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ABSTRACT

Maintaining skin integrity plays a key role in the ongoing care and comfort of patients at the end of life. Unfortunately, patients receiving cancer treatments are at higher risk of altered skin integrity. Cancer treatments involve multiple modalities, all of which impair wound healing. Excess exudate can be distressing to patients, resulting in catastrophic damage to the wound bed and surrounding skin, reducing quality of life and increasing the need for specialist services. This article describes the use of the Kliniderm foam silicone range of dressings, in combination with best practice, in the treatment of wounds in the oncology setting. The case study evidence presented indicates that this range of dressings is useful in the management of radiotherapy and oncology wounds. It had a positive effect on the exudate level, wound-association pain and the peri-wound skin in these patients, aiding the management of the wound bed.

Key words: Oncology ■ Holistic wound management ■ Quality of life ■ Healing ■ Exudate ■ Soft silicone foam dressing

Patients with cancer can experience skin damage or breakdown due to the effects of radiation, chemotherapy, malnutrition and disease progression (Payne et al 2008). Unfortunately, these patients often have several symptoms, such as lymphoedema, nausea, vomiting, fatigue, malnutrition, fungating wounds and psychological issues, that are secondary to their disease and can impair tissue repair. Coupled with the intensity of many cancer treatments, this can make wound management a challenging, long-term issue for these patients, whose lives can be severely affected (O'Regan, 2007).

Cancer can give rise to multiple skin lesions or fungating wounds (O'Regan, 2007). In addition, radiation-induced damage to the epithelium can result in skin breakdown, lower tensile strength, atypical fibroblasts and delayed healing (Anderson and Hamm, 2012). As such, radiotherapy can both impede wound healing and breach skin integrity. Chemotherapy can also cause significant wound-related problems. Administration of specific chemotherapeutic agents can result in an inflammatory reaction in tissue that has been previously irradiated (O'Regan, 2007).

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This is the first of a two-part series on the Kliniderm range of dressings. Both articles illustrate its use in the oncology setting; this article explores the ability of Kliniderm foam silicone to absorb exudate and promote healing; the second article demonstrates that Kliniderm foam silicone lite can prevent medical device-related pressure ulceration

The main effects of a chemotherapeutic drug on wound healing include delayed inflammation, decreased fibrin deposition and collagen synthesis, and delayed wound contraction (Anderson and Hamm, 2012).

Patients with cancer who are experiencing nausea and vomiting can quite quickly become dehydrated and malnourished. Dehydration also adversely affects optimum wound healing by disturbing cellular metabolism and reducing circulatory blood volume. Malnourished patients are at risk of wound infection due to an impaired immune response (O'Regan, 2007).

For many oncology patients, the overall aim of wound management is to achieve wound closure, where possible. However, for a patient with a malignant wound, symptom control is more likely to be important, along with containment of exudate, or the formation of a crust or scab without exudation (World Union of Wound Healing Societies (WUWHS), 2019).

A holistic assessment is essential to determine the cause of the wound and the interventions needed to aid healing. In patients with cancer, the wound aetiology, their age and the presence of significant comorbidities can all affect the healing process, as will the wound size and depth, duration and location (Vowden, 2011). Health professionals must consider all aspects of wound care to avoid these patients further suffering. This article describes how this can be achieved, and outlines the potential role of a soft silicone foam dressing as part of this regimen of care.

Exudate and oncology wounds

Wounds in patients undergoing cancer treatment often produce moderate to high volumes of exudate.

Wound exudate contains serum, leucocytes, fibrin and wound debris, along with water, nutrients, electrolytes, inflammatory mediators, other white blood cells, protein-digesting enzymes and growth factors (WUWHS, 2019). Acute wound exudate is thought to have antibacterial and nutrient properties.

Exudate assessment and management are a vital part of wound care. Exudate is produced throughout the healing process, from the inflammatory phase to epithelialisation, and must be managed to maintain the moist environment that promotes and accelerates healing (Collins et al, 2002; Bullough et al, 2015). According to Swezey (2014), a moist environment can improve the healing rate by up to two or three-fold. The benefits of moist wound healing are summarised in *Box 1*.

Because it is rich in leucocytes and essential nutrients, acute wound fluid supports stimulation of fibroblast formation

and endothelial cells production (Dowsett, 2008). However, excess exudate is implicated in the damage to the wound bed, degradation of the extracellular matrix and peri-wound skin problems observed in chronic wounds (Hampton and Verral, 2013).

