

CLINICAL MANAGEMENT

# extra

## Palliative Wound Care Management Strategies for Palliative Patients and Their Circles of Care



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This continuing educational activity will expire for physicians on March 31, 2016.

### **PURPOSE:**

**To provide information about palliative wound care management strategies for palliative patients and their circles of care.**

### **TARGET AUDIENCE:**

**This continuing education activity is intended for physicians and nurses with an interest in skin and wound care.**

### **OBJECTIVES:**

**After participating in this educational activity, the participant should be better able to:**

1. Recognize study findings, assessment tools, and non-pharmacologic strategies used for patients with palliative wounds.
2. Summarize pharmacologic and dressing treatment strategies used for wound care management of palliative patients.

## ABSTRACT

The principles of palliative wound care should be integrated along the continuum of wound care to address the whole person care needs of palliative patients and their circles of care, which includes members of the patient unit including family, significant others, caregivers, and other healthcare professionals that may be external to the current interprofessional team. Palliative patients often present with chronic debilitating diseases, advanced diseases associated with major organ failure (renal, hepatic, pulmonary, or cardiac), profound dementia, complex psychosocial issues, diminished self-care abilities, and challenging wound-related symptoms. This article introduces key concepts and strategies for palliative wound care that are essential for interprofessional team members to incorporate in clinical practice when caring for palliative patients with wounds and their circles of care.

**KEYWORDS:** palliative wound care, pain and symptom management, skin changes at life's end, circle of care

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clude pressure ulcers (PrUs), ischemic wounds, and skin changes at life's end wounds. To maintain hemodynamic stability and normal functioning of vital organs during critical conditions and at life's end, circulation is diverted from the skin, compromising cutaneous perfusion.<sup>3,5</sup> The National Pressure Ulcer Advisory Panel has introduced the term "skin failure" to describe the inevitable damages associated with hypoperfusion of the skin when metabolic demand outstrips supply of oxygen and vital nutrients.<sup>6</sup> In a recent article by Edsberg et al,<sup>5</sup> the following consensus statement reached an 83% consensus among organizational representatives and a 90% consensus among the audience participants: Pressure ulcers are unavoidable in terminally ill individuals who become immobile.

Early signs that indicate skin breakdown may include dusky erythema, mottled discoloration, and local temperature change; these have been documented in more than 50% of individuals within 2 to 6 weeks before death.<sup>6</sup> In a 2-year audit of a palliative care unit, 26.1% of 542 individuals were admitted with PrUs, and 12.0% acquired new PrUs during their stay.<sup>7</sup> The development of PrUs has been linked to increased mortality.<sup>8,9</sup> It is generally accepted that PrUs are largely preventable, but not always avoidable because of a number of intrinsic factors that may not be correctable in an individual patient.<sup>5</sup>

Given the complexity of palliative wound care, a holistic approach integrating interprofessional collaboration is required to optimize patient outcomes and address the concerns of the patient and his/her circle of care.<sup>10</sup> The key components of interprofessional wound care for the palliative patient and his/her circle of care are outlined in the Figure 2, including (1) risk reduction with the key objectives to prevent skin breakdown and further deterioration of existing ulcers; (2) general symptom management; (3) psychosocial well-being; and (4) local wound care and symptom management.

## PATIENT AND CIRCLE OF CARE

Although research evidence is often applied to help make treatment decisions, additional contextual factors should be taken into account to develop a plan of care that is realistic and pragmatic. These factors generally fall into 4 categories: (1) patient preferences: beliefs, attitudes, expectations, cultural norms, and interpersonal dynamics involving the circle of care; (2) clinical context: severity of illness, location of care settings, interprofessional relationships, practice culture, and standard of care; (3) clinical knowledge: expert opinions, experiences, judgment, and skills; (4) healthcare resources: costs, time, availability of trained personnel, and leadership to champion change.

A patient-centered care approach emphasizes the need to align expectations and build partnerships with patients. Patients

