

# Evaluating a super absorbent dressing (Flivasorb) in highly exuding wounds

Debby Verrall, Anna Coulborn, Cathie Bree-Aslan

Wounds can significantly disrupt any quality of life and cause intense pain, both physically and psychologically. There is a great responsibility in caring for patients with chronic wounds, and this is taken very seriously in the Wound Healing Centre in Eastbourne, where the specialist nurses consider the options for treatment carefully. The aim is to manage symptoms and reduce the distress these life altering wounds can cause.

Exudate production in chronic wounds can be extremely uncomfortable, causing tissue damage around the wound and reducing quality of life as the excessive leaking leads to embarrassment and disrupts social life (Hampton and Collins, 2003). Nurses' decisions on dressing selection should be based on current best evidence and research-based knowledge of principles of topical wound care, even when a dressing (such as Flivasorb) is extremely unlikely to cause harm (Pieper, 2009).

The development of new dressings enables patients to have access to the latest technology. Wound healing units are ideally placed to evaluate such products. The aim of the evaluation was to assess Flivasorb for its ability to absorb the excessive exudate and to reduce colonization by removing the bacteria through absorption into the dressing.

## Background

Exudate is fluid that filters from the circulatory system into areas of the body that are inflamed and, because exudate is present on the wound surface, it promotes moist wound healing and allows the migration of fibroblasts. Normally, the amount of wound exudate should decrease over time (Ratcliff, 2008). However, in chronicity, exudate can also increase over time.

The production of wound exudate occurs as a result of vasodilation during the early inflammatory stage of healing (White and Cutting, 2006). Its production in the acute wound is a normal process of wound healing and, in itself, is generally not a problem. However, when an acute wound becomes chronic, exudate then changes from a normal process into an abnormal one, with an elevation of levels of reactive oxygen and nitrogen species (Wiegand, et al. 2009). Overproduction of these free radicals (atoms or molecules with at least one unpaired electron, causing instability, which can interfere with normal cell function) perpetuates the inflammatory phase and results in severe tissue damage (Figure 1). Exudate then becomes a wounding agent in its own right (Walker, Hadgraft and Lane, 2008).

## Abstract

**This article reports an observational evaluation of 19 patients with highly exuding wounds. Flivasorb was used as a super absorbent dressing that could remove the harmful exudate fluid and promote a healthy wound bed. The outcomes demonstrated that Flivasorb successfully absorbs large amounts of fluid, reduces the number of dressing changes required and therefore, reduces the cost of the patient's care.**

**Key words:** Dressing ■ Exudate ■ Healing ■ Wound

The reduction of these active species seems to be one way to promote normal wound healing (Wiegand et al, 2009). A potential way to control this damaging wound exudate is through the use of a supra absorbent dressing such as Flivasorb.

The superabsorbent properties of Flivasorb give the healthcare professional potential to extend periods between dressing changes. It was important that Flivasorb was applied appropriately in each case with some patients requiring an extra antibacterial to the wound to reduce bacterial loading. Some patients would require an extra antibacterial dressing against the wound to reduce colonization, whereas others could have the Flivasorb directly onto the wound as a primary dressing.

The specific aims of the evaluation were to:

- Absorb exudate and prevent periwound damage
- Reduce the bacterial content in the wound through absorption. This follows research by Bowler et al (1999), which showed that absorptive dressings absorb the bacteria into the dressing. This means the bacteria are discarded with the dressing. Bacteria cause the wound to be malodorous and increase the pH, so the reduction of colonizing bacteria is measured by reduced odour and pH.
- Assess the potential of a superabsorbent (Flivasorb) dressing under compression, as the compression could squeeze the fluid back out of the dressing and onto the wound and surrounding tissue.

