

Approach to skin ulcers in older patients

Christopher Frank, MD, CCFP

ABSTRACT

OBJECTIVE To provide family physicians with an approach to managing skin ulcers in older patients.

SOURCES OF INFORMATION Clinical practice guidelines and best practice guidelines were summarized to describe an evidence-based approach.

MAIN MESSAGE Preventing ulcers is important in frail older patients. Using guidelines can help prevent ulcers in institutions. Clarifying the cause and contributing factors is the first step in management. Pressure and venous ulcers are common in elderly people. Poor nutrition, edema, arterial insufficiency, and anemia often impair wound healing. Adequate débridement is important to decrease risk of infection and to promote healing. There are guidelines for cleaning ulcers. Choice of dressings depends on the circumstances of each wound, but dressings should provide a moist environment. Options for dressings are summarized.

CONCLUSION Family physicians can manage skin ulcers effectively by applying basic principles and using readily available guidelines.

RÉSUMÉ

OBJECTIF Proposer au médecin de famille une façon d'aborder le traitement des ulcères cutanés chez les patients âgés.

SOURCES DE L'INFORMATION Une énumération des lignes directrices de pratique clinique et des directives de pratique optimale est le moyen choisi pour décrire une approche basée sur des données probantes.

PRINCIPAL MESSAGE Il importe de prévenir les ulcères chez les patients âgés fragiles. L'utilisation de lignes directrices peut aider à prévenir ces ulcères en milieux institutionnels. En premier lieu, il faut identifier la cause et les facteurs contributifs. La pression et les facteurs veineux sont fréquemment en cause chez ces sujets. La guérison est souvent entravée par la présence de dénutrition, d'œdème, d'insuffisance artérielle et d'anémie. Un bon débridement est essentiel pour réduire le risque d'infection et favoriser la guérison. Il existe des lignes directrices pour le nettoyage des ulcères. Le choix du pansement dépend des facteurs responsables, mais il devrait assurer un environnement humide. Une liste des options de pansement est fournie.

CONCLUSION Le médecin de famille peut traiter adéquatement les ulcères cutanés à la condition d'appliquer certains principes fondamentaux et de suivre des lignes directrices facilement disponibles.

This article has been peer reviewed.

Cet article a fait l'objet d'une évaluation externe.

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A 77-year-old man was transferred for geriatric rehabilitation after he was admitted to acute care after a fall at home. He had been lying on the floor for 8 hours and had developed a large ulcer on his sacral area before he was found. This ulcer grew larger while he stayed on the medicine ward (**Figure 1**).



Figure 1. Full thickness ulcer at time of assessment.

The patient's history included mild dementia, hypertension, alcoholism, and iron deficiency anemia. He smoked tobacco (one pack daily) and consumed six bottles of beer daily.

Daunting but manageable

Skin ulcers are a common issue in geriatric and nursing home care. Skin ulcers can be responsible for longer hospital stays, higher rates of nursing home placement, and reduced quality of life. Family physicians often provide initial medical management of skin ulcers, particularly in nursing homes and community hospitals. A recent survey found that Canadian family physicians are not confident in their ability to manage skin ulcers.¹ Management of a large ulcer can be daunting, but a sound approach can substantially help to improve most ulcers. This paper aims to provide an approach to ulcer management emphasizing assessment, optimization of the healing environment, and choice of dressings.

Dr Frank is an Assistant Professor in the Department of Medicine, Division of Geriatrics, at Queen's University in Kingston, Ont.

Sources of information

The Cochrane database, MEDLINE, and Google were searched for clinical practice guidelines on wound and ulcer care. Guidelines and best practice documents from the Registered Nurses Association of Ontario,² the Canadian Association of Wound Care,³ the Royal College of Nurses (United Kingdom),⁴ the Agency for Health Care Policy Research (United States),⁵ and the Australian Wound Management Association⁶ were used because they were practical and applicable to patients in a variety of clinical settings. Most clinical practice guidelines rated the quality of evidence used in development of the guidelines; where possible, the quality is reported in this paper. Most recommendations cited have level I or II evidence. When areas of care were not covered by clinical practice guidelines, searches were done on MEDLINE using a variety of MeSH headings. Information reflecting my clinical experience is identified as such.

