05: *Interpreting Appearance and pH Results of Aspirate.* If pH jejunal aspirate in gastric pH range, obtain abdominal x-ray and contact the physician for further management regarding tube migration.

ii. **Decreased gastric motility** leading to high gastric residuals

If gastric residual is >200 ml, re-instill the aspirate to a maximum of 500 ml, give PRN motility medication if not contraindicated.

Re-check residual in one hour. Call physician if residual remain > 200ml.

Procedure 6: Care Of PEG / PEJ Insertion Sites

1. Inspect site daily.
2. Keep the insertion site clean and dry.
3. Do not cover with a gauze unless leakage is present.
4. If leakage is present, use a small drain-type dressing to absorb body fluids or moisture.
5. If debris or drainage present, cleanse the PEG/PEJ insertion site with sterile saline until healed (a healed site is one that has no erythema/edema around the tube)
6. When healed, the site can be cleansed with mild soap and water.
7. If saline is not sufficient, crusty residual can be removed with hydrogen peroxide-soaked cotton tip applicators.
8. If signs of infection are present at the insertion site and drainage present:
    a. Culture the insertion site
    b. Notify the physician
    c. Cleanse the site with an aqueous Chlorhexedine solution.
    d. Rotate the PEG/PEJ tube bolster ½ turn daily to prevent pressure ulcers.
    e. Do not use barrier type of cream around insertion site.
9. All single feeding tubes are to have a Y adaptor added for the administration of sterile water and medications. Change Y adapter every 24 hrs with bag change.

DOCUMENTATION

In the client health record, document:

1. Date and time of insertion;
2. Type of tube, size and route of insertion;
3. Measured external length; and
4. Any special care requirements.
5. Results of X-ray verification
6. Verification of tube placement –measurement of external length of tube, consistency, colour, quantity and pH result of gastric/intestinal aspirate
7. Care of nasal and gastrointestinal insertion sites
8. Client response during insertion, removal, and/or any signs & symptoms of intolerance
9. On fluid management record (as required), amount of irrigation instilled, type and amount of feeding formula administered.
10. Amount of gastric residual

CLIENT TEACHING

1. Purpose of tube and reasons for insertion
2. Enteral feeding schedule
3. Importance of notifying the nurse of any abdominal pain, cramps, nausea, vomiting
4. Preparation for home if necessary, teaching will include the following:
    a. Mouth care
    b. Feeding schedule
    c. Medication administration
    d. Care of feeding tube insertion site
    e. Verification of tube placement (daily measurement of tube and pH testing if tube measurement has changed)
    f. Prevention of aspiration
    g. Bowel care: constipation and diarrhea
    h. Care of equipment
    i. If the client is in the community and the PEG tube falls out, instruct client to contact the nurse-on-call immediately.

REFERENCES:

Health Canada (2003). *Safety warning concerning the use of blue food dye in enteral feedings*.

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NURSING CONSIDERATIONS

1. PH testing is not required for PEG tubes.

2. PH testing is required for PEJ tubes to confirm tube location, as there is some risk that the jejunal port has migrated into the stomach. PH testing will be performed on the jejunal port of the PEJ.

3. Several factors such as presence of feeding, acid-inhibiting medications and presence of blood will affect the pH level (Reference Sheet 11-006-06: *Medications Affecting Gastric pH*). Inspection and pH testing of aspirate are reported to be more accurate in confirming correct tube placement than air insertion and gastric auscultation.

4. PH testing will be affected by the location of the tube, the amount of time between feeding, acid–inhibiting medication and other conditions.

5. PH of ≤ 4 usually indicates gastric placement while a pH of ≥ 7 usually indicates either intestinal or respiratory placement (although it may occasionally indicate gastric placement). Visual inspection of the aspirated fluid is to be used in conjunction with pH to help determine tube location. 11-006-05: *Interpreting Appearance and pH Results of Aspirate*.

6. Specimens for pH testing may be obtained immediately after the feeding has been stopped. In cases where the feeding has been stopped for periods of time for medication absorption,(ie Phentyoin) then collect the specimen for pH testing just prior to resuming feedings.

7. If there is concern regarding the placement of the tube or there is discrepancy between pH results and appearance of aspirate, assess need for confirmation of placement by x-ray.

8. Aspiration for pH testing for tube verification must not be confused with aspiration for gastric residuals to determine gastric motility.

FREQUENCY OF PH TESTING

Initial:

Immediately following the initial placement of a large bore tube that is used for enteral feeding, gastric drainage or medication administration.

On-going:

Daily for continuous feeding
Prior to each intermittent (bolus) feeding
PRN if tube migration is suspected

pH Testing
Equipment
✓ 60ml syringe with adaptor ✓ pH indicator strip ✓ Sterile water ✓ Clean gloves ✓ Medicine cup

Procedure:

1. PH testing is done on the following enteral feeding tubes: Small and large-bore nasogastric tubes, small bore nasojenunal tubes, the jejunal port of the PEJ tube, and the TE tube. pH testing is also done on nasogastric drainage tubes to confirm placement

2. For intermittent (bolus) feeding schedule, collect specimen immediately prior to the next scheduled feeding.

3. For continuous feeding schedule, stop the feeding long enough to obtain a sample.

4. Inject 30 cc of air with a 60 cc syringe into the tube to clear tube of fluid.

5. Aspirate 5 cc of fluid. Aspiration of fluid from small bore feeding tubes must be done slowly to prevent collapse of tube.

    a. If no fluid obtained, wait 5 minutes, reposition the client and attempt again.
    b. If unable to obtain aspirate, determine appropriateness of initiating feeding, obtaining x-ray or notifying the physician.

6. Visualize color of aspirate then saturate pH test strip with aspirated fluid and determine pH based on color match on the pH container.

7. Refer to 11-006-05 to confirm tube placement via pH result and appearance of aspirate.

8. Flush tube with 30 cc of sterile water to maintain tube patency.

9. Re-connect tube to feeds / drainage as applicable.

Documentation:

Document the pH result

CLIENT TEACHING:

Educate the client on the purpose of pH testing.

REFERENCES:

Potter, P.A. & Perry, A.G. (2010). *Clinical Nursing Skills & Techniques*, 7th edition; Mosby: Toronto.

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Approved by: 11 FEB 2011 **Chief Nursing Officer** **Date**	Effective Date: April 1, 2011
February 11, 2011 **Deputy Minister of Health and Social Services** **Date**	

REFERENCE SHEET 11-006-04

Table 1: Frequency of Tube Placement Verification and Gastric Residual

FREQUENCY OF TUBE PLACEMENT VERIFICATION				FREQUENCY OF GASTRIC RESIDUAL
Type of tube	**X-ray**	**pH Testing**	**Tube Measurement**	**(Feeding Tolerance)**
Naso-gastric	Small-bore: on insertion and if migration suspected	➢ Continuous feed: daily ➢ Prior to intermittent feeds	Initially and daily	➢ Initiation of feeding: Q 4h for first 48hrs ➢ Continuous feed: BID ➢ Prior to intermittent feeds
Naso-jejunal	Small-bore: on insertion and if migration suspected	Daily to determine upward migration of tube	Initially and daily	Not applicable
PEG	Not routinely ordered	Not required	Initially and daily	➢ Initiation of feeds: Q4h for first 48hrs ➢ Continuous feed: BID ➢ Prior to Intermittent feedings
PEJ	If migration is suspected (formula aspirated via the jejunal port)	Daily (obtain fluid from jejunal port)	Initially and daily	➢ Check gastric port to determine presence of excess gastric secretions (Presence of gastric secretions may indicate tube migration)
JEJ	Physician may order gastrograffin test to check for leakage (not currently available in health centres)	Not required as tube cannot migrate	Initially and daily	Not applicable
GENIE / LPGD	Not routinely done	Not required with a well established track. Daily for continuous and intermittent (bolus) feeds if new track	N/A	Not applicable with an established track If new track: ➢ Initiation of feed: Q4h for first 48hrs ➢ Continuous feed: BID ➢ Prior to Intermittent feed
TE	If migration suspected	Daily	Initially and daily	➢ Initiation of feed: Q4h for first 48hrs ➢ Continuous feed: BID ➢ Prior to Intermittent feed

Table 2: Appearance and pH Results of Gastrointestinal Fluid Aspirate

Aspirate	Ph result	Appearance of aspirate
Gastric contents: ➢ Fasting ➢ 4 hr post feeding ➢ no acid-inhibiting medications	Usually ≤ 5	➢ Grassy green ➢ If blood is present - brownish sediments ➢ Clear & colorless (often shred of off-white to tan mucous)
Gastric contents: ➢ < 4 hr fasting ➢ acid inhibiting medications	Usually ≤ 6 ➢ Residual formula will ↑ pH ➢ Acid inhibiting medication will ↑ pH	➢ Grassy green, brownish, or tannish with traces of recently ingested materials. ➢ If continuous feedings, may look like formula (curdled)
Intestinal contents	Usually ≥ 6	➢ Light to dark yellow golden color or brownish green. ➢ Fluid is clearer than gastric fluid.
Respiratory contents	Usually ≥ 6 Aspirated stomach content will ↓ pH	Tracheobronchial – off white to tan

Note: If discrepancy between pH results and appearance of aspirate, assess need for confirmation of placement by x-ray.

Table 3: Medications That Increase Gastric pH

Classification	Medications	Duration of Effect on pH
Antacids	calcium carbonate, aluminum hydroxide, magnesium hydroxide, magaldrate	Onset: Immediate Duration: 1 hr (if fasting) **OR** 1-3 hours when taken after meals
H2 blockers	Cimetidine, Rantidine, famotidine, nizatidine	Onset: 15 min (I.V.), 60 min (po) Duration: 8-12 hrs
Proton pump inhibitors	Omeprazole, lansoprazole, pantoprazole	Onset:1-3 hrs Duration: 2-7 days after drug Discontinued
Proton pump inhibitors	Misoprostol	Onset: 60-90 min Duration: 3 hrs
Anticholinergic agents	Scopolamine, hyoscyamine, glycopyrrolate, dicyclomine	Onset: 90 min Duration: 4 hr
Antiviral drug	Videx (didanosine + antacid)	Same effect as antacids

Department of Health Government of Nunavut	NURSING POLICY, PROCEDURE AND PROTOCOLS **Community Health Nursing**	
TITLE:	**SECTION:**	**POLICY NUMBER:**
Nasogastric	Clinical Procedures	11-007-00
EFFECTIVE DATE: / **REVIEW DUE:**	**REPLACES NUMBER:**	**NUMBER OF PAGES:**
February 10, 2018 / February 2021		5
APPLIES TO:		
Community Health Nurses		

POLICY 1:

Nasogastric (NG) drainage tubes are inserted for drainage of gastric content. It is the registered nurses responsibility for the care and maintenance of NG tubes.

POLICY 2:

Insertion and removal of NG tubes requires a physician order, except in urgent and emergency situations. Registered nurses are only permitted to insert and remove NG tubes in populations not at high risk for misplacement.

PRINCIPLES:

Registered Nurses are not authorized to insert NG tubes in high risk populations:

Nasocranial surgery or trauma, maxillofacial trauma, pharyngeal surgery or trauma, acute head injury, basal skull fracture, cerebrospinal fluid rhinorrhea, post-op esophageal and gastric surgery, recent radiation therapy to the mediastinal area, or known or suspected partial obstruction in the naso-pharyngeal or oro-pharyngeal areas.

DEFINITIONS:

Levine® nasogastric tube: Rigid single lumen tube with no venting ability.

Salem® nasogastric tube: The Salem Sump® Tube is a rigid double lumen tube, comprised of a large lumen for suction drainage and a smaller vent lumen through which outside air is drawn.

Anti reflux valve: A one way air vent valve that prevent gastric fluid backing up into the vented lumen of the Salem® nasogastric tube.

RELATED POLICIES, GUIDELINES AND LEGISLATION:

Procedure 11-007-01 Nasogastric Tubes: Nursing Considerations
Procedure 11-007-02 Insertion and Maintenance

REFERENCES:

Potter, P.A. & Perry, A.G. (2010). *Clinical Nursing Skills & Techniques*, 7th edition, Mosby: Toronto.

PROCEDURE 11-007-01

NURSING CONSIDERATIONS:

Policy 11-007-00: *Nasogastric Drainage Tube* relates to Inserting and Maintaining a Nasogastric Tube for Gastric Decompression (refer to Potter & Perry, 2010, p. 914) for additional detailed procedures).

1. Prior to gastric drainage tube placement, review the chart for client conditions that may increase the risk of tube misplacement. This includes the following client groups:
   - Nasocranial surgery or trauma, maxillofacial trauma, pharyngeal surgery or trauma, basal skull fracture, cerebrospinal fluid rhinorrhea, post-op esophageal and gastric surgery, recent radiation therapy to the mediastinal area, or known or suspected partial obstruction in the naso, oro pharyngeal areas.

2. Levine® tubes are not recommended for extended periods of drainage.
   - Following the application of suction, tissue may enter the drainage eyes of the tube and cause a substantially higher increase in vacuum pressure when the stomach and tube are empty.

3. Salem Sump® Tubes have two lumens; a larger lumen acts as a drain and a smaller lumen acts as a vent.
   - The continuous venting of atmospheric air through the smaller tube allows continuous drainage through the larger tube and thus prevents tissue grab and high suction levels which traumatize tissue.

4. Never clamp off the air vent, connect to suction or use for irrigation.

5. Tube placement verification: Air auscultation will **not** be utilized to determine either initial or on-going placement as research has demonstrated that it is unreliable.

6. Do not give more than 30 ml of water at a time when facilitating insertion.

7. NG insertion is very uncomfortable for the client; continually assess the client during the procedure.

8. It is not recommended that Salem/Levine drainage tubes be used for feeding purpose. However, if this occurs, follow Policy 11-006-00: *Enteral Nutrition*.

9. Geriatric considerations:
   a. Remove any ill-fitting dentures prior to NG tube insertion
   b. Oral and nasal mucosal drying may be present; ensure adequate lubrication for insertion.

PROCEDURE 11-007-02

PROCEDURE 1: INSERTION

1. Nurses may insert NG tubes as outlined in Potter & Perry (2010, p.914), except in clients at risk for misplacement (see Policy 11-007-00: *Nasogastric Drainage Tube*).

2. Verify placement and patency of NG tube daily and prior to administration of medications, if administered through the NG tube (refer to Procedure 11-006-01: *Enteral Nutrition, Nursing Considerations* and 11-006-02: *Enteral Nutrition, Care of Feeding Tubes*):

    a. Aspirate fluid and measure pH level

    b. Measurement of the external length of the tube daily

    c. Appearance of aspirated fluid

    d. Chest x-ray verification if tube suspected of migration

PROCEDURE 2: IRRIGATION

1. Nurses may irrigate NG tubes as outlined in Potter & Perry (2010, p. 919).

2. Routine irrigation of an NG tube is not required if draining well.

3. Perform hand hygiene and apply gloves.

4. Verify tube placement as per Procedure 1: Insertion. Re-connect NG tube to connecting tube.

5. Draw up 30ml of normal saline into catheter tip syringe.

6. Clamp NG tube. Disconnect from connecting tubing and lay end of connection tubing on towel.

7. Insert tip of irrigating syringe into end of NG tube. Remove clamp. Hold syringe with tip pointed at floor and inject saline slowly and evenly. Do not force solution.

8. Do not use the air vent lumen on the Salem tube for irrigation, as it may clog.

9. If resistance occurs, check for kinks in tubing. Turn client onto left side. Repeated resistance should be reported to the physician.

10. After instilling saline, immediately aspirate, or pull back slowly on syringe to withdraw fluid.

    a. If amount aspirated is greater than amount instilled, record difference as output.
    b. If amount aspirated is less than amount instilled, record difference as intake.

11. Use a syringe to place 10ml air into blue pigtail of the Sump tube, to ensure patency of air vent.

12. Reconnect NG tube to drainage or suction. Repeat irrigation if solution does not return.

13. Remove and discard gloves and perform hand hygiene.

PROCEDURE 3: SUCTIONING

Establish the suction setting for Salem® tube:

> **Intermittent Suction from a Thermotic Pump (Gomco):** Set suction on "high" setting (e.g. Gomco, 120mmHg.): Use of intermittent suction at this level assures that the level of suction reaching tissue at the drainage eyes of the Salem Sump® Tube will never exceed 20mmHg, thus staying below the level of possible ulceration.
>
> **Intermittent Suction from a Central Suction Source**: Set suction at low level, and increase suction until fluid flow or bubbling is observed in the suction drainage lumen of the Salem Sump® Tube.
>
> **Continuous Suction:** Set suction at a low level and increase suction until flow or bubbling is observed in the suction drainage lumen of the Salem Sump® Tube. Suction should be applied at low levels to avoid overpowering the sump.

Regardless of the type of suction used, it is essential that the vent not be closed while suction is applied to the tube. The Salem Sump® Tube is designed not to occlude. Closing the vent would stop the sump action of the tube, and result in the same problems inherent in Levin tubes.

Establish the suction setting for Levin® tube:

> Use intermittent low suction (80-120mmHg) unless otherwise ordered.

PROCEDURE 3: DISCONTINUATION

Nurses may discontinue NG tubes as outlined in Potter & Perry (2010, p.919).

DOCUMENTATION:

Document the following in the client's health record:

a. Date, time, type, size and route of insertion

b. Initial external length measurement

c. Any special care requirements

d. X-ray verification

e. Verification of tube placement – measurement of external length of tube, consistency, colour, quantity and pH result of gastric aspirate

f. Client response (insertion, removal)

g. On fluid management record (as required), quantity of drainage, quantity and type of irrigation used.

REFERENCES:

Potter, P.A. & Perry, A.G. (2010). Clinical Nursing Skills & Techniques, 7th edition; Mosby: Toronto.

Metheny N.A., Titler M. (2001). Assessing Placement of Feeding Tubes, *American Journal of Nursing,* 101(15) pp.36-45.

Kendall Company (2000). *Clinical considerations In The Use Of The Argyle Salem Sump Tube With Salem sump Anti-Reflux Valve*

Approved by:	Effective Date:
11 FEB 2011 **Chief Nursing Officer** **Date**	April 1, 2011
February 11, 2011 **Deputy Minister of Health and Social Services** **Date**	

Department of Health Government of Nunavut	NURSING POLICY, PROCEDURE AND PROTOCOLS	
	Community Health Nursing	
TITLE:	**SECTION:**	**POLICY NUMBER:**
Topical Hemostatic Agents	Clinical Procedures	11-008-00

EFFECTIVE DATE:	**REVIEW DUE:**	**REPLACES NUMBER:**	**NUMBER OF PAGES:**
February 10, 2018	February 2021		3

APPLIES TO:
Community Health Nurses

POLICY:

Registered nurses, who receive additional instruction from the Nurse Educator / Delegate, may apply topical hemostatic agents to decrease bleeding. Only nurses who have received additional training may apply silver nitrate sticks without a physician's order; all other hemostatic agents require a physician's order.

Hemostasis agents shall not be applied to distal digits or skin appendages.

DEFINITIONS:

Topical Hemostatic Agents are chemical agents which may be applied to superficial wounds to decrease bleeding via rapid vasoconstriction of small area of tissue or when rapid hemostasis is essential.

PRINCIPLES:

- Hemostasis agents should not be used in injuries that involve the distal digits or on skin appendages because it may produce ischemia.

RELATED POLICIES, GUIDELINES AND LEGISLATION:

Procedure 11-008-01 Application of Hemostatic Agents

REFERENCES:

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

NURSING CONSIDERATIONS:

1. Hemostasis agents should be used with caution in clients with a history of poor healing.

2. Hemostasis agents should not be used in clients who have had hypopigmentation or hyperpigmentation skin reactions.

COMMON TOPICAL HEMOSTATIC AGENTS			
AGENT	**CHARACTERISTICS**	**USES**	**LIMITATIONS**
Epinephrine	Extremely potent; vasoconstriction	Apply topically with cotton applicators (may also be injected intradermally or subcutaneously)	Must be used in only small amounts or tissue necrosis and sloughing may develop Cannot be used on digits or with skin appendages
Ferric Subsulfate	Produces rapid hemolysis	Especially useful with seborrheic keratoses or basal cell carcinoma	Frequently causes pigment changes and staining of the skin
Silver Nitrate Sticks	Fast hemolysis; Relatively inexpensive	Silver nitrate is impregnated in the cotton-tipped applicator	Most likely to cause pigment changes and staining of the skin Silver nitrate sticks must be kept dry or they deteriorate.

