Cost-effective management of wound exudate

This clinical evaluation explores the complex challenges involved in managing exudate as part of a holistic wound treatment plan. The benefits of using Kliniderm® (Aria Medical) superabsorbent dressings for patients, nurses and the National Health Service (NHS) will be explained in this article. Quality and cost-effective outcomes will be considered, comparing the test dressing to two well-established Trust formulary superabsorbent dressings. As part of the evaluation, a simple questionnaire assessed nine dressing changes per patient and established feedback that reflected positively in favour of the Kliniderm superabsorbent dressing. A cost analysis was done by comparing data collected over a 3-month period during which Kliniderm superabsorbent dressings were not used with data compiled over 3 months during which only the test dressings were used.

"Superabsorbents have been designed for managing wounds with high levels of exudate. They have a greater fluid-handling capacity than traditional dressings, requiring less-frequent changing."

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The National Health Service (NHS) continues to seek cost-effective treatments, while striving to maintain the standard of care offered to patients in the UK. This general goal also applies to the field of wound care.

Leg ulcer patients whose wounds produce exudate, causing malodour, often express feelings of disgust, self loathing and low self esteem (Herber et al, 2007). The mismanagement of exudate can lead to excoriation, maceration, increased pain, infection and, ultimately, skin breakdown or a further increase in wound bed size. Wound exudate can cause anxiety and distress to patients of all ages undergoing treatment for a wound. When considering treatment options, there is the human cost to consider, as well as the cost to the NHS. Traditionally, we may have looked at unit cost when trying to make financial savings in the way that we deliver wound care. This is potentially a false economy if the suitability of wound care products for inclusion on a Trust formulary is not evaluated.

Ideally, when choosing a product that may have a lower unit cost than the one currently being used, the focus is also on its performance — it would be expected to perform as well as, if not better than, the previous product. In the case of exudate management, it would be ideal if the product absorbed the exudate, locked it in, were comfortable for the patient, conformable, easy to apply and remove, and had a long wear time.

It is essential that wound exudate be managed effectively. To achieve this, it is neccesary to spend time assessing the patient, their social circumstances and the wound bed. It is also crucial to develop a patient-practitioner relationship. This will let the clinician make a diagnosis on which to base an

effective treatment plan that meets the patient's needs, as well as the treatment challenges posed by the wound bed.

What is exudate?

Wound exudate is fluid that has leaked out of the blood vessels and closely resembles blood plasma. It contains molecules and cells that are vital to the wound healing process, including:

- Electrolytes
- Nutrients (glucose)
- Proteins (cytokines)
- Inflammatory mediators
- Matrix metalloproteinases (MMPs)
- Growth factors
- Various cell types, such as leucocytes, macrophages, neutrophils and platelets
- Microorganisms (Cutting, 2004; White and Cutting, 2006).

The role of exudate

Exudate is a vital part of wound healing. It prevents the wound from drying out and provides nutrients for all cell metabolism, which enables the migration of epithelial cells and the separation of necrotic tissue from the wound bed by autolysis (World Union of Wound Healing Societies [WUWHS], 2007).

Management of exudate

Over 50 years ago, George Winter (1962) produced a paper on moist wound healing. Since this work, it has been established that moisture control is critical to the management of wounds. Yet, despite increased knowledge in this area, it is common for clinicians continue to change dressings many times a day to manage the level of exudate produced by a wound over a 24-hour period.

Exudate assessment

The assessment of exudate forms a vital part of any wound evaluation (Ousey and Cook, 2012). A correct assessment requires observation of the wound bed, closely examining the exudate using the following factors:

- Colour
- Consistency
- Odour
- Amount.

It is also crucial to measure the exudate volume, using the following characteristics (WUWHS, 2007):

- Dry
- Moist
- Wet
- Saturated.

Managing exudate

It is critical to establish an underlying cause for the exudate before attempting to manage the wound's exudate levels. The appropriate use of dressings is the responsibility of the clinician until treatment of the underlying cause is addressed. Conditions that may lead to excessive wound exudate are as follows:

- Lymphoedema
- Venous ulceration
- Congestive cardiac, hepatic or renal failure
- Obesity
- Malnutrition
- Surgery
- Fungating wounds
- Infection.

Clinicians must work as part of the multidisciplinary team to address, where possible, the above conditions to reduce excess exudate and manage the wounds more appropriately.