The aim, therefore, is to maintain a moisture balance in the wound, which can promote healing. However, this can be challenging, because exudate levels change throughout the healing process (Davies, 2012). Effective exudate control is therefore an essential requirement of wound management (Forder and Burns, 2020).

Fungating wounds are a potentially devastating complication of advanced cancer (Grocott, 2007). The high levels of exudate associated with these wounds can cause significant quality-of-life issues for patients and be extremely challenging for health professionals to manage (Verdon, 2015). Symptom control is the primary goal of their management. Holistic assessment of both the patient and wound can support this (Verdon, 2015). The management of malignant fungating wounds is complex, requiring a multidisciplinary approach (Dowsett, 2002).

Skin reactions to radiotherapy can vary from mild, such as dry skin, to slight erythema, to moist desquamation. The care of moist desquamation skin reactions is based on the principles of moist wound healing (O'Regan, 2007).

Wound assessment and management in the oncology setting

For patients at the end of life, palliative care often involves wound care (Young, 2017). As with any wound, the underlying cause needs to be identified; consideration also needs to be given to any current treatments, such as radiotherapy, that might affect the type of dressing that can be used and the dressing-change frequency. Other considerations are the wound location, which will affect both dressing application and the patient's body image, and whether necrotic tissue and excess exudate are present, as these are conducive to bacterial proliferation and will increase the risk of malodour and wound infection.

Good wound management involves a holistic approach (Davies, 2012). Dowsett and Newton (2005) argued that the concepts of wound bed preparation (WBP) and TIME (Schultz et al, 2003) must be considered in the context of holistic patient assessment, accurate diagnosis and ongoing evaluation of the outcomes of treatment interventions. Health professionals must ensure that the management plan aims to provide the best outcome for both the patient and the wound (Grothier, 2013). Effective management therefore involves managing the underlying cause of the wound, where possible, as well as product selection (Bullough et al, 2015).

In 2019, Atkin et al introduced a modified version of the TIME paradigm (TIMERS) (Box 2). This provides structured guidance for the management of complex, non-healing wounds, including when to consider using advanced therapies alongside standard care. Here, T is for Tissue, which focuses on the presence of devitalised or non-viable tissue, which can delay healing and/or facilitate infection. The clinical requirement is to observe for its presence and the goal is to eliminate it (Atkin et al, 2019). I is Inflammation and Infection, which pose a major challenge

Box 1. Benefits of a moist healing environment

- Facilitates all aspects of the wound healing phases
- Decreases the extent of the inflammatory response
- Prevents the wound bed from becoming desiccated
- Aids cell migration
- Preserves growth factors

Sources: Cook, 2011; Peate and Glencross, 2015

Box 2. Elements of the TIMERS framework

T	Tissue deficient or non-viable
I	Infection or inflammation
M	Moisture imbalance: too much or too little
E	Edge of wound: undermining or non-advancing
R	Repair of tissue and regeneration
S	Social factors that impact healing

Source: Atkin et al, 2019

to healing, particularly in chronic wounds (Leaper et al, 2012). M is for managing bioburden, in particular biofilm (Wounds UK, 2017) and creating a moisture-balanced environment that promotes healing. E is for the wound Edges, which should be assessed for the need for debridement, and the use of therapies to accelerate re-Epithelialisation (Atkin, 2019). The R aims to promote tissue Regeneration and Repair, supporting wound closure (Atkin et al, 2019). The S relates to Social and patient factors, in recognition that patient engagement increases the likelihood of concordance and healing. Asking the patient about their treatment goals and what aspects of the treatment plan they are willing or able to implement will not only help ensure they receive the right information and have access to the appropriate services, but also is more likely to increase their knowledge and confidence to make informed decisions about their care (Moore, 2016).

It is also important to try to understand the wound from the patient's perspective and gain an insight into its impact on their life (Atkin et al, 2019). The patient's primary concern is not always the treatment itself, but could be a related issue. To explore the psychological impact of the wound and provide support, it is necessary to develop a relationship with the patient and their family, and gain their trust (Dowsett, 2002).

