Positive clinical and patient outcomes with a next-generation foam dressing

KEY WORDS
- AQUACEL Foam dressing
- Dressing selection
- Exudate management
- Foam dressings
- Hydrofiber Technology

Ensuring the correct choice of wound dressing requires clinicians to balance knowledge of the principles of wound healing with understanding of the performance parameters of particular dressings. In addition, clinicians require robust evidence-based knowledge regarding the quality, clinical- and cost-effectiveness of wound dressings in order to assist decision-making. This is particularly paramount when managing moderate-to-highly exuding wounds, where it is essential to select a dressing that can effectively manage the exudate, as well as promoting moist wound healing. This article presents results from two clinical evaluations of AQUACEL® Foam dressing, a unique next-generation foam that incorporates Hydrofiber® Technology. The article details its effective exudate management and periwound skin protection, and its positive impact on patient satisfaction and quality of life.

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The role of clinicians in wound care can be complex. The skilled clinician must provide an orchestrated assessment not only of the wound but also of the patient, followed by implementation of a robust and clinically evidenced management plan. In order to achieve this, the clinician must have the in-depth knowledge and skills needed to inform dressing choice, based upon understanding of composition and mode of action, whilst meeting local formulary and procurement requisites (Weir, 2012). This can be difficult, since clinicians are presented with an ever-growing number of available wound dressings; therefore, it is crucial that clinicians maintain up-to-date knowledge regarding the quality, and clinical- and cost-effectiveness, of available products, in order to support an appropriate and informed clinical decision (Krasner et al, 2011).

EFFECTIVE DRESSING SELECTION: A COMPLEX PROCESS

According to Weir (2012), many wound care products share common objectives to assist with wound healing. These are:

- To fill any wound space (where appropriate)
- To provide the optimal balance of wound care moisture
- To protect the periwound skin.

It is imperative when selecting wound dressings to ensure these objectives are met through correct selection. Equally, it is important that the dressing selected not only assists in effective wound management but also enhances patient comfort and wellbeing, promoting a positive patient experience and assisting with active concordance, an important prerequisite in the wound healing journey (Wounds International, 2012; Bateman, 2015; Hunt, 2015).

In addition, clinicians must be mindful that all patients are individual and all wounds are different. There is no 'one-size-fits-all' option with regards to suitability and selection (Weir, 2012). According to Krasner, et al (2011), knowing the performance parameters of particular dressings or dressing categories and matching these to attributes of an individual's wound, such as high levels of exudate production, can optimise the healing process.

A summary of factors that may influence choice of wound dressing, such as location and size of the wound, is provided in *Table 1*.

EXUDATE MANAGEMENT AND DEVELOPMENTS IN FOAM DRESSING TECHNOLOGY

Moisture balance is crucial in assisting wound healing. Wound dressings must facilitate moist wound healing, as well as being able to absorb

Table 1. Factors that may influence dressing selection (Weir, 2012)	
Location of the wound	The dressing must be secure, remain in place for the appropriate length of time and protect the periwound skin.
Size and depth of the wound	The dressing must adequately fill the wound bed space and cover the wound surface.
Exudate type and volume	The dressing must be able to adequately manage the volume and type of exudate. The wound exudate should be absorbed within the wound dressing in such a way that it prevents excessive exudate remaining in contact with the wound surface and the periwound skin, whilst encouraging moist wound healing.
Tissue composition (type)	The dressing should be appropriate for the predominant tissue type at the wound surface (i.e. necrotic, sloughy, granulating, epithelialising).
Surrounding skin	Dressing selection must maintain healthy periwound skin. Choice of dressing and method of adherence will be influenced by the sensitivity or fragility of the surrounding skin.
Pain or trauma at dressing change	Patient comfort should be paramount in dressing choice. The overall aim is to avoid pain and trauma at dressing change and whilst the dressing is *in situ*.
Patient quality of life	Dressing choice should take into account mode of action, frequency of change, and patient choice, in order not to impede upon the patient's quality of life.
Threat of bacterial contamination	In some cases, a dressing that provides additional antimicrobial action may be required to reduce bacterial burden.

excess wound exudate. Appropriate dressing selection is vital if an effective wound bed moisture balance is to be maintained (Adderly, 2010).

Foam dressings are traditionally made from polyurethane, with or without a film outer layer to prevent strikethrough of exudate. However, foam dressings do vary in their composition; for example, in thickness, ability to donate and absorb moisture, dressing retention ability, and frequency of changes required (Sussman and Sussman, 2012).

