Connecting evidence to outcomes

Evaluation of high breathability foam dressings to prevent strikethrough of fluid

Systagenix WOUND MANAGEMENT

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Abstract

Maintenance of a moist environment is essential to achieve optimal wound healing. Chronic wounds often produce large volumes of exudate, which must be managed to prevent maceration and deterioration of the wound. Modern foam dressings have been developed to achieve this, through a combination of high absorbency and moisture vapour permeability. However these dressings also need to maintain a barrier to the environment in order to prevent strikethrough and leakage, which not only causes staining of clothes, and bedclothes but can also facilitate bacteria accessing the wound and causing infection.

Several foam dressings were evaluated for their ability to allow the transfer of moisture vapour through the dressing whilst preventing strikethrough of fluid. Moisture vapour transmission rate (MVTR) was determined using standard test methods. Fluid strikethrough was determined using a continuous flow model with simulated wound fluid containing blue dye. The blue dye has been shown to be non-volatile therefore any transfer of dye through the dressing was due to transfer of liquid rather than moisture vapour.

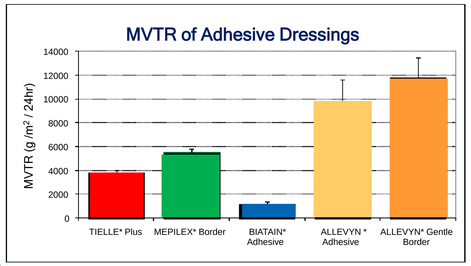
Strikethrough was observed in two dressings tested (Allevyn Adhesive and Allevyn Gentle Border). These dressings also had the highest MVTR measured. No strikethrough was observed in dressings with lower MVTR. The data shows that although the breathability of these foams dressings varies, having a high MVTR may not always be optimal as the risk of strikethrough of liquid is significantly increased.

When evaluating the different foam dressings available on the market today, it is important to focus on all aspects of the dressings performance rather than simply considering fluid handling data. By increasing the MVTR to such an extent as found with some modern dressings, the barrier properties of the dressing, which are also an essential part of dressing functionality, may be compromised.

Standard method for measuring MVTR (Moisture vapour transmission rate)

- European Standards for measuring fluid handling ability of wound dressings
- Moisture vapour transmission rate (part 2 3.2) - Paddington cup method.
- Cylinder is filled with fluid (45ml) sealed and the entire apparatus weighed prior to incubation for 24 hours allowing maximal fluid absorption & evaporation
- After this time the apparatus is again weighed and the MVTR calculated

$$\text{MVTR} = \frac{\text{(Initial weight - Final weight)}}{\text{Area of dressing (m}^2\text{)}}$$



Data correct for product available in 2008

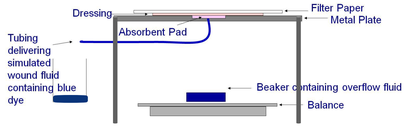
* This product is a trademark of its owner

Objective

- To evaluate the ability of different foam dressings to manage exudate
- Foam dressings have different moisture vapour transmission rates (MVTR) but is this predictive of better performance?

WRAP wound model simulating dressing in-use (Wound care Research for Appropriate Products)

- Standard method developed in collaboration with clinicians, health care industries and academics for measuring fluid handling ability of wound dressings
- This method differs from the Standard method described
  - The dressing is applied flat to a stainless steel plate (as to a wound)
  - Wound fluid is pumped continuously into the dressing from below - simulating wound fluid production in a wound
  - An absorbent pad is used to spread the fluid across the surface - simulating wound fluid production across the surface of the wound
  - When dressing fails the non-absorbed fluid drops onto a balance & is measured by computer
  - The wound fluid is coloured with a dye and the dressing is occluded with a sheet of filter paper to visualise any strikethrough
  - Simulated wound fluid - 140mmol NaCl, 3mmol $CaCl_2$ containing a blue dye

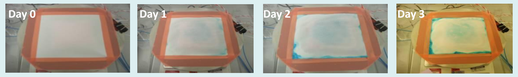


Results

TIELLE* Plus

ALLEVYN* Adhesive

ALLEVYN* Gentle Border



MEPILEX* Border

BIATAIN* Adhesive

Q. Does High MVTR translate into better product performance?

A. NO; highest MVTR was observed with ALLEVYN* Adhesive & ALLEVYN* Gentle border however they were also the only products to show strike through of fluid through the backing, after a simulated wear time of only 1 day

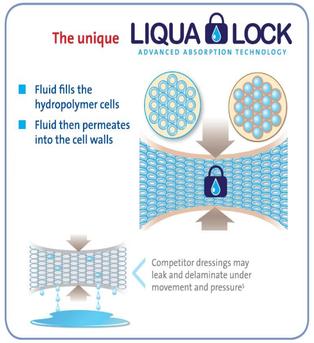
Conclusion

When evaluating the different foam dressings available on the market today, it is important to focus on all aspects of a dressing's performance.

The data show that although the breathability of foam dressings vary, having the highest moisture vapour transfer may not always be optimal as the risk of strikethrough of liquid is significantly increased.

In this study, dressings with a MVTR around 10,000 g/m²/24hr or higher were seen to allow the passage of dyed fluid through the backing whereas those with a lower MVTR did not. It appears that by having such a large MVTR, the ability of the back of the dressing to prevent strikethrough is visibly compromised, which causes leakage and could affect the bacterial barrier properties of the dressing.

It is difficult to define the optimal MVTR required to maintain a moist wound bed as this will vary dependent on many factors including the type of dressing and type and location of the wound. Increasing the moisture vapour transmission rate significantly however may compromise the barrier properties of the dressing which are essential to function.



TIELLE * with LIQUA LOCK Technology

TIELLE does more with optimal MVTR

- In combination with the LiquaLock protection TIELLE continuously transfers fluid away from the wound bed into the wicking layer
- Excess fluid evaporates through the back of the dressing without causing strikethrough
- TIELLE is able to absorb additional exudate minimizing maceration, helping to maintain an optimal moist wound environment

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FEEL BETTER, HEAL BETTER