

# Innovative Technology

The geko<sup>TM</sup> wound therapy device  
A paradigm shift in the management of wounds



Breaking  
the cycle  
of chronic  
wounds

Blood...central to the cause...central to the treatment

# What is geko™ wound therapy?

## Self-contained and wearable, the geko™ device:

- Stimulates the common peroneal nerve, activating the extensor muscles and stretches the antagonistic flexor muscles, acting as a calf muscle pump<sup>1</sup>
- Peak arterial velocity increased from 57 to 78 cm/s ( $P = .001$ ) in sitting position, and from 79 to 98 cm/s in recumbent position ( $P = .001$ )<sup>2</sup>
- Peak venous velocity increased from 10 to 33 cm/s ( $P = .001$ ) sitting, and from 14 to 47 cm/s in recumbent position ( $P = .001$ )<sup>2</sup>
- Significant increases were observed in both venous and arterial blood flow in the lower limb<sup>2</sup>
- This suggested that activation of the venous muscle pump and improvement of arterial flow assisted oxygen delivery to the wound site<sup>2</sup>
- Neuromuscular electrical stimulation immediately increases microcirculatory bloodflow to the wound bed and edge in patients with ischemic lower limb wounds<sup>3</sup>
- Significant increase in flux and pulsatility in both the wound bed and the wound edge<sup>3</sup>
- The pulsatility is 27 units at baseline. With the geko™ device the mean flux increases from 306 to 652 units, and the pulsatility increases from 27 to 219 units<sup>3</sup>
- NMES increased wound bed flux by a mean of 64% ( $P = 0.0005$ ), and pulsatility by a mean of 452% ( $P = 0.004$ ). Peri-wound area flux increased 37% ( $P = 0.02$ ), and pulsatility by a mean of 188% ( $P = 0.002$ )<sup>3</sup>
- Benefits patients with chronic venous insufficiency<sup>4,5</sup>
- Is simple, easy to use, small and lightweight (just 10g) battery operated, enabling the patient to be mobile and independent
- Is worn for 12 hours per day, 7 days per week
- Through gentle muscle contractions, the geko™ device is interactive so that patients feel engaged in their care, and may have better adherence to treatment protocols
- Evidence in an Ontario Home Care setting suggests this may be a first line treatment in conjunction with traditional therapy<sup>6</sup>

## Research evidence:

The geko™ device has been the subject of scientific rigor to demonstrate its ability to increase blood circulation. The body of evidence continues to grow, targeting clinical issues, in the management of lower leg wounds. See [www.gekowound.ca](http://www.gekowound.ca)

# Clinical evidence – evaluation of the geko™ device in the management of venous leg ulcers

## Painful leg ulcer<sup>a</sup>



Prior to treatment  
6-week history



Closed at 18 weeks

41-year-old female, BMI >33kg/m<sup>2</sup>, spontaneous leg ulcers, 6 weeks prior; required IV and later oral antibiotics; still on oral x 5 days at baseline. ABPI: L 1.0,R 1.2; Pain 10/10 initially. As wounds closed, she graduated from low to high compression as pain decreased to 0/10. She was fitted with compression stockings.

## Non-healing venous leg ulcer<sup>b</sup>



Prior to treatment  
6-week history



Closed at 18 weeks

80-year-old female, 6.5-month history of VLU to the R and L medial malleolus and a pressure ulcer on L heel. Unable to tolerate compression due to pain, received wound care 3 x/ week. One wound closed in 18 days, the remaining in 2 ½ months. When pain was reduced, she was fitted with compression. Her nurse commented on a change in her overall appearance and well-being.

## Non-healing surgical amputation<sup>b</sup>



Prior to treatment  
4.5-month history



Closed at 5 weeks

77-year-old male, CVI, diabetes, non-healing R toe amputation site for 4.5 months, previous R leg bypass 7 years prior. Angioplasty was performed 1 month before the toe amputation. Also had a venous ulcer on the R shin, which doubled in size over 3 months. Wearing an inelastic Unna's paste boot dressing. Nursing visits went from every 2 days to every 3 days by week 3. Both wounds closed at 5 weeks.

## Diabetic foot wound<sup>c</sup>



Prior to treatment  
1-year history



Closed at 4 weeks

Female with type 2 diabetes, a non-healing second toe amputation; wedge resection and multiple non-healing plantar DFU following 1 year of wound care. She had 3+ peripheral edema below the knee. Edema reduced after 2 weeks and all plantar surface wounds were closed following 4 weeks of geko™ treatment. Three other wounds were stable dry eschar with no infection.

