Helping remove barriers to healing

Smith+Nephew

IODOSORB◊
Cadexomer Iodine Range

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Detail aid

The biofilm barrier

Biofilm is a cluster of attached bacteria embedded in a matrix of proteins and sugars which offers protection from host defences and antimicrobials.[2]

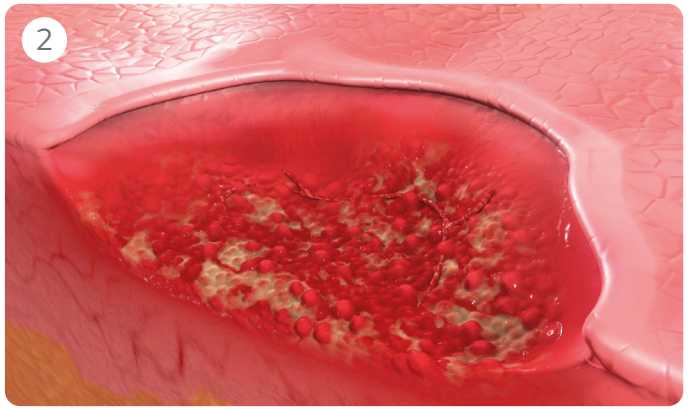
Biofilm formation

Biofilm form with the initial attachment of single planktonic bacteria, creating a coherent cluster of cells within a protective matrix.[3]

EPS matrix

This matrix, composed of protein, DNA and sugars, is known as Extracellular Polymeric Substance, or EPS.[2-4]

Biofilm is difficult to treat as it provides tolerance to antimicrobial treatments[5-7] and the host immune response.[8-10]



Delayed healing

An impaired immune response leads to a vicious cycle of tissue damage and low level inflammation.[11,12]

To effectively disrupt biofilm and promote healing, an antimicrobial must penetrate the EPS and attack the bacteria within[3] with a sustained action that stops biofilm reformation.[5,6]

Did you know?

Biofilm is difficult to identify as it is invisible to the naked eye, non-uniformly distributed across the wound[13] and often present in deeper tissues.[14,15]

Biofilm is thought to be present in up to **78% of all chronic wounds**[1]

References: 1. Malone M. *et al. J. Wound Care*. 2016;25(12):20–25. **2.** Burmølle M, *et al. FEMS Immunol. Med. Microbiol.* 2010; 59:324–336. **3.** Stoodley P, *et al. Annu. Rev. Microbiol.* 2002; 56: 187–209. **4.** Flemming HC, *et al. Nature Rev Microb.* 2010; 8:623–633. **5.** Phillips P, *et al. Int Wound J.* 2013:1–15. **6.** Wolcott RD, *et al. J. Wound Care*. 2010; 19(8): 320–328. **7.** Stewart PS, Costerton JW. 2001. *Lancet* (London, England) 358, 135–8. **8.** Jesaitis AJ, *et al. J. Immunol.* 2003;171(8):4329–4339. **9.** Bjarnsholt T. *et al. Microbiology*. 2005; 151:373–383. **10.** Cochrane DM, *et al. J. Med. Microbiol.* 1998; 27:255–61. **11.** Bjarnsholt T, *et al. Wound Repair Regen*. 2008; 16:2–10. **12.** Costerton JW, *et al. Science* 284. 2008; 284:1318–22. **13.** Thomsen TR, *et al. Wound Rep Reg.* 2010; 18, 38–49. **14.** Kirketerp-Møller K, *et al. J. Clin. Microbiology*. 2008; 46(8):2717–22. **15.** Fazli M, *et al. J. Clin. Microbiology*. 2009;47(12):4084–9.

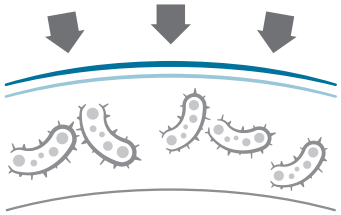
When wound healing stalls, patients experience **lower quality of life** and **healthcare system costs increase**[1]

24% of patients with chronic wounds have lived with their wound for at least 6 months[1]

16% remained unhealed for a year or more[1]

The cost of patient care for a non-healing wound has been shown to be **135%** more than that of a healed wound[2]

Wounds that contain biofilm may not be identified, resulting in **ineffective treatment and delayed healing**[3–6]



Most topical **antimicrobials fail to disrupt biofilm**[7]

*European data.

