HALYARD*

Silicone Foam Wound Dressings: Translating Laboratory Findings Into Clinically Meaningful Insights Is Essential for Improving Wound Care Decision-Making

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Key Findings

- **Strong point deflection:** The HALYARD* Bordered Silicone Foam Dressing demonstrated the ability to distribute an applied force across a wider surface area. This distribution of force away from the point of contact can help reduce localized pressure that can contribute to skin injury.
- **High conformability (Distance of Non-Conformity):** Demonstrated excellent adaptability to complex anatomical contours, minimizing gaps and helping maintain a consistent seal.
- **Effective adhesion and fluid handling (Distance of Non-Conformity & Fluid-Handling Capacity):** Maintained close skin contact while showing high overall fluid-handling capacity to support a moisture-balanced wound environment and reduce contamination risk.
- **Protection under stress (Shear, Friction, & Pressure Mapping):** Distributed external forces broadly, reducing shear, friction, and pressure that contribute to dressing lift and pressure injury risk.
- **Cost-effective:** Cost-evaluation suggests that using advanced, high-performance dressings like HALYARD* Bordered Silicone Foam Dressing can reduce overall wound dressing expenditure, contributing to reduced waste and nursing time.

Introduction

Supporting comprehensive wound care with foam dressings

Silicone foam wound dressings play an important role in both wound treatment and prevention. Their use is recommended by evidence-based international practice guidelines, including recommendations issued in 2025 by the National Pressure Injury Advisory Panel (NPIAP)[1] (**See Appendix**). Bordered silicone foam dressings, such as the HALYARD* Bordered Silicone Foam Dressing (**Figure 1**), are a cornerstone of contemporary wound care due to their ability to achieve optimal wound healing.[2] This is accomplished through several means, including protection from trauma, temperature regulation to ensure normothermia, and cultivation of a moist healing environment.[1,2] Local environment modulation by foam dressings is recognized as important

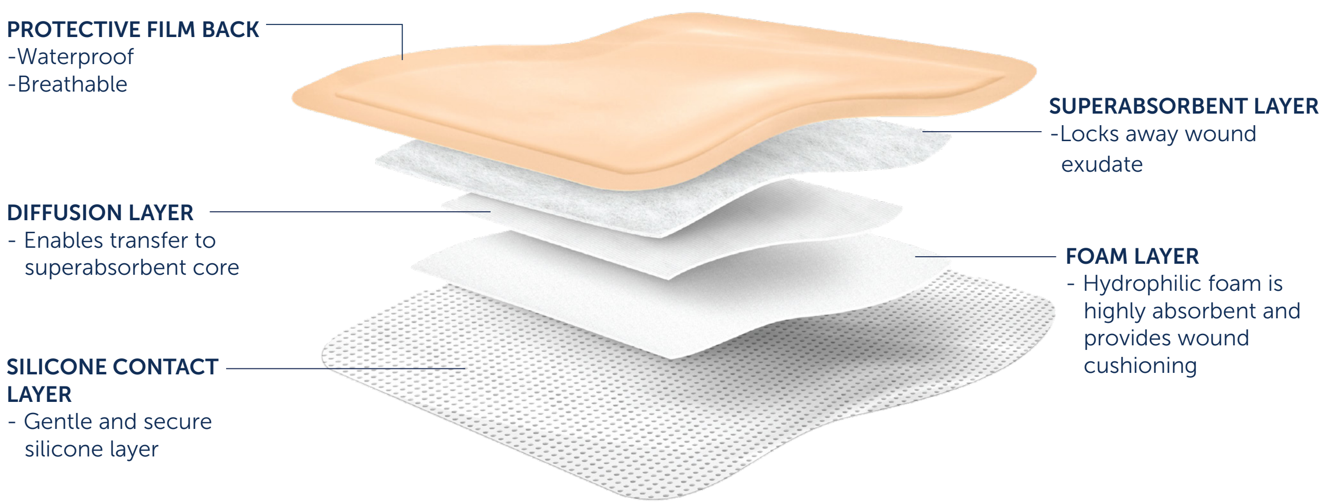

***Figure 1**: Layered components of the bordered silicone foam dressing.*

for optimizing cellular function, angiogenesis, and tissue repair.[3,4] Silicone foam dressings excel in this regard, predominantly utilized for exuding wounds due to their exceptional capacity to absorb and evaporate moisture, thereby maintaining an ideal moisture balance at the wound interface.[2]

Ultimately, effective exudate containment and strong physical performance contribute to improved comfort for the patient, fostering patient trust and quality of life. The use of prophylactic dressings is also common and recommended for prevention of pressure ulcer/injury for patients who may be bedridden or otherwise susceptible to pressure injuries.[1]

Choosing the most effective and cost-efficient dressing can be challenging

The development of effective and cost-efficient wound dressings remains a significant area of research in wound care.[2,5] A standard exists for wound dressing characteristics related to treatment of existing wounds.[6,7] However, this standard only references 4 aspects: moisture vapor transmission rate, waterproofness, extensibility, and absorption. Combined with a lack of established translational relevance, limitations exist that disconnect these standards from real-world clinical use, performance, and application.[8,9] As a result, clinicians may rely on non-standardized methods to evaluate dressings, which can result in unpredictable clinical outcomes, increased health care expenses, and variability in patient satisfaction and wound healingprogression.

Moreover, while national and international standards for testing dressing performance exist for open wounds and soft tissues, there is a lack of standardized benchmarks for assessing dressing performance for prophylactic/preventative function of dressings, which may lead to variability in clinical outcomes.[8] Without standardized metrics for evaluation, clinicians' dressing selection is reliant on contracting, incomplete clinical evidence, their past experience, and availability of products at their institution, the latter being dictated by purchasing contracts with specific suppliers. The Prophylactic Dressing Standards Initiative (PDSI) Task Force—a collaborative effort led by the NPIAP and the European Pressure Ulcer Advisory Panel (EPUAP) in cooperation with clinicians, manufacturers, and researchers—was launched in 2021 to establish international standards for evaluating dressings used in the prevention of pressure injuries.[8]

Bridging the gap between laboratory research and clinical practice is critical

To that end, translating laboratory findings into clinically meaningful insights is essential for improving wound care decision-making. For a comprehensive comparative analysis between dressings, evaluating standardized lab benchmarks provides objective data to differentiate products more effectively.[8,9] Specifically, evaluating the relative performance of different marketed dressings with respect to adhesive properties, fluid handling capacity, conformability, and cost-effectiveness is critical for evidence-based decision-making in a clinical setting.[8,9]

The goal of this report is to bridge the gap between laboratory research and clinical practice by translating comprehensive laboratory data of the HALYARD* Bordered Silicone Foam Dressing compared with other commercially available silicone foam dressings into clinical insights and applicability. Ultimately, access to this information will help clinicians and health systems make better informed decisions to optimize wound care, patient comfort, and cost expenditures for both open wounds and preventative/prophylactic use.