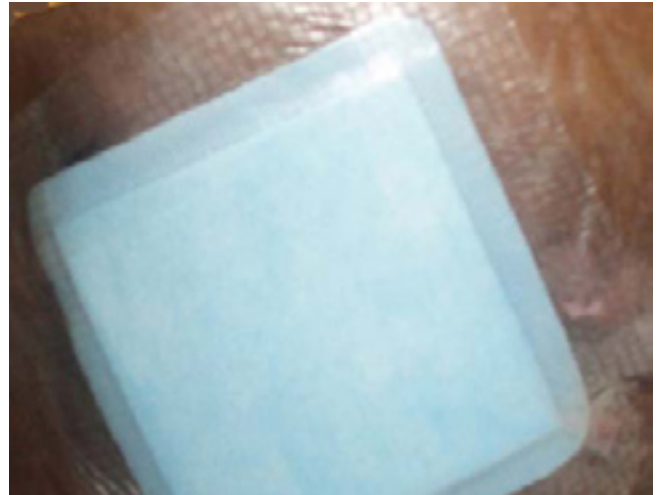
Debby Verrall, Anna Coulborn and Cathie Bree-Aslan,  
The Wound Healing Centre, Eastbourne, East Sussex

Accepted for publication: March 2010

Figure 1. Exudate becomes a wounding agent in its own right.



Figure 2. Flivasorb in situ.



### What is Flivasorb?

Flivasorb (Figure 2) is filled with superabsorbent polymers that can absorb up to 20 times as much fluid as most foam dressings, which is several times their own weight. When exudate comes into contact with the superabsorbent polymers it will attach to the polymer chains and form a complex network structure, resulting in visible swelling and gelling.

Like all highly absorbent dressings (Bowler et al, 1999), Flivasorb will retain some pathogens in the dressing. Although Flivasorb cannot kill the bacteria, it can successfully remove them when the dressing is changed. It is good practice to change the dressing when it is almost full, and Flivasorb should never be used as the only treatment for critically colonized or infected wounds, where the bacteria is in the host tissue and requires antibiotics. Changing the dressing when required will also reduce the potential for any dressing to macerate the tissue surrounding the wound, although this is far less likely to occur with a superabsorbent dressing as it retains the fluid.

The manufacturer claims that Flivasorb is suitable for use under compression, locking fluid in the dressing when a tight bandage is applied. This study assessed that claim with the compression bandaged wounds that were used.

### Method

Nineteen patients, (seven from the Wound Healing Centre and twelve from different clinics) were selected and consented to evaluate Flivasorb. Criteria for selection was any wound that was heavily exuding requiring dressing change of three times to seven times weekly. Sixteen of these patients had venous disease, which had led to venous ulceration of the lower limb. Venous ulceration makes up 70% of the wounds seen in any wound healing centre with a further 10% being arterial (Morrison et al, 2007).

The audit tool used to assess the patients in the Wound Healing Centre is part of the telemedicine system. Telemedicine is a computer programme assessment tool used within the Wound Healing Centre. Audit results are simply produced from telemedicine, which is based on national guidelines. The assessment tool used in all other

centres were individual, but also based on local and national guidelines.

Eleven women and eight men took part in the evaluation, with the average age being 66.5 years. Those patients with venous leg ulcers were all being treated with compression therapy and all had undergone a Doppler assessment prior to application of compression bandages.

Exudate levels were assessed using the recognized continuum of 1 (low exudate – requires dressings weekly) to 10 (extremely high levels of exudate requiring dressing change daily). The wound dressings were changed as required by the individual's needs and the wounds measured at each change.

Nationwide evaluations according to a set questionnaire measured the following parameters :-

- Exudate levels and management
- Skin condition
- Wound improvement
- Frequency of dressing changes
- Use under compression
- Ease of use
- Patient comfort

### Results

There were:

- 16 established venous leg ulcers
- 1 pressure ulcer
- 1 arterial ulcer
- 1 chest wound.

In this study, the average level of exudate was 6.5 (out of 10). This was measured using the wound healing continuum (Gray et al, 2005) and, on average, dressings required changing on alternate days. The average duration of the wounds was 1.5 years, with the longest established wounds being greater than 5 years and the newest wound being 2 months.

The 16 patients who had venous ulceration were already established users of compression bandages. The Doppler assessment was considered necessary, and gave an average ankle brachial pressure index (ABPI) of 1.05 (normal is 1.0). Therefore, these 16 patients were suitable for compression.

Measurement of wounds in the Wound Healing Centre

Figure 3. All wounds were measured before and after the evaluation and the average cm<sup>2</sup> of healing of each wound was 7.92cm (>2½ inches average reduction) over the 4 week period.

