

WHAT IS THE CURRENT STATUS OF FOAM DRESSINGS?

While the literature includes many reports on the clinical efficacy of foam dressings, including some randomised controlled trials (RCTs) (Fletcher, 2005; Vogensen, 2006; Kirby, 2008; Bianchi et al, 2011; Dumville et al, 2011), there is still considerable confusion about their role and value in wound management. Perhaps the single biggest question is that of fluid uptake — for example, how well do the various foams deal with exudate and do they all function under compression to absorb and retain exudate?

Before posing various pertinent questions to three wound care experts, it is useful to look carefully at foams, their provenance, uses and clinical outcomes. What are the manufacturers' claims and indications for these dressings, and how does the evidence support them?

The category 'foam dressings' comprises many variations — adhesive and non-adhesive; silastic; polyurethane; hydrocellular; and composites, which incorporate other materials. With adhesive foams, the 'sticking' agent also varies. Foam dressings have been commercially available for over 30 years (Winter, 1975) and are now in widespread use. Throughout this period, there have been many re-formulations, making historical comparisons difficult.

So, what should be our criteria for judging the value of foams in modern wound care? Should it be fluid-handling properties, adhesion characteristics, cost, pressure ulcer prevention, patient-related factors such as pain, or cost-efficiency?

In respect of fluid handling, a cursory review of published trial data reveals a range of reports of maceration incidence. Whether this is the most suitable marker for fluid handling or not, it does provide useful information. For instance, Schulze et al (2001) in a study on moderate-to-

heavily exuding venous leg ulcers, found maceration in 20% of dressing changes. Vanscheidt et al (2004), in a study on minimal-to-moderately exuding venous leg ulcers found an incidence of between 22–27%. These data must be interpreted in the context of the subjective assessment of wound exudate and the clinical judgement of appropriate wear time. Nevertheless, these robust clinical trials did show significant maceration in venous leg ulcers with compression therapy.

In a novel *in vitro* approach to measuring dressing moisture levels in real time, McCall et al (2007) found a wide range of levels at the dressing-wound interface. This is suggestive of variations in clinical practice, where wounds are either too wet or too dry. Subsequently, in a range of *in vitro* tests, including the WRAP method (Thomas et al, 2001) and an *in vitro* 'compression' technique, Thomas found 'considerable differences' in test results (Thomas, 2010a). In an attempt to relate these findings to clinical practice, Thomas concludes that there were 'marked differences in product performance, which may be reflected in treatment costs.'

So, what can be extrapolated from these *in vitro* studies? Can we conclude that foams do not perform consistently, that they are not appropriate for all wound types or that indications for use are imprecise? Or conversely, are foams a much-maligned dressing type that is clinically valuable and supported by good evidence?

Richard White

What is the current status of foams in wound care and why are they being called into question?

SG: Foams are included in every store cupboard — they are familiar to nurses who use them on a wide range of wounds. When analysing wound care finances, foams will form a significant percentage of any budget.

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KC: 'Foam dressings are a useful inclusion in modern wound care management formularies as they possess a wide range of properties'

MW: 'Foam dressings should always be included in formularies as they offer management of higher levels of exudate when used appropriately'

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Unfortunately, foam dressings can be used inappropriately, resulting in poor healing outcomes. If high spend is not correlating with positive healing rates, we need to question the role of foams within our formularies.

KC: Polyurethane (PU) foam dressings offer an established means of managing wounds and when used correctly are able to provide a moist wound-healing environment in line with Winter's (1962) concept. PU foams have found favour with patients and nurses as a result of their 'spongy' texture, which is generally found to offer a non-abrasive and comfortable interface. Doubt over the relevance of PU foam dressings in 21st century wound care appears to be as a result of high unit cost, a paucity of RCT evidence in relation to clinical performance and the fact that, in the past, they have been promoted heavily as suitable for wounds that are moderately to highly exuding when in fact they are better suited for low to moderately exuding wounds. In addition, foam dressings are generally unable to retain the fluid that they have absorbed, even under application of low levels of pressure. This can lead to maceration of periwound skin with consequential delays in healing.

In your opinion, are foams a useful inclusion in formularies?

SG: With the range of alternative dressings available to us now, including advancements in the production of superabsorbent technology, we can manage wounds effectively without them.

KC: PU foam dressings are a useful inclusion in modern wound care management formularies as they possess a wide range of properties including non-adherence, the ability to convey medicaments, to be cut to shape, to provide thermal insulation, gas-permeability, maintenance of a moist environment and the fact that they are light and comfortable to wear. As with any medical device, their value in terms of outcomes lies in accurate assessment, together with having realistic expectations in respect of performance. It is important to remind ourselves that dressings do not heal wounds.