Methods

Rationale

A series of laboratory-based studies and real-world simulation tests[2] were conducted to assess the performance characteristics

	Table 1. Dressings Evaluated		
	Product Name	**Overall Composition**	**SKU**
1	**ALLEVYN® Life** Smith+Nephew	5-layer, bordered hydrocellular foam pad design (4″ × 4″)	66801067
2	**Optifoam® GentleEX** Medline Industries	5-layer bordered foam with silicone adhesive (4″ × 4″)	MSCEX44EP
3	**ConvaFoam™ Silicone** Convatec	Silicone foam dressing with AQUACEL® Hydrofiber® technology (4″ × 4″)	42353
4	**Mepilex® Border Flex** Mölnlycke Health Care	5-layered, bordered foam with innovative flex technology in spreading and retention layers (4″ × 4″)	595300
5	**HALYARD* Bordered Silicone Foam** Halyard	Multilayered bordered silicone foam dressing with superabsorbent foam layer, protective film backing, and gentle silicone adhesive (4″ × 4″)	50085
6	**ALLEVYN® Life Sacrum** Smith+Nephew	5-layer, bordered foam with hydrocellular foam pad design (6.8″ × 6.9″)	66801306
7	**Optifoam® GentleEX Sacrum** Medline Industries	5-layer, bordered foam with silicone adhesive (7″ × 7″)	MSCEX77EP
8	**ConvaFoam™ Silicone Large Sacral** Convatec	Silicone foam dressing with AQUACEL® Hydrofiber® Technology (9.5″ × 8.25″)	42356
9	**Mepilex® Border Sacrum** Mölnlycke Health Care	5-layer foam dressing with proprietary Deep Defense® technology (6.3″ × 7.9″)	282055
10	**HALYARD* Bordered Silicone Foam Sacral** Halyard	Multilayered bordered silicone foam dressing with superabsorbent foam layer, protective film backing, and gentle silicone adhesive (7″ × 6.5″)	50087

of the novel HALYARD* Bordered Silicone Foam Dressing compared to other common commercially available dressing types in both regular and sacral designs (**Table 1**).

Laboratory tests compared wound dressings under controlled, identical conditions to objectively measure fundamental functional attributes influencing dressing performance. By evaluating the same products using standardized methods, these tests provide reproducible metrics that isolate key dressing characteristics like conformability, secure adhesion, and moisture management. This controlled approach allows for direct comparison between products without the influence of external variability.

To complement the controlled laboratory tests, a series of simulations was designed to assess how dressings are likely to perform under real-world conditions, where dressing performance may be challenged by patient movements, anatomical irregularities at the wound site, environmental exposures, and external stressors. These simulations assessed dressing response to shear and friction forces, temperature fluctuations, and stressors that call for redistribution of pressures applied at the wound site. These factors are all critical to supporting wound healing in clinical practice and preventing new pressure injuries. Together, primary and secondary assessments can offer a comprehensive understanding of dressing performance across both standardized and practical care scenarios.

A cost-analysis was performed to determine whether differences in performance might be accompanied by differences in price. Hospitals and clinics often have supplier contracts,

Table 2. Laboratory Testing Objectives and Significance

Variable	What the Test Measures	Why It Matters Clinically
Point Deflection	Effect of a perpendicular force on a dressing	• Minimizing pressure at a single point, like a boney prominence, and deflecting force to surrounding areas aids in pressure injury prevention
Strain Ratio	Ability of a dressing to spread pressure from an internal force	• Strain ratio indicates if a dressing can spread the force of a boney prominence like the sacrum or coccyx from a small area at the tip of the bone to a wider area across the dressing • Larger dressings provide a greater surface area for pressure distribution than the area directly over the boney prominence
Distance of Non-Conformity	Gaps between a dressing and skin before and after application of pressure	• Poor conformity creates space for contaminants to enter, permit leakage from wounds, risking infection or injury
Fluid Handling	Dressing absorption, evaporation, and retention of fluids mimicking wound drainage	• Effective fluid handling ensures that a dressing adequately absorbs wound exudate, drainage, and sweat, remaining intact throughout the healing process

making cost-effectiveness a key factor in product selection and contracting decisions.

Laboratory tests

Laboratory tests assessed dressing performance under controlled, standardized conditions. Using consistent methods, the evaluations focused on adhesion, conformability, and fluid handling—all factors that are critical to maintaining firm placement and managing wound exudate (**Table 2**).

Point deflection

Point deflection testing measured how sacral wound dressings respond to 30 seconds of perpendicular force applied using a rounded indenter to a gel overlay placed over foam. The test evaluated each dressing's ability to distribute force away from the point of contact, with pressure applied directly to the substrate without a dressing serving as a control condition.

Performance values were depicted as the Newtons of force distributed from the point of contact to surrounding areas, with higher values reflecting greater distribution.

Strain ratio

Strain ratio testing compared the extent to which dressing materials were able to distribute localized internal stress exerted by a bony prominence to a wider area. Localized pressure exerted without a dressing applied served as a control condition.

A ratio of 0.900, for example, would indicate that the material distributes the force applied to 90% of the dressing area. Clinically, a higher strain ratio suggests that a dressing can better accommodate body contours and motion, maintaining skin contact despite irregular skin surfaces and reducing the risk of gap formation. Performance values were depicted as a cone representing the ability of each dressing to distribute an applied force (represented by the point of the cone) to surrounding areas (represented by the base of the cone) before breaking.

Distance of non-conformity

Distance of non-conformity testing was conducted to evaluate each dressing's ability to conform to an anatomically complex surface. The dressing was placed on a custom bronze indenter simulating the geometry and temperature range of the gluteal cleft. The indenter was then lowered onto a test surface that approximated the pressure and heat likely to be experienced during wear. After 30 minutes, a knife-tapered scribe was drawn along the cleft to measure any separation between

Table 3. Real-World Simulation Tests		
Variable	**What the Test Measures**	**Why It Matters Clinically**
Shear	A steel sled with an angled surface was slid over dressings to simulate how internal structures like bones can pull on the skin during movement.	Shear forces, such as those from sliding, can damage the deeper layers of skin and tissue, slowing healing and contributing to new injuries.
Friction	The same steel sled was used to measure resistance when slid over dressings under both static and moving (kinetic) conditions.	Friction affects the outer skin layers to cause or worsen pressure injuries—it also disrupts healing by allowing for damage to fragile new tissue.
Pressure Mapping	The amount of pressure across different segments of the wound area after dressing application was measured.	Excessive or localized pressure on a wound can make it worse; however, limiting or distributing pressure protects vulnerable tissues during healing.
Temperature Regulation	The temperature on a heated mannequin at the point of skin contact and outside the dressing after 175 minutes was measured.	Temperature in the wound area that gets too high or low can slow healing, damage tissue, and/or increase the risk of new wounds forming.

the dressing and the indented surface. A wider gap indicated reduced conformity and adherence to skin under pressure.

