

Developed in collaboration with the Wound Care Champions, Wound Care Specialists, Enterostomal Nurses, and South West Regional Wound Care Program (SWRWCP) members from Long Term Care Homes, Hospitals, and South West CCAC contracted Community Nursing Agencies in the South West Local Health Integration Network.



<b>Title</b>	<b>Procedure: Quantitative Wound Swab Technique</b>																																							
<b>Background</b>	<ul style="list-style-type: none"> <li>The most frequently used methods of (and comparison of) quantitative wound cultures are<sup>1</sup>: <table border="1" data-bbox="544 489 1437 1092"> <thead> <tr> <th>Quantitative Culture Method</th> <th>Definition</th> <th>Pain</th> <th>Cost</th> <th>Skill</th> <th>Invasive</th> <th>Practical Available</th> <th>Accuracy *</th> </tr> </thead> <tbody> <tr> <td>Tissue Biopsy</td> <td>Removal of piece of viable wound tissue with scalpel or punch biopsy</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>3</td> <td>1</td> </tr> <tr> <td>Needle Aspiration</td> <td>Insertion of a needle into the wound tissue (multiple times) to aspirate organism containing fluid</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Quantitative Swab</td> <td>Use of a pre-packaged sterile cotton tipped swab and culture medium to collect organism containing wound fluid</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>3</td> </tr> </tbody> </table> </li> </ul> <p>Legend: 1= most desirable → 3 = least desirable  *Accuracy depends on the technique used. Method sensitivities/specificities/accuracies are unclear</p> <ul style="list-style-type: none"> <li>Traditionally performed, wound swab cultures detect only the bacteria on the surface of the wound, which may not necessarily reflect the causative pathogen(s) deep within the wound tissue<sup>2</sup></li> <li>Performed using a standardized technique that allows for the capture of bacteria in the wound tissue (not the bacteria on the wound surface), a quantitative wound swab can accurately document the bacterial burden in wounds<sup>1</sup></li> <li>Although there is no agreed upon/validated standardized method of quantitative wound swabbing, the Levine Technique seems to be the most useful<sup>3, 4</sup></li> </ul>								Quantitative Culture Method	Definition	Pain	Cost	Skill	Invasive	Practical Available	Accuracy *	Tissue Biopsy	Removal of piece of viable wound tissue with scalpel or punch biopsy	3	3	3	3	3	1	Needle Aspiration	Insertion of a needle into the wound tissue (multiple times) to aspirate organism containing fluid	2	2	2	2	2	2	Quantitative Swab	Use of a pre-packaged sterile cotton tipped swab and culture medium to collect organism containing wound fluid	1	1	1	1	1	3
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<b>Indications</b>	This guideline is intended to be used by front line registered health care providers, to guide their quantitative wound swab technique.																																							
<b>Guideline</b>	<p><b>NOTE: The assessment and management of a person’s wound for bacterial burden/infection is but one part of the holistic assessment and management of individuals admitted with/presenting with a wound.</b></p> <p><b>Assessment</b></p> <ol style="list-style-type: none"> <li>Review the person’s medical records for the following information: <ol style="list-style-type: none"> <li>The size, location, and characteristics of the wound to be</li> </ol> </li> </ol>																																							

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	<p>assessed/debrided/swabbed/dressed, as this will help you anticipate the supplies needed</p> <ul style="list-style-type: none"> <li>b. Documentation of current clinical signs of spreading or systemic infection</li> <li>c. Current wound care orders</li> </ul> <p>2. The following are appropriate situations in which to take a quantitative wound swab:</p> <ul style="list-style-type: none"> <li>a. When an acute or chronic wound exhibits signs of spreading or systemic infection (see: “Definitions of Bacterial Burden in Chronic Wounds”)</li> <li>b. When a chronic wound fails to respond to or is deteriorating despite topical antimicrobial treatment</li> <li>c. As