Main messages

Prevention. While skin ulcers are not always preventable,⁷ they have become an indicator of poor-quality care and represent a possible source of legal liability. The Registered Nurses Association of Ontario guidelines suggest ways for facilities to optimize prevention.

Assessment. Assessment includes examining the ulcer and determining whether it is in an inflammatory, exudative, or granulation stage. Staging pressure ulcers is normally done using the National Pressure Ulcer Advisory Panel system⁸ shown in **Table 1** (level III evidence). Other ulcers are staged as partial or full-thickness wounds (**Figures 2 to 4**). Granulation tissue is made up of fibrin and collagen and appears as small patches of bright red, moist tissue that should coalesce to cover the wound base.

The location of the ulcer and the appearance of the wound bed and surrounding skin can help determine cause. For example, ulcers on the medial shin above the malleolus are likely venous, as this

Table 1. National Pressure Ulcer Advisory Panel staging system

STAGE	DEFINITION
I	Nonblanching erythema of intact skin. Can include one or more of temperature change, boggy or firm consistency, and altered sensations (pain, itching)
II	Partial-thickness loss involving epidermis, dermis, or both
III	Full-thickness loss with damage or necrosis of subcutaneous tissue but not through underlying fascia
IV	Full-thickness loss involving muscle, bone, or supporting structures (eg, joint, tendons)
X	Wound bed is covered with yellowish slough or black necrotic eschar, obscuring the stage of the ulcer

Data from National Pressure Ulcer Advisory Panel.⁸

is the location of maximal venous pressure when upright. Ulcers in areas that are not subject to substantial pressure, friction, or shear should not be assumed to be pressure ulcers. Presence of sinus tracts and undermining or tunneling can indicate inflammatory bowel disease or diabetes. Other relevant information includes the ulcer's stage, circumference, and depth, and presence of odour or

exudate (level III evidence). Accompanying pain is important in assessing cause and contributing factors; relief of pain improves patients' quality of life (level II evidence).

In older patients, the ankle-brachial index (ABI) should be measured to assess the contribution of arterial insufficiency to ulcer healing and before débridement of a lower extremity ulcer (level II evidence). The ABI can be measured in the office using a pocket Doppler or through a vascular laboratory (level III evidence). Vessel hardening among patients with diabetes can falsely elevate ABI scores; scores in diabetic patients should be interpreted in conjunction with clinical findings.

Differential diagnosis. Not all ulcers in institutionalized or frail older patients are caused by pressure. It is important to identify the origin of skin ulcers.

Worldwide, the most common cause of skin ulcers is likely venous insufficiency. The likelihood of other

Figure 2. Stage I skin ulcer.

Figure 3. Stage II and X skin ulcers
Figure 4. Stage III skin ulcer


Table 2. Differential diagnosis of skin ulcers

ETIOLOGY	CLINICAL CLUES
Pressure ulcers (pressure, friction, shear)	Location over areas of pressure (heels, trochanters, scapula, sacrum)
Trauma (wheelchair, bedrails)	Location, skin tears
Venous insufficiency	Usually superior to medial malleolus, can be large and associated with other signs of venous pressure (edema, hemosiderin staining); lipodermatosclerosis ("champagne glass" ankle) could be present
Arterial insufficiency	Commonly distal, usually associated with other signs of peripheral vascular disease, well-defined borders, drier and deeper than venous ulcers, minimal granulation tissue, often painful
Diabetes (related to sensory or autonomic neuropathy, vascular compromise)	Usually in areas of pressure friction; can develop under areas of callus on feet, usually small and deep with steep edges, commonly surrounded by callus
Other causes of neuropathy (eg, alcohol, B ₁₂ deficiency)	Similar to diabetes
Malignancy	A non-healing wound can cause an ulcer in an unexpected area
Infection	More likely to increase size of existing ulcer; unexplained increase in pain or exudate; odour; increased friability, boggy, or firmness
Rheumatoid arthritis and vascular ulcers	Can arise from purpuric lesions, usually associated with systemic symptoms
Pyoderma gangrenosum	Usually on lower extremities, indolent ulcers with necrosis around edges, painful, often start as "bitelike" pustules, associated with inflammatory bowel disease and connective tissue diseases

