



## Wound Cultures: A Deeper Look

Wound infections are diagnosed clinically by local signs and symptoms of infection (e.g. purulence, erythema, pain, etc.). Obtaining wound cultures can help direct antimicrobial therapy. However, accurate assessment of wound culture results should take into consideration the manner in which they were obtained. Wound cultures can be generally categorized into superficial cultures and deep cultures. In general, deep cultures identify the causative pathogens more reliably but are more difficult to obtain.

Superficial Culture		Deep Culture	
Procedure		Procedure	
Rotate the swab over a 1-cm square area with enough pressure to express fluid from within the wound tissue <sup>1</sup>		After debridement of wound, infected tissue from the ulcer should be obtained by biopsy or curettage <sup>2</sup>	
Pros	Cons	Pros	Cons
<ul style="list-style-type: none"> <li>Easier to perform</li> <li>Noninvasive</li> </ul>	<ul style="list-style-type: none"> <li>Significant contamination- Identified organisms that may not be involved in infection</li> <li>May promote overly broad spectrum antibiotic use</li> <li>May fail to yield anaerobic or fastidious organisms</li> </ul>	<ul style="list-style-type: none"> <li>Directly collects the infected tissue</li> <li>Less prone to contaminants</li> </ul>	<ul style="list-style-type: none"> <li>Resource intensive (time, supplies, personnel)</li> <li>Yield may be lowered if patient has been pretreated with antibiotics</li> </ul>

### How do superficial and deep culture results compare?

In a systematic review including 615 wound cultures that were compared with alternative cultures (needle aspiration, wound base biopsy, deep tissue biopsy, surgical debridement, or bone biopsy), the sensitivity and specificity of superficial wound cultures was 49% (95% CI, 37% – 61%) and 62% (95% CI, 51% – 74%), respectively.<sup>3</sup>

### What do guidelines recommend?

2012 Infectious Diseases Society of America Clinical Practice Guideline for the Diagnosis and Treatment of Diabetic Foot Infections:<sup>4</sup>

- For infected wounds, send cultures prior to antibiotic administration
- Recommend sending specimen for culture that is from deep tissue

2019 International Working Group on Diabetic Foot Guidelines on the Prevention and Management of Diabetic Foot Disease:<sup>2</sup>

- Collect appropriate specimen for culture for almost all clinically infected ulcers
- Obtain a sample for culture by collecting a tissue specimen, by curettage or biopsy

**Key Takeaway:** Wound cultures should ideally be obtained from deep tissue after debridement has been performed.

Always review source of wound culture before selecting antibiotics. Caution should be used when interpreting superficial wound cultures due to low sensitivity and specificity.

### References:

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- Lipsky, Benjamin A., et al. "Guidelines on the diagnosis and treatment of foot infection in persons with diabetes (IWGDF 2019 update)." *Diabetes/metabolism research and reviews* 36 (2020): e3280.
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