The ideal dressing for managing wounds with exudate should have the following qualities (Adderley, 2008; Stephen-Haynes, 2011):

- Highly absorbent
- Ability to lock away exudate
- Ability to prevent maceration/ excoriation of the periwound skin
- Ability to use under compression bandaging without being bulky
- Ability to minimise trauma and pain at removal
- Comfort and acceptability to the patient
- Conformability to the wound site
- Cost effectiveness.

Superabsorbents

Superabsorbents have been designed to manage wounds with high levels of exudate. They have a greater fluid-handling capacity than traditional dressings, requiring less frequent changing (Tadej, 2009). The ideal dressing will remove excess exudate from the wound site and surrounding skin while maintaining high humidity in the wound bed (Bale, 1997).

Superabsorbents may vary in ability to absorb and retain fluid, and function under compression. Some superabsorbents can lock fluid and bacteria in the dressing. They are cost effective, due to their enhanced fluid-handling capacity and their absorbency designed for longer wear times and reduced maceration (Wicks, 2012).

Kliniderm superabsorbent consists of four layers: a hydrophilic wound contact layer; an absorbent core; a fluid-repellent backing layer; and an ultrasonic seal that removes the risk of reactions to the glue used.

The key benefits of using the test dressing are as follows:

- Savings of up to 73% on the unit cost, depending on the superabsorbent currently used (National Health Service Business Services Authority, 2015)
- Excellent absorption properties compared with other superabsorbent dressings (Biomedical Ltd, 2015).
- Rapid fluid intake
- Reduces the risk of maceration and excoriation to periwound tissue
- Can be used under compression
- Minimises fluid strikethrough
- Hypoallergenic (no glues or adhesives as the edges have an ultrasonic seal to keep the super absorbent in the centre)
- Easy to use
- Available in a range of sizes and varying shapes. It does not come in an adherent version at the point of going to press.

Cost analysis

To assess the financial impact of making a product switch, it is important to

consider the unit cost and the quantities of the dressings used. It would be inappropriate to use a slightly less-expensive dressing that resulted in more frequent dressing changes because it was not be able to manage the exudate levels produced by the wound bed.

There are many products on the market that claim a health-economic benefit to NHS organisations by justifying a higher unit cost as a trade-off for increased wear time that could reduce the number of nursing contacts required. This might show an overall benefit to a dressing switch. Effectively using such dressings would rely upon nurses following the product guidance and not changing the product too frequently, out of habit.

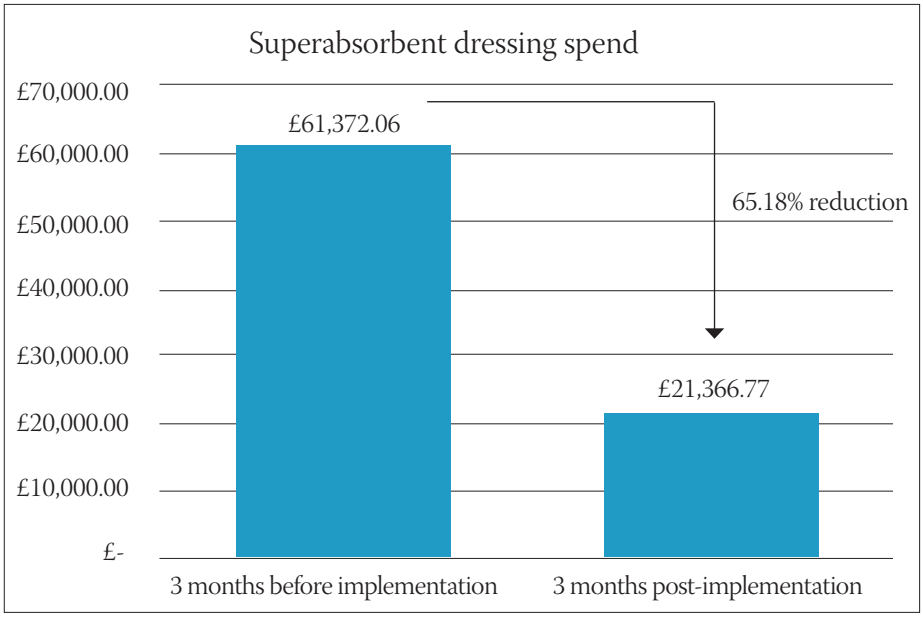

Figure 1. ***This figure shows a 65.18% reduction in cost over a 3-month period when the test dressing was used.***

After evaluating the Kliniderm superabsorbent product and including it on the Trust formulary, the author was able to compare the quality of the test dressing with the superabsorbent currently normally used. The team examined the unit cost as a like-for-like switch and also the total expenditure, looking at the volumes of dressings through an online non-prescription ordering system (ONPOS).