causes depends greatly on patient population and clinical setting (Table 2). Other important causes are pressure ulcers in immobile or institutionalized patients, ulcers caused by arterial insufficiency, and diabetic ulcers. Assessment of the ulcer and a good history and physical examination are the mainstays of diagnosis.

A good medical history is important to identify undiagnosed diabetes, environmental factors and previous treatments, and chronic conditions (such as rheumatoid arthritis or inflammatory bowel disease) that cause ulcers. Ulcers not improving with usual care should be biopsied to rule out malignancies,⁹ such as basal cell or squamous cell cancers (level II evidence). Other laboratory testing should be guided by clinical findings.

Exacerbating factors. Particularly in elderly patients, exacerbating factors interact with the precipitating cause to worsen an ulcer or to slow healing (level III evidence). The role of aging alone versus medical issues common in aging is uncertain. Important factors in healing are shown in Table 3.^{10,11}

Adequate cleaning and débridement. A common adage about cleansing wounds is "never put anything in a wound that you wouldn't put in your eye!"

Many disinfectants are toxic to tissue and can injure healing wounds, particularly those with granulation tissue (level II evidence). Recommended cleaning solutions are sterile water and sterile saline (level III evidence). Topical antibiotics are not recommended for prophylaxis in healing, asymptomatic wounds.

Most guidelines provide specific recommendations for irrigating and cleaning wounds. Staff should irrigate with 100 to 150 mL of solution at room temperature (level II evidence), using enough pressure to clean the wound without injuring the wound bed. This can be done by using a single-use 100-mL saline squeeze bottle or a 35-mL syringe with a 19-gauge angiocatheter (level II evidence).

Adequate débridement of ulcers is important to

Table 3. Factors affecting wound healing

Ongoing pressure or friction
Local edema (eg, venous insufficiency, heart failure)
Anemia
Arterial insufficiency
Poor diabetes control
Chronic steroid use (oral or topical)
Smoking ¹⁰
Micronutrient and macronutrient deficiency ¹¹ (level III evidence for efficacy of supplementation)
Fecal and urinary incontinence (level II evidence for reducing infection rates by protecting wounds from urine and feces)

promote wound healing and to decrease risk of infection. The main options for débridement are sharp (surgical), autolytic, enzymatic, and mechanical. Surgical débridement is the mode most familiar to family physicians and is a method that can be used in offices, hospitals, or long-term care settings for most ulcers. Some serious stage 3 to 4 ulcers require aggressive débridement in the operating room. There are few options for learning the skills formally, but working with an experienced colleague or with a local surgeon can provide the necessary experience. Equipment should be sterile (level II evidence) and include a scalpel, scissors, and toothed forceps (not the plastic forceps provided in most dressing trays). Analgesia can be provided by short-acting oral agents, by topical agents,^{12,13} or by local anesthetic injection. More extensive débridement, however, requires specific nerve or regional blocks.

Infection is an indication for surgical débridement, as eschar provides an ideal medium for bacterial growth (level I evidence). Contraindications to surgical débridement are important to recognize and include substantial arterial insufficiency to the ulcer, protein malnutrition, or other factors limiting development of granulation tissue. Anticoagulation is a relative contraindication to sharp débridement of full-thickness wounds. It should be noted that stable heel ulcers with a protective eschar covering can be considered an exception to the recommendation that all eschar be excised.¹⁴

Autolytic débridement involves use of moisture-retentive dressings, such as gels (eg, IntraSite), hydrocolloid (eg, DuoDERM), film dressing (eg, OpSite), and alginates (eg, Kaltostat), to soften up hard eschar over a week or so. Enzymatic débridement agents break down collagen in the eschar. Collagenase is the most commonly used preparation. Although it has a low risk of injuring local healthy tissue, it should be discontinued once granulation tissue begins to form. Mechanical débridement has little role in management and includes so-called wet-to-dry dressings where gauze dressing is allowed to dry onto the wound and is then pulled off to remove the eschar. This approach can be painful, can damage viable tissue, and can slow healing.

