



Intermediate-level disinfection with accelerated hydrogen peroxide prevents accumulation of bacteria in Versajet™ during repeated daily debridement using simulated-use testing with an inoculated pork hock (Alfa, et al. Burns 40, 2014, pg 460-465)

Abstract

Debridement of necrotic tissue is essential for treatment and prevention of infection in burn injury. Debridement is the removal of damaged tissues or foreign objects from a wound. The Versajet hydrosurgery system is a single use product for surgical debridement of the burn wound in the operating room. Although marketed for single use surgical debridement, given the cost of the unit, it is not economical to use a new hand piece at each dressing change. If the handset could be cleaned sufficiently to permit reuse on the same patient with each dressing change, bedside use may become financially feasible. Accelerated Hydrogen Peroxide® (AHP®) is a leading disinfection technology that was utilized in this study to determine if the Versajet hand piece could be adequately disinfected for reuse.

Background

Bacterial colonization is a potentially life threatening complication of burn injury, that can lead to invasive infection and graft loss. Therefore the debridement of the layer of protein coagulum (mass) mixed with bacteria from tissue must be conducted. Debridement can be achieved through surgical, autolytic, enzymatic, biosurgical or mechanical methods, but is often very painful and may even lead to post-traumatic stress disorder. The Versajet hydrosystem is used for surgical debridement of the burn wound and works by removing debris with fluid. The force of the stream can be adjusted and at the lowest setting is painless to the patient, which is why if the Versajet hand piece can be adequately disinfected and re-used would be the wound debridement method of choice.

Study

This study assessed the feasibility of using the Versajet system on an inoculated pork hock skin surface sequentially for 8 days with daily cleaning and intermediate level disinfection using AHP®. Daily pork hocs were inoculated with bacteria suspended in artificial test soil. An intermediate level disinfectant protocol with AHP® was employed to clean and disinfect the Versajet system between debridement's.

Results

Cleaning with the AHP® intermediate level disinfectant reduced bacterial counts by 6-log. In addition to surface contamination, the possible role of AHP® in reducing the amount of organic bioburden on the inside surfaces of the Versajet system was examined. Protein was used as a surrogate marker of organic contamination and was

reduced by 4.2 fold after post-cleaning and intermediate level disinfection.

Conclusions

The data demonstrated that when AHP® is used as part of an intermediate-level disinfection protocol, it results in a 6-log reduction in bacterial count and reduced protein content by 4.2 fold in the Versajet system after successive debridement of contaminated skin. The process presented is not sufficient to allow reuse of the Versajet systems between different patients, but may allow repeated use of Versajet systems on the same patient over a week's time. Removal of necrotic tissue at the patient's bedside (with minimal risk of contamination over several days as the burn depth is declared) may help promote burn wound healing.

Implications for AHP®

AHP continues to be validated as a leading disinfectant technology in healthcare for surfaces and devices through its confirmation of germicidal efficacy against pathogens of concern.

AHP® Disinfectants are One-Step Disinfectant Cleaners

- AHP® has proven cleaning efficiency resulting in lower costs and faster results as well as added confidence that disinfection can occur

AHP® Disinfectants are compatible

- AHP® formulations are tested to ensure compatibility that preserves your investments in equipment, furniture, and building surfaces

AHP® Disinfectants have realistic contact times

- Short contact times ensure surfaces remain wet for the required contact time, providing comfort and confidence that disinfection has occurred

AHP® Disinfectants provide the perfect balance between safety and efficacy

- AHP® is designed to be easier on employees and occupants resulting in protocol compliance
- The ingredients found in AHP® are all listed on the EPA and Health Canada Inerts lists and the FDA Generally Regarded as Safe List

AHP® Disinfectants are environmentally sustainable

- AHP's® active ingredient, hydrogen peroxide, breaks down into water and oxygen leaving no active residues
- AHP® does not contain Volatile Organic Compounds (VOCs) or other chemicals that will negatively impact indoor air quality