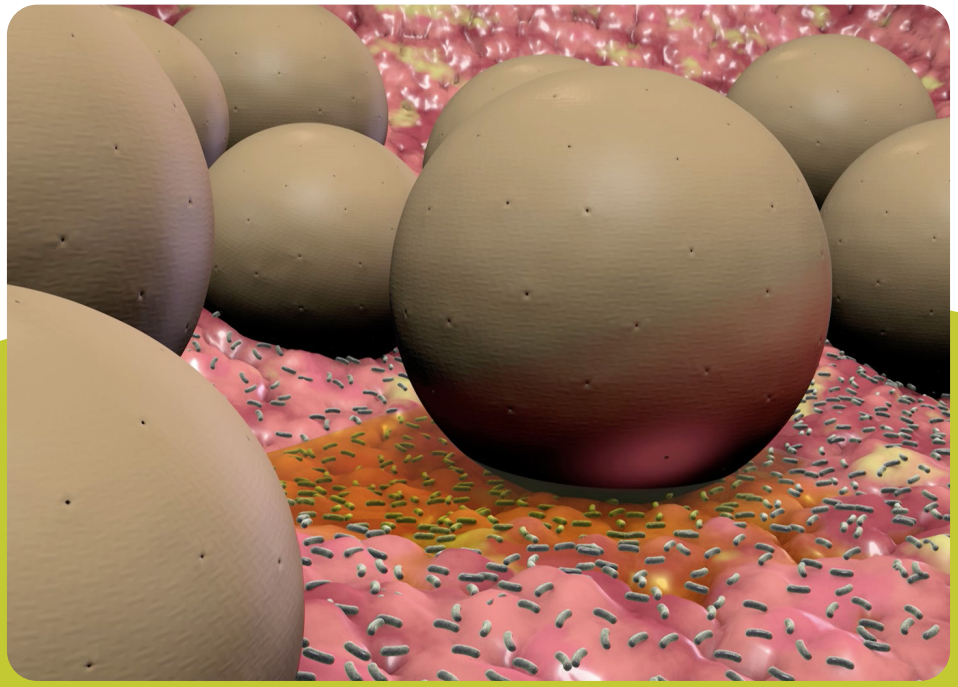
References: 1. Lindholm C, Searle R. *Int Wound J.* (2016) Jul;13 Suppl 2:5–15. **2.** Guest JF, *et al. Int. Wound J.* 14, 2 322–330. (2016)*. **3.** Roche ED, *et al. Wound Repair Regen* (2012); 20: 537–43). **4.** Schierle CF, *et al. Wound Repair Regen.* (2009); 17: 354–9. **5.** Zhao G, *et al. Wound Repair* (2012); 20: 342–352. **6.** Sen CK, *et al. Plast Reconstr Surg.* 2021; 148(2): 275e-288e. **7.** Bjarnsholt J, *et al. APMIS* (2007).115: 921–8.

The **IODOSORB**◊ Range of Dressings

IODOSORB is a range of antimicrobial dressings made of unique cadexomer micro-beads: spherical starch structures loaded with 0.9% elemental iodine.

The IODOSORB Range effectively manages wound exudate[1–3] and removes slough,[4,5] as well as providing sustained broad spectrum antimicrobial activity over 3 days.*[6,7]

Iodine is encapsulated in the cadexomer matrix and provides a sustained release when the bead comes into contact with wound fluid.[8–10]



*As demonstrated *in vitro*.

