**Developed by the BC Provincial Nursing Skin and Wound Committee in collaboration with NSWOCs/Wound Clinicians from:**

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| **TITLE** | **Procedure: Culture & Susceptibility (C&S) Swab in Suspected Wound Infection** |
| **Document Indications for Use** | • This procedure lays out the steps for taking a C&S swab when there is a suspected wound infection. |
| **Practice Level** | • Taking a swab for culture and susceptibility (C&S) is not a restricted activity as per to the British Columbia College of Nursing Professionals' Registered Nurse scope of practice and therefore does not require an order for a nurse to carry it out. However, health authority/agency policy may require a Physician/NP order.<br>• Registered nurses must successfully complete additional education in Conservative Sharp Wound Debridement (CSWD) and follow an established guideline/procedure if this method is used to expose an area of viable tissue prior to collecting a C&S swab.<br>• Clients with an actual or suspected wound infection require an interprofessional approach to provide comprehensive, evidence-based assessment and treatment. This clinical procedure focuses solely on the role of the nurse, as one member of the inter-professional team providing client care. |
| **Background** | • Wound infection is diagnosed by clinical assessment not by culture results.<br>• Wounds are classified as contaminated, colonized, local infection, spreading infection, and systemic infection.<br>• A C&S swab provides information on the type and amount of microorganisms present in the wound and the susceptibility of the microorganism to specific antibiotics.<br>• Chronic wounds have colonized microorganisms but this does not necessarily mean that the wound is infected. Wounds should only be cultured when signs and symptoms of a spreading infection are present.<br>• 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, and provide accurate results when compared to the results of other methods.<br>• The wound must 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.<br>• Wound infection occurs in viable wound tissue and therefore viable wound tissue must be swabbed rather than necrotic tissue or pus. At least 1 $cm^2$ (0.4 inches) area of viable tissue is required to do a C&S swab. Swabbing necrotic tissue or pus may produce false results which can lead to inappropriate antibiotic treatment.<br>• The 'no-touch technique' is used to take a wound swab for C&S.<br>• The 'Levine Method' is used as it directs the staff to swab only viable tissue. This method is superior to the zig-zag method when collecting a wound swab for C&S.[5,6,14,15] |
| **Bookmarks** |  |
| **Related Documents** | Guideline: Assessment, Prevention and Treatment of Wound Infection<br>Guideline: Wound Management for Adults & Children<br>Procedure: Wound Cleansing |

## Clinical Assessment for Wound Infection Guideline: Assessment, Prevention and Treatment of Wound Infection

A wound assessment showing signs and symptoms (S&S) of a spreading or systemic infection need to be done before doing a C&S swab.

**Indications**

- Wounds with 2 or more signs and symptoms of spreading or systemic infection.
- Local, spreading or systemic Infected wounds that do not respond to, or are 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 that have been cultured within the last 24-72 hours.
- Inability to transport the culture within 24 hours of taking the swab.
- The absence of signs of infection or delayed healing unless screening for drug resistant organisms is required.
- Wounds covered with necrotic eschar or slough.

## Equipment and Supplies

- Sterile dressing tray
- 2 sets of clean gloves for cleansing the wound and taking the swab
- 1 set of clean or sterile gloves, depending on the technique used, to apply the new dressing
- 100ml sterile NS or sterile water plus equipment and supplies needed to cleanse the wound (Procedure: Wound Cleansing).
- Sterile swab kit for C&S (**culture for aerobic bacteria only**). If there are 2 or more wounds in the same location use a separate swab kit for each wound.
- Biohazard transport bag and laboratory requisition
- Appropriate supplies to redress the wound

## Procedure

| Steps | Key Points |
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| 1. Ensure that 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 to the lab within 24 hours. |
| 2. Gather necessary supplies. | |
| 3. Assess for the presence of pain and pre-medicate if necessary. | |
| 4. Prepare a clean work surface. | |
| 5. Explain to the client why the swab is being taken and what the procedure involves. | |
| 6. Position the client. If needed, use a disposable pad or kidney basin to catch the cleansing solution. | |

