



Letters

The editor welcomes readers' letters.

These should be emailed to jwc@markallengroup.com

References

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- 3 Bergstrom, N., Bennett, M.A., Carlson, C.E. et al. Treatment of Pressure Ulcers. Clinical Practice Guideline, No. 15. US Department of Health and Human Services. Public Health Service, Agency for Health Care Policy and Research (AHCPR), 1994.
- 4 Winter, G. Formation of the scab and the rate of epithelization of superficial wounds in the skin of the young domestic pig. *Nature*. 1962; 193: 293–294.
- 5 Hurlow, J., Bowler, P.G. Clinical experience with wound biofilm and management: a case series. *Ostomy Wound Manage*. 2009; 55: 4, 38–49.
- 6 Hurlow, J., Bowler, P.G. Potential implications of biofilm in chronic wounds: a case series. *JWound Care*. 2012; 21: 3, 109–119.
- 7 Lenselink, E., Andriessen, A.A. A cohort study on the efficacy of a polyhexanide-containing biocellulose dressing in the treatment of biofilm in wounds. *JWound Care*. 2011; 20: 11, 534–539.
- 8 Wolcott, R.D., Rhoads, D.D. A study of biofilm-based wound management in subjects with critical limb ischaemia. *JWound Care*. 2008; 17: 4, 145–155.

Response to White and Cutting critique

In their letter, published in the March issue of *JWC*, White and Cutting raised concerns about clinical visualisation of wound biofilm in the absence of a definitive assay or validation of visual observations with microscopic confirmation. While I acknowledge that science plays a critical role in extending our knowledge of the role of biofilm in wound healing, clinicians cannot ignore patients' needs, or the patterns we observe as experts in our practice, while we await such scientific developments.

As a thoughtful and experienced wound clinician, I make observations and see patterns. Why is it that such important clinical information can be so easily dismissed? Why are these observations of any less value in progressing our knowledge in wound healing than an *in vitro* analysis of wound tissue? Reputed confirmation of wound biofilm in the laboratory is also accomplished by visual observation by expert scientists using high-tech and expensive equipment. How were these initial visual observations validated?

Progressing our knowledge requires a combination of both clinical and laboratory data; a hierarchy cannot be assumed. In a recent article describing the effects of different combinations of organisms on wound healing, it was stated that 'as the wounds healed, more bacteria were visible in the upper eschar rather than deeper in the dermis'.² As a clinician, this sentence made no sense to me. National guidelines define eschar as a thick, leathery, necrotic tissue,³ while the NPUAP cautions against debridement of stable heel eschar, as it provides a natural, biological protection

from infection. I understand eschar to be a desiccated barrier surface, not a tissue supportive of bacterial growth. On contacting the author, I was advised that 'upper eschar' referred to the scabbed-over part of the wound. Yet, as a clinician, I consider scab to be dried serous exudate,⁴ very different from eschar. In essence, this study defined results in a way that was ultimately of limited practical value.

In personal communications with this author and two industry members, we discussed slough and biofilm, and how the two might differ. All parties agreed that further scientific understanding in this area could be very important. When I offered to send tissue samples for investigation, I was told that a fee would be charged for use of scanning electron microscopy equipment, involvement of a pathologist would be required to evaluate the samples, and that definitive assessment can still be challenging. Laboratory confirmation of what I see on wounds in my practice was too complicated and/or costly for all involved.

Slough is accepted as devitalised tissue, which should be removed as part of the wound bed preparation process; but when is its presence confirmed by laboratory analysis? Surely the same can be said for biofilm. With a trained eye and clinical experience, wound slough and biofilm can likely be differentiated, leading to different treatment strategies.⁵

A paper that I co-authored with Phil Bowler in *JWC* addresses possible relationships between what we considered to be wound biofilm through clinical observations, and underlying comorbidities.⁶ In one case,

osteomyelitis was suspected based on visual observation of considered biofilm; this prompted MRI investigation and was subsequently confirmed. In this situation, based on White and Cutting's cautionary letter, should we have taken tissue samples for microscopic confirmation of biofilm prior to further investigation? What was best practice for the patient?

White and Cutting also challenge the visual interpretation of wound biofilm in a study published by Lenseink and Andriessen.⁷ While I accept caution being raised in this instance, an increasing number of studies and practices are basing biofilm presence on clinical cues. Wolcott and Rhoads used an algorithm based on clinical barriers to healing that prompted a biofilm-based approach to wound management in critically ischaemic cases.⁸ In a study by Dalton et al., visual similarity between biofilm grown *in vitro* and that debrided directly from a wound was demonstrated.² In the same study, *in vitro* grown multi-species biofilms were transplanted into full-thickness wounds in mice to create polymicrobial wound infections.²

Recognising wound biofilm and taking appropriate action is likely to improve patient care and outcomes. Must we wait for lengthy, costly and not necessarily definitive scientific studies before we can consider taking action, or should we act now and maximise the value of expert clinical judgment? I believe that the possibility of improving patient outcomes through clinical observation of biofilm is worth the risk of ridicule.

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