



Position of geko™ device  
on lateral aspect of knee

## IMPROVING BLOOD FLOW IN THE LOWER LIMB CALF VEINS IS KEY IN PREVENTING VENOUS STASIS AND DVT

**Deep vein thrombosis (DVT) is a serious condition that occurs when a blood clot (thrombosis) forms inside a vein located deep in your body. Such clots can develop in any vein but more commonly are found in the deeper veins of the lower leg. This can happen after prolonged immobilisation in bed after illness or surgery causing blood stagnation known as venous stasis. The most dangerous aspect of this condition is that part of the clot may break off and travel to the heart and lungs that may prove fatal.**

One possible way to help reduce the risk of blood clots is to look at one of the factors that we know plays a crucial role in their formation – improving and increasing the amount of blood flow through the calf veins themselves which in turn will prevent venous ‘stasis’ a major risk factor:

Overcoming such venous stasis can be achieved by employing the use of the muscles that surround the deep

veins in the lower leg by some form of stimulation, thereby causing the muscles to contract and effectively ‘squeeze’ the blood through the veins against gravity back towards the heart. One such device that can do exactly that, is the geko™ device. It is a neuromuscular electro-stimulation device which is CE-marked, small, disposable and internally powered. As it is self-adhesive it is applied to the outer/posterior aspect of the knee. This positioning enables integral electrodes to apply a stimulus to the common peroneal nerve, a branch of the sciatic nerve which lies close to the skin. This nerve controls a complex of muscles in the lower leg which activate the calf and foot venous pumps.

### BOOSTS BLOOD FLOW

Stimulation of this nerve by the geko™, causes the muscles to contract without affecting normal movement of the limb or mobility of the subject. Contraction of specific lower leg muscles boosts blood flow from the lower limbs back to the heart thus increasing venous return, local blood circulation and helps prevent venous thrombosis. This device has seven settings to balance maximal effect of stimulation with subject comfort. Made from a flexible polyester film and a polypropylene casing which houses the

electronics of the geko™ device it is then mounted on a hydrogel layer which can easily be stuck onto the skin.

### PAINLESS

Direct electrical muscle stimulation (EMS) of the calf has been used in the past as a method for preventing DVT. However stimuli used in these early studies were painful and could only be used when the patient was anaesthetised. Modern methods of neuromuscular electro-stimulation (NMES) produce stimuli which are painless. NMES of the lower limb muscles has been shown on ultrasound studies to be effective in improving blood flow in both the femoral (upper leg) and popliteal (behind the knee) veins. However we know that calf veins are of particular importance as early blood clots - thrombi – often start here first. The most frequently involved calf vein is the peroneal, followed by the posterior tibial vein and then the gastrocnemius veins.

In a recent study where this device was used in normal volunteers, a significant enhancement of venous blood flow occurred in all the calf veins mentioned above.

### Nicolaides A. Griffin M.

Ref: Nicolaides A. Griffin M. *Measurement of blood flow in the deep veins of the lower limb using the geko™ neuromuscular electro-stimulation device*, Int J Angiol, June 2016; 04