Before the evaluation, the team were concered that the low unit cost may equate to reduced quality, resulting in more nurse contacts if the product did not perform as well as the superabsorbent dressing normally used. The previous expenditure on superabsorbent dressings over a 3-month period totalled £61,372.06. After making the formulary switch to the Kliniderm superabsorbent, the amount spent on superabsorbents over the following 3-month period was £21,366.77. This represents a saving of 65.18% and would result in an annual Trust saving of £160,021 (ONPOS data, 2014-15).

The worry remained that the significant reduction in expenditure may have a negative effect on increasing the nursing contact visits. When looking at the 3 months before the switch, the team used 22,235 superabsorbent dressings; during the following 3 months that the test product was used, 16,475 dressings were used (ONPOS data, 2015). This is a decrease of 5,760 dressings used over a 3-month period, equating to a 26% reduction in dressings used.

If a community nurse contact costs £39.00 per patient visit (Curtis, 2014) and the wound needed to be redressed as frequently as the number of dressings supplied, this would save the organisation an additional £898,560 per annum in nursing costs. This value would not represent a true saving, as the nurses would still be employed and providing other services. It may also be the case that the patient would have more than one dressing applied during each visit.

Aim

A decision was made to evaluate the test dressing with a view to including the product on organisation's wound Formulary if it performed well both clinically and financially when evaluated on patients over a maximum of nine applications and compared with existing Trust superabsorbents, namely Sorbion® (H&R Healthcare) and Flivasorb™ (Activa Healthcare). The trigger for the evaluation was the Trust's increasing spend on superabsorbents.

The organisation had provided training on appropriate product selection and cost-effective use of products post-holistic assessment, yet the spend on superabsorbents has continued to escalate beyond a figure of £200,000 per year. This was not sustainable within the current dressing budget.

Method

The evaluation process took place in Humber NHS Foundation Trust community care setting. The product was evaluated for a maximum of nine applications on 30 patients, replacing the superabsorbent product currently being used. The only variable to the existing treatment plan was the introduction of the test dressing.

For the evaluation, 30 forms were completed. Sixteen patients were male; 14 patients were female. Oral explanation of the evaluation was provided to the patients. Consent was gained and documented in the nursing notes. The local investigators were informed of the reason for the evaluation and the product properties when considering application to appropriate

patients. The evaluation was approved by procurement and members of the clinical network team representing the Trust's tissue viability network. In accordance with local Trust policy, appropriate information was provided for the correct use and disposal of the dressing.

A product evaluation form was used to gather information on the test dressing in comparison to the superabsorbent dressings currently being used. Information was gathered with regards to the following:

- Age
- Gender
- Care setting
- Relevant medical history
- Relevant medications
- Wound type
- Primary dressing
- Wound characteristics, including duration, wound size and level of exudate
- Current treatment aim.

The evaluation form then allowed for documentation over the nine applications to consider the following:

- Patient comfort (with dressing *in situ*)
- Ease of product application
- Ease of product removal
- Conformability to wound
- Ability to manage exudate
- Improvement in condition of the wound.

This was done by the following scoring system of 1–5 comparing it to the existing product for each patient: 1 = very poor; 2 = poor; 3 = average; 4 = very good; 5 = excellent.

There was then a question on how it was thought the dressing compared to the existing product overall. The options were 'worse,' 'equally' or 'better.' The evaluation then asked the clinician to answer 'yes' or 'no' as to whether they would recommend the product for inclusion on the