Fluid-handling capacity

This analysis evaluated how well wound dressings managed moisture by measuring the amount of fluid they absorbed, how much evaporated, and their total fluid-handling capacity. Dressings were exposed to a liquid that mimicked wound drainage, and the amount of fluid each dressing could manage was recorded.

Real-world simulation tests

Real-world simulations were performed to assess dressing response to stressors such as shear and friction forces, external pressure, and temperature fluctuations (**Table 3**). These tests provided insight into how wound dressings are likely to behave when subjected to common stressors in a clinical setting rather than under laboratory conditions (**Table 3**).

Shear and friction

Shear testing simulated the internal tissue strain that occurs when a patient shifts position. A steel sled with an angled surface was used to mimic the way in which underlying bones move against tissue layers during movement, generating shear forces that can damage deep tissues and impair healing. Both peak and average forces over 10 seconds were recorded.

Friction testing, using the same sled, measured how much resistance occurred as the slide moved for 10 seconds across the dressing surface. Measurements were taken under static (initial movement) and kinetic (continued movement) conditions to assess how well the dressing protects against surface-level forces. In both tests, lower values indicated better performance, reflecting greater protection against shear and friction forces.

Pressure mapping

Pressure mapping measured how well a dressing redistributed applied pressure across a simulated wound area. Testing without a dressing in place simulated a wound directly exposed to pressure from an external source, such as clothing, bed linen, or a seat or chair.

A sacral indenter, shaped to mimic the human sacrum, applied a consistent load to simulate pressure over the sacral area. The dressing was stuck to the bottom of a soft gel sheet that represents tissue. This gel sheet was placed over a pressure sensor so the dressing was situated between the gel and the sensor.

A 2-Newton pressure load was applied for 60 second using the sacral indenter. Color-coded pressure maps generated by the sensor showed how pressure was distributed across the dressing to the underlying gel. Red indicated the highest pressure (44.45–50.0 mmHg), followed by orange to yellow (moderately high to high pressure; 37.59–46.9 mmHg), green (moderate pressure; 26.72–36.03 mmHg), blue (low pressure, 5.0–25.17 mmHg), and white (no detectable pressure, 0 mmHg).

Temperature regulation

Researchers placed each dressing on a heated mannequin that mimics skin. After 175 minutes, they measured the temperature at 2 points: where the dressing touches the artificial skin and on the outer surface of the dressing.

Cost analysis

Data was sourced from Decision Resources Group (now Clarivate) and used to compare pricing of dressings. Due to variable pricing in different markets, the average selling price was calculated as the total formula (**Figure 2**). The objective was to provide an indication of whether differences in dressing price correspond to differences in performance.

Results

Laboratory testing

Point deflection

The control condition distributed the least force to areas around the point of contact, while most of the commercial dressings distributed greater Newtons of force to surrounding areas (**Figure 3**). ConvaFoam™ Silicone Foam Dressing redistributed the most force, followed closely by HALYARD* Bordered Silicone Foam Dressing, indicating substantial distribution of applied force away from the point of contact. The error bars show the 95% confidence intervals, meaning there is reasonable confidence that the true average lies within those ranges. Overall, the data suggest that HALYARD* and some competing products have similar ability to redirect localized forces, which may help protect against pressure injuries.

Strain ratio

As expected, the control dressing showed the lowest strain ratio, implying minimal adaptability to body contours (**Figure 4**). The HALYARD* Bordered Silicone Foam Dressing and Allevyn™ Life Sacrum Dressing showed the highest strain ratios, indicating superior ability to conform to complex anatomical areas like the sacrum. This property may improve comfort and further reduce the risk of the dressing becoming unfastened in response to external forces.

$$\text{Average Selling Price (ASP)*} = \frac{\text{Product Revenue}}{\text{Total number of units sold}}$$

- **The cost-effectiveness of the dressing was assessed by comparing its price to other commerically available silicone bordered foam dressings.**
- **The average sales price (ASP) is a reported ratio of product revenue to total number of units sold.**

***Figure 2**: Pricing metrics.*
**Based on ASP for Clarivate Decision Resources Group (DRG) data.*

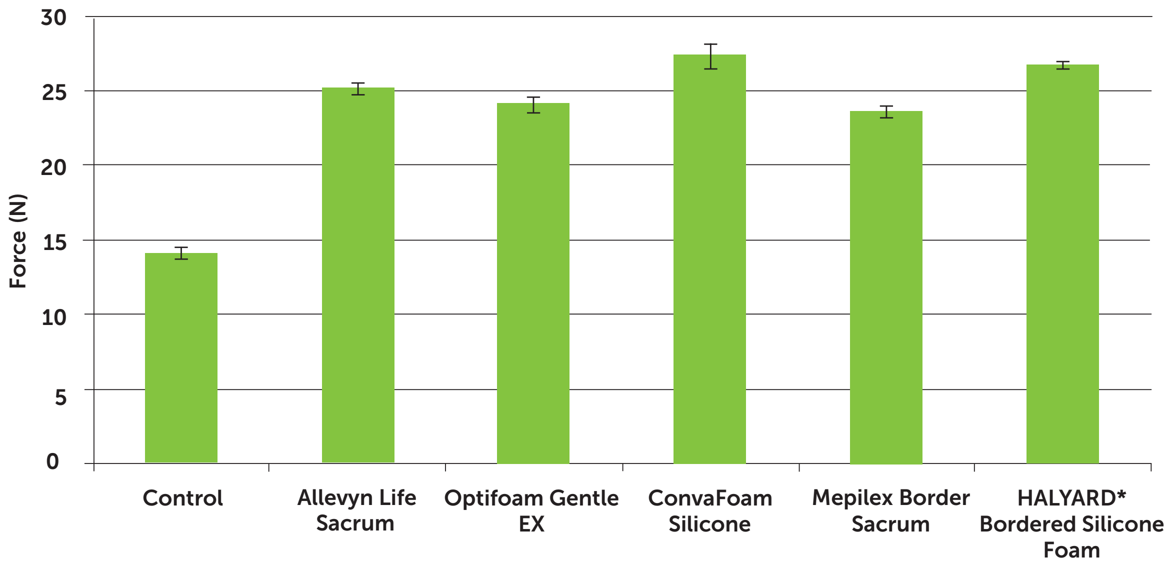

Figure 3. *Average force at finish (after 30 seconds). Error bars indicate 95% confidence intervals.*

Distance of non-conformity

Relative to control, Optifoam® Gentle EX Silicone Faced Foam & Border demonstrated the best performance, maintaining the lowest gap at all time points. HALYARD* Bordered Silicone Foam Dressing and Mepilex® Border Sacrum Foam Dressing also showed strong conformity, maintaining low and consistent gaps between dressing and skin (**Figure 5**). The Allevyn™ Life Sacrum Dressing exhibited the highest non-conformity at all time points, with an average gap of nearly 6.5 mm, suggesting it may be less effective at sealing to the body's contours in response to pressure. Between these extremes, the ConvaFoam™ Silicone Foam Dressing showed moderate performance, with relatively high initial gaps that improved slightly over time.

