

CARING FOR WOUNDS E-BOOK SERIES:

# Preventing infections in patients with wounds



# Evolving knowledge on infection prevention

Proper wound care is essential to preventing infections for patients in all practice settings, and healthcare providers should stay informed about the most current and effective treatments out there. Recognizing factors that increase patients' susceptibility to infection allows providers to identify risks and take measures to prevent infection from occurring or worsening.

According to the Centers for Disease Control and Prevention (CDC), when patients receive medical treatment in healthcare facilities, the following factors can increase their susceptibility to infection:

- underlying medical conditions such as diabetes, cancer, and organ transplantation, which decrease the immune system's ability to fight infection
- certain medications used to treat medical conditions, such as antibiotics, steroids, and some cancer fighting medications

- medical treatments and procedures such as urinary catheters, tubes, and surgery, which provide ways bacteria can enter the body.

In May 2017, the Centers for Disease Control and Prevention issued updated guidelines for the **Prevention of Surgical Site Infection (SSI)** stating: "Surgical site infections are persistent and preventable health care–associated infections."



## SSIs by the numbers

Nearly **1** in **20** patients who undergo surgery will develop an SSI.

**SSIs** make up **31%** of all healthcare-associated infections.

In **2013**, an estimated **157,500** SSI infections were associated with inpatient surgeries.

*Source: CDC National Healthcare Safety Network*

# Confirm an infection first

Most chronic wounds are colonized by polymicrobial aerobic-anaerobic microflora. Typically, chronic wounds aren't cultured unless the patient has signs and symptoms of infection, which vary depending on whether the wound is acute or chronic.

A culture is indicated for patients with local signs and symptoms of suspected wound infection, such as increased pain and drainage, erythema, friable granulation tissue, and edema. Cultures are important in diagnosing the infection, identifying the specific organism, and determining the number of organisms present. This information guides appropriate antibiotic treatment and is crucial in preventing antibiotic-resistant infections.



Adapted from: *When and how to culture a chronic wound*, by Marcia Spear

## Why some wound infections become chronic

What complicates chronic wound infections, making healing difficult? Manuela Martins-Green, a professor of cell biology at the University of California, Riverside, reports that two biological activities are out of control in chronic wound infections: reactive oxygen species and biofilms.

The screenshot shows a news article from the University of California, Riverside (UCR) Today website. The article is titled "Researchers Explain Why Some Wound Infections Become Chronic" and is dated December 17, 2013. The author is Iqbal Pittalwala. The article discusses how chronic wounds affect an estimated 6.5 million Americans annually, costing about \$25 billion. It mentions that foot blisters and other diabetic ulcers or sores account for the vast majority of foot and leg amputations in the United States today. The article also mentions that Manuela Martins-Green, a professor of cell biology at UCR, reports that two biological activities are out of control in chronic wound infections: reactive oxygen species and biofilms. The article includes a photo of a diabetic foot ulcer and a caption: "A diabetic foot ulcer. PHOTO CREDIT: MILORAD DIMIC, UNIVERSITY OF CALIFORNIA, RIVERSIDE".

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Researchers Explain Why Some Wound Infections Become Chronic

UC Riverside's Manuela Martins-Green shows how decreasing levels of "reactive oxygen species" can break cycle of unhealing wounds

By Iqbal Pittalwala On DECEMBER 17, 2013

RIVERSIDE, Calif. — Chronic wounds affect an estimated 6.5 million Americans at an annual cost of about \$25 billion. Further, foot blisters and other diabetic ulcers or sores account for the vast majority of foot and leg amputations in the United States today.

Why does treating chronic wounds cost so much? What complicates chronic wound infections, making healing difficult?

Manuela Martins-Green, a professor of cell biology at the University of California, Riverside, reports that two biological activities are out of control in chronic wound infections. These are reactive oxygen species

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# The big picture: Antibiotic resistance

Organisms that are resistant to antibiotics because of overprescribing can cause serious harm in patients with wounds. For example, a patient could develop a serious infection from *Clostridium difficile*, which can further infect the wound and impede healing. Keep in mind that any drug, including an antibiotic, can cause adverse events or interfere with the action of other drugs.

