Helping remove barriers to healing

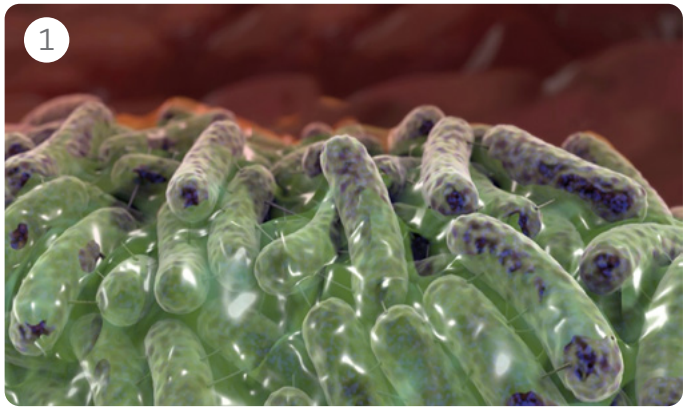
Smith+Nephew

IODOSORB◊
Cadexomer Iodine Range

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]



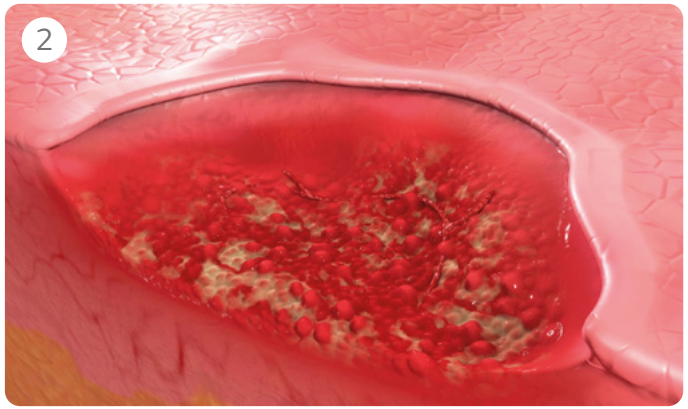
Biofilm formation

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.

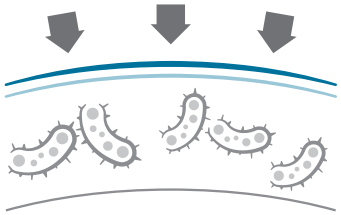
When wound healing stalls, patients experience **lower quality of life** and **healthcare system costs increase**[1]

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.

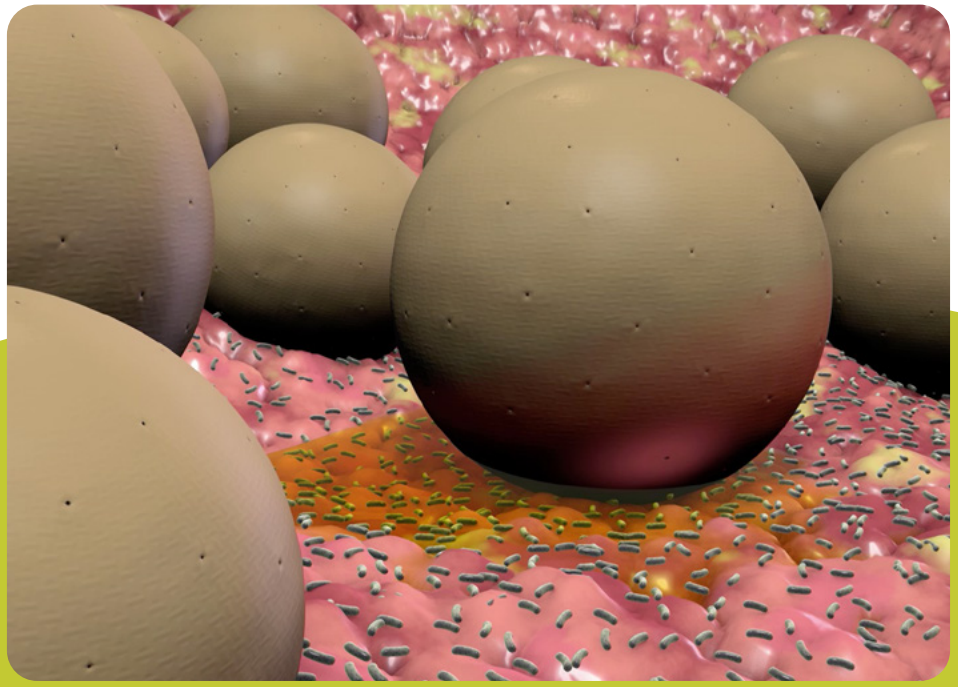
References: 1. Lindholm C, Searle R. *Int Wound J.* (2016) Jul;13 Suppl 2:5–15. **2.** Guest JF, *et al. Int. Wound J.* 14, 2 322–330. (2016)*. **3.** Roche ED, *et al. Wound Repair Regen* (2012); 20: 537–43). **4.** Schierle CF, *et al. Wound Repair Regen.* (2009); 17: 354–9. **5.** Zhao G, *et al. 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.