Fluid-handling capacity

A high level of evaporation coupled with limited absorption of fluid suggests maintenance of a moist wound environment without significant fluid accumulation. ConvaFoam™ Silicone Foam Dressing showed the highest vapor loss, followed by HALYARD* Bordered Silicone Foam Dressing and Allevyn™ Life

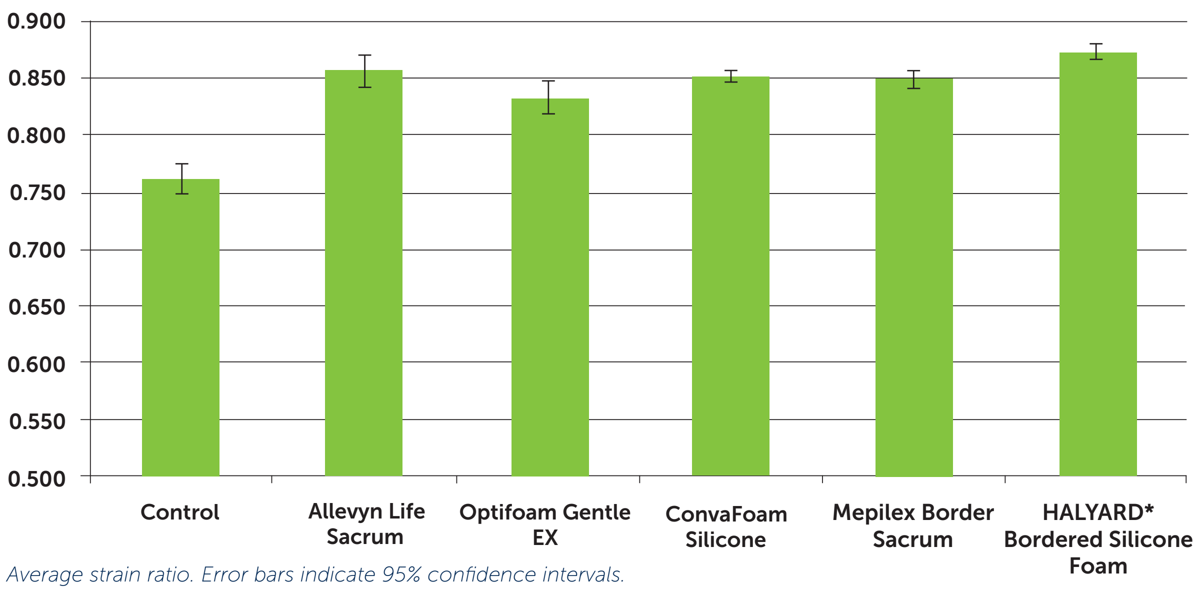

Figure 4. *Average strain ratio. Error bars indicate 95% confidence intervals.*

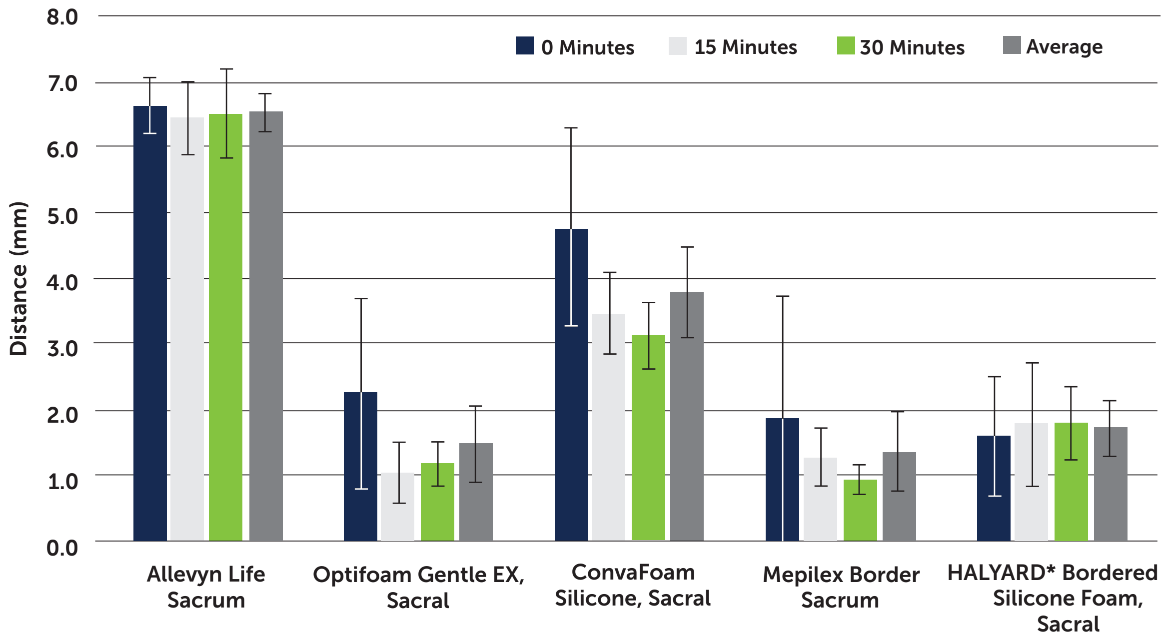

Figure 5. Distance of non-conformity. Error bars indicate 95% confidence intervals.

Sacrum Dressing (**Figure 6**). Optifoam® Gentle EX Silicone Faced Foam & Border and Mepilex® Border Flex had the lowest vapor loss. The Mepilex and Optifoam dressings absorbed the most fluid. The ConvaFoam and HALYARD* dressings absorbed the least. Collectively, the HALYARD* and ConvaFoam dressings had the highest total fluid-handling capacity, followed by the Mepilex dressing. The Optifoam and Allevyn dressing had slightly lower total capacity.