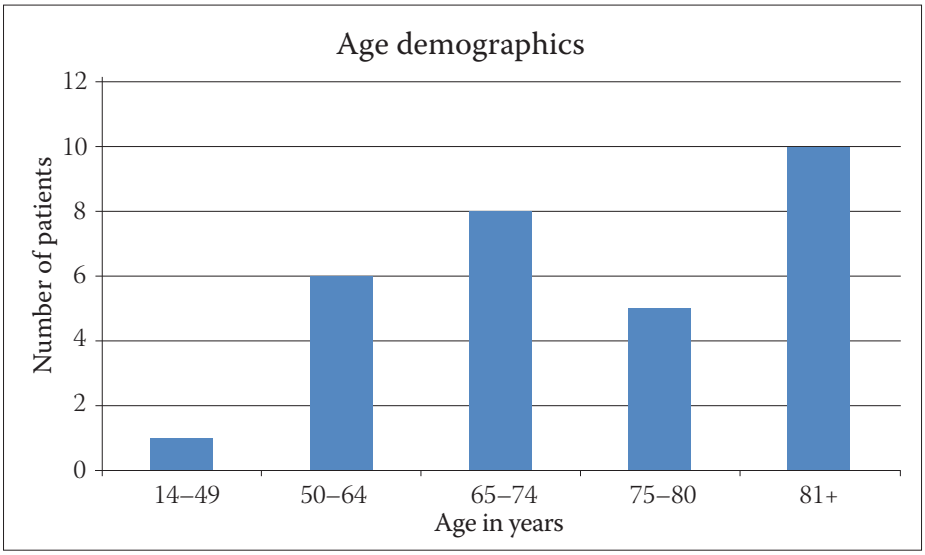

Table 1. ***The table indicates that people of 81 years and older are most likely to suffer with a wound that has exudate as a significant issue, requiring management using a superabsorbent or foam dressing.***

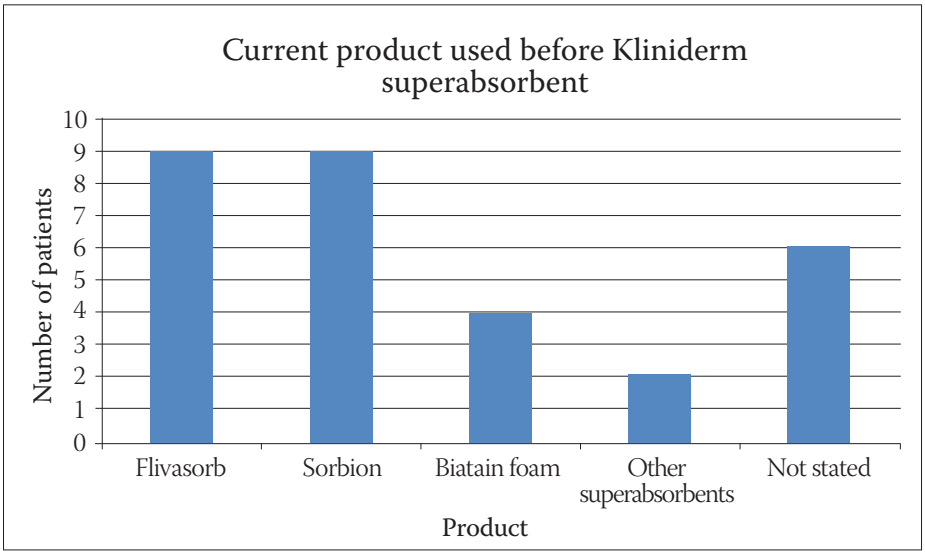

Table 2. ***The table indicated an equal usage on this cohort of patients on Sorbion and Flivasorb.***

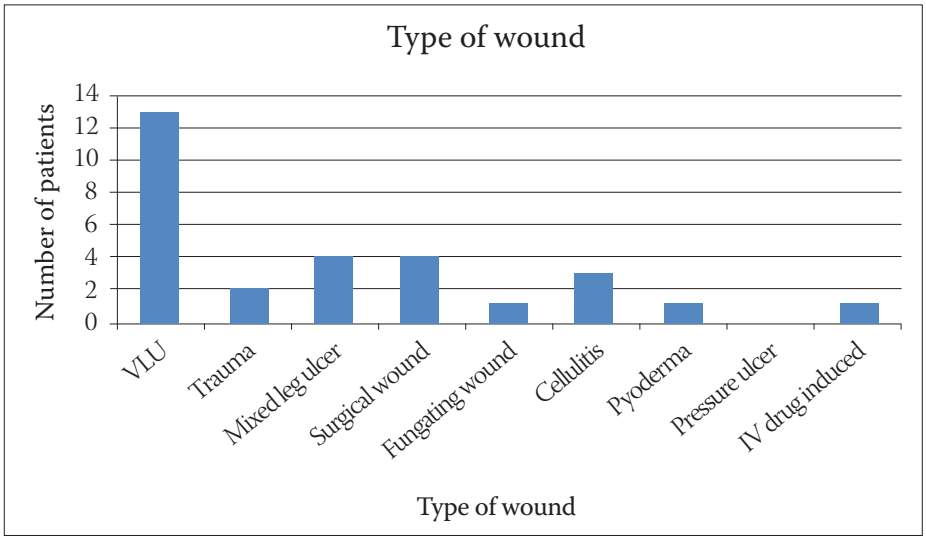

Table 3. ***Of the 29 wound types documented, 13 were recorded as being venous leg ulcers (VLUs).***

