General Principles and Approaches to Wound Prevention and Care at End of Life: An Overview

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Abstract
The incidence and prevalence of wounds in persons at the end of life is largely unknown, but wounds are estimated to occur in at least one third of hospice patients. At the end of life, healthcare professionals must help the patient and/or family decide whether the goals of wound prevention and care should focus on healing or palliation. At all times, it is important to consider that a palliative approach does not negate the potential for wound improvement or even closing before death. A review of the literature suggests that, in general, few differences exist between the general principles of wound prevention and care and an optimal palliative care plan. For example, maintenance of a moist wound environment is recommended to facilitate healing in general protocols of care. In end-of-life patients, dressings should be used for general comfort and prevention of skin exposure to wound exudate and to reduce the number of potentially painful dressing changes. Risk factors for tissue breakdown and pressure ulcer development are also similar. Palliative care patients with limited mobility and physical activity are at highest risk for developing pressure ulcers, but measures to help prevent these wounds may have to be adjusted to meet the overall goals of palliative care for a particular patient. Wounds encountered mainly in cancer patients — eg, fungating and radiation wounds — can pose important challenges for healthcare professionals and are very stressful for the patient. Pressure ulcers, fungating, and radiation wounds at the end of life are to be managed palliatively with the overall goal to minimize pain and odor, enhance comfort, and potentially improve the condition of the ulcer. Although research remains limited, it is clear the clinician and patient must balance best wound prevention and management practices while promoting patient dignity, self-esteem, and quality of life.

Keywords: wounds, palliative care, pressure ulcer, review, prevention

For individuals at the end of life who have a wound, palliative care is most often the most appropriate care approach. Palliative care is focused on holistically supporting the individual for comfort rather than to cure or heal the wound, while improving the quality of living and dying. A 2002 National Consensus Project described palliative care as an organized and highly structured system of care focused on promoting the greatest comfort for and dignity of the patient (www.nationalconsensus-project.org) that is best delivered by a multidisciplinary team. Following the release of this report, many US hospitals developed palliative care units or palliative care teams to serve end-of-life patients.

It is estimated that one fifth of the US population will be 65 years or older by 2030, and more and more people are experiencing multiple comorbid illnesses in their later years. Concomitant with this demographic shift is the fact that the number of frail, elderly patients will increase and likely elect palliative rather than curative care at the end of life. Overall, limited information exists on wounds at end of life; however, at least one third of the nearly 1 million hospice patients in the US are known to have a wound, and this does not account for persons who are not in hospice care. Few studies on the prevalence and incidence of wounds at end of life exist. Reported prevalence rates vary between 13% and 47%, and incidence rates vary from 8% to 17%.

Tippett conducted a cross-sectional study of 383 hospice patients and found 35% had skin wounds. Of these wounds, 50% were pressure ulcers. The same author did a case-series analysis of 192 consecutive patients referred for...
wound consultation. The majority were women, mean age of 82 years, with multiple comorbidities. Forty percent of the wounds were pressure ulcers, located primarily on the sacrum and almost exclusively Stage III and IV pressure ulcers, with concomitant necrosis and gangrene. The author concluded that “wounds at the end of life are a problem of tragic proportion for the nearly 1 million hospice patients and millions of other frail, elderly persons living with chronic disease.”

Most, if not all, individuals at the end of life are at risk for developing soft tissue ulcerations. The vast majority of wound care professionals agrees that pressure ulcers occurring at end of life are often unavoidable and largely attributable to the individual’s frail, compromised condition. A panel at the 2010 National Pressure Ulcer Advisory Panel (NPUAP) Consensus Conference on Avoidable versus Unavoidable Pressure Ulcers unanimously agreed that not all pressure ulcers are avoidable, a determination supported in the literature — ie, it is likely impossible to eradicate pressure ulcers in end-of-life patients owing to their many comorbid conditions and risk factors. NPUAP conference attendees recognized that end-of-life patients experience body organ system and homeostatic mechanism failure. As such, they are rendered unable to counter insults such as pressure, friction, and shear, making some pressure ulcers unavoidable.