Adapted from: Edmunds, M. & Mayhew, M. (2003). *Procedures for Primary Care Practitioners, 2nd ed..* St. Louis: Mosby.

EQUIPMENT
✓ Non sterile gloves ✓ Sterile fenestrated drape ✓ Sterile cotton-tipped applicators ✓ Sterile 4X4 gauze pads ✓ Topical hemostatic agents

PROCEDURE:

1. Position client comfortably wit the area well illuminated with light.
2. Clean the area if this has not already been done.
3. Drape area with sterile fenestrated drapes.
4. Either remove two silver nitrate sticks from the sealed container for use or dip a cotton-tipped applicator into the hemostatic solution. Then squeeze the cotton applicator against the side of the container top to ensure that extra solution runs back into the bottle so it will not drip or run when applied to the skin.
5. Using two fingers stretch the skin tight over the area where hemostasis is required.
6. Wipe off any excess blood from the skin with sterile gauze and immediately apply the chemically filled cotton-tipped applicator to the area for at least 15 seconds.
7. Discard the cotton-tipped applicator and then release tension on the skin.
8. The procedure may need to be repeated more than once until successful hemolysis is achieved.
9. If the base of a lesion is being cauterized with this chemical method, make certain that the chemical is applied to the whole base of the lesion.

CLIENT EDUCATION:

- Skin will appear red and inflamed for up to 48 hours from the chemical irritation.
- Pain is usually mild. Client may take acetaminophen every 4 hours as needed to reduce pain.
- Instruct client to return to the health centre for evaluation if bleeding or any signs of infection (swelling, warmth of tissues, drainage, and foul-smelling odour) develop.

Approved by:	Effective Date:
11 FEB 2011 **Chief Nursing Officer** **Date**	April 1, 2011
February 11, 2011 **Deputy Minister of Health and Social Services** **Date**	

Department of Health Government of Nunavut	NURSING POLICY, PROCEDURE AND PROTOCOLS	
	Community Health Nursing	
TITLE:	**SECTION:**	**POLICY NUMBER:**
Anesthesia: Topical, Local & Digital Nerve Block	Clinical Procedures	11-009-00
EFFECTIVE DATE: / **REVIEW DUE:**	**REPLACES NUMBER:**	**NUMBER OF PAGES:**
February 10, 2018 / February 2021		10
APPLIES TO:		
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, 2nd 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

NURSING CONSIDERATIONS:

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.

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 Onset: 1 min Duration: ½ to 1 hour (depending on site and vascularity)	➢ Contaminated wounds; ➢ Fingers, nose, penis, toes & earlobes; ➢ If vascular disease present or immunocompromised; ➢ If cerebrovascular / cardiovascular risks ➢ For nerve blocks	For 1% Lidocaine: 4.5mg/kg not to exceed 300mg (30ml in adult)
Lidocaine (Xylocaine) with epinephrine	Causes vasoconstriction Onset: 1 min Duration: 2-6 hours	➢ Highly vascular areas to improve visualization of field ➢ Do not use on fingers, nose, penis, toes & earlobes	For 1% Lidocaine: 7mg/kg not to exceed 500mg (50ml in adult)
Bupivacaine (Marcaine)	Onset: 5 min Duration: 2-4 hours	➢ Nerve blocks	For 0.25%: 3mg/kg not to exceed 175mg (50ml per adult)

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

PROCEDURE 1: TOPICAL ANESTHESIA

EQUIPMENT	
EMLA	**Lidocaine & Epinephrine**
✓ Non sterile gloves ✓ EMLA cream ✓ Occlusive dressing	✓ Non sterile gloves ✓ Sterile 2 X 2 gauze ✓ Topical hemostatic agents

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

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

EQUIPMENT
✓ Sterile gloves ✓ Local anesthetic agent (*without* epinephrine) ✓ 18 Gauge needle to draw up solution ✓ 27 to 30 gauge needle for injection ✓ Sterile field ✓ Agent for skin preparation (10% povidone-iodine solution or chlorhexidine gluconate solution) ✓ Appropriate syringe (3 to 5 ml)

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 .

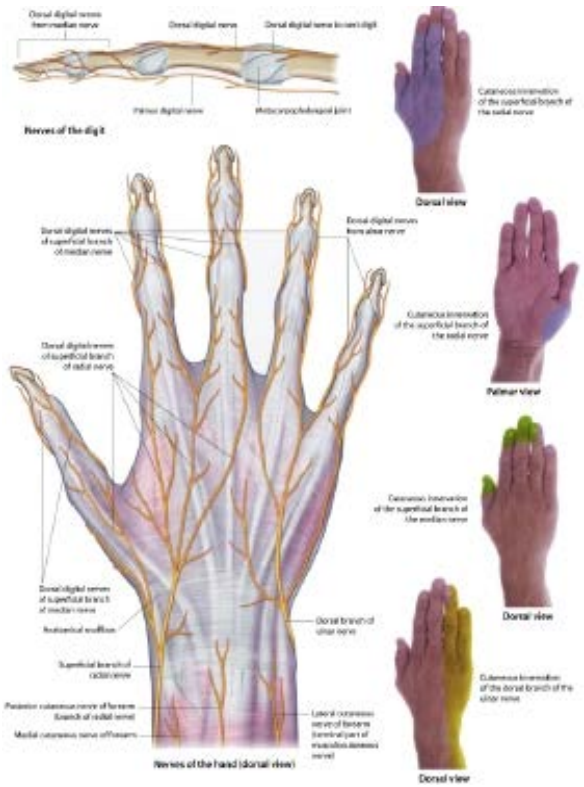
    a. Angle needle toward dorsal nerve and inject about 0.5 ml of anesthetic agent (after aspiration) near bone
    b. Partially withdraw needle to tip
    c. Redirect needle toward palmer nerve and inject about 1 ml of anesthetic agent (after aspiration)
    d. Repeat for opposite side of digit.

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.

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

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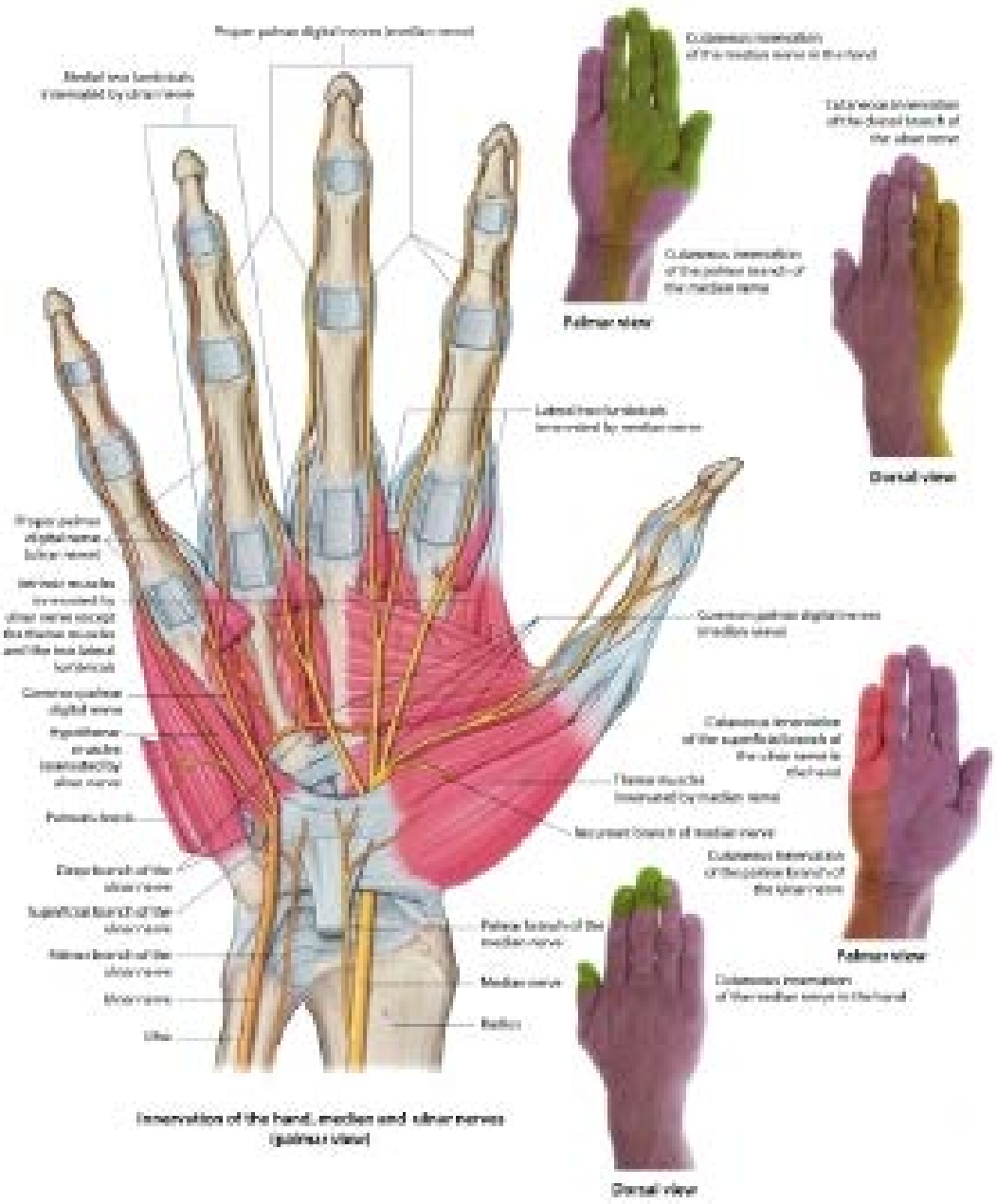
Higginbotham, E. & Vissers, RJ. (2004). Local and Regional Anesthesia. *Emergency Medicine: A Comprehensive Study Guide, 6th ed*., pp 264-275. McGraw-Hill: New York

Figure 2: Palmar digital nerves.



Approved by: 11 FEB 2011	Effective Date:
Chief Nursing Officer **Date**	April 1, 2011
February 11, 2011	
Deputy Minister of Health and Social Services **Date**	

Department of Health Government of Nunavut	NURSING POLICY, PROCEDURE AND PROTOCOLS	
	Community Health Nursing	
TITLE:	**SECTION:**	**POLICY NUMBER:**
Suturing	Clinical Procedures	11-010-00
EFFECTIVE DATE: / **REVIEW DUE:**	**REPLACES NUMBER:**	**NUMBER OF PAGES:**
February 10, 2018 / February 2021		14
APPLIES TO:		
Community Health Nurses		

POLICY 1:

Suturing requires specialized competence and training. Registered nurses, who work within the role of Community Health Nurse and have successfully completed additional training from the Nurse Educator / Delegate, may suture simple lacerations. A physician will need to be contacted for all other wound closures to discuss further interventions.

POLICY 2:

Registered nurses shall not suture lacerations inside the mouth, lacerations beyond verineal border, lacerations to the scrotum and penis, below the eye brow and episiotomy repairs. These conditions require physician consultation

POLICY 3:

A thorough history and assessment shall be retrieved prior to wound care to determine appropriateness of suturing. There are some incidences where the wounds must not be sutured. These include, but are not limited to:

1. **Wounds will not be closed with sutures if more than 6 to 8 hours has elapsed since the time of injury.**
2. **Wounds which potentially had contact with seal contaminants (e.g. ulu used to cut seal meat and/or skins) – due to the risk of developing seal finger**
3. **Wounds which cannot be assessed and adequately explored.**
4. **Wounds which cannot be cleansed, irrigated and debrided adequately shall not be closed.**
5. **Wounds with underlying structural damage. For example, cut to tendon, nerve, bone or blood vessels.**
6. **Wounds that require multiple layer closure.**
7. **Compression or crush injuries with extensive soft tissue damage.**
8. **Injection injuries caused by high-pressure equipment (e.g. paint guns)**
9. **Wounds of the face where there is a concern about cosmetic outcome.**
10. **Hand wounds with damage to flexor tendons or nerves, with open fractures, or with joint penetration.**
11. **Wounds associated with fractures.**
12. **All animal bites should be discussed with the CMOH and/or physician.**

The on-call physician shall be consulted in these incidents to discuss further treatment options.

DEFINITIONS:

Suturing is a method for closing cutaneous wounds

PRINCIPLES:

- Proper suturing technique is needed to ensure good results.
- The choice of suture technique depends on the type and anatomic location of the wound, the thickness of the skin, the degree of tension and the desired cosmetic result.

RELATED POLICIES, GUIDELINES AND LEGISLATION:

Policy 11-009-00	Anaesthesia: Topical, Local and Digital Nerve Block
Procedure 11-009-01	Application of Topical & Local Anesthesia
Reference 11-010-01	Basic Suturing Principles
Procedure 11-010-002	Suturing Simple Lacerations

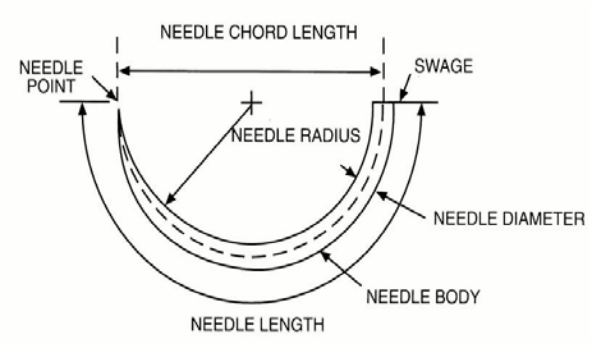
REFERENCES:

Edmunds, MW & Mayhew, MS (2003). *Procedures for Primary Care Practitioners*, 2nd ed. Mosby: St. Louis.

Ratner, D. (2009). *Suturing Techniques*.

Thomsen, TW., Barclay, DA. & Setnik, GS (2006). Basic Laceration Repair. New England Journal of Medicine: 355.

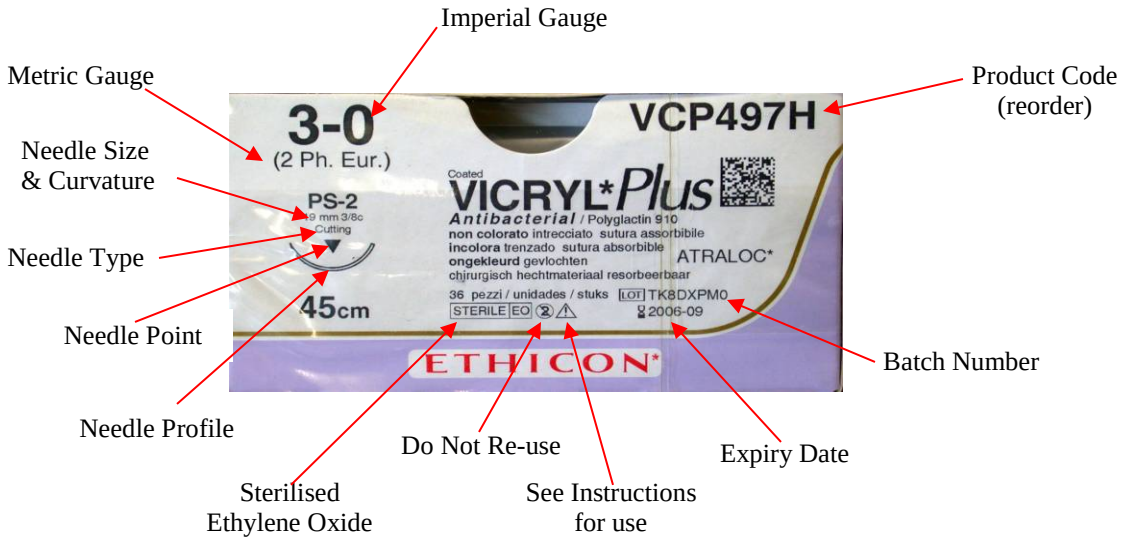
NEEDLE CONSTRUCTION



Adapted from Ethicon suturing presentation.

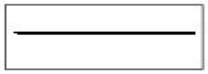
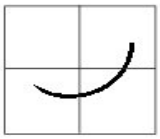
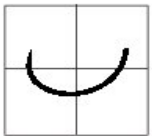
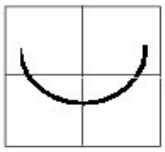
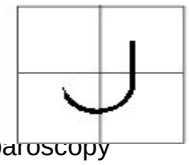
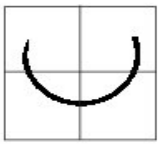
Needle Point: Penetration of a needle is dependent on the point.
Chord Length: Straight line from the point of a curved needle to the swage. Length determines the width of bite taken by the needle.
Swage: The area where suture attaches to the needle. It is the weakest point of the needle.
The swage area reduces additional trauma by achieving the closest one to one suture needle ratio.
Needle Diameter: The gauge of the needle wire.
Needle Radius: If the curvature of the needle were to continue to make a full circle, the radius of the curvature is the distance from the centre of the circle to the body of the needle.

PACKAGING



Adapted from Ethicon information inserts and suturing presentation.

NEEDLE SHAPES

NEEDLE SHAPES			
1/4 Circle  Eye Microsurgery	Straight  Nasal cavity Nerve Skin Tendon	3/8 Circle  Dura Eye Fascia Nerve	Compound Curve  Eye (Anterior segment)
1/2 Circle  Mus Eye Skin Peritoneum	J Shape  Laparoscopy	5/8 Circle  Car Oral Pelvis Urogenital tract	

3/8 Circle and the ½ Circle needle shapes are most commonly used needles in the health centres.

COMMON SUTURING MATERIALS

COMMON SUTURE MATERIALS STOCKED IN COMMUNITY HEALTH CENTRES				
	Skin (interrupted)	**Skin (Subcuticular)**	**Buried**	**Removal**
Face	5-0 or 6-0 nylon **OR** Prolene	4-0 or 5-0 Prolene	4-0 or 5-0 Synthetic absorbable **OR** 6-0 clear nylon	4-7 days
Extremities, trunk	4-0 or 5-0 nylon **OR** Prolene	3-0 or 4-0 synthetic absorbable	4-0 Prolene **OR** 3-0 or 4-0 synthetic absorbable	7-14 days

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

COMMON NON-ABSORBABLE SUTURE MATERIALS						
Suture	**Types**	**Material**	**Use**	**Tissue Reaction**	**Absorption Rate**	**Strength Retention**
Polypropylene (Prolene)	Mono	Synthetic polymer	Skin, vascular, plastic surgery	Minimal	Never	Indefinite
Nylon (Ethilon, Dermalon)	Mono	Synthetic polymer	Skin	Very Low	20% a year	Loses 20% a year
Silk	Braided	Silkworm spun fiber	Ligating, some skin but rarely used	Moderate	2 years	Gone in 1 year

Adapted from: Edmunds, MW & Mayhew, MS (2003). *Procedures for Primary Care Practitioners*, 2nd ed. Mosby: St. Louis.

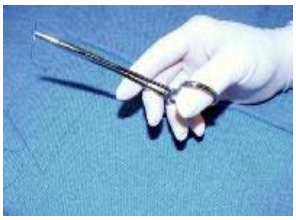
COMMON ABSORBABLE SUTURE MATERIALS IN COMMUNITY HEALTH CENTRES						
Suture	**Types**	**Makeup**	**Use**	**Tissue Reaction**	**Absorption Rate**	**Strength Retention**
Gut	Plain	Mammalian collagen	Superficial vessels & quick healing subcutaneous tissues	Moderate	70 days	7-10 days
Gut	Chromic	Mammalian collagen	Versatile; good in presence of infection; (not for skin due to risk of reaction	Moderate	90 days	21-28 days
Polyglactic Acid (Vicryl)	Braided	Coated polymer	Subcutaneous skin; buried sutures	mild	60-90 days	60% in 14days 30% in 21days
Polyglycolic Acid	Mono	Synthetic polymer	Buried sutures; good tensile and knot strength	mild	40% 7 days	20% in 15days 5% in 28 days

Adapted from: Edmunds, MW & Mayhew, MS (2003). *Procedures for Primary Care Practitioners*, 2nd ed. Mosby: St. Louis.

