

## Long-Term Care Survey Alert

### WOUND CARE: Coming to Wounds in Your Nursing Facility: Biofilms

Here's what you need to know to combat these 'armored' microorganisms.

If your care team isn't on top of biofilm, the nursing facility may have unexplained high rates of poor wound healing and infection. The good news: Incorporating key concepts for identifying, treating, and preventing biofilm can turn a flailing wound care program into one with star quality.

The first step: Get up to speed on what biofilm is and how it interferes with healing, if you aren't already.

In a nutshell, "biofilms basically provide a shield-type defense for the involved bacterial species that allows it to resist the host's immune system and antibiotic therapy," says **Michael Miller, DO**, a wound care specialist in Linton, Ind.

How it forms: "Bacteria don't walk around like ants on a sidewalk," says **Jennifer Hurlow, GNP, CWO CN**, a geriatric nurse practitioner and wound care specialist with the Plastic Surgery Group of Memphis, Tenn. Instead, they tend to encase themselves in a protective polysaccharide matrix, a complex carbohydrate consisting of sugars, she adds. Bacteria appear to begin to form this matrix when they attach firmly to a surface that provides substrate, moisture, nutrition, and stasis, Hurlow says. "A skin ulcer can be an ideal environment for biofilm development," she notes.

Some clinicians believe biofilms form "an adherent yellow tissue on the wound surface," says **Dorothy Doughty, MSN, RN, FNP, CWO CN, FAAN**, a wound-care specialist at Emory University in Atlanta. Others maintain that biofilms are microscopic, and must be identified through wound excision and specialized laboratory analysis, she adds. Hurlow falls in the camp of those who believe you can see a wound biofilm. She notes that it's likely, however, that early stages of bacterial biofilm formation are microscopic, and provide some level of bacterial resistance and protection.

Experts suggest these additional strategies to help you get the upper hand with biofilms.

**1. Recognize the difference between critical colonization and biofilm.** Critical colonization occurs when there's enough bacteria in the wound to stall its healing. A wound affected by critical colonization may deteriorate suddenly, produce more exudate, and cause increasing pain, says Doughty. "However, with critical colonization, there is no erythema or induration of the surrounding tissue because the infection is confined to the wound surface itself."

Key difference: Unlike a biofilm, critical colonization can usually be treated with topical agents, such as sustained-release silver dressings or other antimicrobial agents and dressings, says Doughty. Thus, if a wound stops healing and shows signs of critical colonization, irrigate it thoroughly and apply an antimicrobial dressing, Doughty suggests. "If the wound responds and begins to heal again, you can feel fairly confident that you were dealing only with critical colonization." But if the wound fails to respond--or develops adherent yellow tissue--you have to consider the probability that you may have a biofilm on your hands, Doughty says.

**2. Know the best way to eliminate a biofilm.** To date, the most effective way to get rid of a biofilm is to mechanically remove it, says Doughty. You can do this by using instrumental debridement or by curettage of the wound surface. "Curettage involves lightly scraping the wound surface with a curette," she says. You can compare the action to scraping plaque (also a biofilm) from your teeth, she adds.

Clinical tip: "Enzymatic debriders (Santyl, Accuzyme) do break down slough but have no action to remove or prevent biofilm," cautions Hurlow.

Proof is in the results:

Removing the biofilm can jumpstart healing even in difficult cases. For example, one patient on Coumadin had a "rather

thick, opaque biofilm build-up on his wound that reformed daily," Hurlow reports. The man had leg cellulitis and copious wound exudate. Using forceps and a scalpel, Hurlow removed the biofilm without causing bleeding. Then the wound team tried more absorptive products (foam, silver alginate, silver hydrofiber) with varying levels of success, although none completely prevented the film from reforming under the sulfamylon cream being used to control wound infection.

"So we physically removed the film each day, which allowed us to cleanse the wound underneath," says Hurlow. That strategy, combined with systemic antibiotics, helped support resolution of the infection and wound over time, she adds.

Resource: Read about the above and other case studies in "Clinical Experience with Wound Biofilm and Management: A Case Series" by Jennifer Hurlow, GNP, CWOCN, and Philip G. Bowler, MPhil, BSc, in *Ostomy Wound Management*, 2009, Vol. 55, No. 4.

3. Use preventive strategies. In nature, biofilm is more likely to form on a pond than a stream, notes Hurlow. Thus, maintaining a dynamic wound environment by using effective wound drainage management can help hinder biofilm development, she says.

Prompt debridement of necrotic tissue and aggressive management of critical colonization also help to prevent biofilm from forming by keeping bacterial counts low, adds Doughty.