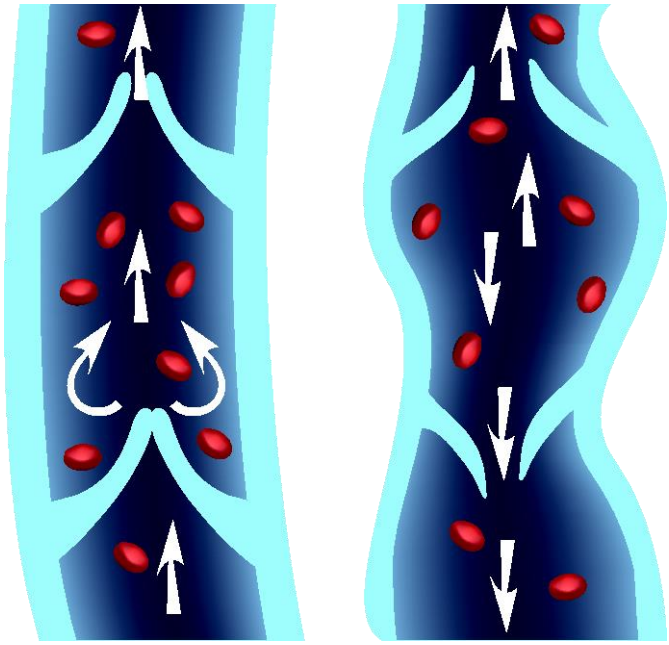
The Circulatory System

As you know, blood flows through our bodies in our arteries and veins. The arteries are the blood vessels that carry oxygenated blood from the heart to the rest of the body whereas veins are the blood vessels that carry deoxygenated from the body tissue back towards the heart. Because this arterial blood generally flows downwards, gravity assists the process of transporting the blood to various parts of the body. In the body tissue (eg: muscles, skin), the blood passes from the arteries, through capillaries and then into veins that will carry the blood back up to the heart. The pressure in the veins, at this point is low and this, along with the fact that venous blood is generally flowing upwards (against gravity), means that various features need to be in place to aid the process of transporting the blood back to the heart.

The main veins that take the blood back to the heart as mostly found within the muscular layer of the body with superficial veins located under the skin. Veins have thin, elastic walls and contain **one-way valves** which allow the blood to flow towards the heart. When the muscles around the veins contract with physical activity, the vessel walls are squeezed together. The valves open up and the blood is pushed in the direction of the heart. When the muscles relax, the vein walls return to their normal shape and the valves close. Back flow is prevented.

This process is particularly important where legs are concerned as the venous blood has to flow a long way, against gravity, back to the heart. The calf muscle is often referred to as the **second heart** because it plays such an important role in pumping blood from the legs back towards the heart.

The Problems -Venous disorders



If a person is inactive or stands for long periods of time, blood that has been transported via the arteries to the legs, for example, cannot be moved back to the heart via the veins efficiently because of the **lack of sufficient muscle movement**. This will result in an increased volume of blood in the veins and therefore an increased pressure in the veins. These people often suffer from tired, aching legs. Furthermore, if a person has **weakened veins due to venous disorders** such as thrombosis or varicosis, the pressure on the flimsy vein walls will lead to damage of the walls and valves. Blood will then start to flow backwards and blood volume in the veins will increase. This will increase the pressure in the smaller veins closer to the surface of the skin and cause general swelling and skin discolouration. This swelling stretches the skin to the point where it can break. Because of poor circulation, healing of this wound unlikely and results in **ulcer formation**.

The Solution – Graduated Compression

In order to compensate for insufficient support provided by the muscles in the leg, graduated compression hosiery offers additional **controlled pressure** to prevent pooling of blood in the superficial veins. This increased pressure on the capillaries and surrounding tissue/muscle results in **greater support of the vein walls** therefore improving blood flow through the veins towards the heart. The additional pressure on the skin reduces the leaking of fluids from superficial vessels into the surrounding tissue thereby reducing swelling (oedema)

Graduated compression hosiery have different pressure zones along its length. A sock or stocking would have the greatest compression (measured in mmHg) around the ankle. This is where the greatest pressure is needed. The compression decreases gradually towards the knee and thigh.

Patients who suffer from venous or lymphatic related conditions such as tired or heavy legs, venous insufficiency, chronic oedema (swelling) or lymphoedema, will greatly benefit from the use of graduated compression ware.

Garments are available in various compression ranges to suit the condition being treated. A patient with heavy legs, for example, will require a garment with lower compression than one suffering from Lymphoedema. These garment must be fitted by a medical professional such as Medical Orthotist Prosthetist who is trained in the measuring and fitting of compression garments. Custom made garments can also be manufactured is needed.

