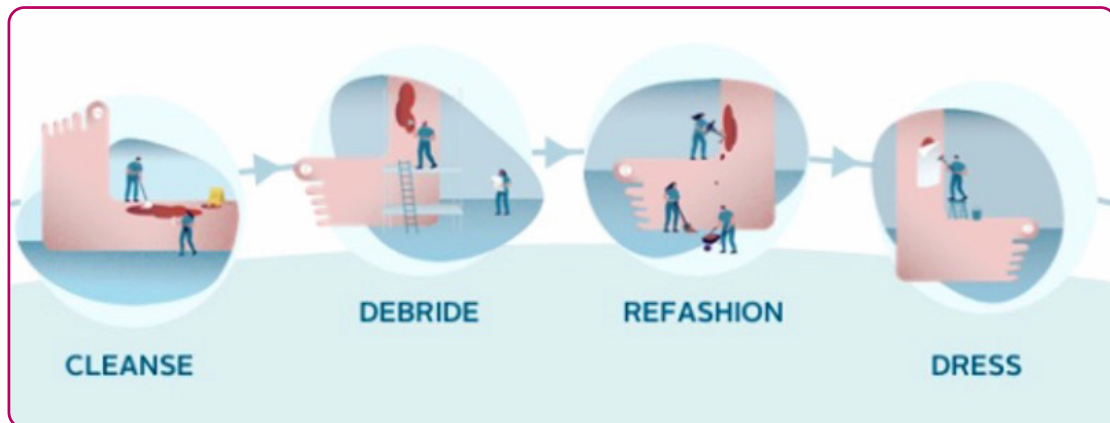


Wound Cleansing?

Are you doing enough to keep biofilm at bay?

Wound cleansing is considered a mainstay of wound care. It is one of the four pillars of 'Wound Hygiene' - an important contemporary consensus document that describes how best to tackle biofilm in a clinical setting ⁽¹⁾. Yet until recently, little information was available to inform cleansing routines including the precise amount of time that a cleanser needed to be left 'in situ' in order to lift and eradicate biofilm.



Exploring the utility of topical cleansers

Curious about the efficacy of topical cleansing solutions, Johani and colleagues designed a series of studies to explore whether shorter durations of exposure to antimicrobial wound solutions, were sufficient for topical cleansing solutions to be effective against microbial biofilms ⁽²⁾. The authors chose a timeframe of 15 minutes, which they considered usual for the cleansing stage of wound care in a clinical setting where time is of the essence. The studies tested cleansing solutions across in vitro (outside a living organism); ex vivo (on tissue from an organism in an external environment with minimal alteration of natural conditions); and in vivo (within a living organism, in this case a person with a diabetic foot ulcer) conditions:

- (i) in vitro against mature biofilms of *Staphylococcus aureus* and *Pseudomonas aeruginosa*
- (ii) in an ex vivo porcine skin explant model against mature *P. aeruginosa* biofilms; and
- (iii) in vivo in 10 patients with chronic non-healing diabetic foot ulcers

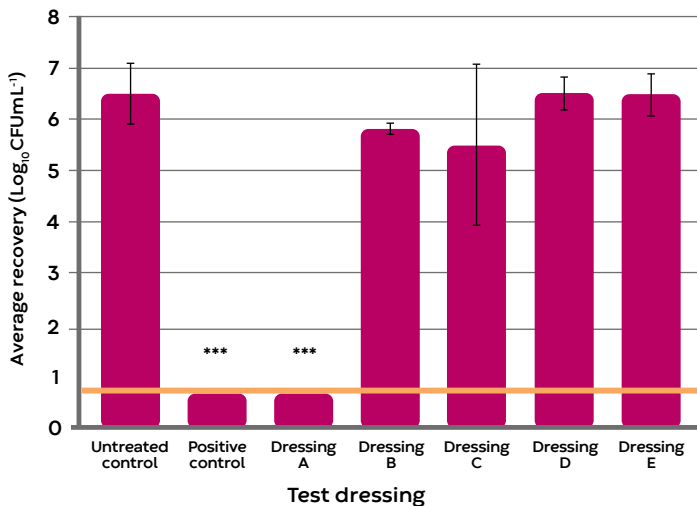
The findings?

The findings were published in the *Journal of Antimicrobial Chemotherapy* and the authors concluded that in general, topical cleansing solution did not remove all biofilm following only 15 minutes of cleanser-biofilm contact ⁽²⁾. Overall, commercially available cleansing solutions did perform better than more inert cleansers such as saline, indicating that topical cleansers definitely have a place in a wound care routine. At 24 hours the same cleansers performed much better against biofilm, but in practice it is not feasible to leave these agents in place for such protracted periods.

What does this mean?

It is important to cleanse wounds. This can be achieved mechanically for example, with a debridement pad and/or with a topical solution. However, to ensure that the opportunity for sustained activity against biofilm, Aquacel Ag+ Extra™ is a wound dressing which has cleansers cleverly incorporated into it to

keep attacking biofilm even whilst the dressing is in place. Not only does Aquacel Ag+ Extra™ contain cleansers but also ionic silver which is released 'on demand' to the wound. All this is incorporated into Convatec's tried and tested Hydrofiber technology which contours to the wound bed and is able to vertically wick wound exudate, minimising damage to the peri-wound area. Indeed, in laboratory tests, Aquacel Ag+ Extra™ reduced viable micro-organism counts to almost undetectable after 72 hours of exposure, as shown in dressing A below ⁽³⁾.



Dressing A: carboxymethylcellulose (CMC) dressing containing ionic silver, ethylenediaminetetraacetic acid (EDTA) and benzethonium chloride (BEC). (**AQUACEL Ag+ Extra**, Convatec Ltd., UK; **AQUACEL Ag Advantage** in the US)

Dressing B: lipid-colloid and polyabsorbent fibre dressing containing silver sulphate (**UrgoClean Ag**, Urgo Ltd., UK)

Dressing C: a polyvinyl alcohol (PVA) dressing coated with a hydroxypropylcellulose (HPC) gel containing silver sulphate (**Exufiber Ag+**, Molnlycke Health Care AB, Sweden)

Dressing D: CMC/calcium alginate dressing containing a silver sodium zirconium phosphate (**Maxorb Extra Ag+**, Medline Industries Inc., US)

Dressing E: CMC dressing containing silver oxysalts (**KerraCel Ag**, Crawford Healthcare Ltd., UK).

Quantity of total viable organisms recovered from 72 hours multispecies biofilm membranes after 72 hours exposure to dressings A-E. Dressings and the untreated control were tested in triplicate (n=3).

***indicates Log₁₀ reductions that were significantly different to the untreated control, p<0.001.

So it seems that a multi-modal approach of wound cleansing followed by a dressing with cleansing biofilm is the way forward in disrupting and destroying biofilm.

References:

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