Concordance and adherence

Patient choice and involving patients in clinical decision-making are central to the national agenda to improve the patient experience, concordance and thus care outcomes (Department of Health, 2010; Stanton et al, 2016). Concordance places greater emphasis on factors that may not be directly associated with the condition, but might affect a patient's choice of whether or not to follow a treatment plan (Moffatt, 2004). Non-concordance is highly prevalent in oncology settings and is associated with moderate to severe patient distress and with poor quality of life (Chadwani, 2017). The health professional must ensure that their

objectives for the treatment plan are the same as those of the patient; otherwise, a disempowered patient and non-adherence to treatment are the likely outcomes (Weiss and Britten, 2003).

Involving patients in their care is likely to improve their understanding of how their wound might progress towards healing and give them an opportunity to make informed decisions about their management plan (Moore, 2016). The availability of easy-to-understand, accurate information on cancer prognosis, treatment (including its benefits and harms), palliative care, psychosocial support and likelihood of treatment response can improve patient-centred communication and shared decision-making (Chan et al, 2012). This is likely to improve adherence to treatment (Chadwani, 2017).

Dressing selection

Dressing selection should aim to:

- Promote a moist healing environment
- Address any issues within the wound bed and at the wound edges and peri-wound skin
- Identify the least costly dressing that will meet the wound requirements (Jeffcoate et al, 2009).

Foam dressings are generally made from polyurethane that has been heat treated to provide a smooth contact surface. They provide thermal insulation, do not shed fibres or particles, and are gas permeable (Thomas, 2010). They are generally soft, pliable (for conformability) and low adherent. An important function is their ability to absorb exudate and maintain a moist environment (Hedger, 2014).

Soft silicone foam dressings were developed to minimise the problems of pain and trauma at dressing change and to protect the peri-wound skin (Lawton and Langoen, 2009). These dressings are a family of solid silicones, which are 'soft and tacky' (Drewery, 2015). Ideally, a wound dressing should have sufficient tack to stay securely in place for the duration of wear, but able to be removed without skin stripping or trauma to the wound bed (Rippon et al, 2008).

Soft silicone foam dressings adhere gently to the surrounding skin, and are designed to minimise trauma on removal and not leave an adhesive residue on the skin (Meuleneire and Rücknagel, 2013). Several clinical studies have shown that they minimise pain on removal in a range of wound types and patient groups, including paediatric patients (Morris et al, 2009) and patients with burns (Edwards, 2011), heel ulcers (Hampton, 2010) and radiation-induced skin reactions (MacBride et al, 2008). In addition, Timmons et al (2009) found that their use improved patients' quality of life by reducing pain on removal, lessening anxiety and accelerating the healing process. This encouraged the author to evaluate the Kliniderm foam silicone range of dressings in the oncology setting.

Case study 1

A 20-year-old woman with a history of dermoid tumour on her upper left back was treated with chemotherapy and scheduled for proton beam therapy, which is an advanced form of external radiotherapy that uses high-energy proton beams instead of photon X-ray beams or electrons (Cancer.Net, 2018). Her skin integrity was poor due to the enlargement of the tumour, as