1. **Simple Interrupted Dermal Suture:**
    a. Approximate the wound edges or hold them slightly everted.
    b. Using the needle holder, take a "bite" at the edge of the wound with the needle, entering the skin at a 90-degree angle and continuously using a curving motion of the wrist to drive the needle through the wound and out the opposite side. The stitch should be as wide as it is deep. Check to see that the wound is symmetrically approximated before tying. The suture is tied using an instrument tie. When tying the suture, pull tight enough to approximate the wound edges and slightly evert them. If there is excessive skin tension, it may be necessary to remove the stitch and to further undermine the skin. Continue to place sutures to close the wound, spacing them a distance equal to the distance between the entrance and exit sites of each suture.
2. **Subcutaneous Suture (Deeper, Layered Closure)**
    a. Usually an absorbable suture is used for subcutaneous sutures.
    b. The knot is buried or inverted to aid in approximation of the skin edges.
    c. Begin the stitch in the bottom of the wound, coming out through the dermis, then entering the dermis from the opposite side, and then coming out deep below the dermis. Use an instrument tie, but do not use a locking wrap on your first tie, and use only two or three knots. This reduces the "bulk" from the knots below the skin.
3. **Vertical Mattress Suture**
    a. This suture is strong stitch that helps to evert the wound edges.
    b. Take a large bite of tissue about 10mm away from the wound edge, proceeding as with a simple interrupted suture through the wound and out the opposite side of the wound.
    c. Reverse the needle and take a small bite 1 to 2 mm from the wound edge where the needle just came out, through the wound, coming out with a small bite on the opposite side of the wound just 1 to 2 mm from the edge.
    d. Tie the suture using an instrument tie.
    e. General wound care and apply dressing as appropriate.

PLACING SUTURES

1. The needle holder is held in the palm of the dominant hand with the thumb and the fourth fingers placed into the loops and by placing the index finger on the fulcrum to provide stability.

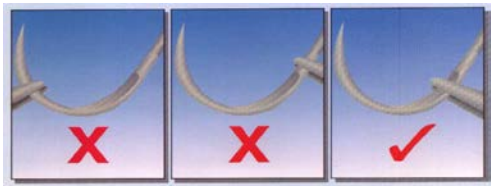
   Do not put your fingers through the loops of the driver while suturing; this interferes with proper technique. You may put your fingers into the holes when opening the driver and while tying knots.

2. Alternatively, the needle holder may be held in the palm to increase dexterity.

3. Hold the forceps in your non-dominant hand.

4. Grasp needle with the needle holder. Incorrect placement of the needle in the needle holder may result in a bent needle and/or an undesirable angle of entry into the tissue.

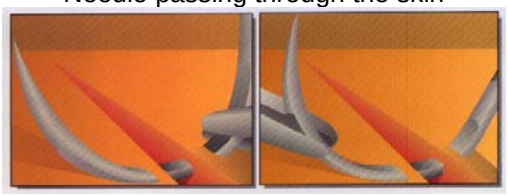
5. In most cases, the wound should be closed in segments, beginning with a stitch in the center of the laceration. Subsequent stitches are placed to bisect each resulting segment. This method allows accurate opposition of wound edges. For smaller lacerations, the sutures may be placed in an end-to-end fashion.

6. Gently grasp the tissue with the forceps to stabilize it for suture placement. Excessive trauma to the tissue should be avoided to reduce the possibility of tissue strangulation and necrosis.

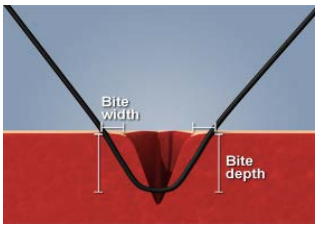
7. The needle should penetrate the skin at a 90° angle, minimizing the size of the entry wound and promoting eversion of the skin edges.

   a. The needle should be inserted 1-3 mm from the wound edge, depending on skin thickness. The depth and angle of the suture depends on the particular suturing technique (see *specific suture types*).

   Needle passing through the skin

   b. Stabilize the needle in the centre of the laceration and reload the needle onto the needle holder. Gently evert the wound edge closest to you with the forceps, and then drive the needle first through the subcutaneous tissue and then through the epidermis by supinating your wrist.



c. Match both the bite depth and bite width on both sides of the laceration. The 2 sides of the suture should become mirror images, and the needle should also exit the skin perpendicular to the skin surface.

8. Pull the suture material through the laceration so that a 3-cm tail remains on the opposite side.

9. As you progress with the repair and the wound edges become approximated, you can drive the needle through both sides of the laceration in a single pass, again using a gentle supination of the wrist.

KNOT TYING

- Three square knots will secure a stitch made with silk or other braided, non-absorbable materials;
- Four knots are sufficient for synthetic, absorbable and non-absorbable monofilament sutures as long as they are carefully squared during tying.
- Excessive number of throws in a knot weakens the suture at the knot.

1. Place the needle holder parallel over the laceration. Use a free hand to wrap the long end of the suture material (the one attached to the needle) over the needle driver twice. Rotate the needle driver 90 degrees toward the free end of the suture, grasp it, and gently pull it through.
    a. Tighten the knot just enough so that the wound edges are approximated;
    b. Too much tension at this stage can cause necrosis of the wound edges.

2. For the next throw, again place the needle holder parallel over the wound. Wrap the long end of the suture material over the needle driver once, rotate the holder 90 degrees, grasp the free end of the suture, and pull it through. This throw can be tightened without creating excessive tension on the wound edges. Place two more throws in this fashion.

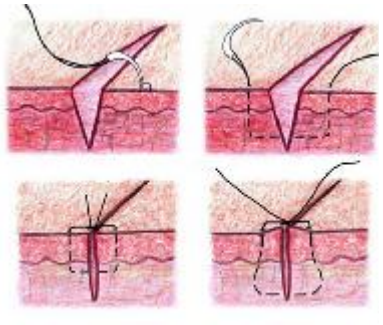
3. After the final throw, pull the knot closed just enough to approximate the wound edges. (Remember that the wound edges will swell over the next several days and the knots will become tighter. Knots that are pulled too tightly may lead to wound edge ischemia and infection.)

4. Use the suture scissors to cut the suture material, leaving tails of approximately 1 cm.

PROCEDURE: SIMPLE INTERRUPTED SUTURES

The most commonly used suture in the health centre.

1. This suture is placed by inserting the needle perpendicular to the epidermis, traversing the epidermis and the full thickness of the dermis, and exiting perpendicular to the epidermis on the opposite side of the wound.

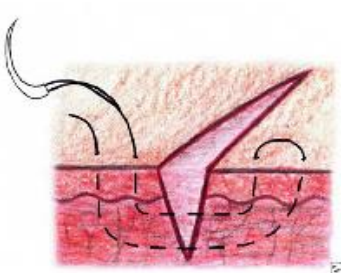


2. The 2 sides of the stitch should be symmetrically placed in terms of depth and width. In general, the suture should be wider at its base than at its superficial portion to avoid eversion of wound edges and a depressed scar.

PROCEDURE: VERTICAL MATTRESS SUTURES

The vertical mattress suture is a variation of the simple interrupted suture.

1. It consists of a simple interrupted stitch placed wide and deep into the wound edge and a second more superficial interrupted stitch placed closer to the wound edge and in the opposite direction.



2. The width of the stitch should be increased in proportion to the amount of tension on the wound. That is, the higher the tension, the wider the stitch.

3. A vertical mattress suture is especially useful in maximizing wound eversion, reducing dead space, and minimizing tension across the wound.

4. One of the disadvantages of this suture is crosshatching. The risk of crosshatching is greater because of increased tension across the wound and the 4 entry and exit points of the stitch in the skin.

5. The recommended time for removal of this suture is 5-7 days (before formation of epithelial suture tracks is complete) to reduce the risk of scarring.

6. Placing each stitch precisely and taking symmetric bites is especially important with this suture.

REFERENCES:

Edmunds, MW & Mayhew, MS (2003). *Procedures for Primary Care Practitioners*, 2nd ed. Mosby: St. Louis.

MacKay-Wiggan, J. & Ratner, D. (2009). *Suturing Techniques*.

Ratner, D. (2009). *Suturing Techniques*.

Thomsen, TW., Barclay, DA. & Setnik, GS (2006). Basic Laceration Repair. New England Journal of Medicine: 355.

PROCEDURE 11-010-02

NURSING CONSIDERATIONS:

Registered nurses shall perform suturing only to simple lacerations. All other wounds must be consulted with a physician.

1. Control of bleeding is the first priority, as well as assessing the ABCs

2. All lacerations must be thoroughly inspected for damage to underlying structures, such as tendons or bones, as well as for foreign bodies. Obtain a good history of the incident and past medical history, including immunization status (ensure Tetanus is up to date).

3. Devitalized tissue should be debrided before a wound is closed, which appears with a blue or black appearance and is often shredded. Only simple debridement shall be performed by the registered nurse.

4. Remove all rings and other jewelry from injured hands or fingers.

5. Wounds under considerable tension should have sutures placed closer to each other (and with a smaller bite width) to decrease tension exerted by the sutures.

6. Wounds should be closed in layers – deep fascia to deep fascia, superficial fascia to superficial fascia, and dermis to dermis – approximating each layer as the wound is closed.

7. Wound edges should be closed with minimal tension and with slight eversion of wound edges so that as healing takes place and the scar contracts, the resulting site is flat.

8. Synthetic monofilament sutures have the troublesome property of "memory" – a tendency of the filament to spring back to its original shape, which causes the knot to slip and unravel.

9. Follow the guidelines and protocols contained within the *Communicable Disease Manual* for post wound care. For example, dog bite protocol.

ALTERNATE TREATMENT:

1. Leave wound open to heal by secondary intention

2. For appropriate wounds, apply Dermabond® topical skin adhesive to achieve wound closure.

3. Refer for treatment and/or closure by a surgeon or other experienced colleague

4. For superficial wounds, Steri-strips® may be applied to close the wound.

EQUIPMENT
✓ Anesthesia supplies (as per Procedure 11-009-01) Irrigation supplies: ✓ Bottle of normal saline or IV bag of normal saline (size depends on the size of the wound(s) and amount of contamination. ✓ 20ml syringe with large bore IV catheter (needle removed) ✓ Non sterile gloves Suture tray: ✓ Sterile 2 X 2 gauze (at least 8 to 10) ✓ Needle holder ✓ Suture scissors (Iris scissors) ✓ Tissue forceps ✓ Curved mosquito clamp ✓ Sterile fenestrated drapes ✓ Sterile bowl Suture materials: ✓ Sterile gloves ✓ Personal protective equipment as necessary (eye and face protection and protective gown) ✓ Skin cleansing agent (e.g. 10% povidone-iodine solution or chlorhexidine gluconate solution) ✓ Appropriate suture selection ✓ Appropriate needle selection ✓ Antibiotic ointment as required

PROCEDURE:

1. Position client on the stretcher, at a height that is comfortable for you. The laceration should be well lit, preferably with an overhead procedure light, and your equipment should be within easy reach.

2. Assemble equipment, perform hand hygiene and apply gloves.

3. Clean, irrigate and explore wound (may not be able to explore wound until area anesthetized).

    a. Irrigate wound with copious amounts of normal saline solution.

    b. A large (20ml) syringe with a large bore IV catheter (needle removed) is effective in forcing gout bacteria and debris from the wound.

    c. Vigorous irrigation is required to remove bacteria and particulate matter. Irrigation should continue until all visible, loose particulate matter has been removed.

4. Prepare wound by scrubbing a wide area of skin surrounding the wound with an antiseptic solution (e.g. 10% povidone-iodine solution or chlorhexidine gluconate) to remove contaminants.

    a. It is important to remove all particulate matter; any material left in the dermis may become impregnated in the healed tissue and result in a disfiguring "tattoo" effect.

    b. Avoid introducing any cleansing agent directly into the wound because many are toxic to local tissues and may interfere with wound healing.

5. Anesthetize the region (as per Procedure 11-009-01).

6. Place a single fenestrated drape or multiple folded drapes over the wound site.

7. Explore the entire depth and the full extent of the wound under direct visualization with good lighting in a bloodless field. Attempt to locate hidden foreign bodies, particulate matter, bone fragments, and any injuries to underlying structures that may require repair (e.g. tendons, ligaments, blood vessels). A metal probe or forceps will assist in the identification of deep structures and foreign bodies.

8. Debride devitalized areas as needed. If devitalized areas are extensive, a physician must be consulted.

9. Place sutures as outline in 11-010-01: *Basic Suturing Principles*.

10. The total number of **sutures** will vary by laceration. Enough sutures should be placed so that the wound edges are fully approximated. In general, the spacing between sutures should be equal to the bite width. Avoid placing an excessive number of sutures, which may increase the risk for infection and unnecessarily injure delicate tissues.

11. Administer tetanus prophylaxis in accordance with the *Nunavut Immunization Guide*.

APPLY A WOUND DRESSING

1. After wound repair, gently wipe away dried blood on the skin surface with moistened gauze to minimize subsequent itching and cover the wound with a non-adherent dressing.
2. The type of dressing will depend on the wound characteristics and the type of repair done.

    a. A dressing may involve a simple dry gauze pad or a complex multilayer dressing.

    b. Some wounds, such as sutured scalp lacerations, do not routinely require any dressing.

3. Apply topical antibiotic preparations on wound surfaces are as clinically indicated and in accordance with the *Nunavut Formulary*.

IMMOBILIZE THE INJURY

1. Wounds and sutured lacerations may be immobilization to promote healing and comfort.
2. Wounds overlying joints are subjected to repeated stretching and movement, which delays healing, widens the scar, and could possibly disrupt the sutures
3. Splints are useful for::

    a. Lacerations that overlay joints;
    b. Protection of wounds involving fingers, hands, wrists, the volar aspects of forearms, the extensor surfaces of elbows, the posterior aspects of legs, the plantar surfaces of feet; and
    c. Extremities when skin grafts have been applied.

SUTURE REMOVAL

- Remove sutures on the face on the fifth day following the injury, or remove alternate sutures on the third day and the remainder on the fifth day.
- On the extremities and the anterior aspect of the trunk, leave sutures in place for approximately 7 days to prevent wound disruption.
- Leave sutures on the scalp, back, feet, and hands and over the joints in place for 10 to 14 days, even though permanent stitch marks may result.

REFERENCES:

Edmunds, MW & Mayhew, MS (2003). *Procedures for Primary Care Practitioners*, 2nd ed. Mosby: St. Louis.

MacKay-Wiggan, J. & Ratner, D. (2009). *Suturing Techniques*.

Ratner, D. (2009). *Suturing Techniques*.

Thomsen, TW & Setnik, GS (2008). *Laceration Repair: Simple Interrupted Sutures.* Elsevier.

Thomsen, TW., Barclay, DA. & Setnik, GS (2006). Basic Laceration Repair. *New England Journal of Medicine*: 355.

Approved by:	Effective Date:
11 FEB 2011 **Chief Nursing Officer** **Date**	April 1, 2011
February 11, 2011 **Deputy Minister of Health and Social Services** **Date**	

Department of Health Government of Nunavut	NURSING POLICY, PROCEDURE AND PROTOCOLS	
	Community Health Nursing	
TITLE:	**SECTION:**	**POLICY NUMBER:**
Wound Closure: Skin Adhesive	Clinical Procedures	11-011-00
EFFECTIVE DATE: / **REVIEW DUE:**	**REPLACES NUMBER:**	**NUMBER OF PAGES:**
February 10, 2018 / February 2021		5
APPLIES TO:		
Community Health Nurses		

POLICY:

A Registered Nurse working as a Community Health Nurse may apply skin adhesive (e.g. Dermabond® for the purpose of wound closure.

Skin adhesive is not to be used if any of the following applies:

1. **Animal bites**
2. **Jagged or stellate lacerations**
3. **Severely contaminated wounds**
4. **Ulcers**
5. **Puncture wounds**
6. **Mucous membranes**
7. **Areas of high moisture content (e.g. axillae or groin)**

DEFINITION:

Dermabond is a cyanoacrylate tissue adhesive that forms a strong bond across apposed wound edges, allowing normal healing to occur below.

PRINCIPLES:

Skin adhesive may replace sutures 5-0 or smaller in diameter for laceration repair. It is best suited for small, superficial lacerations, it may also be used on larger wounds where subcutaneous sutures are needed.

RELATED POLICIES, GUIDELINES AND LEGISLATION:

Procedure 11-011-01 Applying Skin Adhesive

REFERENCES:

Burns, TB., and Worthington, JM. (2000). Using Tissue Adhesive for Wound Repair: A practical guide to Dermabond. *American Family Physician*

NURSING CONSIDERATIONS

1. Control of bleeding is the first priority, as well as assessing the ABCs.
    a. Excessive wound seepage before closure may prevent good bonding to the epithelial layer

2. Extremity and torso wounds tend to heal better when subcutaneous sutures are placed first.

3. If adhesive must be used on areas of high tension or mobility (e.g. joints), this area should be immobilized in a splint to prevent premature peeling of the adhesive.

4. When skin adhesive is used on scalp wounds, care should be taken to avoid getting excess adhesive in the client's hair.

5. Dermabond reaches maximum bonding strength in two and one-half minutes.

6. All lacerations must be thoroughly inspected for damage to underlying structures, such as tendons or bones, as well as for foreign bodies. Obtain a good history of the incident and past medical history, including immunization status (ensure Tetanus is up to date).

7. Devitalized tissue should be debrided before a wound is closed, which appears with a blue or black appearance and is often shredded. Only simple debridement shall be performed by the registered nurse.

8. Remove all rings and other jewelry from injured hands or fingers.

9. Follow the guidelines and protocols contained within the *Communicable Disease Manual* for post wound care. For example, dog bite protocol.

PROCEDURE

1. Position client on the stretcher, so excess adhesive does not run off into areas not meant to be glued. The laceration should be well lit, preferably with an overhead procedure light, and your equipment should be within easy reach.

2. Assemble equipment, perform hand hygiene and apply gloves.

3. Clean, irrigate and explore wound (may not be able to explore wound until area anesthetized).

    a. Irrigate wound with copious amounts of normal saline solution.

    b. A large (20ml) syringe with a large bore IV catheter (needle removed) is effective in forcing gout bacteria and debris from the wound.

    c. Vigorous irrigation is required to remove bacteria and particulate matter. Irrigation should continue until all visible, loose particulate matter has been removed.

4. Prepare wound by scrubbing a wide area of skin surrounding the wound with an antiseptic solution (e.g. 10% povidone-iodine solution or chlorhexidine gluconate) to remove contaminants.

    a. It is important to remove all particulate matter; any material left in the dermis may become impregnated in the healed tissue and result in a disfiguring “tattoo” effect.

    b. Avoid introducing any cleansing agent directly into the wound because many are toxic to local tissues and may interfere with wound healing.

5. Anesthetize the region if indicated (as per Procedure 11-009-01).

6. Place a single fenestrated drape or multiple folded drapes over the wound site.

7. Explore the entire depth and the full extent of the wound under direct visualization with good lighting in a bloodless field. Attempt to locate hidden foreign bodies, particulate matter, bone fragments, and any injuries to underlying structures that may require repair (e.g. tendons, ligaments, blood vessels). A metal probe or forceps will assist in the identification of deep structures and foreign bodies.

8. Debride devitalized areas as needed. If devitalized areas are extensive, a physician must be consulted.

9. Dermabond comes in a single-use vial in sterile packaging. It consists of an outside plastic casing with an inner glass ampule containing 0.5 mL of adhesive that can be expressed through the applicator tip once the vial has been crushed.

