# The Use of a Silver Oxynitrate Wound Dressing in the Treatment of Chronic Wounds: A Feasibility Study

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## BACKGROUND INFORMATION

- **Infection Control and Wound Healing Promotion:** Silver-impregnated dressings are frequently used for the management of chronic wounds[1].
- **Enhanced *in vitro* antimicrobial and anti-biofilm capacities:** Silver-oxynitrate is a novel silver compound **with higher oxidation states**, showing stronger antimicrobial capacities over conventional silver compounds[2].
- Silver oxynitrate dressings could be of further benefit as they **eradicate biofilms at lower silver concentrations** than other silver compounds[3].

## OBJECTIVES

- A **feasibility pilot study** was developed to **evaluate the effectiveness of an silver oxynitrate wound dressings in chronic wounds** of various etiologies within the Calgary Zone pertaining to Alberta Health Services, Canada.

## METHODS

- **Study Population:** Total of 23 patients presenting chronic wounds. Females: 12; Males: 11, Average Age: 66.1 ± 13.8 years (mean±SD)
- **Definition of Chronic Wound:** Wound that has been present for >6 weeks and has shown no progression in 2 weeks (length and width change ≤20%)
- **Intervention:** Application of silver oxynitrate wound dressing for two weeks
- **Outcome Measures of Interest:**
  - ***Wound Area Reduction:*** Wound area assessment using 3D Imaging (Silhouette® Star 3D Imaging Camera, Aranz Medical Ltd).
  - ***BWAT Scores***
  - ***Pain***: Using a Visual Analogue Scale (VAS)
- **Study Assessment Timeline:**

| Visit 1 | | Visit 3 | | Visit 4 |
|---|---|---|---|---|
| **Initial Patient Assessment** | 2 weeks with silver oxynitrate dressing | **Post-intervention Assessment** | 2 weeks with standard dressing | **Follow-Up Assessment** |

## RESULTS

### WOUND PAIN

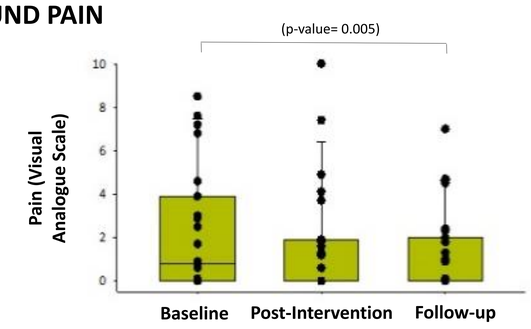


**Figure 1.** Box plot diagram for wound pain at baseline, post-intervention (Visit 3) and follow-up (Visit 4)

### BWAT SCORES

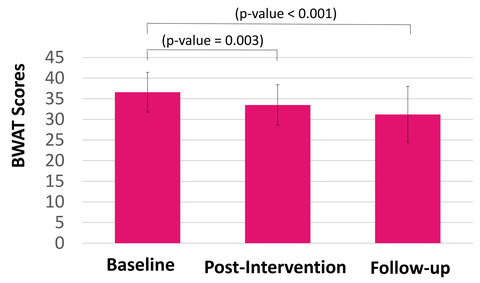


**Figure 2.** BWAT scores (mean and SD) at baseline, post-intervention (Visit 3) and follow-up (Visit 4)

### WOUND AREA

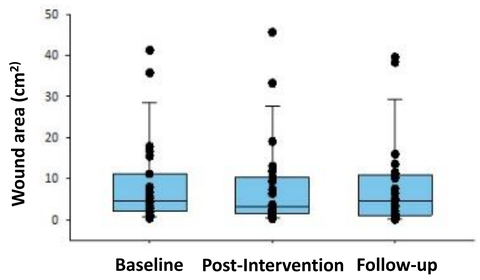


**Figure 3.** Box plot diagram for wound area at baseline, post-intervention (Visit 3) and follow-up (Visit 4).

### WOUND AREA REDUCTION

***Baseline to Post-Intervention (Visit 3):*** Decreased area by 11.9 ± 28.7%

***Baseline to Follow-up (Visit 4):*** Decreased area by 16.9 ± 42.2%

- **There were no significant differences in mean wound area** at visit 3 (post-intervention) or at visit 4 (follow-up assessment) compared to baseline.
- **15 patients evidenced a non-significant decrease** in wound area at visit 3, whereas **16 showed a non-significant decrease** in wound area at visit 4.
- **Significantly decreased BWAT scores** were observed two-weeks post-intervention (p-value= 0.003) and at 4 weeks follow-up (p-value < 0.001) compared to baseline.
- **The BWAT parameter for size** was not responsible for changes in BWAT scores.
- **Improved epithelialization, granulation tissue, necrotic tissue type and wound edges** were observed at **post-intervention** visit in comparison to baseline.
- **Reduced depth, wound edges, necrotic tissue amount and peripheral tissue edema** was observed at **follow-up visit** in comparison to baseline. **Improved necrotic tissue type, granulation and epithelization tissue** was also observed.
- **17 patients evidenced improved BWAT scores at visit 3, whereas 18 showed improved BWAT scores at visit 4.**
- **Pain was significantly reduced at 4 weeks follow-up** (p-value= 0.005) compared to baseline.
- **10 patients reported less wound pain** at visit 3 (non-significant), whereas **14 reported significantly less** wound pain at visit 4.

## CONCLUSION

- The use of Silver oxynitrate dressings on patients with chronic wounds may improve healing progression as measured by BWAT and significantly reduce wound-related pain.
- Given that this was a feasibility pilot study, a larger scale study is warranted to obtain additional results.

## REFERENCES

1. Leaper, D.J., *Silver dressings: their role in wound management.* Int Wound J, 2006. **3**(4): 282-94.
2. Lemire, J.A., et al., *Silver oxynitrate - an efficacious compound for the prevention and eradication of dual-species biofilms.* Biofouling, 2017. **33**(6): 460-469.
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## ACKNOWLEDGEMENTS

This research is made possible through funding from Exciton Technologies Inc., and in-kind Silhouette® loan from ARANZ Medical Ltd. The authors gratefully acknowledge the Sheldon Chumir Wound Care Clinic and its staff for their assistance with the study.