Although the literature had supported use of foam dressings in highly exuding wounds due to prevention of exudate strikethrough and reduction in frequency of dressing change, there has been recent debate regarding their use in clinical practice (White et al, 2012). However, the addition of Hydrofiber® Technology to a foam dressing — in the form of AQUACEL® Foam dressing (ConvaTec) — is a recent development that has extended the use of foams across a wider range of wound types (Bishop et al, 2012).

AQUACEL Foam dressing *(Figure 1)* is used for chronic and acute wound management as a primary or secondary treatment, and has been shown to provide:

- Superior fluid handling capacity, with high levels of absorption and retention (Pritchard et al, 2012)*
- Effective moisture balance, with a retentive wound contact surface and a high moisture vapour transmission rate (Bishop et al, 2003)*
- Minimisation of lateral fluid spread, protecting the periwound skin from maceration (Bishop et al, 2003; Robinson, 2000)*
- Protection of the underlying skin and wound tissue, via a low friction outer surface and foam core (ConvaTec Inc, Data on File).
- Atraumatic skin adhesion; easy to apply and remove (ConvaTec Inc, Data on File).

AQUACEL Foam dressing's unique design incorporates the gelling Hydrofiber wound contact layer, which maintains a moist environment, provides intimate contact across the whole wound surface (with no adhesive barrier between the Hydrofiber and the surface), and reduces pain associated with the wound (Armstrong et al, 1995; Barnea et al, 2004; Caruso et al, 2006; Pritchard et al, 2012).

AQUACEL Foam dressing has also been demonstrated as comparable with some competitor foam dressings with regards to optimal fluid handling capacity (ConvaTec, Data on File [*in vitro*]), and early clinical studies have shown effective exudate management, periwound skin improvement, and cost-effectiveness (Renfrey, 2012; Walker et al, 2012).

CLINICAL EVIDENCE FOR THE USE OF AQUACEL FOAM

The results of two product evaluations (supported by ConvaTec) of AQUACEL Foam dressing are provided below — a multicentre evaluation and another by the South-Tees Hospitals NHS Foundation Trust.

*As demonstrated *in vitro*

Study 1: Multicentre product evaluation

Method

A multicentre product evaluation was carried out to determine clinical experiences and outcomes with AQUACEL Foam dressing for different wound aetiologies, whilst also recording patient comfort.

Study design

The study was undertaken in over 40 locations across the UK. It comprised a questionnaire evaluation addressing wound management outcomes when using AQUACEL Foam dressing. Questions asked in the questionnaire included:

- Patient wound type and wound management history
- Wound characteristics at initial assessment, including aetiology, pressure ulcer category, duration, exudate level, and condition of wound bed and periwound skin
- Whether the dressing was used as a primary or secondary intervention
- Details of dressing changes: frequency, wound progress, patient pain rating (using a VAS of 0 [no pain] to 10 [worst pain]), reason for dressing change, and exudate management.

The questionnaire was completed at each dressing change for a maximum of 20 dressing changes or a period of 4 weeks, whichever came first. At final wound assessment, the questionnaire reviewed wound progress, condition of surrounding skin, patient comfort rating, and frequency of dressing changes compared with previously used dressings. Each of the questions had a small number of non-responders (numbers stated below).

Study population

Inclusion criteria included all individuals (*n*=75) with chronic exuding wounds for which AQUACEL Foam dressing could be used as a primary or secondary treatment (18 years or over). Exclusion criteria included clinical signs and symptoms of infection or any skin-related condition that may affect healing of the periwound skin.

At the start of the evaluation, patients were changed (with consent obtained by the evaluator) from their current foam dressing to AQUACEL Foam dressing, either adhesive or non-adhesive, using the same dressing regimen.

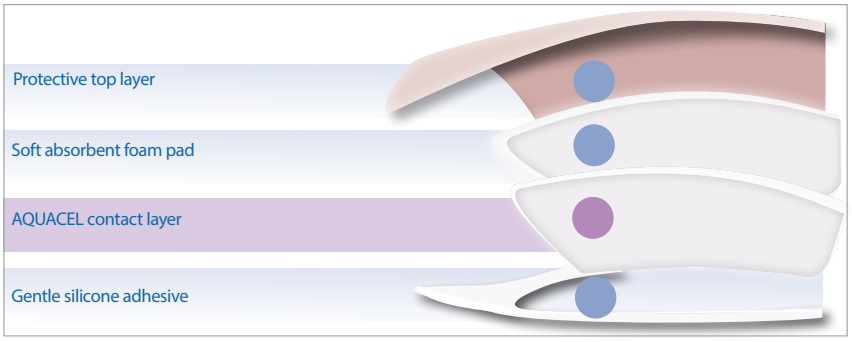

Figure 1: AQUACEL Foam Dressing

Results

In total, 75 patients aged between 11—97 years (mean age: 70 years; 45 male [60%]; no age given for six patients) were enrolled in the evaluation. Wound aetiologies included diabetic foot ulcers, leg ulcers, pressure ulcers, moisture lesions, fungating wounds, surgical wounds and trauma wounds *(Figure 2)*.