## INTRODUCTION

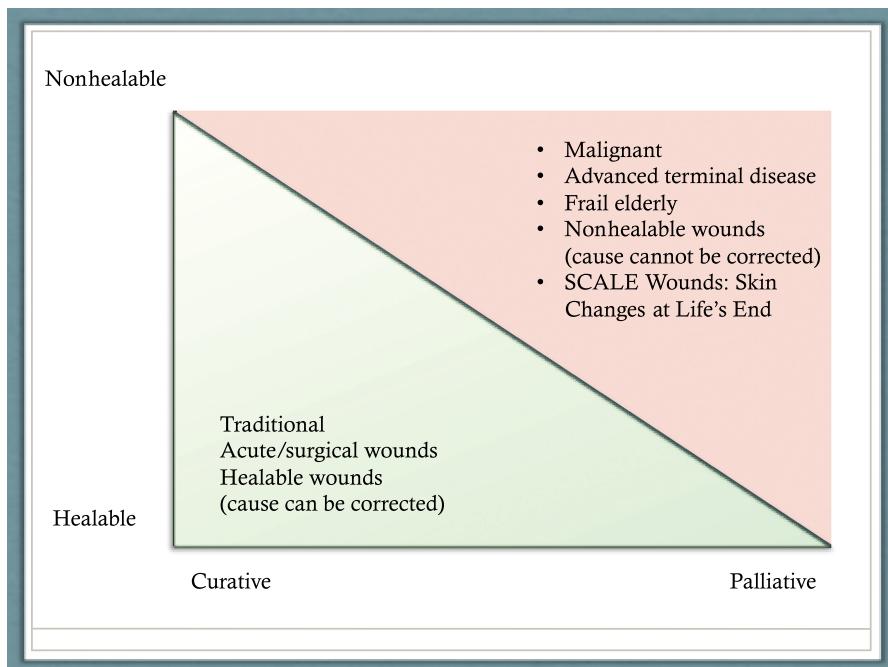
Palliative wound care is complex, dynamic, and constantly evolving to balance the individual care needs of the palliative patient and his/her circle of care.<sup>1</sup> The patient's circle of care includes the members of the patient unit including family, significant others, caregivers, and other healthcare professionals who may be external to the current interprofessional team.<sup>2</sup> When following a palliative wound care pathway, the focus shifts from traditional wound care, where healing and wound closure are the goals, to promoting comfort and dignity, relieving suffering, and improving quality of life.<sup>3</sup> Palliative care principles are adopted to meet the whole person care needs of terminally ill patients, as well as older and frailer people who often present with chronic debilitating diseases, advanced diseases associated with major organ failure (renal, hepatic, pulmonary, or cardiac), profound dementia,<sup>4</sup> complex psychosocial issues, diminished self-care abilities, and challenging wound-related symptoms, whether the wound has the potential to heal or not. The authors propose a paradigm that could be integrated along the continuum of wound care, and its relevance may vary with the individual's goals, disease processes, and wound condition (Figure 1).

## PALLIATIVE APPROACH TO WOUND CARE

The skin is the largest organ of the body and is vulnerable to wound development as a result of the deterioration of the body and multiorgan systems failure. Typical end-of-life wounds in-

**Figure 1.**

**OUTCOME-DRIVEN WOUND CARE**



are perceived to be experts in their care, and they should be empowered to take part in selecting the most appropriate treatment, monitoring response to treatment, and communicating concerns to their healthcare providers.<sup>11–13</sup>

## SAFEGUARDING AND PATIENT SAFETY

Safeguarding connotes the professional obligation to promote patients' well-being and protect human rights to live free from harm, abuse, and neglect. Palliative wound care should begin with a thorough and holistic assessment to identify the risk for wounds and PrUs and other potential skin problems (such as incontinence-associated dermatitis secondary to incontinence or skin tears due to frequent falls).<sup>14</sup> A number of instruments, such as the Palliative Performance Scale and the F.R.A.I.L. Healing Probability Assessment Tool,<sup>15</sup> have been validated for the assessment of PrU risk among individuals who are receiving palliative and end-of-life care. Some of the risk factors are advanced age, physical inactivity, immobility, poor food and fluid intake, incontinence, compromised immunity, poor oxygenation, diminished level of consciousness, and lean body types.<sup>9,16,17</sup>

