

## An Approach to Wound Care in the Urgent Care Setting

**Urgent message:** Understanding the body's natural ability to heal itself—and factors that diminish that ability—is of great clinical value and can help you determine whether a wound is acute or chronic, and inform the decision to clean and dress or refer to a wound specialist.

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### Introduction

The skin is the largest organ in the human body. In simplest terms, its primary function is to protect the delicate insides from the harsh external environment. Injury to (or a defect in) the skin is not a cause for alarm in most cases, as this particular organ has a remarkable ability to regenerate itself.

The goal of treatment is to maximize the healing potential of the skin and to create a “neoskin” to recreate the protective function until the original tissue has healed.

Equally important is to employ techniques, products, and activities that promote healing as opposed to inhibiting it. Unfortunately, many of those activities commonly performed in the name of “wound healing promoting” are in fact “wound healing inhibiting.”

This review will familiarize practitioners in the urgent care setting with the general principles of managing common and less common wounds and describe com-



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mon pitfalls, with an emphasis on cleaning and dressing of wounds appropriate for treatment there. Repair of specific wound types is beyond the scope of this article and will be addressed in a future issue of *JUCM*.

### Definitions

Let's start with some simple definitions. Generally, wounds can be divided into two major categories: acute and chronic.

*Acute wounds* are those likely to be seen more often in the urgent care setting and include lacerations,

abrasions, burns, and skin/tissue avulsions. Acute wounds go through the normal phases of wound healing:

1. inflammation
2. proliferation (also called *granulation*)
3. epithelialization
4. maturation

An acute wound can be expected to heal usually within seven to 14 days, depending on the size, depth, etc.

Figure 1.



Third-degree burns to the lower back of a paraplegic inflicted by an electric heating pad.

Unfortunately, there are wounds that for any number of reasons fail to advance past the inflammation phase. Any wound that fails to show progress in about three to four weeks can be considered *chronic*.

This is not a hard and fast rule, however, as occasionally a wound may take that long to heal. For the purposes of simple categorization, though, this period is considered a reasonable standard.

The reason for this differentiation is that while the evaluations of these two types overlap, the treatments often differ significantly. A wound may fail to progress (or become chronic) for a variety of reasons (one quick tidbit, however: the reason is rarely infection).

### General Management

Clearly, a good history of the wound is essential; how it occurred, previous occurrences, related conditions, timing and longevity, and previous treatments are all important basics.

All wounds should have a through assessment, including evaluation of the integrity of the neurovascular bundles and tendons in proximity.

Special attention should be paid—and documented—to ensure that no fracture, joint violation, or foreign body exists.

Documentation of the length (usually the longest linear dimension), width (the longest linear dimension that is perpendicular to the length), and the depth (taken at a right angle to the skin edge) is important. Photodocumentation is strongly recommended, though many facilities do not have the capability for storage of such pictures.

With respect to the defining characteristics of acute versus chronic wounds, any wound greater than 12-hours-old should be evaluated for signs of infection. (Remember, however, that the signs of infection and inflammation related to healing—red, hot, swollen and tender—are identical. Remember, also, that just as we

do not treat acutely sprained ankles with antibiotics, a knee-jerk antibiotic prescription is to be avoided.)

All wounds—both acute and chronic—should be cleansed if contaminated, and covered to prevent further contamination.

Identifying tetanus vaccination status is mandatory.

All wounds need to be kept moist so cells can migrate across the surface of the wound to heal. There is significant evidence that moist wounds heal faster than those exposed to the environment. “Letting the air get to it” is an old wives’ tale that has no basis in science.

### Wounds and Burns

The approaches to open wounds and to burns are similar in that both injuries represent a disruption in skin integrity.

In a burn injury, be it thermal or chemical, your concern should be that the damage extends below the skin into the deeper tissues.

For thermal injuries, the application of ice or very cold dressings should be scrupulously avoided, as the addition of these to already injured tissues will only increase the amount and depth of the damage. *Cool* dressings should be applied gently and in a manner that allows them to be removed without causing trauma through adherence to

the skin and tissues.

For chemical injuries, the appropriate diluent should be generously applied (a mnemonic rhyme that may be helpful: The solution to pollution is dilution), then the area covered with an easily applied, non-adherent dressing.

There are now numerous antimicrobial dressings that have been shown to reduce the risk of subsequent infection. The old standard—silver-impregnated creams—cause considerable pain with application and removal, and make evaluating the status of the wound difficult.