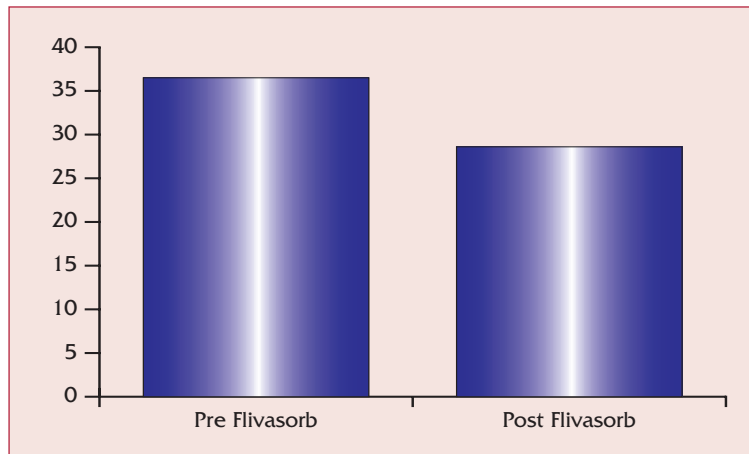
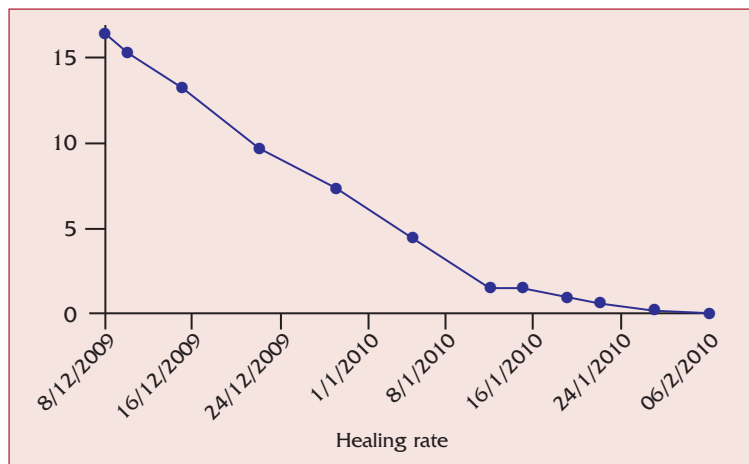


Figure 4. This is an example of the one of the Flivasorb graphs produced by the telemedicine programme.



were undertaken on telemedicine, providing a graph of changes in wound dimension (see Figure 3), and total reduction in surface area of all wounds was 79.2 cm<sup>2</sup>. The outcome of each measurement was plotted on the telemedicine assessment programme (see Figure 4).

In ten cases Flivasorb was used as the primary dressing, and in six cases it was used secondary to honey, Steripaste, Aquacel and foam. There was no difference in the absorption levels when used as secondary dressing.

In the 16 venous ulcer patients with compression therapy, the types of bandages used were a mixture of Actico, multi-layer and Coban2. In each case, Flivasorb had absorbed and successfully retained the fluid without reflection of exudates onto the periwound area, even under the high compression bandages.

The incidence of clinical infection was zero during the evaluation, and each wound improved during the four weeks with obvious signs that colonization was reducing (judged by assessing the granulation levels in the wound and reduction of odour).

The nurses found Flivasorb did not adhere to the wound and reduced dressing changes by an average of 1 to 2 visits per week. Dressings cost an average of £24 per change (see Table 1). By reducing daily dressing changes (at a cost of

Figure 5. All patients dressing changes weekly prior to and during the evaluation.