Real-world simulation tests

Shear and friction

In shear testing, the percentage of peak force transmitted through the bandage was lowest with ConvaFoam™ Silicone Foam Dressing, followed by Mepilex® Border Sacrum Foam Dressing and HALYARD* Bordered Silicone Foam Dressing (**Figure 7**). Average force transmitted was lowest with the ConvaFoam and Mepilex dressings, followed by the

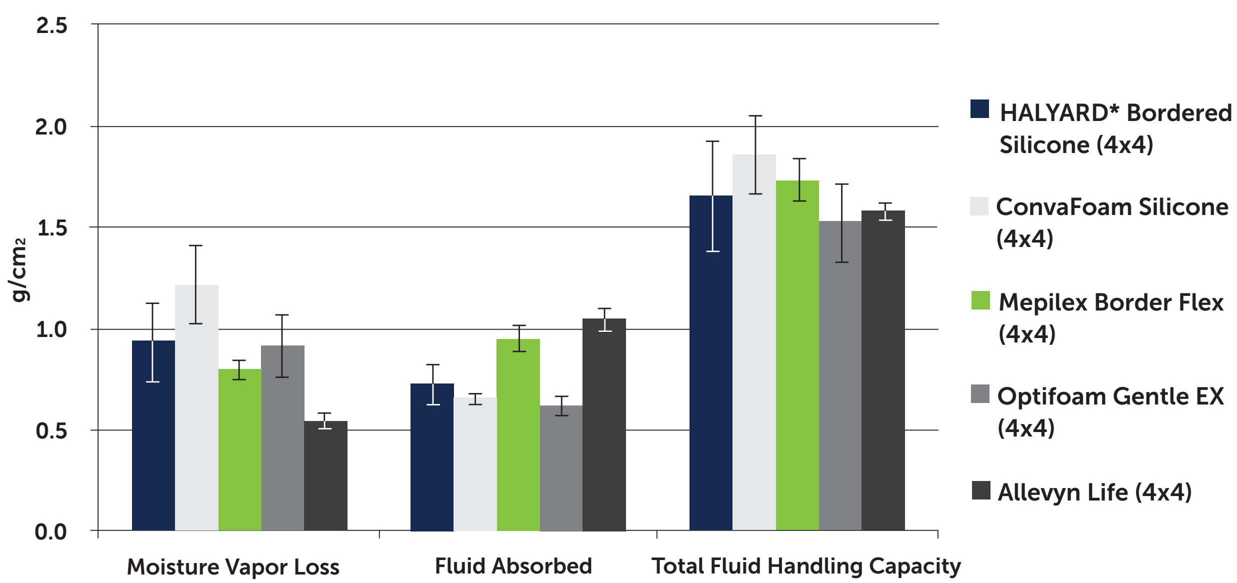

Figure 6. Fluid-handling capacity (evaporation, absorption, and total). Error bars indicate 95% confidence intervals.

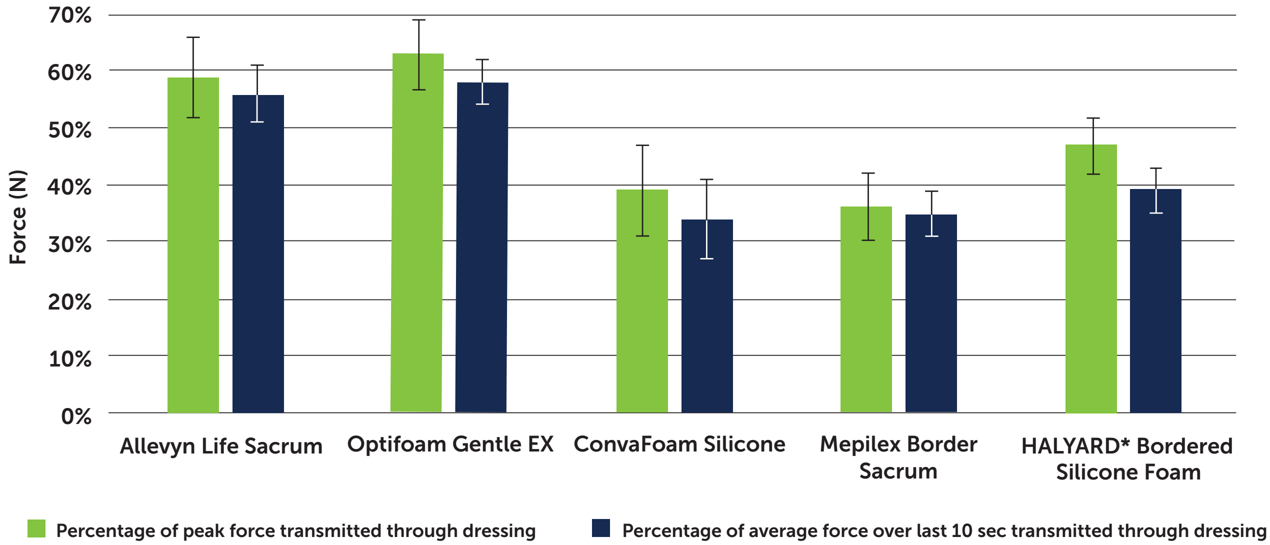

Figure 7. *Percentage of shear force distributed throughout sacral dressing. Error bars indicate 95% confidence intervals.*

HALYARD* dressing. Transmission of both peak and average force through the dressing was substantially higher with Allevyn™ Life Sacrum Dressing and Optifoam® Gentle EX Silicone Faced Foam & Border.

Similarly, in friction testing, the percentage of static force transmitted through the bandage was lowest with the ConvaFoam dressing, followed by the HALYARD* and Mepilex dressings (**Figure 8**). Kinetic force transmitted was similar and lowest with the ConvaFoam, HALYARD*, and Mepilex dressings. Transmission of both static and kinetic forces through the dressing was higher with the Optifoam dressing and highest with the Allevyn dressing.