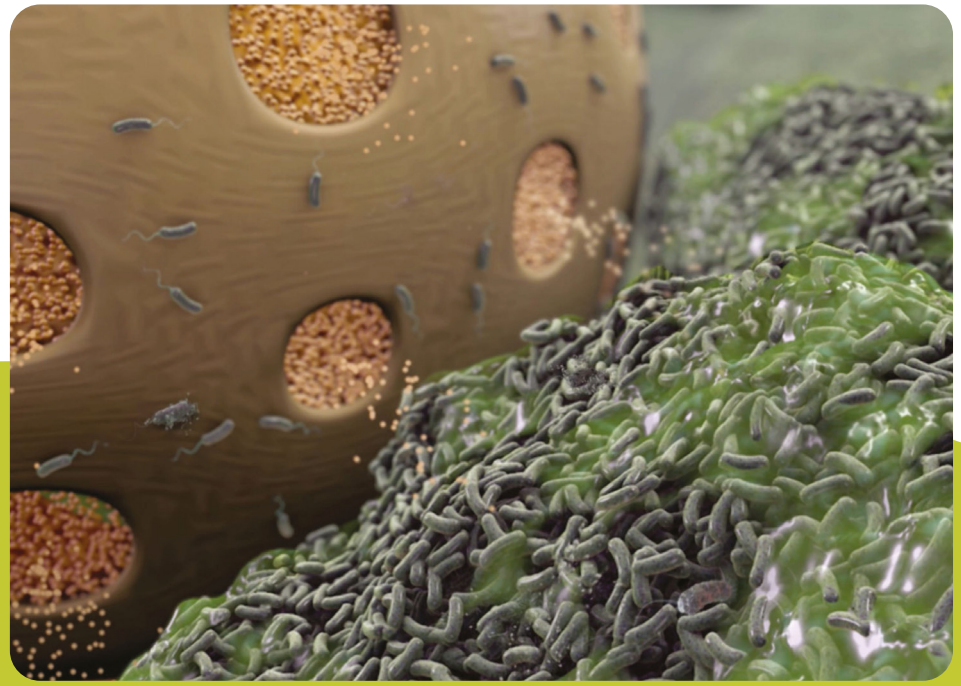
References: 1. Skog E, *et al. Br. J. Dermatol*. 1983; 109:77–83. **2.** Troeng T, *et al.* Stuttgart: Schattauer Verlag; 1983. **3.** Malone M, *et al. Antimicrob Chemother*. 2017;72(7):2093–2101. **4.** Hansson C, *et al. International Journal of Dermatology*. 1998; 37:390–396. **5.** Smith+Nephew 2007. Internal Report. SR/CE/027/IOD. **6.** Smith+Nephew 2018. Internal Report. 1801001. **7.** Smith+Nephew 2018. Internal Report. 1801002. **8.** Smith+Nephew 2018. Internal Report. DS/18/024/R. **9.** Smith+Nephew 2018. Internal Report. DS/18/025/R. **10.** Smith+Nephew 2018. Internal Report. DS/18/026/R.

Anti-biofilm mode of action

Dual-action to disrupt biofilm[1]

It is suggested that the cadexomer micro-beads are able to dehydrate and physically disrupt the biofilm structure.[1–4]

Once the cadexomer beads are able to breach the biofilm-specific matrix, the iodine can subsequently kill the exposed bacteria within the biofilm community.[5,6]



References: 1. Fitzgerald DJ, Renick PJ, Forrest EC, *et al. Wound Repair Regen.* 2017;25(1):13–24. **2.** Forrest EC, Gunning P, Coleman D, Fitzgerald DJ. Paper presented at: EWMA; 2019; Gothenburg, Sweden. **3.** Akiyama H, Oono T, Saito M, Iwatsuki K. *The Journal of Dermatology.* 2004;31:529–534. **4.** Phillips PL, Yang Q, Davis S, *et al. Int Wound J.* 2015;12(4):469–483. **5.** Smith+Nephew 2008. Internal Report. 0804007. **6.** Oates JL, Phillips CD, Wolcott R, Woodmansey E. Paper presented at: SAWC; 2016; Las Vegas, USA.