required by local surveillance protocols, i.e. for MRSA/VRE surveillance</li> </ul> <p><b>Planning</b></p> <p>1. Expected outcomes:</p> <ul style="list-style-type: none"> <li>a. The wound culture does not reveal bacterial growth or reveals growth that allows identification of organisms growing deep within the wound bed in order to treat properly</li> <li>b. The culturette and its cotton tipped swab are not contaminated by skin bacteria</li> <li>c. Registered nursing staff, in collaboration with other involved health care disciplines and the person with the wound and/or their substitute decision maker (SDM)/power of attorney for personal care (POA C) if applicable, will be able to use the quantitative wound swab results and their assessment information to initiate/modify and implement an appropriate, interdisciplinary, person-centered plan of care which contains clear directions to staff and others who are providing the person with direct care</li> </ul> <p>2. Explain the procedure and its purpose to the person and/or their SDM/POA C and obtain informed implied/verbal consent</p> <p>3. Assess the need for pre-procedure pain medication – removal of dressings, the dressing procedure itself, debridement and/or wound swabbing may be painful. If required, the person <b>must</b> be allotted enough time to achieve the drug’s peak effect BEFORE initiating the dressing change/debridement/wound swab. Do not apply topical analgesics prior to wound swabbing</p> <p><b>Implementation</b></p> <p>1. Provide for privacy and ensure the person is in a comfortable position to facilitate assessment of the wound and for the wound debridement/culture/dressing procedures</p> <p>2. Wash your hands and attend to the person with your assessment</p>
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	<p>tools, anticipated debridement and/or wound dressing supplies, and a pre-packaged sterile cotton tipped swab and culture medium. <b>NOTE: ensure your culture kit is appropriate for the type of test ordered, i.e. an aerobic or anaerobic culture kit</b></p> <ol style="list-style-type: none"> <li>3. If the person is in bed, raise the bed (if you are so able to) to an appropriate ergonomic position to allow for the wound assessment, culture and treatment while preventing self-injury</li> <li>4. Ensure adequate lighting</li> <li>5. Don clean disposable gloves and additional personal protective equipment (PPE), i.e. gown, goggles, and/or mask as required, if risk for splash back or spray exists</li> <li>6. Remove the existing wound dressing as per the manufacturer’s instructions. Observe the dressing for the appearance of the drainage on the dressing. Assess for odor</li> <li>7. Dispose of the soiled dressings in the proper receptacle and remove and dispose of your soiled gloves</li> <li>8. Perform hand hygiene and apply new clean disposable gloves and cleanse the wound as ordered or as per the “SWRWCP’s Dressing Selection and Cleansing Enabler – HEALABLE WOUNDS” or the “SWRWCP’s Dressing Selection and Cleansing Enabler – MAINTENANCE/NON-HEALABLE WOUNDS”. <b>NOTE: Do NOT cleanse with an antiseptic solution prior to obtaining a quantitative wound culture.</b> Cleansing removes slough, necrotic tissue, dried exudates, and dressing residues which should not be swabbed</li> <li>9. Gently pat the wound bed dry (if required) and dry the surrounding skin with gauze</li> <li>10. If indicated, and if you have the knowledge, skill, judgment, and authority, conservatively sharp debride any necrotic tissue present and re-cleans the wound as above [see: “Guideline and Procedure: Conservative Sharp Wound Debridement (CSWD)”]</li> <li>11. Assess the wound using the “NPUAP PUSH Tool 3.0” (see “Procedure: NPUAP PUSH Tool 3.0”)</li> <li>12. Observe for clinical signs of increased bacterial burden/infection using the “Bioburden Assessment Tool”, confirming the person’s level of risk as spreading infection, or systemic infection, appropriate for wound swabbing</li> <li>13. Locate the cleanest, healthiest looking tissue in the wound bed, i.e. NOT non-viable tissue, rather healthy looking red/pink granulation tissue. This will be the area you will swab. <b>NOTE: if there is no healthy granulation tissue present, there is no point in swabbing the wound as the results will only tell you what is growing on top of the non-viable tissue, not what is deep within the wound bed causing the infection</b></li> <li>14. Using aseptic technique, being careful not to touch the sterile cotton tipped swab nor the inside of the culturette tube, remove the sterile cotton tipped swab from the culturette</li> <li>15. If the wound bed is dry, pre-moisten the cotton tipped swab with</li> </ol>
