Wound Care at End of Life

A Guide for Hospice Professionals

2nd Edition

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DISCLAIMER: All clinical recommendations contained herein are intended to assist with determining the appropriate wound therapy for the patient. Responsibility for final decisions and actions related to care of specific patients shall remain the obligation of the institution, its staff, and the patients attending physicians. Nothing in this document shall be deemed to constitute the providing of medical care or the diagnosis of any medical condition. Use of product brand names are intended to assist the clinician in identifying products and does not connote endorsement or promotion of any kind. No financial support for the development of this book was provided by any product vendor or manufacturer.
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To the Staff of Optum Hospice Pharmacy Services
The authors wish to thank all of our colleagues for their assistance in the creation of this resource. Without their generous support this work would not have been possible. Their compassionate commitment to improving end of life care for all individuals is an inspiration.

This book provides guidance for the assessment and palliative management of wounds. Many factors influence whether healing a wound is a realistic goal. Whether the goal is for healing or for symptom relief, untreated wounds can lead to physical discomfort and impair quality of life. It is necessary that they receive appropriate intervention.

How to Use This Book
Wound Care at End of Life is a quick reference guide for palliative management of wounds in hospice care. The authors and collaborators have systematically reviewed and collected the pertinent literature and resources related to palliative wound care.

- For those already skilled in wound care, this book is a resource for support of current practices and a quick treatment lookup tool.
- For those with less wound care experience, this book can serve as a learning guide and resource to ensure best practices for palliative wound management.
- For educators, this book may be used as a training guide to address the basics of palliative wound care and assist learners in developing a comprehensive plan of care for the patient with wounds.
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INDEX
DIABETIC FOOT ULCERS

GOALS

Within the confines of the patient’s prognosis and in alignment with the wishes of the patient and family:

- Maintain skin integrity with individualized prevention strategies
- Preserve existing areas of ulceration to prevent infection and gangrene
- Relieve distressing symptoms and promote quality of life

DEFINITIONS

A **diabetic foot ulcer** is an ulceration that presents on the foot of a diabetic patient. Diabetic foot ulcers fall into three categories: neuropathic, ischemic, and neuroischemic. The **neuropathic diabetic foot ulcer** is secondary to **lower extremity neuropathic disease (LEND)**. An individual with lower extremity neuropathic disease will demonstrate sensory, motor, and autonomic neuropathy. Sensory neuropathy leads to the loss of sensation in the foot putting the patient at risk of injury from trauma. Motor neuropathy leads to deformities of the foot placing the patient at risk of abnormal pressure to the bony prominences of the foot, callus formation, and subsequent ulceration. Autonomic neuropathy results in a reduction of oil and moisture to the foot, which will manifest as dry skin that may peel or fissure, placing the patient at risk of developing an infection. Diabetic foot ulcers are also associated with lower extremity arterial disease, either purely ischemic (**ischemic diabetic foot ulcers**) or a combination of neuropathy and ischemia (**neuroischemic diabetic foot ulcers**).1

ASSESSMENT

Diagnose neuropathic diabetic foot ulcers based on distinguishing characteristics (see Table 4).1,2,3 Identify neuropathy using the monofilament test and tuning fork. An Ankle Brachial Index rules out ischemic and neuroischemic ulcers in the diabetic patient population. An Ankle Brachial Index of 0.90 or less indicates that arterial disease is present; however, the Ankle Brachial Index can be greater than 1.30 in the diabetic patient, which means that the arteries of the ankle are calcified. If this occurs, obtain a Toe Brachial Index (TBI). The TBI is equal to the toe systolic pressure divided by the brachial systolic pressure. A TBI less than 0.64 indicates that arterial disease is present.2

Use the Wagner classification system to grade the severity of the diabetic foot ulcer. This classification system assigns a grade ranging from 0 (no ulcers present) to 5 (gangrene of the entire foot) by evaluating ulcer depth, presence of gangrene, and loss of perfusion.1
Table 4. Presentation of Diabetic Foot Ulcers