Instead, opt for one of the numerous modern dressings that use silver, iodine, honey, and other constituents that far surpass the “standard” regimens by decreasing pain, improving patient compliance, and, potentially, increase the rapidity of healing. The patient should be advised that more specialized dressings can be more expensive, with the cost balanced by the above factors.

### Wound Preparation

The purpose of irrigating a wound is to remove contam-

ination without killing off the body’s own defensive cells. Irrigation both dilutes and washes away bacteria and particles.

The choice of irrigating fluids is critical, since many chemical are toxic to white blood cells and new epidermal cells. A good rule of thumb is that a fluid is safe to use on a wound if you are willing to put it in your own eye.

As with any treatment, it is important to know the potential risks and benefits. Commonly used substances such as betadine, chlorhexidine, alcohol, Dakin’s solution, and peroxide actually have a toxic effect on wound healing and have the potential to cause more harm than good. Simple, plain, unsophisticated normal saline still holds the position as the standard irrigation for wounds, based on its long history of success and its minimal effect on the wound.

There are multiple articles relating to the amount of force needed to cleanse a wound. The goal is to rid the wound of foreign matter adequately without damaging the delicate and already injured (and, therefore, more sus-



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ceptible to additional injury) tissue; simply pouring saline onto a wound creates about 4 pounds per square inch (psi) of pressure, whereas irrigating the wound using a 30 cc syringe with an 18 g catheter creates about 15 psi.

While this is the standard regimen and pressure for cleaning a wound, other factors such as the type and amount of foreign matter, the adherence, and patient's tolerance to the irrigation are all mitigating factors in choosing which method of irrigation is best.

### Debridement

The purpose of debridement is to remove all tissue that is non-viable and that will inhibit wound healing and promote infection. For the sake of this article, *debridement* is defined as the use of a scalpel blade, sharp curette, or scissor.

In an acute wound, the dilemma is that the effects of the injury may have not fully manifested; tissue that looks viable may not, in fact, survive and vice-versa. In this case, applying a protective dressing and reevaluating the wound at 24 hours may be sufficient to allow a line of demarcation to develop between viable and non-viable tissues.

In a chronic wound in which the healing process has been arrested, debridement provides a means to convert a chronic wound into an acute wound to restart the healing process.

The question of how much to debride in urgent care is often limited by a patient's tolerance to pain and the ability to provide hemostasis. Liberal use of local anesthetic is advised; however, there is a risk of further damage to fragile tissue via vascular compromise through the amount of anesthetic used, and depending on whether or not epinephrine is used.

When in doubt, defer on debridement and refer the patient to a wound care specialist or surgeon. This is especially advisable in patients with diabetes, arterial insufficiency, vasculitis, immunocompromised states, and those with a history of difficulty healing previous wounds.

### Dressing Choices

The purpose of dressings is to provide an optimum environment for the wound to heal and to protect the wound until healing is completed. There are a wide variety of dressings; however, it is unlikely that the typical urgent care facility will have more than a few standard types.

Be careful not to use ointments that have neomycin as an ingredient, since a large number of patients can become sensitized and allergic.

One controversy involves the use of a sterile versus clean dressings. In an acute wound, there is general consensus that a sterile dressing is preferable to reduce the risk of infection. In contrast, chronic wounds are most commonly treated with a clean dressing; interestingly, using clean technique for their care is considered standard.

This differentiation makes better sense when the relative risk of infection in both types is considered.

The question of whether to use a topical antimicrobial ointment versus a non-active dressing in acute wounds is a relatively low-risk decision. While there is evidence that use of a topical antimicrobial such as triple antibiotic ointment promotes rapid wound healing, the use of topical antimicrobials has been shown to increase the risk of skin sensitization and, of course, the (albeit low) risk of superinfection.

### Homecare Instructions

As with any venture, keeping the wound care simple will reduce the potential for problems and complications.

All open wounds should be kept covered, in order to keep the wound moist. One of the basics of wound healing is that keeping the wound bed moist will promote cell migration. Further, the adjacent skin should be kept dry, as maceration increases the risk of damage to the healthy intact skin. This is underscored by the fact that most dressings have adhesive borders, and macerated skin can be easily damaged with the removal of these dressings.

The timing of a dressing change is based on several factors. Dressing changes of more than once a day can be expensive, time consuming, and increase the time of exposure of the wound to the environment. If the dressings is adherent, frequent dressing changes can also cause repeated trauma to delicate tissues.

On the other hand, a dressing with excessive drainage needs to be changed at an interval sufficient to reduce the risk of hygiene problems such as odor or soilage from the drainage. In this case, a more absorbent dressing may be beneficial.

Overall, a dressing change routine of every other day, when possible, seems to offer a good balance of all these issues.