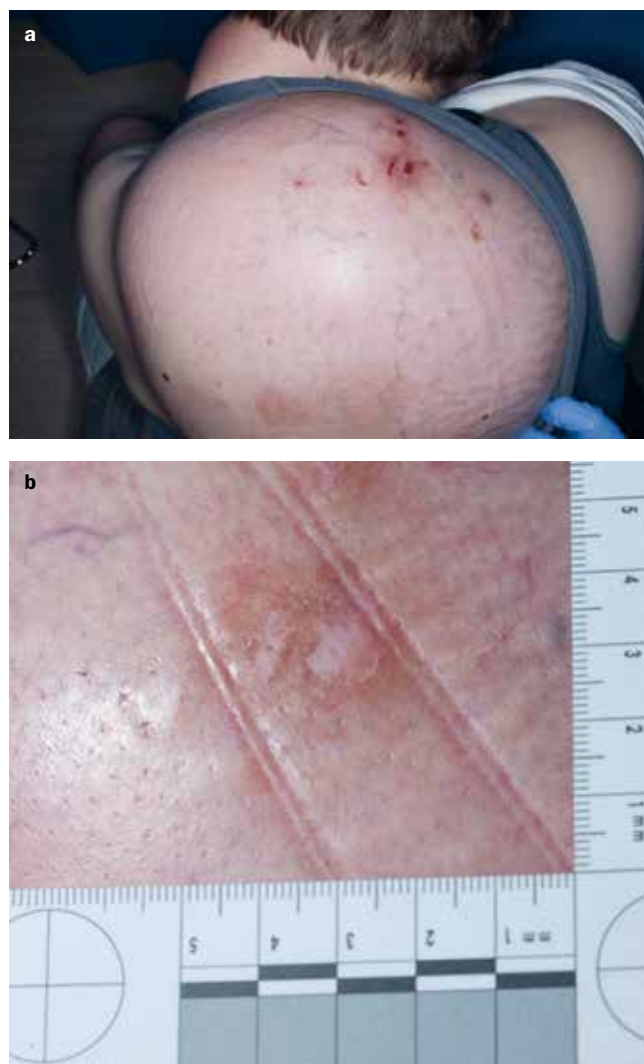


Figure 1. Case study 1: simple, non-advanced wound dressings had been applied previously, but these were ineffective

well as because of the effects of systemic chemotherapy. She presented with multiple areas of skin breakdown at the tumour site. The pain from the weight of the tumour was such that she was using a sling to support her arm.

It was not possible to measure the wound because the skin breakdown was scattered around the upper back, making it difficult to map. The exudate level was low and the wound bed was granulating. The patient had previously tried different types of simple, non-advanced wound dressings, but these were ineffective, with each one being used for one day only (Figure 1a and Figure 1b).

The patient consented to try Kliniderm foam silicone in the hope that it would prevent the discomfort experienced when the wound rubbed against the sling. Due to the patient's fragile skin, Kliniderm foam silicone lite was used to absorb exudate and promote a moist environment, as well as to provide some pressure relief from the sling rubbing against the tumour.

A 50 x 20 cm dressing was selected, which covered the entire tumour. The patient reported that the dressing was very comfortable, and continued to wear the sling. The soft

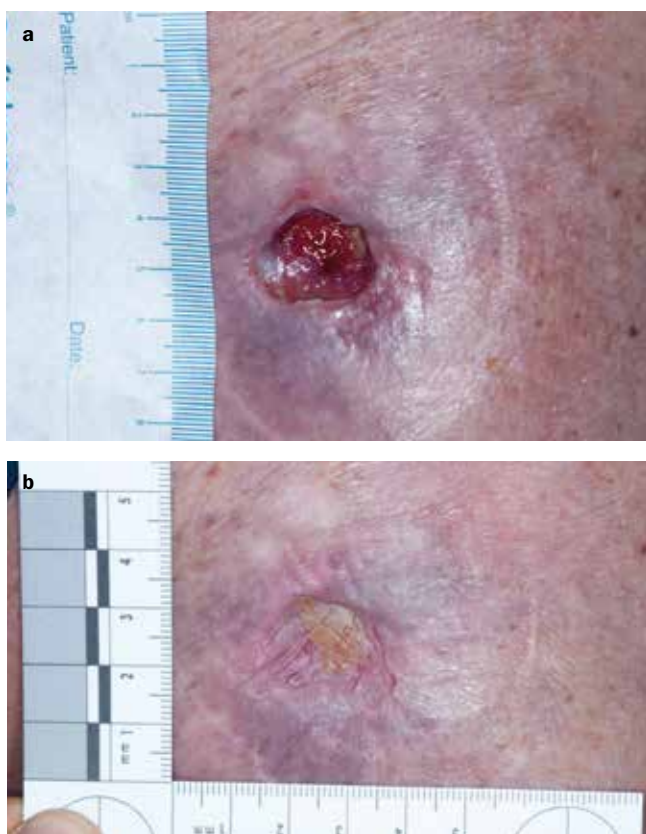


Figure 2. Case study 2: a chronic wound developed on the patient's right hip following radiotherapy. The wound at presentation (a); the wound healed after 4 weeks of treatment with the soft silicone foam dressing (b)

silicone foam dressing was changed twice a week. No other dressing products were used. The wound healed, with full epithelialisation, in 3 weeks, despite the patient receiving multimodal treatments and proton beam therapy.

Case study 2

A 64-year-old man developed a chronic wound on his right hip from radiotherapy for a biopsy-confirmed basal cell carcinoma. He has a history of Hodgkin's lymphoma and cutaneous T-cell lymphoma. Before his referral, the wound had been treated with an antimicrobial dressing, followed by an alginate (for desloughing) and a secondary foam dressing for 4 weeks. By the time the patient presented at the clinic, the wound was 2 months old and was deep (because the large, thickened tumour had broken down) and sloughy.