Exudate management

At study inclusion, the level of exudate for each wound was assessed by the clinicians and recorded as none to minimal (*n*=3; 4%), low (*n*=20; 27% [dressing change 1–2 times per week]), medium (*n*=27; 36% [dressing change 3–4 times per week]) or high (*n*=24; 32% [dressing change ≥5 times per week]) (one non-responder).

After the first and final dressing changes, the dressing's ability to manage wound exudate was rated by the clinician. At the final dressing change, the majority rated exudate management with AQUACEL Foam as excellent (*n*=44; 59%) (one non-responder) *(Figure 3)*.

*Other: trauma (n=4), fungating wounds (n=2), and moisture lesions (n=1).

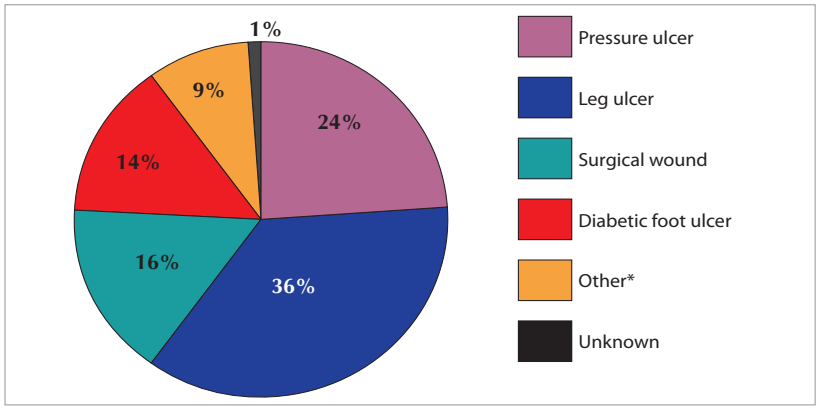

Figure 2: Distribution of wound types at study inclusion

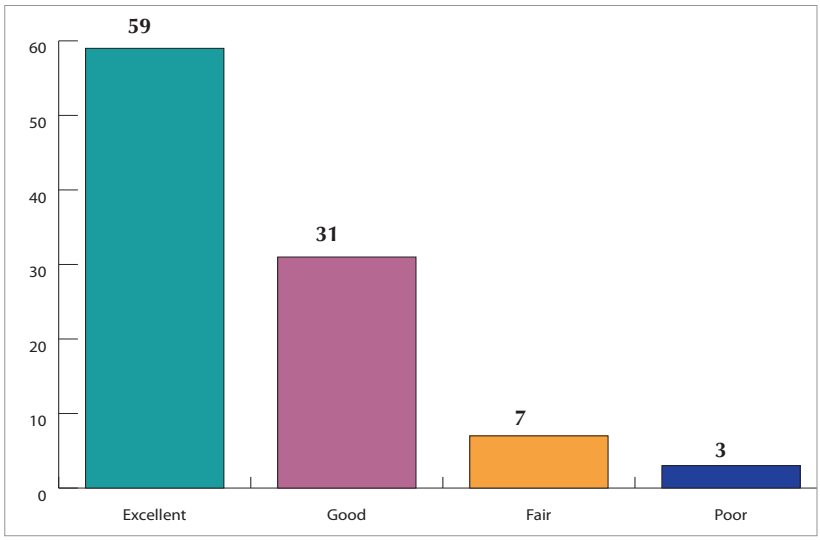

Figure 3: Wound exudate management, as rated by clinicians

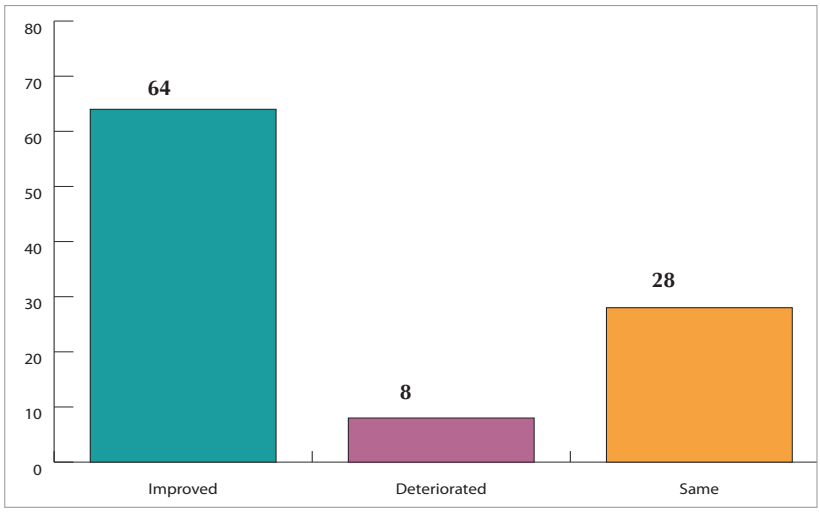

Figure 4: Condition of periwound skin at final dressing change compared with initiation

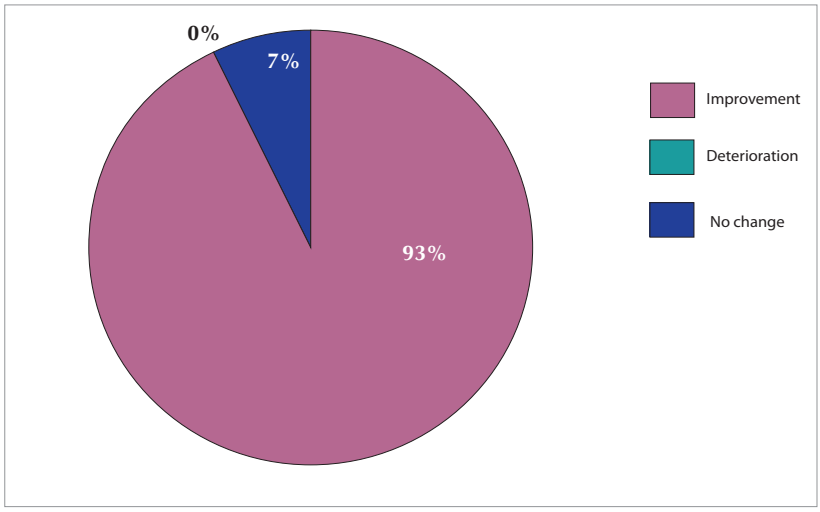

Figure 5: Wound progression at final assessment

Condition of periwound skin

Condition of the periwound skin was evaluated at inclusion and recorded as macerated (*n*=30), irritated (*n*=19), eczematous/dry (*n*=18), normal (*n*=16) or other (*n*=1; recorded as 'inflamed') (two non-responders; and some overlap of reported conditions).

After the first and final dressing changes, the condition of the periwound skin was assessed in comparison with the initial condition. The majority of clinicians reported improvement in periwound condition (*n*=47; 64%) (one non-responder) *(Figure 4)*.

