


British Columbia Provincial Nursing Skin & Wound Committee
 Procedure: Removal of Non-therapeutic Maggots (Myiasis)

Developed by the BC Provincial Nursing Skin & Wound Committee in collaboration with NSWOCs/Wound Clinicians from:	
	
Title	Procedure: Removal of Non-Therapeutic Maggots (Myiasis)
Practice Level for British Columbia	<ul style="list-style-type: none"> The procedure to remove non-therapeutic maggots can be initiated by RNs/RPNs with notification to the Physician/NP/Nurse Specialized in Wound Ostomy Continence (NSWOC) /Wound Clinician. For LPNs, this procedure can be undertaken once there has been a discussion of the treatment plan with the RN/RPN. Agency/health authority policy/standards must be in place to support this practice. The care of a client (see definition) undergoing removal of non-therapeutic maggots requires a comprehensive, evidence-based assessment and treatment. This clinical practice guideline focuses solely on the role of the nurse, as one member of the interprofessional team.
Background	<ul style="list-style-type: none"> Myiasis in humans is the infestation of unwanted/unintentional/non-therapeutic maggots; these types of maggots are also called non-medical-grade or wild. There are different types of myiasis, this document will only speak to wound and cavity types of myiasis. The most common fly is the housefly but there are different types of flies, with varying life-cycles, within the world and any type of fly can create myiasis. Some flies are more prone to carry disease e.g tetanus (rare), therefore it is important to know if the client lives on a farm/ranch or has done any recent travelling e.g farm/ranch, international travel. Although sterile medical-grade maggot debridement therapy is an effective wound debridement method, non-medical grade maggots may not be beneficial to the client and the multiple bacteria that they carry may put the client at risk for infection. In addition, although most maggots feed on dead tissue there are maggots who will feed on healthy tissue of a wound. Myiasis can cause psychological stress and distress to both the client and the caregiver. In Canada, myiasis typically occurs in warmer months when clients are more likely to leave their wounds open to the air as they find this more comfortable and when windows/doors are left open to external environment. Clients who have poor living conditions and those who are immuno-compromised are more at risk. The common female housefly will lay eggs where there is a source of food such as necrotic/decaying tissue or cavities; she lays usually 150 eggs per laying and can do 5-6 layings within a few days. Within a 24hr period, the eggs hatch and the larvae (maggots), over the next 3-5 days, feed on the food source. Maggots then leave the host and go into a pupa stage where they develop a hard, dark shell and in 3-20 days, depending upon the temperature, emerge from this shell as a fly. Note, flesh flies (Sarcophagidae) do not lay eggs, they deposit living maggots directly into the host. Daily removal of, and ongoing monitoring for, maggots is necessary due to the multiple laying of eggs within a short time period and the short hatching period of the maggot. Maggots can be found in the nares, ears, eyes, tracheotomies, urogenital areas, skin folds and wounds. The treatment involves two steps; the removal of the maggots followed by containment. The treatment must be done daily for at least 3 days or until 2 successive removal treatments have occurred where there are no maggots observed.
Indications	Use this document to guide the determination of which procedure method is to be used for the removal of non-therapeutic maggots.
Bookmarks	Determination of Treatment Supplies & Equipment Procedure Documentation Bibliography/References Date of Creation
Related Guidelines	Wound Management Guideline Procedure Decision Grid: Removal of Non-Therapeutic Maggots (Myiasis)

Determination of Procedure Method

1. Client factors, the characteristics of the wound infested, the care setting will inform the method of removal. If unsure which removal method is most appropriate for the client situation:
 - Contain the infestation with gauze-based cover dressings and secure with tape or layers of gauze roll/Kling or securement stocking e.g. Stockinet,
 - Consult with Physician/NP/ NSWOC/Wound Clinician.
2. For a client with compromised peripheral vascular perfusion:
 - Consult with Physician/ NP/ NSWOC/ Wound Clinician.
 - If current treatment plan is to keep the limb/foot wound dry, then use the mechanical removal method and cover the foot/limb with a containment dressing e.g. gauze-based dressings (abdominal pads) and loosely-wrapped layers of gauze roll/ Kling (avoid compression or tourniquet affect) or a securement stocking e.g Stockinet.
 - If current treatment plan is using moist wound healing, then use the irrigation or submersion removal methods and cover with gauze-based dressings as above or a cover dressing suitable for daily dressing changes.
3. For the following infestation areas; abdomen without intact fascia, tumours, tubes/drains, wound sinus tracts/tunnels, ears, surgical wounds:
 - Cover the area with a containment dressing (gauze-based dressings (abdominal pads, classic pads, etc) and secure with tape or gauze roll/Kling.
 - Consult with Physician/NP/ NSWOC/Wound Clinician for the most appropriate removal method.
4. For infestation in the nasopharynx, the oropharynx or the eyes, contact Physician/NP for appropriate treatment and consider Contact Precautions.

