Evaluation of Fluid Management Properties of Adhesive Border Foam Dressings Utilizing a Novel *in-vitro* Test Method

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BACKGROUND & PURPOSE

Foam dressings are frequently designed to have maximum fluid handling capacity, scientifically measured as bulk absorption or free swell absorptive capacity. To measure this, the dressing is submerged in fluid and calculated for total amount absorbed.[1] While this testing is beneficial for measuring overall performance of the dressing *in-vitro*, it does not consider local saturation.

Many wound dressings become locally saturated at the point of contact with fluid, not utilizing the entire dressing. Dressings can become saturated prior to meeting the dressing's free swell capacity, thus resulting in increased frequency of dressing changes.

A novel test method, termed Clinical Relevant Capacity (CRC), was utilized to analyze the capacity of a dressing to absorb and move moisture across the dressing. An ideal dressing should move fluid up and away from the delivery source, as well as across the foam.

METHOD

CRC testing consisted of delivering simulated wound fluid (SWF) at a constant rate of 6 mL/hr. through a localized source for 2 hrs. The edge of the dressing's wound contact side was positioned overtop of the wound bed.[2] A grid template was created with 5mm x 5mm patterning to track SWF movement on the backside of each test dressing and to calculate area of saturation.

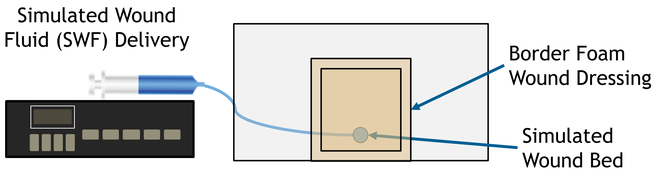


Figure 1. Clinical Relevant Capacity (CRC) testing setup.

Performance analysis of a new moisture management border foam dressing (study dressing*) was conducted alongside three other border foam dressings on the market for both free swell and CRC.

REFERENCES

1. BS EN 13726-1:2002 Test methods for primary wound dressings
2. Thomas, S. "Assessment and Management of Wound Exudate." Journal of Wound Care, vol. 6, no. 7, 1997, pp. 327–330.

FREE SWELL ABSORPTIVE CAPACITY

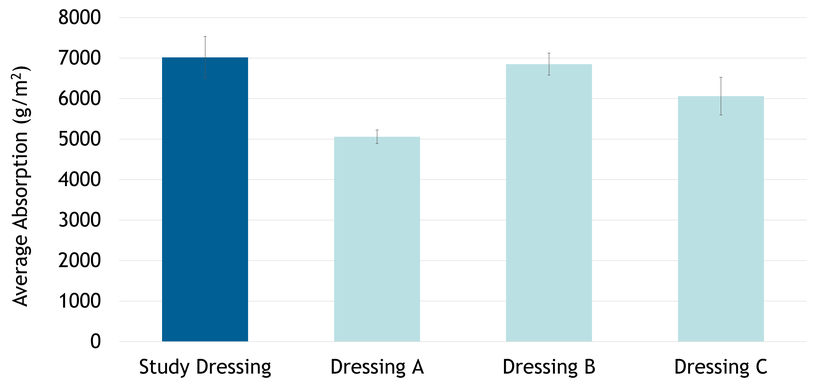


Figure 2. Free Swell Absorptive capacity for all bordered foams tested.

