

## **Investigating the Impact of External Leg Compression on Venous Return to the Heart**

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The calf muscle pump is a biological mechanism that is an important component of the vascular system. The pump assists in the return of venous blood back to the heart from the lower extremities of the body. Diseases of the venous system induce pooling of blood in the lower extremities as a result of valve dysfunction and loss of compliance. This counteracts the effectiveness of the calf muscle pump leading to reduced stroke volume. As a consequence, the heart rate increases and, in the long term, this causes cardiac dysfunction. Venous insufficiencies are currently being treated by wearing graduated compression socks, which apply an external passive compression to the lower leg. There is conflicting scientific evidence as to how effective external compression of the lower leg is in enhancing venous return. The present study focuses on using experimental methods to determine the mechanism by which external compression works as well as its effectiveness. Doppler ultrasound is used to quantify the changes in venous geometry and flow rate as a result of the external compression. Presented in this talk will be an overview of the experimental plan as well as preliminary results of a pilot study.