10. The edges of the wound must be approximated manually and evenly. If there is uncertainty about whether this can be done, the wound should probably be sutured instead.

11. Crush the vial between the thumb and index finger and inverted. The vial must be used within a few minutes.

12. Gently squeeze the vial so the adhesive until a drop begins to form at the applicator tip. Then apply to the apposed wound edges with gentle brushing motions. Never press the applicator tip into the wound.

    a. After applying adhesive across the wound edges, hold the edges together for at least 30 seconds before releasing.

b. Reapply the adhesive in an oval pattern (at least three layers) around the wound to add greater strength to the wound closure.

c. The first layer of adhesive reaches maximal strength within two and one-half minutes; the subsequent layers usually take longer to dry because less moisture is available for polymer formation.

13. If the adhesive inadvertently covered an area not intended to be glued, it should be wiped off immediately with dry gauze.

    a. If a finger or forcep becomes inadvertently adhered to the client during the procedure, place pressure on the client's skin adjacent to the edge of the object and gently roll the object away.

14. If the wound edges are aligned, the wound should not be touched until the adhesive dries completely

    a. If the wound edges are not aligned after the first application of adhesive, wipe the adhesive off immediately with dry gauze. (a window of approximately 10-seconds before the adhesive cannot be wiped off).

    b. If the adhesive has already dried, apply an antibiotic ointment or petroleum jelly for 30 minutes to loosen the adhesive for removal.

15. Do not apply topical antibiotics to the closed wound because of the risk of causing the adhesive to break down and peel prematurely.

16. Administer tetanus prophylaxis in accordance with the *Nunavut Immunization Guide*.

17. A wound dressing is not required, as the skin adhesive acts as a water-resistant bandage. However, a bandage may be applied to children to prevent the child from 'picking' at their wound.

CLIENT EDUCATION

1. Dermabond must be kept dry for at least five days for normal healing.

    a. Client may shower normally but must be instructed to pat the area dry immediately following the shower.

    b. Avoid taking baths to avoid premature peeling.

2. Instruct the client to monitor the wound for infection and to contact the nurse-on-call if any signs or symptoms are noted.

DOCUMENTATION

Document the history and physical examination in the client health record, including any preliminary x-ray findings. If a physician was consulted, document his/her name and any recommendations given.

Clearly document the procedure, client teaching, and any follow-up arranged.

Complete WSCC forms, if applicable.

Approved by: 11 FEB 2011 **Chief Nursing Officer** **Date**	Effective Date: April 1, 2011
February 11, 2011 **Deputy Minister of Health and Social Services** **Date**	

Department of Health Government of Nunavut	NURSING POLICY, PROCEDURE AND PROTOCOLS
	Community Health Nursing

TITLE:		SECTION:	POLICY NUMBER:
Cerumen Removal		Clinical Procedures	11-012-00
EFFECTIVE DATE:	**REVIEW DUE:**	**REPLACES NUMBER:**	**NUMBER OF PAGES:**
February 10, 2018	February 2021		7
APPLIES TO:			
Community Health Nurses			

POLICY:

Registered nurses, working in the expanded role, may remove cerumen from a client's ear when cerumen impaction is visualized. The following methods are acceptable for the nurse to use in removing impacted cerumen:

1. **Instilling a ceruminolytic into the ear canal and/or**
2. **Irrigating and syringing the canal with warm water**

Mechanical removal of cerumen with ear curettes may be performed by the nurse upon a physician's order.

Cerumen removal will not be performed when:

1. **Multiple prior failed attempts and/or presence of complications from prior attempts including tympanic membrane (TM) perforation and infection;**
2. **Client unable to cooperate;**
3. **Otitis media (chronic or acute) or Otitis externa;**
4. **Past or present TM perforation;**
5. **History of ear or mastoid surgery; and/or**
6. **Contralateral deafness.**

DEFINITIONS:

Cerumen is composed mostly of exfoliated squamous epithelium and two types of glandular secretions: sebaceous and ceruminous. Cerumen is a natural lubricator, protectant, and antibacterial substance.

PRINCIPLES:

Cerumen impaction can cause significant discomfort and impair hearing.

RELATED POLICIES, GUIDELINES AND LEGISLATION:

Procedure 11-012-01 Cerumen Removal

REFERENCES:

Burton, MJ. & Doré, CJ (2003). Ear Drops for the Removal of Ear Wax. *Cochrane Database of Systematic Reviews*, 3.

Edmunds, MW & Mayhew, MS (2003). *Procedures for Primary Care Practitioners*, 2nd ed. Mosby: St. Louis.

Roberts, RR. (2004). Cerumen Impaction Removal. Emergency Medicine Procedures. pp 1267-1272. McGraw-Hill: New York.

Riviello, RJ (2004). Otolaryngolic Procedures. *Clinical Procedures in Emergency Medicine*, 4th ed., pp 1280-1316. Philadelphia, WB Saunders.

NURSING CONSIDERATIONS:

1. Cerumen removal is contraindicated when:

    a. Multiple prior failed attempts and/or presence of complications from prior attempts including tympanic membrane (TM) perforation and infection;
    b. Client unable to cooperate;
    c. Otitis media (chronic or acute) or Otitis externa;
    d. Past or present TM perforation;
    e. History of ear or mastoid surgery; and/or
    f. Contralateral deafness.

2. The inner one third of the canal is lined with skin that is only 0.1 mm thick, so special care should be taken to avoid iatrogenic traumatic injury to this area

3. Signs and symptoms of cerumen impaction:
    a. Hearing loss (conductive), especially unilateral
    b. Foreign body sensation; ear fullness
    c. Tinnitus (uncommon)
    d. Vertigo or “dizziness” (uncommon)
    e. Mild pain or discomfort (earache)
    f. Pruritus
    g. Reflex cough

4. Irrigation is the primary removal method. It is generally well tolerated and less painful than manual extraction.

5. The irrigation fluid (water or normal saline) must be warmed to body temperature to reduce the incidence of cold-caloric response with symptoms of nausea, vomiting, nystagmus, and vertigo.

6. Antibiotics are not routinely necessary. Some degree of erythema of the canal and tympanic membrane is expected after removal attempts.

7. Unsuccessful removal and minimal post-removal discomfort and/or erythema are the most common complications. Proper planning and appropriate, unrushed technique will minimize the risk of more significant complications. Although rare, **when significant complications do occur, they almost always warrant specialty consultation**.

8. Potential complications include:
    a. Unsuccessful removal
    b. Abrasions or other injury to the canal
    c. Bleeding (usually mild and self-limited)
    d. Tympanic membrane perforation with possible hearing loss, pain, tinnitus, infection
    e. Otitis externa
    f. Otitis media
    g. Ossicular dislocation, injury with possible hearing loss, tinnitus, pain
    h. Allergic reaction to ceruminolytic

EQUIPMENT
✓ Adequate light source (e.g. head/ENT lamp, head reflector, otoscope) ✓ Ear speculum (largest tolerated) with or without magnifying loops ✓ Eye protection and/or face shield (as per universal precautions) ✓ Ceruminolytic (water based vs. alcohol or oil based) ✓ Ear curette, right-angle hook ✓ 30-mL or 60-mL syringe ✓ Angiocatheter or butterfly tubing ✓ Irrigating fluid warmed to body temperature ✓ Basin ✓ Towels

PROCEDURE:

1. Explain the procedure to the client, parent and/or caregiver.

2. Position the client in a comfortable position, preferably lying down on the examining table

3. If appropriate, have the parent or caregiver seated facing the patient to provide reassurance.

Application of Ceruminolytics

1. In general, if ceruminolytics are used, they should be used several times before removal is attempted. It is possible to pre-treat with softeners as a one-time dose, leaving them in for at least 15 minutes before irrigation or curette removal; however, multi-day pretreatment is recommended.
    a. Water-based agents: dosing varies
        i. 4 drops twice daily for 5 days

        ii. For one-time dosing (prior to syringing or curette removal), 1 mL for 15 minutes

    b. Oil- and alcohol-based agents: dosing varies
        i. 4-10 drops twice daily for 5-7 days
        ii. 4-5 drops nightly for 3 days
        iii. For one-time dosing (before syringing or curette removal), 1 mL for 15 minutes

Irrigation and Syringing

1. Fill a 60-mL syringe with body-temperature tap water or normal saline for irrigation of the external auditory canal (EAC). Attach an 18- to 20-gauge plastic intravenous catheter or a butterfly catheter (with the needle removed) to the syringe.

2. Place a towel or basin under the client's ear to collect the effluent.

3. Straighten the EAC by pulling the pinna posteriorly and laterally.

4. Insert the catheter (or butterfly tubing) approximately 1 cm into the EAC and begin to irrigate. Aim the stream superiorly and slightly posteriorly to decrease likelihood of stream directly striking the tympanic membrane. Usually 30-60 mL of fluid is used.

5. Stop if there is any suspected trauma, sudden pain, hearing loss, or cold-caloric symptoms.

6. After irrigation, position the client's head with the affected ear down on a towel for a minute or two to allow the irrigation fluid and/or waxy debris to drain out.

7. Re-examine the affected canal. Remove superficial dislodged debris with a curette under direct visualization.

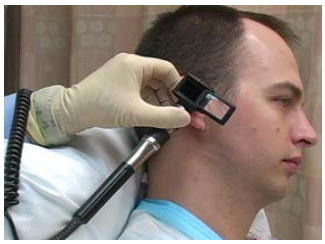
8. Repeat syringing if needed.

Manual Extraction

1. Directly visualize the impacted cerumen using an otoscope. All manual extraction methods must be done under direct visualization to prevent iatrogenic injury.

2. Slide the otoscope's magnification lens off to the side to allow the passage of the instrument through the scope.

3. Rest your hand (the one holding the otoscope) against the client's head during the procedure. This allows your hand to move as a unit with the client's head and prevents injury should the client suddenly move.

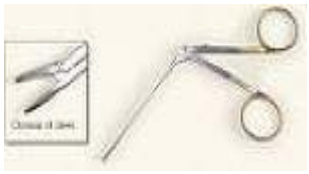


Proper use of otoscope for extraction

4. A variety of instruments and manoeuvres may be used for manual extraction.

    a. Use an ear curette (scoop) to gently separate the cerumen from the EAC wall, and then to drag and pull out the waxy debris.

    b. Use alligator forceps to directly grasp cerumen that has been freed from the EAC wall.



5. Re-examine the canal for confirmation of removal and to evaluate for iatrogenic injury.

6. Significant complications, repeated treatment failures, or complicating factors including the presence of relative contraindications to removal attempts should be referred to the physician and/or otolaryngologist for specialty care.

CLIENT EDUCATION:

Provide client and/or parent or caregiver with appropriate aftercare instructions.

1. Instruct clients not to insert cotton swabs or other objects into the ear canal.

2. Provide instructions on periodically using ceruminolytics to decrease likelihood of recurrent impaction, if appropriate.

3. Arrange a follow-up appointment with the client if:

    a. The treatment plan involves a multi-day wax-softening treatment;

    b. Initial removal attempts are unsuccessful; or

    c. Minor complications occured.

REFERENCES:

Burton MJ and Doré CJ (2003). Ear Drops for the Removal of Ear Wax. *Cochrane Database of Systematic Reviews,* 3.

Riviello RJ (2004). Otolaryngolic Procedures. *Clinical Procedures in Emergency Medicine, 4th ed.* Philadelphia, Saunders, pp 1280-1316.

Thomsen, TW and Setnik, GS (2009). *Cerumen Removal* in Emergency Medicine.

Approved by: 11 FEB 2011 **Chief Nursing Officer** **Date**	Effective Date: April 1, 2011
February 11, 2011 **Deputy Minister of Health and Social Services** **Date**	

Department of Health Government of Nunavut	NURSING POLICY, PROCEDURE AND PROTOCOLS		
	Community Health Nursing		
TITLE:		**SECTION:**	**POLICY NUMBER:**
Measuring Intra-Ocular Pressures		Clinical Procedures	11-013-00
EFFECTIVE DATE:	**REVIEW DUE:**	**REPLACES NUMBER:**	**NUMBER OF PAGES:**
February 10, 2018	February 2021		5
APPLIES TO:			
Community Health Nurses			

POLICY:

The Registered Nurse, who has received additional training in tonometry, shall be authorized to measure intraocular pressures when clinically indicated. The nurse shall use the Tono-pen to measure intraocular pressures for the following clinical incidences:

1. **Confirmation of a clinical diagnosis of acute angle-closure glaucoma;**
2. **Determination of a baseline ocular pressure after blunt ocular injury;**
3. **Determination of a baseline ocular pressure in a patient with iritis;**
4. **Documentation of ocular pressure in the client at risk for open-angle glaucoma**

Tonometry shall not be performed in the following clinical incidences:

1. **When the cornea cannot be completely anesthetised (e.g. client allergy to the local anesthesia).**

2. **With a suspected penetrating ocular injury.**

3. **The presence of corneal defects represents a relative contraindication to tonometry and requires physician consultation.**
   - **For example, the use of a tonometer on an abraded cornea may lead to further injury.**

4. **Clients who cannot maintain a relaxed position.**
   - **For example, significant apprehension, blepharospasm, uncontrolled coughing, nystagmus, or uncontrolled hiccups**

DEFINITIONS:

Tonometry is the estimation of intraocular pressure. It is obtained by measuring the resistance of the eyeball to indentation by an applied force.

Tono-pen is a pocket-size tonometer that uses the Mackay-Marg principle. The Tono-pen calculates an average intraocular pressure after four valid measurements.

PRINCIPLES:

- Early detection of elevated intraocular pressures is essential to preserving eye sight.
  - Prolonged elevated intraocular pressure is associated with visual field loss and blindness.
  - Sudden elevation of intraocular pressures can result from trauma or primary angle-closure glaucoma.
- The Tono-pen is a useful screening tool. If an elevated intraocular pressure is measured, the client requires additional testing by applanation tonomety in a designated referral site.

RELATED POLICIES, GUIDELINES AND LEGISLATION:

Procedure 11-013-01 Measuring Intra-Ocular Pressures: Tono-pen

REFERENCES:

Thomsen, TW and Setnik, GS (2009). *Measurement of Intraocular Pressure: Tono-pen technique*.

PROCEDURE 11-013-01

NURSING CONSIDERATIONS:

Follow the manufacturer's specific instructions for Tono-pen use. This procedure is an addendum to the manufacturer's instructions.

1. Tonometry is the estimation of intraocular pressure (IOP). It is obtained by measuring the resistance of the eyeball to indentation by an applied force.

2. Prolonged elevated IOP is associated with visual field loss and blindness.

3. Sudden elevation of IOP can result from trauma or primary angle-closure glaucoma.
    a. Suspect glaucoma in clients with the following symptoms: acute aching pain in one eye, blurred vision (including "halos" around lights), a red eye with a smoky cornea, and a fixed mid-position pupil.
    b. Sometimes the presentation of acute angle-closure glaucoma is less dramatic with systemic complaints, including nausea, vomiting, and headache. On occasion, these clients may even deny complaints of pain in or about the eye.

4. There are a variety of techniques used to measure intraocular pressure. Devices used for tonometry include the Goldmann tonometer, the pneumatic applanation tonometer, the Schiøtz tonometer, and the Mackay-Marg tonometer (permits a continuous tonographic recording).

    The Tono-pen and Schiotz tonometer are both available in the community health centre setting.

5. The Tono-Pen and Tono-Pen XL are pocket-size tonometers which use the Mackay-Marg tonometer principle.
    a. A transducer tip sits on the cornea to measure resistance to the movement of the plunger in the transducer tip.
    b. The Tono-Pen XL calculates an average intraocular pressure after four valid measurements.
    c. It is a portable, lightweight, relatively accurate with built-in provisions for calibration.

EQUIPMENT
✓ Tono-Pen or Tono-Pen XL ✓ Disposable latex cover for the tip of the Tono-pen ✓ Topical ocular anesthetic (e.g., tetracaine, proparacaine) ✓ Non sterile gloves 

PROCEDURE:

1. Place the client in a comfortable position for both the client and the nurse. With the use of the Tono-pen, the client can be positioned in any tolerated position as long as the device can be applied perpendicular to the corneal surface.

2. Explain the procedure, perform hand hygiene and put on gloves.

3. Instil a local ocular anaesthetic to the cornea and wait about 30 seconds.

4. Ask the client to look at a fixed object (the client's own thumb or finger held directly in front of his or her eyes may work) and to keep absolutely still.

5. With the thumb and index finger of one hand, gently hold open the client's eyelids, taking care not to put any pressure on the eye.

6. Apply the latex cover snugly over the probe tip of the Tono-pen.

7. Perform calibration before use at least once daily.

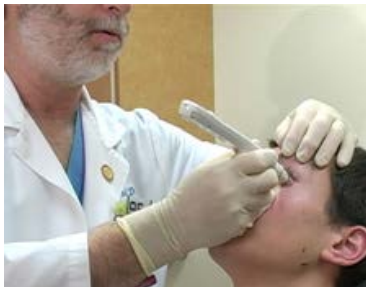
    a. Hold the probe vertically with the tip pointing straight down.
    b. Press and release the activation switch twice in rapid succession. Two beeps will then sound, and "CAL" will appear (on LCD).
    c. Hold the probe in this position (up to 20 seconds) until a beep sounds and "-UP-" appears (on LCD). Immediately turn the probe 180 degrees so that the tip points straight up. In a few seconds, another beep occurs, and the LCD changes.
    d. If the LCD reads "Good," the calibration was successful. If the LCD reads "bAd," the calibration was unsuccessful.
    e. With an unsuccessful calibration, repeat the calibration steps just described until two consecutive "Good" readings are obtained.
    f. If further attempts at calibration are unsuccessful, loosen the Ocu-Film tip cover and repeat the calibration process.
    g. If attempts are still unsuccessful, press the RESET button and repeat the process.
    h. If still unsuccessful, use compressed air to clean the probe tip and repeat the process.
    i. If still unsuccessful, the battery should be replaced and the process repeated.
    j. Continued failure warrants a call to the designated biomedical technician.

8. Proceed to measurement once the device is calibrated and the client is prepared as previously outlined

9. Depress and release the activation switch to obtain "====" (on LCD screen).

    a. A beep will occur when ready.
    b. If the switch is not depressed long enough, the LCD will be blank.
    c. If a blank screen is seen, press and release the activation switch again to obtain "====" (on LCD).

10. Hold the probe like a pen, and rest the heel of your hand against the patient's cheek.



11. Quickly and lightly touch the cornea at least four times until four valid readings are obtained.

12. A click will sound and a reading will appear on the LCD each time a valid reading is obtained.

13. After four valid readings, a final beep will sound and the averaged measurement will appear on the LCD.

    a. The number represents the IOP in millimeters of mercury (mm Hg).
    b. The associated bar reflects the statistical reliability (a reading of >20% reflects an unreliable measurement and should be repeated).

14. If four dashes ("----") appear on the LCD after the final beep, too few valid readings were obtained.

    a. In such a case, reactivate the probe (without recalibration) and repeat the measurement procedure.
    b. If the probe is not reactivated within 20 seconds, the LCD will clear, but the device can be activated as noted previously without recalibration.

15. Discuss the tonometer readings with the physician and arrange follow-up care as appropriate.

16. Store the device with an unused Ocu-Film cover protecting the probe tip.

REFERENCES:

Thomsen, TW and Setnik, GS. (2008). *Measurement of Intraocular Pressure: Tono-pen technique.*

Approved by:	Effective Date:
11 FEB 2011 **Chief Nursing Officer** **Date**	April 1, 2011
February 11, 2011 **Deputy Minister of Health and Social Services** **Date**	

Department of Health Government of Nunavut	NURSING POLICY, PROCEDURE AND PROTOCOLS
	Community Health Nursing

TITLE:		**SECTION:**	**POLICY NUMBER:**
Pap Smear		Clinical Procedures	11-014-00
EFFECTIVE DATE:	**REVIEW DUE:**	**REPLACES NUMBER:**	**NUMBER OF PAGES:**
February 10, 2018	February 2021		5

APPLIES TO:
Community Health Nurses

POLICY:

PAP smears shall be offered to adolescent girls and women in accordance with the recommendations of Canadian Task Force on Preventive Health Care and any clinical guidelines sanctioned by the Department of Health and Social Services. Registered nurses, who have received additional training from the clinical educator/delegate, are authorized to perform papanicolaou (PAP) smear testing in adolescent girls and women.