Wound progression

As part of the final wound assessment, clinicians were asked to rate wound progression. Sixty-five clinicians (93%) reported improvement and five (7%) reported no change *(Figure 5)*; no clinicians reported wound deterioration (five non-responders).

Of the 65 improved cases, the majority of clinicians (*n*=59; 95%) felt that AQUACEL Foam dressing had contributed to the improved condition of the surrounding skin (three non-responders).

Pain ratings

At the final dressing change, the majority of patients experienced no pain whilst the dressing was *in situ (Figure 6a)* or at dressing removal *(Figure 6b)* (83% and 84%, respectively) (five non-responders).

Dressing change frequency compared with previously used dressing

The frequency of dressing changes as compared with previously used dressings was lower for 35 patients (51%), the same for 32 patients (47%) and more for one patient (1%) (*n*=68) *(Figure 7)*. In two cases, no dressings were previously used (new wound) (five non-responders).

Patient comfort

At the final wound assessment, AQUACEL Foam dressing was rated in terms of comfort. The majority of patients rated it as 'excellent' (*n*=49; 75%) (ten non-responders) *(Figure 8)*.

Adverse events

Infection was observed and recorded in two cases (3%). In two further cases (3%), patients

discontinued AQUACEL Foam dressing as a result of the dressing falling off, although this was not attributed to the dressing on the evaluation form.

