INESSS
LE SAVOIR PREND FORME

MEDICAL LABORATORY TEST
WOUND CULTURE

This decision support tool is intended for front-line clinicians. It is provided for information purposes only and should not replace the clinician's judgment. It is based on recommendations developed by INESSS using a systematic process and supported by the scientific literature and the knowledge and experience of Québec clinicians and experts. For further details, go to the Publications section of inesss.qc.ca.

GENERAL CONSIDERATIONS

IMPORTANTS POINTS

- A wound culture is a microbiological test aimed at identifying the one or more pathogenic bacterial species responsible for a wound infection.
- The judicious use of this test takes into account the type of wound, the presence of an infection, and the indication for systemic antibiotic therapy in the treatment plan under consideration.

WOUND TYPES

Photos available

- **Acute wounds:** Are of sudden onset, with healing progressing in a timely manner. All acute wounds have the potential to become chronic.
  - Traumatic wounds (e.g., bites, skin tears, and lacerations)
  - Postoperative wounds
  - Burns and frostbite
- **Chronic wounds:** The healing process progresses slowly, or healing is delayed, interrupted or blocked.
  - Examples: Pressure ulcers, diabetic foot ulcers, arterial ulcers and venous leg ulcers

DIAGNOSING A WOUND INFECTION

- The diagnosis is based mainly on the clinical signs and symptoms of a superficial infection[1].

CLINICAL SIGNS AND SYMPTOMS OF A SUPERFICIAL INFECTION	
• Localized erythema • Localized heat • Local warmth • Purulent discharge • Delayed healing • Onset of pain or increase in pain • Pronounced odour	• Bleeding friable granulation • Premature covering of the wound and formation of cavities or sinus tracts in the granulation tissue • Deterioration of the wound • Increase in size • No signs of an infection requiring systemic antibiotic therapy (e.g., cellulitis or fever)

1. The clinical signs and symptoms of an infection may be more difficult to recognize in immunocompromised patients and those with a neuropathy.

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INDICATIONS FOR CULTURING A WOUND

Culturing a wound (acute or chronic) is not indicated if there are no clinical signs of a superficial infection.

<table>
<tr><th colspan="3">ACUTE WOUNDS</th><th>CHRONIC WOUNDS</th></tr>
<tr><th>No abscess</th><th>With superficial or deep abscess</th><th>Animal bite</th><th>With clinical signs of infection</th></tr>
<tr>
<td rowspan="2">A culture may be indicated for wounds showing clinical signs of infection when systemic antibiotic therapy is being considered.</td>
<td>A routine culture is not indicated.</td>
<td>A routine culture is not indicated*.</td>
<td rowspan="2">A culture is indicated when systemic antibiotic therapy is being considered.</td>
</tr>
<tr>
<td>A culture is indicated when systemic antibiotic therapy is being considered after incision and effective drainage of the abscess.</td>
<td>A culture may be indicated for wounds with clinical signs of infection when systemic antibiotic therapy is being considered in the presence of the following complications:
• Abscessed or severe cellulitis or cellulitis with a purulent discharge
• Devitalized tissue
• Severe sepsis</td>
</tr>
</table>

* A culture is not routinely indicated for animal bites, since it usually reveals the species in the animal's oral flora without providing any additional information.

TECHNIQUES AND PROCEDURE FOR OBTAINING A WOUND CULTURE SPECIMEN

- **The specimen for a wound culture should be taken from a wound bed that has been debrided and cleaned with sterile normal saline.**

  Photos available

  ! *Debriding a wound on an ischemic limb or stable eschar on a heel is contraindicated.*

- The specimen can be obtained using the Levine swab technique:
  - Before collecting the specimen, prepare the wound bed in order to dislodge any contaminants present on the surface of the wound:
    - Rinse the wound thoroughly with sterile normal saline;
    - Debride the wound superficially in order to access the deep compartment, if this is indicated.
  - Identify the specimen collection site.
  - Inform the patient that he or she may feel some discomfort when the specimen is being collected.
  - Proceed to specimen collection:
    - Collect the specimen from a surface of the wound with clean granulation tissue by turning the cotton tip of the swab 360° over a surface of only 1 cm^2;
    - Do not directly swab pus or exudate or swab hard eschar or necrotic tissue;
    - Apply enough pressure to extract some exudate from the wound bed for 5 seconds.
  - Send the specimen for a culture within the required time.
- Fine needle aspiration and tissue biopsy are other possible sampling options. The latter option may be especially useful for documenting infections caused by rarer microorganisms and/or when a noninfectious etiology is suspected.

TYPES OF MICROBIOLOGICAL TESTS

Superficial pus culture	• Performed for any specimen taken from the surface of a wound • Test to look for aerobic bacteria only
Deep pus culture[§]	• Test on specimens generally obtained from tissues or by needle aspiration to look for aerobic and anaerobic bacteria on special request

[§] Performing a deep pus culture on a wound to look for anaerobic microorganisms is rarely indicated.

INFORMATION TO BE PROVIDED TO THE MICROBIOLOGY LABORATORY

- The exact location of the wound
- The type of specimen (swab, tissue biopsy or aspiration)
- The type of wound (e.g., a bite, burn, surgical or traumatic wound or an abscess)
- If there is suspicion of an infection by a specific atypical pathogen or if there is a risk to laboratory personnel (e.g., tularemia, anthrax, histoplasmosis or blastomycosis)

! *See the local standard operating procedures for the specimen transport conditions and times.*

MAIN REFERENCES

Ordre des infirmières et infirmiers du Québec (OIIQ). Les soins de plaies au cœur du savoir infirmier – De l'évaluation à l'intervention pour mieux prévenir et traiter, Montréal, OIIQ, 2007, 486 p.

For all the references, see the INESSS report in support of this tool.

PHOTOS

ACUTE WOUNDS

CULTURE NOT RECOMMENDED

Burn with phlyctena with no clinical signs of infection

A Before debridement

B After debridement

CULTURES RECOMMENDED

Infected traumatic hematoma of the lower limb

C Before debridement

D After debridement

Infected Postoperative skin graft wound

E

CHRONIC WOUNDS

CULTURES NOT RECOMMENDED

F Noninfected pressure injury

G Noninfected venous ulcer

H Pressure injury with necrotic eschar with no clinical signs of infection

CULTURE RECOMMENDED

I Infected wound with cellulitis

TECHNIQUE FOR OBTAINING A WOUND CULTURE SPECIMEN

J Swabbing: Levine technique

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