## Pressure injury<sup>d</sup>



Prior to treatment  
4-month history



Closed at 3 months

92-year-old female, Atrial fib, type 2 diabetes, benign hypertension, arthritis, glaucoma, and dementia. Wound etiology: pressure-related. Offloading and repositioning schedule in place. ABPI not available; suspected some arterial compromise. R heel 0.9 x 0.6cm covered with scab. L heel 2.1 x 1.7 cm, covered in eschar and dry scab, surrounded by hyperkeratotic skin. Wound duration of 4 months healed in 3 months with the geko™ device in combination with conservative sharp wound debridement.

## Woody Fibrosis<sup>a</sup>



Prior to treatment  
14-month history



Some areas closed at 12 weeks, remainder at 9 months

67-year-old male, type 1 diabetes, a long history of bilateral VLU and recurrent blisters. Three hospitalizations for leg cellulitis and sepsis IV antibiotics in the year prior to using the geko™ device. Within 2 weeks his legs were getting softer and he had increased ankle mobility. The recurrent blisters decreased in frequency and duration. During the evaluation he experienced only 1 course of oral antibiotics and no hospitalization.

# Speckle spectroscopy<sup>8</sup> – evaluation of a venous leg ulcer

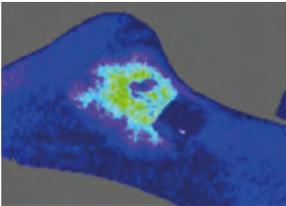
The geko™ device caused a 225% increase in flux ( $p < 0.001$ ) in the wound bed and a 67% increase in flux ( $p < 0.001$ ) surrounding the peri-wound area. Increases in flux corresponds to an increase in microcirculatory blood flow, which is clearly seen in the comparison below. This results in an increase in red blood cells carrying oxygen and nutrients necessary for healing.

Further evidence can be reviewed at:

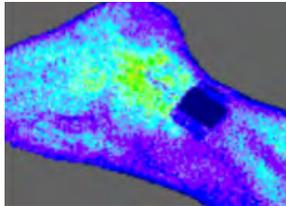
[www.gekowound.ca](http://www.gekowound.ca)



Baseline speckle flow pattern



After activation of the geko™ device



## Benefits of the geko™ device

The geko™ device increases venous, arterial and microcirculatory blood flow while reducing pain<sup>7</sup> in individuals with lower leg ulcers.

In addition, consider the geko™ device<sup>9</sup>:

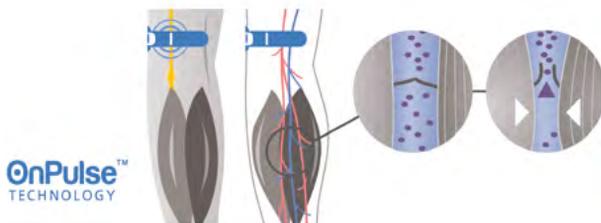
- In the management of lower leg edema that is contributing to reported pain
- In the management of stalled, chronic lower leg wounds that are not progressing along the expected healing trajectory
- In wounds that can be predicted to be slow in healing from the onset
- In conjunction with compression or when compression cannot be tolerated
- For patients with fixed ankle joints, those who are bedridden or those with limited mobility

## References:

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2. Das SK, Dhoonmoon L, Chhabra S. Neuromuscular stimulation of the common peroneal nerve increases arterial and venous velocity in patients with venous leg ulcers. *Int Wound J*. 2020;1-7. <https://pubmed.ncbi.nlm.nih.gov/33236847/> Williams KJ, Moore HM, M Ellis and Davies AH. Haemodynamic changes with the use of a neuromuscular stimulation device compared to intermittent pneumatic compression. *Phlebology*. Online 10 April 2014. <http://phl.sagepub.com/content/early/2014/04/10/0268355514513255>
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4. Williams KJ, Babber A., Ravikumar R, Ellis M, Davies AH. Pilot Trial of neuromuscular stimulation in the management of chronic venous disease. 2 Posters from VEINS Conference, UK. 2014
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## Case Study References:

- a. Harris C, Duong R, Vanderheyden G, Byrnes B, Cattryse R, Orr A, Keast D. Evaluation of a muscle pump-activating device for non-healing venous leg ulcers. *Int Wound J* 2017; 14:1189-1198
- b. Harris C, Loney A, Brooke J, Charlebois A, Coppola L, Mehta S, Flett N. Refractory venous leg ulcers: observational evaluation of innovative new technology. *Int Wound J* 2017; 14:1100-1107
- c. Case Study from Perfuse Medtec Inc. Archives used with patient permission
- d. Harris C, Ramage D, Boloorchi A, Vaughan L, Kuilder G, Rakas S. Using a muscle pump activator device to stimulate healing for non-healing lower leg wounds in long-term care residents. *Int Wound J*. 2019;16:266-274. <https://doi.org/10.1111/iwj.13027>



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