DVT STUDIES

Published in *Eur J Vasc Endovasc Surg 2010 Dec;40(6):766-71.*

THE EFFICACY OF A NEW STIMULATION TECHNOLOGY TO INCREASE VENOUS FLOW AND PREVENT VENOUS STASIS

Also presented at: *American Venous Forum, Amelia Island 2010*

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Objective: Electrical stimulation of calf muscles has been shown to be effective in prevention of DVT. The aim was to determine: (a) dependence of venous blood velocity and ejected volume on the rates of stimulated calf contractions: (b) clinical factors affecting efficacy in healthy individuals.

Methods: The maximum intensity stimulus tolerated was applied to calves of 24 volunteers. In popliteal veins, Peak Systolic Velocities (PSV), ejected volume per individual stimulus (Stroke Volume SV) and ejected Total Volume Flow per minute (TVF) of expelled blood were determined using ultrasound. Stimulation rates from 2 to 120 Beats Per Minute (bpm) were applied.

Results: Mean baseline popliteal PSV was 10 cm/s. For stimulation rates between 2 and 8 bpm, the PSV was 10 times higher and reached 96-105 cm/s. Stroke volume (SV) per individual stimulus decreased in a similar fashion. With increasing rates of stimulation the TVF increased by a factor of 12 times (from 20 ml/min to 240 ml/min).

Conclusion:
Electrical stimulation is an effective method of activating the calf muscle pump.
Enhancements of popliteal blood velocity and volume flow are key factors in the prevention of venous stasis and DVT. Further studies are justified to determine the stimulation rates in those with a compromised venous system.