

# Comprehensive Wound Management: Best Practices for Nurses

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## ABSTRACT

Wound healing is a complex physiological process that restores the functionality of skin and tissues following injury. This healing process is influenced by a range of external and internal factors that can either facilitate or impede progress. In delivering wound care, nurses collaborate with other healthcare team members to evaluate and address these factors to ensure an optimal healing environment for the patient (Cox, 2019, p. 101). Specialized care is often necessary for complex wounds.

Certified wound care nurses are responsible for assessing, treating, and developing care plans for patients experiencing complex wounds, ostomy issues, and incontinence. Additionally, they serve as educators and consultants for staff nurses and other healthcare professionals. This review will cover fundamental aspects of wound care targeted at entry-level nurses. A consultation with a certified wound care nurse is advised when caring for patients with complex or non-healing wounds.

**KEYWORDS:** healing, nurses, healthcare.

## 1. Introduction

Wound healing is a complex physiological process that restores the functionality of skin and tissues following injury. This healing process is influenced by a range of external and internal factors that can either facilitate or impede progress. In delivering wound care, nurses collaborate with other healthcare team members to evaluate and address these factors to ensure an optimal healing environment for the patient (Cox, 2019, p. 101).

Specialized care is often necessary for complex wounds. Certified wound care nurses are responsible for assessing, treating, and developing care plans for patients experiencing complex wounds, ostomy issues, and incontinence. Additionally, they serve as educators and consultants for staff nurses and other healthcare professionals. This review will cover fundamental aspects of wound care targeted at entry-level nurses. A consultation with a certified wound care nurse is advised when caring for patients with complex or non-healing wounds.

The provision of fundamental care presents a significant challenge for nurses and nursing aides globally. Fundamental care is described as “care that involves actions on the part of the nurse that respect and focus on a person’s essential needs to ensure their physical and psychosocial wellbeing. These needs are met by developing a positive and trusting relationship with the person being cared for as well as their family/carers” (Feo et al., 2018; Kitson et al., 2013). A key component of the physical dimension within the Fundamentals of Care Framework involves maintaining patient comfort and minimizing pain. Wounds are often associated with severe pain, and wound-related factors such as limited mobility, infection, and unpleasant odors can negatively impact both the physical and psychological wellbeing of patients. These impacts can diminish quality of life and heighten patient dependency on healthcare providers, thereby hindering a sense of positive health. Wounds may also lead to feelings of embarrassment or frustration, particularly when healing is prolonged (McCaughan et al., 2018).

Acute and chronic wounds affect a vast population worldwide. In Europe, it is estimated that approximately 1.5-2 million people suffer from acute or chronic wounds. In the United States, around 6.5 million individuals are affected by chronic wounds at any given time. Wound care is a costly aspect of healthcare, with estimates indicating that wounds contribute to nearly 3% of total healthcare expenditures, or roughly £5 billion annually in the United Kingdom alone (Lindholm & Searle, 2016).

Acute wounds typically heal within 8 weeks and do not require extensive

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intervention. Conversely, chronic wounds, such as pressure ulcers or decubitus ulcers, are characterized by their failure to progress through a typical, timely healing process that restores anatomic and functional integrity (Lazarus et al., 1994). Chronic wounds often exhibit a prolonged inflammatory phase, recurrent infections, and an impaired ability of dermal or epidermal cells to respond to healing signals (Demidova-Rice et al., 2012). Due to these factors, chronic wounds are more prone to complications, which can significantly hinder wound healing, patient comfort, and overall health (Jung et al., 2016). Irrespective of the wound's origin, all wounds have a considerable, though often underappreciated, impact on patients, their caregivers, and the healthcare system (Lindholm & Searle, 2016). Thus, ensuring that all wounds receive effective treatment is crucial.

Nurses play an essential role in wound care, as they are well-positioned to identify poorly healing wounds or complications promptly. As a result, wounds like pressure ulcers or infections are often considered nursing-sensitive outcomes (Tuinman et al., 2021). Beyond wound care, nurses can promote a positive outlook and encourage proper nutrition, which are patient-controlled factors known to aid in wound healing (Dryden et al., 2013) and reduce the likelihood of pressure ulcer development (Roberts et al., 2015). By fostering these factors, nurses contribute to fundamental care by enhancing patient well-being (e.g., reducing pain, preventing ulcers, and accelerating wound healing), thereby decreasing patient dependency on healthcare services. This, in turn, ultimately conserves time and resources.