The unique dual action of the IODOSORB◊ Range is particularly effective in the **disruption of biofilm:**[1–3]

High absorptive property

- Absorbs up to 7x its own weight in exudate[4–6]
- Dehydration of the biofilm matrix[1,7–9]
- Desloughing action[11,12]
- Assists autolytic debridement*[10,12–14]

0.9% antimicrobial iodine

- Kills mixed species biofilm†[15,16]
- Sustained release of iodine[17–20]
- Broad spectrum antimicrobial efficacy‡[21–23]

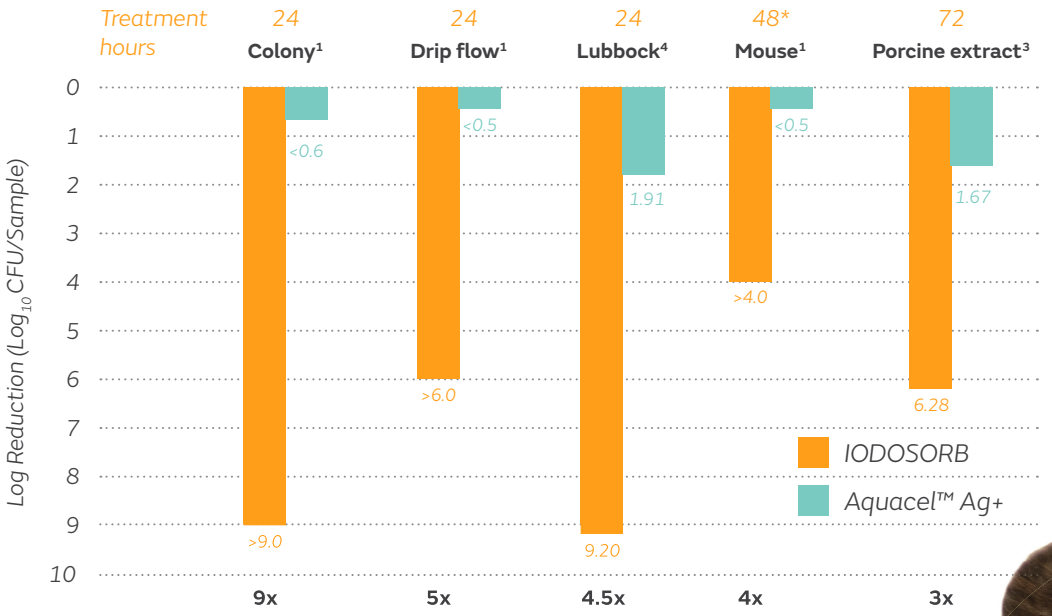
*By absorbing slough and debris. †Typical of chronic wounds, as demonstrated *in vitro*. ‡As demonstrated *in vitro*.

References: 1. Akiyama H, *et al. J. Dermatol.* 2004;31(7): 529–534. **2.** Hill E, *et al. J Antimicrob Chemother.* 2010;65(6):1195–1206. **3.** Zhou LH, *et al.* Br. *J. Dermatol.* 2002;146(3): 365–74. **4.** Smith+Nephew 2017. Internal Report. DS/17/365/R. **5.** Smith+Nephew 2017. Internal Report. DS/17/363/R. **6.** Smith+Nephew 2017. Internal Report. DS/17/364/R. **7.** Fitzgerald DJ, *et al. Wound Repair Regen.* 2017; 25(1): 13–24. **8.** Forrest EC, *et al.* Paper presented at: EWMA. (2019); Gothenburg, Sweden. **9.** Phillips PL, *et al. Int Wound J.* 2015;12(4):469–483. **10.** Ormiston MC, Fox J. *Br. Med. J.* (Clin. Res. Ed). 1985; 291, 1424–1425. **11.** Smith+Nephew 2007. Internal Report. SR/CE/027/IOD. **12.** Hansson C, *et al. International Journal of Dermatology.* 1998; 37:390–396. **13.** Holloway GA, *et al. The Western Journal of Medicine.* 1989; 151(1):35–38. **14.** Troeng T, *et al.* Stuttgart: Schattauer Verlag; 1983. **15.** Smith+Nephew 2008. Internal Report. 0804007. **16.** Oates JL, Phillips CD, Wolcott R, Woodmansey E. Paper presented at: SAWC; 2016; Las Vegas, USA. **17.** Skog E, *et al. Br. J. Dermatol.* 1983; 109:77–83. **18.** Smith+Nephew 2018. Internal Report. DS/18/024/R. **19.** Smith+Nephew 2018. Internal Report. DS/18/025/R. **20.** Smith+Nephew 2018. Internal Report. DS/18/026/R. **21.** Smith+Nephew 2018. Internal Report. 1801001. **22.** Smith+Nephew 2018. Internal Report. 1801002. **23.** Johnson A. *Prof. Nurse* 7, 60, 62, 64 (1991).