Study 2: South-Tees product evaluation

Method

Study design

A further product evaluation of AQUACEL Foam dressing was carried out in the South-Tees Hospitals NHS Foundation Trust. All patients changed to AQUACEL Foam dressing at the start of the evaluation. The evaluation continued for a period of 3 months, with data collected at each dressing change.

Dressings were changed 1–2 times per week in 68 patients (70.1%), 3–4 times per week in 27 patients (28.8%) and more than 4 times per week in 1 patient with a surgical leg wound. Exudate levels ranged from low (21.6%), moderate (34%) to high (44.4%).

Study population

The study enrolled 97 patients (56% male; mean age: 72 years) with acute and chronic wounds of various aetiologies *(Figure 9)*. Of these patients, 46.39% had pressure ulcers, ranging from grade II–IV.

Results

Results of this evaluation of AQUACEL Foam dressing identified:

- Signs of wound improvement at the third dressing change (mean: 10 days)
- Improved appearance of the periwound skin over the course of the evaluation in 77.3% of patients (no change in remaining patients), with signs of improvement including reduced or resolved maceration, reduced slough, and evidence of increased granulation formation
- Conformability ratings of 'excellent' or 'good' in 96.9% of patients (*n*=94), while three patients whose wounds were located in difficult-to-dress areas (scrotum, ear and sacrum), found the dressing to be 'acceptable'
- An absorbency rating of 'excellent' in 63% of patients (n=58) and 'good' in 36.9% (*n*=34) (five non-responders)
- Ease of application rated as 'excellent' or 'good' for all patients, with no reports of damage to the wound bed on removal

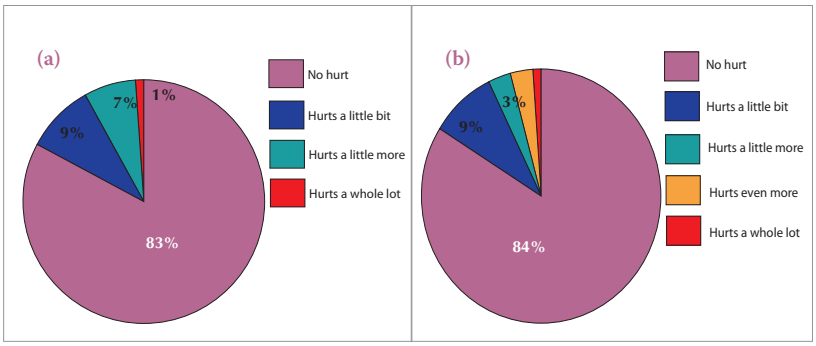

Figure 6: Pain ratings while dressing was in situ (a) and on removal (b)

