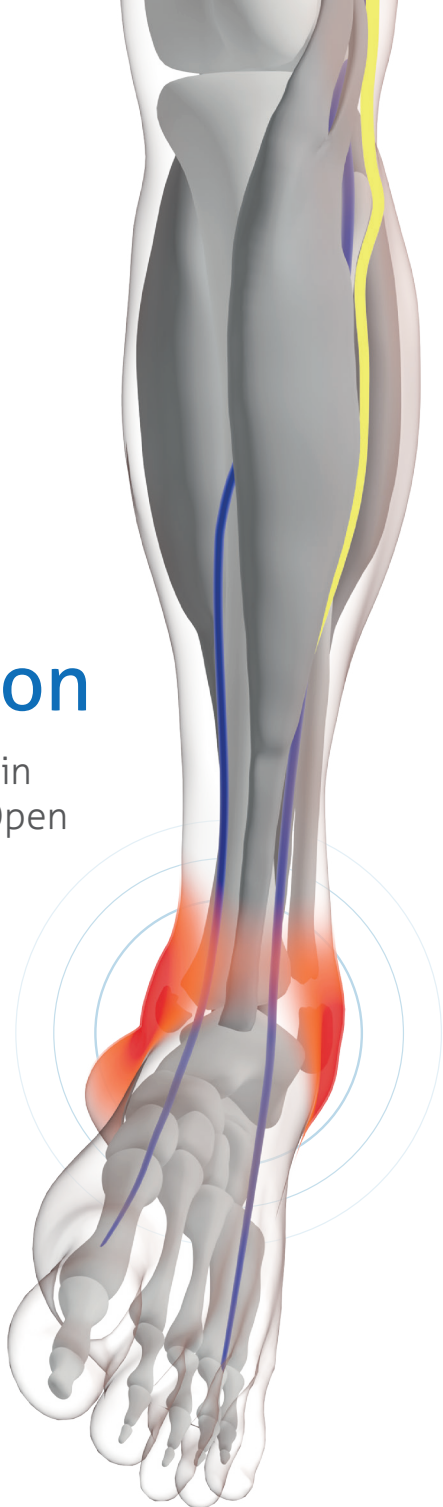


# Pre-operative oedema reduction

Accelerating readiness for theatre in  
ankle fracture patients requiring Open  
Reduction Internal Fixation (ORIF).



**Accelerating  
readiness to theatre**

**A new approach using  
OnPulse® technology**

# Managing pre-operative oedema

Due to their unstable nature, many ankle fracture patients will require Open Reduction Internal Fixation (ORIF)<sup>1</sup>.

Ankle swelling can often delay surgical fixation due to risk associated with operating on swollen tissue, including wound dehiscence and subsequent infection<sup>2</sup>.

Accordingly, interventions that reduce swelling and accelerate readiness to theatre for more immediate surgical fixation can provide significant benefits to patients and healthcare providers<sup>2</sup>.

**Current care can be summarised as leg elevation plus:**

- Backslab plaster cast.
- Backslab plaster cast + external fixation.
- Backslab plaster cast + intermittent pneumatic compression (IPC).



# A new approach

## The geko® device accelerates the reduction of oedema.

Easy to use, the geko device is a battery powered, disposable neuromuscular electrostimulation device designed to increase blood flow in the deep veins of the leg<sup>3</sup>.

The geko device gently stimulates the common peroneal nerve **activating the calf and foot muscle pumps**<sup>4</sup> to prevent and treat oedema and to accelerate and maintain readiness for theatre.

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# 60%

The increase in blood flow is equal to 60%<sup>4</sup> of walking without a patient having to move.

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# Zero

No wires or leads.  
Small, light and comfortable to wear.  
Silent in operation.

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# 10g

Weighs just 10g.  
Quick and easy to fit.