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Neuropathic</th>
<th>Ischemic</th>
<th>Neuroischemic</th>
</tr>
</thead>
</table>
| Location       | • Plantar surface of foot  
• Areas of the foot that bear weight – heel, ball of the foot, great toe | • Margins of the feet and toes  
• Tips of toes | • Margins of the feet and toes  
• Tips of toes  
• Under thickened toe nails |
| Etiology       | • Neuropathy (assess using the monofilament test and tuning fork) with unrecognized pressure to bony prominences or trauma as sources of injury | • Ischemia from lower extremity arterial disease with trauma as a source of injury (e.g., poorly fitted shoes) | • Combination of neuropathic changes of the foot and ischemia from lower extremity arterial disease |
| Wound Bed      | • May be hidden under thick callus or have callus around perimeter  
• Pink; granulation tissue possible  
• Round and “punched out” | • May present as a blister  
• Necrosis likely  
• Pale in color  
• Granulation reduced/absent | • May present as a red area  
• If callus is present, may be minimal  
• Necrosis possible  
• Granulation reduced/absent |
| Appearance of Foot | • Dry, flakey skin, fissures  
• Deformities  
• Warm | • Cool  
• Pulses absent  
• Thin, shiny, hairless skin | • Cool  
• Pulses absent  
• Thin, shiny, hairless skin |
| Pain           | • Usually painless due to numbness and loss of sensation | • Painful | • May be present or absent |

PLAN OF CARE

Develop an individualized plan of care to prevent the development of or treat existing diabetic foot ulcers to guide the actions of all members of the interdisciplinary team. The care plan serves to translate the data gained from completion of the comprehensive assessment into a specific plan of action to prevent or manage diabetic foot ulcers. Table 5 includes potential care plans for diabetic foot ulcers.

Table 5. Plan of Care for Diabetic Foot Ulcers

<table>
<thead>
<tr>
<th>Nursing Diagnosis</th>
<th>Related Factors</th>
<th>Interventions</th>
</tr>
</thead>
</table>
| Risk for Impaired Skin Integrity | • Advanced age  
• Alcohol abuse  
• Chemotherapy  
• Diabetes  
• Pressure  
• Cardiovascular disease  
• Lower extremity arterial disease  
• Kidney disease  
• Smoking  
• Knowledge deficit  
• Trauma | • Assess skin, note areas of discoloration, texture, or temperature and any existing skin alterations  
• Relieve pain if present  
• Revascularization surgery if ischemia is present  
• Maintain adequate nutrition and hydration  
• Offload pressure and assist with ambulation  
• Protect from lower extremities from trauma – monitor lower extremities and feet daily  
• Assess skin alteration and determine etiology, reassess regularly, monitor daily  
• Diabetic foot care  
• Localized wound care, prevent/treat infection |
INTERVENTIONS

Prevention
Diabetic foot ulcers are undesirable because they fail to heal and often become infected. Gangrene and the subsequent necessity for amputation are also possible. Therefore, prevention of the diabetic foot ulcer should continue to be a focus for the palliative care patient. Instruct the patient to:³

- Check feet daily – both looking and feeling
- Wash feet with warm water and dry thoroughly (even between the toes)
- Apply moisturizer to the feet but never between the toes
- Ensure socks and shoes fit well – not too loose or too tight
- When ambulating, shoes should always be worn – never barefoot
- Cut toenails straight across
- Rotate shoes throughout the day to vary the pressure on the feet
- Refrain from soaking the feet or self-trimming a callus (may use a pumice stone)
- Protect the feet from trauma while in bed (e.g., float heels), during transfers from bed (e.g., sheepskin or foam boots), and while ambulating (e.g., good-fitting shoes, offload pressure with assistive devices)

Localized Wound Care
Treatment of the diabetic foot ulcer varies based on the underlying cause. If ischemia is present, revascularization of the leg may be necessary to achieve wound healing. Tight glycemic control, smoking cessation, and maximizing nutrition are critical. The source of trauma needs to be reversed, whether it is from ill-fitting footwear, deformities of the foot, or the presence of a foreign body. The pressure of the foot must be offloaded, usually through the use of a total contact cast or assistive devices. The callus will need debridement, with sharp debridement being the method of choice. If gangrene is present, amputation is a possible outcome. Collectively, these treatment options impose significant burden on the patient and may not be practical at the end of life. Therefore, for the palliative management of the diabetic foot ulcer, the primary goal will be the prevention of infection and symptom management. Principles of moist wound healing and wound bed preparation will govern the dressing selection for the neuropathic diabetic foot ulcer. ³⁵ Conversely, principles of dry wound healing will govern dressing selection if ischemia is severe and wound healing is unlikely.⁶⁷ Use the following algorithms and treatment grids to assist in selecting an appropriate dressing.
# WOUND TREATMENT GRID: Diabetic Foot Ulcers

