Developed by the British Columbia Provincial Nursing Skin & Wound Committee in collaboration with NSWOCs/WCs from:

Culture & Susceptibility (C&S) Swab for Suspected Wound Infection: Procedure

HA Endorsement **British Columbia & Yukon**	• Endorsement done: FNHA, FHA, ISLH, NHA & VCH/PHC. • Endorsement pending: PHSA & Yukon; until endorsement has been granted by your Health Authority (HA) please follow your HA's current document.
DST Indications for Use	• This Decision Support Tool (DST) lays out the procedure steps for taking a culture & susceptibility (C&S) swab when there is a suspected wound infection. • Adult or children clients with a suspected or confirmed wound infection require an interprofessional team to provide comprehensive, evidence-based assessment and treatment. This DST focuses solely on the role of the nurse, as one member of the team.

Practice Level
British Columbia
as laid out by BCCNM and as per HA/agency policy
	Applicable BCCNM Practice Standards:
	• Registered Nurses (RNs) and Registered Psychiatric Nurses (RPNs): RN or RPN *Screening and Diagnostic Tests & Imaging Practice Standard*, and the RN or RPN *Acting Within Autonomous Scope of Practice Standard.*
	• Licensed Practical Nurses (LPNs): acting with client-specific order for a wound below the dermis and autonomous scope of practice for a wound above the dermis.
	Nurses' Practice:
	• RNs and RPNs may collect the wound swab for C&S if:
	  ○ There is a client-specific order from the MRP.
	  ○ There is no order but based upon the clinical assessment of the signs & symptoms (S&S) make a nursing diagnosis of a spreading or systemic wound infection, if this activity is:
	  ○ Supported by their HA/agency.
	  ○ Within their individual competency.
	The RN/RPN must then consult with the MRP and receive a client-specific order **prior** to send the swab to the microbiology lab for C&S testing.
	• LPNs may collect a wound swab for C&S when:
	  ○ For wounds below the dermis:
	  ○ There is a client-specific order from the MRP.
	  ○ This activity is supported by their HA/agency.
	  ○ Is within their individual competency.
	  ○ For wounds above the dermis:
	  ○ There is a client-specific order from the MRP.
	  ○ There is no order but based upon the clinical assessment of the signs & symptoms (S&S) make a nursing diagnosis of a spreading or systemic wound infection, if this activity is:
	  ○ Supported by their health authority/agency.
	  ○ Within their individual competency.
	The LPN must then consult with the MRP and receive a client-specific order **prior** to send the swab to the microbiology lab for C&S testing.
	• Certified Practice RNs can order a wound swab for C&S if:
	  ○ This activity is within their Certified Practice role.
	  ○ In accordance with their RN certified practice limits and conditions.
	  ○ Done as outlined in their certified practice designation's DSTs.

Practice Level **Yukon**	RNs, RPNs and LPNs refer to organizational policy and practice in accordance with regulatory bodies.

Need to Know	• The use of conservative sharp wound debridement (CSWD) to expose an area of viable tissue prior to the collection a C&S swab may only be done by RNs/RPNs as per their Health Authority/agency policy or standard. These nurses must also successfully complete CSWD additional education and follow an established CSWD guideline and procedure. • Wound infection is classified along a continuum as contaminated, colonized, local, spreading and systemic. • Chronic wounds have colonized microorganisms, but this does not necessarily mean that the wound is infected. Wound infection is diagnosed by the clinical assessment of the S&Ss present, and a swab should be taken only when the S&Ss of a spreading or systemic infection are present. • A C&S test provides information on the type and amount of microorganisms cultured in the wound and the microorganisms' susceptibility to specific antibiotics. • Wound C&S testing may be done using a swab, tissue biopsy or needle aspiration. Needle aspiration and tissue biopsy are preferred methods of specimen collection, however swab cultures are acceptable as they are practical, commonly used, non-invasive, cost effective. Note: C&S swabs are used for culturing anerobic microorganisms only. • The wound must only be cleansed with sterile normal saline (NS) or sterile water prior to swabbing the wound to avoid contaminating the swab with skin flora, necrotic tissue, or pus; do not use antiseptic/antimicrobial solutions, (e.g., Vashe, Anasept, Chlorhexidine Gluconate (CHG),) as these may interfere with the results. Either sterile or no-touch aseptic technique is used to take a wound swab. • The Levine Method is used as it calls for swabbing only viable tissue as wound infections occurs in viable tissue. At least 1cm^2 (0.4 inches) area of viable tissue is required to do a C&S swab. Swabbing nonviable (slough/necrotic) tissue or pus may produce false results which can lead to inappropriate antibiotic treatment.
Bookmarks	Clinical Assessment for Wound Infection Equipment & Supplies Procedure Documentation Definitions References/Bibliography Document Management
Related Documents	Guideline: Wound Infection Guideline: Wound Management Procedure: Wound Cleansing

Clinical Assessment for Wound Infection Wound Infection: Guideline

Indications

- Wound assessment show two or more signs and symptoms of spreading or systemic infection.
- A local, spreading or systemic infected wound that do not respond to, or is deteriorating, despite antimicrobial and/or antibiotic treatment.
- As required by local infection control surveillance protocols for drug resistant organisms.

