



# Venous Disease and its Treatments



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Mathematics

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## Introduction

As the arteries bring out blood from the heart to our body, the veins bring oxygen-deprived blood back up to the heart. Sometimes veins can clog up and become abnormal causing venous diseases or chronic venous disease (CVD). Chronic venous disease includes spider veins and varicose veins (enlarged veins).

## Symptoms of Venous Disease:

- Fatigue in legs
- Cramping/heaviness/aching
- Swelling
- Itching
- Discoloration of skin
- Ulceration/breaking of the skin

## Site Information:

Center for Vein Restoration

7474 Greenway Center Drive, Suite 1000

Greenbelt, MD 20770

Supervisor: Vinay Satwah

The Center for Vein Restoration's mission is to create the greatest treatment plan for any patient seeking help for their venous insufficiency.

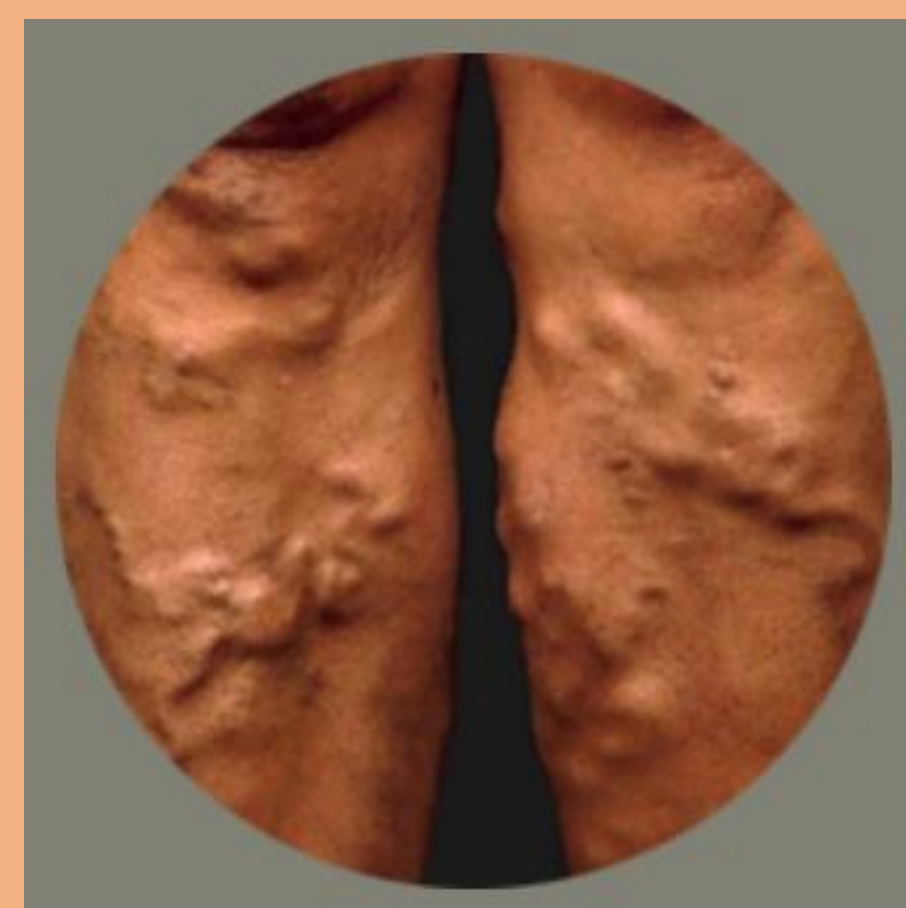
## Issues Confronting Site:

The site's main issue is finding the best treatment for the different levels of venous insufficiency. Not only that, but also accommodating what various insurances can cover.

## Future Work:

Possible future issues involve healthcare. As treatments improve and become more advanced, then the prices can increase as well. With higher prices, insurance companies might not be able to cover treatments.

**Radio frequency machine for ablation treatment**



**Varicose veins**



**Spider veins**

## Impact:

From my observations, I learned that anyone is able to easily get CVD. Different people with many different jobs and backgrounds came in everyday for the same problems. Any job that requires a lot of standing or requires the veins to work extra hard against gravity in order to bring blood back up to the heart from the legs, is at risk for getting CVD. Doctors, teachers, and many other common professions have the same amount of risk. A way to prevent from getting CVD is to wear compression stockings during the day while doing most of the standing.

## Personal Impact:

From this project I see that everyone is equally at risk for getting CVD and that we all need to take precautions for our health. We all do not realize how easily our health is affected from everyday activities.

A challenge was training myself mentally to tolerate the amount of blood I saw on a daily basis. I also had to train myself mentally to tolerate the moans of pain some patients made when getting through the treatments.

## Activities

From shadowing Dr. Satwah, I learned about the main four treatments used for venous diseases:

1. Conservative: this is the least aggressive type of treatment. It involves patients wearing compression stockings that helps squeeze the blood out like toothpaste. It is usually the first thing every patient receives.
2. Ablation: this is the heating of the vein from the inside. This is used on straight, non-twisted veins. There are two types of ablation: laser and radiofrequency. Laser is measured in joules while radiofrequency is measured in degrees Celsius and uses a catheter.
3. Sclerotherapy: this treatment involves the injection of sodium tetradecyl sulfate (STS) through a butterfly needle. The injection of STS into the vein coats the walls of the vein and lets it close. It is like injecting foam into the vein. This is used for more twisted, abnormal veins.
4. Phlebectomy: this involves making small stabs/cuts in the skin and then proceeding to pulling the thick, solid vein out.

The last 3 treatments involve tumescent injections which help numb the leg.

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**Laser machine for laser ablation treatment**