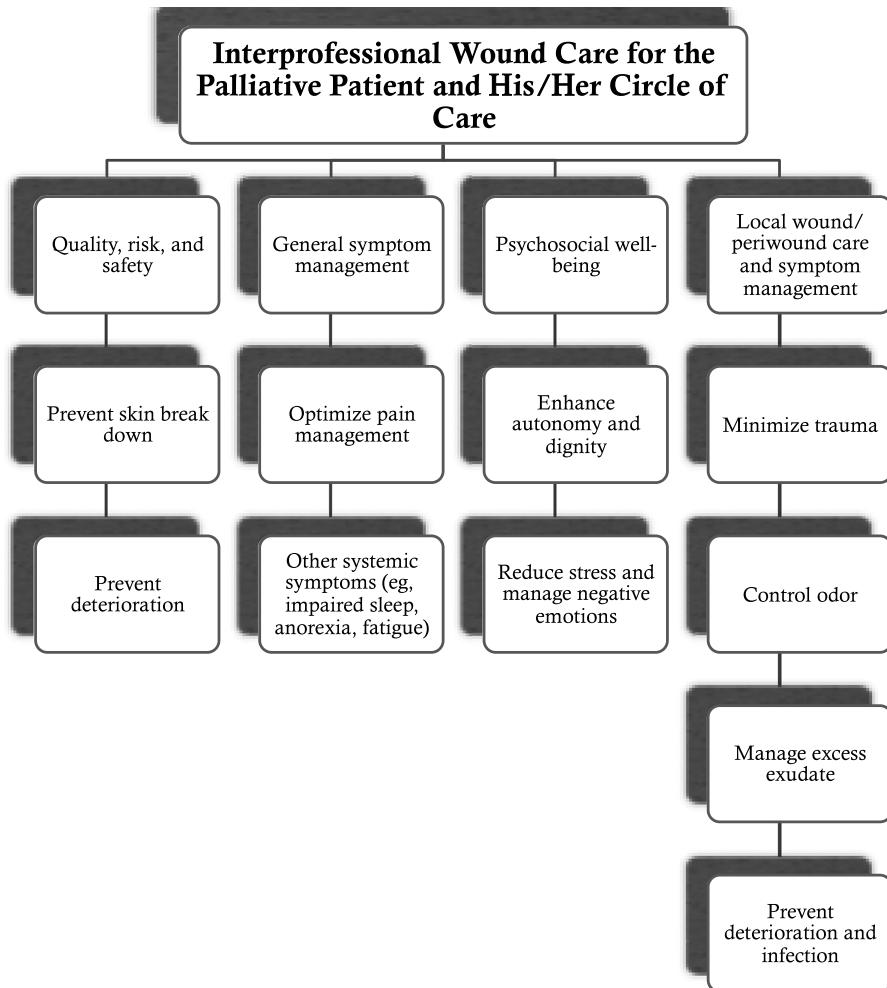
Palliative care does not preclude active treatment and other supportive strategies to prevent exacerbation of existing wounds and new wounds from developing. To prevent PrUs, at-risk in-

dividuals may benefit from therapeutic support surfaces and regular repositioning (frequency determined by the person's condition, with some clinicians recommending at least every 4 hours).<sup>18–20</sup> Although best practice recommendations are targeted at pressure redistribution and shear elimination, the plan of care must be customized to promote comfort and maintain the patient's dignity. The risk of executing the treatment plan should not outweigh the potential benefits. For example, repositioning may precipitate vascular collapse or exacerbate shortness of breath. Certain support surfaces may exacerbate dehydration or the potential for aspiration (see Table 1 for tips on surface selection). Individualized plans of care based on individual risk factors and comorbidities are essential. Such plans must be consistent with the individual patient's total plan of care and may involve a modification of the standard of care (eg, positioning for comfort versus every-2-hour turning).

Among people who develop cachexia, decreased tissue thickness is associated with more pronounced tissue deformation and increased localized stress concentration—potentially putting patients at high risk for skin breakdown. Weight loss could be attributed to physiological changes at life's end, including impaired absorption, increased metabolic demand, and decreased oral intake as a result of poor appetite, swallowing difficulties, nausea,

**Figure 2.**

**KEY COMPONENTS FOR INTERPROFESSIONAL WOUND CARE**



vomiting, taste alteration, and mucositis. Meticulous skin care after each incontinent episode, together with the use of a mild cleanser and skin protectant, may reduce irritation to the skin.<sup>21,22</sup> The role of skin surface temperature and humidity in the formation of PrUs warrants further scrutiny. An increase of 1° C in skin temperature results in approximately a 13% increase in tissue metabolic requirements, rendering the skin more vulnerable to mechanical damage.

## PAIN AND SYMPTOM MANAGEMENT

Wound-associated pain continues to be a common problem for patients, and it is described as one of the worst aspects of living with chronic wounds.<sup>23</sup> In a study of patients with malignant

breast wounds, more than 50% reported uncontrolled pain, and their pain remained unchanged over 20 months during the study.<sup>24</sup> Dallam et al<sup>25</sup> reported that two-thirds of patients with PrUs experienced severe pain. Wound-associated pain may be persistent even if the patient is resting.<sup>26</sup> The need to improve pain assessment and management is incontestable.