If a male health care provider is to perform a PAP smear, another female staff member of the health centre shall also be present in the room during the procedure.

DEFINITION:

PRINCIPLE:

- PAP smear testing is an effective tool for cancer prevention and early detection. It is a screening test and is not diagnostic.
- Liquid-based cytology test kits have a greater sensitivity and specificity; lower rate of unsatisfactory specimen samples; and allows for adjunctive HPV_DNA testing of same sample.

RELATED POLICIES, GUIDELINES AND LEGISLATION:

Procedure 11-014-01 Performing a Pap Smear
Policy 11-015-00 Wet Mount

REFERENCES:

Murphy, KJ & Howlett, R. (2007). Canadian Consensus Guidelines on Human Papillomavirus. *Journal of Obstetrics and Gynaecology Canada 29(8).*

Canadian Task Force on Preventive Health Care (1992). *Screening for Cervical Cancer.*

NURSING CONSIDERATIONS:

The frequency in which PAP smear screening is offered to adolescent girls and women shall be in accordance with the recommendations of the Canadian Task Force on Preventive Health Care and any additional clinical guidelines sanctioned by the Department of Health and Social Services.

1. There is no evidence that women who are pregnant should be screened any differently than women who are not.
2. A PAP smear consists of sampling the endocervical canal and the entire transformation zone.
3. The client should avoid douching, vaginal medications and intercourse for 24 hours prior to the procedure.
4. Ensure the room and equipment is warm. Maintain client privacy throughout the exam.

Cervical Anatomy:

1. The cervix is the distal portion of the uterus. Other segments of the uterus, moving proximally, are the isthmus, the corpus, and the fundus.

2. The endocervical canal is closed off from the main cavity of the uterus by a narrowing at the cervical isthmus.

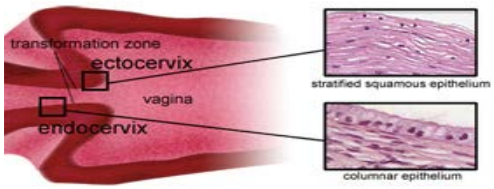
3. The external opening on the cervix is the external os. The vaginal vault just outside the cervix ends at the vaginal fornix.

4. The area of the **squamocolumnar junction** marks the transition from the squamous epithelium of the exterior cervix to the columnar epithelium of the endocervical canal.

5. **Transformation zone** sampling:
   - **a.** The transformation zone cells are far more susceptible to the HPV virus and thus are the primary target of sampling for the Pap smear.

   - **b.** Successful Pap smear technique requires sampling from the active transformation zone in women with an intact cervix, or vaginal cuff for those status post hysterectomy.

   - **c.** The position of the transformation zone varies according to age. Women of childbearing age, the transformation zone is more often exposed (on the ectocervix), whereas in postmenopausal women, the transformation zone often is located within the endocervical canal.



Pap Smears in Pregnancy

1. During pregnancy, the cervix progressively enlarges, the **squamocolumnar junction** displaces outward, mucus becomes thicker and more abundant, and the cervix becomes much more vascular.

2. Extra care must be taken when gently blotting off excess mucus and when applying the Pap sampling device, especially after 20 weeks gestation. Do not disturb the mucous plug.

3. Despite these changes, evidence supports that Pap smears remain similarly sensitive and specific compared with the nonpregnant state, and that the pregnant state itself does not accelerate or worsen cervical dysplasia**.** In most women, the first-trimester cervix appears very similar to the nonpregnant cervix and behaves the same way as in the nonpregnant state.

4. The active transformation zone everts or externalizes progressively with advancing gestation, therefore, there is little need to probe or sample the cervical canal.

5. Ideally, obtain the Pap smear as early in pregnancy as possible to avoid exaggerated spotting and the discomfort the client experiences in the lithotomy position with an advanced gestation.

6. Be gentle while rotating the brush because cervical bleeding is more common in pregnancy. If the PAP is being performed beyond 10 weeks gestation, only the spatula should be used.

EQUIPMENT	
✓ Appropriate sized disposable speculum (use metal sterile speculum as indicated) ✓ Water-soluble lubricant (for bimanual exam) ✓ Nonsterile gloves ✓ Cervical broom **OR** Cervical brush and plastic spatula ✓ Media for liquid-based testing	✓ Culture swabs as necessary (e.g. for gonorrhoea, Chlamydia, herpes, etc) ✓ Cotton swabs and transport media for wet mount as necessary ✓ Laboratory requisition forms

PROCEDURE:

1. Obtain a medical history and review of systems. Clarify the client's risk factors for cervical dysplasia and review past PAP results if available.

2. Position client on the exam table/ stretcher in the lithotomy position, drape appropriately.

3. Prepare all equipment and supplies and test equipment. Apply non sterile gloves

4. Inspect the external genitalia and evaluate for discolouration, erythema, inflammation, lesions, rashes, masses, and tenderness. Ask the client if she has any concerns.

5. Choose a speculum that is of an appropriate size for the client.

6. Warm speculum with warm water and insert it. (Do not use lubricant on the speculum, particularly if additional cultures or wet mount are to be collected). Carefully advance the speculum, applying gentle pressure posteriorly.

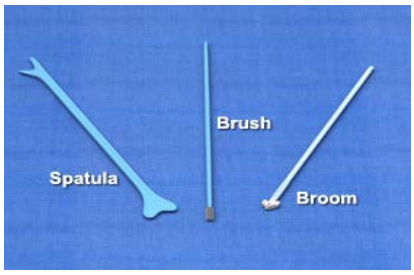
7. Open the speculum to adequately visualize the cervix, then tighten the screw or lock the speculum into place.

8. Examine the cervix and note any signs of inflammation, infection, erosions or ulcerations, or condylomata. Avoid rubbing or otherwise traumatizing the cervix.

9. Identify cervical landmarks, including the transformation zone with its squamocolumnar junction.

10. Note the nature of the cervical mucus. Markedly excessive mucus or discharge may be gently blotted, not rubbed, from view. However, mucus actually may contain the exfoliated cells needed for microscopic examination. So, unless truly necessary, do not remove this mucus; include it in the sample.

11. Examine the vaginal fornices for obvious abnormalities.



12. Obtain the Pap smear by using either a cervical broom device or a combination of a cervical brush and a spatula. Follow the manufacturer`s specifications

13. Cervical Broom:

    a. Insert the central or longest bristles into the cervical canal
    b. Apply gentle pressure to allow the outer bristles to contact the cervix.
    c. Rotate the broom clockwise five turns.

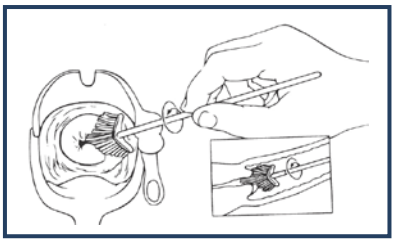
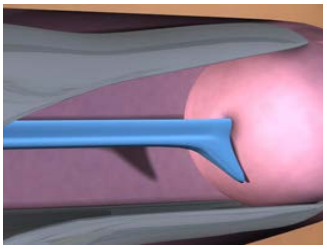
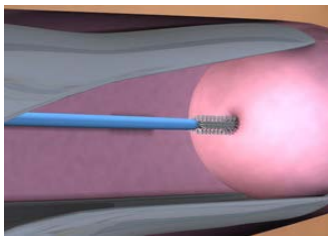


Figure 1: Obtaining the PAP smear using cervical brush (Adapted from Cytyc Corp).

14. Combination Spatula and Cytobrush:
    a. Insert the contoured end of the plastic spatula and rotate 360 degrees around the entire exocervix.



    b. Insert the cytobrush into the endocervix until only the bottom most bristles are exposed at the os. Slowly rotate ¼ to ½ turn. Do not overturn the brush to avoid unnecessary bleeding.



15. Disconnect the broom, spatula quid transport vial. Ensure the cap is tightened so leakage during transportation does not occur.

Adapted from Cytyc Corp, Malborough, MA.

16. If the client has had a hysterectomy, be sure to sample the vaginal cuff itself.

17. If clinically indicated, collect other appropriate cervical cultures and/or wet mount samples.

18. Examine the vagina by slowly withdrawing the speculum, which is held slightly open, allowing the vagina to collapse over the blades. Note abnormalities.

19. Lubricate the gloved hand and proceed with the bimanual examination.
    a. Pay particular attention to palpated abnormalities of the introitus, vagina, fornices, and cervix.
    b. Palpate the areas of Skene's and Bartholin's glands.
    c. Ask your client to bear down, and observe for uterine or pelvic floor prolapse and for leakage of urine. Having her cough facilitates assessment of pelvic support

20. Complete the remainder of the bimanual examination, noting size, contour, tenderness, and mobility of the uterus and adnexal structures.

21. Perform a rectal examination, as clinically indicated and as recommended by the Canadian Task Force on Preventive Health Care and any clinical guidelines sanctioned by the Department of Health and Social Services.

22. Make sure the Pap smear requisition form includes all pertinent data regarding your client, including clinical findings and client risk factors.

23. Clearly label all specimens with the client's identifier data.

22. Safely dispose of used equipment and supplies.

23. Inform the client to expect minor spotting or cramping, especially when performed during pregnancy.

24. Ensure accurate follow-up contact information is available on the client's health record and discuss the client's preferences for contact methods.

REFERENCES:

Arbyn M, Bergeron C, Klinkhamer P, et al (2008). Liquid Compared with Conventional Cervical Cytology. *Obstetrics & Gynecology.* 111: 167.

Murphy, KJ & Howlett, R. (2007). Canadian Consensus Guidelines on Human Papillomavirus. *Journal of Obstetrics and Gynaecology Canada 29(8).*

Canadian Task Force on Preventive Health Care (1998). *Screening for Cervical Cancer.*

Approved by:	Effective Date:
11 FEB 2011 **Chief Nursing Officer** **Date**	April 1, 2011
February 11, 2011 **Deputy Minister of Health and Social Services** **Date**	

Department of Health Government of Nunavut	NURSING POLICY, PROCEDURE AND PROTOCOLS
	Community Health Nursing

TITLE:		SECTION:	POLICY NUMBER:
Wet Mount		Clinical Procedures	11-015-00
EFFECTIVE DATE:	**REVIEW DUE:**	**REPLACES NUMBER:**	**NUMBER OF PAGES:**
February 10, 2018	February 2021		6

APPLIES TO:
Community Health Nurses

POLICY:

Registered nurses may collect and analyze a wet mount specimen when clinically indicated. A physician`s order is not required to collect the specimen.

Indications for collecting a wet mount specimen include, but not limited to:
1. **Vaginal discharge**
2. **Vulvar or vaginal pruritus**
3. **Vulvar or vaginal pain**
4. **Malodours vaginal secretions.**

DEFINITION:

Wet mount is a microscopic procedure which a vaginal secretion sample is collected and analyzed.

PRINCIPLE:

- The wet mount is the most useful technique available for the diagnosis of certain vaginal infections.
- A wet mount sample should be collected on all women with vaginal symptoms, despite a seemingly obvious diagnosis.
- The wet mount is about 80% sensitive, however, the quality of sample and the viewer`s experience will affect the sensitivity rate.

RELATED POLICIES, GUIDELINES AND LEGISLATION:

Policy 11-014-00 Pap Smear
Procedure 11-014-01 Performing a Pap Smear
Procedure 11-015-01 Collecting a Wet Mount Specimen
Refernce 11-015-02 Interpreting a Wet Mount
Public Health Agency of Canada (2006). *Canadian Guidelines for Sexually Transmitted Infections*

REFERENCES:

Edmunds, MW & Mayhew, MS (2003). Procedures for Primary Care Practitioners, 2nd ed. Mosby: St. Louis.
Carcio, HA (1999). *Advanced Health Assessment of Women*. Lippincott Williams & Wilkins

NURSING CONSIDERATIONS:

1. Relative contraindications for collecting a wet mount include: recent douching, intravaginal medications and menses.

2. If the pH test tape is available in the health centre, it may be used for screening specific types of vaginitis. Generally, the following conditions are indicated various pH values:

    a. Normal flora: pH < 4

    b. Candidiasis: pH 4 to 5

    c. Bacterial vaginosis: pH 5 to 6

    d. Trichomoniasis: pH 6 to 7

3. The client should be instructed to empty her bladder before performing the test.

4. Arrange follow up as indicated by the results of the wet mount specimen examination.

5. Treatment and education shall be in accordance with the *Canadian Sexually Transmitted Infections* and the *Nunavut Formulary*.

EQUIPMENT
✓ Well lit & warm room with additional 'focused' light source (e.g. light attached to a speculum)
✓ Paper drapes
✓ Two pairs of non sterile gloves
✓ Specula of varying sizes
✓ Method for warming speculum if a metal one is used
✓ Cotton-tipped applicators
✓ Glass slides and coverslips
✓ Small test tubes
✓ Culture swabs for testing Chlamydia and gonorrhoea (if urine test not used)
✓ Normal saline solution
✓ 10% KOH solution
✓ Microscope
✓ pH test tape (if available)
✓ Appropriate forms and requisitions as needed.

PROCEDURE:

1. Gently insert the vaginal speculum (no lubricants, except water to be used) and visualize the vaginal walls and cervix, noting any lesions, erosions, ulcerations, leukoplakia, or condylomata. Observe the vaginal discharge: note the amount, the colour, and any odour.

2. Collect a copious amount of vaginal discharge with a cotton swab and place it in a tube containing 1ml of normal saline. Vigorously mix the swab in the saline.

3. The pH test tape (if available in the health centre) may be directly applied to the vaginal wall, or the tape can be touched to the speculum after it's removed.

4. If collecting cultures for Chlamydia and gonorrhoea at the same time that the wet smear specimens are obtained (Urine specimen is the standard practice in Nunavut for testing for Chlamydia and gonorrhoea). Insert the appropriate applicators directly into the cervical canal until the tip is completely inside the os. Gently twirl the tip several times in the os (leaving it in there for several seconds to absorb organisms).

5. Withdraw the applicator and place in the proper containers.

6. Remove the speculum and conduct a bimanual examination if it is indicated. Save the speculum so that, if for some reason a repeat specimen needs to be obtained, a sample may be obtained from the upper edges for a repeat wet mount, pH testing and the whiff test.

7. Place one large drop of saline mixture in the centres of two glass slides (or on each end of one slide).

8. Add one drop of KOH to one speculum and sniff it immediately for the characteristic "fishy" odour of bacterial vaginosis.

9. Cover both specimens with coverslips. Plan to view the plain saline specimen first, to allow time for the KOH to lyse cells before looking for Candida.

10. Alternatively, use two test tubes with 0.5ml saline in one tube and 0.5ml KOH (10% to 20% in the other tube. Collect two specimens with cotton swabs; dip one specimen swab into saline, stir three or four times, and dilute until slightly opaque; dip the other specimen swab into KOH, and stir once or twice, leaving a thick, concentrated specimen. Take a few drops from each test tube and put on a slide, covering with a slide cover.

11. With the 10X lens in place, using low-power light, and with the condenser in the lowest position, place the slide on the stage and lower the objective until it is as close to the slide as possible.

12. Adjust the eyepieces until a single round field is seen. Turn the coarse focus knob until the specimen is focused. Use the fine-focus knob to bring the specimen into sharp focus.

13. Examine the slide in a systematic manner, until you have a general impression of the number of squamous cells.

14. Switch to high power (40X); it may be necessary to slightly increase the amount of light.

15. Move to the KOH slide. Switch back to low power to scan the slide for Candida. If hyphae, spores or buds are noted, switch to high power to confirm impression.

16. Be sure to wipe any spilled fluid from the stage. If the objective becomes contaminated, use only special lens paper to clean it.

REFERENCES:

Edmunds, MW & Mayhew, MS (2003). Procedures for Primary Care Practitioners, 2nd ed. Mosby: St. Louis.

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11 FEB 2011 **Chief Nursing Officer** **Date**	April 1, 2011
February 11, 2011 **Deputy Minister of Health and Social Services** **Date**	

REFERENCE SHEET 11-015-02

INTERPRETATION OF RESULTS

1. Evaluate the saline slide for:
    a. Vaginal epithelial cells (flat with sharp, clear edges),
    b. Clue cells (epithelial cells covered with bacteria, obscuring the edges of the cell and giving the cell a granular “moth-eaten” appearance),
    c. Bacteria (normal vaginal bacteria),
    d. Lactobacilli (large rods),
    e. White blood cells (a few are normal but should not exceed the number of epithelial cells), and
    f. Trichomonas (ovoid, flagellated organisms recognizable by their motility).
2. Even if one organism is identified, continue to scan the slide systematically to evaluate the specimen fully. Vaginitis may have multiple causes.
3. Evaluate KOH slide for evidence of Candida (branching pseudohyphae)

WET MOUNT INTERPRETATIONS					
	Physiologic	**Candida**	**Gardnerella**	**Trichomonas**	**Atrophia**
Symptoms	None	Pruritus, burning	May have pruritus, burning	May have pruritus	Vulvar, vaginal dryness
Odour	None	Yeast odour	Fishy or musty	Varies	Varies
Increased mucosal erythema	None	Yes	May or may not have this	Yes	May or may not have this
Consistency	Floccular	Thick curd like	Thin, creamy	Copious, frothy	Mucoid, blood tinged
pH	3.5 – 4.1	3.5 – 4.5	5 – 6	6 – 7	As high as 7.0
Wet smear	Rare WBCs, large gram-positive rods; squamous epithelial cells	Budding, filaments spores, pseudohyphae	Clue cells	Copious WBCs, trichomonads	Copious WBCs and parabasal and intermediate cells; paucity of superficial cells
KOH		Budding filaments spores, pseudohyphae	Fishy odour, musty odour		

Adapted from: Edmunds, MW & Mayhew, MS (2003). Procedures for Primary Care Practitioners, 2nd ed. Mosby: St. Louis.

Department of Health Government of Nunavut	NURSING POLICY, PROCEDURE AND PROTOCOLS
	Community Health Nursing

TITLE:		SECTION:	POLICY NUMBER:
Episiotomy		Clinical Procedures	11-016-00
EFFECTIVE DATE:	**REVIEW DUE:**	**REPLACES NUMBER:**	**NUMBER OF PAGES:**
February 10, 2018	February 2021		2

APPLIES TO:
Community Health Nurses

POLICY

Registered Nurses may not perform episiotomies in the health centre setting. The only exception to this policy would be in an obstetrical emergency, whereby delivery of the infant is impeded by a breech presentation or shoulder dystocia.

DEFINITIONS

Breech Presentation is defined as a fetus in a longitudinal lie with the buttocks or feet closest to the cervix.

Shoulder Dystocia occurs when, after delivery of the fetal head, the baby's anterior shoulder becomes stuck behind the mother's pubic bone. Delivery is then impeded.

PRINCIPLES

- Shoulder dystocia is an obstetrical emergency and has the potential for causing significant, lifelong injury or even fetal demise. Episiotomy is not a mandatory manoeuvre in the management of shoulder dystocia, however, it may be clinically indicated to conduct some manoeuvres.
- Episiotomies may be performed when indicated to facilitate delivery of a breech presentation.
- RNANTNU (2004) outlines the decision-making model for registered nurses performing additional nursing functions (see reference sheet 05-008-03).

RELATED POLICIES, GUIDELINES AND LEGISLATION

Policy 05-008-00	Nursing Practice – additional nursing function
Guideline 05-008-01	Developing a Policy for Additional Nursing Functions
Guideline 05-008-02	Performing Additional Nursing Functions
Guideline 05-008-03	Decision-making model for performing additional nursing functions and transferred functions
Policy 05-009-00	Transferred Functions
Guideline 05-009-01	Policy Guidelines for Transferred Functions

REFERENCES

Hutten-Czapski, P., and Anderson, A. (2007). The Occasional Shoulder Dystocia. *Canadian Medical Association.*

Kotaska, AD, Menticoglou, SM, and Gagnon, R. (2009). Vaginal Delivery of Breech Presentation. *Society of Obstetricians and Gynecologists of Canada.*

Nunavut *Nursing Act* (S.Nu. 2003, c.17).

