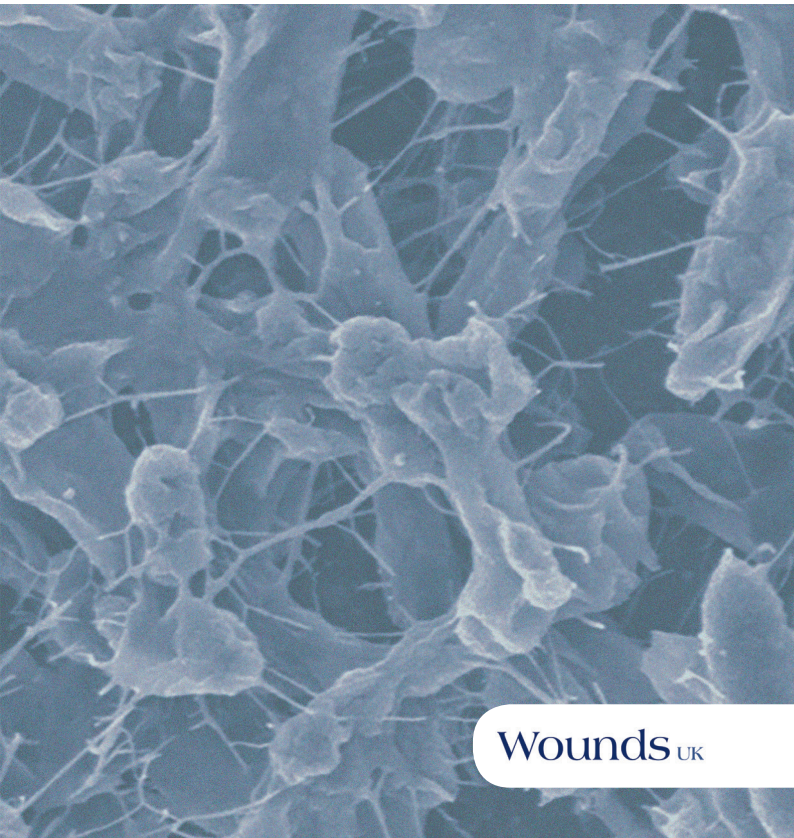
QUICK GUIDE

MANAGING BIOFILM IN STATIC WOUNDS



Wounds UK

UNDERSTANDING BIOFILM

Biofilm has been found to be present in a majority of static wounds[1] and may be a key cause of delayed wound healing[2] and a precursor to infection.[3]

Biofilms are complex microbial communities containing micro-organisms, embedded in a protective, slimy barrier of sugars and proteins.

Biofilm can protect micro-organisms from the host immune response and from antimicrobial agents, protecting micro-organisms and allowing them to multiply. In addition, biofilm is difficult to completely remove,[4] even with debridement, and it can reform quickly.[5]

Because of the variability and complexity of biofilm structure, visual observation of wound bioburden can be challenging. Specialist diagnostic testing is not readily available.[6]

A 'shiny' or 'slimy' wound surface, persistence of slough-like material and stalled healing may indicate the presence of biofilm. Early identification and management of biofilm in a wound can improve wound healing and patient wellbeing.[6]

Managing wounds containing biofilm:[7]

Adopt strategies to reduce the amount of biofilm and help prevent its reformation.

Address factors that may contribute to wound chronicity, such as wound infection and moisture imbalance.

Follow a protocol of care that incorporates cleansing and/or debridement, and select an appropriate antimicrobial dressing.

1. James GA et al (2008) Biofilms in chronic wounds. Wound Rep Regen 16:37-44
2. Metcalf D, Bowler P (2013) Biofilm delays wound healing: A review of the evidence. Burns & Trauma 1:5-12
3. Percival SL, Bowler PG (2004) Biofilms and their potential role in wound healing. Wounds 16:234-40
4. Wolcott RD et al (2010) Biofilm maturity studies indicate sharp debridement opens a time-dependent therapeutic window. J Wound Care 19:320-8
5. Wolcott RD et al (2009) Regular debridement is the main tool for maintaining a healthy wound bed in most chronic wounds. J Wound Care 18:54-6
6. Phillips et al (2010) Biofilms Made Easy. Wounds Int
7. Parsons D et al (2014) Next-generation antimicrobial dressings: AQUACEL® Ag+ Extra and Ribbon. Wounds Int
8. Metcalf D et al (2014) A clinical algorithm for wound biofilm identification. J Wound Care 23(3):137-43
9. Physical Disruption of Biofilm by AQUACEL® Ag+ Wound Dressing Scientific Report. WHR13850 MA232. 2013. Data on File, ConvaTec Inc.
10. Antimicrobial activity and prevention of biofilm reformation by AQUACEL™ Ag+ EXTRA dressing. Scientific Background Report. WHR13857, MA236, 2013. Data on file, ConvaTec Inc.

