

WOUND HEALING AND CRITICAL CARE

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The utility of a wireless electroceutical dressing in the treatment of chronic venous leg ulcers: A pilot study

Millions of Americans are afflicted with painful, open, draining ulcers on their lower extremities. Venous leg ulcers (VLUs), cause significant clinical and economic burden to the health care system and society.^{1,2} It is not uncommon for clinicians to see patients who have suffered for years with VLUs. VLUs are the result of chronic venous insufficiency, a malady caused by an abnormality of the veins in the lower extremity. Correction of the underlying venous hypertension is the crux of treatment for VLUs, but compression alone fails to allow for optimization of the wound healing environment.

Even with advanced wound care many VLUs fall short of achieving complete wound resolution. The author/investigator hypothesized that the addition of a wireless electroceutical dressing (WED) to standard of care could further support wound healing in chronic VLU patients. The WED harnesses V.Dox Technology (Vomaris Wound Care, Inc. Tempe, AZ) that mimics the electric potential found in the skin. When skin is wounded the physiologic electric field is disrupted.

Clinical evidence has shown that application of low level of exogenous electricity can support the body's natural electrical gradient, contributes to cell migration, and encourages wound healing. The contact layer of the WED is composed of elemental silver and elemental zinc in a dot-matrix pattern on a polyester substrate. In the presence of a conductive medium such as wound exudate, sterile saline, water or a wound hydrogel, silver and zinc ions are activated, and the dot-matrix pattern creates a microcell battery. Low-level electric fields are generated at the surface of the dressing. Electricity is generated via a redox reaction. This mechanism of action is dissimilar to

the 'release of ions' seen in traditional silver dressings.

The voltage between the dots is measured to be 0.2-1.0 V when in contact with wound fluid. These levels are non-hazardous and support the natural skin current. Biofilm is believed to be one of the most common causes of wound chronicity. It has been estimated that up to 90% of chronic wounds have biofilm bacteria. The WED has also been shown to effectively disrupt biofilm bacterial. VLUs are heavily exudative and are plagued by adherent biofilm formation at the wound base. Therefore, it would stand to reason that reducing biofilm bacteria with the use of the WED dressing would support more rapid wound healing.

The purpose of this study was to determine the effects of the WED on modulating biofilm, as detected by qPCR wound cultures, to support wound healing in chronic venous leg ulcers. This presentation will discuss the materials and methods, results and conclusions obtained through this research study. The presenter will also discuss the development of new ideas and the expansion of future agenda items based on this pilot study for the progress of science and scientific communities' knowledge of VLU management

Recent publications

1. Windy Cole, Thomas Wild et al- Topical autologous blood clot therapy: an introduction and development of consensus panel to guide use in the treatment of complex wound types. Wounds: a Compendium of Clinical Research and Practice, 01 Sep 2022, 34(9):223-228 DOI:10.25270/wnds/22011
2. Windy Cole and Stacey Coe et al-A Proposed Algorithm to Diagnose and Treat Lower Extremity Hematomas Wound Management & Prevention 2022 Jul;68(7):11-17.

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Biography

Windy Cole is a Proven healthcare Administrator, Medical Writer, Clinical Content Creator, Educator, Wound Care Clinician, Speaker, Researcher & Consultant with a 20+ years of experience.

Board certified in wound care by the ABWM. Focuses include healthcare

delivery, public health, policy development, strategic growth initiatives, wound management, clinical research, medical writing, consulting and medical education. Currently, Dr. Windy Cole is Director of Wound Care Research Kent State University, College of Podiatric Medicine.

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