A One-Year Evaluation of a Variable Pressure Foaming (VPF™) Mattress with Surface Modification Technology (SMT™) for Prevention and Treatment of Pressure Ulcers in General Medical-Surgical Patients

AUTHORS:

Catherine T. Milne APRN, MSN, BC-ANP/CNS, CWOCN[A], Darlene Saucier APRN, MSN, BC-FNP, CWCN[A], Glenda Motta RN, MPH[B]

CLINICAL PROBLEM

Increased tissue interface surface pressures are a well-known and greatly studied cause of pressure ulcers. Reports of viscoelastic foam use in specific clinical populations suggest that these surfaces may be more effective than Group 1 devices.[1, 2, 3] Previous in vivo studies have shown that the Variable Pressure Foaming (VPF™) mattress with Surface Modification Technology (SMT™)* offers greater average and maximum weight reductions versus other viscoelastic mattresses[4] with a 49.2% reduction in average peak pressure.[5] It is unknown if routine use of the VPF/SMT mattress in general Medical-Surgical patients may be more effective than traditional Group 1 support surfaces. Short-term clinical evaluations have been completed for these surfaces, but one-year performances have not been reported.

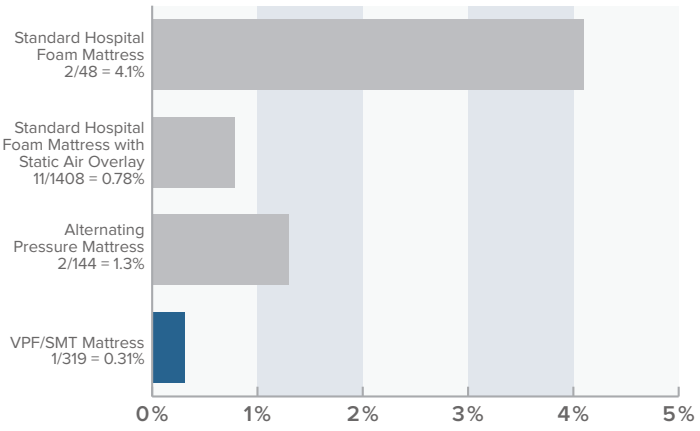
METHOD

A retrospective review was conducted of all patients on a general Medical-Surgical unit with reported hospital-acquired pressure ulcers (HAPUs) over a one-year period to correlate the location and severity of ulcers with pressure redistribution surfaces used. All patients received one of the following: a standard hospital foam mattress (HFM) if Braden Scale score was > 18, a standard hospital foam mattress with static air overlay or a VPF/SMT (if Braden Scale score was ≤ 18) upon admission. Nursing protocol also allowed placing the patient on an alternating pressure or low air loss surface if clinically warranted, regardless of Braden score.

RESULTS

1,919 patients were admitted to this unit over a one year period. 16 patients developed 20 hospital acquired pressure ulcers for an overall incidence of .94%. Nineteen of 20 pressure ulcers were in contact with a pressure redistribution surface. One pressure ulcer was located on the ear and not in contact with a pressure redistribution surface. The mean Braden Score in the HAPU group was 13.2 (range 9-16). Four pressure ulcers were observed in the standard hospital foam mattress group, twelve pressure ulcers were reported in the standard hospital foam mattress with static air overlay group, one ulcer was reported in the VPF/SMT use group, and two ulcers were reported in the low air loss/alternating pressure group.

Pressure Ulcers by Pressure Redistribution Surface



A One-Year Evaluation of a Variable Pressure Foaming (VPF™) Mattress with Surface Modification Technology (SMT™) for Prevention and Treatment of Pressure Ulcers in General Medical-Surgical Patients

CONCLUSION

This VPF/SMT surface was more effective in preventing pressure ulcers than the standard hospital foam mattress with or without a static air overlay and as effective in high risk patients who received low air loss/alternating pressure in general Medical-Surgical patients over a period of one year. Significant cost reduction may be achieved by eliminating static air overlays. Further studies are warranted.

Month	Pressure Ulcer Number of Hospital Acquired Pressure Ulcers	Stage	Location	Pressure Redistribution Surface
08-10	1	1	Heel	HFM w/Static Air Overlay
09-10	2	1	Heel	HFM w/Static Air Overlay
		1	Ear	N/A
10-10	0	N/A	N/A	N/A
11-10	1	2	Coccyx	HFM w/Static Air Overlay
12-10	2	1	Sacrum	Alternating Pressure
		2	Heel	HFM w/Static Air Overlay
01-11	3 (same patient)	1	Heel	HFM no Static Air Overlay
02-11	1	1	Heel	VPF/SMT
03-11	1	2	Coccyx	HFM w/Static Air Overlay
04-11	2	1	Heel	HFM w/Static Air Overlay
		1	Heel	HFM w/Static Air Overlay
05-11	2	2	Coccyx	HFM no Static Air Overlay
		2	Heel	HFM w/Static Air Overlay
06-11	2	1	Heel	HFM w/Static Air Mattress
	1	2	Coccyx	HFM w/Static Air Mattress
07-11	1	2	Coccyx	HFM w/Static Air Mattress
	1	Deep Tissue Injury	Coccyx	Alternating Pressure

References

1. Krapfl , LA, Gray, M, Does regular repositioning prevent pressure ulcers? J WOCN. 2008; 35(6): 571-577.
2. Price, MC, Whitney, JD, King CA. Development of a risk assessment tool for intraoperative pressure ulcers. J WOCN. 2005; 32(1): 19-30.
3. Defloor, T, De Bacquer, D, Grypdonck, MHF. The effect of various combinations of turning and pressure reducing devices on the incidence of pressure ulcers. Int J Nurs Studies. 2004;42: 37-46.
4. Hermans MHE, Warren ST, McCabe K, et al. Variable pressure foaming and surface modification technology in polyurethane systems show a clear reduction of pressure in an in vivo test model. Poster. SAWC Fall 2009.
5. Hermans MHE, Warren ST, Neto M, Reger SI. Evaluation of a new mattress technology by mapping the pressure on the trochanter major in healthy volunteers. Poster. SAWC April 2010.

* BodyZone™ 500, FXI, Media, Pa. (Hercules Dream Gel™)

A Connecticut Clinical Nursing Associates, LLC

B GM Associates, Inc

THE morel COMPANY®