# Comparative *in-vitro* Assessment of Adhesive Border Foam Dressings Using a Validated Periwound Protection Test Method

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## BACKGROUND & PURPOSE

There are many causes of periwound damage, including one of the most common, maceration.[1] The periwound skin is vulnerable to maceration, resulting in delayed healing, when the volume of exudate is greater than what can be managed by the dressing applied.[2]

A validated *in-vitro* test method[3] was used to compare the moisture management capabilities of a new AFM† border foam dressing* (study dressing) to other commercial border foam dressings. An ideal dressing reduces the risk of maceration by removing the Simulated wound fluid (SWF) away from the dressing-wound interface to minimize the amount of exudate that reaches the periwound and healthy surrounding skin.

## METHOD

The test method involved a simulated wound surrounded by gauze to serve as a simulated periwound. The border foam dressing was applied over the simulated periwound with a weight (45 g) added to ensure contact with all layers. (See Figure 1 below).

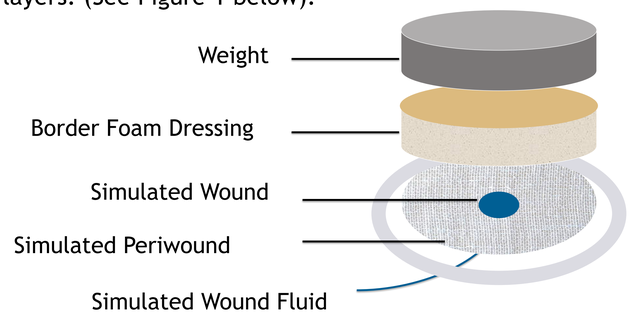



*Figure 1. Test Setup*

SWF was delivered at a constant rate of 0.2 mL/hour which is consistent with a moderately exuding wound.[4]

Six replicates of each of the 4 border foam dressings were analyzed qualitatively (residual SWF inspection) and quantitatively (% SWF absorbed) after 24 hours.

## QUALITATIVE ANALYSIS

Blue dye was added to the SWF to allow for qualitative residual SWF inspection. Minimal residual SWF is captured on the Study Dressing's simulated periwound when compared to the 3 commercial border foam dressings tested.

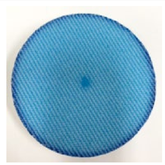
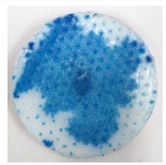
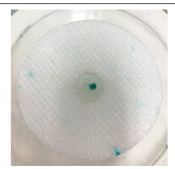
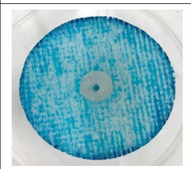
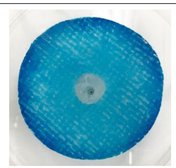
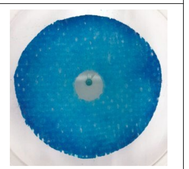
| | Study Dressing | Dressing A | Dressing B | Dressing C |
|---|---|---|---|---|
| Foam Dressing Wound Contact Surface |  |  |  |  |
| Simulated Periwound |  |  |  |  |

*Table 1. Representative photos taken after 24 hr for each test dressing.*

## QUANTITATIVE ANALYSIS

The average %SWF absorbed by the simulated periwound was calculated for six replicates and is shown below for each dressing tested.

$$\%\ \text{SWF Absorbed} = \frac{(\text{Final Simulated Periwound Weight} - \text{Initial Simulated Periwound Weight}) \times 100}{\text{Initial Simulated Periwound Weight}}$$

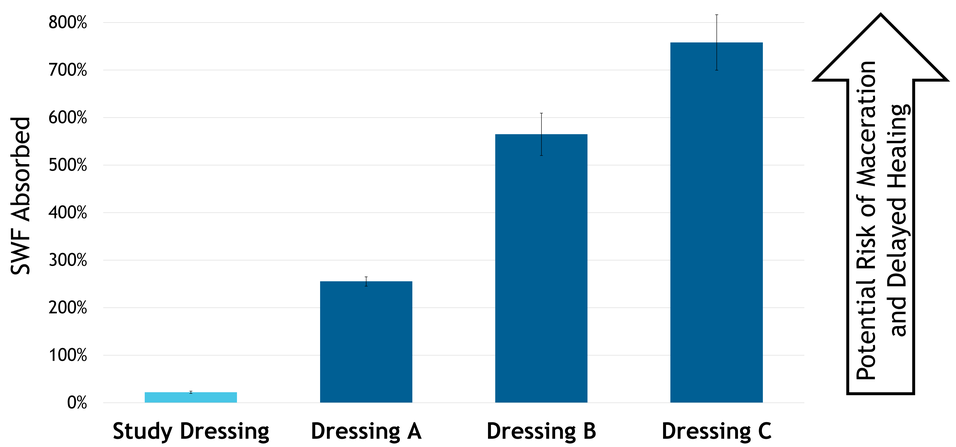



*Figure 2. Simulated periwound saturation levels based on % SWF absorbed.*

## DISCUSSION

Significant moisture management differences were observed qualitatively across all four dressings in the study (Table 1). The curling seen in Dressing A was consistent for all replicates as was saturation in both the dressing and simulated periwound. Dressings B and C displayed a localized saturation pattern on the wound contact side of the dressing while the simulated periwounds were saturated across the whole area.

The Study Dressing's wound contact side appears to be saturated; however, the simulated periwound remains unsaturated. The technology† within the study dressing is designed to move excess fluid into the foam layer while protecting the simulated periwound from becoming saturated.

On average, the study dressing reduced the amount of SWF absorbed by the simulated periwound by a factor of 24 (data from Figure 2) as compared to other dressings in the study indicating the potential for significant reduction in risk for maceration with this dressing.

## CONCLUSION

The study dressing proved to be effective at moving SWF from a simulated wound bed into the foam layer of the dressing while protecting the simulated periwound from exposure to SWF.

Additional/further clinical studies will be conducted to validate that the protection of the periwound should lead to a decreased risk for maceration.

## FOOTNOTES

*Study Dressing: ULTRA Border, †Active Fluid Management® (AFM), Milliken Healthcare Products, LLC, Spartanburg, SC

Dressing A: OPTIFOAM® GENTLE Border, Medline, Northfield, IL
Dressing B: ALLEVYN Gentle Border, Smith & Nephew, London, UK
Dressing C: Mepilex® Border, Molnlycke, Gothenburg, Sweden

## REFERENCES

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2. Woo, Kevin Y, et al. "Management of Moisture-Associated Skin Damage: A Scoping Review." Advance in Skin & Wound Care, vol. 30, no. 11, Nov. 2017, pp. 494–501.
3. Kang, Peter, et al. "Assessing Periwound Moisture Using a Novel In Vitro Test Method." WOUNDS, vol. 27, no. 1, Jan. 2015.
4. Thomas, S. "Assessment and Management of Wound Exudate." Journal of Wound Care, vol. 6, no. 7, 1997, pp. 327–330.
5. MHP Internal Lab Notebook #5.