The routine use of ineffective or costly wound care products, or the improper use of effective products, is not uncommon (Gillespie et al., 2015). Although nurses generally make decisions regarding wound care products, physicians may occasionally direct them to diverge from standard recommendations. Such deviations may offer little or no benefit to the patient, may even result in harm, and can be viewed as instances of low-value care, which also leads to resource wastage (Verkerk et al., 2018). Broad dissemination of evidence-based recommendations is essential to achieving positive patient outcomes (Kuhnke et al., 2019). For example, the "Choosing Wisely" recommendations, introduced in the Netherlands in 2014, are straightforward and practical; one such recommendation suggests avoiding the use of dressings on primarily closed wounds, as this practice does not prevent infections or improve healing but may increase pain during dressing changes (Ubbink et al., 2015).

To empower nurses in their role as gatekeepers against low-value care when necessary (Colla et al., 2017) and to minimize the use of practices unsupported by rigorous research (T. A. Gray et al., 2018), it is essential that nurses are equipped with the information and evidence needed to make optimal decisions. Insufficient information and inadequate research can lead to a significant burden of low-value care in surgical wound practice (Gillespie et al., 2020). To enhance care quality and continue professionalizing nursing, the emphasis should be on reducing low-value care and promoting high-value care (Verkerk et al., 2018).

## Assessing wounds

### Anatomic Location and Type of Wound

The location of a wound should be precisely documented using accurate anatomical terminology and numbering. This method ensures that, if multiple wounds are present, each wound is correctly identified, assessed, and treated. Many healthcare facilities incorporate images into documentation to support clear communication about wound locations among the healthcare team. For instance, some facilities include visual documentation of wound locations to enhance clarity in records. The position of a wound also offers insight into its cause and type; for example, a wound on the sacral area of an immobile patient is likely to be a pressure injury, while a wound near the ankle in a patient with venous insufficiency is probably a venous ulcer. Different types of wounds require specific treatments tailored to their underlying causes to support successful healing (L. McNichol et al., 2021).

### Degree of Tissue Damage

Assessing the degree of tissue damage in pressure injuries is critical, as the extent of damage can worsen without appropriate treatment.

### Wound Base

The colour of the wound base should be evaluated. Healthy granulation tissue, which is indicative of healing, appears pink due to new capillary formation; it is moist, painless to the touch, and may look “bumpy.” In contrast, unhealthy granulation tissue is dark red, often painful, bleeds easily with light contact, and may have biofilm. The presence of slough (yellow) or eschar (black) on the wound base should be recorded and reported to the healthcare provider, as these tissues generally need to be removed to promote healing. Tunnelling and undermining should also be assessed, documented, and communicated.

### Type and Amount of Exudate

The colour, consistency, and quantity of exudate (drainage) should be observed and documented during each dressing change (Grey, Enoch, et al., 2006). The drainage amount is categorized as scant, small/minimal, moderate, or large/copious. Use the following guidelines to choose the appropriate terms:

- No exudate: The wound base is dry.
- Scant amount of exudate: The wound is moist, but no measurable exudate appears on the dressing.
- Minimal amount of exudate: Exudate covers less than 25% of the bandage.
- Moderate amount of drainage: Wound tissue is wet, with drainage covering 25% to 75% of the bandage.
- Large or copious amount of drainage: Wound tissue is fluid-filled, and exudate covers over 75% of the bandage.

Exudate should also be classified with medical terms, such as serosanguinous, sanguineous, serous, or purulent:

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- **Sanguineous:** Sanguineous exudate contains fresh blood.
- **Serous:** Serous drainage is a clear, thin, watery plasma typical in the inflammatory stage of wound healing; small amounts are normal.
- **Serosanguinous:** This exudate contains serous drainage with traces of blood.
- **Purulent:** Purulent exudate is thick, opaque, and may appear tan, yellow, green, or brown; it is not normal in a wound bed, and new purulent drainage should be reported to a healthcare provider. for an example of purulent drainage.

### Wound Size

Wounds should be measured upon admission and with each dressing change to track healing. Accurate measurements are critical for monitoring progress. To ensure consistency, measurements should be taken the same way by all clinicians. This is particularly challenging for irregularly shaped wounds, as measurement consistency may be affected. Wounds should be documented by length and width, with length based on the head-to-toe axis and width measured laterally. If a wound is deep, the deepest point should be measured from the wound base to the surface using a sterile, cotton-tipped applicator. Many facilities use clear, disposable measurement tools to gauge the area of wounds healing by secondary intention, with measurements recorded in centimetres for a sample of a wound measurement tool. Tunnelling, a phenomenon in full-thickness wounds that can lead to abscesses, should be measured by gently probing the tunnelled area with a sterile cotton-tipped applicator from the wound base to the end of the tract, stopping if resistance is felt to avoid further injury. The tunnel's location should be noted using the analogy of a clock face, with 12:00 aligned toward the patient's head.