<table>
<thead>
<tr>
<th>Wound Need</th>
<th>Intervention</th>
<th>Comments</th>
</tr>
</thead>
</table>
| **Cleanse** | - Clean wound bed: pour normal saline or wound cleanser  
- Infection/necrosis: irrigate with wound cleanser or antiseptic* | - Irrigate with 4-15 psi: piston syringe (4.2 psi), squeeze bottle+irrigation cap(4.5 psi), 35 mL syringe+18 gauge needle (8 psi) |
| **Debridement** | - Dry: hydrogel, hydrocolloid  
- Moist: calcium alginate, hydrocolloid, hydroconductive  
- Infected: silver alginate, cadexomer iodine, hydroconductive | - Neuropathic: Sharp debridement of callus.  
- Ischemia: Debridement is NOT recommended unless perfusion status is known. See Arterial Ulcer Algorithm, page 65 |
| **Exudate** | - None/Minimal Exudate: hydrogel, hydrocolloid, PMD*  
- Moderate Exudate: foam, calcium alginate, PMD*  
- Heavy Exudate: GFD* (Hydrofiber®), hydroconductive, PMD*  
- Stable eschar: paint perimeter with povidone-iodine | - Monitor daily – rapid deterioration of the wound is possible  
- Cautious use of occlusive dressings  
- PMDs* can be used on all exudate levels – moisten with saline if wound bed is dry |
| **Infection** | - None/Minimal Exudate: honey, hydrogel with silver  
- Moderate Exudate: silver alginate, honey alginate, silver foam  
- Heavy Exudate: GFD* (Hydrofiber®) with silver, cadexomer iodine, hydroconductive | - Decreased inflammatory response so only subtle signs of an infection may be present  
- Can lead to gangrene; rule out osteomyelitis  
- Systemic antibiotics are necessary – wound culture guides selection* |
| **Malodor** | - Cleansers*: hypochlorous acid (Vashe®), sodium hypochlorite (Dakin's® 0.125%)  
- Dressings: cadexomer iodine, honey, charcoal, silver, essential oils (wintergreen or lavender) on dressing  
- Environmental strategies: kitty litter, vanilla extract, coffee grounds, or dryer sheets placed in room | - Rule our infection  
- Wound cleansing aids odor control.  
- Change dressing more often to manage odor (e.g., hydrocolloid every 24-48 hours).  
- Hydrocolloid dressings tend to create odor (doesn't mean infection is present) |
| **Dead Space** | - None/Minimal Exudate: hydrogel, PMD*  
- Moderate Exudate: foam, calcium alginate, PMD*  
- Heavy Exudate: GFD* (Hydrofiber®), hydroconductive, PMD* | - Loosely fill any dead space.  
- Products are available in different forms, such as roping, to pack tunnels |
| **Pruritus** | Not usually associated with the wound, assess surrounding skin. | Evaluate for contact dermatitis, hypersensitivity, or yeast dermatitis |
| **Bleeding** | - Dressing strategies: calcium alginate (silver alginate is not hemostatic), non-adherent dressing, or coagulants (gelatin sponge, thrombin)  
- Topical/local strategies: sclerosing agent (silver nitrate), antifibrinolytic agent (tranexamic acid), astringents (alum solution, sucralfate), vasoconstrictive agents [topical oxymetazoline (Afrin®), topical epinephrine] | - Atraumatic removal of dressings – irrigate with normal saline to remove dressings  
- Ask: Is transfusion appropriate? Is patient on warfarin? Is the wound infected?  
- Consider checking: platelet count, PT/INR, vitamin K deficiency  
- Use topical vasoconstrictors only when bleeding is minimal, oozing, or seeping |
| **Support Surface** | - Consider the need for a support surface if pressure was causative injury leading to ulceration | - What was the causative injury? |
| **Nonpharmacological Interventions:** | **Pharmacological Interventions:** | - Rule out infection and wound deterioration  
- Neuropathic diabetic foot ulcers can be painful due to loss of sensation  
- Consider placing: hydrocolloid, foam, calcium alginate, PMD*, soft silicone, or hydrogel |

*Cleansers: Rinse wound bed with normal saline after using antiseptic cleanser to minimize toxic effects  
PMD: polymeric membrane dressing (PolyMem*)  
GFD: Gelling fiber dressing  
*Topical Antibiotics: Use of a topical antibiotic is NOT recommended due to the potential for adverse reactions and antimicrobial resistance
Treatment Algorithm for Diabetic Foot Ulcer

1. Diabetic Foot Ulcer
   - Discuss & set realistic goals of care: preservation, prevention, patient preference, prescription, palliation.
2. Evaluate & modify plan of care for prevention & management of diabetic foot ulcers.
3. Assess lower extremity for perfusion and vascular status.

