

Skin Deep: Caring for Skin and Pressure Ulcers

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The most common types of chronic wounds are pressure ulcers, venous ulcers, arterial ulcers and diabetic foot ulcers. These ulcers require specific interventions to deal with the cause (Table 1). Applying a dressing to a wound will not heal the wound if the underlying cause has not been corrected or controlled.

Many other types of ulcers or wounds occur with varying pathologies. In all cases, the health-care professional should attempt to minimize the cause to support healing.

Wound care

Wounds are dynamic and the choice of dressing will need to be adjusted as the wound evolves and the treatment goals change. The performance criteria for modern dressings include the maintenance of a moist, interactive environment to allow cellular activity, the control of exudate to reduce the frequency of dressing changes and the reduction of risk of wound trauma.

To meet these criteria, we have a plethora of dressings available to us.

Table 1

Treating ulcer causes

Ulcer	Cause	Contributing factors	Location	Intervention
Pressure	Pressure	Shear, friction, skin exposure to moisture	Over a bony prominence	Turning schedule, pressure-relieving mattress or seating surface
Venous	Venous hypertension	Obesity, previous DVT, varicose veins, lifestyle	Medial or lateral aspect of lower leg	Compression
Arterial	Atherosclerosis	Smoking, lifestyle	Below site of occlusion	Revascularization
Diabetic foot	Neuropathy: sensory, motor & autonomic	Pressure, friction	Plantar surface or over metatarsal heads	Glucose control and pressure off-loading

DVT: Deep venous thrombosis

Moist Wound Healing

The wound surface must remain moist, but should not be wet. This is possible using occlusive dressings that trap moisture on the wound surface. To absorb excess exudate, thick hydrocolloid dressings, foam and hydroactive dressings can be used. To increase the absorptive capacity of the dressing, a hydrofiber, foam or hypertonic sodium chloride gauze may be added beneath the outer dressing or used to pack a cavity. Any combination is acceptable as long as moisture at the wound surface is maintained. If the wound is dry and the goal is to rehydrate the wound, the use of an amorphous or sheet hydrogel may be indicated.

To protect against trauma, one may consider a dressing that has a nonadherent surface or a wound contact layer with a silicone, petrolatum or glycerine base.

Bacterial Balance

Following injury, all wounds are colonized within a very short period of time. In the presence of a healthy host immune response, this is usually not a problem. However, there is a relationship between the increasing number and virulence of organisms in a wound that can overcome the natural defense of the host's immune system. In this situation, the wound is critically colonized, wound healing will be delayed and consideration should be given to using topical antiseptics and antimicrobial agents.

One should avoid using topical agents that can be used systemically, as this increases the risk of breeding resistant organisms and may limit future systemic effectiveness. The use of known common allergens, such as neomycin, bacitracin and lanolin found in topical antimicrobial creams and ointments, should also be avoided. Finally, the use of agents with high cellular toxicity, such as antiseptics, are harmful to the wound environment and should be used with caution and discontinued as quickly as possible.

Some safer topical antimicrobial agents contain cadexemer iodine and silver sulfadiazine, which are both low-risk to cellular activity and effective to reduce bacterial burden in the wound. An antimicrobial dressing containing nanocrystalline silver is also an option to treat critically colonized wounds. However, the addition of systemic antibiotics will be necessary to treat infected wounds.

Debridement

Necrotic material is a nidus for bacterial proliferation and efforts should be made to rid the wound of this dead tissue as quickly as possible. Fast and selective debridement can be achieved by surgical removal. A slower and sometimes safer method is autolytic debridement, which can be accomplished by using an amorphous hydrogel under an occlusive dressing to break down necrotic tissue. A combination of both methods can also be used.

In the event the wound does not heal, despite best efforts to meet the wound's needs, biologic agents, such as growth factors and skin substitutes, may be considered. These options are costly and should only be applied by experienced wound-care physicians.

What can affect proper wound healing?

Many factors will negatively impact the patient's wound-healing capabilities.

Extrinsic factors

- Repetitive trauma of a mechanical nature, as with dressing removal or aggressive wound cleansing.
- Chemical trauma associated with the routine use of antiseptic solutions in the attempt to disinfect a wound or wound contamination following exposure to products of incontinence (urine and stool).
- Thermal trauma associated to the frequency of exposing a wound to ambient air, reducing cellular activity.

Intrinsic factors

Intrinsic factors are patient-specific and may not always be possible to control.

- An older patient has fewer capabilities to heal, as essential cells become senescent and react at a slower rate.
- Adequate protein, vitamin and mineral intakes are essential for wound healing to occur.
- Medical conditions and comorbidities and their treatments also negatively impact wound healing.
- Any condition that alters the patient's ability to mount an appropriate inflammatory response to injury, affects oxygen transport and impedes nutrient absorption and transport will slow down wound healing.

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