Assessing the ability of hydropolymer foam dressings to manage wound exudate

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Objective

To evaluate the performance of a family of absorbent foam dressings with an improved hydropolymer layer and to compare to similar product offerings
A key requirement for optimal healing of chronic wounds is to manage exudate and maintain a moist wound environment. Poor management of wound exudate can lead to maceration and deterioration of the wound, thereby impeding healing.

Foam dressings have been developed to achieve management of all levels of exudate through high absorbencies and through Moisture Vapour Transmission (MVTR).

The aim of this study is to evaluate the performance of a family of absorbent foam dressings with an improved hydropolymer layer and to compare to similar product offerings.
The foam dressings under evaluation for their fluid handling properties were tested using a standard *in vitro* test methodology.

Several foam dressings were evaluated for their fluid handling properties using a modified version of the European Standard for measuring moisture vapour transmission rate (MVTR) as set out in BS: EN 13726, aspects of absorbency and MVTR.

The assay involves fluid in contact with dressings in a closed system for 24 hours prior to calculating the absorbent capacity and MVTR of the dressing.

For non-adhesive dressings, only the absorbent capacity was evaluated, as these dressings are typically used under compression bandaging. This makes MVTR less relevant to the total fluid handling ability of these dressings.
Paddington Cup Method (BS:EN 13726)
Total Fluid Handling: MVTR and Absorbency

Method Description
(Performed in replicates of 5 samples)

- A round 55mm diameter sample was cut from the dressing
- Sample was placed on the flange of the cup and secured with the retaining ring
- Weight of the Paddington Cup and dressing was recorded
- 20ml deionised water was added to the Cup and the weight is recorded
- Cup was placed in 37°C incubator, containing trays of silica gel and the test began after a 30 minute period in order to condition the cup to temperature (humidity at less than 20% RH throughout the test).
- After 24 hours the cup was placed in a desiccator for 30 minutes and weight was recorded
- Excess water was then removed from the cup and the cup inverted to allow drainage
- Weight of the cup with sample was recorded

\[ \text{MVTR} = \frac{x-y}{\text{storage time/area}} \]
\[ \text{Absorbent Capacity} = \frac{b-a}{\text{storage time/area}} \]
\[ \text{Total Fluid Handling} = \text{MVTR} + \text{Absorbent Capacity} \]
Upon testing the range of hydropolymer foam dressings, those with an improved hydropolymer were found to have an increased fluid handling capacity primarily due to an improved absorbent capacity. The increase in absorbent capacity of each dressing are shown in red. The results shown are means of 3 batches of product.
The improved hydropolymere foam dressing was shown to have a greater total fluid handling capacity due to its superior absorption and retention of fluid, when tested alongside a leading competitor indicated for the same level of exudate.
Results: Total fluid handling with similar product offerings

Absorbent Capacity is shown only, due to its intended use with compression bandaging, deeming its Moisture Vapour Transfer properties less relevant. The improved hydropolymer dressing performed better than similar product offerings.
Discussion

Results from several dressings were evaluated and dressings with the improved hydropolymer foam showed the largest combined MVTR and absorbent capacity when compared to other dressings for similar indications.

Conclusion

This study demonstrates that the absorbent dressings with improved hydropolymer foam had the greatest ability to handle fluid by providing superior absorption of fluid.

This would suggest that these dressings should be suitable for use across a wide range of exudate levels, and provide longer dressing wear times.

References: