# Periwound Maceration made easy



WOUNDS | UK

## Introduction

The significance of the periwound in healing should not be overlooked (Rippon et al, 2022). The skin surrounding a wound is influenced by systemic, holistic and local variables and is especially susceptible to damage in exuding wounds (LeBlanc et al, 2021). The aim of this Made Easy is to provide clinicians with a greater understanding of the wound edge and discuss how optimum periwound skin management can support wound healing.

The production of exudate is vital for wound healing; however, where high levels of exudate are present, or if poorly managed, damage to the periwound area can occur (WUWHS, 2019). Hyper-hydration and prolonged exposure to wound exudate can result in maceration [Box 1]. This maceration can increase the risk of the wound enlarging (Rippon et al, 2016) or delay healing. Whilst this is frequently seen, particularly in non-healing wounds (Thomas, 1997), effective management of the periwound skin to prevent maceration has the potential to significantly improve wound healing outcomes.

Protecting the vulnerable periwound area and ensuring appropriate management of a moist wound bed should be integral to a comprehensive wound assessment and plan (Freitas, 2022). Identifying and addressing the cause of excessive exudate is essential. Maintaining a healthy periwound supports faster wound healing, lowers the risk of infection, reduces pain and discomfort, and minimises dressing changes and their associated costs (Woo et al, 2017).

**Box 1. What is maceration?** *(Young, 2017)*

**Maceration manifests as wrinkling, softening and breakdown of the skin surrounding the wound.**

### What is the periwound, and why can it be easily damaged?

The periwound area has been described in the literature as 'the defensive zone that contains the wound' (Dowsett et al, 2015) and is typically defined as the region within 4cm of the wound edge (Thayer et al, 2016). However, Onesti et al (2011) suggest that, in the case of 'difficult wounds', this area may extend up to 10cm. The area surrounding a wound is highly susceptible to injury, making periwound complications common. The extent of epithelial cell damage can vary significantly (Bianchi, 2012). The primary causes and key characteristics are highlighted in Table 1.

Woo et al (2017) conducted a large scoping review on the management of moisture-associated skin damage and reported that periwound skin damage is common but not well-documented. This lack of documentation makes it challenging to determine its exact prevalence. However, the impact of damage to the periwound skin is significant, as periwound skin damage can impair keratinocyte migration, delaying overall wound healing (Woo et al, 2017).

Price et al (2008), in a large international survey of patients with chronic wounds, reported that 25% experienced pain around the wound. This pain was likely attributed to damaged skin in the periwound area and heightened inflammation.

**Table 1. Different types of periwound skin damage** *(adapted from Young, 2017)*

| Type of damage | Description | Causes/factors | Characteristics |
|---|---|---|---|
| Hyper-hydration | Overhydration of the skin surface (Rippon et al, 2016) | Prolonged contact with a pH-neutral or mildly acidic fluid compatible with the skin surface | • Swelling and wrinkling of the skin<br>• Pain-free<br>• The skin will recover once the fluid is removed or dries. |
| Maceration | Reversible skin pallor caused by overhydration and saturation of the skin | Prolonged exposure to alkaline fluids such as wound exudate, excess moisture and hyper-hydration | • Softening, wrinkling and white discolouration of the skin around the wound. |
| Excoriation | Upper layers of the skin are stripped away | Excessive exposure to an alkaline pH fluid or the proteolytic enzymes contained within exudate (Holloway and Mahoney, 2020) | • Redness, skin erosion and abrasions on the skin surrounding the wound. |
| Denudement | Can occur in severe excoriation | Lifting of chunks of the epidermis to reveal the underlying dermis | • Exposed extensive dermal tissue<br>• Painful. |
| Skin stripping | Tearing of the skin causing the epidermis to lift away | Removal of adhesive dressings or tapes — medical adhesive-related skin injury (Holloway and Mahoney, 2020) or skin tears | • Trauma injury surface skin is removed and the underlying dermis exposed. |
| Allergic reactions | An inflammatory response where contact with an irritant (e.g. wound dressing) occurred | Contact dermatitis — response to an irritant | • Dry, itchy, cracked skin<br>• Inflammation and blistering may occur. |

# Periwound Maceration made easy

Whilst maceration is often thought of as pallor or whitening of the skin, it can present differently in different individuals. Skin assessment should incorporate the patient's skin tone and any changes in the skin that may have occurred due to ageing or lifestyle. A baseline assessment of the periwound skin tone needs to be taken upon first assessment of the wound, as well as assessment of the temperature and feel of the surrounding skin (Dhoonmoon et al, 2023). This can be compared to similar areas of skin to gain an understanding of the condition of the wound edge and whether periwound skin damage is present.