Pressure mapping

The control (no dressing) image was compact, indicating that pressure was not distributed widely (**Figure 9**). The red core with yellow and green around it suggest substantial, focused pressure over the wound, which is a risk factor for pressure injuries. In contrast, the ConvaFoam™ Silicone Foam Dressing, Mepilex® Border Sacrum Foam Dressing, and HALYARD* Bordered Silicone Foam Dressing distributed pressure to wider

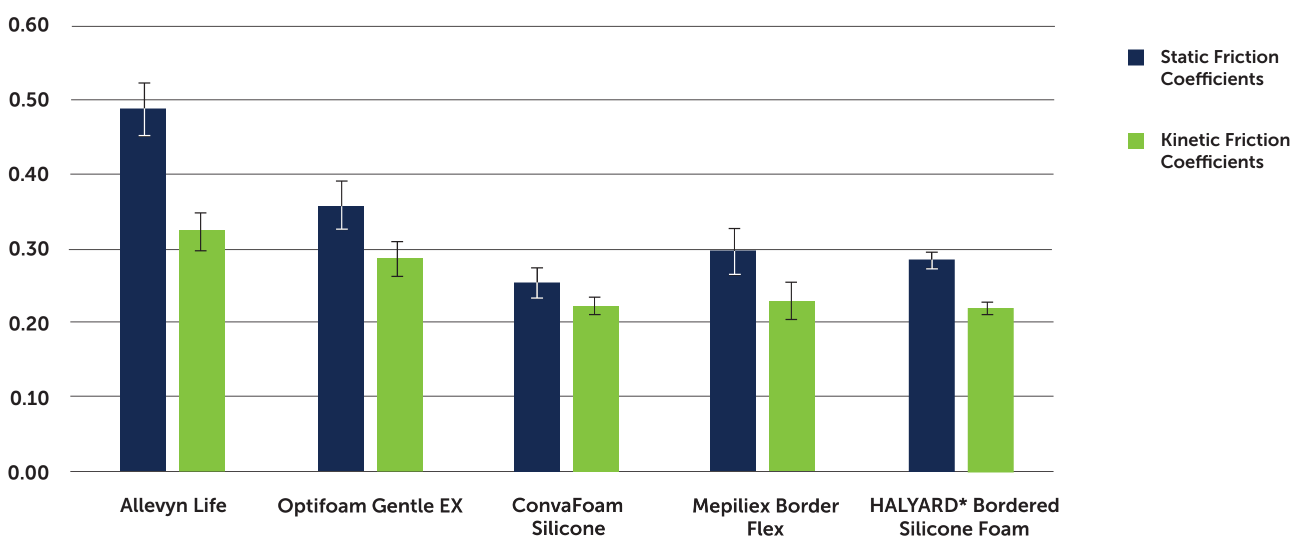

Figure 8. *Coefficients of friction for sacral dressings. Error bars indicate 95% confidence intervals.*

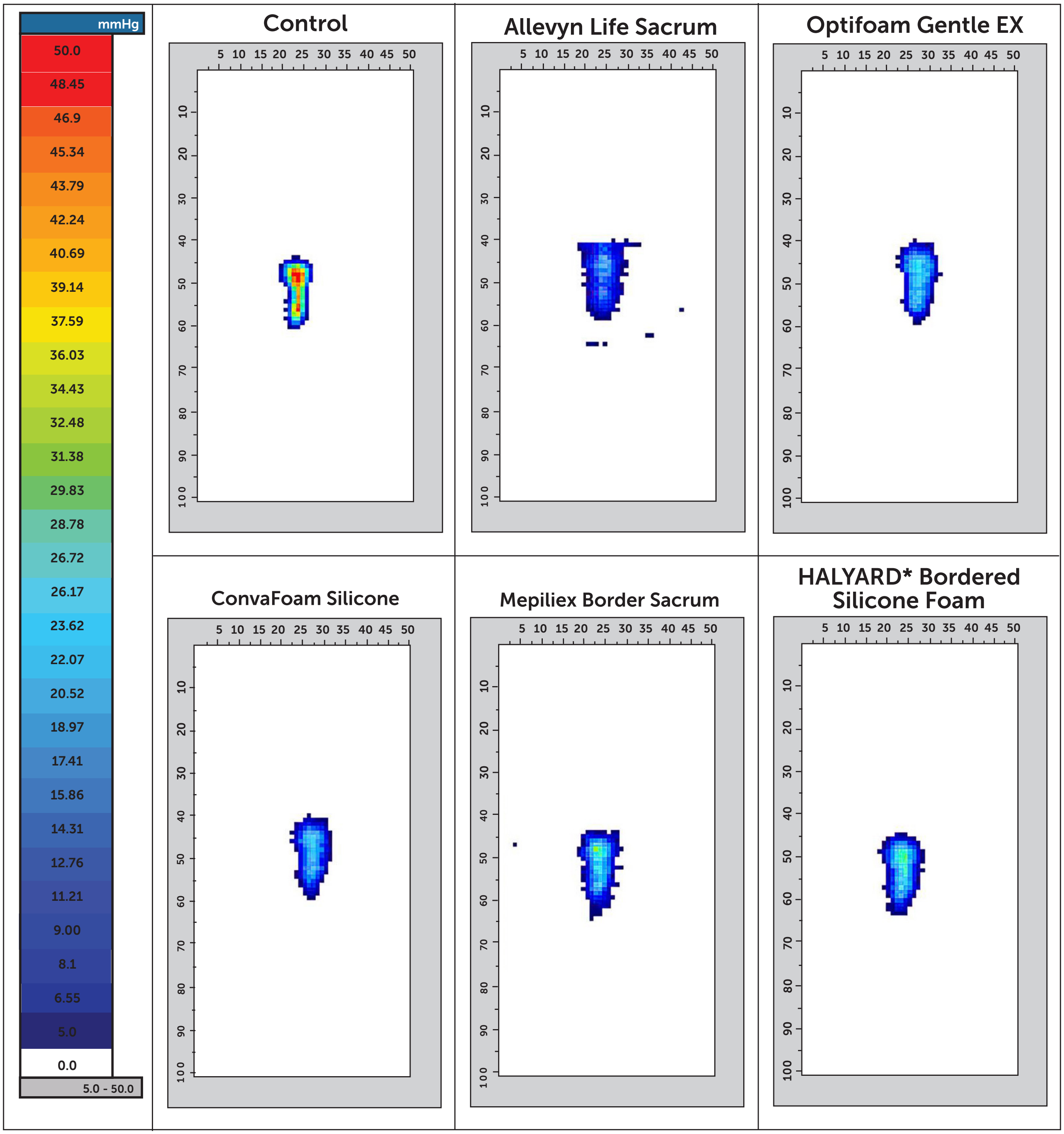

Figure 9. Pressure map images.

areas, with the predominantly blue color denoting a low risk of pressure injury.

Temperature regulation

Similar temperatures were observed across all dressings tested prior to dressing application, with very little change in temperature after affixing any of the dressings (**Figure 10**).