Perinatal manual of Southwest Ontario. *Chapter 12 Shoulder Dystocia.*

Registered Nurses Association of Northwest Territories and Nunavut (2004). *Guidelines for Nursing Practice Decisions*. Yellowknife: RNANTNU

Royal College of Obstetricians and Gynecologists (2006). *The Management of Breech Presentation.*

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11 FEB 2011 **Chief Nursing Officer** **Date**	April 1, 2011
February 11, 2011 **Deputy Minister of Health and Social Services** **Date**	

Department of Health Government of Nunavut	NURSING POLICY, PROCEDURE AND PROTOCOLS		
	Community Health Nursing		
TITLE:		**SECTION:**	**POLICY NUMBER:**
Splinting		Clinical Procedures	11-017-00
EFFECTIVE DATE:	**REVIEW DUE:**	**REPLACES NUMBER:**	**NUMBER OF PAGES:**
February 10, 2018	February 2021		43
APPLIES TO:			
Community Health Nurses			

POLICY 1:

Registered nurses, who are employed in the expanded role and who have completed additional training with the Nurse Educator or delegate, may apply a plaster splint for traumatic injuries. Generally, a physician's order is not required; however, a physician shall be consulted for all fractures and suspected fractures.

Plaster splinting will not be performed under the following conditions without prior consultation of a physician:

1. **Signs of infection**
2. **Impending compartment syndrome**
3. **Diabetic or other neuropathy**
4. **Compound fracture**
5. **Significant displacement or misalignment**
6. **Fracture involving the growth plate**
7. **Fractures involving the long bones of the extremities.**

POLICY 2:

The Registered Nurse is expected to be proficient in the application of short arm and short leg splints. The nurse is permitted to apply other types of splints upon direction of the physician. These splints include:

1. **Long Arm Splint**
2. **Long Leg Splint**
3. **Thumb Spica Splint**
4. **Sugar Tong Splint**
5. **Ulnar Gutter Splint**

DEFINITION:

Compartment syndrome is a condition that can develop in injured tissue in which swelling occurs within an anatomic area that does not allow expansion (e.g., within fascial planes).

PRINCIPLE:

- Splints are not circumferential and are able to accommodate swelling. Splints are helpful for immobilizing acute injuries in which inflammation is expected and protecting wounds and repairs.

- Splints are not as rigid as a cast and offer less immobilization; therefore casts are more appropriate for long-term immobilization that requires rigid stability.

- The injuries which require immobilization beyond the short arm and leg splints tend to involve additional considerations and therefore must have physician consultation prior to splinting.

RELATED POLICIES, GUIDELINES AND LEGISLATION:

Policy 08-005-00	Acknowledgement of Diagnostic Test Results
Policy 08-006-00	Follow-up of Abnormal Diagnostic Test Results
Policy 08-007-00	X-Rays
Policy 08-008-00	Types of Sanctioned X-Rays
Procedure 11-017-01	General Plaster Splinting
Procedure 11-017-02	Short Arm Splint
Procedure 11-017-03	Short Leg Splint

REFERENCES:

Chudnofsky, CR, Byers, S. (2004). Splinting Techniques. *Clinical Procedures in Emergency Medicine, 4th ed*. WB Saunders: Philadelphia.

Fromy B, Abraham P, Bouvet C, et al. (2002). Early Decrease of Skin Blood Flow in Response to Locally Applied Pressure in Diabetic Subjects. *Diabetes*; 51: 1214-1217.

Kumar S, O'Connor A, Despois M, Galloway H (2005). Use of Early Magnetic Resonance Imaging in the Diagnosis of Occult Scaphoid Fractures: The CAST study. *New Zealand Medical Journal*; 118: 1296.

Thomsen, TW., and Setnik, GS. (2008). *General Splinting Techniques*.

Woolfrey KGH, Eisenhauer MA (2006). Wrist and Forearm. *Rosen's Emergency Medicine: Concepts and Clinical Practice, 6th ed*. Elsevier: Philadelphia.

NURSING CONSIDERATIONS:

1. Appropriate radiographic studies must be performed prior splinting to fully assess the extent of the injury with x-rays interpreted by the appropriate physician and radiologist.

2. Examine the extremity carefully before splinting for:
    a. Signs of Infection: Covering an infected area can aggravate the infection as well as interfere with monitoring and examining the area. Do not apply a splint if signs of infection are present and a physician must be consulted.
    b. Openings in the skin: Openings may indicate a compound fracture, which requires a medivac to a designated facility for specialist evaluation. A physician must be consulted immediately.
    c. Significant displacement or misalignment: A reduction manoeuvre may be necessary before application of a splint. A physician must be consulted.
    d. Swelling within the anatomical area: Compartment syndrome causes pressure on compressible tissues, leading to vascular compromise and potentially necrosis. Fasciotomy (surgical incision to relieve the pressure) may be required to maintain adequate perfusion to tissues within and distal to the affected anatomic area. Physician must be consulted immediately.

3. A detailed neurovascular examination must be completed prior to splinting.
    a. Assess for any vascular insufficiency by palpating distal pulses, testing for capillary refill time, and assessing the color and warmth of the extremity.
    b. Assess for any sign of nerve compression, such as numbness and/or tingling of the distal extremity.
    c.
    d. Applying a splint to a limb with neuropathy can lead to pressure ulceration**,** particularly over bone prominences.

1. In people with diabetes, the integrity of the skin can be further compromised due to microvascular changes associated with the disease.

2. It is important that any abnormalities be corrected if possible and documented before placement of the splint.

3. Thicker splints are stronger but are heavier and more uncomfortable for the client. Additionally, thicker splints are more likely to cause plaster burns than thinner ones. Thinner splints are lightweight and more comfortable but may not provide adequate strength. The decision on the thickness of the splint to be used will depend upon patient and fracture characteristics.

Plaster Burn

- The severity of the burns is related to the plaster temperature and the contact time.
- Burns can be avoided by using room temperature water to soak plaster bandages.

Pressure Sores

- Pressure sores can be caused by anything that applies point pressure to the skin under the splint.
- Most commonly, pressure sores are attributable to folds or wrinkles that were left during application of the initial Cast padding layer, or when insufficient padding was given to areas with bony prominences such as the ankle fibular head, the malleoli, or the metatarsal heads.
- Pressure sores can also arise from indentations made on the plaster by finger pressure before the plaster is fully hardened.
- Pressure sores can be prevented by providing adequate cast padding to bony prominences; careful placement of the Cast padding to avoid wrinkles; and avoiding direct pressure from the fingertips while forming the unhardened plaster.

Nerve Palsy

- Nerve palsy most commonly occurs from direct compression of a relatively superficial nerve.
- Nerve injury can be avoided by providing adequate padding in places where nerves are typically superficial and making sure that once the splint has hardened there is enough free space to not compress the nerves.

Vascular Compromise

- Vascular compromise occurs from direct compression. It can be avoided by providing adequate padding and ensuring there is enough free space after the splint has hardened.
- Conducting a vascular examination and assessing capillary refill time are helpful in identifying vascular compromise caused by compression.

Splint Dermatitis

- Splint dermatitis can arise from inadequate ventilation and hygiene of the skin directly below the splint. In some occasions, this dermatitis can also be due to an allergic reaction to the plaster chemicals.
- Dermatitis can be avoided by providing adequate ventilation to the skin under the splint as well as instructing the client to keep the cast clean and dry. Allergic dermatitis can be avoided by ensuring there is no direct contact of plaster to skin.

Permanent joint stiffness

- Stiffness around the joints inevitably occurs when joints are immobilized for an extended time. Capsular tissue, ligaments, and tendons tend to retract during immobilization.

- Stiffness can be diminished by splinting in positions where tendons and ligaments are at extended positions, such as the flexion of metacarpophalangeal (MP) and extension of proximal interphalangeal (PIP) in metacarpal fractures

APPROPRIATE SPLINTS FOR UPPER AND LOWER EXTREMITY FRACTURES	
Upper Extremity Fractures	**Appropriate Splints**
Proximal Humerus	Coaptation Splint Technique
Midshaft Humerus	Sugar Tong Splint Coaptation Splint Technique
Distal Humerus	Long Arm Splint
Olecranon / Radial Head	Long Arm Splint
Forearm	Long Arm Splint
Distal Radius	Sugar Tong Splint
Scaphoid	Thumb Spica Splint
Other Carpus	Short Arm Splint
Thumb, metacarpal, phalanges	Thumb Spica Splint
Lower Extremity Fractures	**Appropriate Splints**
Midshaft Femur Fracture	Long Leg Splint
Distal Femur / Proximal Tibia	Long Leg Splint
Patella Fracture / Ligament Injury of Knee	Long Leg Splint
Midshaft Tibia Fracture	Long Leg Splint
Distal Tibia / Ankle Fracture	Short Leg Splint

PROCEDURE:

EQUIPMENT (PLASTER SPLINTS)
✓ Slightly warm (not over 24°C) water and bowl ✓ Stockinette (optional) ✓ Soft cotton bandage/undersplint material (e.g., Cast padding padding or Kendall), available in 2-, 3-, 4-, and 6-inch width sizes ✓ Plaster bandages, available in 2-, 3-, 4-, and 6-inch width sizes ✓ Elastic Ace bandages ✓ Adhesive tape

Plaster splints are typically made up of 4 layers of material. They are generally arranged in the following order: Cast padding – Plaster – Cast padding – Elastic bandage. An optional fifth under layer (stockinette) may be used for added comfort. The purpose of this technique is to protect the skin, pad and protect any bony prominences, and immobilize the limb.

1. Apply stockinette to the extremity (recommended).

    a. The stockinette should extend beyond the anticipated ends of the splint by several inches.
    b. A 3-inch stockinette is generally used for the upper extremity, and 4-inch stockinette is used for the lower.
    c. Be careful to avoid wrinkles in the stockinette, which may cause pressure injury.

2. Measure the required length of splinting material.

    a. Unroll a single layer of Cast padding along the anticipated course of the splint.
    b. Tear off this segment and place it on the bedside table.

Figure 1: Measuring Padding

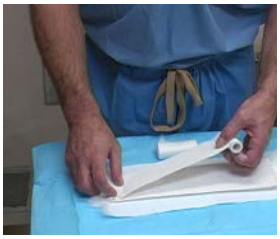
3. Prepare the layer of Cast padding.
    a. Place an additional 3 layers of Cast padding onto the layer that was used to measure splint length.
    b. Make the top layer out of 2 strips of Cast padding, each offset from the middle of the other layers by half their width.
    c. The overhanging edges of this top layer of Cast padding will be used to fold over the plaster bandages.

Figure 2: Preparing Cast Padding

Note: When splinting, it is crucial to understand the compromise between padding and stability. The closer the plaster is to the skin, the more effective the immobilization becomes. It is critical to strike a balance in the amount of padding, such that the wound and bony prominences are protected while adequate immobilization is provided.

4. Place layers of dry plaster bandages onto the Cast padding.

Figure 3: Preparing Plaster



   a. Roll out layers of plaster bandages on top of the Cast padding.
   b. The width of plaster bandage used will vary depending on the extremity being splinted and the size of the client.
   c. In general, the width of the splint should be slightly wider than the extremity.
   d. The number of layers of plaster required will depend on the individual splint.
   e. In general, upper extremity splints require 8-10 layers of plaster, whereas lower extremity splints will require 10-15 layers.

5. Soak the plaster bandages.

   a. Using a bowl, soak the layers of plaster bandages in **room temperature water** until no more bubbles arise from the material.
   b. Warm water (up to 24° C) reduces setting time, which may be helpful when casting freshly reduced fractures.

   Note: Heat is released when plaster bandages are exposed to water. Hot water must not be used, because this may cause burns from the plaster.

Figure 4: Removing Excess Water

6. Once soaked, raise the layers vertically over the bowl, firmly holding each end of the roll in your hands.

7. Remove excess water by allowing the plaster to fold upon itself and then gently squeeze the layers.

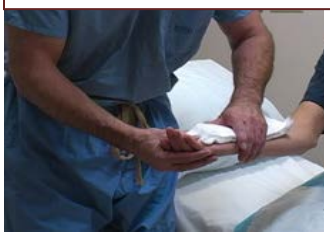
8. Place the wet plaster onto the cast padding, and smooth the surface by running your hands over it. This causes the layers to form a single mass of plaster.

9. Fold the overhanging edges of cast padding over the plaster. This single layer of padding is used to prevent the plaster from adhering to the elastic bandage.

10. Finally, fold any excess padding over the ends of the splint, to provide additional cushioning.

11. Carefully place the splint in the desired location. Be sure to place the padded side of the splint (i.e., the side with the 4 layers of Cast padding) next to the skin.

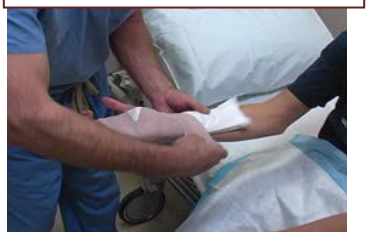
Figure 5: Moulding Splint



12. Gently mould the plaster to the area, using the palms of your hands.
    a. Avoid using your finger tips, which may create indentations in the plaster that may lead to pressure sores.
    b. During the moulding process, ensure that the extremity remains in the desired anatomic position.

13. Roll an elastic bandage over the splint, from distal to proximal with an overlap of approximately 50%

Figure 6: Applying Bandage



a. **Modest tension** should be placed on the bandage, because this is the only compressive component of the splint.
b. Adequate compression is important to reduce local edema.
c. If this compressive layer is applied too tightly, it can be corrected very easily by removing the elastic bandage and reapplying it with less tension.

14. Use adhesive tape to secure the elastic bandage. Do NOT place the tape circumferentially because it may cause constriction and ischemia if subsequent edema develops.

15. Gently mould the splint again to the extremity using your hands.

a. This must be done before the plaster has begun to set, which usually occurs within 10 minutes.
b. Manipulation of the splint after this time period must be avoided to maintain the structural integrity of the splint.

POST-PROCEDURE CARE

Post-Splinting Radiography

If a reduction maneuver was performed, obtain a second set of radiographs, showing two views, to confirm that anatomical reduction was not lost during the splinting process.

Neurovascular Examination

1. Repeat a thorough neurovascular examination of the splinted limb

2. If there are signs of neurovascular compromise, remove the elastic bandage first and replace it with more with gentle compression.

3. If the neurovascular deficit persists, the splint should be removed, the limb should be inspected, and another splint should be placed. Persistent neurovascular deficits will require immediate orthopedic consultation.

Client Education

1. Instruct the client to keep the splint clean and dry.
2. The extremity should remain elevated for the first 2-3 days to decrease swelling.

    a. Lower extremity injuries should be elevated above the level of the heart when lying down.
    b. Upper extremity injuries should be elevated over the head when lying down.

4. Educate the client about the signs and symptoms of neurovascular compromise and about how to loosen the bandages if neurovascular symptoms arise.
5. Instruct clients to contact the nurse on call if there are is increased pain or paraesthesia. It is possible for pressure ulcers and infection to develop underneath the splint.
6. Clients should be advised to avoid scratching inside the splint with any objects as small lacerations can occur and secondary infections develop.

DOCUMENTATION

Document the following in the client's health record:

- Client history, including mechanism of injury
- Pre-splint assessments, including initial x-ray interpretation
- Post-splint assessment, including neurovascular assessment and repeat x-ray findings (if applicable)
- Client education and follow-up appointment
- Complete WSCC forms (as required)

PROCEDURE 11-017-02

SHORT ARM SPLINT

Splinting coupled with anatomic reduction allows healing to take place by keeping the fractured bones opposed in an anatomic position for a period of time.

This procedure is an addendum to the Procedure 11-017-01 *General Plaster Splinting*. For detailed instructions and considerations, refer to Procedure 11-017-01.

Nursing Considerations

1. Short arm splinting is indicated for temporary immobilization for:

    a. Fractures of the carpal bones
    b. Small non-displaced fractures of the distal radius or ulna

2. The short arm splint does not prevent supination and pronation of the forearm, and thus a sugar tong splint is better suited for displaced and/or complex fractures of the distal radius and ulna. The physician shall be consulted for such circumstances.

3. The short arm splint does not provide adequate immobilization of the first metacarpal and scaphoid bone, and thus a thumb spica splint should be used for scaphoid fractures. The physician shall be consulted for such circumstances.

4. The short arm splint is contraindicated for:

    a. Infections: all wounds must be assessed for signs of infection before splinting. The physician must be consulted if signs of infection are noted.
    b. Impending compartment Syndrome
    c. Diabetic or other neuropathy
    d. Open fracture

EQUIPMENT
✓ Slightly warm (not over 24°C) water and bowl ✓ Stockinette (optional) ✓ Soft cotton bandage/cast padding material (e.g., Webril; Kendall), 3- or 4-inch width ✓ Plaster bandages, available in 3- or 4-inch width ✓ Elastic bandages (E.g. Ace bandage) ✓ Adhesive tape

Procedure

1. Examine the extremity carefully for signs of an open fracture.

2. Perform a detailed neurovascular examination before splinting.

    a. Assess for any vascular insufficiency by palpating distal pulses at the ulnar and radial arteries, testing for capillary refill time, and assessing the color and warmth of the extremity.
    b. Assess for any sign of nerve compression, such as numbness and/or tingling of the distal extremity.
    c. Numbness in the proximal thumb and/or dorsal hand suggests radial nerve compromise.
    d. Numbness in the medial dorsal or palmar hand/fifth digit (small finger area) suggests ulnar injury.
    e. Numbness in the lateral palmar region and the tips of the second and third digits (forefinger and middle finger) suggests median nerve injury.
    f. It is important that any abnormalities be corrected if possible and documented before placement of the splint.

3. Obtain appropriate radiographic studies. Two views of the fractured bone should be obtained, making sure to image the joints directly proximal and distal to the fracture.

4. If the fracture has significant displacement or misalignment, a reduction maneuver may be necessary before splint application and the physician must be consulted.

5. Position the client in a sitting position with the arm in 90° abduction, external rotation, and 90° elbow flexion.

6. Apply stockinette to the extremity (recommended).

    a. Stockinette is placed from distal palm crease in the hand to approximately 5 cm distal to the elbow.

    b. This stockinette (usually 3-inch) should extend beyond the anticipated ends of the splint by several inches.

    c. Ensure all wrinkles in the stockinette have been removed to avoid pressure injury.

7. Measure the required length of splinting material by unrolling a single layer of Cast padding along the anticipated course of the splint - from the distal palmar crease to a point 5-10 cm proximal to the elbow.

Figure 1: Measuring Splint

8. Lay this piece of Cast padding on a bedside table, and then roll out an additional 3 layers on top of it to form the cast padding. Make the top layer out of two strips of Cast padding, each offset from the middle of the other layers by half their width.

Figure 2: Measuring Plaster

9. Roll out 8-10 layers of plaster bandages on top of the Cast padding. The plaster may be folded back and forth upon itself during this process.

10. Soak the layers of plaster bandages in room temperature water in a bucket. Do not use hot water, because it increases the risk for burns from the exothermic plaster.

11. Once soaked, raise the layers vertically over the bowl, firmly holding each end of the roll in your hands.

12. Remove excess water by allowing the plaster to fold upon itself and then gently squeeze the layers.

13. Place the wet plaster onto the cast padding, and smooth the surface by running your hands over it. This causes the layers to form a single mass of plaster.

14. Fold the overhanging edges of cast padding over the plaster. This single layer of padding is used to prevent the plaster from adhering to the elastic bandage.

15. Finally, fold any excess padding over the ends of the splint, to provide additional cushioning.

16. Carefully place the splint in the desired location. Be sure to place the padded side of the splint (i.e., the side with the 4 layers of Cast padding) next to the skin.