Get the pressure off. This factor is important in all ulcers but particularly in pressure ulcers. A collaborative approach involving nurses, occupational therapists, physical therapists, enterostomal therapists, and sometimes administrators is required to obtain potentially costly treatment options (level III evidence). Use of pressure-reducing surfaces, such as high-specification foam mattresses, is recommended for all patients at high risk of ulcer development and those with existing ulcers (level I evidence).

Alleviating pressure also relates to venous ulcers, as high venous system pressures cause these ulcers. In the last few years, several protocols have been developed and are being used by some Ontario home care programs to treat venous ulcers aggressively with high-compression dressings. Level I evidence shows that multi-layer, high-compression dressings are more effective than single-layer or low-compression choices. One challenge is that most family physicians will not have the training to apply these dressings and will need assistance in managing venous ulcers (level II evidence). As noted above, use of ABI measurement should be considered for patients being assessed for high-compression dressings. These dressings should be used with great caution for patients with an ABI below 0.8 (level II evidence).

Choosing a dressing. Dressings help provide the optimal environment for wound healing. Dressings used depend on the needs of patients and the goal of treatment. The most important function of dressings is to keep wounds moist (level I evidence). This aim represents a major shift from the past, when efforts focused on drying out wounds with dressings and mechanical means. Moist wound healing has been shown to improve re-epithelialization and to decrease infection rates. It is important to note that wounds with excessive exudate can become macerated, so dressings should be appropriate for wounds with a large amount of drainage.

Appropriate dressings for different stages of wound healing are shown in Table 4. Dressings can be occlusive, such as the hydrocolloids, or non-occlusive, such as wet saline dressings. Occlusive

dressings are generally used when a good granulation base is formed, as this will increase epithelialization and protect the healing tissue from trauma. Collaborative discussions with nursing staff are very important in developing feasible and effective strategies for dressing applications.

Ongoing management issues

Pain. Pain can be an important issue for patients with ulcers. Unfortunately, oral analgesics might not help for painful ulcers, even at higher doses (level III evidence).¹⁵ Some small studies have looked at topical opiates used for skin ulcers, particularly in palliative care (level II evidence).^{13,16,17} Although it has not been studied extensively, we have found that a combination of hydrogel (IntraSite) and injectible morphine can be helpful for painful wounds (10mg of injectible morphine mixed in a 1:1 ratio with the gel can be used with each dressing change).¹³ We have found that the effect is longer than one would expect with oral administration. Lidocaine-prilocaine (EMLA

cream) can decrease pain from dressing changes,¹² although its effect on healing is uncertain. Drugs used for other types of pain, such as sublingual fentanyl, can be used before dressing changes but have not been studied for skin pain.¹⁸

Failure to improve. Slow healing should prompt collaborative review of management and consideration of referral. Options such as electrical stimulation, vacuum-assisted closure, ultraviolet light, and ultrasound should be considered (level I and II evidence) but will not be discussed in this review.