Many methods of pain assessment have been developed, ranging from subjective self-reports to objective behavioral checklists. Pain is a subjective experience. An individual's self-report of pain is the most reliable method to evaluate pain. Categorical scales, numerical rating scales, pain thermometers, visual analog scales, FACES scales, and verbal categorical scales are 1-dimensional tools commonly used to quantify pain in terms of intensity,

**Table 1.****SUPPORT SURFACE SELECTION CRITERIA**

<b>Indications</b>	<b>Rationale</b>
Microclimate and moisture	Low air loss for moisture problems (eg, sweating) and heat accumulation
Activity levels	Certain surfaces may hinder mobility in bed and individual's ability to get out of bed
Tissue tolerance	Tolerance to pressure and other mechanical forces is determined by local perfusion and oxygen delivery
Total body weight	Individuals with an extreme body mass index (high or low) are more susceptible to pressure damage
Repositioning needs	Repositioning surface is lacking or individual presents with condition(s) that create repositioning challenges
Edema	Dynamic pressure may aid edema management by promoting lymph flow and air circulation for weeping edema
Shear and friction	Surfaces that conform to the body may prevent sliding and associated shear damage to the tissue
Symptom management	Pain, shortness of breath, fatigue, and other associated symptoms
Existing pressure ulcer(s)	Existing pressure ulcer(s) indicates that the person is at high risk for further skin breakdown
Site	Heels are more prone to pressure ulcers; heels should be managed independently of the support surface

quality (characteristics), pain unpleasantness, and perceived pain relief.<sup>27</sup> Other assessment methodologies include physiological indicators, behavioral manifestations, functional assessments, and diagnostic tests. Clinicians should consider specific tools to evaluate neuropathic pain. To obtain a comprehensive assessment of pain, multidimensional measurements are available to evaluate the many facets of pain and its impact on daily functioning, mood, social functioning, and other aspects of quality of life. The key questions to ask about pain can be remembered by the acronym PQRSTUV:<sup>28</sup>

- **P—Provoking and palliating factors:** What makes your pain worse? What makes your pain better (eg, warm weather, walking, certain types of cleansing solutions or dressings)?
- **Q—Quality of pain:** What does your pain feel like? Descriptors (eg, burning, electrical shocks, pricking, tingling pins) may help to differentiate the 2 types of pain: nociceptive and neuropathic.
- **R—Regions and radiation:** Where is the pain, and does the pain move anywhere (eg, in and around the wound, the wound region, unrelated)?
- **S—Severity or intensity:** How much does it hurt on a scale of 0 to 10, with 0 representing no pain and 10 representing pain as bad as it could possibly be?
- **T—Timing or history:** When did the pain start? Is it present all the time? A pain diary may help to map out the temporal pattern of pain (eg, the pain worsens at night).
- **U—Understanding:** What is important to you for pain relief? How would you like to get better?
- **V—Values:** What is your comfort goal or acceptable level of pain relief? Are there any other views or feelings about the pain that are important to you or your circle of care?

In addition to pain, ask the patients if they are experiencing additional symptoms using standardized tools such as the Edmonton Symptom Assessment System-Revised.<sup>29</sup>

Pharmacotherapy continues to be the mainstay for pain management. Appropriate agents are selected based on severity and specific types of pain. The World Health Organization analgesic ladder proposes that the treatment of mild to moderate nociceptive pain should begin with a nonopioid medication, such as acetaminophen and nonsteroidal anti-inflammatory drugs.<sup>30</sup> For controlling more severe and refractory pain, opioid analgesics should be considered. Management of neuropathic pain or associated symptoms (eg, anxiety and depression) may include the possibility of adding adjuvant treatments. Three classes of medications are recommended as first-line treatments for neuropathic pain: antidepressants with both norepinephrine and serotonin reuptake inhibition (tricyclic antidepressants and selective serotonin and norepinephrine reuptake inhibitors), calcium-channel ligands (gabapentin and pregabalin), and topical lidocaine (lidocaine patch 5%). In addition to the severity and pain types, selection of appropriate medications should always take into account the characteristics of the drug (onset, duration, available routes of administration, dosing intervals, adverse effects) and individual factors (age, coexisting diseases, and other over-the-counter or herbal medications). As a general rule of thumb, analgesics should be taken at regular intervals until pain is adequately relieved. It may be necessary to consider the use of 2 or more drugs with complementary mechanisms of action that may provide greater pain relief with less toxicity and lower doses of each drug. For severe pain during dressing change, short-acting and potent narcotic analgesics, such as sublingual fentanyl (approximately