Individuals at the end of life who have a wound face a conundrum of considerations, including whether to accept aggressive curative wound treatment or a palliative approach. Patients need to be apprised of care options available and educated regarding the fact that many wounds at end of life do not close or heal, particularly as the body’s organs shut down. It is often overlooked and not included in patient/family education that the skin is the largest organ of the body and can and does fail along with the other organs. Some studies report that up to 50% of wounds heal at end of life; others report far smaller percentages. When care is shifted from a curative to a palliative focus, it is not unexpected to see some deterioration in the condition of the wound, even though care of the wound never stops; for individuals at the end of life with a nonhealing wound, supportive, comfort-enhancing interventions may be the most appropriate strategy.

By educating the patient, including a comprehensive question-and-answer session between the patient and family and primary care provider(s), the goal of care should be established. Moving a patient from a curative to a palliative treatment plan is incumbent on the fact that the primary care provider has determined the wound is ultimately nonhealing and not merely undertreated, and that the patient has agreed to accept a palliative approach.

The purpose of this overview is to summarize how some of the general principles of wound prevention and care may apply to end-of-life care patients.


Key Points

- End-of-life care usually centers around preventing complications while promoting patient dignity, self-esteem, and quality of life.
- Palliative care patients are at high risk for skin breakdown; although prevention measures should be instituted, some (such as frequent turning) may have to be adjusted to improve comfort.
- This review suggests that the general principles of optimal wound care should be applied unless they do not meet the overall goal of patient care.

Common Risk Factors for Skin Breakdown and Pressure Ulcer Development

Multiple factors place the individual at the end of life at risk for tissue breakdown and impaired wound healing. Impaired oxygenation results from low hemoglobin levels and impaired gas exchange. Blood pressure is lower at end of life. With age, skin becomes drier, more fragile, and prone to injury; healing may be delayed. As the end of life draws near, activity and mobility decrease, leading to tissue ischemia from prolonged pressure and lack of movement. The number of comorbid conditions and the presence of pain, as well as pain medication administration, can deleteriously impact mobility; the sacrum, elbows, and heels are particularly vulnerable to pressure, friction, and shear. Friction is the “resistance to motion in a parallel direction relative to the common boundary of two surfaces.” Shear stress is defined as the “force per unit area exerted parallel to the plane of interest.” Shear strain is the “distortion or deformation of tissue as a result of shear stress.” Friction, shear, and immobility are risk factors. Tissue damage is compounded when combined with pressure. The presence of moisture — eg, from perspiration, wound exudate, and urine and/or feces — makes the tissue much more vulnerable to the forces of friction, shear, and pressure and increases the risk for tissue breakdown.

Nutrition at the end of life can be challenging as well. In the weeks to months before death, food and fluid requirements decrease as body systems shut down. Hunger and thirst are diminished, resulting in dehydration, decreased oral intake, and impaired metabolism. Protein-calorie malnutrition and dehydration impair skin turgor. All of these factors leave tissue vulnerable to new breakdown and impair the normal wound healing mechanisms.

Chronic wounds. Any wound present for 30 or more days is considered chronic. A chronic pressure ulcer often has a well-defined border, and the surrounding skin may exhibit nonblanchable erythema, induration, or feel hard to the touch. Rolled-under edges that occur when the wound bed...
is dry, a common characteristic of chronic wounds, may impede healing and wound closure. The edgerolling under is an attempt by the wound bed to preserve the minimal moisture present. When the wound bed is too dry, re-epithelialization is slowed.

Wound Care

Palliative and curative wound care goals vary little from one another, aside from the goal of healing. Palliative care becomes the primary focus when the wound fails to progress or significantly deteriorates, new wounds begin to form, the patient’s clinical condition deteriorates to where aggressive interventions are no longer appropriate, or quality of life can no longer be enhanced. The focus of care then is redirected toward palliation to include wound pain management, appropriate dressing choice, infection management, odor management, and periwound protection.

Goals of care will focus on optimizing quality of life by controlling of physical symptoms and enhancing psychosocial status. Skin breakdown can best be prevented through risk appraisal and assessment, providing meticulous skin care and good positioning, reducing friction and shear, using pressure-redistributing support surfaces, supporting nutrition and hydration, and managing skin moisture.

Assessment. A complete head-to-toe assessment of the patient nearing end of life, including physical and psychosocial health and overall quality of life, is essential to establishing realistic goals. The assessment should document both risk for and presence or absence of skin breakdown, including the presence of a wound and the risk for developing additional wounds. The assessment should include comorbid health diagnoses, medications, risk factors for tissue breakdown and nonhealing of wounds, nutritional status, results of diagnostic tests, psychosocial factors, environmental resources, and patient/family goals of care. A risk assessment for palliative care patients — the Pressure Sore Risk Assessment Scale for Palliative Care — was developed in a study of 98 Swedish hospice patients followed over 18 months. A total of 10 risk assessment tools were tested in the study, and this tool was found to be the most predictive of pressure ulcer development in this population. The three most predictive factors were physical activity, mobility, and age. Sensitivity was 100%, specificity 71%, positive predictive value 50%, and negative predictive value 100%.