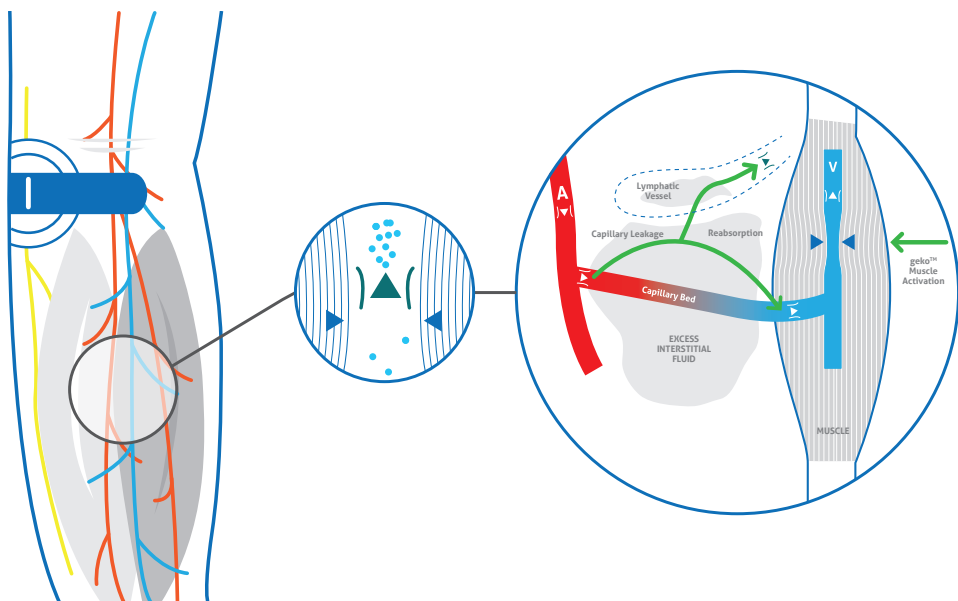


Figure 1 - Image modified for illustrative purposes<sup>12</sup>

# Proven to significantly accelerate readiness for theatre

A prospective and retrospective study investigated the use of geko® to reduce pre-operative oedema in ankle fracture patients and compared the results to the current standards of care.

The study recruited ankle fracture patients requiring surgical fixation. The device was fitted above their backslab plaster casts. Patient compliance and readiness to theatre was recorded and matched to a historical cohort for comparison.

The study data was statistically significant:  $p=0.001^6$ .

The geko device was well tolerated and easy to use.

## Results showed:

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2

2 days improvement in readiness for theatre per patient (average).

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2

With geko use, 60% of patients ready for theatre in 2 days, compared to 27% in control arm, a 122% improvement.

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3.66

Current treatment = 3.66 days readiness to theatre (average).

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1.66

The geko + plaster cast = 1.66 days readiness to theatre (average).

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# The geko<sup>®</sup> device is cost saving

Independent health economic analysis<sup>7</sup> of this study outcome has examined the financial benefit of routinely using the geko device + backslab plaster cast in the ORIF ankle fracture pathway.

- This analysis shows that compared to current standards of care the value associated with accelerating readiness to theatre in this patient group would save an average of £569<sup>7</sup> per patient.

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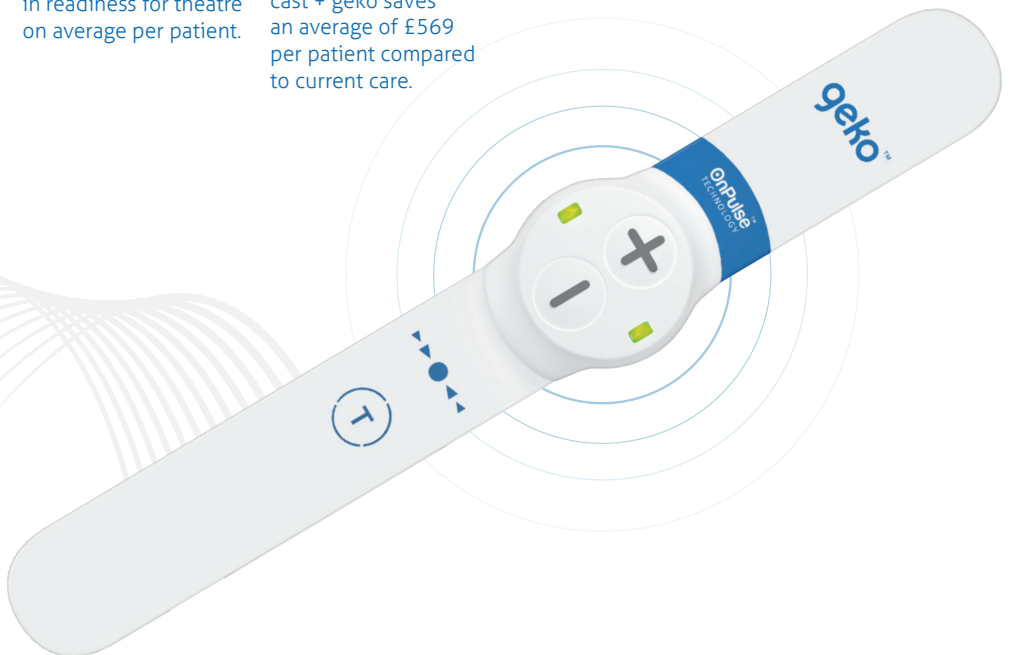
2