100 times more potent than morphine), should be considered. In resistant cases, general anesthesia, local neural blockade, spinal analgesia, or the use of mixed nitrous oxide and oxygen may be indicated.<sup>23</sup> Regardless of the type of systemic agents used for the treatment of pain, it is prudent to review the “4 A’s” at each assessment: analgesia, activities of daily living, adverse events, and potential aberrant drug-related behavior.<sup>31</sup>

Topical agents or dressings play a role in alleviating wound-related pain. Evidence suggests that slow-release ibuprofen foam dressings are effective in providing rapid and prolonged pain relief. Alternatively, local anesthetic, with eutectic mixture of lidocaine 2.5% and prilocaine 2.5%, has been used with favorable results to significantly reduce sharp debridement-induced pain.<sup>32</sup> To achieve optimal results, the cream mixture of lidocaine 2.5% and prilocaine 2.5% should be applied liberally on intact skin and covered with an occlusive material for 30 to 45 minutes to ensure adequate skin penetration. Although data on pharmacokinetics are limited, the amount of transdermal absorption depends on surface area and duration of application. When 21 g topical lidocaine gel (containing 1050 mg of lidocaine) was applied over 420 cm<sup>2</sup> of skin on the center of the back for 12 hours, the mean absorbed dose of lidocaine was 100 mg (55 mg).<sup>33</sup> The level is below the concentrations anticipated to give rise to systemic toxicity.<sup>34</sup> Several investigations reported successful use of topical morphine for the treatment of open wound pain. Hydrogel is

mixed with an aqueous form of morphine (injectable solution). Other options are described in Table 2. There are potential advantages to using local rather than systemic treatment. Any active agent is delivered directly to the affected area, bypassing the systemic circulation, and the dose needed for pain reduction is low with minimal risk of adverse effects. However, because of the paucity of research, it is prudent to monitor the effectiveness and maintain vigilance for the possibility of associated toxicity from systemic absorption.

Wound-associated pain is frequently experienced during dressing changes.<sup>35</sup> Dressing materials may adhere to the fragile wound surface because of the glue-like nature of dehydrated or crusted exudate; each time the dressing is removed, potential local trauma may evoke pain. Granulation tissue and capillary loops that grow into the product matrix, especially gauze, can also render dressing removal traumatic. According to a review of dressings and topical agents for secondary intention healing of postsurgical wounds, patients experienced significantly more pain with gauze than other types of dressings including foam, alginate, and hydrocolloid dressings.<sup>34</sup> Nonetheless, gauze continues to be one of the commonly used dressing materials indicating a need to bridge research to practice.<sup>36</sup> Careful selection of dressings withatraumatic and nonadherent interfaces, such as silicone, has been documented to limit skin damage/trauma with dressing removal and minimize pain at dressing changes.

**Table 2.**  
**TOPICAL OPIOIDS AND ANESTHETICS**

Drug	Comments
Morphine 0.1% (25 mg in 25 g of hydrogel) <sup>38–40</sup> (use morphine sulfate injection 10 mg/mL, or higher concentration—preferably without preservative)	20% systemic absorption has been reported, <sup>41</sup> as well as 75%; wound size dependent <sup>45–47</sup>
For convenience, 10 mg morphine in 8 g size of hydrogel (0.125%) is also often used. <sup>41–43</sup> Stable for 28 d. <sup>44</sup>	None has occurred in small wounds <sup>41</sup>
Onset of pain relief reported within 20 min to a few hours. <sup>45</sup>	If hydrogel is too drying, a petroleum base has been suggested as an alternative
Apply 1–3 times daily (relief lasts 2–45 h) <sup>38</sup>	Adverse effects reported; itching, burning <sup>42,48</sup>
Hydromorphone 0.02% in lidocaine 2% gel or 5% ointment. Recommended to use 50 mg/mL injection strength to minimize dilution of base. <sup>49</sup>	No published studies
Methadone powder 1% 100 mg in 10 g of stoma powder and distributed on wound (sprayed) from a 60-mL syringe or in arboxymethylcellulose gel <sup>50</sup>	4 Case study patients. Worked best with exudative wounds with exposed tissue
Applied 25 mg of methadone per 225 cm <sup>2</sup> once daily. <sup>51</sup>	4% systemic absorption reported, in 16-cm <sup>2</sup> wound <sup>51</sup>
Diamorphine (medical heroin) 0.1% in hydrogel <sup>52–54</sup>	Similar effectiveness to morphine 0.1% <sup>55</sup>
Ketamine gel 1% (100 mg in 10 g of base) pain relief within 15 min applied 3 times daily. Duration of effect reported as short as 2.5 h	Less stable in hydrogel gel <sup>4</sup>
Application dose is 0.13–0.37 mg of ketamine per kg of patient weight <sup>56</sup>	Sedation, lightheadedness, sensation of warmth have occurred <sup>56</sup>
Ketamine 10%, with bupivacaine 4% Q.S. in a petroleum base <sup>57,58</sup>	Not for open wounds because of risk of irritation <sup>57,59</sup>