   - Clean wound?
     - Yes → Slough/Eschar?
       - Yes → Choose Dressing:
         - Calcium alginate
         - Hydrocolloid
         - Hydroconductive
       - Choose Dressing:
         - Hydrogel
         - Hydrocolloid
       - Address any distressing symptoms (pain, odor, bleeding, puritus)
     - No → Mold?
       - Yes → Interventions:
         - Systemic antibiotic if appropriate
         - Choose dressing based on exudate
       - No → Moisten?
         - Yes → Interventions:
           - No debridement
           - Protect w/ povidone-iodine or antiseptic
         - Choose Dressing:
           - Hydrogel
           - Silver
           - Hydrocolloid
       - Choose Dressing:
         - Hydrogel
         - Hydrocolloid
         - PolyMem®
   - No → Stable, attached, non-infected, dry eschar?
     - Yes → Choose Dressing:
       - Calcium alginate
       - Hydrocolloid
       - Hydroconductive
     - No → Interventions:
       - No debridement
       - Protect w/ dry gauze dressing
     -讨论:
       - Healing likelihood improved with surgical/ sharp debridement of callus.
   - Elevate heels, moisten skin, good-fitting shoes, protect from trauma.

4. If perfusion inadequate, consider following Arterial Ulcer Algorithm

5. Reassess wound
   - No
   - Yes → Infection?
     - Yes → Interventions:
       - Systemic antibiotic
       - Wound consult
     - No → Choose Dressing:
       - Calcium alginate
       - Hydrocolloid
       - Hydroconductive

6. Monitor daily
   - Reassess weekly & PRN
   - Reassess current plan: Adjust therapy if needed
   - Discuss achievable/acceptable goals

7. Goal met → Yes → Maintain therapy
   - Monitor

8. *Use in conjunction with details in wound treatment grid.

*Cleanse w/ normal saline or wound cleanser; Protect w/ liquid barrier film.
KEY POINTS

- Diabetic foot ulcers are defined as any skin alteration in the foot of the diabetic patient. They fall into three categories: neuropathic, ischemic, and neuroischemic.
- Because diabetic foot ulcers are associated with a decrease in quality of life, prevention strategies should continue in the palliative care population.
- Principles of moist wound healing and wound bed preparation will govern the dressing selection for the neuropathic diabetic foot ulcer.

CASE STUDY

The nurse is admitting a 64-year-old male patient to hospice with a primary diagnosis of malignant melanoma. While performing a head to toe assessment, the nurse notes a diabetic ulcer to the plantar surface of the right great toe. The nurse performs a comprehensive wound assessment and documents the following:

Full thickness diabetic neuropathic ulcer to the plantar surface of the right great toe measuring 1.3 x 1.9 x 0.7 cm. Wound bed with 100% granulation tissue. Callus surrounds the perimeter of the wound. Moderate serous exudate. No odor, redness, induration, or edema noted. Surrounding tissue is warm, dry, and intact. Numeric pain score 2/10 during wound assessment. ABI is 0.8, and capillary refill is within normal limits. The patient denies the use of any prevention strategies at this time. The patient reports having custom orthotic shoes but stopped wearing them after being diagnosed with cancer. Comorbidities include hyperlipidemia and hypertension. The patient is taking comfort medications only. The patient eats approximately 75% of all meals and weight is stable at 182 pounds. The patient ambulates independently. PPS is 50%. The patient does not wish to pursue intensive treatment for this wound, including surgical/sharp debridement of callus. The family currently cares for the wound by washing daily with soap and water and applying a gauze dressing.

The nurse educates the patient and family on preventive strategies for diabetic foot ulcers to prevent further injury to the patient’s feet. The nurse suggests discontinuing the gauze dressing because this places the patient at increased risk of developing an infection. Instead, the nurse recommends an absorptive dressing. The nurse notifies the physician of her assessment and recommendations. The physician agrees with the nurse’s assessment and provides the following wound care orders:

- Cleanse diabetic foot ulcer plantar surface of the right great toe with normal saline. Pat periwound tissue dry. Loosely fill dead space with calcium alginate and cover with a foam dressing. Secure with tape. Change every three days and as needed if soiled.

The nurse reviews the wound care orders with the family, and the family is agreeable to the plan of care. The nurse provides education regarding the application of the dressing. The patient and family return-demonstrate the procedure.
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Wound Care at End of Life is a quick reference guide for palliative management of wounds in hospice care.

- For those already skilled in wound care, this book is a resource for support of current practice and a quick treatment lookup tool.

- For those with less wound care experience, this book can serve as a learning guide and resource to ensure best practices for palliative wound management.

- For educators, this book may be used as a training guide to address the basics of palliative wound care and assist learners in developing a comprehensive plan of care for the patient with wounds.