## The issue of periwound maceration

Maceration refers to the softening and breakdown of the skin, resulting from prolonged exposure to moisture [Figure 1a–c]. Various bodily fluids, such as urine, faeces, sweat and exudate, can increase the risk of tissue damage (Hampton and Stephen-Haynes, 2005). A study by Haryanto et al (2017) found that healing was significantly delayed in wounds with macerated edges, and that maceration contributes to wound pain and discomfort.

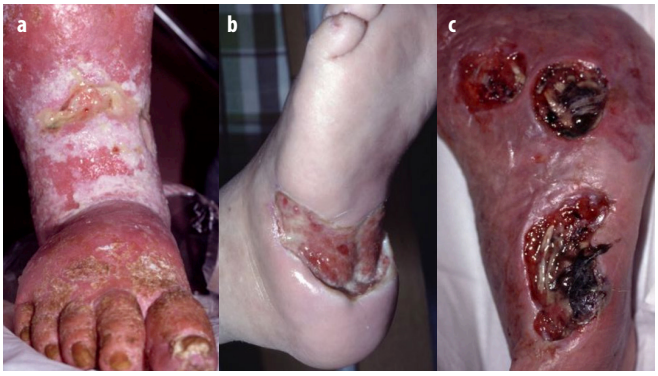


**Figure 1. (a–c) Macerated periwound skin**

Excessive exposure to exudate can damage keratinocytes (that form the outermost layer of the skin, see Figure 2). These cells originate in the stratum basale (the deepest layer of the skin) and, as they migrate toward the surface, they fill with keratin, a protein that helps to maintain the skin's waterproof barrier. The stratum corneum is the outermost layer of the skin, where cells are tightly packed to create a robust protective barrier. Approximately every 4 weeks, old skin cells are shed and replaced by new ones (Wounds UK, 2022).

## Macerated skin and healthy skin: how do they differ?

The skin is mildly acidic with a surface pH between 4 and 6 (Wound Care People, 2025). Non-healing wounds tend to have a more alkaline pH. Whilst wound exudate is essential for healing, too much can be detrimental to the wound bed and the periwound area [Box 2]. In non-healing wounds, the formation of biofilm can stimulate an inflammatory response, which increases exudate volume and the potential for skin damage (Wounds UK, 2022).

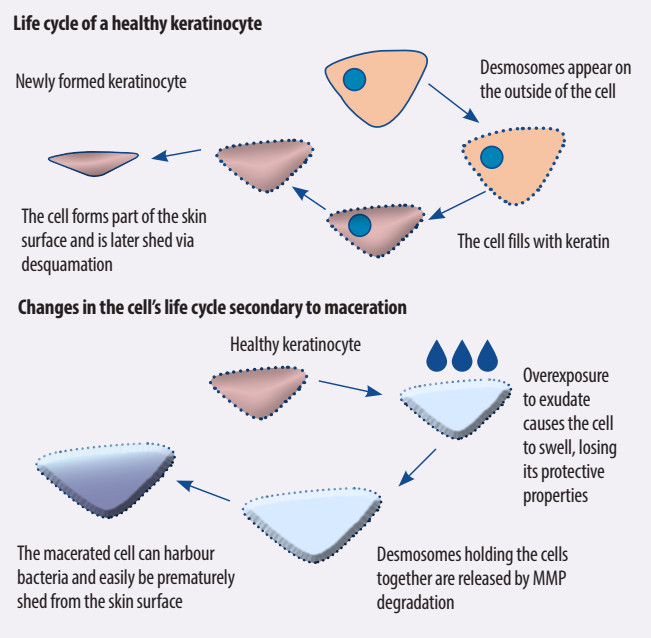


**Figure 2. Life cycle of a healthy keratinocyte**

**Box 2. Why is maceration harmful for wounds?**
*(Wounds UK, 2022)*

- **Reduces the protective barrier of the skin**
- **Softens bonds between cells**
- **Allows bacteria to enter the skin**
- **Makes skin susceptible to trauma from dressing adhesives**
- **Contributes to delayed wound healing.**