Cost analysis

The cost analysis highlighted how HALYARD* Bordered Silicone Foam Dressings deliver

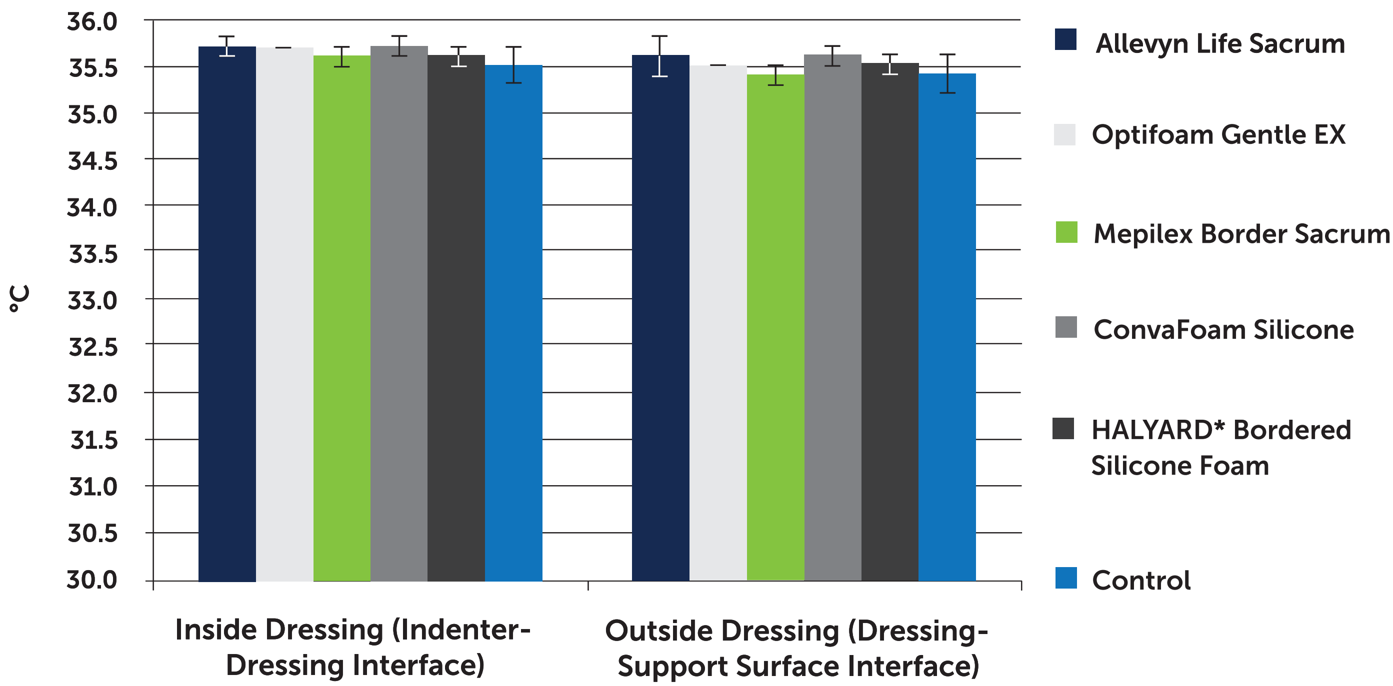

Figure 10. Temperature after 175 minutes (Centigrade). Error bars indicate 95% confidence intervals.

significant value for hospitals and wound centers when compared to other established brands. Notably, despite equivalent or superior clinical performance, HALYARD* Bordered Silicone Foam Dressings are offered at a more cost-effective price point, making them a fiscally responsible choice for healthcare providers focused on value-based care. For healthcare facilities, the financial benefits become apparent when considering the total cost of care rather than unit price alone. Using HALYARD* dressings enables hospitals, wound centers, long-term care facilities, and home health agencies to maintain optimal healing environments and reduce dressing-change frequency, helping to lower staff labor requirements and minimize resource consumption.

Furthermore, the proven effectiveness of the HALYARD* Bordered Silicone Foam Dressing with respect to exudate containment and patient comfort reduces risks associated with wound complications – such as infection, delayed healing, or the development of pressure injuries – that typically lead to higher downstream costs. Ultimately, the HALYARD* dressing delivers a compelling value proposition. Healthcare providers can achieve both guideline-recommended outcomes and operational efficiency without the premium pricing seen with some other market leaders, resulting in both immediate and sustained cost savings for institutions.

Discussion

Good wound dressings stay securely in place, protect again additional injury, and prevent complications like medical adhesive-related skin injury (MARSI) and dermatitis. These are shared goals between clinicians, patients, and manufacturers, as well as groups such as the Wound Care Collaborative Community (WCCC), NPIAP, EPUAP, Pan Pacific Pressure Injury Alliance, and the PDSI—a joint initiative of the NPIAP and EPUAP.[1,10,11]

Understanding the relative performance results of wound care and prevention dressings and how any differences might influence clinical practice is of great importance. In the present experiments, laboratory tests were conducted to compare wound dressings under controlled, identical conditions to objectively measure fundamental functional attributes influencing dressing quality. By evaluating the same products using standardized methods, such as point deflection, adhesive strength, and fluid handling, these tests provide reproducible metrics that isolate key dressing characteristics like force redistribution, conformability, secure adhesion, and moisture management. This controlled approach allows for direct comparison between products without the influence of external variability.

Secondary evaluations built on this foundation by assessing how dressings perform under real-world conditions, where variability and environmental challenges are greater. These tests simulated factors such as sustained pressure, exposure to contaminants, and irregular anatomical surfaces to understand how dressings respond under individualized conditions. Together, primary and secondary assessments offer a comprehensive understanding of dressing performance across both standardized and practical care scenarios.

Clinical interpretation of HALYARD* Bordered Silicone Foam

Dressing laboratory results

The results of the laboratory tests performed demonstrate that the HALYARD* Bordered Silicone Foam Dressing has excellent adhesive properties without over-securement, where over-securement can be a concern for MARSI and dermatitis.[11] Specifically, point deflection, strain ratio, and distance of non-conformity testing, and fluid handling capacity testing indicated how well each of the dressings tested stays in place, adapts to the body, and protects the wound area, including in challenging locations, such as bony prominences like the sacrum. Dressings with high point deflection values—most notably, the ConvaFoam™Silicone Foam and HALYARD* dressings—were better able to redistribute localized forces that might be applied to the skin surface through contact with clothing, bedding, or other potential irritants. Similarly, the high strain ratio observed with the HALYARD* and Allevyn™ Life Sacrum dressings means these dressings can stretch and mold around challenging surfaces, like the sacrum and coccyx. Lower distance of non-conformity values seen with the Optifoam® Gentle EX Silicone Faced Foam & Border and HALYARD* dressings suggests that fewer, narrower gaps between dressing and skin are expected with these dressings, an important attribute that protects against urinary and fecal incontinence backflow, exudate leakage, wound contamination, and pressure injuries.