Next to dressing removal, wound cleansing is also likely to evoke pain during the dressing change.<sup>37</sup> The routine practice of using abrasive materials and gauze to scrub the wound surface is discouraged. Techniques that involve compressing and irrigation may be less traumatic and painful. Irrigation may not always be appropriate for wounds with extensive and deep tunnels or undermining that allows irrigant to accumulate. In the presence of

unexpected pain or tenderness, clinicians should consider antimicrobial therapy for wound infection (Table 3).

Education is a key strategy to empower patients/residents and their circles of care and to improve wound-related pain control (Table 3). They should be informed of various treatment options and be empowered to be active participants in care. Being an active participant involves taking part in the decision making for

**Table 3.**  
**MULTIFACETED STRATEGIES FOR PAIN MANAGEMENT**

Strategy	Objectives
Education for patient and his/her circle of care	<ul style="list-style-type: none"> <li>• Web-based learning</li> <li>• Face-to-face education: <ul style="list-style-type: none"> <li>◦ Explain mechanism of pain</li> <li>◦ Dispel misconceptions about pain</li> <li>◦ Address concerns about addiction</li> <li>◦ Emphasize the availability of multiple strategies</li> </ul> </li> </ul>
Pharmacological	<ul style="list-style-type: none"> <li>• Topical: <ul style="list-style-type: none"> <li>◦ Topical ibuprofen (dressing)</li> <li>◦ Morphine</li> <li>◦ Topical lidocaine</li> </ul> </li> <li>• Systemic <ul style="list-style-type: none"> <li>◦ Nociceptive pain: ASA, NSAIDs, acetaminophen for mild to moderate pain</li> <li>◦ Opioids for moderate to intense pain</li> <li>◦ Neuropathic pain: SNRI, anticonvulsants</li> </ul> </li> </ul>
Local wound care	<ul style="list-style-type: none"> <li>• Atraumatic interface (silicone)</li> <li>• Sequester: remove inflammatory mediators</li> <li>• Protect periwound skin</li> <li>• Treat infections</li> <li>• Demonstration/return demonstration</li> </ul>
Physical therapies	<ul style="list-style-type: none"> <li>• Heat or cold; massage and vibration; positioning, pressure reduction and pressure relief therapies, exercise, transcutaneous electrical nerve stimulation, and laser therapy</li> </ul>
Energy therapies	<ul style="list-style-type: none"> <li>• Qi gong, therapeutic touch, Reiki, and healing touch</li> </ul>
Anxiety reduction	<ul style="list-style-type: none"> <li>• Distractions, education, support groups, imagery, relaxation and breathing, mindfulness meditation, hypnosis, biofeedback, music therapy, art therapy, counseling</li> </ul>
Cognitive therapy	<ul style="list-style-type: none"> <li>• Cognitive behavior therapy, problem-solving skills, positive thinking</li> </ul>
Therapeutic alliance	<ul style="list-style-type: none"> <li>• Communication techniques, eg, reflective listening</li> <li>• Goal setting</li> <li>• Align expectations</li> <li>• Demonstrate sympathy</li> <li>• Allow individual to call “time out”</li> <li>• Respect individual’s choices</li> <li>• Maximize autonomy: active participation</li> <li>• Functional-focused therapy</li> </ul>
Empowerment	

Abbreviations: ASA, acetylsalicylic acid; NSAID, nonsteroidal anti-inflammatory drugs; SNRI, serotonin–norepinephrine reuptake inhibitors

the most appropriate treatment, monitoring response to treatment, and communicating concerns to healthcare providers. Common misconceptions about pain management should be addressed.

Fear of addiction and adverse effects has prevented patients/residents and their circles of care from utilizing regular analgesics. In a pilot study, 5 chronic wound patients described dressing change pain as being more manageable after receiving educational information.<sup>38</sup> Pain-related education is a necessary step in effecting change in pain management by debunking common misconceptions and myths that may obstruct effective pain management. Cognitive therapy that aims at altering anxiety by modifying attitudes, beliefs, and expectations by exploring the meaning and interpretation of pain concerns has been shown to be successful in the management of pain (Table 3). This may involve distraction techniques, imagery, relaxation, or altering the significance of the pain to an individual.