2 days improvement in readiness for theatre on average per patient.

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£569

Backslab plaster cast + geko saves an average of £569 per patient compared to current care.



# Associated benefits

## Successful oedema management promotes:

- Post-operative wound closure and surgical site infection reduction<sup>2,8</sup>.
- Accelerated recovery - rehabilitation can begin sooner<sup>8</sup>.
- Improved theatre time scheduling<sup>9</sup>.

## NICE guidance (MTG19)\* recommends use of geko<sup>®</sup> for:

- Reducing the risk of DVT in patients who may be contraindicated to drugs or mechanical prophylaxis<sup>10</sup>.

## Clinically proven to increase blood flow velocity in the deep veins:

- Griffin and Nicolaides report that the geko significantly increases blood flow velocity in the deep veins of the calf ( $p=0.001-0.05$ ), where early thrombi form<sup>10</sup>.
- Warwick et al report that geko significantly increases blood flow velocity in patients with plaster casts ( $p=0.001-0.003$ ), where calf muscle activation is reduced<sup>11</sup>.





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#### \* NICE Guidance

NICE Guidance (MTG19) supports use of geko® device for people who have a high risk of VTE.

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#### USA

In the USA geko® devices are sold for increased blood circulation and the post-surgical stimulation of the calf muscles to prevent venous thrombosis and oedema reduction.

Caution: Federal law restricts this device to sale by or on the order of a licensed healthcare practitioner.

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#### References

1. Jameson SS, Augustine A, James P, Serrano-Pedraza I, Oliver K, Townshend D, et al. Venous thromboembolic events following foot and ankle surgery in the English National Health Service. *J Bone Joint Surg Br* 2011 04;93(4):490-497.
2. Keehan R, Guo S, Ahmad R, Bould M. Impact of intermittent pneumatic foot pumps on delay to surgery following ankle fracture. *Foot Ankle Surg* 2013 Sep;19(3):173-176.
3. A Nicolaidis, M Griffin, Measurement of blood flow in the deep veins of the lower limb using the geko™ neuromuscular electro-stimulation device. *Journal of International Angiology* August 2016-04.
4. Tucker A, Maass A, Bain D, Chen LH, Azzam M, Dawson H, et al. Augmentation of venous, arterial and microvascular blood supply in the leg by isometric neuromuscular stimulation via the peroneal nerve. *The International journal of angiology: official publication of the International College of Angiology, Inc.* 2010 Spring; 19(1):e31-7.
5. Wainwright TW, Immins T, Middleton RG, Poster Physiotherapy UK, October 2014, Birmingham.
6. James Cook, retrospective data on file, April 2017, Firstkind.
7. Health economic analysis performed subsequent to the completion of the study by Mtech Access Ltd, Bicester UK, 2017.
8. Caschman J, Blagg S, Bishay M. The efficacy of the A-V Impulse system in the treatment of posttraumatic swelling following ankle fracture: a prospective randomized controlled study. *J Orthop Trauma* 2004 Oct;18(9):596-601.
9. NHS Modernisation Agency. Theatre Programme. Step Guide to Improving Operating Theatre Performance. June 2002.
10. NICE medical technologies guidance (MTG19). Published date: June 20 2014.
11. Warwick D, et al. Neuromuscular electrostimulation via the common peroneal nerve promotes lower limb blood flow in a below-kneecast: A potential for thromboprophylaxis. *Bone Joint Res* 2013; 2:179-85.
12. Klabunde, RE (2014). Cardiovascular Physiology Concepts. Available at: <http://cvphysiology.com/Microcirculation/M010> [Accessed 21 Feb. 2018].



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