Precautions

- Consider additional factors that may impact wound healing before re-culturing a wound that is not responding to treatment.

Contraindications

- Wounds covered with slough and/or necrotic eschar.
- Absence of S&S of infection or delayed healing, unless drug resistant organisms screening is required
- Wounds that have been cultured within the last 24-72 hours.
- Inability to transport the culture within 24 hours of taking the swab.

Equipment and Supplies

- Sterile dressing tray.
- Clean gloves for cleansing the wound.
- Personal Protective Equipment (PPE) as needed.
- 2 sets of gloves (clean or sterile, depending upon technique used) to take the swab & apply new dressing.
- At least 100ml sterile NS or sterile water plus equipment and supplies needed to cleanse the wound.
- Sterile swab kit for C&S (**culture for aerobic bacteria only**), check the expiratory date on the kit. Note: if a second wound requires swabbing, collect a second kit.
- Biohazard transport bag and laboratory requisition.
- Appropriate supplies to redress the wound.

Culture & Susceptibility (C&S) Swab for Suspected Wound Infection: Procedure	
Steps	**Key Points**
1. Ensure transport of the swab can be done within 24 hours.	Specimens should be transported to the lab as soon as possible (same day) for best results. If transport within 24 hours is not possible, do not take the swab until it can be delivered.
2. Prepare the client: • Explain the procedure to client/family keeping in mind the concepts of Trauma Informed Practice and, where appropriate for the client, Indigenous Cultural Safety, obtain verbal consent (if possible). • Assess for the presence of wound pain, pre-medicate if necessary.	
3. Prepare for the procedure: • Gather necessary supplies. • Prepare a clean work surface • Position the client. Use a procedure pad or kidney basin to catch the cleansing solution. • Perform hand hygiene. • Set up a dressing tray using sterile or no-touch aseptic technique as per wound treatment plan. • Put on clean gloves. • Remove the soiled wound dressing. • Remove the gloves, perform hand hygiene. Put on gloves (sterile or clean).	Follow agency guidelines for hand hygiene. One of these two aseptic techniques are used when taking a C&S swab.
4. Prepare the wound: • Thoroughly cleanse the wound and peri-wound/surrounding skin with at least 100mL sterile Normal Saline (NS) or sterile water. • Use sterile gauze(s) to remove excess NS or sterile water from the wound surface. • Pat dry the periwound/surrounding skin. • At least a 1cm^2 area of viable wound bed tissue **must** be visible in the wound in order to continue with the procedure. ○ If not visible, do not take the culture and notify the MRP or NSWOC/WC.	Do not use antiseptic/antimicrobial wound cleaning solutions, (e.g., Vashe, Anasept, CHG) as these can interfere with the result. This amount of solution cleanses the wound and provide moisture to the wound bed to improve the yield of bacteria, larger amounts are required for larger wounds. Wound Cleansing: Procedure If a 1cm^2 area of viable wound bed tissue **is not visible,** debridement is required before the C&S swab can be collected. CSWD is the quickest non-surgical debridement method Guideline: Wound Management).

Steps	Key Points

5. Take the swab using the Levine Method:
• Rotate the tip of the swab over a 1cm^2 clean (slough/necrotic free) area of the wound bed for 5 seconds using firm but gentle pressure to extract fluid from the wound tissue. Do not swab tunnelled or undermined tissue.
• Avoid touching the wound edge or periwound skin with the swab.
• Immediately place the swab into the transport medium:
  ○ Avoid touching the opening of the tube.
  ○ Ensure the swab tip is in contact with the transport medium at the base of the tube.
  ○ Ensure lid is properly closed.
• Remove gloves. Perform hand hygiene.
	Non-viable tissue, (e.g., necrotic slough, purulent material or eschar) is heavily contaminated with bacteria.
	An anerobic swab is to be taken only of the visible wound bed. A C&S swab for tunnelled or undermined tissue requires a MRP order and an anaerobic test kit.

6. Dress the wound: • Put on clean or sterile gloves appropriate for the technique required to complete the dressing change. • Apply the wound dressing as per the client's care plan. • Clean the work surface. • Remove gloves and personal protective equipment. Perform hand hygiene.	

7. Prepare the container for the lab:
• Document the following on the swab tube:
  ○ Client identification
  ○ Date and time swab taken.
  ○ Site the swab was taken from.
• Document the following on the laboratory requisition:
  ○ Client identification.
  ○ Initials of the person who collected the specimen.
  ○ Collection date and time.
  ○ Wound location and etiology if known.
  ○ Client diagnosis.
  ○ Antibiotics the client is currently receiving.
  ○ Name of MRP who has ordered the test.
• Place a specimen in a biohazard transport bag and transport to the lab as soon as possible.
  ○ If transportation of the collected specimen cannot be immediately, store specimen in the refrigerator at 2-8^0 C until it can be transported.
  ○ If the swab cannot be sent to the lab within 24 hours discard it and collect a new swab.
	If there are two or more wounds in the same location, specify the wound by documenting the location or another identifier on the specimen container and the laboratory requisition, (e.g., Right Lower Leg Wound#1, Right Lower Leg Wound#2).
	Specific identifiers help others to attribute the C&S results to the appropriate wound.
	Delays in getting the specimen to the lab for analysis may alter the C&S results, as some of the bacteria may die, and others may be overgrown by more rapidly growing strains.
	For community clients, follow HA/agency policy on the transportation of dangerous goods as this governs the transportation of all C&S swabs.