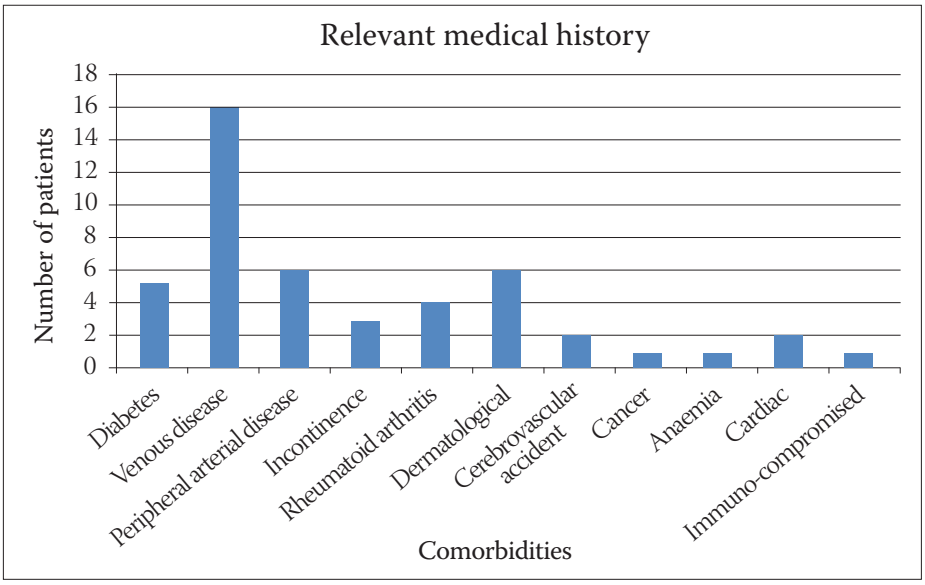

Table 4. ***There are 47 listed co-morbidities, indicating that each patient has 1.5 or more, with venous disease being the most frequently documented.***

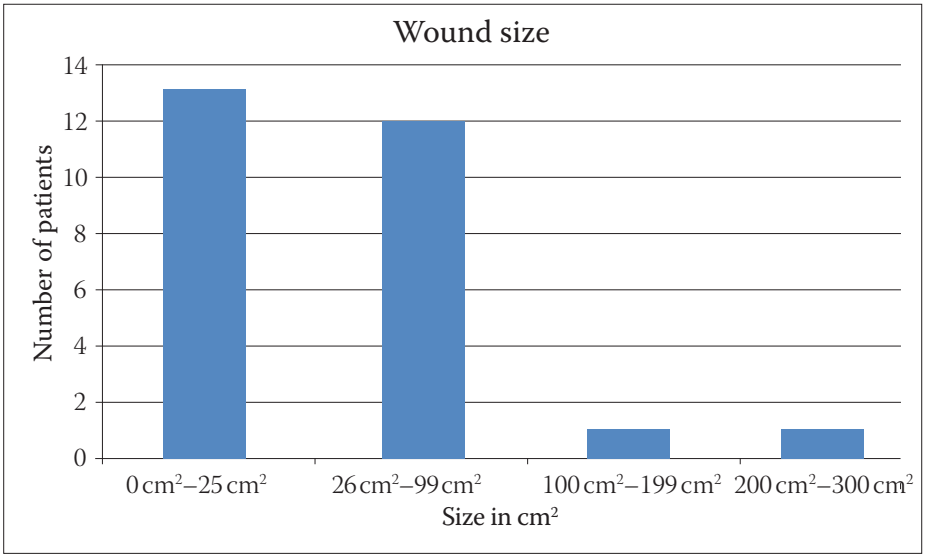

Table 5. ***There were 27 documented wound sizes, the vast majority being less than 100 cm2 (10x10 cm). All the wounds were documented as being 1cm in depth or less, except one documented having a depth of 5 cm.***