AQUACEL® Ag+ dressings

Demonstrated wound healing in a real-life evaluation of clinical cases[11]

113
113 cases of challenging, at-risk or infected wounds

74%
74% had suspected biofilm

95%
95% of wounds improved or healed

4.1
4.1 weeks average management period

Ag+ Technology

Ag+ Technology is a unique, silver-containing formulation[12] that:

- disrupts and breaks down biofilm slime to expose bacteria*[9,10,13]
- kills a broad spectrum of bacteria, including antibiotic resistant superbugs, with its reservoir of silver†*[10,13,14]
- prevents biofilm reformation*[10,13]

Hydrofiber® Technology

Helps create an ideal environment for healing, and for the Ag+ Technology to work

- Locks in excess exudate and bacteria to help minimise cross-infection and prevent maceration*[15-18,19,20]
- Micro-contours to the wound bed, helping to maintain optimal moisture balance and eliminating dead spaces where bacteria and biofilm can develop*[21-23]
- Responds to wound conditions by forming a cohesive gel, while helping minimise pain associated with dressing changes*[24-26]

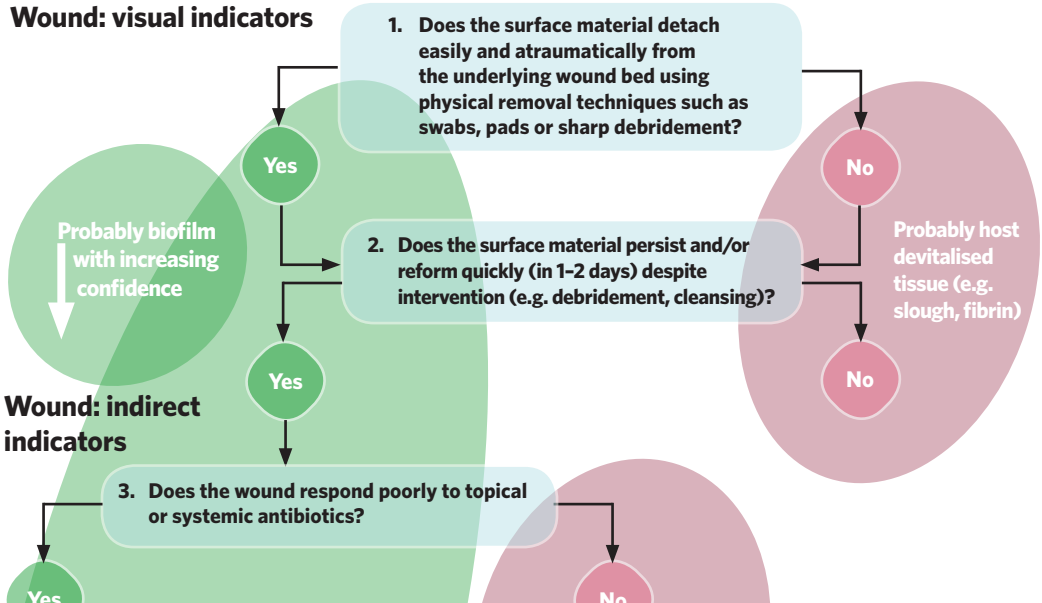
Supported by ConvaTec | www.convatec.co.uk

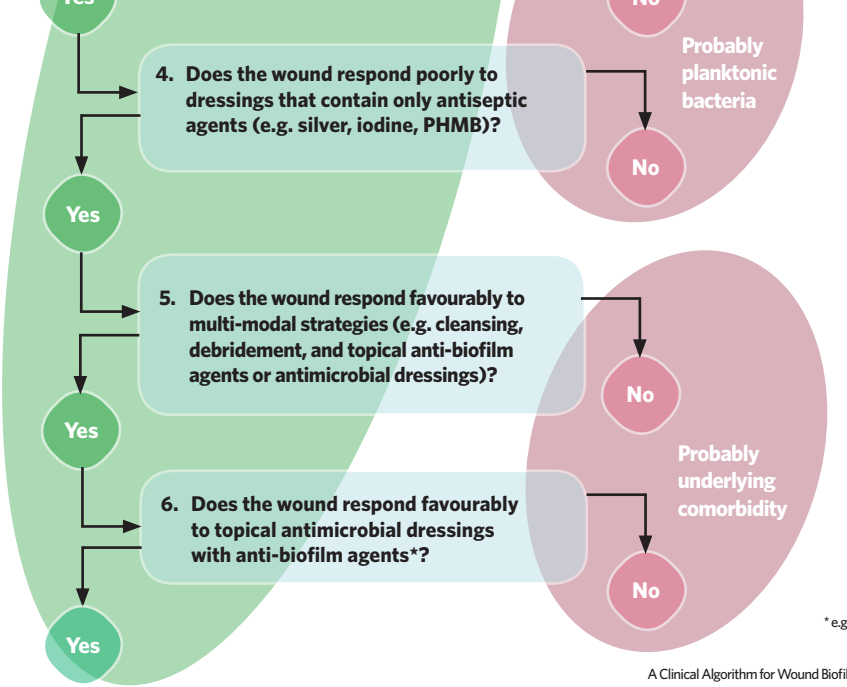
*As demonstrated in vitro / †including MRSA, VRE and ESBL bacteria