Undermining occurs when tissue beneath the wound edges erodes, creating a pocket beneath the wound's edge. It is measured by inserting a probe under the wound edge, nearly parallel to the wound surface, until resistance is encountered. The amount of undermining is the distance from the probe tip to where the probe aligns with the wound edge. Clock terms are also used to describe the undermined area.

### Wound Edges and Periwound Skin

In wounds healing by primary intention, documentation should note whether wound edges are well-approximated (closed together) or if there are signs of dehiscence. The periwound skin, or the area surrounding the wound edges, provides clues about wound development and healing. For example, venous ulcers often have excessive drainage, which can macerate the periwound skin, causing it to appear waterlogged, soft, and Gray white. for an example of erythematous periwound with partial dehiscence.

### Signs of Infection

Wounds must be continually checked for signs of infection. Symptoms of localized infection include erythema (redness), induration (hardening of tissue), pain, edema, purulent exudate (yellow or green drainage), and wound odor. Any new signs of infection should be communicated to the healthcare provider, who may order a

wound culture (Acute and Chronic Wounds, 2015).

### Pain

The patient's pain intensity associated with a wound should be regularly assessed and documented. If pain arises during dressing changes, it should be managed with pain medication before the procedure. The severity of pain may not always reflect tissue damage; for instance, skin tears are often painful due to exposed nerve endings, while patients with severe diabetic ulcers may experience minimal or no pain due to neuropathy (Cox, 2019, p. 101).

### Identify wound etiology

After the nurse completes a comprehensive evaluation of the wound and surrounding skin, the underlying cause of the wound may become clearer. Common wound types encountered in acute care include pressure injuries, venous ulcers, arterial ulcers, skin tears, diabetic foot wounds, and moisture-associated skin damage.

### Pressure Injuries

Pressure injuries (formerly known as pressure ulcers) are defined by the National Pressure Ulcer Advisory Panel (NPUAP) as damage to the skin and/or underlying soft tissue, often located over a bony prominence or associated with medical devices. This injury may present as intact skin or an open ulcer, and it can be painful. Pressure injuries arise from intense or prolonged pressure, or pressure in combination with shear forces. The tolerance of soft tissue to pressure and shear is influenced by factors such as microclimate, nutrition, blood flow (perfusion), other health conditions, and the condition of the soft tissue itself. The NPUAP classifies pressure injuries by observable clinical damage stages (Edsberg et al., 2016).

### Venous Ulcers

Venous ulcers are associated with valve dysfunction in the lower extremity veins, allowing blood to pool in the superficial venous system and leading to edema. Insufficient emptying of the deep veins can elevate pressure in the peripheral veins of the lower extremities, eventually resulting in ulcer formation (Acute and Chronic Wounds, 2015; O'Donnell et al., 2014).

### Arterial Wounds

Arterial wounds develop due to severe tissue ischemia, often caused by atherosclerosis in the peripheral arterial vessels. This is a common underlying factor in lower extremity arterial disease and ulcerations (Grey, Harding, et al., 2006; L. McNichol et al., 2021).

### Diabetic Foot Wounds

Diabetic foot wounds, also known as neuropathic ulcers, are linked to peripheral neuropathy, which is present in over 80% of patients with foot ulcers. Neuropathy contributes to ulcer formation by altering pain and pressure sensation in the foot. It can also impair skin integrity and reduce microcirculation. Healing is often challenging, especially in patients with infections involving deep tissue or bone and in those with reduced blood flow to the foot (Kruse & Edelman, 2006).

## Skin Tears

According to the International Skin Tear Advisory Panel (ISTAP), a skin tear is a traumatic wound caused by mechanical forces (e.g., shear, friction, or blunt force), such as the force exerted during adhesive removal. Severity varies according to depth but does not extend through the subcutaneous layer. The ISTAP skin tear classification system categorizes skin tears as follows:

- Type 1: No skin loss; a skin flap can be realigned to cover the wound base.
- Type 2: Partial loss of the skin flap.
- Type 3: Complete loss of the skin flap, with the entire wound bed exposed (LeBlanc et al., 2018).

## Moisture-Associated Skin Damage (MASD)

Moisture-associated skin damage (MASD) is defined as inflammation and skin breakdown caused by prolonged exposure to moisture, such as urine, sweat, or wound drainage. Continuous moisture exposure softens (macerates) the skin, weakening its protective barrier and disrupting normal skin flora, increasing susceptibility to infections, such as candidiasis. Incontinence-associated dermatitis (IAD), a subtype of MASD, results from prolonged contact with urine and/or liquid stool (M. Gray et al., 2011; L. L. McNichol et al., 2018).

