Urgo Sponsored Learning:

Can There Be Gentle Yet Effective Ways For Slough Removal? What Does The Evidence And Experience Say?

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The 'Chronic Wound' Dilemma

Chronic wounds are wounds that have not progressed through the phases of healing properly and in a sequential and predictable manner. Traditionally, chronic wounds have been thought to be trapped in the inflammatory phase of healing. In actual fact, hyperinflammation is the main contributor to chronic wounds, rendering them hard-to-heal. Research has shown that bacterial biofilm is largely responsible for this hyperinflammatory state. To properly manage chronic wounds, clinicians must adequately address the cause of hyperinflammation (i.e., biofilm).

From Gingivitis to Granulitis – Wound Hygiene & Oral/Dental Hygiene

Gingivitis a classic example of hyperinflammation of the gum due to dental plaque biofilm build up. Granulitis, inflammation of the granulation tissue, is essentially "gingivitis of the wound". It is a hyperinflammatory state of the wound caused by bacterial biofilm. Biofilm is the preferred way of being for bacteria and requires ongoing management. Parallels can be drawn between anti-biofilm strategies in oral/dental hygiene and wound hygiene.

	Oral/Dental Hygiene	Wound Hygiene
Routine cleansing	Cleansing with toothpaste	Cleansing wound and peri-wound with anti-biofilm solution
Physical removal	Regular cleansing with toothbrush and flossing	Regular cleansing with intent
Regarding biofilm regrowth	Toothpaste and mouth wash	Advanced antimicrobial dressings
Optimizing health	Professional cleaning (i.e., dental hygienists)	Debridement
Promoting environment	Fluoride, sealants etc.	Advanced dressings (e.g., protease modulators, extracellular matrices, negative pressure wound therapy)

Vashe® - The Ideal Wound Cleanser

Wound cleansing is an essential part of wound hygiene, especially in the management of chronic, hard-to-heal wounds. Various best practice guidelines cite the importance of wound cleansing as part of routine wound care practice. An ideal wound cleanser should:

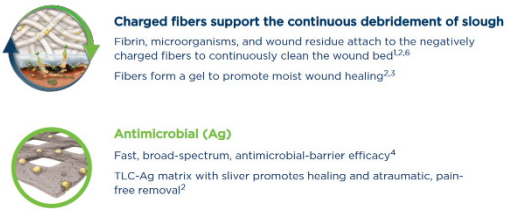
- Be **effective** in eradicating pathogens
- Be **non-cytotoxic** to cells in the wound/healed tissues
- Have a **pH** range close to that of intact skin (i.e., to not disrupt the skin's acid mantle)
- Be suitable for **everyday** use
- Be effective in disrupting **biofilm**.

HOCl is a naturally occurring substance found in the human – it is produced by white blood cells (i.e., neutrophils) to combat pathogens. Vashe® is a hypochlorous acid (HOCl) wound cleanser. It has been found to be effective against various multi-drug resistant bacteria, viruses, fungi and spores. It can penetrate and disrupt biofilm – it has been demonstrated to be more effective in disrupting Methicillin-Resistant *Staphylococcus aureus* and *Pseudomonas aeruginosa* biofilms than chlorhexidine and normal saline.[1] Compared to conventional antiseptics and wound cleansers, HOCl is non-cytotoxic.[2] Specifically, Vashe® has been shown to be non-toxic, non-mutagenic and non-cytotoxic.[3,4]

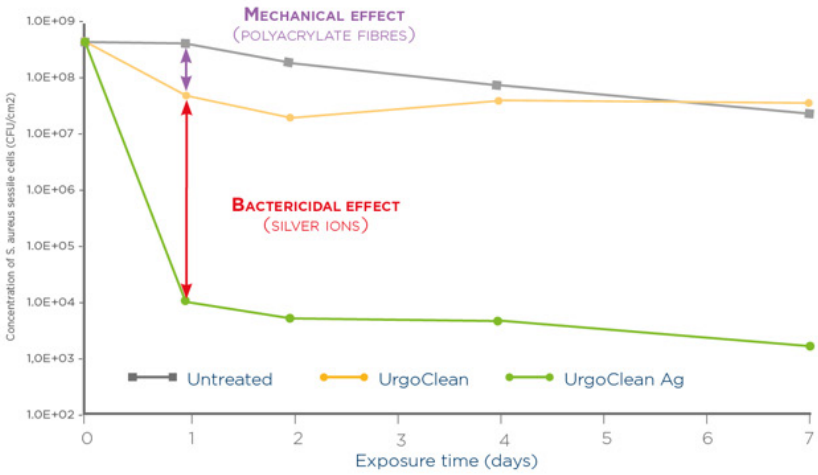
Wound Debridement as Part of Wound Hygiene