When the skin is exposed to too much exudate, the cells start to swell and lose their protective mechanism. The cells are connected by desmosomes, which break down allowing exudate and bacteria to seep between them. Skin integrity reduces and the risk of infection increases. Maceration occurs initially; however, the alkaline pH of exudate and the presence of proteolytic enzymes weakens the cells, meaning they are more likely to be shed early (Wounds UK, 2022) and there is potential for the dermis below to be exposed.

## Management strategies for periwound maceration

Although periwound skin damage is common, its management can sometimes be overlooked. Understanding and addressing underlying pathology and causes of exudate production are vital, along with assessment of the periwound skin. Clinicians must ensure safe, evidence-based practice, which incorporates periwound assessment and ensures pathways for exudate management are followed (Woo et al, 2017; Freitas, 2022). Educating clinicians about periwound management is essential to promoting best practices and improving patient outcomes.

Correct management of periwound skin is multifaceted; wound cleansing, dressing selection and good skin care form the basis of

| Table 2. Holistic considerations in exudate management *(adapted from Freitas, 2022)* | |
|---|---|
| **Step** | **Details** |
| Identify and address the cause of exudate | • Identify sources of excess exudate: venous disease, infection, systemic conditions (e.g. heart failure, kidney disease)<br>• Address contributing comorbidities, medications and psychosocial factors<br>• Consider lifestyle factors (e.g. nutrition, smoking, employment, lower limb dependency). |
| Optimise microclimate | • **Humidity:** improve airflow, use appropriate occlusive dressings, and manage continence<br>• **Temperature:** adjust for individual and environmental factors (e.g. positioning, medical conditions)<br>• **Airflow:** consider wound location, mattress type, or footwear (e.g. diabetic foot ulcers). |
| Choose appropriate dressings | • Consider whether an antibacterial is needed to reduce risk of biofilm formation<br>• Select dressings that absorb exudate effectively and prevent lateral moisture spread across the surrounding skin<br>• Match dressing size and frequency of changes to exudate levels<br>• Use materials with high fluid-handling capacity and appropriate moisture vapour transmission rate. |

| Table 3. Optimising the wound bed and periwound skin to achieve healing | | |
|---|---|---|
| **Process** | **Wound bed** | **Periwound skin** |
| Cleanse | • To disrupt biofilm<br>• Use an antibacterial cleanser containing a surfactant<br>• Allow sufficient time for the cleanser to be effective<br>• Avoid cytotoxic solutions such as povidone iodine. | • Use a cleanser designed to readily remove dried exudate and debris from the skin surface<br>• Use a no rinse, no sting formula. |
| Debride | • Physically remove debris and biofilm from the wound surface using a debridement tool or monofilament cloth. | • Pat dry macerated periwound skin carefully to avoid trauma<br>• Gentle debridement can be used to remove any dry skin scales outside of the macerated wound edge. |
| Optimise | Dress the wound with an appropriate dressing:<br>• Antimicrobial dressings to help reduce bacterial burden<br>• An appropriate contact dressing to optimise moist wound healing and meet the aims of the wound management plan<br>• A secondary dressing (e.g. a super absorbent dressing) to manage the excess exudate, proteases and bacteria by wicking them away from the wound bed and periwound. | Using a barrier at the wound edge will:<br>• Provide a barrier to protect the skin from maceration<br>• Reduce the risk of any debris at the wound edge contaminating the wound; the skin protectant used is dependent upon exudate production, skin condition and patient preference. |

successful exudate control (Freitas, 2022). Optimising the surrounding skin gives it every chance of migrating across the wound surface enabling healing to occur. Table 2 outlines the important steps and considerations in holistic management of an exuding wound; Table 3 outlines a two-pronged approach to wound care, emphasising the dual goals of protecting vulnerable periwound skin and optimising the wound bed.

