The Vascular Education Foundation was established to increase awareness of the dangers and severity of vascular disease through the education of both the community and healthcare professionals.

The VEU™

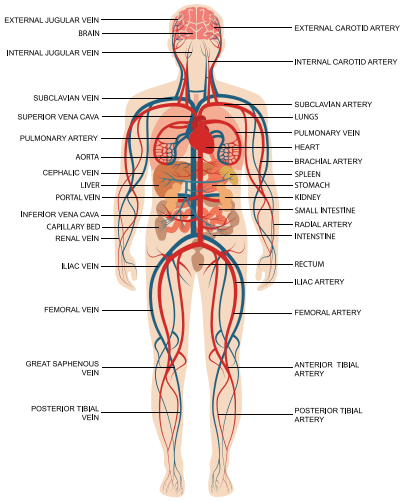
The Vascular & Endovascular Update

Fall 2018

Care, Treatment and Healing of the Chronic Wound

Without proper and prompt care, a small wound on your leg, foot or toes can be life-changing. When wounds won't heal because of a lack of proper blood flow, you can lose mobility and quality of life and eventually, may require amputation.

A better understanding of wounds and their treatment can help you save your limbs and your ability to enjoy a full life.



There are four types of wounds that are of concern; ***arterial, venous, neuro diabetic and mixed arterial/venous wounds***. These wounds are open sores, usually found on the legs and feet.

Arterial ulcers form when damage to the arteries diminishes blood flow to the tissues in the lower leg, feet and toes. These wounds have a "punched out" look and are red, yellow or black. Surrounding skin tends to be cold or cool and tight, with little or no hair. There is little to no bleeding. The limb will turn red when dangled and pale when elevated. You may often experience night pain.

Risk factors for arterial damage include:

- atherosclerosis
- diabetes
- smoking
- high blood pressure
- high cholesterol
- kidney failure
- vasculitis
- trauma
- age

Damage to the veins, caused by inadequate return of blood back to the heart, or venous reflux, will cause ***venous ulcers***. These wounds usually form below the knee and on the inner ankle, with inflammation, swelling, aching, or hard and itchy skin, scabbing and flaking, a brown or black stain and discharge.

Risk factors for vein damage are:

- varicose veins
- high blood pressure
- deep vein thrombosis
- obesity
- blood clotting disorders
- heart failure
- trauma
- fractures or injuries

Neuro diabetic ulcers occur when there is decreased physical sensation in feet and legs caused by neuropathy. Because you cannot feel scrapes, cuts or repeated stress occurs, a wound can quickly develop into an ulcer.

As blood flow is restricted in your legs, these ulcers will rarely heal without intervention. Neuro diabetic ulcers are usually well-defined and often deep, with infected pockets. They may be red to brown or black, depending upon the health of your circulation.

Neuro diabetic ulcers are caused by:

- diabetes
- renal failure
- neurological conditions
- trauma or surgery

Mixed arterial/venous leg ulcers (MAVLU) are difficult to define, but developing these ulcers means you suffer from both chronic venous insufficiency and peripheral artery disease (PAD). Not only are your veins unable to return blood to your heart (venous reflux), but your arteries are filled with fatty deposits, weakening blood flow to tissues.

These lower extremity chronic wounds are all caused by poor blood flow, either because of damage to the arteries or the veins. Because of that compromised blood flow, these wounds are difficult to treat and may take months to heal. Unfortunately, for many, amputation becomes the solution. Preventing these wounds altogether should be your goal.

Request screening to ensure proper blood flow if you are over the age of 65. Screening is also strongly advised if you are over the age of 50 and have the following risk factors:

- diabetes
- smoking
- obesity
- claudication, leg pain while walking that eases when at rest
- high blood pressure
- high cholesterol
- family history of peripheral artery disease, stroke or heart disease

The ***ankle/brachial index*** is a simple, non-invasive test. It compares the blood pressure measured at your ankle with the blood pressure measured at your arm (brachial). When compared to the arm, a lower blood pressure reading at the ankle may indicate peripheral artery disease. Typically, these readings are first taken when you are sitting. If there is an indication you have PAD, you may repeat the test after walking on a treadmill. If PAD is still indicated, an ultrasound or angiogram may be ordered to find the blockage and determine treatment.

An ***arterial duplex scan*** is a painless ultrasound exam that uses sound waves to create images of the major arteries, generally in the arms, legs and neck, identifying precise locations of any blockages or narrowing.

Venous reflux testing is also a painless ultrasound exam, capturing images to determine the presence of venous reflux or venous insufficiency, when the tiny valves in veins fail to push blood back up to your heart. This causes the blood to pool in the veins, distending and misshaping them, resulting in swelling, varicose veins and thrombosis.