17. Apply the splint along the volar surface of the forearm and wrist. Gently mould the plaster to the area, using the palms of your hands (do not use fingertips to mould plaster)

Figure 3: The “position of function:

18. Roll 3-inch elastic bandage over the splint, in a distal to proximal direction.

19. Once again, gently mould the splint to the extremity using your hands. For most indications, the wrist and hand should be immobilized in the “position of function,” with the wrist extended to approximately 30°.

Post-Splinting Radiography

If a reduction maneuver was performed, obtain a second set of radiographs, showing two views, to confirm that anatomical reduction was not lost during the splinting process.

Neurovascular Examination

1. Repeat a thorough neurovascular examination of the splinted limb

2. If there are signs of neurovascular compromise, remove the elastic bandage first and replace it with more with gentle compression.

3. If the neurovascular deficit persists, the splint should be removed, the limb should be inspected, and another splint should be placed. Persistent neurovascular deficits will require immediate orthopedic consultation.

Client Education

1. Instruct the client to keep the splint clean and dry.

2. The extremity should remain elevated for the first 2-3 days to decrease swelling.

3. Educate the client about the signs and symptoms of neurovascular compromise and about how to loosen the bandages if neurovascular symptoms arise.

4. Instruct clients to contact the nurse on call if there are is increased pain or paraesthesia. It is possible for pressure ulcers and infection to develop underneath the splint.

5. Clients should be advised to avoid scratching inside the splint with any objects as small lacerations can occur and secondary infections develop.

DOCUMENTATION

Document the following in the client's health record:

- Client history, including mechanism of injury
- Pre-splint assessments, including initial x-ray interpretation
- Post-splint assessment, including neurovascular assessment and repeat x-ray findings (if applicable)
- Client education and follow-up appointment
- Complete WSCC forms (as required)

PROCEDURE 11-017-03

LONG ARM SPLINTING

Splinting coupled with anatomic reduction allows healing to take place by keeping the fractured bones opposed in an anatomic position for a period of time. The long arm splint is used to immobilize a variety of injuries to the upper extremity.

This procedure is an addendum to the Procedure 11-017-01 *General Plaster Splinting*. For detailed instructions and considerations, refer to Procedure 11-017-01.

Nursing Considerations

1. The long arm splint can be used for temporary immobilization for

    a. Elbow joint dislocation
    b. Olecranon fracture
    c. Distal humerus fracture

2. Due to the conditions which require a long arm splint, physician services should be consulted prior to splinting.

3. The long arm splint is contraindicated for:
    a. Infections: all wounds must be assessed for signs of infection before splinting. The physician must be consulted if signs of infection are noted.
    b. Impending compartment Syndrome
    c. Diabetic or other neuropathy
    d. Open fracture

EQUIPMENT
✓ Slightly warm (not over 24°C) water and bowl ✓ Stockinette (optional) ✓ Soft cotton bandage/cast padding material (e.g., Webril; Kendall), 4- or 6-inch width ✓ Plaster bandages, available in 4- or 6-inch width ✓ Elastic bandages (E.g. Ace bandage) ✓ Adhesive tape

Procedure

1. Examine the extremity carefully for signs of a compound fracture.

2. Obtain appropriate radiographic studies. Two views of the fractured bone should be obtained, making sure to image the joints directly proximal and distal to the fracture

3. Perform a detailed neurovascular examination before splinting.

    a. Assess for vascular insufficiency by palpating distal pulses at the ulnar and radial arteries, testing for capillary refill time, and assessing the color and warmth of the extremity.
    b. Assess for signs of nerve compression, such as numbness and/or tingling of the distal extremity.
        - Numbness in the proximal thumb and/or dorsal hand suggests radial nerve compromise.
        - Numbness in the medial dorsal or palmar hand/fifth digit (small finger area) suggests ulnar injury.
        - Numbness in the lateral palmar region and the tips of the second and third digits (forefinger and middle finger) suggests median nerve injury.
    c. It is important that any abnormality is reported to the physician and corrected if possible prior to splinting. Document such findings and interventions.

4. If the fracture has significant displacement or misalignment, a reduction maneuver may be necessary before splint application and thus the physician must be consulted.

5. Position the client in a sitting position with the affected arm in neutral abduction with 90° of elbow flexion

6. Apply stockinette to the extremity (recommended).

    a. Stockinette may be placed from distal palm crease in the hand to approximately 5 cm below the axillary fold.
    b. This stockinette (usually 3-inch) should extend beyond the anticipated ends of the splint by several inches.
    c. Ensure all wrinkles in the stockinette have been removed to avoid pressure injury.

7. Measure the required length of splinting material by unrolling a single layer of Cast padding along the anticipated course of the splint - posteriorly from the inferior border of the deltoid muscle, along the triceps proximally, along the ulnar border distally, to the head of the fifth metacarpal.

Figure 1: Measuring Splint

8. Lay this piece of Cast padding on a bedside table, and then roll out an additional 3 layers on top of it to form the cast padding. Make the top layer out of two strips of Cast padding, each offset from the middle of the other layers by half their width.

Figure 2: Measuring Plaster

9. Roll out 10-12 layers of plaster bandages on top of the Cast padding. The plaster may be folded back and forth upon itself during this process.

10. Soak the layers of plaster bandages in room temperature water in a bucket. Do not use hot water, because it increases the risk for burns from the exothermic plaster.

11. Once soaked, raise the layers vertically over the bowl, firmly holding each end of the roll in your hands.

12. Remove excess water by allowing the plaster to fold upon itself and then gently squeeze the layers.

13. Place the wet plaster onto the cast padding, and smooth the surface by running your hands over it. This causes the layers to form a single mass of plaster.

14. Fold the overhanging edges of cast padding over the plaster. This single layer of padding is used to prevent the plaster from adhering to the elastic bandage.

15. Finally, fold any excess padding over the ends of the splint, to provide additional cushioning.

16. Carefully place the splint in the desired location. Be sure to place the padded side of the splint (i.e., the side with the 4 layers of Cast padding) next to the skin.

17. Apply the splint to the posterior aspect of the arm, from the deltoid muscle to the hand. Gently mould the plaster to the area, using the palms of your hands**.**

Figure 3: Applying Splint

18. Roll 4-inch elastic bandage over the splint.

    a. Use 1 to 2 Ace bandages to wrap the arm from the fifth metacarpal to the axillary fold
    b. Providing adequate compression while moving proximally.

19. Once again, gently mould the splint to the extremity using your hands and not your fingertips.

Post-Splinting Radiography

If a reduction maneuver was performed, obtain a second set of radiographs, showing two views, to confirm that anatomical reduction was not lost during the splinting process.

Neurovascular Examination

1. Repeat a thorough neurovascular examination of the splinted limb

2. If there are signs of neurovascular compromise, remove the elastic bandage first and replace it with more with gentle compression.

3. If the neurovascular deficit persists, the splint should be removed, the limb should be inspected, and another splint should be placed. Persistent neurovascular deficits will require immediate orthopedic consultation.

Client Education

3. Instruct the client to keep the splint clean and dry.

4. The extremity should remain elevated for the first 2-3 days to decrease swelling.

6. Educate the client about the signs and symptoms of neurovascular compromise and about how to loosen the bandages if neurovascular symptoms arise.

7. Instruct clients to contact the nurse on call if there are is increased pain or paraesthesia. It is possible for pressure ulcers and infection to develop underneath the splint.

8. Clients should be advised to avoid scratching inside the splint with any objects as small lacerations can occur and secondary infections develop.

DOCUMENTATION

Document the following in the client's health record:

- Client history, including mechanism of injury
- Pre-splint assessments, including initial x-ray interpretation
- Post-splint assessment, including neurovascular assessment and repeat x-ray findings (if applicable)
- Client education and follow-up appointment
- Complete WSCC forms (as required)

PROCEDURE 11-017-04

SHORT LEG SPLINT

Splinting coupled with anatomic reduction allows healing to take place by keeping the fractured bones opposed in an anatomic position for a period of time.

This procedure is an addendum to the Procedure 11-017-01 *General Plaster Splinting*. For detailed instructions and considerations, refer to Procedure 11-017-01.

Nursing Considerations

1. The short leg splint is useful for the temporary immobilization of:

    a. Fractures of the distal tibia and fibula
    b. Fractures of the talus, calcaneus, cuboid, navicular, cuneiform, and metatarsal bones of the foot
    c. Ankle dislocations

2. The short leg splint is contraindicated for:

    a. Infections: all wounds must be assessed for signs of infection before splinting. The physician must be consulted if signs of infection are noted.
    b. Impending compartment Syndrome
    c. Diabetic or other neuropathy
    d. Open fracture

EQUIPMENT
✓ Slightly warm (not over 24°C) water and bowl ✓ Stockinette (optional) ✓ Soft cotton bandage/cast padding material (e.g., Webril; Kendall), 4- or 6-inch width ✓ Plaster bandages, available in 4- or 6-inch width ✓ Elastic bandages (E.g. Ace bandage) ✓ Adhesive tape

Procedure

1. Examine the extremity carefully for signs of an open fracture.

2. Perform a detailed neurovascular examination before splinting.

    a. Assess for any vascular insufficiency by palpating distal pulses at the popliteal, posterior tibial, and dorsalis pedis arteries, testing for capillary refill time, and assessing the color and warmth of the extremity.

    b. Assess for any sign of nerve compression, such as numbness and/or tingling of the distal extremity.

        - Numbness in the anterior leg and/or dorsal foot suggests peroneal nerve damage.
        - Numbness in the webspace between the great and second toe suggests deep peroneal nerve damage.

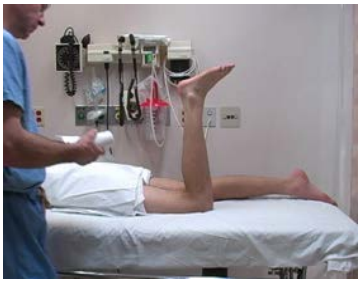
    c. It is important that any abnormalities be corrected if possible and documented before placement of the splint.

3. Obtain appropriate radiographic studies. At least two views of the fractured bone should be obtained, making sure to image the joints directly proximal and distal to the fracture.

4. If the fracture has significant displacement or misalignment, a reduction maneuver may be necessary before splint application and the physician must be consulted.

5. Position the client prone on the bed with the knee flexed at 90°. This position allows the client to relax the gastronemius muscles, making it easier to place the foot in the neutral position.

Figure 1: Correct Client Positioning



6. Apply stockinette to the extremity (recommend
    a. Stockinette is placed from the foot to the proximal lower leg.

    b. This stockinette (usually 4 or 5-inch) should extend beyond the anticipated ends of the splint by several inches.

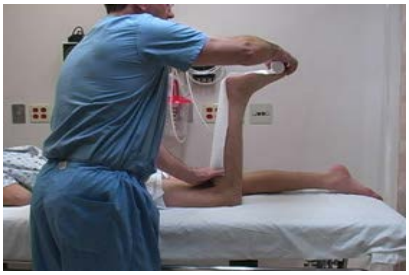
    c. Ensure all wrinkles in the stockinette have been removed to avoid pressure injury.

7. Measure the required length of splinting material by unrolling a single layer of Cast padding along the anticipated course of the splint - from the proximal posterior leg, down around the ankle, and then to the level of the metatarsal heads.

8. Lay this piece of Cast padding on a bedside table, and then roll out an additional 3 layers on top of it to form the cast padding. Make the top layer out of two strips of Cast padding, each offset from the middle of the other layers by half their width.

9. Roll out 12-15 layers of plaster bandages on top of the Cast padding. The plaster may be folded back and forth upon itself during this process.

Figure 2: Measuring Cast Padding



10. Soak the layers of plaster bandages in room temperature water in a bucket. Do not use hot water, because it increases the risk for burns from the exothermic plaster.

11. Once soaked, raise the layers vertically over the bowl, firmly holding each end of the roll in your hands.

12. Remove excess water by allowing the plaster to fold upon itself and then gently squeeze the layers.

13. Place the wet plaster onto the cast padding, and smooth the surface by running your hands over it. This causes the layers to form a single mass of plaster.

14. Fold the overhanging edges of cast padding over the plaster. This single layer of padding is used to prevent the plaster from adhering to the elastic bandage.

15. Finally, fold any excess padding over the ends of the splint, to provide additional cushioning.

16. Carefully place the splint in the desired location. Be sure to place the padded side of the splint (i.e., the side with the 4 layers of Cast padding) next to the skin.

17. Apply the splint along the posterior surface of the leg. Gently mould the plaster to the area, using the palms of your hands.

18. Roll 4- or 6-inch elastic bandages over the splint, in a distal to proximal direction.

19. Once again, gently mould the splint to the extremity using your hands. The ankle should be flexed to 90°.

Figure 3: Apply Splint

NOTE: If additional support is required, such as in the case of a displaced ankle fracture that has been reduced in a closed fashion, a lower-leg sugar tong splint may be applied in addition to the short leg splint.

To apply the sugar tong splint, refer to Procedure 11-017-06.

POST-PROCEDURE CARE

Post-Splinting Radiography

If a reduction maneuver was performed, obtain a second set of radiographs, showing two views, to confirm that anatomical reduction was not lost during the splinting process.

Neurovascular Examination

1. Repeat a thorough neurovascular examination of the splinted limb

2. If there are signs of neurovascular compromise, remove the elastic bandage first and replace it with more with gentle compression.

3. If the neurovascular deficit persists, the splint should be removed, the limb should be inspected, and another splint should be placed. Persistent neurovascular deficits will require immediate orthopedic consultation.

Client Education

5. Instruct the client to keep the splint clean and dry.

6. The extremity should remain elevated for the first 2-3 days to decrease swelling.

9. Educate the client about the signs and symptoms of neurovascular compromise and about how to loosen the bandages if neurovascular symptoms arise.

10. Instruct clients to contact the nurse on call if there are is increased pain or paraesthesia. It is possible for pressure ulcers and infection to develop underneath the splint.

11. Clients should be advised to avoid scratching inside the splint with any objects as small lacerations can occur and secondary infections develop.

DOCUMENTATION

Document the following in the client's health record:

- Client history, including mechanism of injury
- Pre-splint assessments, including initial x-ray interpretation
- Post-splint assessment, including neurovascular assessment and repeat x-ray findings (if applicable)
- Client education and follow-up appointment
- Complete WSCC forms (as required)

PROCEDURE 11-017-05

LONG LEG SPLINT

This procedure is an addendum to the Procedure 11-017-01 *General Plaster Splinting*. For detailed instructions and considerations, refer to Procedure 11-017-01.

Nursing Considerations

1. The long leg splint is useful for the temporary immobilization of:

    a. Fractures of the tibia
    b. Fractures of the fibula
    c. Fractures of the distal femur
    d. Dislocations of the knee

2. For many indications, a prefabricated knee immobilizer provides an equivalent degree of immobilization and may be used instead of a plaster long-leg splint, consult the physician.

3. The long leg splint is contraindicated for:

    a. Infections: all wounds must be assessed for signs of infection before splinting. The physician must be consulted if signs of infection are noted.
    b. Impending compartment Syndrome
    c. Diabetic or other neuropathy
    d. Open fracture

EQUIPMENT
✓ Slightly warm (not over 24°C) water and bowl ✓ Stockinette (optional) ✓ Soft cotton bandage/cast padding material (e.g., Webril; Kendall), 6-inch width ✓ Plaster bandages, available in 6-inch width ✓ Elastic bandages (E.g. Ace bandage) ✓ Adhesive tape

Procedure

1. Examine the extremity carefully for signs of an open fracture.

2. Perform a detailed neurovascular examination before splinting.

3. Assess for any vascular insufficiency by palpating distal pulses at the popliteal, posterior tibial, and dorsalis pedis arteries, testing for capillary refill time, and assessing the color and warmth of the extremity.

4. Assess for any sign of nerve compression, such as numbness and/or tingling of the distal extremity.

    - Numbness in the anterior leg and/or dorsal foot suggests peroneal nerve damage.
    - Numbness in the webspace between the great and second toe suggests deep peroneal nerve damage.
    - Numbness in the thigh suggests femoral nerve injury.
    - Numbness in the lateral thigh suggests lateral femoral cutaneous nerve injury.
    - Numbness in the posterior thigh suggests injury to the posterior femoral cutaneous nerve.

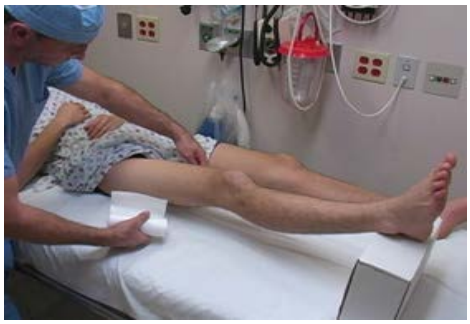
5. It is important that any abnormalities be corrected if possible and documented before placement of the splint.

6. Obtain appropriate radiographic studies. At least two views of the fractured bone should be obtained, making sure to image the joints directly proximal and distal to the fracture.

7. If the fracture has significant displacement or misalignment, a reduction maneuver may be necessary before splint application and the physician must be consulted.

8. Position the client in a supine position, with the knee joint bent at 20° and ankle bent at 90°.

Figure 1: Correct Client Positioning



9. Apply stockinette to the extremity (recommended).

    a. Stockinette is placed from the foot to proximal thigh

    b. This stockinette (usually 4 or 5-inch) should extend beyond the anticipated ends of the splint by several inches.

    c. Ensure all wrinkles in the stockinette have been removed to avoid pressure injury.

10. Measure the required length of splinting material by unrolling a single layer of Cast padding along the anticipated course of the splint, from the proximal thigh, past the knee, to a level 5 cm proximal to the malleoli.

Figure 2: Measuring Cast Padding

11. The splint may be extended to the metatarsal heads if immobilization of the ankle joint is required.

12. Lay this piece of Cast padding on a bedside table, and then roll out an additional 3 layers on top of it to form the cast padding. Make the top layer out of two strips of Cast padding, each offset from the middle of the other layers by half their width.

13. Roll out 12-15 layers of plaster bandages on top of the Cast padding. The plaster may be folded back and forth upon itself during this process.

17. Soak the layers of plaster bandages in room temperature water in a bucket. Do not use hot water, because it increases the risk for burns from the exothermic plaster.

18. Once soaked, raise the layers vertically over the bowl, firmly holding each end of the roll in your hands.

19. Remove excess water by allowing the plaster to fold upon itself and then gently squeeze the layers.

20. Place the wet plaster onto the cast padding, and smooth the surface by running your hands over it. This causes the layers to form a single mass of plaster.

21. Fold the overhanging edges of cast padding over the plaster. This single layer of padding is used to prevent the plaster from adhering to the elastic bandage.

22. Finally, fold any excess padding over the ends of the splint, to provide additional cushioning.

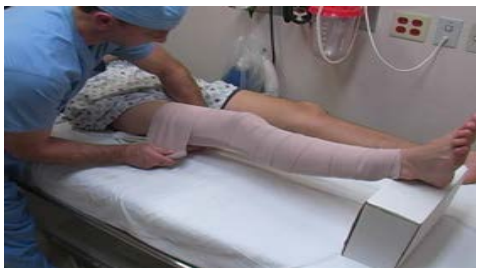
23. Carefully place the splint in the desired location. Be sure to place the padded side of the splint (i.e., the side with the 4 layers of Cast padding) next to the skin.

20. Apply the splint along the posterior surface of the leg. Gently mould the plaster to the area, using the palms of your hands.

21. Roll 6-inch elastic bandages over the splint, in a distal to proximal direction.

22. Once again, gently mould the splint to the extremity using your hands. The knee should be flexed 10° to 20°. If the splint extends to the foot, the ankle should be flexed to 90°.

Figure 3: Apply Splint



POST-PROCEDURE CARE

Post-Splinting Radiography

If a reduction maneuver was performed, obtain a second set of radiographs, showing two views, to confirm that anatomical reduction was not lost during the splinting process.