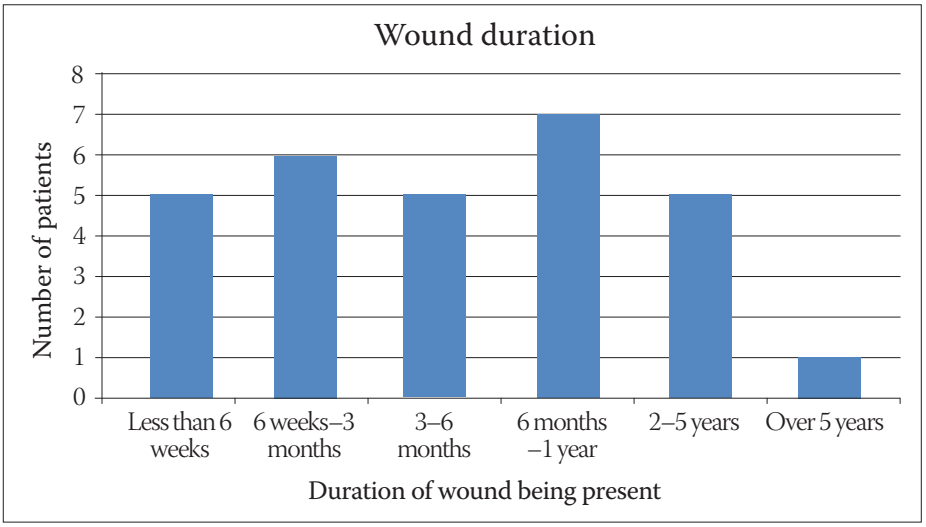

Table 6. ***Of the 29 responses, each duration category was similarly populated, except over 5 years.***

formulary. There was also a section for any other comments.

Results

The patients were selected randomly from five centres within Humber NHS Foundation Trust, and all had exudate management issues. The patient demographics are summarised in *Table 1*. All 30 patients completed the evaluation. The only discontinuation of treatment was for wounds that heeled prior to the nine dressing changes.

Table 2 indicates that the Flivasorb and Sorbion superabsorbents were the most commonly used products in the 30-patient evaluations, before the switch to Kliniderm superabsorbent for the comparative evaluation.

Table 3 shows that venous leg ulcers were the most prevalent wound type the Kliniderm superabsorbent was used on, in combination with compression therapy where safe and appropriate.

Table 4 demonstrates that the patient group had one or more co-morbidities, the most prevalent being venous hypertension. There were also a significant number of patients with peripheral arterial disease, diabetes and dermatological conditions which, in fact, are linked to increasing age. In fact, the most prevalent age category was 81+ years, comprising 33% of the patients.

Table 5 shows that over 80% of all the wounds documented were less than 99 cm^2 (i.e. 10x10 cm dressing size). This might be an interesting indication for stock ordering of dressings, or it may be sometimes wrongly assumed that wounds are generally much larger.

Table 6 highlights a largely even spread of wound duration between less than 6 weeks and up to 5 years.

Table 7 shows that, of the wounds included in the evaluation, 26 out of 30 had moderate to highly exuding wounds, indicating the appropriate use of the superabsorbent product in those cases.