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	<p>sterile saline to increase the chance of recovering organisms from the wound bed</p> <ol style="list-style-type: none"> <li>16. At a 90 degree angle to the wound bed (perpendicular), press the cotton tip directly into the healthy tissue previously identified, and apply pressure downwards – the hope is that you will be able to express deeper wound fluid for culturing</li> <li>17. Still applying pressure downward, rotate the swab tip over a 1cm<sup>2</sup> area of healthy granulation tissue for a period of five seconds</li> <li>18. Remove the protective cap from the culturette tube, and carefully insert the cotton tipped swab into the culturette and its medium without contaminating the vessel</li> <li>19. Squeeze the lower part of the culturette, where the culture medium resides, to ensure the swab is surrounded by medium</li> <li>20. Continue to implement measures as indicated for increased bacterial burden/wound infection as per the “Guideline: The Assessment and Management of Bacterial Burden in Acute and Chronic Wounds”</li> <li>21. Once you have provided wound care, remove your gloves and other PPE and dispose of them and of any soiled supplies in the appropriate receptacle</li> <li>22. Dispose of any used sharps in a sharps container</li> <li>23. Clean reusable equipment/surfaces touched during the procedure with soap and water or detergent wipes and dry thoroughly to prevent cross infection, returning reusable equipment to the appropriate places</li> <li>24. Wash your hands</li> <li>25. Label the culturette container with the person’s name, room number, date, time, and exact source of the specimen</li> <li>26. Complete the laboratory requisition (date, time, name of test, personal identifiers, and source of culture). Note on the requisition if the person is already taking antibiotics. <b>NOTE: The Ontario Laboratories Act requires a health care practitioner’s order to process the culture</b></li> <li>27. Place the culturette and the requisition in a clean plastic biohazard bag, and have the specimen transported to a laboratory as soon as possible (within one hour ideally, but within 24 hours at a maximum). The culturette must remain at room temperature – do not let it freeze or become overheated</li> <li>28. Assist the person to a comfortable position if required, and assess for any concerns</li> <li>29. Lower the person’s bed to an appropriate height (if applicable), and ensure the person’s safety, i.e. apply side rails, personal alarms, restraints, etc. as per the person’s care plan/medical orders</li> <li>30. Discuss your findings of the assessment and your thoughts re the presence/absence of signs of infection with the person and/or their SDM/POA C and implement referrals and further interventions as indicated</li> <li>31. Share your wound assessment and intervention implementation</li> </ol>
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	<p>findings/outcomes with the interdisciplinary members of the person’s wound care team</p> <p>32. Complete/update and implement an appropriate, person-centered, interdisciplinary plan of care, based on your holistic assessment and interventions, and as per your organization’s policy</p> <p><b>Evaluation</b></p> <ol style="list-style-type: none"> <li>1. Unexpected outcomes: <ol style="list-style-type: none"> <li>a. The wound culture is contaminated with superficial skin cells</li> <li>b. The person reports unexpected pain related to the procedure(s)</li> <li>c. Registered nursing staff, in collaboration with other involved health care disciplines and the person with the wound and/or their SDM/POA C are unable to use the swab results to initiate/update