NICE guidance (MTG19) supports the geko™ device for reducing the risk of VTE.

VTE Prophylaxis

Providing venous thromboembolism (VTE) prophylaxis to all at risk hospital patients
NICE guidance (MTG19) supports the geko™ device for reducing the risk of VTE\(^1\)

The geko™ is a battery powered, disposable, neuromuscular electro-stimulation device designed to increase blood flow in the veins of the leg, reducing the risk of VTE.

The geko™ device **stimulates** the common peroneal nerve **activating** the calf and foot muscle pumps, increasing venous, arterial and microcirculatory blood flow\(^2,4\). The increase in blood flow is similar to that achieved by walking, up to 60%\(^2\), without a patient having to move\(^2\).
The geko™ device prevents stasis in the deep veins of the calf where early thrombi form

The publication of a recent study by Professor Andrew Nicolaides and Dr Maura Griffin has measured the effect of the geko™ device on blood flow in the deep veins of the calf. The study has shown significant volume and velocity increases within the gastrocnemius, peroneal and posterior tibial veins – of particular clinical importance as early thrombi often form in these veins.

This is the first time that a mechanical device has reported enhancement to blood flow for the prevention of stasis in the deep veins of the calf, and is the result of the unique dorsiflexion achieved by the geko™ device. With this proven ability to prevent stasis in the deep veins of the calf, the study strongly supports use of the geko™ device for VTE prevention.

The four Doppler flow readings (over the page) clearly validate the muscle contraction and rhythmic blood flow increases before and after geko™ device application and show distinct increases in both peak volume and velocity.

3. A.Nicolaides, 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
The geko™ device increases blood flow in the deep veins in the lower limb

The gastrocnemius vein

The venous colour filling highlights the rhythmic muscle contractions resulting from the application of the geko™ device. The gastrocnemius vein (top of the image) emptying into the popliteal vein (middle of the image) with the popliteal artery lying posterior to the popliteal vein.

The peroneal vein

The image clearly validates the muscle contraction resulting from the applied geko™ device. The results show the rhythmic increases in peroneal venous flow which would otherwise show low flow states without the use of the device.
Direct comparison before and after geko™ device application

The posterior tibial vein

The geko™ device increases venous blood flow through neuromuscular activation via the common peroneal nerve. Figure 3 shows the baseline Doppler flow pattern typical of venous flow. However, after the activation of the geko™ device, the Doppler flow pattern shows a distinct increase in not only peak velocity but overall flow too (figure 4).

Figure 3. Baseline Doppler flow pattern

Peak velocity increased by 137% in the posterior tibial vein

Figure 4. After activation of the geko™ device
The geko™ device is significantly more effective than IPC devices in increasing microcirculatory blood velocity \(^4\)

In this study H Jawad and A Tucker investigated the geko™ device at low and higher pulse widths in enhancing lower limb blood perfusion with two leading IPC devices.

Blood flow and microvascular parameters were measured using ultrasound and Laser Doppler flowmetry respectively, in ten healthy volunteers at rest (baseline) and following each device being active for a period of 30 minutes, a 10 minutes’ recovery phase was allowed between each device.

The geko™ device is 30% better than IPC at augmenting venous flow (p<0.001). The geko™ device increases venous flow once every second, with each electrical pulse, while IPC devices increase venous flow only when the device inflates, which is typically once every 60 seconds.
Jawad study comparison between the geko™ device and IPC mechanical compression

**Blood volume**

The results show that the geko™ device is superior to IPC Huntleigh Flowtron™ and IPC Kendall SCD™ mechanical compression in enhancing blood flow in the lower limbs. At higher geko™ settings increases in the femoral venous and arterial blood volume flow of ~30% was seen over the other two devices.

**Blood velocity**

The peak velocity produced by the geko™ device is approximately equivalent to the peak velocity produced by IPC. This means that although the geko™ device produces more venous flow than IPC over any given time period, the geko™ device does not produce velocities or shear stresses higher than those produced by IPC or by physiological norms such as walking.
Providing venous thromboembolism (VTE) prophylaxis to all at risk hospital patients

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

- Simple and easy to use
- Small and light (weighing just 10g) with no leads or wires, enables the patient to be as mobile as possible
- No tripping hazard

CE marked:

- To increase blood circulation
- For the prevention of venous thrombosis
- For the prevention and treatment of oedema

NICE Guidance:

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

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

RCN Accredited:

The geko™ device user training programme is RCN accredited for VTE prevention.

References

1. NICE medical technologies guidance [MTG19] Published date June 20 2014
3. A.Nicolaides, 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