Neurovascular Examination

1. Repeat a thorough neurovascular examination of the splinted limb

2. If there are signs of neurovascular compromise, remove the elastic bandage first and replace it with more with gentle compression.

3. If the neurovascular deficit persists, the splint should be removed, the limb should be inspected, and another splint should be placed. Persistent neurovascular deficits will require immediate orthopedic consultation.

Client Education

7. Instruct the client to keep the splint clean and dry.

8. The extremity should remain elevated for the first 2-3 days to decrease swelling.

12. Educate the client about the signs and symptoms of neurovascular compromise and about how to loosen the bandages if neurovascular symptoms arise.

13. Instruct clients to contact the nurse on call if there are is increased pain or paraesthesia. It is possible for pressure ulcers and infection to develop underneath the splint.

14. Clients should be advised to avoid scratching inside the splint with any objects as small lacerations can occur and secondary infections develop.

DOCUMENTATION

Document the following in the client's health record:

- Client history, including mechanism of injury
- Pre-splint assessments, including initial x-ray interpretation
- Post-splint assessment, including neurovascular assessment and repeat x-ray findings (if applicable)
- Client education and follow-up appointment
- Complete WSCC forms (as required)

PROCEDURE 11-017-06

SUGAR TONG SPLINT

Splinting coupled with anatomic reduction allows healing to take place by keeping the fractured bones opposed in an anatomic position for a period of time. The sugar tong splint is used to immobilize a variety of distal forearm fractures.

This procedure is an addendum to the Procedure 11-017-01 *General Plaster Splinting*. For detailed instructions and considerations, refer to Procedure 11-017-01.

Nursing Considerations

1. The sugar tong splint is useful for the temporary immobilization of distal fractures of the radius, such as:

    a. Colles' or Smith's fracture
    b. Radial styloid (chauffeur's) fracture
    c. Comminuted intraarticular fracture of the distal radius

2. The sugar tong splint is contraindicated for:

    e. Infections: all wounds must be assessed for signs of infection before splinting. The physician must be consulted if signs of infection are noted.
    f. Impending compartment Syndrome
    g. Diabetic or other neuropathy
    h. Open fracture

EQUIPMENT
✓ Slightly warm (not over 24°C) water and bowl ✓ Stockinette (optional) ✓ Soft cotton bandage/cast padding material (e.g., Webril; Kendall), 3 or 4-inch width ✓ Plaster bandages, available in 3 or 4-inch width ✓ Elastic bandages (E.g. Ace bandage) ✓ Adhesive tape

Procedure

1. Examine the extremity carefully for signs of an open fracture.

2. Perform a detailed neurovascular examination before splinting.

3. Assess for any vascular insufficiency by palpating distal pulses at the ulnar and radial arteries, testing for capillary refill time, and assessing the color and warmth of the extremity.

4. Assess for any sign of nerve compression, such as numbness and/or tingling of the distal extremity.

    a. Numbness in the proximal thumb and/or dorsal hand suggests radial nerve compromise.

    b. Numbness in the medial dorsal or palmar hand/fifth digit (small finger area) suggests ulnar injury.

    c. Numbness in the lateral palmar region and the tips of the second and third digits (forefinger and middle finger) suggests median nerve injury.

5. It is important that any abnormalities be corrected if possible and documented before placement of the splint.

6. Obtain appropriate radiographic studies. At least two views of the fractured bone should be obtained, making sure to image the joints directly proximal and distal to the fracture.

7. If the fracture has significant displacement or misalignment, a reduction maneuver may be necessary before splint application and the physician must be consulted

8. Position the client in a sitting position, with the elbow in 90° abduction, external rotation, and 90° elbow flexion.

9. Apply stockinette to the extremity (recommended).

    a. Stockinette may be placed from the distal palmar crease of the hand to the level of the midshaft humerus.
    b. Excess stockinette around the elbow joint should be cut off as to prevent wrinkles.
    c. This stockinette (usually 3” width) should extend beyond the anticipated ends of the splint by several inches.
    d. Ensure all wrinkles in the stockinette have been removed to avoid pressure injury.

10. Measure the required length of splinting material by unrolling a single layer of Cast padding along the anticipated course of the splint, from the dorsal metacarpal heads, proximally along the dorsal aspect of the forearm, around the elbow, distally along the volar forearm, up to the distal palmar crease.

11. Lay this piece of Cast padding on a bedside table, and then roll out an additional 3 layers on top of it to form the cast padding. Make the top layer out of two strips of Cast padding, each offset from the middle of the other layers by half their width.

12. Roll out 8-10 layers of plaster bandages on top of the Cast padding. Fold plaster back and forth upon itself during this process.

13. Soak the layers of plaster bandages in room temperature water in a bucket. Do not use hot water, because it increases the risk for burns from the exothermic plaster.

14. Once soaked, raise the layers vertically over the bowl, firmly holding each end of the roll in your hands.

15. Remove excess water by allowing the plaster to fold upon itself and then gently squeeze the layers.

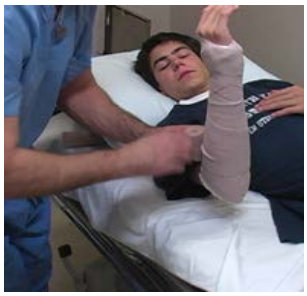
16. Place the wet plaster onto the cast padding, and smooth the surface by running your hands over it. This causes the layers to form a single mass of plaster.

17. Fold the overhanging edges of cast padding over the plaster. This single layer of padding is used to prevent the plaster from adhering to the elastic bandage.

18. Finally, fold any excess padding over the ends of the splint, to provide additional cushioning.

19. Carefully place the splint in the desired location. Be sure to place the padded side of the splint (i.e., the side with the 4 layers of Cast padding) next to the skin.

Figure 2: Apply Splint



20. Apply the splint to the arm, starting from the volar distal palmar crease, around the elbow, and up to the dorsal metacarpals. Gently mould the plaster to the area, using the palms of your hands.

21. Roll 4-inch elastic bandages over the splint, in a distal to proximal direction.

Avoid immobilizing the volar metacarpophalangeal (MCP) joints of the hand

22. Once again, gently mould the splint to the extremity using your hands. Stabilize the distal third of the forearm by placing the arm in a protective shoulder sling.

Post-Splinting Radiography

If a reduction maneuver was performed, obtain a second set of radiographs, showing two views, to confirm that anatomical reduction was not lost during the splinting process.

Neurovascular Examination

1. Repeat a thorough neurovascular examination of the splinted limb

2. If there are signs of neurovascular compromise, remove the elastic bandage first and replace it with more with gentle compression.

3. If the neurovascular deficit persists, the splint should be removed, the limb should be inspected, and another splint should be placed. Persistent neurovascular deficits will require immediate orthopedic consultation.

Client Education

1. Instruct the client to keep the splint clean and dry.

2. The extremity should remain elevated for the first 2-3 days to decrease swelling.

3. Educate the client about the signs and symptoms of neurovascular compromise and about how to loosen the bandages if neurovascular symptoms arise.

4. Instruct clients to contact the nurse on call if there are is increased pain or paraesthesia. It is possible for pressure ulcers and infection to develop underneath the splint.

5. Clients should be advised to avoid scratching inside the splint with any objects as small lacerations can occur and secondary infections develop.

DOCUMENTATION

Document the following in the client's health record:

- Client history, including mechanism of injury
- Pre-splint assessments, including initial x-ray interpretation
- Post-splint assessment, including neurovascular assessment and repeat x-ray findings (if applicable)
- Client education and follow-up appointment
- Complete WSCC forms (as required)

PROCEDURE 11-017-07

THUMB SPICA SPLINT

Splinting coupled with anatomic reduction allows healing to take place by keeping the fractured bones opposed in an anatomic position for a period of time.

This procedure is an addendum to the Procedure 11-017-01 *General Plaster Splinting*. For detailed instructions and considerations, refer to Procedure 11-017-01.

Nursing Considerations

1. The thumb spica splint is useful for the temporary immobilization of scaphoid fractures of the wrist.

2. Up to 25% of scaphoid fractures may not be visible on the initial radiograph. Clients with wrist, hand, or thumb injuries who have tenderness in the "anatomical snuffbox" should be placed in a thumb spica splint, regardless of radiographic findings, until further evaluated by the physician / orthopedist. A physician must be consulted.

3. The thumb spica splint is contraindicated for:

    a. Infections: all wounds must be assessed for signs of infection before splinting. The physician must be consulted if signs of infection are noted.
    b. Impending compartment Syndrome
    c. Diabetic or other neuropathy
    d. Open fracture

EQUIPMENT
✓ Slightly warm (not over 24°C) water and bowl ✓ Soft cotton bandage/cast padding material (e.g., Webril; Kendall), 3 or 4-inch width ✓ Plaster bandages, available in 3 inch width ✓ Elastic bandages (E.g. Ace bandage) ✓ Adhesive tape

Procedure

1. Examine the extremity carefully for signs of an open fracture.

2. Perform a detailed neurovascular examination before splinting.

3. Assess for vascular insufficiency by palpating distal pulses at the ulnar and radial arteries, testing for capillary refill time, and assessing the color and warmth of the extremity.

    a. Assess for signs of nerve compression, such as numbness and/or tingling of the distal extremity.
    b. Numbness in the proximal thumb and/or dorsal hand suggests radial nerve compromise.
    c. Numbness in the medial dorsal or palmar hand/fifth digit (small finger area) suggests ulnar injury.
    d. Numbness in the lateral palmar region and the tips of the second and third digits (forefinger and middle finger) suggests median nerve injury.

4. It is important that any abnormalities be corrected if possible and documented before placement of the splint.

5. Obtain appropriate radiographic studies. At least two views of the fractured bone should be obtained, making sure to image the joints directly proximal and distal to the fracture. **Special scaphoid views should be obtained** if there is high clinical suspicion despite normal AP and lateral views of the wrist.

6. If the fracture has significant displacement or misalignment, a reduction maneuver may be necessary before splint application and the physician must be consulted

7. Position the client in a sitting position, with the elbow resting on the table and flexed at 90°.

8. Measure the required length of splinting material by unrolling a single layer of Cast padding along the anticipated course of the splint - along the radial aspect of the forearm, from the tip of thumb to the proximal third of the radius.

Figure 1: Measuring Cast Padding

9. Lay this piece of Cast padding on a bedside table, and then roll out an additional 3 layers on top of it to form the cast padding. Make the top layer out of two strips of Cast padding, each offset from the middle of the other layers by half their width.

10. Roll out 6-8 layers of plaster bandages on top of the Cast padding. The plaster may be folded back and forth upon itself during this process.
11. Soak the layers of plaster bandages in room temperature water in a bucket. Do not use hot water, because it increases the risk for burns from the exothermic plaster.

12. Once soaked, raise the layers vertically over the bowl, firmly holding each end of the roll in your hands.

13. Remove excess water by allowing the plaster to fold upon itself and then gently squeeze the layers.

14. Place the wet plaster onto the cast padding, and smooth the surface by running your hands over it. This causes the layers to form a single mass of plaster.

15. Fold the overhanging edges of cast padding over the plaster. This single layer of padding is used to prevent the plaster from adhering to the elastic bandage.

16. Finally, fold any excess padding over the ends of the splint, to provide additional cushioning.

17. Carefully place the splint in the desired location. Be sure to place the padded side of the splint next to the skin.

Figure 2: Apply Splint

18. Apply the splint along the thumb and radial aspect of the forearm starting. Gently mould the plaster to the area, using the palms of your hands.

19. Roll 2 to 3-inch elastic bandages over the splint, in a distal to proximal direction.

20. Once again, gently mould the splint to the extremity using your hands. The wrist should be splinted in approximately 20° extension, and the thumb should be flexed at both the metacarpophalangeal (MCP) and interphalangeal (IP) joint.

Figure 3: Neurovascular Exam

POST-PROCEDURE CARE

Post-Splinting Radiography

If a reduction maneuver was performed, obtain a second set of radiographs, showing two views, to confirm that anatomical reduction was not lost during the splinting process.

Neurovascular Examination

4. Repeat a thorough neurovascular examination of the splinted limb

5. If there are signs of neurovascular compromise, remove the elastic bandage first and replace it with more with gentle compression.

6. If the neurovascular deficit persists, the splint should be removed, the limb should be inspected, and another splint should be placed. Persistent neurovascular deficits will require immediate orthopedic consultation.

Client Education

1. Instruct the client to keep the splint clean and dry.

2. The extremity should remain elevated for the first 2-3 days to decrease swelling.

3. Educate the client about the signs and symptoms of neurovascular compromise and about how to loosen the bandages if neurovascular symptoms arise.

4. Instruct clients to contact the nurse on call if there are is increased pain or paraesthesia. It is possible for pressure ulcers and infection to develop underneath the splint.

5. Clients should be advised to avoid scratching inside the splint with any objects as small lacerations can occur and secondary infections develop.

COMPLICATIONS

In addition to the complications identified in Procedure 11-017-01 *General Plaster Splinting*, the nurse must assess for: **Avascular necrosis and nonunion of the scaphoid bone**

Because of its unique anatomy and tenuous blood supply, the scaphoid bone is at high risk of avascular necrosis and nonunion. All scaphoid injuries, known or suspected, require timely follow-up with an orthopedist.

DOCUMENTATION

Document the following in the client's health record:

- Client history, including mechanism of injury
- Pre-splint assessments, including initial x-ray interpretation
- Post-splint assessment, including neurovascular assessment and repeat x-ray findings (if applicable)
- Client education and follow-up appointment
- Complete WSCC forms (as required)

PROCEDURE 11-017-08

ULNAR GUTTER SPLINT

Splinting coupled with anatomic reduction allows healing to take place by keeping the fractured bones opposed in an anatomic position for a period of time.

This procedure is an addendum to the Procedure 11-017-01 *General Plaster Splinting*. For detailed instructions and considerations, refer to Procedure 11-017-01.

Nursing Considerations

1. Splinting is indicated for temporary immobilization for:

    a. Fractures of the fourth or fifth metacarpals or phalanges.
    b. The boxer's fracture, which is a fracture of the diaphysis of the fifth metacarpal, is a common injury.

2. The ulnar gutter splint is contraindicated for:

    a. Infections: all wounds must be assessed for signs of infection before splinting. The physician must be consulted if signs of infection are noted.
    b. Impending compartment Syndrome
    c. Diabetic or other neuropathy
    d. Open fracture: Wounds adjacent to metacarpal head fractures should be considered open fractures and emergent consultation should be obtained.

3. Lacerations overlying the metacaropophalangeal (MCP) joints may be seen in conjunction with metacarpal head fractures. These are often referred to as "fight bites" or clenched-fist injuries, if sustained during an altercation. These wounds should be assumed to be open fractures, and the physician must be consulted as soon as possible.

EQUIPMENT
✓ Slightly warm (not over 24°C) water and bowl ✓ Stockinette (optional) ✓ Soft cotton bandage/cast padding material (e.g., Webril; Kendall), 2, 3, 4 or 6-inch width ✓ Plaster bandages, available in 2, 3, 4 or 6- inch width ✓ Elastic bandages (E.g. Ace bandage) ✓ Adhesive tape

Procedure

1. Examine the extremity carefully for signs of an open fracture.

2. Perform a detailed neurovascular examination before splinting.

3. Assess for any vascular insufficiency by palpating distal pulses at the ulnar and radial arteries, testing for capillary refill time, and assessing the color and warmth of the extremity.

4. Assess for any sign of nerve compression, such as numbness and/or tingling of the distal extremity.

5. It is important that any abnormalities be corrected if possible and documented before placement of the splint.

6. Obtain appropriate radiographic studies. At least two views of the fractured bone should be obtained, making sure to image the joints directly proximal and distal to the fracture.

7. The physician must be notified if any displacement or angulation is visible on the radiograph, as a hand specialist will need to be consulted.

8. Position the client in a sitting position, with the arm held in 90° abduction, and external rotation, and 90° elbow flexion.

9. Apply stockinette to the extremity (optional).

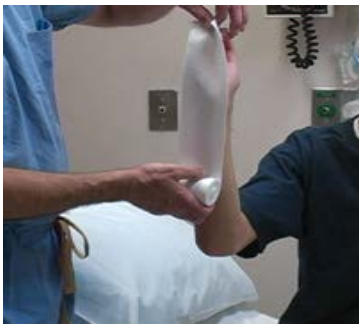
    a. The stockinette should extend beyond the anticipated ends of the splint by several inches.
    b. Ensure all wrinkles in the stockinette have been removed to avoid pressure injury.

10. Measure the required length of splinting material by unrolling a single layer of Cast padding along the anticipated course of the splint - from the tip of the little finger to a point 5-10 cm proximal to the elbow, along the ulnar portion of the forearm.

11. Lay this piece of Cast padding on a bedside table, and then roll out an additional 3 layers on top of it to form the cast padding. Make the top layer out of two strips of Cast padding, each offset from the middle of the other layers by half their width.

12. Roll out 6-8 layers of plaster bandages on top of the Cast padding. The plaster may be folded back and forth upon itself during this process.

Figure 1: Measuring Cast Padding



13. Soak the layers of plaster bandages in room temperature water in a bucket. Do not use hot water, because it increases the risk for burns from the exothermic plaster.

14. Once soaked, raise the layers vertically over the bowl, firmly holding each end of the roll in your hands.

15. Remove excess water by allowing the plaster to fold upon itself and then gently squeeze the layers.

16. Place the wet plaster onto the cast padding, and smooth the surface by running your hands over it. This causes the layers to form a single mass of plaster.

17. Fold the overhanging edges of cast padding over the plaster. This single layer of padding is used to prevent the plaster from adhering to the elastic bandage.

Figure 2: Padding between fingers

18. Finally, fold any excess padding over the ends of the splint, to provide additional cushioning.

19. Before applying the splint, place a small piece of folded Cast padding between the ring and little fingers. This serves as a padding and will prevent maceration of the digits after the splint has been applied

20. Carefully place the splint in the desired location. Be sure to place the padded side of the splint next to the skin.

21. Apply the splint along the ulnar aspect of the forearm. The splint should extend to the tip of the little finger and wrap around the ring and little finger.

Figure 3: Applying Splint

22. Gently mould the plaster to the area, using the palms of your hands.

23. Roll 2 to 3-inch elastic bandages over the splint, in a distal to proximal direction. Both the ring and little fingers should be included in the elastic bandage

24. Once again, gently mould the splint to the extremity using your hands. For fractures involving the distal metacarpal or the metacarpal-phalangeal joint, the MCP joint should be placed in 90° flexion, and the interphalangeal (IP) joints should be extended.

Post-Splinting Radiography

If a reduction maneuver was performed, obtain a second set of radiographs, showing two views, to confirm that anatomical reduction was not lost during the splinting process.

Neurovascular Examination

7. Repeat a thorough neurovascular examination of the splinted limb

8. If there are signs of neurovascular compromise, remove the elastic bandage first and replace it with more with gentle compression.

9. If the neurovascular deficit persists, the splint should be removed, the limb should be inspected, and another splint should be placed. Persistent neurovascular deficits will require immediate orthopedic consultation.

Client Education

6. Instruct the client to keep the splint clean and dry.

7. The extremity should remain elevated for the first 2-3 days to decrease swelling.

8. Educate the client about the signs and symptoms of neurovascular compromise and about how to loosen the bandages if neurovascular symptoms arise.

9. Instruct clients to contact the nurse on call if there are is increased pain or paraesthesia. It is possible for pressure ulcers and infection to develop underneath the splint.

10. Clients should be advised to avoid scratching inside the splint with any objects as small lacerations can occur and secondary infections develop.

DOCUMENTATION

Document the following in the client's health record:

- Client history, including mechanism of injury
- Pre-splint assessments, including initial x-ray interpretation
- Post-splint assessment, including neurovascular assessment and repeat x-ray findings (if applicable)
- Client education and follow-up appointment
- Complete WSCC forms (as required)

Approved by:	Effective Date:
11 FEB 2011 **Chief Nursing Officer** **Date**	April 1, 2011
February 11, 2011 **Deputy Minister of Health and Social Services** **Date**	