Superior efficacy against biofilm **proven across different lab models**[1–3]

IODOSORB◊ Dressings have a long history of effectiveness against biofilm with superior results compared to other topical antimicrobials such as PHMB, silver and povidone iodine.*[1,2]

In line with the biofilm experts' recommendations on selecting an effective anti-biofilm dressing, IODOSORB Dressing has been tested and shown to be more effective than Aquacel™ Ag+ across multiple challenging and clinically relevant biofilm models.[1,2,5]



Adapted from: Fizgerald *et al.* 2017,[1] Oates *et al.* 2016[4] and Schultz G, *et al.* 2016[3]

Why silver is not effective against biofilm

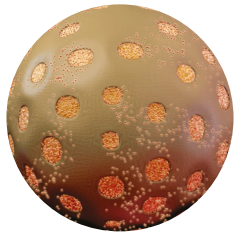
Charged ions, such as silver or chlorides are more easily neutralised by the EPS matrix.[7]

Moreover the concentration of silver required to eradicate biofilm is estimated to be 10 to 100 times higher than that used to eradicate planktonic bacteria.[6] Such concentrations are currently unavailable in any silver dressing.

*p<0.05; as demonstrated *in vitro*.

References: 1. Fitzgerald DJ, *et al. Wound Repair Regen.* 2017; 25(1): 13–24. **2.** Roche, *et al. Int Wound J.* 2019;16(3):674–683. **3.** Schultz G, *el al.* In WUWHS Florence 1. 2016. **4.** Oates JL, *et al.* Paper presented at: SAWC. 2016; Las Vegas, USA. **5.** Schultz G, *et al. Wound Repair Regen.* 2017;25(5): 744–757. **6.** Bjarnsholt T, *et al. APMIS: acta pathologica, microbiologica, et immunologica Scandinavica.* 2007; 115(8): 921–928. **7.** Stewart PS, *et al. J App Micro.* 2001; 91, 525–532.

Removing barriers to healing



The IODOSORB Range are dual-action wound management products that offer the benefits of fluid handling[1–3] in combination with desloughing[4,5] and provide sustained broad spectrum antimicrobial activity for up to 3 days.*[6,7]

IODOSORB◊ Dressings with cadexomer bead technology is highly effective in the treatment of wounds with infection and biofilm.†[8–11]

The IODOSORB Range's anti-biofilm efficacy has been verified by data from the laboratory to the clinic.[12–14] Its efficacy, resulting in a fast rate of healing, is also supported by a positive Cochrane review.[15]

IODOSORB Cadexomer Iodine Products: efficacy backed by evidence

For detailed product information, including indications for use, contraindications, precautions and warnings, please consult the product's applicable Instructions for Use (IFU) prior to use.

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*As demonstrated *in vitro*. †Compared to standard treatment

References: 1. Smith+Nephew 2018. Internal Report. DS/18/024/R. **2.** Smith+Nephew 2018. Internal Report. DS/18/025/R. **3.** Smith+Nephew 2018. Internal Report. DS/18/026/R. **4.** Hansson C, *et al. International Journal of Dermatology.* 1998; 37:390–396. **5.** Smith+Nephew 2007. Internal Report. SR/CE/027/IOD. **6.** Smith+Nephew 2018. Internal Report. 1801001. **7.** Smith+Nephew 2018. Internal Report. 1801002. **8.** Skog E, *et al. Br. J. Dermatol.* 1983; 109:77–83. **9.** Hillstrom L. *Acta Chir Scand* Suppl. 1988;544:53–56. **10.** Ishibashi Y, *et al. J Clin Therap Med.* 1990;6(4):785–816. **11.** Moss C, *et al. Clinical and Experimental Dermatology.* 1987;12:413–418. **12.** Malone M, *et al. Antimicrob Chemother.* 2017;72(7):2093–2101. **13.** Fitzgerald DJ, *et al. Wound Repair Regen.* 2017; 25(1): 13–24. **14.** Smith+Nephew 2008. Internal Report. 0804007. **15.** O'meara S, *et al.* Cochrane Database of Systematic Reviews. 2014 (Issue 1 Art. No.: CD003557).