8. Follow-up: • Connect with MRP regarding the results of the C&S testing and any change to treatment plan.	

Documentation

1. Document the wound assessment for infection and the C&S collection procedure.
2. Label the specimen tube and complete the laboratory requisition as per HA/agency policy as indicated in the procedure step 7 above.
3. Document the date and time when the swab was taken to the laboratory (note if client or family were responsible for delivery of the specimen to the lab).
4. Based upon the MRP's order in light of a positive C&S result, update the treatment plan.

Definitions

Aerobic bacteria: Bacteria that survive in an oxygenated environment. *Aerobic C&S swabs kits are not used to collect anaerobic bacteria.*

Anaerobic bacteria: Bacteria that survive in an environment with little or no oxygen. They are usually found in tunnelling, undermining, and deeper wound tissue.

Antibiotics: Agents that act selectively against bacteria and can be used either topically (not usually recommended) or systemically. Development of resistance to systemic and topical antibiotics is an increasing problem.

BCCNM: British Columbia College of Nurses & Midwives

Client: Generic term used to identify an adult or child recipient of care regardless of care setting; patient in hospital, client in community and primary care; resident/person-in-care in long-term care.

Client/Family: Family is two or more individuals who come together for mutual aid. Families are self-defined, and family is 'who the client says their family is'; this is individualized.

Culture: Placing material from a wound into a growth medium to optimize identification of microorganisms.

Debridement: The removal of non-viable tissue. Debridement supports the development of granulation tissue which is necessary for wound healing to occur.

Levine Method: The most accurate method of determining the presence of infection using a swab. At least 1cm^2 area clear of pus, slough and necrotic tissue is needed when doing the swab as infection resides in viable wound bed tissue. The swab is taken by rotating the tip of the swab on wound bed with firm but gentle pressure to express wound fluid.

MRP: Most Responsible Provider.

Needle aspiration: A procedure whereby a needle is inserted into wound tissue to aspirate fluid. Needle aspiration determines the type and number of microbes below the surface of the wound. It offers reliable results but is invasive and can be painful.

Non-viable tissue: Soft, spongy, slough/necrotic tissue that is yellow, tan, grey, brown or black in colour. It may be thin or thick and the consistency may be fibrous, stringy or mucinous. It is firmly or loosely attached to the wound edges and wound base. Fluctuance and drainage may be present.

No-Touch Technique: An aseptic technique using clean gloves and a sterile field, sterile dressing tray, sterile instruments, sterile solution, and sterile dressings; only sterile instruments are used for direct contact with the wound.

NSWOCs: Nurses Specialized in Wound Ostomy Continence.

Sterile Technique: An aseptic technique using sterile gloves and a sterile field, sterile dressing tray, sterile instruments, sterile solution, and sterile dressings; sterile instruments and/or sterile gloved hands are used for direct contact with the wound.

Susceptibility Testing: Susceptibility testing is carried out to determine which antibiotics are most likely to be effective in eradicating a bacterial wound infection.

Viable tissue: issue that is healthy and capable of living.

Wound cleansing: The use of a sterile wound cleansing solution and sterile gauze to remove loose and/or loosely adherent devitalized tissue from the wound surface.

WC: Wound Clinician

Wound Infection Continuum:

Contamination - Wound contains low levels of non-proliferating microbes that typically do not impede wound healing.

Colonization - Wound contains microbial organisms that undergo limited proliferation without evoking a host (living organism) reaction.

Local infection - Occurs when microorganisms invade the wound tissue and evoke a host response in one area of the body. Subtle S&S of infection may evolve into more classic S&S of infection.

Spreading infection - Occurs when microorganisms invade the wound, proliferate and spread beyond the wound border, this may involve deep tissue, muscle, fascia, organs or body cavities.

Systemic infection - Occurs when microorganisms invade the body and spread via the vascular and lymphatic system. Systemic inflammation, sepsis, organ dysfunction and death may result.

References/Bibliography

1. Levine, N., et al. (1976). *The quantitative swab culture and smear: A quick simple method for determining the number of viable aerobic bacteria in open wounds*. Journal of Trauma, *16*(2), 89-94.
2. Kuhnke JL, Burrows CA, Evans RM, Orsted HL, Rosenthal S, editors (2025). *Best practice recommendations for skin health and wound management.* Toronto (ON): Wounds Canada.
3. Internation Wound Infection Institute (IWII) 2022. *Wound infection in clinical practice*. Wounds International.

Document Management

This procedure was approved at the time of its publication by the British Columbia Provincial Infection Control Network Management Office for use within the province of British Columbia.

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