MW: Foam dressings should always be included in formularies as they offer management of higher levels of exudate when used appropriately. As modern dressings, they manage exudate by both absorption and transpiration. It has been shown that foams have the ability to increase transpiration when liquid migrates from the wound bed towards the backing film (Thomas, 2010b). Foams in combination with films have also been shown to be able to manage large volumes of fluid by transpiration (Thomas and Young, 2008). Furthermore, the backing film of modern foam dressings can provide a low coefficient of friction and minimise infection due to their bacterial barrier properties. Foam dressings may be highly conformable and provide protection for bony prominences against pressure sores.

Should formularies be evidence-based, if so, who provides the evidence?

SG: Formularies should always strive to be evidence-based, but frequently there is insufficient high-quality evidence to distinguish between products. It is reasonable for industry to provide some of the evidence to support decision making, although much of it is based solely on clinical case studies. Ideally, clinicians should be sourcing then critically analysing evidence themselves, then backing up potential formulary inclusions with robust product evaluations. Alas, the time required to do this can be prohibitive.

KC: Relevant evidence should be applied when considering the clinical application of wound dressings. The difficulty here is the provenance of that evidence. Wound care (and hence patients) has benefited immensely from the evidence that has been produced. However, the majority of this evidence has been produced for commercial sources with a vested interest and sometimes this can taint the value of the findings. As no two patients, or indeed their wounds, can ever be considered to be the 'same', it is inappropriate to consider evidence purely in terms of relevance to the formulary document. Evidence should be considered in relation to the dressing, the patient and his or her particular circumstances. Procuring evidence in relation to product performance is challenging. Performance between different foam dressings will vary considerably. It is impossible to procure comparative *in vitro* and *in vivo* evidence that will cover all formulations. In any case, Treadwell (2007) has clearly stated that policies and regulations should never replace clinical experience or care tailored to the individual patient.

MW: I agree with the principle of evidence-based formularies as long as *in vitro* evidence is supported by clinical experience. It is also important that any *in vitro* evidence is appropriate

for foam dressings — free swell absorbency and measurement of fluid-handling capacity, for example, are only able to characterise the materials used in a dressing, not clinical performance. Absorbency under load is also questionable as a test as the dressing is often hydrated before the load is applied, therefore, this does not simulate the clinical situation, where it is more likely that the dressing will be compressed before it becomes hydrated. More appropriate for foams is WRAP dynamic testing (Thomas et al, 2007), which offers realistic simulation of the clinical situation as the fluid can be delivered to the dressing at a rate equivalent to that found in an exuding wound (Thomas et al, 1996). Pressure can also be applied to the dressing throughout the test to simulate compression. The measurement of fluid migration across the surface of a dressing with and without an applied load is also useful as this can be indicative of the potential of the dressing to cause maceration when compressed.

If a dressing can be used inappropriately, should its availability be restricted?

SG: I think all dressings can be used inappropriately and, therefore, rather than restricting dressings, we should be developing better strategies to support and educate nurses in making the right clinical decisions. Measuring clinical outcomes and monitoring spend will help assess the effectiveness of any dressing policy.

KC: If we were to apply this concept to the motor car there would be very few on the road! We should not lose sight of the fact that working in healthcare bestows a responsibility upon the clinician to identify and select those therapeutic interventions that are relevant to the patient's clinical circumstances and are most likely to achieve optimal outcomes. Any tool is only as good as the workmen who use it!

MW: I believe it is possible to use any dressing inappropriately — it is the dressing selection experience of the carer that should be brought into question. Lack of experience is not a reason to reduce dressing availability.

What, in your opinion, is the future of foams in wound care?

SG: I think the days of foams are numbered. We have already removed all foams from our local formulary and I suspect that other trusts will be considering this too. However, as they are such a well-established product, I think their demise will be slow.

KC: We should not lose sight of the fact that PU foam dressings possess a number of valuable properties and that accurate patient/wound assessment is essential. It is also important that manufacturers make realistic claims as regards product performance and that they do not get carried away with hyperbole. The future of PU foams in wound care is also somewhat dependent on the relevance of the current classification of wound dressings. This is based chiefly on the ingredient(s) of the dressing. If we were to move to a system of classifying dressings according to the outcomes that can be achieved (van Rijswijk, 2006) then dressing selection would more likely be focused on the needs of the patient and their wound, which takes us neatly back to the relevance of accurate assessment.

MW: *In-vitro* data suggests that foams have a place in the management of heavily exuding chronic wounds. However, the main disadvantage of foams when transpiration is restricted is that they are generally unable to immobilise the exudate they absorb. This can result in fluid migration when pressure is applied and result in maceration of periwound skin. Efficient foams are those that at least slow down fluid migration when compressed — the most effective are those that are

able to immobilise exudate within the dressing as it is absorbed. **WUK**

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