17. Bowler PG et al (1999) Infection control properties of some wound dressings. J Wound Care 8:499-502
18. Walker M et al (2007) In vitro studies to show sequestration matrix metalloproteinases by silver containing wound care products. Ostomy Wound Manage 53:18-25
19. Walker M, Parsons D (2010) Hydrofiber technology: its role in exudate management. Wounds UK 6(2):31-8
20. Parsons D et al (2005) Silver antimicrobial dressings in wound management: A comparison of antibacterial, physical and chemical characteristics. Wounds 17:222-32
21. Jones SA et al (2005) Antimicrobial activity of silver-containing dressings is influenced by dressing conformability with a wound surfact. Wounds 17:263-70
22. Bowler P et al (2010) Dressing conformability and silver-containing wound dressings. Wounds UK 6(2):14-20
23. Walker M et al (2011) Evaluation of low-adherent antimicrobial dressings. Wounds UK 7(2):32-45
24. Barnea Y et al (2004) Clinical comparative study of Aquacel and paraffin gauze dressing for split-skin donor site treatement. Ann Plast Surg 53:132-6
25. Kogan L et al (2004) Comparative study of Aquacel and Silverol treatment in burns. Ann Burns Fire Dis 17:201-7
26. Brunner U et al (2000) Experiences with hydrofibres in the moist treatment of chronic wounds, in particular of diabetic foot. VASA 29:253-7

CLINICAL ALGORITHM FOR BIOFILM IDENTIFICATION[8]

Routine assessment of static wounds should include a thorough review that incorporates visual and indirect indicators to identify suspected biofilm and guide management. This algorithm (developed by ConvaTec Ltd), helps identify biofilm.[8]





* e.g. AQUACEL® Ag+ dressings

A Clinical Algorithm for Wound Biofilm Identification, Metcalf et al. Adapted from Journal of Wound Care 2014; 23(3): 137-143

11. Walker et al (2015) A real-life clinical evaluation of a next-generation antimicrobial dressing on acute and chronic wounds. J Wound Care 24:1, 11-22

12. Composition comprising antimicrobial metal ions and a quarternary cationic surfactant. Scientific Background Report. WO 2012136968 A1, 2012. Data on file, ConvaTec Inc.

3-STEP PROTOCOL OF CARE[7]

ASSESS

Evaluate both the patient and the wound

- Carry out a holistic patient assessment (e.g. medication, comorbidities, lifestyle issues)
- Assess the wound:
  - Wound type and length of time wound has been present
  - Wound bed appearance (tissue type and percentage of: slough, necrosis, granulation, suspected biofilm)
  - Size (length, width, depth)
  - Exudate (colour, consistency, level)
  - Associated pain and/or odour
  - Peri-wound skin condition (swelling, discolouration, maceration)
  - Signs/symptoms of infection (pain, odour, heat, redness, swelling, purulence)

MANAGE

Cleanse and debride

- Cleanse and debride the wound where necessary to remove barriers to healing (e.g. slough, necrosis, biofilm)
- Dress the wound:
  - Apply an appropriate dressing that can disrupt biofilm, kill bacteria and prevent biofilm reformation, while managing exudate and infection (e.g. AQUACEL® Ag+ dressings)*[7]

MONITOR

Reassess and document the wound at each dressing change

- If the wound remains infected or at risk of infection, continue to use a suitable dressing such as AQUACEL® Ag+ Extra™ dressing or AQUACEL® Ag+ Ribbon dressing covered with a secondary dressing such as AQUACEL® Foam dressing

*As demonstrated in vitro

13. Antimicrobial activity against CA-MRSA and prevention of biofilm reformation by AQUACEL™ Ag+ EXTRA™. Scientific Background Report. WHR13875 MA239, 2013. Data on file, ConvaTec Inc.
14. Bowler PG et al (2012) Multi-drug resistant organisms, wounds and topical anti-microbial protection. Int Wound J 9:387-96
15. Newman GR et al (2006) Visualisation of bacterial sequestration and bacterial activity within hydrating Hydrofiber™ wound dressings. Biomaterials 27:1129-39
16. Walker M et al (2003) Scanning electron microscopic examination of bacterial immobilization in a carboxymethylcellulose (AQUACEL™) and alginate dressing. Biomaterials 24:883-90