## Pruritus

Pruritus is a common and distressing symptom in people with chronic wounds.<sup>60</sup> Paul et al<sup>61</sup> documented that of 199 people with chronic wounds 28.1% complained of itch. Peripheral pruritus is often triggered by pruritogens (eg, histamine, serotonin, cytokines, and opioids) giving rise to signals that are transmitted via pain-related neuronal pathways and terminated in the somatosensory cortex where the sensation of itch is perceived.<sup>62</sup> In contrast, central pruritus is associated with psychiatric disorders or damages to the nervous system mediated through opioid and serotonin receptors. For patients with wounds, itch is commonly caused by peripheral stimulation of itch receptors due to irritation of the skin and related dermatitis. People with chronic wounds are exposed to a plethora of potential contact irritants accounting for approximately 80% of all cases of contact dermatitis.<sup>63</sup>

Excessive washing and bathing strip away surface lipid and induce dryness that can exacerbate pruritus. To replenish skin moisture, humectants or lubricants should be used on a regular basis. Drug treatment with paroxetine, a selective serotonin re-uptake inhibitor, and gabapentin has been shown to be beneficial in palliative care patients.<sup>64,65</sup>

## Psychosocial Well-being

It is undisputable that skin breakdown constitutes a significant source of emotional distress to patients and their circles of care.<sup>66,67</sup> Using a qualitative approach, Lo et al<sup>67</sup> interviewed 10 patients living with malignant fungating wounds. A recurring theme emerged that articulated the bleak feeling of isolation due to wound-related stigma.<sup>67</sup> Individualized education and appropriate information should be provided to help patients understand the parameters of care. Probst et al<sup>68</sup> examined the experience of living with a fungating breast wound. Participants described suffering and distress that stemmed from uncontrollable symp-

toms, such as odor, bleeding, exudate, pain, and itching.<sup>68</sup> Similar results were reported by Lo et al.<sup>69</sup> Together, age, odor, pain, and psychological issues are predictors for quality of life constituting 87% of the total variance.

## LOCAL WOUND CARE

### Trauma and Bleeding

Granulation tissue within a malignant wound is often friable and bleeds easily because of local stimulation of vascular endothelial growth factor, resulting in excess formation of abundant but fragile blood vessels.<sup>70</sup> Reduced fibroblast activity and ongoing thrombosis of larger vessels in infected and malignant wounds may compromise the strength of collagen matrix formation rendering the granulation less resilient to trauma. Even minor trauma from the removal of wound dressings that adhere to the wound surface can provoke bleeding.

Repeated application and removal of adhesive tapes and dressings pull the skin surface from the epithelial cells, and this can precipitate skin damage by stripping away the stratum corneum.<sup>70</sup> Dressing-related trauma is associated with wound enlargement, increased exudate, bleeding, pain, inflammation, and anxiety.<sup>71</sup> Dressings with silicone adhesive are the least likely to cause maceration<sup>72</sup> and skin damage with repeated application.<sup>73</sup> To protect periwound skin, a number of sealants, barriers, and protectants, such as wipes, sprays, gels, and liquid roll-ons, are useful on the periwound skin.<sup>74</sup> See Table 4.

### Odor

Unpleasant odor and putrid discharge are associated with increased bacterial burden, particularly involving anaerobic and certain gram negative (eg, *Pseudomonas*) organisms. In studies of patients with fungating breast lesions, odor was noticeable with the presence of strict anaerobes, polymicrobial colonization (>4 bacterial species), and increased bacterial counts reaching a threshold of greater than  $10^5$  colony-forming units per gram in the tissue samples.<sup>24,75</sup> Metabolic by-products that produce this odor include volatile fatty acids (propionic, butyric, valeric, isobutyric, and isovaleric acids), volatile sulfur compounds, putrescine, and cadaverine.<sup>14</sup> To eradicate wound odor, metronidazole as an anti-inflammatory and anti-infective agent against anaerobes has been demonstrated to be efficacious.<sup>76</sup> Topical application of metronidazole is readily available as a gel and cream. Alternatively, gauze can be soaked with an intravenous metronidazole solution to use as a compress, or tablets can be ground into powder and sprinkled onto the wound surface.<sup>77</sup> Some individuals derive the greatest benefit if the metronidazole is administered orally. According to a systematic review of topical agents for the management of fungating wounds, there is evidence to indicate that foam dressings containing silver are more

