

Wound biofilm consensus – Recommendations from an expert panel

This is a brief summary of a presentation given at the annual conference of the Canadian Association of Wound Care, in Niagara Falls, Ontario, on November 5, 2016. It has been produced with the financial support of Smith & Nephew. The presenters were Garth James, PhD; Gregory Schultz, PhD, and Randall Wolcott, MD, CWS



The problem with biofilms

Biofilms are made up of microbial cells such as bacteria and fungi. In biofilms the microbial cells are surrounded by a polymer matrix that forms a protective coating and helps the micro-organisms adhere to natural surfaces, artificial surfaces or themselves. Biofilms are present in most chronic wounds (previous research showed ~60%; new meta analysis showed ~80% vs. 6% in acute wounds) and are likely to be located both on the surface and deeper tissue. They may not be present uniformly across the wound. All chronic non-healing wounds contain a biofilm.

Biofilms cause significant problems for patients and the clinicians who treat them. Not only do biofilms delay wound healing, but they are very difficult to identify as they cannot be seen with the naked eye. Slough, debris and exudate, which may be the result of the biofilm, are often visually mistaken for biofilm.

To confirm the presence of a biofilm so that effective treatment and faster healing can begin a number of tests are possible, but all have drawbacks in the average clinical setting. Tissue biopsies are better than swabs to reveal biofilm in wounds but do not necessarily identify biofilm presence; specialist knowledge of biofilm culture is required. Microscopic analysis is time-consuming and subjective.

In the absence of bedside diagnostic tests, specific signs and symptoms should be used to confirm biofilm presence. These include:

- Recurrent infection
- Recalcitrance to antibiotic treatment
- Antibiotic treatment failure
- Low-level chronic inflammation
- Low-level erythema
- Delayed healing

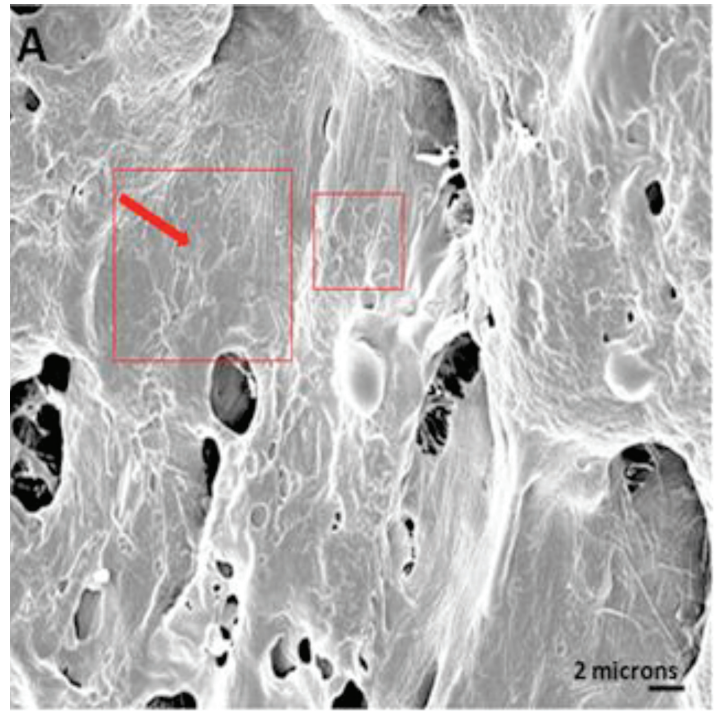
This presentation was based on recommendations made by 10 global experts with a goal to bridge the gap between scientific understanding and clinical practice addressing core issues in wound biofilm understanding, diagnosis and treatment variables. The team included Terry Swanson, Dr Matthew Malone, Prof Greg Schultz, Dr Randy Wolcott, Prof David Leaper, Prof Paul Stoodley, Prof Thomas Bjarnsholt, Dr Garth James, Dr Andrew McBain, and Prof Masahiro Tachi. Their full consensus document will be published in the February 2017 issue of *Wound Repair and Regeneration*.

Getting closer to zero

Any plan of care must address the challenges posed by the presence of biofilm, such as the inability of the host's immune system to destroy the biofilm and the poor outcomes from normal antibiotic therapy.

Debridement is one of the most important treatment strategies. It must be done frequently and aggressively. It does not, however, remove all biofilm and cannot be used alone. Biofilms can re-form within 24 hours post debridement. Therefore, **dressings** with strong evidence for effect against biofilms need to also be used, including iodine, Silver Methylene Blue. **Anti-biofilm agents** to consider include Lactoferrin, Xylitol, and Farnasol. **Antibiotic therapy** should be personalized and in general be long and strong in effect.

These strategies should be continued until the wound bed is visibly clean, displaying healthy granulation tissue and/or on a healing trajectory.



The bottom line

Biofilms cause chronic infections. Chronic wounds are chronically infected. Proper assessment and diagnosis enable proper and effective treatment. Biofilms require de-escalation and intervention. Implement multiple simultaneous strategies and then taper for successful treatment. Remember that when it comes to biofilms “for every mistake for not knowing, 10 are made for not looking.”

Presentation Digest is a production of the Canadian Association of Wound Care (CAWC)—info@cawc.net.

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