Evaluation Of The Fluid Handling Properties Of Hydropolymer Foam Dressings For Managing Wound Exudate

Kyle Turton, Joy Thistlethwaite, Michelle Delbono, Breda Cullen
Systagenix Wound Management, Gargrave, UK

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ABSTRACT

Introduction

A key requirement for optimal healing of chronic wounds is to maintain a moist wound environment. Poor management of exudate can lead to maceration and deterioration of the wound, 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 the TIELLE® Family of dressings with an improved TIELLE® Comfort Plus range of dressings and similar other product offerings.

Methods

Several foam dressings were evaluated for their fluid handling properties by a standard *in vitro* test methodology. The chosen assays were as set out in the European Harmonized Standard 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 dressings are typically used under compression bandaging, making MVTR less relevant.

Results

Results from several dressings were evaluated and TIELLE® dressings from the 'Comfort Plus' range showed the largest combined MVTR and Absorbent capacity results when compared to other dressings for similar indications.

Conclusions

This study demonstrates that TIELLE® with 'Comfort Plus' had the greatest ability to handle fluid by providing superior absorption of fluid.

OBJECTIVE

- To evaluate the performance of the TIELLE® family of dressings with an improved TIELLE® Comfort Plus range of dressings and similar other product offerings.

Paddington Cup Method (BS:EN 13726)

- **Total Fluid Handling: MVTR and Absorbency**

1) The dry "Paddington Cup" with sample is weighed *weight = a*

2) The "Paddington Cup" with sample + water is weighed *weight = x*

3) After storage the apparatus is weighed again, *weight = y*

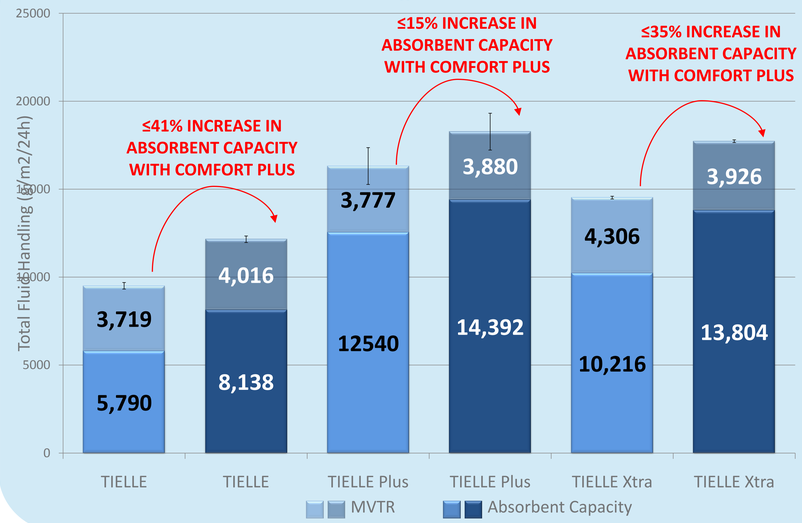
4) Water is drained and the apparatus weighed *weight = b*

MVTR = *x-y /storage time/ area*
Absorbent Capacity = *b-a /storage time/ area*
Total Fluid Handling = MVTR + Absorbent Capacity

Method Description (performed in replicates of 5 samples)

- A round 55mm diameter sample is cut from the dressing
- Release paper is removed and the sample weighed
- Sample is placed on the flange of the cup and secured with the retaining ring
- Weight of the Paddington Cup and dressing is recorded
- 20mL deionised water is added to the Cup and the weight is recorded
- Cup is placed in 37°C incubator ,containing trays of silica gel and the test begins after a 30 minute period in order to condition the cup to temperature
- After 24 hours the cup is placed in an desiccator for 30 minutes and weight is recorded
- Excess water is then removed from the cup and the cup inverted to allow drainage
- Weight of the cup with sample is recorded