**Table 4.****STRATEGIES TO PROTECT PERIWOUND SKIN**

<b>Types</b>	<b>Advantages</b>	<b>Disadvantages</b>
Silicone (1%–5%) Polymers, including polydimethylsiloxane and dimethicone	Hydrophobic and water-repelling properties Viscoelastic that makes it easy to spread in room temperature Leave skin smooth and silky to touch Allergy is rare	Certain types of silicone products are more viscous and tacky
Zinc oxide: inorganic compound	May be mixed with calamine lotion Cost-effective and good availability	Leaves a white residue on skin Difficult to remove residue and vigorously cleansing may injure fragile tissue Interferes with tapes and adhesives may remain on the skin
Petrolatum (white petrolatum, soft paraffin, mineral oil): mixture of hydrocarbons	Colorless and translucent Relatively cheap and accessible Hydrophobic	Occlusive nature of the material may cause folliculitis Flammable and should not be used around oxygen Dissolves latex
Acrylates and cyanoacrylate (superglues): plastic-like substances	Resistance to breakage Available in sprays or wipes Translucent	Facilitate visualization of periwound skin
Hydrocolloids: carboxymethylcellulose	Moisture retentive Water repellent Wet tack on open areas Window frame the wound margin to prevent recurrent stripping of skin	Occlusive or semiocclusive Allergies have been reported from some colophony-related adhesives associated with some hydrocolloid dressings

effective in reducing odor than nonsilver dressings.<sup>76,78</sup> Honey-coated dressings seem to be as effective in the management of odor and wound pain as silver dressings. Activated charcoal dressings have been used to control odor, but their effectiveness remains equivocal. Povidone-iodine is a broad-spectrum topical antiseptic that has been recommended for nonhealable wounds to reduce bacterial burden and associated odor.<sup>79</sup>

### Exudate

Wound exudate contains endogenous protein-degrading enzymes, known as proteases or proteinases that are extremely corrosive and damaging to the intact skin. According to a recent study of periwound skin in patients with fungating breast lesions, moisture-associated dermatitis is a common problem due to wound exudate leakage.<sup>80</sup> Excessive moisture also creates an ideal wound environment for bacteria to proliferate, especially when the host defense is compromised. Moisture is usually contraindicated in nonhealable wounds; hydrating gels and moisture-retaining

dressings (hydrocolloids) typically should be avoided if the wound is nonhealable.<sup>14</sup> To contain and remove excess exudate from the wound, a plethora of absorbent dressings have been developed. Major categories of dressings include foams, alginates, and hydrofibers. When drainage volume exceeds the fluid-handling capacity of a dressing, enzyme-rich and caustic exudate may spill over the wound margins causing maceration or tissue erosion (loss of part of the epidermis but maintaining an epidermal base) and pain.<sup>81</sup> Irritant dermatitis is not uncommon from the damage of wound effluent; topical steroids continue to be the mainstay therapy.

The moist and warm wound environment is also ideal for proliferation of fungi and yeast including *Candida*. Individuals with coexisting conditions that affect the immune system (such as diabetes mellitus, kidney disease, and hepatitis C) or receiving immunosuppressive drugs (eg, steroids) or chemotherapy are more susceptible to fungal infection. In addition, antibiotic use may disrupt the normal ecology of skin flora permitting the overgrowth of fungi.

## CONCLUSION

The principles of palliative wound care are becoming more relevant in clinical practice because of shifting demographics, increasing wound complexity, and more complex palliative patient profiles. Starting with an assessment of the whole person, it is important to maintain high quality of care, manage general symptoms, address psychosocial concerns, and implement strategies aimed at minimizing the unpleasant impact of living with a chronic wound for the patient with a palliative wound and his/her circle of care.

## PRACTICE PEARLS

- Patient safeguarding is an important concept in palliative care, connoting the professional obligation to promote patients' well-being and protect human rights to live free from harm, abuse, and neglect.
- Pharmacotherapy is the mainstay for pain management; select appropriate agents based on severity and specific types of pain.
- Topical agents such as slow-release ibuprofen foam dressings, topical opioids, and local anesthetic, with eutectic mixture of lidocaine 2.5% and prilocaine 2.5%, are effective in providing pain relief without excessive systemic adverse effects.
- Pruritus is a common symptom, and drug treatment with paroxetine, a selective serotonin reuptake inhibitor, and gabapentin has been shown to be beneficial in palliative care patients.
- To eradicate wound odor, metronidazole as an anti-inflammatory and anti-infective agent against anaerobes has been demonstrated to be efficacious.

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