## Culture first

The gold standard is to obtain a tissue biopsy. A tissue biopsy will identify organisms invading the wound, not those contaminating the wound surface. Unfortunately, surface swabs will only reveal the colonizing organism and may not reflect deeper tissue infection. If the wound is in need of debridement, this is an ideal time to obtain the tissue biopsy.

If a tissue biopsy is not feasible, then obtain a swab using the Levine method: twirling the end of the cotton-tipped applicator on a 1-cm<sup>2</sup> area of the wound bed with enough pressure to cause minimal bleeding.

### PREVENT ANTIBIOTIC OVERUSE

**Suspected infection of wound or pressure injury?**

**Yes** ► Confirm infection before starting antibiotic

**Infection confirmed?**

**Yes:** ► Implement targeted antibiotic

**No:** ► No antibiotic necessary



**Adapted from:** *Wise use of antibiotics in patients with wound infections,* by Jeri Lundgren

# Obtaining a wound culture

When a wound culture is necessary, what's the best way to obtain it? Three techniques can be used:

- deep-tissue or punch biopsy
- needle aspiration
- swab culture.

Although guidelines exist for obtaining a wound culture, no single guideline is used universally. No matter which technique you use, however, these principles apply:

- Always obtain the culture from properly cleaned and prepared tissue to avoid collecting only a culture of surface contamination.
- Collect the culture before topical or systemic antibiotics are started.
- Obtain a swab culture from a viable wound bed, as recommended by the Wound Ostomy and Continence Nursing Society guideline. Don't culture avascular tissue.

Follow these basic steps to obtain a swab culture:

1  
Irrigate the tissue with normal saline solution.

2  
Moisten a swab with normal saline solution.

3  
Swab a 1-cm<sup>2</sup> area of viable tissue for 5 minutes with enough force to produce exudate.



**Learn more at:** *When and how to culture a chronic wound*

# Advocating for evidence-based infection prevention

Some clinicians have limited current wound care knowledge, so their treatment recommendations or orders related to infection prevention might not be based on evidence-based practices and standards of care.

These clinicians may be resistant to change and unreceptive to treatment suggestions. When sharing your expertise, be prepared to defend your position with evidence-based practices and, if necessary, provide resources to support your position.



**Adapted from:** *Becoming a wound care diplomat*, by Bill Richlen and Denise Stetter

## NEWS AND UPDATES

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This FDA-cleared hypochlorous acid-based wound cleanser supports the physiological healing process. Facts about this solution include

### **Acidic pH**

An acidic pH reduces the activity of proteases, decreasing the formation and toxicity of their end products. It also improves tissue oxygenation and promotes epithelization.

### **Wound cell viability**

In chronic wounds, the preservation of cell viability is essential to allow required reconstructive activity of wound repair.

### **Contains > 95% hypochlorous acid**

Hypochlorous acid inhibits microbial contamination within the solution while in storage. Antimicrobial preservative effectiveness has been demonstrated against certain organisms in in vitro testing.



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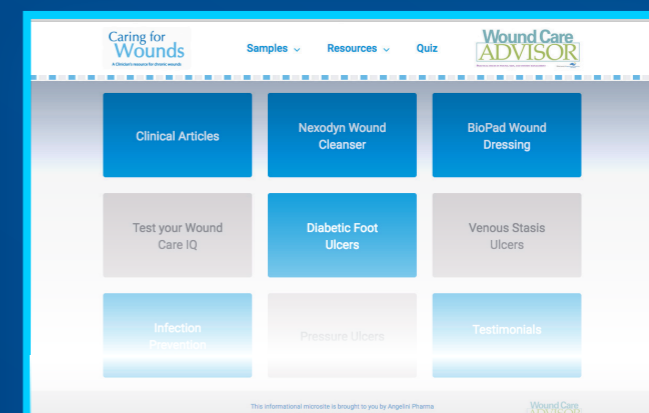
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