Diagnosing diabetic peripheral neuropathy can be accomplished through a simple, noninvasive, rapid and low-cost test, the ***Semmes Weinstein monofilament examination (SWME)***. Different gauges of monofilaments are applied perpendicularly to multiple test sites - legs, ankles and feet - until they bend. If you do not sense the monofilament on the test site after it bends, that site is diagnosed as insensate, lacking in physical sensation.

The minimally invasive ***angiogram*** is the gold standard for determining arterial health. Through a needle puncture in your groin, a catheter is inserted into your femoral artery and threaded through your arterial system. A contrast dye, usually iodine, is injected and x-rays are taken to illustrate the flow of the dye and any blockages. You may be treated with a balloon angioplasty or stent placement during an angiogram, or may have other treatments depending upon the test results.

Chronic wounds may require physical intervention to aid healing. ***Debridement, the medical removal of necrotic, damaged or infected tissue***, can help hasten healing and reduce infection.

Sharp debridement involves the use of forceps, scissors, scalpel or tweezers to remove unhealthy tissue. Sharp debridement is an aggressive form of debridement and can prompt fast healing results. This technique should only be performed by physicians and practitioners who are licensed to do so. Sharp debridement usually needs to be repeated to continue to remove unhealthy tissue.

Chemical debridement uses enzymes to slough away dead tissue and promote rapid healing. This technique is often used on wounds with eschar or with a large amount of unhealthy tissue.

The enzyme can be expensive and extreme care must be used so the enzyme does not come in contact with healthy tissue. You may experience inflammation, burning and increased pain in the wound.

Other debridement techniques include surgical, mechanical, and maggot therapy.

Open wounds require ***dressings*** to keep the wound clean, protected from infection and to help in healing. Different types of wounds call for different types of dressings, to control moisture, resist bacteria and create an optimum temperature for healing.

Wounds that produce exudate, or fluid that leaks from the wound, require dressings with powerful absorption capabilities that trap the fluid while preventing the softening of surrounding healthy tissue. Dressings will be chosen based on the amount of fluid your wound produces, and your input about how many dressing changes you perform each day, while accounting for the fact that applying a dressing and compression will increase the amount of fluid exuded. Dressings that can absorb large amounts of fluid while still allowing the correct amount of moisture necessary for healing include alginates, hydrofibers, foams and polymeric membrane dressings.

Infected wounds, or those prone to infection, require specialized dressings that consistently deliver antimicrobial agents to the wound bed over a period of time, reducing the risk of toxicity. These dressings may use silver, iodine or polyhexamethylene biguanide. They are available in many sizes and shapes, with various degrees of absorption capabilities for handling exudate as well. Silver dressings can include foams, hydrocolloids, alginates, barrier layers and activated charcoal cloth dressings.

Wounds with eschar, thick dead tissue covering the wound, require dressings with extra moisture to help with eschar debridement and then heal. Hydrogel dressings, composed of 95% water and available in a sheet or as a gel, bathe your wound in a water-filled environment, encouraging your body's natural healing capabilities. Your own enzymes and water content will soften the eschar, enabling it to slough away. These dressings are very soothing and cause little pain when changed, but must be changed frequently to avoid softening of surrounding healthy tissue.

When severe wounds are not responding to these treatment methods, it may be time to consider a ***skin substitute***.

Natural skin substitutes are created from live cells that have been harvested, processed and prepared for use in wound care. They include:

- human allograft, the epidermal and dermal skin from a human cadaver
- pig skin dermis, consisting of only the dermis
- human amnion, thin transparent membrane from human placenta
- Oasis wound matrix®, derived from the mucosal cells in the walls of the small intestines

Synthetic skin substitutes are created for each individual patient, depending upon the unique characteristics of the wound. They usually include a layer of silicone with tiny "pores" and a layer of nylon or human fibroblast.

Prompt and highly effective wound care is vital to maintaining the quality of life for your patients. Without proper treatment, wounds can turn gangrenous and require amputation. With amputation comes dramatically increased mortality rates. Over a 5-year period, below the knee amputation mortality was 40% to 82% and above the knee amputation mortality was 40% to 90%. While many patients suffer from other conditions such as peripheral artery disease, diabetes and renal disease which should also be aggressively treated, these statistics confirm that wound care and healing is a vital tool in maintaining the health of patients.

Inside: Care, Treatment and Healing of the Chronic Wound

About the author, Dr. Eugene Tanquilut

Award-winning and recognized as a Vitals Top 10 Doctor and a Patient's Choice Doctor, ***Dr. Eugene Tanquilut*** is board-certified in both vascular and endovascular surgery. He earned Vascular and Endovascular Fellowships at Cleveland Clinic.

Dr. Eugene Tanquilut, Dr. Sanjeev Pradhan, Dr. Saadi Alhalbouni and Dr. Sherazuddin Qureshi are the only board-certified, award-winning vascular and endovascular surgeons in the Chicago Southland.

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Reserve your seat with Julie Rivera
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