Wounds Canada Pressure Injury Symposium

How can pure hypochlorous acid (pHA) wound cleanser treatment improve the healing outcomes of lower limb wounds?

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Jeremy Caul is a registered nurse with a graduate degree focused on wound healing. He has worked with a predominantly Indigenous population for nearly a decade. In his current role he serves as a resource for wound care expertise to the patients and care providers in the Sioux Lookout catchment, which includes more than 30 First Nations, most of which are remote fly-in communities.

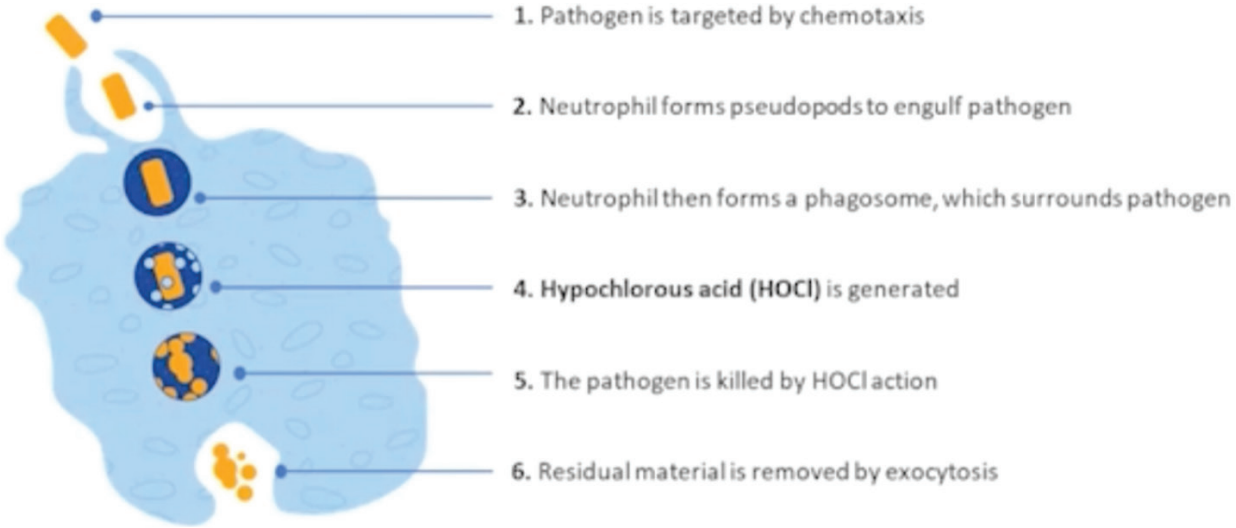
Amanda Loney earned a BScN from the University of Western Ontario, acquired her WOCN designation from Albany Medical Center in New York and has completed the IIWCC at the University of Toronto. As a community-based nurse and educator for 25 years, she has spent the last 20 of those as a certified nurse specialized in wound, ostomy and continence.

Most available wound cleanser options force health-care professionals and patients to compromise. Finding the right balance between competing factors and products can be a challenge. When the safest options are not used, patients are not proactively protected from their predisposed risk of infection, which can result in infection and/or delayed wound closure. Vashe wound cleansing solutions offer clinicians an option that is safe and effective, removing the need for compromise.

Vashe Wound Solution and Pure Hypochlorous Acid

Wound pH change is a gradual process; pH in the wound bed changes slowly via surface effect. Vashe Wound Solution contains 0.033% hypochlorous acid (pHA) as an antimicrobial preservative. pHA is a natural molecule with a pH of 3.5 to 5.5, a range that helps wound healing. Vashe has created an electromechanical manufacturing process that ensures the molecule remains stable within that range over the course of the cleanser's shelf life. Whereas cleansers without pHA may by cytotoxic, particularly if they contain hypochlorite (present in Dakin's solution),

Figure 1. Oxidative Burst Pathway



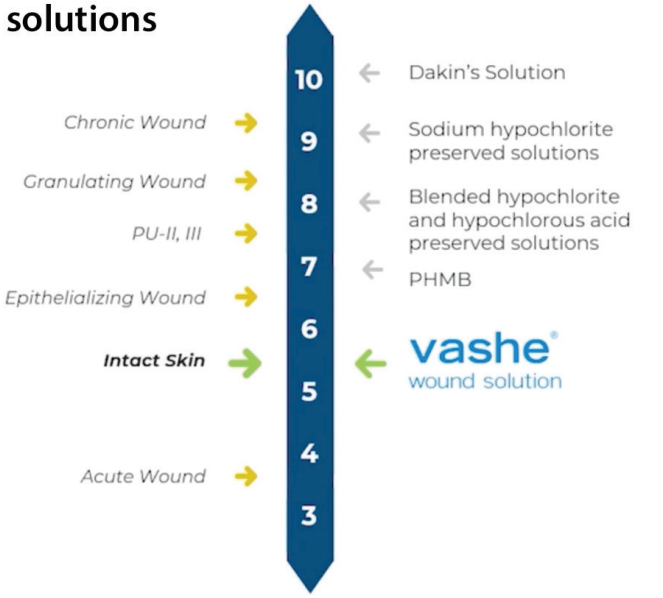
pHA cleanser (Vashe) is non-toxic to tissues. This means patients are not sacrificing the key cells necessary to promote healing of their skin and closure of their wound.

The body finds hypochlorous acid at 300 parts per million, which is the level present in Vashe (i.e., it mimics the normal pH of healthy human skin and encourages the natural immune system response, see Figure 1). Because it creates the same molecule to kill germs that invade tissue, it's managed by the tissue protective systems that keep hypochlorous toxicity low.

The acidic pH is also hostile to pathogens and biofilm. Vashe stimulates fibroblast proliferation to penetrate and remove biofilm that is 24–48 hours old (MRSA, *E. coli, C. albicans*) in a matter of minutes.

International consensus guidelines on wound infection (IWII, 2022)[1] and a recent consensus publication in the journal *Wound Repair and Regeneration*[2] recommend the use of hypochlorous acid-based cleansers due to the high margin of product safety; it is far less toxic to wound cells than it is to germs. Using pHA to address biofilm using non-cytotoxic, topical antimicrobials promotes the body's natural inflammatory and immune responses, as well as keratinocyte and fibroblast migration.

Figure 2. Vashe® Mimics Natural Skin pH



Why pH Matters: The Role of pH in Chronic Wounds and Solutions

The presence of biofilms, proteases, defective extra-cellular matrix and changing pH make wound healing difficult. Micro-organisms thrive in high-pH environments (pH ~7–9), meaning that increased pH levels in the wound bed can lead to increased biofilm development. Targeting the pH and making the wound environment acidic can therefore benefit the healing process.

As chronic wounds heal, the wound pH decreases significantly. As the wound continues through the healing process, there is protease activity and oxygen release, reduced toxicity of bacterial end products, enhanced destruction of abnormal collagen, angiogenesis, increased macrophage and fibroblast activity, and control of enzyme activity. While other wound cleansers do address bacteria, they are not creating an environment for wound healing (see Figure 2).

Key Take-away Points

- Vashe Wound Solution offers the best results for safety and efficacy.
- Vashe Wound Solution's superiority is driven by a pH associated with optimal wound healing and a robust innate immunity system.

References

1. International Wound Infection Institute (IWII) Wound infection in clinical practice: Principles of best practice. Wounds International. 2022.
2. Eriksson E, Liu PY, Schultz GS, Martins-Green MM, Tanaka R, Weir D, et al. Chronic wounds: Treatment consensus. Wound Rep Reg. 2022;30(2)1–16.

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