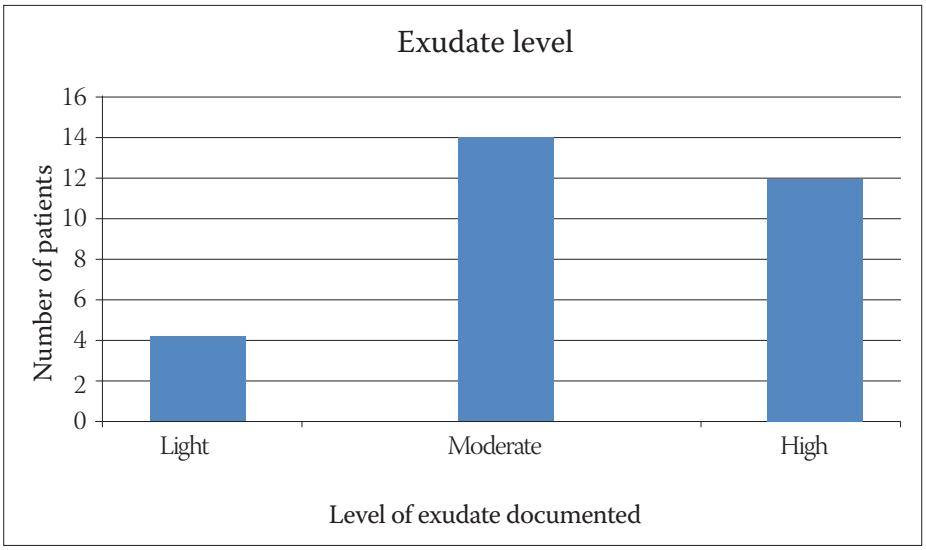

Table 7. ***The number of responses was 30, the vast majority being moderate to highly exuding wounds.***

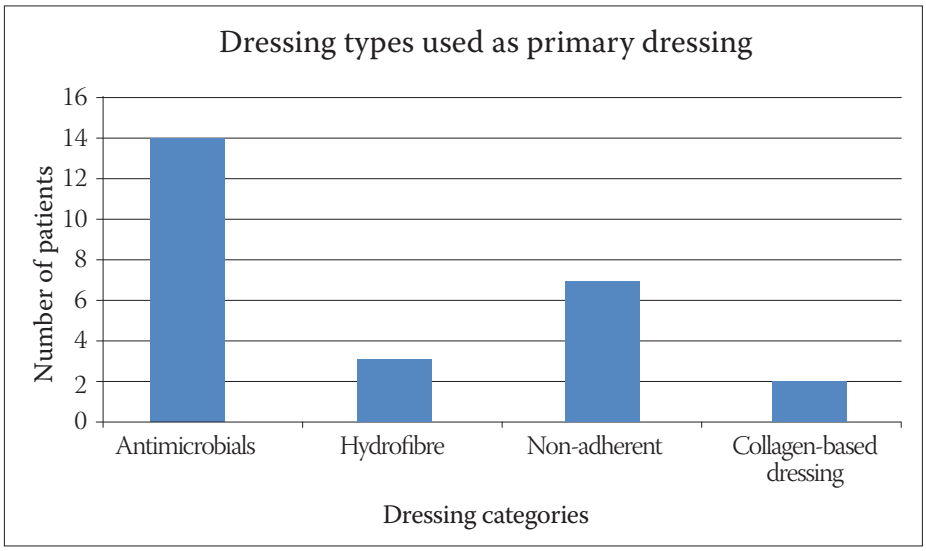

Table 8. ***There were 30 responses; 4 of these responses did not use a primary dressing under the existing product.***

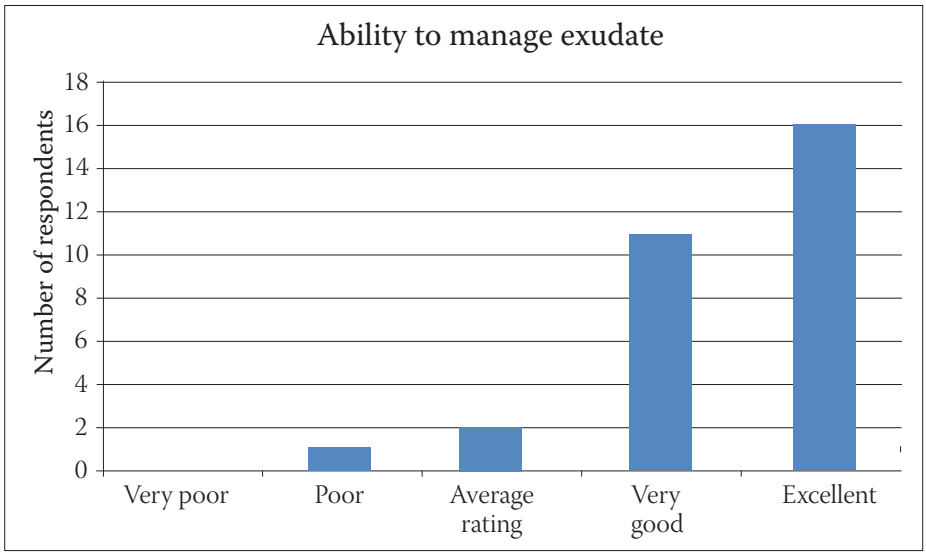

Figure 9. ***Of the 30 responses from practitioners, 27 rated the test dressing performance as 'very good' or 'excellent.'***

Table 8 highlights that the practitioners have used primary dressings on 26 of the 30 subjects who took part in the evaluation. This may or may not be appropriate, as it may affect the absorbency effect of the dressings used.