### Bathing Issues

In many cases, patients will be unwilling to alter their bathing routine to coincide with dressing changes, or the dressing choice is simply not compatible with exposure to water. As with any treatment, the goal is to improve overall compliance by minimizing intrusion into

the patient's daily routine.

In most cases, the dressing choice can itself be a liquid-impervious substance such as a film, hydrogel sheet, or hydrocolloid.

In a situation where the patient's need or desire for bathing cannot be resolved by a dressing choice, there are numerous alternatives such as commercial rubber, latex, or plastic covers that are easily applied and removed.

When, because of wound location or other patient factors, the dressing (and wound) cannot be protected, then the next best choice is to simply keep the dressing on the wound as best as possible during the bathing activity. It is important to remember that the goal is to minimize further injury to the wound.

On that note, an important skill to develop is to remove a dressing while minimizing further damage to the wound and, equally important, minimizing additional injury to the adjacent skin. To do this, it may be helpful to consider the intent to be to remove the skin from the dressing and *not* to remove the dressing from the skin.

Simply pulling a dressing away from the skin means that there will be a traction force from the dressing on the skin. This causes the skin to extend, twist, and shear, thus assuring new skin damage at most, and considerable pain at least.

Potential for injury while removing a dressing can be minimized by following the steps detailed in **Table 1**.

### Wound Healing in Compromised Patients

Healing is a complex process involving the entire physiology, but especially the immune system and circulation. Any compromise in this process can make healing suboptimal.

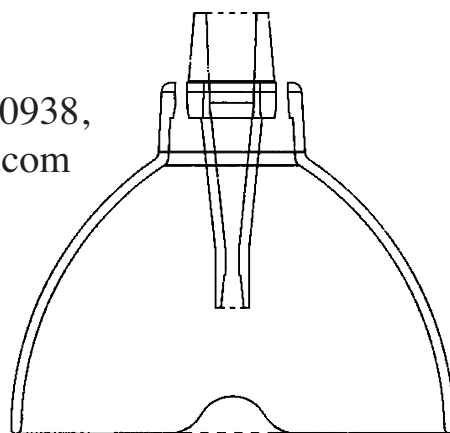
Unfortunately, there is very little that can be done to minimize skin

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**Table 1. Low-risk Procedure for Removing Dressing**

Trauma to even the most fragile skin will be minimized using this technique:

1. Elevate one edge of the dressing.
2. As you grasp the edge and start to elevate it, use a finger of the other hand to gently push the skin down, away from the dressing.
3. Once you have separation of the dressing and skin, the force of removing the dressing should be directed back over itself, as if to peel the dressing away on top of itself.
4. Simultaneously push the skin down and away from the dressing, while the dressing is gently and slowly peeled *tangentially* over itself in the same plane as the skin.
5. Of course, you will need to do repeated skin pushes as you peel the dressing away. *Do not ever elevate the dressing as you remove it*, but continue the tangential pulling.

damage overall. Moisturizing creams, vitamin E application, etc., have shown little effect on preventing skin trauma. In patients with “paper thin” skin from long-term medication use (e.g., steroids) or significant systemic diseases (chronic renal failure), the risk of open wounds from even the slightest trauma is high. The keys are to identify the most likely etiology and attempt prevention.

One factor all too often overlooked is the effect of medications on healing. The basis for healing is inflammation; thus, any medication that affects inflammation will affect healing. It is not enough to just recognize that patients on steroids or antineoplastic agents, among others, will heal more slowly. We must also be aware of *what* medications should not be used when evaluating and treating a patient with an open wound of any kind.

A prime example: NSAIDs for analgesia. If you remember that the “AI” in NSAIDs means “anti-inflammatory,” then common sense should tell you that using this class of medications is counterproductive, and alternative analgesics should be considered.

Topical steroids should also be avoided in situations where an open wound needs to be healed.

Taking the extra time to understand the physiologic effects of many of the medicines we commonly use will help to minimize detrimental effects on what should be simple wound healing.

### Skin Tears and Avulsions

Skin tears are common injuries in the elderly, especially on the upper extremity. Both aging and malnutrition may contribute to thin, fragile skin.

Skin tears are caused by shear forces separating the epidermis from the subcutaneous dermis. The epidermis is avascular; once it is separated from the subcutaneous layers, it will necrose and may inhibit wound healing. All too often, the edge of the skin tear has rolled under itself and, thus, there appears to be more open area of the wound than there actually is.