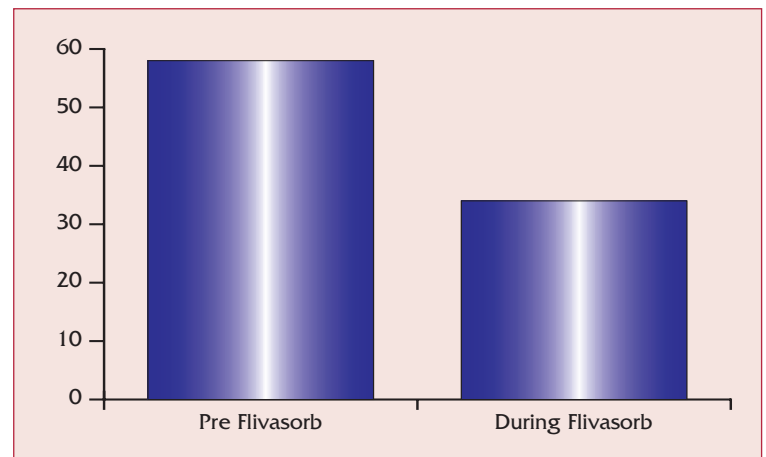
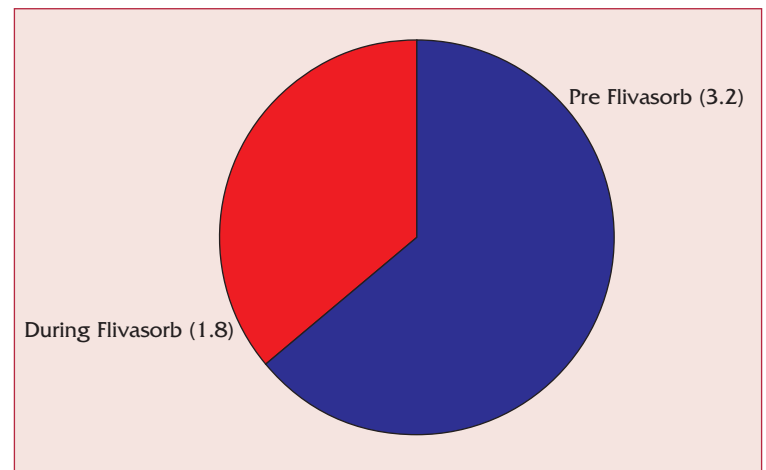


Figure 6. The Flivasorb had not only absorbed the exudates but had also locked it away within the central core of the dressing.



£8,736 per year) to twice weekly, a significant saving of £6,240 per year is made for each patient that does not heal within the year for dressing costs alone. Adding the nursing costs doubles the total cost of each dressing change, and would also create a significant saving if reduced.

During the evaluation period, dressing changes were reduced in 100% of the cases, with the average dressing change Flivasorb application being 3.2 and during Flivasorb, this dropped to 1.8 (Figures 5 and 6) times per week.

### Examining the outcomes of the evaluation

The nurses in the Wound Healing Centre have found from experience that wounds will heal faster if:

- The patient is confident in the treatment they are given
- They are treated by the same nurse at each visit
- The pain is reduced
- The nurse has obvious knowledge in the wound healing process
- The patient's quality of life is improved by the treatment they are given

This fits with the concept identified by Gottrup (2003).

The evaluation of Flivasorb was part of a process of understanding the patient needs and developing the 'tool

Figure 7. Patient 1. The wound on day 1. Flivasorb applied directly to the wound.



Figure 8. Patient 1. The wound after 10 days use of Flivasorb.



Figure 9. Patient 2. Day 1. The wound has been static for 2 months and is sloughy with maceration around the wound.



Figure 10. Patient 2. The wound is clean and healthy and the maceration is cleared.



Figure 11. Patient 3. The wound on day 1 is sloughy and is of 3 months duration.



Figure 12. Patient 3. The wound is clean and granulating.



box' required for wound healing. Using this process has led the Wound Healing Centre to healing 83% of venous ulcers within a very short period of time. Therefore, the process of evaluation and development cannot be undervalued when it comes to treating and caring for patients with chronic wounds. The benefits of good absorption of exudate can clearly be seen in *Figures 7 to 14*.

These patients (*Figures 7 to 14*) are a small example of those included in the evaluation. Nevertheless, this example is representative of the changes seen in the 4 weeks of observational study, and clearly shows the benefits of removing the exudate from the wound and the area around the wound.

Nurses should be knowledgeable of the therapeutic effects of a dressing when selecting it for wound care, and

should be prepared to evaluate products and change practice according to the identified outcomes. Change, and how people react to it, are important features of organizational life. This relates strongly to how we accept new dressings such as Flivasorb.