and implement an appropriate, person-centered, interdisciplinary plan of care</li> </ol> </li> <li>2. Obtain, review and interpret the laboratory report for the results of your wound culture: <table border="1" data-bbox="548 905 1433 1276"> <thead> <tr> <th>Quantitative Growth (Colony Forming Units)</th> <th>Gram Stain Results</th> <th>Sector (1+ to 4+)</th> <th>Semi-Quantitative Result</th> <th>Suggested Antibiotic Treatment</th> </tr> </thead> <tbody> <tr> <td>&lt;10<sup>3</sup></td> <td>No growth</td> <td>No growth</td> <td>No growth</td> <td>None</td> </tr> <tr> <td>&gt;=10<sup>3</sup></td> <td>No growth</td> <td>1</td> <td>Scant or light</td> <td>None</td> </tr> <tr> <td>&gt;=10<sup>4</sup></td> <td>No growth</td> <td>1, 2</td> <td>Small to moderate</td> <td>None</td> </tr> <tr> <td>&gt;=10<sup>5</sup></td> <td>No growth</td> <td>1, 2, 3</td> <td>Moderate to heavy</td> <td>Treat with topical antimicrobials</td> </tr> <tr> <td>&gt;=10<sup>6</sup></td> <td>Bacteria observed</td> <td>1, 2, 3, 4</td> <td>Large or heavy</td> <td>Treat with topical and systemic antimicrobials</td> </tr> </tbody> </table> <p>*The bacterial culture report MUST be taken in context with the clinical findings to determine if antibiotic treatment is warranted!</p> </li> <li>3. Based on the quantitative swab results, review your current plan of care re bacterial burden management, and consider modifications as indicated (see Guideline: The Assessment and Management of Bacterial Burden in Acute and Chronic Wounds)</li> <li>4. Re-assess the wound using the “NPUAP PUSH Tool 3.0” at a minimum of weekly to ensure your bacterial balance interventions were effective, and to determine if consideration of other/additional forms of infection management interventions are necessary</li> </ol>	Quantitative Growth (Colony Forming Units)	Gram Stain Results	Sector (1+ to 4+)	Semi-Quantitative Result	Suggested Antibiotic Treatment	<10 <sup>3</sup>	No growth	No growth	No growth	None	>=10 <sup>3</sup>	No growth	1	Scant or light	None	>=10 <sup>4</sup>	No growth	1, 2	Small to moderate	None	>=10 <sup>5</sup>	No growth	1, 2, 3	Moderate to heavy	Treat with topical antimicrobials	>=10 <sup>6</sup>	Bacteria observed	1, 2, 3, 4	Large or heavy	Treat with topical and systemic antimicrobials
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<p><b>References</b></p>	<ol style="list-style-type: none"> <li>1 Bates-Jensen BM, Ovington LG. Management of exudate and infection. In: Sussman C, Bates-Jensen B., eds. Wound Care: A collaborative practice manual for health professionals. Third Ed. Baltimore: Lippincott Williams &amp; Wilkins, 1997:215-233.</li> <li>2 Bergstrom N, Bennett MA, Carlson CE, et al. Treatment of pressure</li> </ol>																														

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	<p>ulcers. Clinical practice guideline no. 15. Agency for Health Care Research and Quality (AHRQ), formerly known as the Agency for Health Care Policy and Research (AHCPR). Publication No. 95-0652. Rockville, MD: AHRQ, US Public Health Service, US Department of Health and Human Services (DHHS); December 1994:15-22.</p> <p>3 Harding K, Queen D (eds.). Wound infection in clinical practice: An international consensus. International Wound Journal. 2008;5(3):1-11.</p> <p>4 Gardner SE, Franz RA, Saltzman CL, et al. Diagnostic validity of three swab techniques in identifying chronic wound infection. Wound Repair Regen. 2006;14:548-57.</p>
<p><b>Related Tools</b>  <b>(NOTE: these tools and their instructions can be found on the SWRWCP's website: <a href="http://swrwoundcareprogram.ca">swrwoundcareprogram.ca</a>)</b></p>	<ul style="list-style-type: none"> <li>• Definitions of Bacterial Burden in Chronic Wounds</li> <li>• SWRWCP's Dressing Selection and Cleansing Enabler – HEALABLE WOUNDS</li> <li>• SWRWCP's Dressing Selection and Cleansing Enabler – MAINTENANCE/NON-HEALABLE WOUNDS</li> <li>• Guideline and Procedure: Conservative Sharp Wound Debridement (CSWD)</li> <li>• NPUAP PUSH Tool 3.0</li> <li>• Procedure: NPUAP PUSH Tool 3.0</li> <li>• Bioburden Assessment Tool</li> <li>• Guideline: The Assessment and Management of Bacterial Burden in Acute and Chronic Wounds</li> </ul>