Medical Orthotist Prosthetists (MOP's) will be able to assist patients with claiming for these garments from their medical aids, provided funds are available.

Types of Venous Disorders

Spider veins:

Small purple or red veins visible are under the surface of the skin. This results from the weakening of the walls of these vessels. This condition is harmless.

Varicosis:

When superficial vein walls become weakened, they lose their shape and become twisted and uneven. This is as a result of back flow and pooling of blood in weakened veins that have damaged valves. Pooling causes distention and misshapen veins.

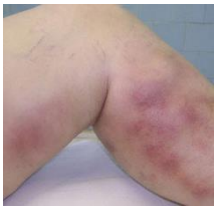
Deep Vein Thrombosis (DVT):

This occurs when a blood clot causes an obstruction in the deep veins of the venous system, often near the valve. This caused permanent damage, in the form of scarring or fibrosis, to that part of the vein and valve. Constant back flow and pooling of blood in that area will result.

Pulmonary embolism:

This occurs when a blood clot causes an obstruction in an artery in the lungs

Superficial phlebitis

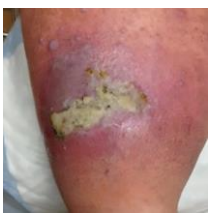


Inflammation of a superficial vein occurs due to the presence of a thrombosis (blood clot)

Chronic Venous Insufficiency (CVI):

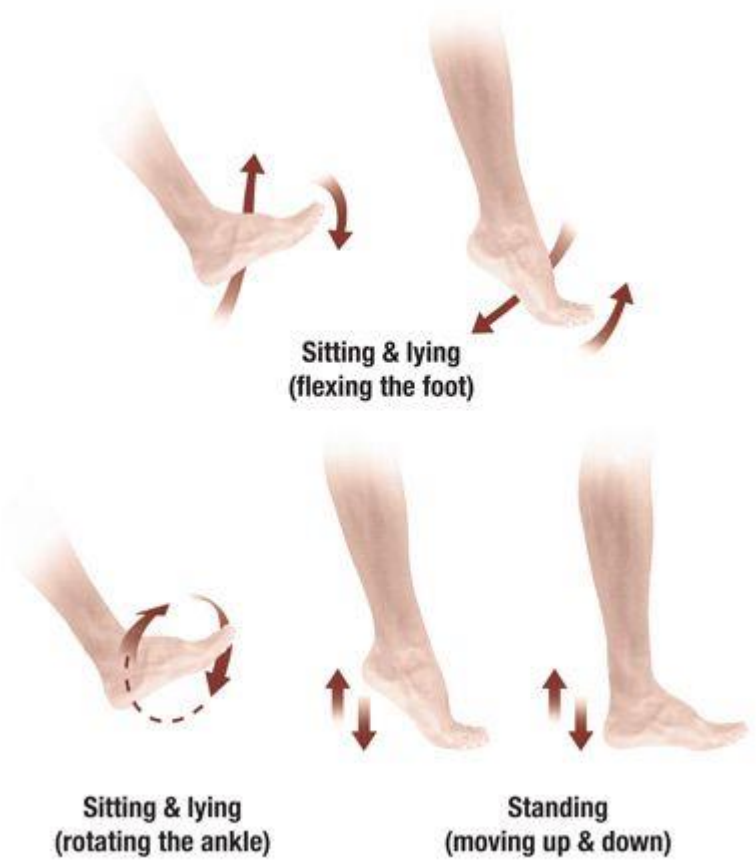
This is the consequences of venous disorders (eg: DVT and varicosis): skin hardening (sclerosis) and/or discolouration, swelling and leg ulcers

Venous stasis ulcers (leg ulcers):



Because of poor circulation and the resulting CVI symptoms, there is a constant lack of oxygen and nutrient supply to the skin. In extreme cases the tissue in a particular area dies off and an ulcer develops. This needs immediate care and treatment by a trained professional such as a Wound Care Nurse.

What you can do?



If someone suffers from poor circulation, exercise is essential to assist in promoting blood flow. As mentioned earlier in this article, the calf is considered to be the "second heart" when it comes to stimulating the movement of blood through the veins. With the contraction of the calf muscle, blood is pushed up through the veins, up towards the heart. By simply doing the following exercises regularly, lower limb blood flow can be significantly improved – even where mobility is a problem.

Sufferers of venous disorders need to consult with their practitioners regarding treatments, exercise programs & lifestyle changes that will improve their condition.

If you suffer from any of the venous conditions listed above, please consult with a Medical Orthotist Prosthetist (MOP) in your area regarding as suitable hosiery solution.

Please refer to our BL Medical Website distributors tab for a Medical Orthotist Prosthetist in your area.