Because it is important to manage the wound and periwound on a regular basis per the individual’s wishes, the individual and the wound should be assessed, noting comorbid conditions, nutritional status, wound etiology, presence of necrotic tissue, presence and type of exudate and odor, and psychosocial implications.

Recommendations for wound prevention and care. The National Pressure Ulcer Advisory Panel-European Pressure Ulcer Advisory Panel (NPUAP-EPUAP) Pressure Ulcer Prevention and Treatment Guidelines contain numerous recommendations for prevention and treatment of pressure ulcers. Most recommendations are also applicable to other wounds at end of life.

Skin integrity. In general, recommendations for maintaining skin integrity include gentle cleansing with a low-pH skin cleanser followed by the application of a moisture barrier to minimize the effects of excess moisture. As noted previously, macerated tissue is more vulnerable to injury, because it is less able to tolerate the forces of friction, shear, and pressure. Clinicians report that a gentle overall body massage often is appreciated in an individual at the end of life, unless contraindicated, such as by ulcer location on the body, a wound with very fragile tissue, a diagnosis of bleeding, or thrombocytopenia.

Skin emollients applied according to manufacturer’s direction are helpful in maintaining adequate skin moisture and preventing dryness. Minimizing the harmful effects of incontinence with skin barrier products is helpful. When redistributing pressure or moving the patient, the buttocks and sacral areas can be protected by using a lift sheet or an overhead trapeze. Heel pressure can be decreased by suspending the heels over a pillow while supporting the entire length of the leg or using heel protectors. Although a general guideline is to reposition an individual in bed every 2 hours or as frequently as the condition requires, one must consider the repositioning difficult for patients with hemodynamic instability, pain, nausea or vomiting, or inability to lay in certain positions. With impaired ventilation ability at end of life, many individuals require elevation of the head of the bed. The guideline is to maintain the head of the bed at the lowest elevation possible — preferably, 30° or lower — to minimize friction and shear to the sacrum and buttocks. A pressure-redistributing mattress overlay or mattress that can distribute load over the contact areas of the body also may be helpful. However, clinicians should always respect that after explaining the rationale for intervention, the individual’s wishes must be taken into consideration.

Pain management. Pain and discomfort may be associated with prevention, as well as treatment of a wound, even for individuals at the end of life. Moderate to severe pain is experienced by most patients with a wound, particularly with dressing changes and manipulation of the wound bed. A qualitative study found that 21 of 23 hospital inpatients (91%) 33 to 92 years old reported that a pressure ulcer or its treatment affected their lives physically, socially, emotionally, and mentally, including being painful. As systematic review revealed that 15 studies addressing the impact of pain with a pressure ulcer concluded that “pain was the most significant consequence of having a pressure ulcer and affected every aspect of patients’ lives.”

Pain assessment. Based on the 2000 Joint Commission on Accreditation of Healthcare Organizations (JCAHO) accreditation guidelines, routine pain assessment is now mandatory, even for individuals incapable of expressing pain.
Three validated tools to assess for pain include the Numerical Rating Scale, the visual analog scale, and the Faces Pain Rating Scale. They can be used for individuals who are verbal and can comprehend data intervals. Cognitively impaired individuals can be assessed by observing behaviors such as facial expression, body movement, vocalizations, activity changes or mental status changes such as crying or irritability. Initial and routine pain assessment, as well as pain treatment, is recommended.

Pain control should be part of the goals and desires of the patient and family related to care and, as such, integrated into the treatment paradigm. Wound pain can be minimized by maintaining a moist wound bed, covering the wound, repositioning the patient frequently (unless contraindicated), and keeping linens unbunched. Managing pain associated with wounds is achieved through a balance of appropriate wound care, medication as needed, and conservative measures.

Analgesics should be prescribed based on the World Health Organization (WHO) guidelines for control of cancer pain and within local prescribing parameters and guidelines. Premedication for breakthrough pain 30 to 60 minutes before treatments and dressing changes also is recommended.