Interventions

1. Assess if the client lives on a farm/ranch or if, in the past 6 months, has visited a farm/ranch or has done any travel. If so, inform the Physician/NP/ NSWOC/Wound Clinician, as a sample of the maggots may be needed for identification by an entomologist.
2. Assess when the client last had a tetanus vaccine as fly may, although very rare, carry the tetanus bacteria. If it has been 10 years or longer, consult with Physician/NP for consideration of tetanus vaccination.
3. Assess for signs and symptoms of a local, systemic or septic wound infection; inform Physician/NP if noted.
4. The management of the maggot infestation involves two steps; the removal of the maggots followed by containment:
 - Removal of the maggots can be done using one or combination of the following methods:
 - **Mechanical:** physical removal using gauze and/or forceps.
 - **Irrigation:** uses large volumes of fluid (Normal Saline (NS) or Potable Water) for flushing the area of infestation.
 - **Submersion:** usually done for limbs, the limb is placed in water/normal saline deep enough to cover the area of infestation.
 - Containment is required to prevent the maggots from escaping from the wound(s) in which they currently occupy and migrating to client's other wounds or into the surrounding environment. There are two methods of containment:
 - Following the removal of the maggots, use a containment dressing to hold the remaining maggots in the area until the next removal procedure, this procedure takes place within 24 hours so consider a dressing appropriate for removal within 24 hours e.g. gauze-based dressings.
 - For maggots removed using the mechanical method (see above), place in a double plastic bag and double-knotted the bag
5. The procedure is to be done daily for 3 days or until 2 successive removal procedures have occurred where no maggots were observed in the area; this is to ensure complete elimination of the maggots. Due to the multiple laying of eggs in a short period of time and the short hatching period of the maggot, the procedure for removal must occur on successive, multiple occasions.

Equipment and Supplies

- Hand hygiene equipment
- Clean gloves
- Protective Personal Equipment (PPE) (must include a face shield, gown, protective foot covering).
- Plastic bags (with ties) for garbage and collection of solution
- Procedure pads/towels as needed
- Odour neutralizer / room deodorizer, if needed.

If doing mechanical removal:

- Sterile dressing tray containing two forceps

If doing irrigation removal:

- 30 mL syringe
- Irrigation tip catheter
- Large amounts of Normal Saline or potable water

If doing submersion removal:

- An appropriately sized container for submerging the limb (single client use)
- Enough potable water to immerse the limb

Containment Dressing (choose appropriate supplies):

- Gauze-based cover dressings (abdominal pads, classic pads, etc.)
- Securement stocking e.g. Stockinet
- Kling wrap
- Tape

Procedure also see [Procedure Decision Grid: Removal of Non-Therapeutic Maggots \(Myiasis\)](#)

Steps	Key Points
1. Notify Infection Control of the situation and follow their recommendations for managing the situation (patient and environment).	
2. Explain to the client the situation and the procedure that will be done to remove the maggots. Offer reassurance. Close all doors and windows in the surrounding area. In facility setting, if maggots are not able to be contained, place the client on Contact Precautions or in a private room.	The presence of maggots can be distressing to the client. To contain the flies to one area and to minimize new flies from entering other areas.
3. Assess for presence of wound pain and need for analgesia before the procedure.	
4. Determine appropriate removal method or combination of methods: <ul style="list-style-type: none"> • Mechanical • Irrigation • Submersion 	The method used will determine the supplies and equipment needed. Note: Do not use the irrigation or submersion method if maggots are on an ischemic limb.
5. Gather supplies/equipment. Ensure the solution to be used is at least room temperature (20°C).	Using a cool/cold solution can cause client discomfort.
6. Put on personal protective equipment must include a face shield, gown, and gloves. Foot covering may be needed.	
7. Perform hand hygiene. Prepare/clean work surface.	
8. Position client in the most appropriate position based upon the removal method to be done.	

