# **Economic Evaluation of Multilayer Polyurethane Foam Dressings for Preventing Pressure Ulcers in Hospitalized Patients in the United States**

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# Introduction

- Hospital-acquired pressure ulcers (HAPUs) are injuries to the skin and/or underlying tissue caused by sustained pressure or a combination of pressure and shear forces. HAPUs are significant adverse events in hospitals, particularly affecting older adults and other vulnerable patient groups.<sup>1,2</sup>
- HAPUs have a substantial negative impact on patients and impose a considerable financial burden on hospital providers, primarily due to the resources required to manage complications. Patients who develop HAPUs often experience longer hospital stays, higher readmission rates, and increased in-hospital mortality.<sup>3</sup>
- Estimates of the economic burden of HAPUs vary widely but show a consistent upward trend over time. In 2014, the Agency for Healthcare Research and Quality (AHRQ) estimated the annual national cost of HAPUs in the United States (U.S.) to be \$9.1–\$11.6 billion.<sup>4</sup>
- More recently, Padula et al. (2019) estimated that in 2016, the total national cost of acute care attributable to HAPUs was \$26.8 billion (USD). Notably, 59% of these costs were associated with the most severe pressure ulcers (Stages 3 and 4).<sup>5</sup>
- Similarly, Wassel et al. (2020) analyzed 9.6 million patient records (from October 2009 to September 2014) and, after weighting by severity, estimated an average cost of \$21,767 per HAPU. Assuming an incidence rate of 3.6%, this translates to an estimated \$7.8 million in costs per 10,000 hospital admissions (360 HAPU cases) and a national burden of \$27.4 billion for 35 million hospital admissions (1.26 million HAPU cases).<sup>6</sup>
- This study aims to assess the cost-effectiveness of adding a foam dressing to Standard Prevention (SP) for HAPU management in hospitalized patients, using evidence from a meta-analysis stratified by HAPU stage and analyzed from a U.S. payor perspective.

## Methods

- A decision-analytic model was developed to assess the incremental cost of incorporating a foam dressing strategy alongside SP when compared to SP alone.
- The model utilized a decision tree structure, with a seven-day post-admission timeframe to identify HAPUs stratified by stage, as reported in the included studies.<sup>7,8</sup>
- Both arms of the model, depicted in Figure 1, had identical potential outcomes: (1) Stage I HAPU (2) Stage ≥II HAPU, and (3) No HAPU within seven days postadmission.
- The cost of dressings were estimated using the average selling price (ASP), while the number of dressing changes, required application time, and cost of treating a HAPU were derived from the literature. <sup>5-8</sup>
- Where necessary, all costs were adjusted to 2024 values using inflation data from the Bureau of Labor Statistics (BLS).<sup>9</sup>
- After conducting a deterministic analysis, we performed both one-way sensitivity analysis (OWSA) and probabilistic sensitivity analysis (PSA) to assess the robustness of our findings under uncertainty.
- Results were expressed as an Incremental Cost-Effectiveness Ratio (ICER), calculated as cost per HAPU avoided.

An economic analysis demonstrated that from a U.S. payor perspective, multi-layer silicone-adhesive polyurethane foam dressing (ALLEVYN<sup>o</sup>) in addition to standard prevention (SP) is a preferred treatment strategy when compared to SP alone for the prevention of sacral hospital-acquired pressure ulcers (HAPUs) in at-risk patients. Adding a foam dressing resulted in increased effectiveness and decreased costs.

<sup>o</sup>ALLEVYN LIFE Foam Dressings. Smith+Nephew, Inc. Andover, MA, U.S. All Trademarks Acknowledged. ©2025 Smith+Nephew, Inc. Poster presented at Symposium on Advanced Wound Care (SAWC) Spring 2025, Grapevine, TX, U.S.

### Figure 1: Model Structure



## Results

- As shown in Table 1, from a U.S. payor perspective, adding a foam dressing reduces both costs and HAPU incidence for the average hospitalized patient. Specifically, the foam dressing strategy resulted in a cost reduction of \$573 and a decrease of 0.09 HAPUs per patient, indicating that it is cost-saving.
- Table 2 presents a breakdown of HAPU reductions by stage for a hypothetical cohort of 1,000 patients. The findings demonstrate a reduction of 78%, 49%, and 66% for Stage I, Stage ≥II, and all HAPUs, respectively.
- Sensitivity analysis confirmed that the foam dressing remains the optimal strategy, even when model inputs are varied to account for uncertainty. Probabilistic analysis (visualized in Figure 2) showed that the foam dressing strategy was cost-saving in 98.9% of simulations, with most outcomes plotted in the southeast quadrant of the cost-effectiveness plane; reinforcing its economic advantage.

### Table 1: Total Cost and Hospital-acquired Pressure Ulcers (HAPUs) per Patient

Intervention	Costs	HAPUs	Cost saving	HAPUs Avoided	Outcome
Standard Prevention (SP)	\$1,165	0.14			
Foam Dressing + SP	\$593	0.05	-\$573	0.09	Preferred strategy*

\*SP + Foam Dressing is the preferred strategy as it prevents more HAPUs at a lower cost

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HAPU = Hospital-acquired Pressure Ulcer

### Table 2: Hospital-acquired Pressure Ulcers (HAPUs) by Stage per 1,000 Patients



### Figure 2: Cost-effectiveness Plane with Probabilistic Sensitivity Analysis (PSA)



# Conclusion

- 90 fewer HAPUs per 1,000 patients.

### References

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	Standard	SP + Foam	HAPUs	%
	Prevention (SP)	Dressing	Avoided	Reduction
APUs	78	17	61	78%
HAPUs	59	30	29	49%
S	137	47	90	66%



HAPU = Hospital-acquired Pressure Ulcer

• Adding a multi-layer silicone-adhesive polyurethane foam dressing alongside SP was found to be cost-saving in preventing sacral HAPUs in at-risk hospitalized patients.

• The addition of a foam dressing resulted in 0.09 fewer HAPUs per patient, equivalent to

• The analysis showed per-patient cost savings of \$573, representing a 49% cost reduction from a U.S. payor perspective.

• Sensitivity analysis confirmed adding a foam dressing remains the preferred approach, even when key model inputs were varied to account for uncertainty.

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