Wound dressings. Comfort normally is enhanced with fewer dressing changes, so selecting a dressing that can remain in place for several days is advised. As a rule, nonadherent dressings are believed to cause less pain because they do not damage tissue when removed. The sacral area or other bony prominences should be protected with a low-friction transparent film, foam, or hydrocolloid to minimize friction.

Exudate. Wound exudate is the fluid exuding from the extracellular spaces. Protecting periwound tissue is important and can be a challenge; excess exudate can cause periwound maceration. Protecting periwound tissue is important and can be a challenge; excess exudate can cause periwound maceration. Protecting periwound tissue is important and can be a challenge; excess exudate can cause periwound maceration.

Wound infection. All chronic wounds are considered to be colonized with bacteria. During colonization, microorganisms are present and replicating on the wound surface; in true infection, they have invaded healthy tissue and are multiplying, producing pathophysiologic effects. Colonization does not constitute infection, but once the microorganisms invade healthy tissue, infection can occur.

Individuals at the end of life usually have a compromised immune response and less able to fight the infection. Classic signs of wound infection include pain, erythema, warmth, edema, and purulent exudate. Bacteremia also can occur. When the goal for the wound is maintenance, culturing and treatment of the wound infection may not be warranted.

Necrotic tissue and debridement. When tissues are deprived of oxygen and nutrients, they become devitalized and nonviable and a nidus for bacteria to thrive on. As bacteria colonize, necrotic material forms in the wound, promoting bacterial growth and inhibiting leukocyte phagocytosis of bacteria. The necrotic tissue in the wound bed becomes black and at times leathery with exposure to air or yellow/grey when exposed to moisture. Most distressing to the patient are the odor, drainage, and pain arising from the infection.

Odor. Wound odor can be embarrassing to the individual and lead to isolation and poor quality of life. It is important to treat the cause of the odor and the odor itself. More frequent dressing changes may be helpful, along with frequent wound irrigation to remove exudate and odor.

Nonviable tissue can be debrided; autolytic debridement is often the least painful method for the individual. Sharp debridement is not recommended because excessive bleeding and undue pain often occur.

The NPUAP-EPUAP Guidelines recommend a variety of approaches for controlling odor. Topical metronidazole can be used, as well as activated charcoal dressings, occlusive dressings (although not when infection is present), and frequent dressing changes. Cadexomer iodine and povidone iodine are effective antiseptics. Silver dressings are effective for infections and odor control. Gauze saturated with Dakin’s solution can be placed in the wound for a limited time, although it may cause some discomfort. Larvae have been used effectively in wounds with extensive necrotic tissue.

A hyperosmotic wound environment that inhibits bacterial growth and assists in debridement may be achieved using a sugar-based paste and honey. Ancillary products that may be used include alcohol, povidone-iodine saturated dressings, and alpha glucosidase enzymes. Cleansing of the wound can be cleansed at each dressing change using potable water (ie, water suitable for drinking), normal saline, or an nontoxic cleanser to minimize trauma to the wound and help control odor.

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Nutrition. As end of life approaches, the individual may consume little in the way of fluids and food. The NPUAP-EPUAP Guidelines note that, while it is important to address nutrition and hydration needs in order to maintain the individual’s condition and wishes, adequate nutritional support is not attainable. Providing several small meals per day, a liberal diet, and nutritional protein supplements when ulcer healing is the goal are some suggestions.
Fungating Wounds

The term fungating is used to reflect a wound originating from a malignant (ulcerating, proliferative\(^95\) or mixed\(^95\)) growth process. In the ulcerating growth process, a crater-like wound develops; when the growth is primarily proliferative, a nodular “fungus-” or “cauliflower-” appearing lesion develops.\(^95,96\) The fungating tumor wound bed is ulcerated and has a bacterially contaminated surface.\(^85\) Patients with a fungating tumor often experience exudate, odor, pruritis, pain, bleeding, and related psychosocial issues.\(^87,97\)

A fungating wound is caused by local tumor infiltration or direct metastatic tumor spread into the skin, blood, and lymphatics. Fungating wounds occur because the oxygen to the tissue is cut off, leading to eventual necrosis.\(^87,97-99\) Fungating tumors occur in 5% to 10% of individuals who have metastatic cancer,\(^73,100\) with a higher incidence in elderly individuals.\(^73,100\) Fungating tumors most frequently develop in the last months of life, but also can develop and be present for years.\(^14\) The breast is the most frequent location, although tumors also can occur on the head, neck, and in an area of melanoma. Given the location of these tumors and the fact that the tissue is fragile and bleeds easily, providing care can be challenging.