Case discussion

The patient made good functional gains in rehabilitation. He was given iron supplements, and his anemia resolved. The clinical dietitian recommended a nutritional supplement and a multivitamin. The patient's wound was cleaned with sterile water and packed with saline-soaked gauze ribbon. He was discharged with home care nursing and followed

Table 4. Dressing options

TYPE OF ULCER	DRESSING OPTIONS	FUNCTION OF DRESSING	COMMENTS
Stage I pressure ulcer	Transparent film • OpSite • Tegaderm	• Decreasing shear • Protecting skin from feces and urine	• "Get the pressure off!" • Little evidence for benefit • Can tear surrounding skin, particularly of elderly patients
Exudative ulcer (partial or full thickness)	Foam dressing • Allevyn hydrocellular • Hydrasorb • Curafoam	• Absorbing exudate in superficial or deep wounds • Prolonging interval between or frequency of dressing changes	• Can be helpful when exudate causes maceration • Secondary dressing usually needed to retain foam • Can be left for up to 7 days
Exudative ulcer (partial or full thickness)	Alginates • Kaltostat • Algisite M • Curasorb	• Absorbing exudate • Can be used in exudative wounds with granulation tissue	• Can be helpful for maceration of skin • Supplied as pads or ropes • Requires a secondary dressing • Usually changed daily
Dry ulcer (partial or full thickness)	Hydrogels • IntraSite Gel • DuoDERM Gel • Restore	• Creating or maintaining moist wound environment • Autolytic débridement • Packing for dry deep cavity wounds	• Requires secondary dressing • Can be difficult to keep in place with superficial wounds • Usually changed daily or twice daily
Dry ulcer (partial or full thickness)	Wet saline gauze dressings	Creating or maintaining moist wound environment in wounds with minimal or no granulation tissue	• Must be changed frequently to avoid drying and damaging viable tissue • Wetness could macerate surrounding skin • Usually changed daily or twice daily
Uninfected granulating or epithelializing ulcer	Hydrocolloids • DuoDERM • Tegaderm • Comfeel	Moist wound healing in ulcer with granulation tissue	• Changed every 5-7 days • Inappropriate for infected wounds or those with heavy exudate • Can be difficult to maintain over sacrum or buttocks • Can injure surrounding skin when removed

up by a family physician interested in ulcer care. A mattress with air-filled sections (Roho mattress) was provided for pressure relief at home, and the wound was dressed with a combination of saline-soaked gauze ribbon and IntraSite gel. A 1-month course of antibiotics and then an antibacterial dressing (Iodosorb) treated wound infection. When the ulcer became shallower as granulation tissue formed, the patient was switched to a hydrocolloid dressing, changed every 5 days. The wound healed after almost 6 months of treatment.

Conclusion

Prevention and treatment of skin ulcers involves awareness of risk factors and prompt intervention with an evidence-based approach. By identifying the cause and contributing factors and by optimizing the healing environment, family physicians can play a crucial role in ulcer management. ✱

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Competing interests

None declared

Correspondence to: Dr Christopher Frank, *St Mary's of the Lake Hospital, 340 Union St, Kingston, ON K7L 5A2; telephone (613) 548-7222, extension 2208; fax (613) 544-4017; e-mail frankc@pccchealth.org*

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EDITOR'S KEY POINTS

- The location and appearance of skin ulcers often distinguish between sustained pressure and venous ulcers. Clinical evaluation allows physicians to determine the precise stage of ulcers: inflammatory, exudative, or granulation.
- Topical antibiotics are not recommended for prevention of skin ulcers.
- Surgical or enzymatic débridement is indicated to decrease risk of infection and to promote healing.
- Maintaining a moist wound environment promotes re-epithelialization and reduces risk of infection.

POINTS DE REPÈRE DU RÉDACTEUR

- Les causes les plus fréquentes d'ulcères chez les aînés sont l'insuffisance veineuse et la pression locale. L'évaluation clinique permet de déterminer le stade et de préciser si l'ulcère est en phase inflammatoire ou exsudative ou en phase de granulation.
- Les antibiotiques topiques ne sont pas recommandés en prophylaxie pour une plaie asymptomatique en voie de guérison.
- Le débridement chirurgical ou enzymatique est indiqué lorsque la plaie est infectée ou recouverte d'une escarre qui est un milieu idéal pour la croissance bactérienne.
- Le pansement qui garde la plaie humide améliore la ré-épipithélialisation et diminue le risque d'infection.

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