The patient found it extremely painful when the wound area was touched (self-reported pain score: 9/10), making it difficult to cleanse and dress. The wound measured 2 x 1.8 cm (length x width) (Figure 2a) and was producing a moderate volume of exudate, but there was evidence of granulation tissue.

Kliniderm foam silicone border was applied to provide a moist environment and absorb the exudate. No other dressings were used. The dressing was changed twice weekly.

The wound healed within 4 weeks (Figure 2b). The patient reported that the peri-wound pain reduced with each week. The dressing was easy to apply and remove without causing

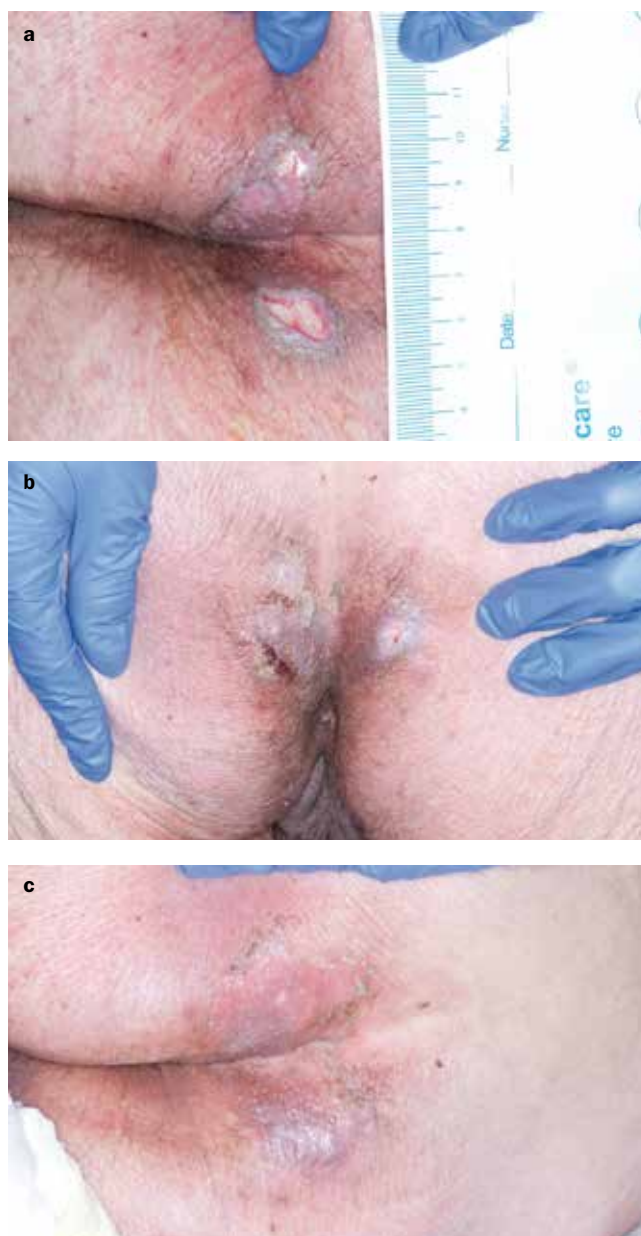


Figure 3. Case study 3: the pressure ulcers at presentation in a patient with metastatic endometrial cancer (a); the ulcers after 1 week, when the honey dressing was discontinued (b); healing occurred after 3 weeks of treatment with the soft silicone foam dressing (c)

any trauma. It conformed to the wound, avoided epithelial stripping and was comfortable during wear (Hampton, 2010; Meuleneire and Rücknagel, 2013). The patient commented that he was able to change the dressing by himself. It managed the exudate well, which improved his quality of life.

Case study 3

A 68-year-old woman was admitted with neutropenic sepsis of unclear source, anaemia and acute kidney injury. She has a diagnosis of stage 4 endometrial cancer with metastases to the liver. She was undergoing weekly chemotherapy, taking oral steroids, and had oedema and ascites. Subsequently, her skin condition was very poor (Figure 3 and Figure 4).