CRC TESTING PHOTOS

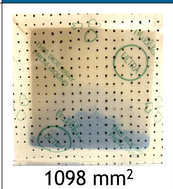
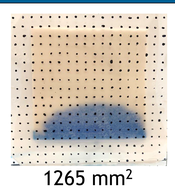
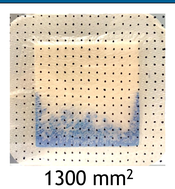
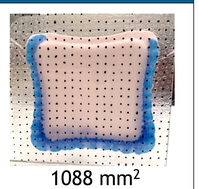
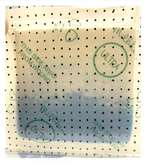
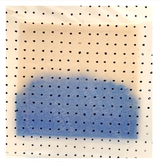
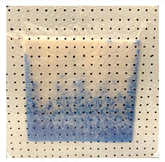
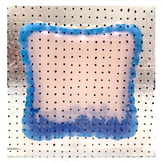
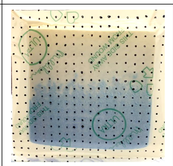
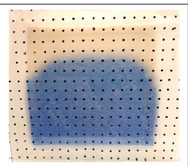
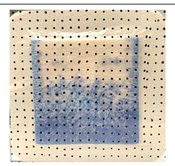
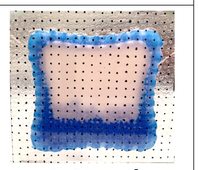
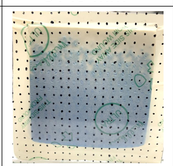
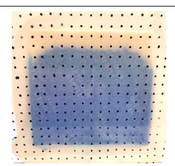
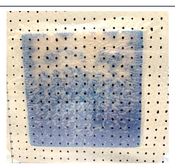
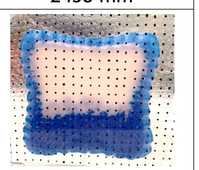
	Study Dressing	Dressing A	Dressing B	Dressing C
30 minutes (3 mL dispensed)				
Area of Saturation:	1098 mm²	1265 mm²	1300 mm²	1088 mm²
60 minutes (6 mL dispensed)				
Area of Saturation:	2035 mm²	2254 mm²	2296 mm²	1950 mm²
90 minutes (9 mL dispensed)				
Area of Saturation:	3140 mm²	3073 mm²	3125 mm²	2438 mm²
120 minutes (12 mL dispensed)				
Area of Saturation:	3929 mm²	3869 mm²	3550 mm²	3142 mm²

Table 1. Representative photos from backside of the dressing for four testing time points.

FREE SWELL RESULTS

Free swell absorptive capacities were highest for the Study Dressing, followed closely by Dressing B, then Dressing C and A. This data represents 100% saturation of the border foam dressings.

Clinically, dressings are not designed to be used to 100% saturation and should be changed before reaching this point at the discretion of the clinician. CRC testing was performed to track fluid movement and clinically determine when the dressings should be changed.

CRC RESULTS

At each 15-minute interval for the duration of testing, photos were taken, the amount of SWF dispensed was recorded, and the area of saturation was measured. These images and values were later used for comparison.

A survey was provided to clinicians to identify, based on photos of the back of the test dressings, at what time point they would deem the dressings needed to be changed.

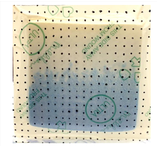
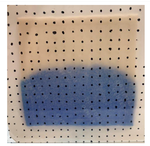
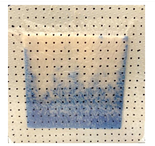
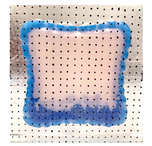
Study Dressing	Dressing A	Dressing B	Dressing C
			
90 minutes (9 mL dispensed)	75 minutes (7.5 mL dispensed)	60 minutes (6 mL dispensed)	60 minutes (6 mL dispensed)

Table 2. Most commonly selected timepoints for dressing change by clinicians.

DISCUSSION & CONCLUSION

Based on clinician surveys, the Study Dressing would theoretically be utilized longer when compared to the other bordered foam dressings for CRC testing.

It is also noted that a lower area of saturation does mean a dressing should not be changed. Clinicians indicated that dressing C would be changed at 60 minutes (6.0 mL dispensed), even though only 1950 mm² of the dressing had been utilized.

Performance analysis of a new moisture management border foam dressing (study dressing*) demonstrated fluid movement when using the novel CRC test method.

FOOTNOTES

*Study Dressing: ULTRA Border, Milliken Healthcare Products, LLC, Spartanburg, SC
Dressing A: OPTIFOAM® GENTLE Border, Medline, Northfield, IL
Dressing B: Mepilex® Border, Molnlycke, Gothenburg, Sweden
Dressing C: ALLEVYN Gentle Border, Smith & Nephew, London, UK

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