Table 9 shows that it was thought that the Kliniderm superabsorbent performance was 'very good' or 'excellent' in 27 of the 30 case evaluations. Interestingly, the ones who stated 'poor' (no = 1) or 'average' (no = 2) had only low levels of exudate. Thus, the issue may not have been the dressing but the clinician's skill in assessing and appropriately managing the wound using the right dressing for a wound with low levels of exudate.

Table 10 indicates that there was an average to excellent improvement in the wound bed in 29 of the 30 evaluations. One evaluation scored 'very poor.' This may be an indication of the primary dressing's performance as opposed to the superabsorbent's performance.

Finally, 29 out of 30 evaluations would suggest that the Kliniderm superabsorbent performed as well, if not better, in the evaluation. Meanwhile, 28 out of 30 completed evaluations would recommend the product for inclusion in the Trust formulary. The clinicians were then asked to state whether they would recommend Kliniderm superabsorbent for formulary inclusion.

Summary

The switch to Kliniderm superabsorbent resulted in less dressings being used, while maintaining wound management clinical outcomes. This represents an annual forecast in savings of £160,021, based on the 3 months of ONPOS data analysis.

It is the author's opinion that the test dressing has the potential to provide large-scale financial savings to the NHS without compromising the quality of patient and wound care based on the evaluations within Humber NHS Foundation Trust.

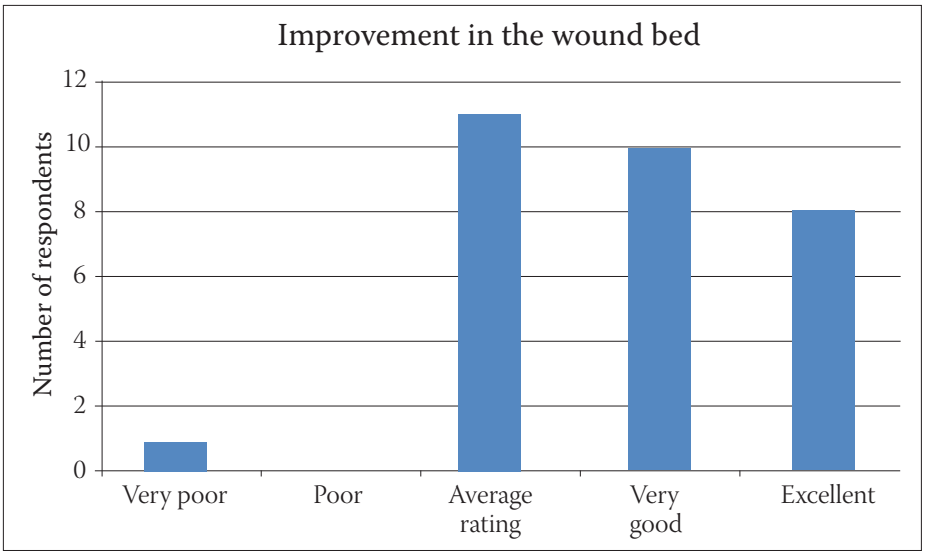

Figure 10. ***Of the 30 responses, 18 rated improvement in the wound bed as 'very good' or 'excellent.'***

Recommendations for practice

Due to the success of the evaluation on an initial pilot of five patients, which was then extended to 30 patients, the organisation has added the product to the Trust Formulary as the first-line superabsorbent product. This has allowed the Trust to make significant financial savings in the first 3 months as stated in the cost analysis, without compromising the quality of care being delivered. It has also allowed the organisation to reconsider the number of nursing visits required to provide care. The Kliniderm superabsorbent has now been implemented into all base stock cupboards with the general feedback being very good, in the author's opinion.

Conclusion

Exudate management is a critical part of any wound management treatment plan, while simultaneously attempting to maintain a moist wound healing environment.

The clinicians within the Trust need to continue to complete a holistic assessment of the patient, making a good quality treatment plan with clear aims and objectives that direct towards the correct and appropriate use of products that are on the Trust Formulary. According to the author, Kliniderm superabsorbent has proven, both in the evaluation, and latterly while on the formulary for the 3-month period, that it is cost- and quality-effective, and that it can and has enhanced the care provided in Humber NHS Foundation Trust. We

Acknowledgement

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