Whenever possible, skin tears should be evaluated by gently manipulating the edges of the tear using two saline moistened cotton tips (one in each hand). More often than not, you will find that the skin has rolled over onto itself and is adherent (similar to a taco shell folding over on itself). Using the cotton tip and gentle manipulation, you can usually tease the skin away from itself and expose the true

edge.

One key is that the edge is almost always ragged and irregular and not smooth. Only in the rarest of circumstances should the skin be debrided in such an injury; even when it is grossly torn or ragged, the edge can still be used to cover a portion of the open part of the tear. Simply maneuver the skin in a jigsaw puzzle fashion, when possible, to cover whatever area possible.

Epidermis is not usually suturable because of its fragility. In this case, steri strips can be used.

The technique here is to apply the steri strip from the flapped side and then gently manipulate the flap toward the other side. Care should be taken to not pull on the steri strip itself, as this may cause more tearing of the skin flap.

Once the flap is as approximated as can be obtained to the one side, then the other side of the steri strip should be sealed to the connecting side. Applying other steri strips at regular intervals along the flap in the same fashion will ultimately result in good skin tear re-approximation, with only the smallest defect left to epithelialize.

In flaps with little to no tension on approximation, the wound edges may be approximated with octyl cyanoacrylate.

There are unique silicone dressings with a natural adherence to epithelium that can be used to bolster, support, and immobilize skin tear edges to allow for healing.

Use of padded sleeves or leggings may help reduce injury to extremities from trauma and are used often in long-term care facilities.



Friction/shear-based wounds on an elderly, bedridden patient.

While many non-institutionalized patients may balk at similar measures, it is important to have them recognize that the risk of an acute traumatic skin injury is much more painful and more potentially injurious than a padded cloth protective device.

### Chronic Wounds

It is natural for wounds to go through the phases of healing delineated previously as they heal. However, for a variety of reasons (*rarely* infection), sometimes the wound fails to progress and the healing process is arrested.

Although the length of time a wound has been present may give an indication that the wound is chronic, this is not necessarily a reliable indicator. The signs of a wound that has stopped the acute process are:

- no change in the dimensions
- an increase in the amount of fibrinous slough on the wound's surface
- no progression beyond the inflammatory phase.

The goal of chronic wound management is to maximize the body's ability to heal the wound by identifying factors that have impeded its healing. Examples in-

clude, but are not limited to:

- managing blood sugars in diabetic
- restoring arterial circulation
- managing venous congestion
- offloading the wound itself
- improving nutrition
- eliminating medications that affect healing
- removing non-viable tissue.

Suffice it to say that the process of jump-starting a recalcitrant wound towards healing is always multifactorial.

In simplest terms, the goal is to convert a chronic wound into an acute wound so the healing process can be restarted.

### When to Refer to a Wound Specialist

As with any other medical dilemma we encounter, it is imperative that a rational, reasonable diagnosis be considered and the appropriate treatment instituted.

At the risk of redundancy, knee-jerk antibiotic prescribing should be avoided for obvious reasons.

The diagnostic consideration of a wound that is red, hot, swollen, and tender should be tempered with its longevity, location, associated medical conditions, and your own experience. Is this infection or chronic inflammation?

The decision as to when to treat in the urgent care center or refer to a wound specialist will be guided by the answers to a few basic questions, such as:

- How long has the wound been present?
- Has the wound improved at all since it developed?
- What treatments have been used to promote healing?
- What diagnoses have been rendered for the persistence of the wound?
- What work-up has been done thus far to evaluate the wound?
- What other constitutional signs/symptoms are present?

*“Never put anything in a wound that you would not put into your own eye.”*

- Has this condition been present previously and healed?

In simplest terms, consideration of these questions will guide you toward or away from a decision to refer to a specialist, as will your judgment of whether other issues may alter the potential for healing).

It is important to remember that definitive wound care education has been available only recently, and that it has not been limited to the surgical or dermatological specialties. Referral should be made to a practitioner with a definitive wound care background. The current practice of a four-hour per week shift in a wound care center does not a wound care specialist make.

### Conclusion

With each break in the skin we encounter in urgent care, numerous questions must be answered. It should come as no surprise that the vast majority of the wounds we all see will heal *despite* our interventions of antibiotics, toxic, caustic dressings (e.g., Dakin’s solution, betadine, peroxide), and anti-quated treatments (again, “letting the air get to it” is not a good thing for open wounds; nor is bacon grease, alcohol, whirlpools or Epsom salt soaks, etc.).

One of the best tenets to remember, and one that bears repeating, is that you should never put anything in a wound that you would not put into your own eye.

Healing a wound is simple: maximize good things for the tissue and wound and minimize the detrimental and undetermined.

And when in doubt, get help. ■

### Resources

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