



## Abstract

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**PI Title:**

**Project Title:** Venous Ulcers: Testing Effects of Compression & Position

**Abstract:** *DESCRIPTION (provided by applicant): Chronic venous insufficiency causes changes in the skin microcirculation that result in hypoxia, impaired blood flow, edema, and painful venous ulcers. Nursing management of these ulcers is an ongoing challenge. Usual nursing interventions include compression bandages and frequent leg elevation. It is important for nurses to know how the combination of compression bandaging and leg elevation affect skin microcirculation. The objective of this revised New Investigator proposal is to determine the effect of leg/body position changes and compression bandaging on four key parameters of microvascular responsiveness and function. The specific aims are: Specific Aim 1) To measure baseline (supine) skin oxygen (O<sub>2</sub>), skin carbon dioxide (CO<sub>2</sub>), skin blood perfusion, and limb volume in the lower limbs of venous ulcer subjects and healthy adults; Specific Aim 2) To measure skin O<sub>2</sub>, skin CO<sub>2</sub>, skin blood perfusion and limb volume in the lower limbs of venous ulcer subjects and healthy adults in response to leg/body position changes; Specific Aim 3) To measure skin O<sub>2</sub>, skin CO<sub>2</sub>, skin blood perfusion, and limb volume in the lower limbs of venous ulcer subjects and healthy adults in response to leg/body position changes with compression bandaging; Specific Aim 4) To correlate skin blood perfusion estimated by laser Doppler flux with skin blood perfusion estimated by transcutaneous oximetry with inspired O<sub>2</sub> in the lower limbs of venous ulcer subjects and healthy adults in response to changes in leg/body position with and without compression bandaging. A convenience sample of 64 venous ulcer and 64 healthy subjects will be recruited. Subjects will have skin O<sub>2</sub>, skin CO<sub>2</sub>, and skin blood perfusion measured at the medial malleolar area and foot while lying supine, lying supine with legs elevated 300, and standing. The measures will be repeated with the subject wearing an elastic compression bandage. Limb volume will be measured after baseline 1,*

*after the position protocol, at baseline 2, after the position/compression protocol, and after baseline 3. To answer Aim 1, a Hotellings T2 will be used. To answer Aims 2 and 3, a repeated measures ANOVA will be used. To answer Aim 4, correlations will be performed. These questions must be answered in order to develop a nursing intervention that prescribes optimal leg/body position and compression combinations that maximize healing.*

***Thesaurus Terms:***

*blood circulation, compression, human therapy evaluation, leg, nursing intervention, patient care, posture, skin circulation, ulcer, varicose vein*

*blood volume, microcirculation, outcomes research, oxygen transport, respiratory gas level*

*adult human (19+), human subject, oximetry, patient oriented research, ultrasound blood flow measurement*

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