| Steps | Key Points |
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| 7. Perform hand hygiene. | Follow agency guidelines for hand hygiene. |
| 8. Set up a dressing tray using sterile or no-touch aseptic technique to take a C&S swab. | These two sterile techniques are used when taking a C&S swab. |
| 9. Put on clean gloves. | |
| 10. Remove the soiled wound dressing, if present. | |
| 11. Remove the gloves and perform hand hygiene. Put on clean gloves. | |
| 12. Thoroughly cleanse the wound and the periwound skin with at least 100mL sterile Normal Saline (NS) or sterile water<br><br>Use sterile gauze(s) to remove excess NS or water from the wound surface. | This amount of cleansing solution provides moisture to the wound bed to improve the yield of bacteria.<br><br>Larger amounts of NS or water are required for larger wounds. |
| 13. A 1cm$^2$ area of viable wound bed tissue **must be visible** in the wound in order to continue with the procedure.<br>If a 1cm$^2$ area of viable wound bed tissue **is not visible**, do not take the culture and notify the Physician/NP or Wound Clinician. | This ensures that the swab is collected from viable tissue and not necrotic slough, purulent material or eschar that is heavily contaminated with bacteria.<br>If a 1cm$^2$ area of viable wound bed tissue **is not visible** then debridement is required before the C&S swab can be collected.<br>CSWD is the quickest non-surgical debridement method (Guideline: Wound Management for Adults & Children) |
| 14. Rotate the tip of the swab over at least a 1 cm$^2$ area of viable wound bed tissue for 5 seconds (Levine Method). Do not swab tunnelled or undermined tissue.<br>• Use sufficient pressure to extract fluid from the wound tissue.<br>• Avoid touching the wound edge or periwound skin with the swab. | If there are 2 or more wounds in the same location, use separate swab kits for each wound.<br>To swab tunnelled or undermined tissue required a Physician/NP order and an Anaerobic C&S test kit. |
| 15. Immediately place the swab into the transport medium in the tube and twist the lid closed. | Avoid touching the surface of the swab on the tube opening.<br>Ensure the swab tip is in contact with the transport medium at the base of the tube. |
| 16. Remove gloves. Perform hand hygiene. | |
| 17. Put on clean or sterile gloves that are appropriate for the technique required to complete the dressing change. | |
| 18. Apply the wound dressing as per the client's care plan. | |
| 19. Apply the wound dressing as per the client's care plan. | |
| 20. Clean the work surface | |

| Steps | Key Points |
|---|---|
| 21. Remove gloves and personal protective equipment. Perform hand hygiene. | |
| 22. Document the following on the swab/specimen container and complete the laboratory requisition:<br>• Client identification<br>• Client diagnosis<br>• Initials of the person who collected the specimen<br>• Wound location, type and etiology<br>• Antibiotics the client is currently receiving<br>• Collection date and time | 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.<br>For example, note the relative positions of wounds in the same location e.g., right ankle-proximal wound, and right ankle-distal wound, **or** Wound A and Wound B **or** Wound #1 and Wound #2.<br>Specific identifiers help others to attribute the C&S results to the appropriate wound. |
| 23. Place a specimen in a biohazard transport bag and transport to the lab as soon as possible.<br>If the collected specimen cannot be transported immediately, store it in the refrigerator at 2-8$^0$ C until it can be transported.<br>If the swab cannot be sent to the lab within 24 hours discard it and collect a new C&S swab. | Delays in getting the specimen to the lab for analysis may alter the C&S results, as some bacteria may die and others may be overgrown by more rapidly growing strains.<br>For community clients, follow health authority/agency policy on the transportation of dangerous goods as this governs the transportation of all C&S swabs. |

## Documentation

1. Document the wound assessment for infection and the C&S collection procedure.
2. Label the specimen tube as indicated in the procedure and complete the laboratory requisition as per health authority/agency policy.
3. Document the date and time that the swab was taken to the laboratory (note if client or family were responsible for delivery of the specimen to the lab.

## Definitions

**Aerobic bacteria** - Bacteria that survive in an oxygenated environment.
**Anaerobic bacteria** - Bacteria that survive in an environment with little or no oxygen. They are usually found in tunnelling, undermining, and deeper wound tissue. **Aerobic C&S swabs kits are not used to collect Anaerobic bacteria.**
**Antibiotics** - Agents that act selectively against bacteria and can be used topically (not usually recommended) or systemically. Development of resistance to systemic and topical antibiotics is an increasing problem.
**Client** - Recipient of care: in the community-client, residential care-resident, and in acute care-patient.
**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 in growth medium to optimize the recovery and 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 1 cm$^2$ 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, with gentle pressure, the tip of the swab on wound bed.

**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.

**No-Touch Technique** -The use of 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

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

**Slough (necrotic)** - Soft, spongy necrotic tissue that is black, brown, tan, yellow or gray 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.

**Viable tissue** - Tissue that is healthy and capable of living. Necrotic tissue is described as non-viable as it is dead and care focuses on its' removal in order to support healing.

**Wound cleansing** - The use of sterile normal saline or water to gently remove adherent contaminants and devitalized tissue from the wound surface.

**Wound Infection Continuum** [16,17,18,19]

**Contamination** - Wound contains low levels of non-proliferating microbes that typically do not impede wound healing.[2,47]

**Colonization** - Wound contains "microbial organisms that undergo limited proliferation without evoking a host reaction"[47]

**Local infection** - Occurs when microorganisms invade the wound tissue and evoke a host response. "Local infection is contained in one location, system, or structure".[47] Subtle S&S of infection may evolve into more classic S&S of infection.[2,25,47]

**Spreading infection** - Occurs when the microorganisms invade the wound leading to classic S&S of infection. Microorganisms proliferate and spread beyond the wound border, this may involve deep tissue, muscle, fascia, organs or body cavities.[47]

**Systemic infection** - Occurs when the microorganisms invade the body and spread via the vascular and lymphatic system. Systemic inflammation, sepsis, organ dysfunction and death may result.[47]

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## Document Creation/Review

This procedure has been reviewed and approved by the British Columbia Provincial Infection Control Network Management Office for use within the province of British Columbia.

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