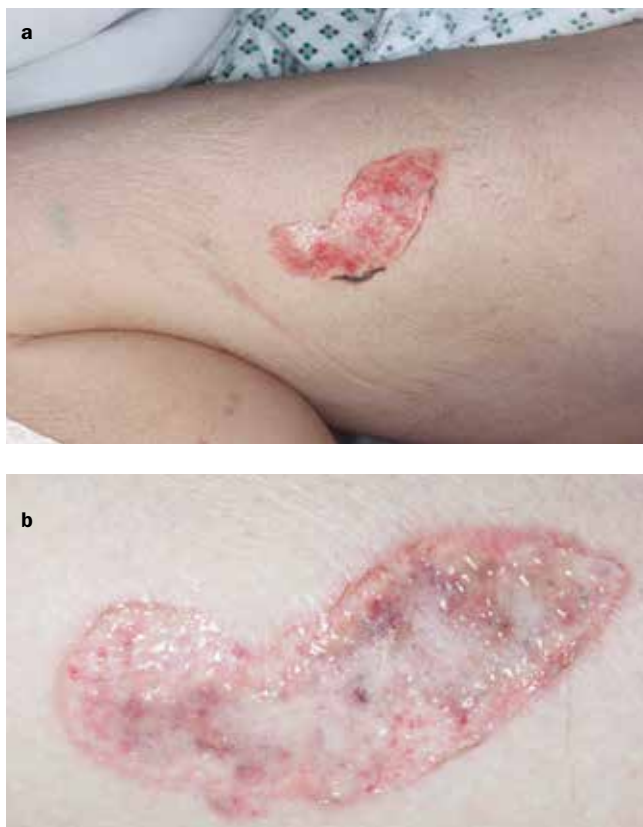


Figure 4. Case study 3: the skin breakdown on the thigh resulting from a reroofed blister caused by fluid overload: the wound at presentation (a); after 3 weeks of treatment with the soft silicone foam dressing, 50% of the wound had healed and the remaining area was epithelialising (b)

The patient presented with two sacral category II pressure ulcers (European Pressure Ulcer Advisory Panel (EPUAP)/National Pressure Ulcer Advisory panel (NPUAP)/National Pressure Injury Advisory Panel (NPIAP), 2019), as well as skin breakdown on her left thigh resulting from a reroofed blister caused by fluid overload. The pressure ulcers measured 2 x 1 cm and 1 x 0.8 cm (Figure 3a) and had minimal slough and exudate. The wound on the thigh measured 7 x 3 cm, and was producing a moderate level of exudate, but was also granulating (Figure 4a).

Following a wound assessment, Kliniderm foam silicone border was applied to the left thigh to absorb the exudate and promote a moist wound environment. A primary dressing containing 100% manuka honey was used to autolytically debride the pressure ulcer and the Kliniderm foam silicone border to manage the exudate. The honey dressing was discontinued at the end of week 1 because the wound was completely debrided. From thereon, only the soft silicone foam dressing was used to treat the pressure ulcers (Figure 3b). As a wound progresses through the healing continuum, health professionals are advised to adjust their management plan. A ‘step-up’ and ‘step-down’ approach is needed to ensure that the appropriate dressing is used at the appropriate time (Bajjada, 2017; WUWHS, 2019).

The range of sizes and shapes for this dressing enabled an appropriate selection for the sacrum. The dressing was used in conjunction with the a SSKINg bundle (NHSI, 2018)

prevention strategy. After 3 weeks, the pressure ulcer had fully healed (Figure 3c) and 50% of the thigh wound had healed, with the rest epithelialising (Figure 4b).

Conclusion

Good wound management involves a holistic approach to care; without considering the whole person, the wound management might not be as good as it could be. The optimal goal of effective exudate management is containment, protection and healing. This is alongside the promotion and maintenance of patient comfort, safety, quality of life and provision of patient education and collaboration. Selecting the right product every time and creating an optimal wound healing environment by managing wound exudate is paramount. The cases presented here indicate that Kliniderm foam silicone border and Kliniderm foam silicone lite dressings are effective in the management of both acute and chronic wounds and are safe, effective and acceptable to both health professionals and patients. **BJN**

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KEY POINTS

- Treating patients with cancer involves multiple modalities, all of which have a direct impact on wound healing
- Many cancer treatments can make wound management challenging
- Good wound management involves a holistic approach to care that considers the whole person
- Effective exudate control is an essential requirement of wound management
- The Kliniderm foam silicone range of dressings is effective in the management of both acute and chronic wounds. They are safe, effective, and acceptable

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