

Wound Care: A Holistic Approach

What is a wound? Seems like a simple question, but incorporates a multitude of answers. Wounds can occur due to internal causes (medical illnesses, neuropathy, or impaired circulation,) or external causes (outside sources such as trauma or force.)

Lets look at **internal causes**- impaired circulation can be due to ischemia (caused by reduced blood supply due to narrowing or blocked blood vessels that result in poor circulation.) This can occur due to immobilization (difficulty moving) for lengthy periods of time or can occur due to valves in veins that fail and lead to blood pooling and not flowing normally to the heart.

Neuropathy (usually occurs in people with diabetes mellitus) results in a loss of sensation in affected areas which makes these people unaware of trauma to the skin or wound formations.

Medical Illnesses (when not controlled for periods of time) can cause impaired immune systems, decreased circulation, and can damage organs and systems. This can be caused by high blood pressure, high cholesterol, diabetes, AIDS, cancer, morbid obesity and Hepatitis C to name a few.

Internal wound complications:

Impaired circulation: In both ischemia and stasis- the supply of blood, oxygen, nutrients, and flushing extra waste products is altered resulting in tissue death, wound formations, and later may develop venous and arterial ulcers, or gangrene.

Neuropathy: may increase the risk of diabetic foot ulcers: Parts of the nervous system responsible for sweating and moisturizing the skin is impaired. This leaves the skin on the feet dry and vulnerable to cracks/injuries. With decreased sensation to these areas, many skin cuts, cracks, and injuries can go unnoticed progressing to ulcers.

Charcot or neuropathic joints: The part of nervous system controlling the muscles of the leg/foot are damaged. This leads to improper distribution of force and pressure while doing routine activities which can eventually cause joint dislocation, deformity, fracture and injury.

Medical illness: A weakened immune system (and malfunctioning/diseased systems) decrease the ability of the human body to defend itself against infections, inflammations, ulcers or wounds. A weakened immune system can also delay or prevent wound healing.

External Causes: can be open or closed (intact skin present but the underlying tissue is affected but may not be exposed to the outside.)

Closed wounds can include:

Contusions (common due to sport injuries,): present as a painful bruise (red-purplish-bluish color) this is due to damage of small blood vessels and capillaries, muscle, underlying tissue, internal organs or even the bone being affected by blunt trauma.

Hematomas: injury that causes damaged small blood vessels and capillaries that cause blood to pool and collect in a limited space. Typically present as spongy rubbery painful like areas. They can range in size and be inside the body or just under the skin.

Crush Injuries: Caused by high pressure external forces that squeeze part of the body between two surfaces. This can result in a minor bruise to complete destruction of the area of the body crushed (dependent on the site, size, power and duration of trauma.)

Open Wounds: Skin that is open and exposing underlying tissue. Major types include:

Abrasions: on the upper layer of skin, are shallow and irregular wounds, caused by brushing against a rough or smooth surface at high speed. Usually have little to no bleeding present, and mild pain that shortly subsides post initial injury.

Lacerations: tear like wounds that have irregular torn deeper edges than abrasions, cause more pain and bleeding. Caused by trauma or direct contact with objects (accidents, hard blows, etc.)

Incisions: Most likely caused by surgery or skin that is cut with a sharp object (scalpel or knife.) usually linear with smooth edges in shape, can be life threatening due to depth of the area (especially if involving internal organs or major blood vessels/nerves.)

Punctures: small rounded wounds resulting from objects such as needles, nails, or teeth. Wound size, depth, and pain relate directly to size and force of the object.

Penetrating: Caused by an object or force that breaks through the skin to the underlying tissue or organs. Come in variable sizes and shapes dependent on the cause. Can be life threatening if major blood vessels, nerves or internal organs are affected.

Gun Shot Wounds: Penetrating wounds caused by bullets/firearms. Entrance areas may have burn marks on the edges and surrounding skin. If the bullet goes all the way through the body, there will be an exit wound that will be irregular and larger than the entrance wound and bleeds more. The fast spinning movements may cause serious damage to the surrounding tissue as it passes through the body, and may hit vital organs and major blood vessels.

Complications of External Wounds:

Internal organ damage, severe bleeding, large bruises, bone fractures, nerve damage, compartment syndrome (lower/upper limbs where damage causes swelling and increased pressure in the fascia (surrounds muscles, blood vessels and nerves in that area,) which can block the blood flow to the affected limbs- leading to severe damage to the nerves and muscles. This can be permanent and lead to loss of function and may require amputation.

Infections: Symptoms may include pus/yellowish drainage, foul odor, fever, and pain.

Inflammation: The area may be red, swollen, hot and painful- this results from the body's immune response to a foreign material that causes a wound.

Loss of function: can be temporary or permanent, depending on the extent of the wound and the damage to the affected limb/area- this can be due to pain or the trauma.

Scarring: Many open wounds will leave a scar post healing. Some may even cause a deformity of the affected area.

Risk Factors

Having one or more of the following can increase the risk of wound formation.

Heavy smoking, alcohol consumption, and increased age: these all reduce elasticity of blood vessels, increase the probability of blood clots that can lead to vascular disease and improper healing.

Immobility: can cause stasis and increase the risk of developing ulcers, venous ulcers, deep vein thrombosis (blood clots,) and varicose veins. This can all be attributed to standing, sitting, or lying down for long periods (ex: cases of severe burns, multiple surgeries, car accidents, immobility)

Unhealthy lifestyle: decreased exercise, poor diet, obesity, and poor hygiene.

Weakened immune system: People on corticosteroids, immunosuppressant's, chemotherapy, radiotherapy or receiving a transplant have weakened immune systems.

History of chronic medical illnesses or vascular disease: illnesses include cancers, diabetes, high cholesterol, AIDS, heart disease, hypertension, atherosclerosis, anemia, varicose veins or deep venous thrombosis (blood clots.)

Wound Treatments

The best way to treat internal wounds is to prevent them from occurring in the first place. This is accomplished through controlling underlying chronic medical condition by

complying with treatment plans/medications, maintaining a healthy lifestyle (regular exercise, proper hygiene, balanced diet, cessation of bad habits (smoking and drinking alcohol.))

External wounds: main goal of treatment is pain control, and keeping the bleeding and inflammation to a minimum. This can be done with the use of ice packs, compression, elevation and immobilization of the affected area. In cases of compartment syndrome, a physician can make linear surgical cuts through the fascia to alleviate the pressure. The wound is usually left open for two to three days while covered with a sterile bandage to allow the swelling to subside and prevent further pressure from building up.

Open wounds typical treatment includes:

Stop the bleeding: Apply gentle pressure over the wound with a clean bandage for twenty to thirty minutes- avoid checking to see if the bleeding has stopped (this may prevent the blood from clotting.)

Clean the wound: wash the wound with clean water, and flush it with a sterile solution (using a syringe) to remove any bacteria/remaining debris. Surgical debridement (provides a clean environment to stimulate healing) may be necessary to remove any dead tissue and foreign material that couldn't be removed during initial cleaning.

Local antibiotic: Apply a thin layer of antibiotic ointment (such as Neosporin/Polysporin) on top of the wound to reduce the risk of infection.

Wound closing: Staples, stitches, dressings, and skin adhesives can all be used. In cases of infected surgical wounds, the area may be left open after surgery until the infection resolves. Closing infected wounds can lead to more complications and failure to heal properly.

Dressing change: Dependent on the type of dressing being used. Changing the dressing as minimally as possible (in regards to drainage amounts and current risk of infection,) ideally leaving for a few days is best.