Steps	Key Points
<p>9. Set up dressing tray using clean technique. Perform hand hygiene and put on gloves. Remove the dressing, if present. Assess the area and observe for presence of larvae/maggots.</p>	
<p>10. Remove the maggots using the most appropriate method(s):</p> <p><u>Mechanical</u> Place a double plastic bag or collection device beneath the infestation area to collect the maggots</p> <p>Use a gauze and/or forceps to remove the maggots to remove as many of maggots as possible.</p> <p>Place all 'captured' maggots in a doubled plastic bag and double-knot the bag.</p> <p><u>Irrigation</u> Place a double plastic bag or collection device beneath the infestation area to collect maggots and irrigation solution.</p> <p>Using an irrigation tip catheter and 30 mL syringe of Normal Saline or potable water to irrigate the infested area. Use copious amounts of solution 500 to 1000 mL. and full force to irrigate any undermining/sinus/ tunnels and wound bed.</p> <p>Keep irrigating until maggots are no longer observed</p> <p><u>Submersion</u> Place infested limb in appropriately sized container and fill with enough potable water to fully immerse the infested area. Maggots will float out into the water.</p> <p>If necessary, empty the container down a <u>flushable</u> drain e.g. toilet or cleaner/disinfector (hopper/tornado); and refill with clean water.</p> <p>Soak for a total of 20 minutes</p>	<p>Use of full force is needed to remove the maggots but use in consideration of the client's tolerance to this force or friable wound bed, Note; using fluid under pressure can cause splash-back.</p> <p>Using a fluid-gelling agent e.g. Vernacare in the plastic bags/collection device will gel the irrigation water into a semi-solid state which can then be immediately double-bagged and double-knotted for disposal in the garbage.</p> <p>Flushable drains do not have a J-style drainage trap in which the maggots could get caught in.</p>
<p>11. Apply the containment dressing: Pat dry the area (if needed).</p> <p>Cover the entire area with gauze-based dressings or other dressing suitable for daily removal; secure with tape or with gauze roll/Kling or securement stocking.</p> <p>Leave the containment dressing in place until the next removal procedure (24 hours later).</p>	<p>The dressing is to ensure that the maggots are contained to the area.</p> <p>For limbs with decreased perfusion, if using gauze roll, ensure that the wrap is not too tight to avoid cutting off the circulation.</p> <p>Dressing needs to be removed daily in order to do the maggot removal procedure.</p>
<p>10. Clean up work area: <u>Double bag</u> all disposables, securely tie the bag(s) and disposed of in the waste container.</p> <p>Gather any towels/linens used in the procedure; for acute/long-term care, placed in a laundry bag and then securely tied. In the home, launder the linens in the hottest water and longest setting possible, dry in a hot dryer.</p> <p>Plastic bags containing any used gelled solution are to be tied and placed in the regular garbage.</p>	

Steps	Key Points
<p>Any gelled used solution must be disposed of down a flushable drain e.g. toilet or cleaner/disinfector (hopper/tornado); care is to be taken when transporting the solution to avoid splashes/ spillage.</p> <p>Clean the single-client-use bucket used for submersion in between treatments. Disinfect and/or discard when the procedure is completed.</p>	
<p>11. Clean up the immediate environment:</p> <p>Ensure removal of any uncovered perishable food or garbage.</p> <p>Check chairs and cushions for potential accumulation of perishable food. Clean/disinfect as needed.</p> <p>If odour present consider using a Health Authority approved deodorizer.</p>	<p>Minimizing fly attraction and preventing them from coming into the environment is important.</p> <p>Presence of odour attracts additional flies which may increase risk of laying eggs on undressed and exposed wounds.</p>
<p>The removal procedure must be done daily for at least 3 days or until 2 successive removal procedures have occurred where there are no maggots observed in the infestation area.</p> <p>Monitor for local wound infection with each removal procedure.</p>	

Documentation

For each procedure, document the:

- maggot removal method used
- presence/absence of maggots at the beginning of the procedure and at the end of the procedure
- client's tolerance of the procedure.

Definitions

Client: A recipient of care: in acute care – patient; in community care – client; and in long-term care – resident.

Containment dressing: any covering used to ensure that the maggots do not leave their current location to infest another.

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Document Creation/Review

This guideline is based on the best information available at the time it was published and relies on evidence and avoids opinion-based statements where possible. It was developed by the Provincial Nursing Skin & Wound Committee and has undergone provincial stakeholder review.

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