Care of the fungating wound. Fungating wounds rarely heal, making management long-term. Care centers on symptom control, comfort enhancement, and quality-of-life maintenance to the extent possible.\(^101,102\) As with any wound, assessment and management necessitates excellent interdisciplinary care and patient-caregiver communication.

When debridement is necessary, a nonsurgical (auto-lytic or enzymatic) approach is recommended to minimize bleeding and “seeding” of malignant cells.\(^70,72,74\) The tissue is friable and predisposed to bleeding; platelet function often is impaired and hemorrhage is a common emergency.\(^72,97\) Bleeding can be minimized by using non-adherent dressings, maintaining a moist wound bed, and gently irrigating rather than swabbing.\(^72\) Dry dressings should be avoided, because they can cause bleeding on removal.\(^70,97\) An alginate dressing enhances the clotting cascade and can absorb large amounts of exudate. Caution upon removal is needed; this is a time when bleeding can occur.\(^103\) In case of bleeding, a hemostatic surgical sponge can be placed on the wound and left in place for a time.\(^14\)

Radiation Wounds

Radiation therapy targets a high-energy x-ray beam to an area of treatment: the tumor, the area surrounding the tumor, or an area where a tumor has been surgically removed. A specific depth of tissue is targeted; however, the tissue overlying the site can be damaged as well.\(^104,105\) Tissue damage can occur during, immediately after, or an extended time after the radiation therapy.\(^104,105\) Radiation skin problems continue to be observed many years after radiation treatments because targeting of tissues was less specific in previous decades.

Radiation wounds can be small or large, sometimes with a draining sinus.\(^84\) Most radiation wounds are fairly superficial, but some can be much deeper. Radiation skin reactions almost always occur in the irradiated area; in many cases, the inflammation occurs almost immediately.\(^105,106\) The radiation dilates blood vessels in the area, leading to an acute erythematous wound. Skin reactions that occur include flaking or peeling skin, erythema, pigmented changes, hair loss, diminished perspiration, superficial changes of the blood vessels, edema, ulceration, and scarring.\(^72,85,97\) Poor or nonhealing ulcers are common due to atrophy of the epidermis and epidermal accessory structures, microvascular occlusions, exuberant connective tissue, diminished fibroblast reproduction, and extensive tissue damage.\(^84,85\)

Care of a radiation wound. Essentially, treatment of a radiation-induced wound is similar to other types of wounds. All tissue within the field of radiation should be protected. Skin moisturizers and protectants can be used to enhance tissue health. The patient should be advised to avoid restrictive clothing, heat and sunlight, harsh chemicals, trauma, and adhesives. A topical hydrogel to enhance wound bed moisture can be used for dry desquamation and a topical steroid cream for erythema.\(^85\) If the desquamation is moist, a hydrogel with a non-adherent or foam dressing is helpful. The wound should be kept covered to minimize fluid evaporation, pain, and risk of infection.\(^105,106\)

As with all wounds, moist healing is recommended.\(^85,106\) It should be ascertained the wound is not a malignancy.\(^106\) In the more extreme cases of radiation injury, skin grafting or growth factor application may be needed.\(^107\) Infection should be avoided or controlled with good cleansing and protection techniques; topical antibiotics are helpful because this damaged tissue is less able to resist or fight infection.\(^84\)

Pain in the radiation wound results from the vascular changes and hypoxia, as well as from exposure to air and dryness of the wound bed.\(^84\) Management of radiation wounds is challenging; they heal slowly. Supporting the individual systemically is necessary to promote the best chance for some potential healing as well as comfort.\(^105\)

Conclusion

The goal of care in palliative wound care patients who are nearing or at the end of life may be healing and often consists of maintenance and comfort. Whatever the goal, healthcare professionals are obligated to provide compassionate, symptom-relieving, comfort-promoting care. The challenge is to balance best wound prevention and management practices while promoting patient dignity,
self-esteem, and quality of life. Comprehensive palliative wound care programs with an interdisciplinary team are needed in clinical agencies that care for these individuals. Results of one study suggest that appropriate care of these wounds at the end of life, based on the goals of the patient and family, can be achieved and improve outcomes in at least half of the cases, even on a hospice unit.4 n

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