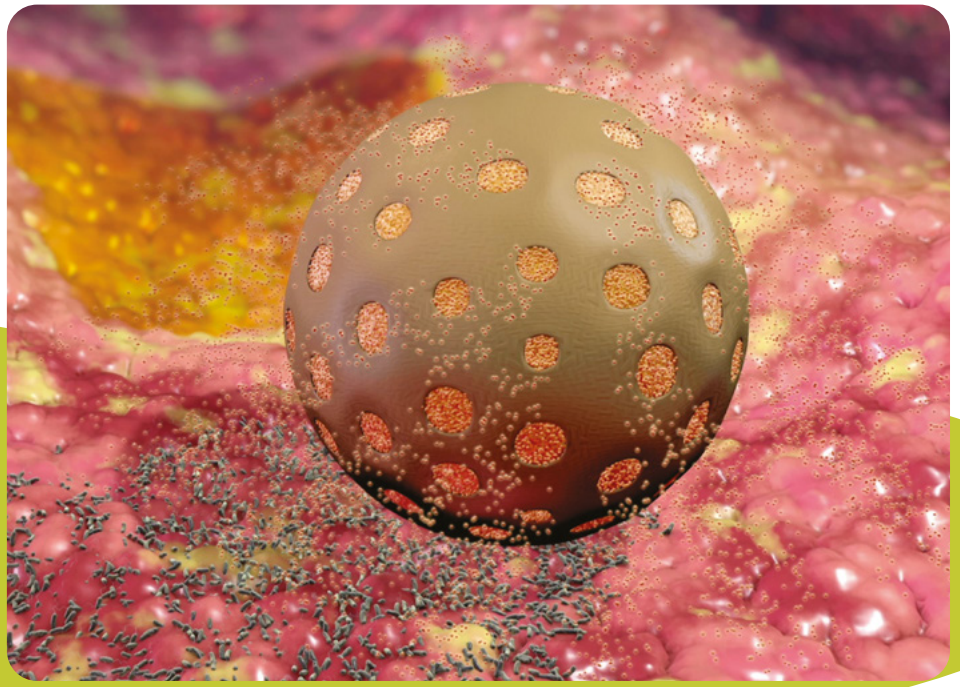
The **IODOSORB**◊ Range of Dressings

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*.