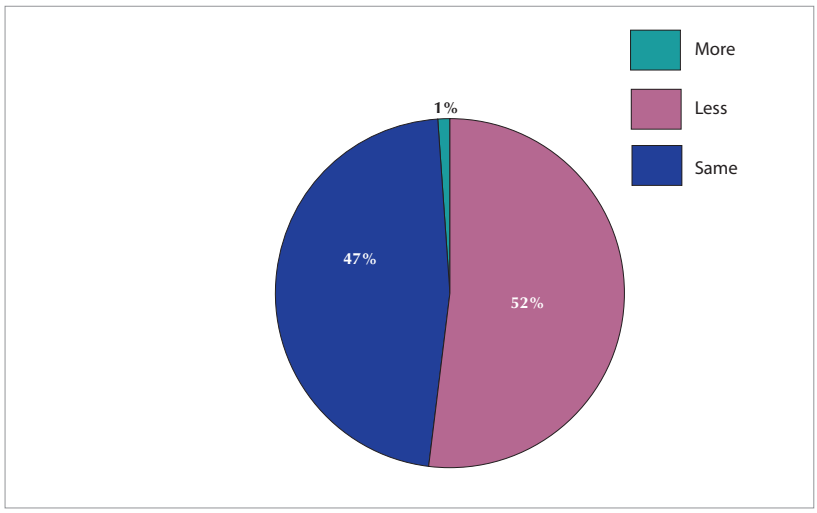

Figure 7: Frequency of dressing changes compared with previously used dressings

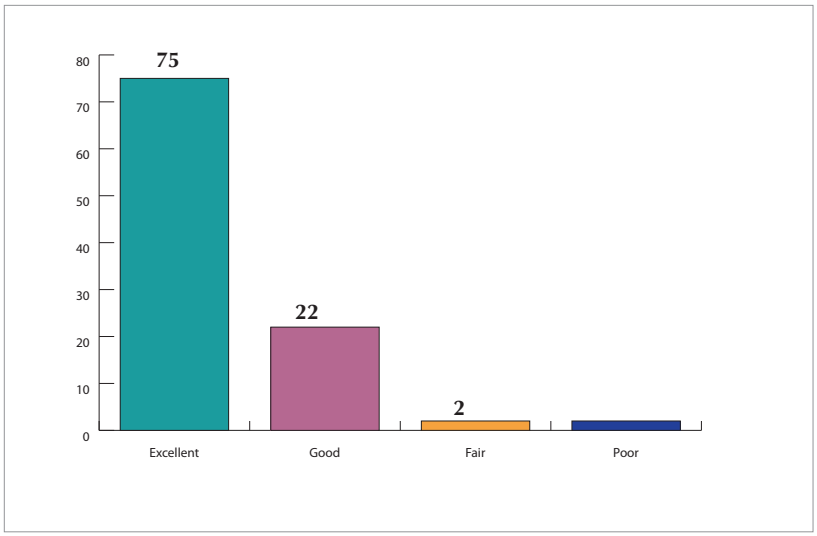

Figure 8: Overall patient comfort ratings

- All patients 'liked' and chose to keep using the dressing; in addition, all clinicians (*n*=75) involved in the evaluation favoured AQUACEL Foam dressing over previous dressing used.

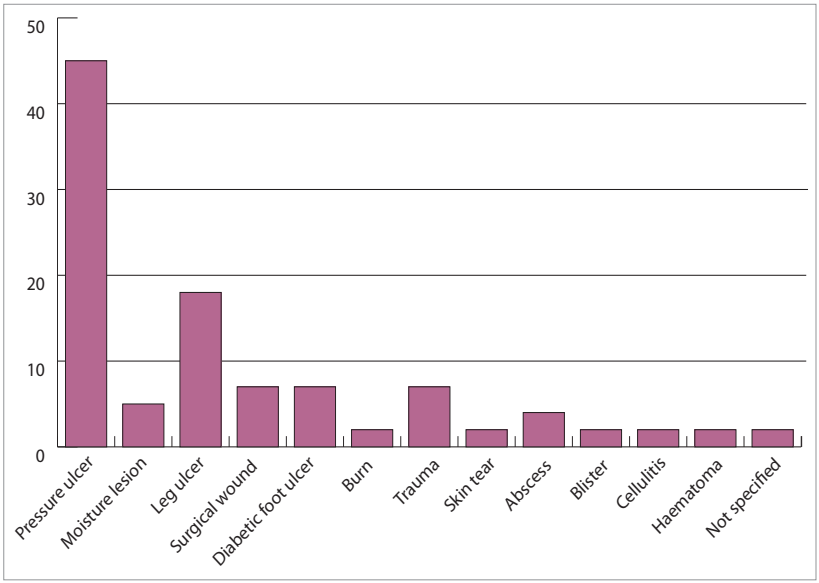

Figure 9: Wound types included in the evaluation

CONCLUSION

Wound assessment and management are complex processes that require the clinician to have knowledge and skill not only in the principles of wound healing, but also of wound dressing products; in particular, their modes of action and clinical effectiveness. In today's healthcare arena, there are myriad dressings available; therefore, simplification of dressing selection is vital in order to assist the clinician.

The results of the clinical evaluations presented in this article demonstrate overall positive outcomes for use of AQUACEL Foam dressing with regards to the provision of superior exudate management. The majority of clinicians rated the dressing 'excellent' in terms of absorbency and exudate handling capability. The dressing also facilitated an optimum wound bed environment, assisting in maintaining healthy periwound skin by reducing lateral fluid dispersion.

Across all evaluation centres, AQUACEL Foam was rated as 'excellent' in its atraumatic application and removal properties. In addition, the majority of patients expressed positive feedback in terms of comfort. Patient and clinician opinions also highlighted that the dressing promotes self-care, and most were satisfied to continue with its use; indeed, the majority of clinicians preferred the AQUACEL Foam dressing to previous products used. As such, AQUACEL Foam dressing can assist with effective wound management and patient satisfaction whilst also assisting in simplifying dressing selection, due to its unique design and the addition of Hydrofiber Technology.

It is recommended that further similar evaluations are undertaken by clinicians in order to contribute to clinical evidence supporting effective wound management. As highlighted in the results of these evaluations, it is vital that patients' and clinicians' voices are heard, as this will steer appropriate developments in wound care products. WUK

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