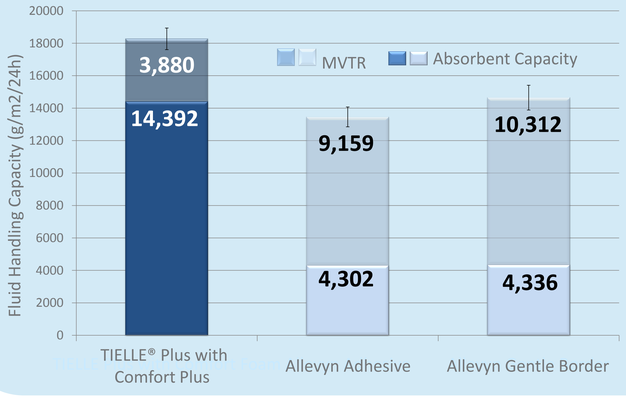
RESULTS: Total fluid Handling of TIELLE® with Comfort Plus



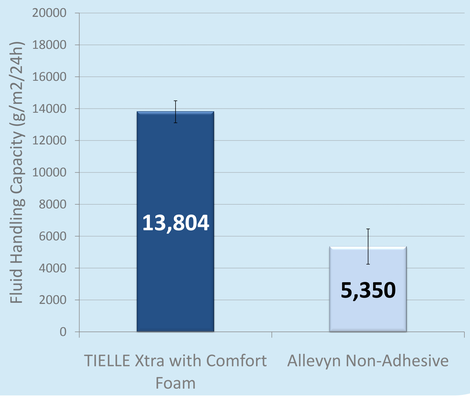
Upon testing the TIELLE® range of products, those with Comfort Plus were found to have an increased fluid handling capacity by means of an improved absorbent capacity. The increases in absorbent capacity of each dressing are shown in red. The results shown are means of 3 batches of product.
This was further demonstrated by the increase in absorbent capacity shown by TIELLE® Packing with Comfort Plus.

RESULTS: Total Fluid Handling

TIELLE® with Comfort Plus 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.



TIELLE® Xtra is shown in the graph below as Absorbent Capacity only, due to it's intended use with compression bandaging, deeming its Moisture Vapour Transfer properties less relevant.

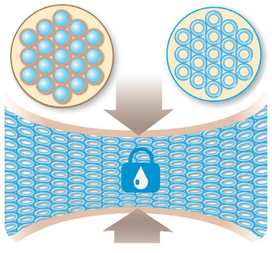


DISCUSSION

LIQUALOCK® ADVANCED ABSORPTION TECHNOLOGY

Advanced Absorption Technology

- Fluid fills the hydropolymer cells.
- Fluid then transfers into the cell walls.
- Fluid is locked away under normal conditions of use, movement and pressure[3].

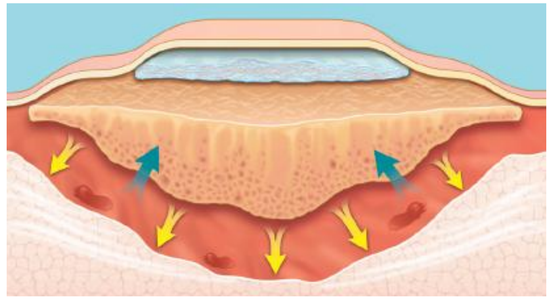


3. Foster, S. et al. Evaluation of the liquid retention capabilities of foam dressings, Poster, Wounds UK 2010.

DISCUSSION

Super absorption and expansion

- Absorbs exudate - the super absorbent layer of TIELLE® Plus and TIELLE® Xtra absorbs up to 30x its own weight[1].
- Expands and conforms to the contour of the wound bed.
- Non-adhering[2], does not gel or disintegrate - for easy removal with less pain.



1. Clinical evaluation of TIELLE® Plus dressing in the management of exudating chronic wounds. Schulze, H.J. Br. J. Comm. Nursing 2003, 8(11):18-22.
2. A non-comparative multicentre clinical evaluation of a new hydropolymer adhesive dressing. Taylor, A., Lane, C., Walsh, J., Whittaker, S., Ballard, K., Young, S.R. J Wound Care 1999, 8(10):489-492

CONCLUSIONS

- TIELLE® dressings with 'Comfort Plus' have increased fluid handling capability compared to TIELLE® without 'Comfort Plus'.
- TIELLE® dressings from the 'Comfort Plus' range showed the largest combined MVTR and Absorbent Capacity when compared to other dressing for similar indications.
- TIELLE® Xtra demonstrated a greater Absorbent Capacity when compared to other dressings indicated for use in compression bandaging.

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