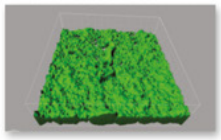
Much like regular brushing is essential to oral health, wound debridement (when appropriate) is an integral part of wound hygiene. Current wound debridement methods include, but are not limited to, conservative sharp debridement, mechanical debridement, autolytic debridement (via advanced interactive dressings), and enzymatic debridement. Studies have shown that microbial colonies and associated debris begin to re-form 24 hours after wound debridement.[5] Slough and necrotic tissue in the wound can promote bacteria growth and delay wound healing. More frequent debridement has been associated with improved wound healing.[6] Autolytic debridement via advanced interactive dressings alone has shown to be insufficient to meet the requirements of wound hygiene as it takes a longer time to occur, requires numerous dressing changes, and can increase the risk of infection in hard-to-heal wounds.[7]

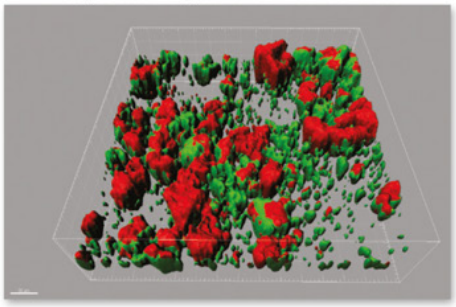
UrgoClean Ag – A New Way to Debride



Continuous debridement of slough is the solution. It must be effective, continously removing slough and wound debris, mitigating reformation of microbial colonies post sharp debridement. It must be accessible, all caregivers can harness the benefits of sharp debridement, throughout the continuum of care. Lastly, it must be easy to use by healthcare providers and well tolerated by patients. UrgoClean Ag supports the continuous debridement of slough with its negatively charged fibers that remove slough as the slough is positively charged. Moreover, The TLC-Ag matrix with silver provides broad-spectrum, antimicrobial properties. It promotes healing and atraumatic, pain-free dressing removal. UrgoClean Ag has been shown to have fast and effective anti-biofilm action - it can reduce 99.99% of biofilm in just 24 hours and block biofilm re-attachment for up to seven days. UrgoClean Ag has been clinically proven in

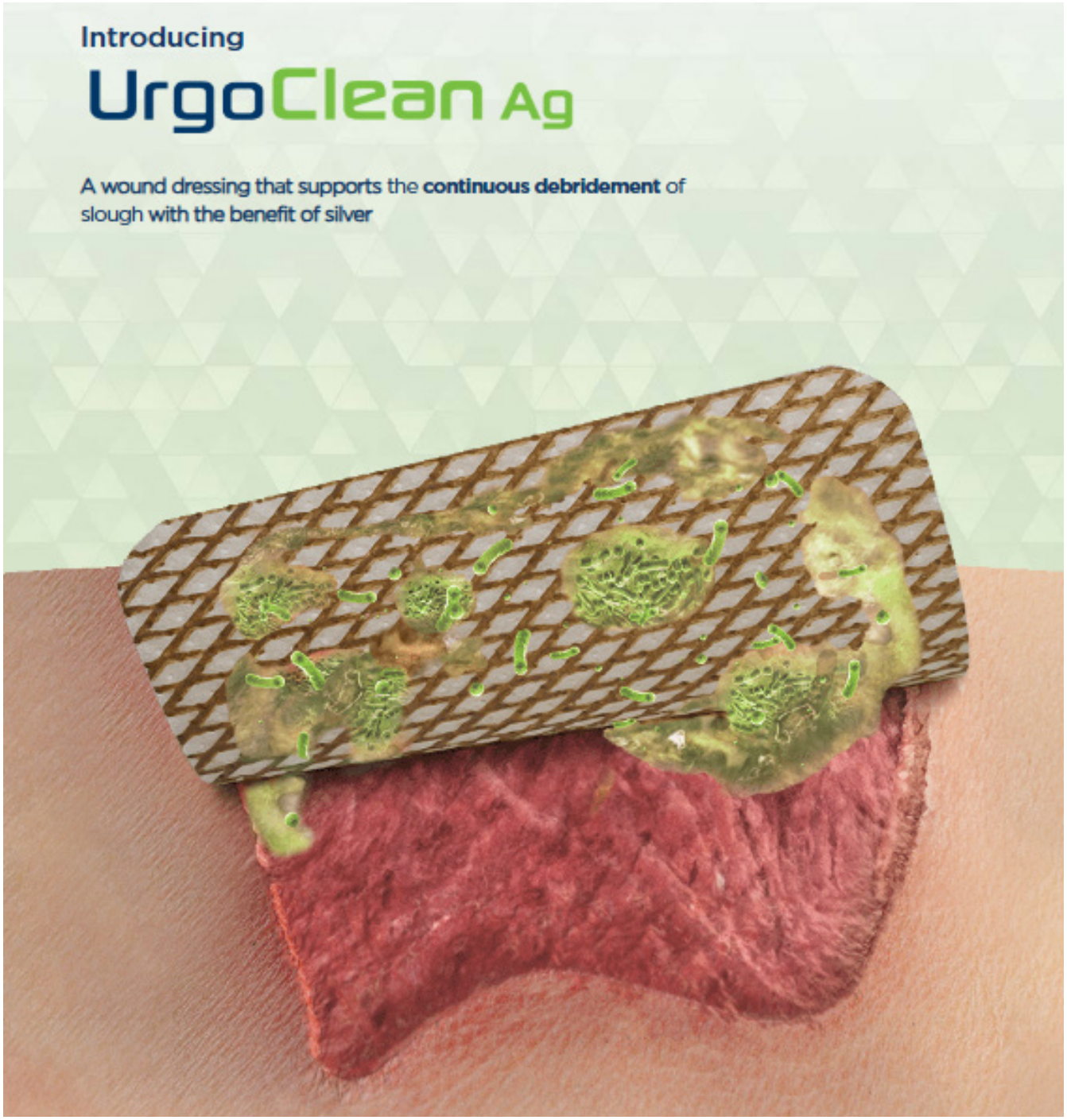






Red-labelled cells are dead cells (bactericidal activity of Ag+)

Clear zones = biofilm that was destroyed and removed (synergistic action of Ag+ and polyacrylate fibres)



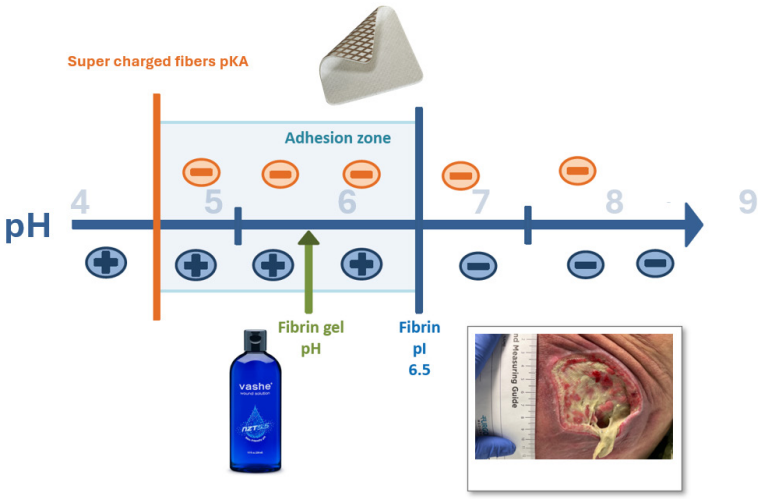
one RCT showing +50% greater debridement of slough compared to Hydrofiber technology, and in the largest observational study ever conducted for a silver dressing (2200+ patients) showing 90.6% of wounds treated demonstrated improvement of the healing process and UrgoClean Ag reduces exudate level by 70%.