## Wound therapy

Wound therapy is often prescribed by a multidisciplinary team that can include the provider, a wound care nurse, a dietician, and the bedside nurse who performs dressing changes. Topical dressings should be selected that create an environment conducive to healing the specific type of wound and its causes. It is important to perform the following actions when providing wound care:

### Prevent and Manage Infection

A key objective of wound dressings is to shield the wound base from bacterial invasion and contaminants, including urine and feces. If new signs of infection are observed during a dressing change, wound swabs should be collected as per facility protocol, and the need for a wound culture or potential antibiotic treatment should be discussed with the primary provider (Kottner et al., 2019).

Silver sulfadiazine is commonly prescribed as a topical antibiotic for wounds and is typically applied beneath a secondary dressing.

### Cleanse the Wound

Routine cleansing of the wound should occur with each dressing change using products that are compatible with wound tissue. Normal saline is considered the gentlest solution for this purpose and is typically applied with a syringe or commercial cleanser. Commercial cleansers may be utilized; however, hydrogen peroxide, betadine, and acetic acid should be avoided due to their cytotoxic properties (Kottner et al., 2019).

## Debride the Wound

Debridement is the process of removing nonviable tissue from a wound. In most cases, necrotic (black) tissue must be cleared from the wound bed to allow healing, although stable, dry eschar on a patient's heel may remain intact until the patient's vascular status is determined.

There are several debridement methods, including autolytic, enzymatic, and sharp debridement. Autolytic debridement occurs when moist dressings encourage the breakdown of necrotic tissue. Enzymatic debridement involves the application of prescribed topical agents directly to the wound bed. Collagenase ointment, an example of an enzymatic debridement ointment, is applied daily (or more often if soiled) and covered with sterile gauze or a foam dressing. Sharp debridement, conducted by a trained healthcare provider, may take place at the bedside or in an operating room. This invasive technique uses a scalpel or scissors to remove necrotic tissue, preserving only viable tissue (Gould et al., 2016).

## Maintain Appropriate Moisture in the Wound

Dressings should create a moist environment within the wound to support granulation tissue formation. However, excess exudate should be managed with dressings that absorb moisture to prevent maceration of surrounding tissue. For example, alginate or hydrofiber dressings are suitable for wounds with heavy exudate, helping to maintain moisture balance and prevent tissue maceration. Wounds with significant drainage may also necessitate more frequent dressing changes.

## Eliminate Dead Space

Packing deep wounds or wounds with tunnelling is essential to maintain a moist wound bed. Moistened sterile gauze or hydrogel-impregnated dressings are commonly used for this purpose. Packing materials should be easy to remove to avoid damaging fragile granulation tissue during dressing changes. It is important to note that alginate dressings have a slight greenish tint when removed and should not be mistaken for purulent drainage.

## Control Odor

When a wound has an odor, the nurse should consult the healthcare provider to assess the need for more frequent dressing changes, adjust wound cleansing agents, or consider the use of topical antimicrobials or debridement. Additionally, room deodorizers can be used after dressing changes.

## Manage Wound Pain

If a wound becomes increasingly painful, it should be evaluated for potential infection or dehiscence. The nurse should prepare to administer pain medication prior to dressing changes for painful wounds. If no pain medication is prescribed, the nurse should contact the healthcare provider to request a prescription before proceeding with the dressing change.

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## Protect Periwound Skin

Excessive drainage or improper use of moist dressings may lead to maceration of the periwound skin. Nurses should carefully apply dressings to maintain adequate moisture in the wound bed while protecting the surrounding skin. Skin barrier creams, protective wipes, or skin barrier wafers can also help shield the periwound area from maceration.

## 2. Conclusion

Wound management is a critical area of nursing practice, requiring a thorough understanding of wound assessment, treatment modalities, and patient-centered care. Nurses are at the forefront of ensuring effective wound healing, utilizing evidence-based practices to assess wound characteristics, prevent complications, and optimize the healing process. The role of nurses extends beyond physical care, encompassing the management of pain, prevention of infection, and education of patients and their families.

This review highlights the importance of integrating evidence-based recommendations into daily wound care practices to minimize low-value care and enhance patient outcomes. Nurses must remain informed about advancements in wound care techniques, such as new dressing technologies and debridement methods, while fostering a multidisciplinary approach to address the complex needs of patients with acute and chronic wounds. By doing so, nurses can significantly contribute to reducing healthcare costs, improving patient quality of life, and promoting optimal wound healing outcomes.

Continued professional education and access to updated guidelines are essential to empower nurses in their vital role as decision-makers and advocates in wound care. Investing in these areas ensures that nursing practices evolve in tandem with advancements in healthcare, ultimately benefiting both patients and healthcare systems.

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