Poster 0010: Using a Neuromuscular Electrostimulation Device for Non-healing Lower Leg Wounds in Long Term Care Residents

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Goals:

Chronic non-healing wounds are a burden in the Long Term Care (LTC) sector, increasing costs, morbidity and mortality, and causing pain and suffering[1]. The aim of this Revera LTC Innovation Pilot was to test the value of a novel neuromuscular electrostimulation muscle pump activator (MPA)* stimulates the common peroneal nerve, causing passive motion of the flexor muscles, acting as a calf muscle pump. Hoped-for outcomes included elevating the experience and satisfaction of the residents; engaging and empowering the nursing staff; and improving healing[3] and/ or reducing costs.

Methodology:

Small, wireless and worn at the knee, this MPA increases lower leg blood circulation (up to 60% of that achieved by walking[2]). It has no wires and is easy to use. Residents in four LTC homes with non-healing lower leg wounds were selected.

Ethics:

Ethics review was obtained from The Regional Centre for Excellence in Ethics, Homewood Health Centre, Guelph, Ontario.

Results:

Eleven residents with 14 non-healing wounds, including venous/ mixed, diabetic foot ulcers, pressure, traumatic or surgical. The nurses were excited about the possibility of improving healing or reducing pain in any lower leg ulcers.

All wounds were considered non-healing. Many of the residents were non-ambulatory. One patient became palliative and died shortly after starting the evaluation, and is not included in the analysis. Pre-MPA healing rates were available for 7 of the 11 residents, used as the control. Prior to the evaluation, there was an average change of -1.5% (an increase) in Surface Area (SA) per week.. With the MPA, for 8 patients with 12 measurable wounds (one was acquired during the evaluation resulting from a fall), the average percentage change per week was 4.2% decrease in wound size. For residents whose wounds could not be measured, one had revision from below to above-knee amputation with complete healing in 5-6 weeks, and the other had an estimated 90% reduction in wound size over 27 weeks.

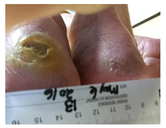
Patient 1: Previous Right above-knee amputation; DFU left foot x 3 years (on and off); open now for 72 weeks; trauma to left shin unknown duration.

Baseline

Both Closed @ 8 weeks

Patient 2: Pressure injuries x 19 weeks bilateral heels

Baseline

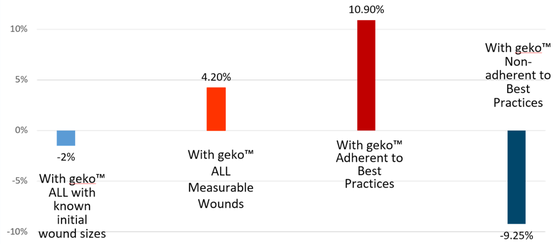


4 weeks

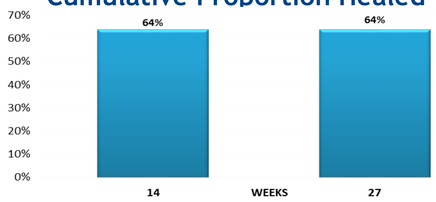
Closed @ 12 weeks

All patients were adherent with wearing the MPA, for those also adherent to best practices there was a 10.9 % decrease in size per week for 8 wounds over 14 weeks. This contrasts sharply with residents who were non-adherent with best practices (compression therapy x 2 and offloading/non-weight bearing of plantar DFU), although they wore the MPA device faithfully, there was a -9.25% (increase) in wound size per week over 27 weeks.

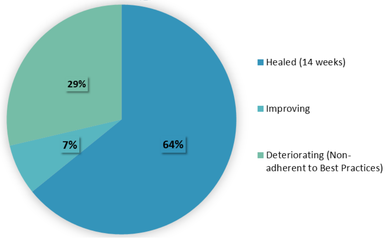
Average Weekly % Change pre- & with-MPA



Cumulative Proportion Healed



Ulcer Healing Status at 27 weeks



Key Messages:

Nursing staff and cognizant residents could easily adjust the setting of the muscle pump activator, and application and removal were simple. Most residents felt engaged with the therapy, "because they feel it working". Revera feels that it's a great adjunctive solution for many types of lower leg wounds (venous, mixed, diabetic, pressure) in addition to best practices in the LTC and Retirement home sectors.

Ontario Long Term Care Association Quality and Innovation Award Winner 2016

Best New Long-Term Care Product or Service of the Year

The geko device, distributed by Perfuse Medtec and piloted by Revera, significantly improves wound healing

References:

This material is part of a manuscript being submitted to the International Wound Journal in 2017.

1. Takahashi PY, et al. Six-Month Mortality Risks in Long Term Care Residents with Chronic Ulcers. Int Wound J. 2008;5(5):625-631.
2. Tucker AT, et al. Augmentation of venous, arterial and microvascular blood supply in the leg by isometric neuromuscular stimulation via the peroneal nerve. *Int J Angiol* 2010;19:e31-e37.
3. Warwick D, et al. Microcirculation in the foot is augmented by neuromuscular stimulation via the common peroneal nerve in different lower limb postures: a potential treatment for leg ulcers. *International Angiology* 2015;34(2):158-65.

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