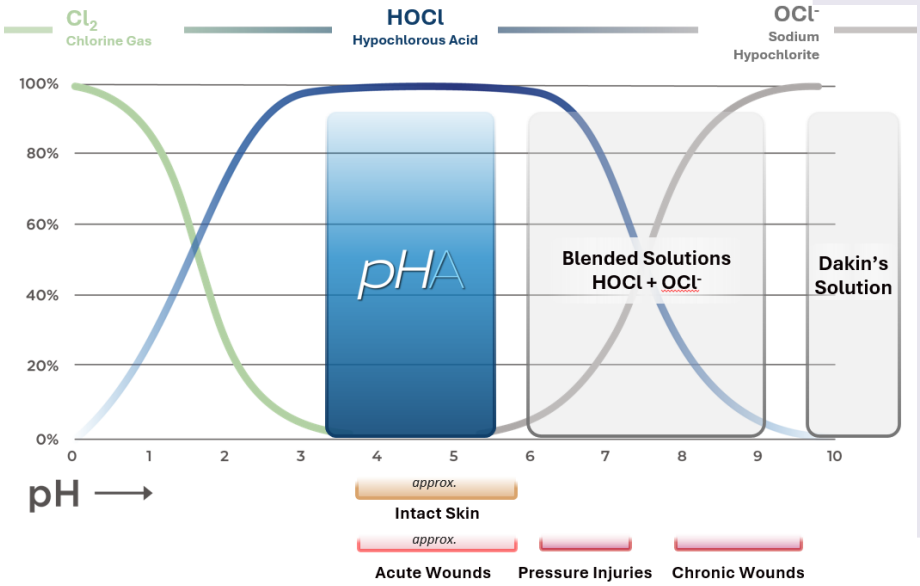
The Synergistic Effects of Vashe® and UrgoClean Ag

The pH of intact skin is from 3.5 to 5.5. The pH of wounds can range from 3.5 to 9.5. Acute wounds are usually closer to intact skin pH where chronic wounds are typically more alkaline. To heal chronic wounds we need to acidify them using Vashe which has the same pH as intact skin.

(Hypochlorous) HOCl ⇌ H^+ + OCl^- (hypochlorite)

Slough can be positively or negatively charged depending on the pH. In an acidic wound environment, slough is positively charged – this is when the negatively charged UrgoClean Ag is most effective as opposite charges attract. Vashe® is a HOCl solution that is stabilized at a pH of 3.5 to 5.5. Using Vashe on a wound lower the pH rendering it more acidic and the slough is more positively charged. UrgoClean Ag is even more efficient. This is the synergistic effect of Vashe and UrgoClean Ag.





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Dr. Debashish Chakravarthy is a PhD with a techno-commercial specialty in the subject of wound/skin care and tissue regeneration. His primary focus is on Development and Commercialization, Evidence Creation, Medical and Regulatory Affairs, publication strategy development, KOL engagement, and product life cycle management. Dr. Debashish is an author of over 24 papers and several product patents.

References

1. Day, Alkhalil, Carney, Hoffman, Moffatt, Shupp. Disruption of Biofilms and Neutralization of Bacteria using Hypochlorous Acid Solution: An In Vivo and In Vitro Evaluation.
2. Block SS. Disinfection, sterilization, and preservation. Philadelphia: Lea & Febiger; 2000.
3. Sampson CM, Sampson MN. Hypochlorous acids: A safe and efficacious new wound therapy. Poster presented at: World Union of Wound Healing Societies; 2008. Toronto, Ontario, Canada.
4. Data on file with Urgo Medical North America
5. Schultz, G. et al (2017), Consensus guidelines for the identification and treatment of biofilms in chronic non-healing wounds. Wound Rep and Reg, 25: 744-757
6. European Pressure Ulcer Advisory Panel, National Pressure Injury Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline. The International Guideline. Emily Haesler (Ed.). EPUAP/NPIAP/PPPIA: 2019
7. Murphy C, et al. International consensus document. Defying hard-to-heal wounds with an early antibiofilm intervention strategy: wound hygiene. J Wound Care 2020; 29 (Suppl 3b):S1-28.
8. UrgoClean Ag data on file
9. Percival S. L. (2018). Restoring balance: biofilms and wound dressings. Journal of wound care, 27(2), 102–113
10. Percival SL, et al., Slough and biofilm: removal of barriers to wound healing by desloughing. J Wound Care. 2015 Nov;24(11):498, 500-3, 506-10
11. Desroche N, Dropet C, Janod P, Guzzo J. Antibacterial properties and reduction of MRSA biofilm with a dressing combining polyabsorbent fibres and a silver matrix. J Wound Care. 2016 Oct 2;25(10):577-584. doi: 10.12968/jowc.2016.25.10.577. PMID: 27681588.

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