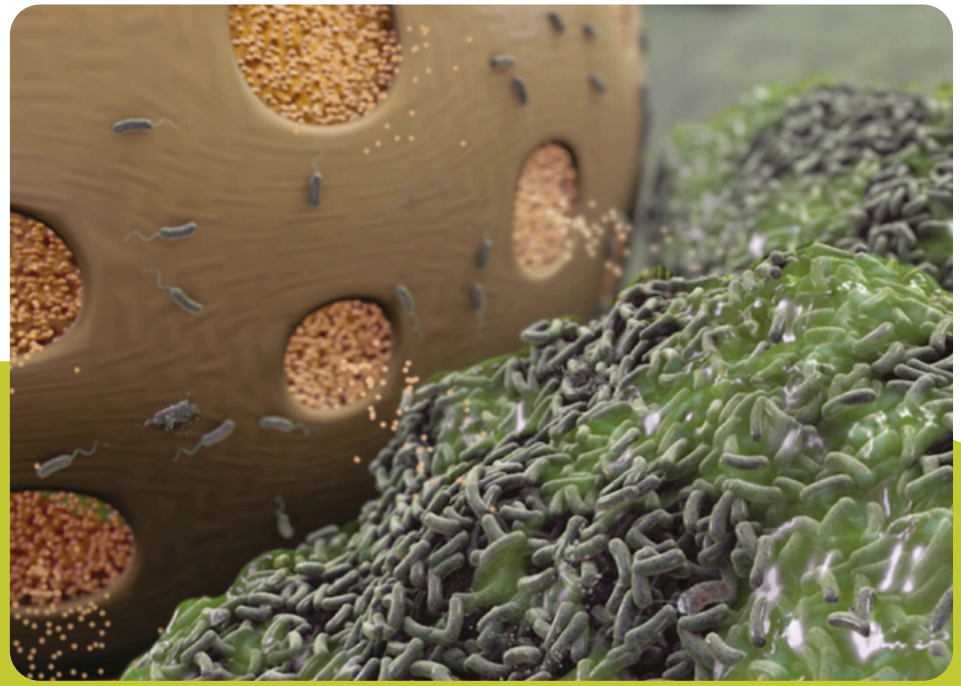
References: 1. Skog E, *et al. Br. J. Dermatol*. 1983; 109:77–83. **2.** Troeng T, *et al.* Stuttgart: Schattauer Verlag; 1983. **3.** Malone M, *et al. Antimicrob Chemother*. 2017;72(7):2093–2101. **4.** Hansson C, *et al. International Journal of Dermatology*. 1998; 37:390–396. **5.** Smith+Nephew 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]

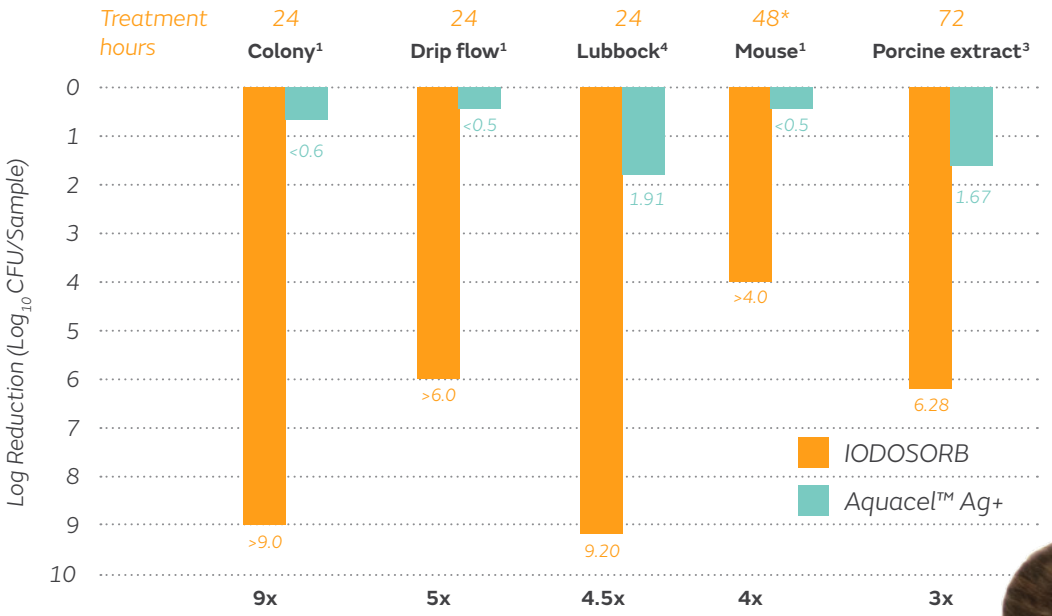
*By absorbing slough and debris. †Typical of chronic wounds, as demonstrated *in vitro*. ‡As demonstrated *in vitro*.

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

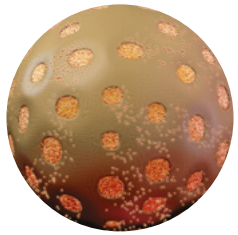
Charged ions, such as silver or chlorides are more easily neutralised by the EPS matrix.[7]

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]

Indications: Assists the healing and treatment of chronic ulcers. IODOSORB reduces the bacterial count, facilitates desloughing, absorbs exudate and maintains a moist wound environment to promote healing.

Contraindications: Not to be used in patients with known or suspected iodine sensitivity.

Precautions: Should not be used in children under 12 years of age.

This material is intended for healthcare professionals. 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.

IODOSORB Cadexomer Iodine Products: efficacy backed by evidence

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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).