

Jill Damon, CWON1, Gina Perkins, WCC2, Nora Sammon, WOCN3, Kristen Turner, CWOCN1 and Sarah Aquino, COCN1, (1) Mayo Clinic Florida, Jacksonville, FL, (2) WOCN, Mayo Clinic Florida, Jacksonville, FL, (3) Mayo Clinic Florida, Jacksonville, FL, Division of Nursing, Wound Ostomy Continence

## ABSTRACT

### BACKGROUND

Infections can significantly delay the wound healing process, negatively affecting the patient's quality of life and creating an enormous economic burden on health resources. Wound bed preparation is critical to optimizing healing and minimizing costly complications of care. One tool in this wound optimization arsenal is the use of Negative Pressure Wound Therapy (NPWT), which has been shown to improve oxygen saturation and perfusion, and lower the rate of infections, proves more effective for wound healing compared to traditional wet-to-dry dressing changes. To further improve our wound healing outcomes, NPWT with Normal Saline instillation was added several years ago to clean wounds at continuous intervals. Research supports cleaning wounds with a hypochlorous acid solution with a pH of 5.5 as it safely and effectively reduces 99.999% of common pathogens without reducing the necessary cells required for the proliferative phase. The commonly used solution of hypochlorite with boric acid has a pH of 10.0 is cytotoxic, can harm intact tissue and slows healing. Based on this empirical data, a hypochlorous acid solution was used in lieu of normal saline for irrigation with the NPWT. It is imperative that proper wound care begins at the acute phase to ensure wounds do not become infected and chronic thus improves patient quality outcomes.

### OBJECTIVE

To determine if a hypochlorous acid solution in conjunction with NPWT will improve the outcome and quality of healing for complex surgical wounds.

### METHOD

Three complex patient cases are presented, consisting of large surgical wounds with delayed healing despite the use of NPWT with Normal Saline instillation. All patients had medical histories contributing to their delayed healing and increased risk for infection. To address these unique patients' needs, the instillation solution was changed to hypochlorous acid solution (0.033% / pH 5.5). The goal of this intervention was to further reduce bioburden, decrease necrotic tissue, increase granulation tissue, and promote healing.

### RESULTS

All three patients experienced decreased wound measurements with the introduction of hypochlorous acid solution instillation. Compared to use of NPWT without instillation, improved wound healing was achieved despite each patient's unique but equally complex medical histories and contributing co-morbid conditions. A reduction in non-viable tissue, increase in granulation, and absence of infection was also achieved. Hypochlorous acid solution used in conjunction with NPWT improved the rate and quality of healing for three patients with complex surgical wounds.

### CONCLUSIONS

Hypochlorous acid solution used in conjunction with NPWT improved the rate and quality of healing for three patients with complex surgical wounds. It would be beneficial to continue to use a hypochlorous acid on additional case studies further supporting the use of this solution in improving quality outcomes.

## CASE STUDIES

### CASE STUDY 1

8/26/22



**Hx:** 68 yo Black female underwent thigh plasty and liposuction on 07/11/2022, heart transplant 2016, OSA, DM2, GERD, HTN, CKD stage 3, neuropathy, hypothyroid, immunosuppressed state, morbid obesity. Developed necrotizing fasciitis on 8/17/22.

10/10/22



### CASE STUDY 2

10/7/22



**Hx:** 25-year-old Black female with x2 Liver transplants, DM 2, anxiety, hypertension, gastroparesis

11/4/22



### CASE STUDY 3

10/6/22



**Hx:** 78 yo Caucasian male underwent exploratory laparotomy with sigmoidectomy on 9/5/22 due to abdominal perforation and pneumoperitoneum. Returned to OR 9/6 for wash out and colostomy formation and wound vac placement on 9/7, pt experienced a STEMI.

10/31/22



## RESULTS

- **CASE STUDY 1:** 52% Reduction in surface area, increase in granulation tissue, no evidence of infection
- **CASE STUDY 2:** 52% Reduction in surface area, increase in granulation tissue, decrease in slough, no evidence of infection
- **CASE STUDY 3:** 92% Reduction in surface area, increase in granulation tissue, decrease in slough, no evidence of infection

## CONCLUSIONS

Hypochlorous acid solution has the safety of saline with the strength of hypochlorite with boric acid. It can be used in multiple settings including ophthalmology, dentistry and with infants and neonates. This solution can be used for daily wound cleansing and assisting with debridement. When used in conjunction with NPWT the rate and quality of healing improved for three patients with complex surgical wounds. It would be beneficial to continue to use a hypochlorous acid on additional case studies further supporting the use of this solution in improving quality outcomes.

## REFERENCES

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