It is essential to address challenges in the wound bed whilst optimising good skin care. Wound hygiene denotes the importance of effective cleansing of the wound bed and removal of debris at the wound edge. Murphy et al (2022) suggests use of an antibacterial cleanser and vigorous rubbing of the wound allows for removal of biofilm, whilst refashioning of the wound edge can stimulate epithelialisation. Nonetheless, the wound edge is likely to be susceptible to damage where the presence of biofilm has resulted in high exudate production and, therefore, requires protection rather than refashioning. The approach in Table 3 aims to improve the condition of the wound edge, reduce unnecessary trauma and stimulate epithelialisation.

## Medi-Derma range in practice

The Medi Derma-PRO range [Table 4] offers a complete, cost-effective treatment strategy against damage to the periwound skin, which:

- Is suitable for use on both intact and damaged skin (Dykes et al, 2012)
- Prevents exudate damage and maceration (Dykes et al, 2012; Bianchi et al, 2013)
- Leads to reduced wound healing time
- Improves clinical outcomes in lower limb ulcer management (Rogers and Watret, 2003).

The range incorporates solutions to:

- Cleanse the wound and surrounding area (**Medi Derma-PRO** *Incontinence Cleanser*)

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**To cite this document:**
Whitlock K, Bateman-Limmer J, Salter L (2025) Periwound Maceration Made Easy. Available from: www.wounds-uk.com/made-easy

**This document has been supported by an educational grant from**

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- Prevent damage to the periwound area (**Medi Derma-S** *Total Barrier Cream*)
- Protect skin with mild or moderate periwound damage (**Medi Derma-S** *Barrier Film Wipe/Spray*)
- Repair and restore skin with moderate to severe periwound damage (**Medi Derma-S** *Barrier Film Application* or **Medi Derma-PRO** *Skin Protectant Ointment*).

## Conclusion

Management of the periwound in wound care is often overlooked, despite its crucial role in wound healing. Maceration of the periwound can significantly delay the healing process, increase the risk of infection, and exacerbate patient discomfort. However, these challenges can be addressed by emphasising the importance of maintaining periwound skin integrity, ultimately improving outcomes and the quality of life for patients with hard-to-heal wounds.

Evidence highlights the importance of a proactive approach that prioritises prevention, early identification, and effective management of periwound skin complications, including cleansing, debridement, and optimisation of the wound environment. Wound care should aim to prevent damage, protect the periwound area, and restore its integrity when necessary. By incorporating periwound assessment into routine wound care practices, healthcare providers can adopt a more comprehensive, patient-centred approach to wound management.

The ongoing advancement of evidence-based practices and the development of innovative wound care technologies offers promise for improved outcomes. However, further research is vital to strengthen the evidence base and deepen understanding of how periwound damage influences wound healing and clinical outcomes. Such research can provide a robust framework for clinical recommendations, education, and industry innovation, ultimately optimising periwound care.

**Table 4. The Medi Derma-S & Medi Derma-PRO Range**

| | | |
|---|---|---|
| **Cleanse** | • Effectively removes dried-on fluids from the periwound area<br>• No-rinse formulation, promoting patient comfort and minimising friction damage<br>• pH-balanced promotes wound healing. |  <br>**Medi Derma-PRO** Incontinence Cleanser |
| **Prevent** | • Intact or broken skin at risk of periwound damage<br>• Restores skin hydration<br>• Maintains skin integrity<br>• Quick-drying and easily absorbed. |  <br>**Medi Derma-S** Total Barrier Cream |
| **Protect** | • Mild to moderate periwound damage<br>• Long-lasting film protection<br>• Non-sting, pain-free application<br>• Protects skin from exudate damage<br>• Reduces trauma and related pain. |  <br>**Medi Derma-S** Barrier Film Wipe/Spray |
| **Repair & Restore** | • Moderate to severe periwound damage<br>• Moisturises clinically dry skin<br>• Skin protectant can be applied over antifungal cream to ensure longer protection, in cases of fungal infection<br>• Skin-friendly, pH-balanced, no-rinse, moisturising cleanser. |  <br>**Medi Derma-S** Barrier Film Applicator or **Medi Derma-PRO** Skin Protectant Ointment |

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LT580PU-TB150725V1