The HALYARD* dressing showed high absorbency capacity, effectively managing a wide range of exudate levels with appropriate moisture vapor transition rate to manage the dermal-dressing microclimate, which aligns with the goals of wound care laid out by the NPIAP.[1,11] This is of critical importance, as effective fluid management requires a balance between the amount of moisture that evaporates and the amount that is absorbed. Sufficient moisture vapor loss with limited absorption can prevent fluid buildup, protecting the skin from contamination. Nonetheless, sufficient absorption, noted with all dressings, is necessary to prevent tissue around a wound from drying out. Total fluid-handling capacity—a composite of vapor loss and absorption—offered a balanced picture of how dressings managed drainage to maintain a wholesome environment between skin and dressing. In this comparison, HALYARD* and ConvaFoam dressings showed the highest total fluid-handling capacity, while Optifoam and Allevyn dressings ranked the lowest.

Clinical implications of real-world simulation tests

Simulation tests approximating conditions likely to be encountered in the real world outside the laboratory further demonstrate the excellent clinical performance of the HALYARD* dressing compared with other dressings. Temperature regulation was consistent across all dressings, with minimal changes before and after application, suggesting that all products helped maintain a stable microclimate. Effective temperature regulation has been shown to translate to uniform comfort and reduced risk of inflammation.[13]

In shear and friction testing, HALYARD* ranked among the top performing dressings, transmitting relatively low peak and average forces, which is critical for minimizing mechanical stress on skin both at rest and during movement. Only ConvaFoam and Mepilex dressings showed slightly better performance in these measures. Pressure mapping revealed that HALYARD*, along with ConvaFoam and Mepilex, effectively redistributed pressure across a wide area around the wound, reducing localized high-pressure zones associated with pressure injury risk. These results clinically correlate with prevention of pressure injuries, which is a goal in published guidelines.[11,14]

Cost-effectiveness evaluation of foam dressings

Wound dressings exert a significant economic impact on health care systems globally.[15] The cost of wound care, including dressings, constitutes a notable portion of health care budgets, with expenditures in the United States alone reaching billions of dollars annually.[5] Advanced wound dressings, while improving healing outcomes and reducing complications, are costly. The global wound care market size is valued at USD 23.13 billion in 2024 and projected to reach USD 32.75 billion in 2033.[16] Conversely, the appropriate use of dressings can lead to fewer wounds, less severe wounds, faster healing, reduced infection rates, and shorter hospital stays, resulting in cost savings.[1,17] Furthermore, the economic burden extends beyond direct treatment costs to include lost productivity for patients and caregivers. The wound dressing market is large and expanding, driven by factors such as the rising prevalence of chronic diseases in an aging population. This, accompanied by advancements in wound care technology, highlights the economic relevance of these medical products.

Multilayered foam dressings are frequently cited for their contribution to cost savings due to their effectiveness in reducing pressure injury incidence—particularly in high-risk patients—by redistributing pressure and managing the microclimate.[17,18] When examining the cost-effectiveness of prophylactic wound dressings, it is important to consider not only the inter-product price variation, but also the clinical field performance. Dressing failure is a term defining a dressing's loss of function—a status that an astute clinician would recognize—and the product would need to be removed and replaced. Dressing failure can shorten the time a dressing remains in place and can be due to multitudinous factors including poor surface attachment (eg, diaphoresis, dermatitis, irregular peri-wound), moisture saturation, adhesive failure, and mechanical forces.

The economic landscape of pressure injury prevention dressings demonstrates considerable variability, with differences in pricing potentially creating opportunities for cost savings in the event of dressing non-inferiority. A common but unproven assumption is that higher-priced dressings necessarily offer better performance. This belief is being reevaluated, prompting questions about whether clinicians truly face a trade-off between performance and cost when selecting products for pressure injury prevention. This study suggests that standard bench laboratory and real-world simulation testing can establish comparable performance between wound dressings, enabling clinicians and value assessment teams to apply real-world performance and cost data to support product selection.

Limitations and Future Recommendations

Further clinical studies are warranted to evaluate the dressing's performance in real-world settings and assess its impact on wound healing and wound prevention outcomes. Improved standardized testing with direct clinical relevance for treatment of existing wounds and prevention of pressure injuries will be crucial, moving forward, to aid in scientific evidence-based selection of the most appropriate and cost-effective dressing.

Conclusion

Overall, the HALYARD* Bordered Silicone Foam dressing demonstrated performance in laboratory evaluations that was highly comparable to the other market-available dressings assessed. Taken together, these data indicate that the HALYARD* dressing is a reliable option that aligns closely with established benchmarks while also offering the potential for substantially better overall value relative to the expenditure. Consequently, this product represents a pragmatic and cost-conscious addition to the wound care armamentarium.

The results of these experiments reinforce the impact of laboratory findings on clinical practice and demonstrate real-world wound management with relevancy of laboratory results. Overall, the dressings tested generally performed well within the wide range of tests conducted. The results also suggest that higher cost does not necessarily translate to better dressing performance, supporting cost savings as reasonably factored into clinical decision making. Translating rigorous scientific laboratory testing into meaningful clinical outcomes shows the clinical utility of standardizing benchmarks in laboratory research for evaluating dressing performance. Complementing these tests with additional measures that replicate clinical practice may enhance clinicians' confidence that their decisions around dressing selection are being guided by concrete data rather than subjective impressions, anecdotal experience, or price alone. Establishing objective dressing metrics can improve patient outcomes, standardize clinical management, and lower health care costs, supporting the multifactorial goals of health care.

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Appendix. Summary of the Key International Guidelines and Consensus Documents Relevant to Bordered Silicone Foam Dressings

Organization/ Document Name	Type of Document	Primary Focus	Relevance to Bordered Silicone Foam Dressings	Publication Year/Edition
Wounds International	Consensus Document, "Made Easy" Guide	General wound care, dressing properties, exudate management	Direct recommendations for bordered soft silicone foam dressings, specific product examples, detailed evidence for various wound types.	Various (eg, "Soft Silicones Made Easy" PDF, 2023)[1]
National Pressure Injury Advisory Panel (NPIAP), European Pressure Ulcer Advisory Panel (EPUAP), Pan Pacific Pressure Injury Alliance (PPPIA) International Pressure Injury Guideline	Clinical Practice Guideline, Quick Reference Guide	Pressure injury prevention and treatment	Foundational guidance on pressure injury management; specific recommendations for bordered silicone foam dressings not explicitly detailed in provided core guideline snippets	4th Edition (2025)[5]
International Skin Tear Advisory Panel (ISTAP)	Clinical Practice Guideline	Skin tears	Bordered silicone foam dressings protect reapproximated skin flaps and exposed tissues while managing the environment to allow for undisturbed wound healing, minimizing trauma with removal on at risk skin	
World Union of Wound Healing Societies (WUWHS)	Consensus Document	Wound exudate and the role of dressings	Provides general principles for best practice in exudate management, which informs dressing selection; specific recommendations for bordered silicone foam dressings not explicitly detailed in provided WUWHS snippets	2007 (exudate document)[3]

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