In order for wound care to develop, nurses need to engage in research and integrate research findings into practice and yet, in spite of the seemingly common acceptance of this principle, the actual merger of research and practice has yet to become widespread (Carroll et al, 1997). We must change in order to enhance high standards of patient care (Smith 1986) and, at the same time we must utilise research and evaluations to validate and prove that these changes are beneficial (Jaarsma and Dassen, 1993; Muellera et al, 2006). This is the important process that is understood within the

Figure 13. Patient 4. The wound was of 2 months duration and due to trauma.



Figure 14. Patient 4. The wound has almost complete epithelialization.



Wound Healing Centre; the evaluation of new dressings, such as Flivasorb must not only be undertaken, but the outcomes should be disseminated to colleagues as, without this dissemination, wound care will become static, along with many of the wounds.

## Conclusion

With the dynamically changing environment of the NHS, managing change and developing and improving patient care is the vital element of nursing's survival and growth. This evaluation was beneficial for both the patients and the nurses, enlarging the nurses' portfolio of knowledge and increasing the patient's quality of care and quality of life. Our nurses summarized the outcome: 'Flivasorb absorbs and retains the exudate, without reflecting it onto the skin, even under compression'. The patients were simply glad that they did not have to worry about leakage. BJN

- Bowler P, Jones SA, Davies BJ, Coyle E (1999) Infection control properties of some wound dressings *J Wound Care* **3**(10): 499–502
- Carroll DL, Greenwood R, Lynch KE, Sullivan JK, Ready CH, Fitzmaurice JB (1997) Barriers and facilitators to the utilisation of nursing research, *Clinical Nurse Specialist* **11**(5): 207–212
- Gray D, White R, Cooper P, Kingsley A (2005) Understanding applied wound management. *Wounds UK* **1**(1): 62–8
- Gotttrup F (2003) Multidisciplinary Wound Healing Concepts. *EWMA Journal* **3**(1): 5–11
- Hampton S, Collins, F (2003) *Tissue Viability a Comprehensive Guide* Whurr Publications, London
- Jaarsma T, Dassen T (1993) The relationship of nursing theory and research: the state of the art. *J Adv Nurs* **18**(5):783–787
- Morrison M, Moffatt, C, Franks P (2007) *Leg Ulcers: A Problem-Based Learning Approach*. Mosby
- Mueller, S, Vogt, PM, Steinau et al (2006) Repithel®: Removing the Barriers to Wound Healing *Dermatology* **212** (Suppl. 1):77–81
- Pieper B (2009) Honey-Based Dressings and Wound Care: An Option for Care in the United States *Journal of Wound, Ostomy and Continence Nursing* **36**(1): 60–66

- Ratloff CR (2008) Wound exudate, an influential factor in healing. *Adv Nurse Practitioner* **16**(7): 32–35
- Smith JP (1986) The beginning of the end *Senior Nurse* **5**(1):14–15
- Walker M, Hadgraft J, Lane ME (2008) Investigation of the permeability characteristics of peri-ulcer and whole ischaemic skin tissue. *Int J Pharm* **357**(1 & 2): 1–5
- White R, Cutting K (2006) Modern exudate management: a review of wound treatments (online) Available at: <http://www.worldwidewounds.com/2006/september/White/Modern-Exudate-Mgt.html> (Accessed 30 March 2010)
- Wiegand C, Abel M, Ruth P, Hipler U-C (2009) *A polyacrylate-superabsorber inhibits the formation of ROS/RNS in vitro* Wounds UK, Wound Care Conference, Harrogate 10–12th November 2009 Available at: [www.lohmann-rauscher.com/media/archive/1416.pdf](http://www.lohmann-rauscher.com/media/archive/1416.pdf) (accessed 30 March 2010)

With thanks to the evaluators: Harrogate District NHS Foundation Trust; TVCS, Eastbourne; Risedale at Lonsdale Hospice, Barrow in Furness; TVS, Warwick Hospital; Bury St. Edmunds Community Nursing; Thurrock Day Hospice; Community Health Buckinghamshire; Christie NHS Foundation Trust; Stalybridge Hospital, Cheshire

## KEY POINTS

- Nurses' decisions on dressing selection should be based on current best evidence.
- Exudate has the potential to damage the peri wound area and requires active management.
- Dissemination of outcomes is vital for the development of nursing and the promotion of high quality care.
- In this observational evaluation Flivasorb achieved its claim to being a super-absorbent dressing.