

Prevention and Treatment of Pressure Ulcers with a New Viscoelastic Foam Mattress with Surface Modification Technology in General Medical-Surgical Patients

AUTHORS:

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CLINICAL PROBLEM

Pressure reduction and redistribution is essential in the prevention of pressure ulcers. Reports of viscoelastic foam use in specific clinical populations suggest that these surfaces may be more effective than devices classed as Group 1 under Medicare policy and the literature.^{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 mattresses⁴ 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. Therefore, we conducted a trial in Medical-Surgical patients to analyze the potential of this technology to aid in reducing the incidence of new pressure ulcers and healing existing ones.

METHODOLOGY

- During a 30-day period, Medical-Surgical patients were randomly placed on one of six VPF/SMT* surfaces on admission to a central Connecticut hospital or upon transfer from the critical care unit and prospectively evaluated during hospitalization.
 - Data on diagnosis, sex, age, weight, length of stay, body mass index (BMI), Braden scores, PUSH Tool scores, and skin condition was recorded for all patients who were placed on the VPF/SMT* surface.
 - Braden Scores were determined on admission or transfer, daily and upon discharge
 - Skin assessment was performed daily
 - PUSH Tool scores were calculated for patients who were admitted with wounds or developed wounds regardless of etiology on admission and at discharge
 - Discharge skin assessment included the following:
 - Did skin intact on admission remain so at discharge?
 - Did skin with altered integrity on admission improve at discharge as determined by PUSH Tool score?
 - Did patient develop alteration in skin integrity while hospitalized?
 - If yes, what type of alteration?
 - Professional caregivers and patient comments were also noted
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RESULTS

Demographics

- 54 patients used one of six identical mattresses over a 30-day period
- Sex: 33 males; 21 females
- Mean age: 67.4 (range 39 - 99)
- Mean length of stay: 3.87 days (range 2 – 9)
- 2 patients expired as was expected (i.e., were admitted as hospice care)

Body Mass Index

- Mean BMI: 27.5 (range 14.3 – 47.9)
- Percentage underweight as determined by BMI: 5.6%
- Normal weight: 31.4%
- Overweight: 29.6%
- Obese: 33.4%

Braden Scale Scores

- Mean on admission: 17.5 (range 9 – 23)
- Low or no risk: >18 (n=13)
- Mild risk: 15–18 (n=32)
- Moderate risk: 13–14 (n=7)
- High risk: 10–12 (n=1)
- Very high risk: <9 (n=1)
- Mean on discharge: 17.6 (range 8 – 22)

Admission Skin Assessment

- Skin integrity altered at time of placement on mattress: 24.1% (n=13 patients)
- Type of skin integrity alteration: pressure ulcers (n=5), venous leg ulcers (n=1), surgical incisions (n=2), skin tears (n=2), irritant dermatitis (n=2), cellulitis from dog bite (n=1)

Pressure Ulcer Data

- Pressure ulcers on admission: 9.2% (n=5 patients with 9 pressure ulcers)
- Patient #1: Stage II on sacrum; Stage I on each buttock (total of 3 ulcers)
- Patient #2: Stage I ulcers: sacrum; right and left sacroiliac (total of 3 ulcers)
- Patient #3: Stage II on heel
- Patient #4: Stage IV on heel
- Patient #5: Stage I on sacrum
- Mean Pressure Ulcer Scale for Healing (PUSH Tool) score: 5.1 (range 2 – 9)
- 1 patient with 3 pressure ulcers: healed
- 2 patients: ulcers improved by discharge
- 2 patients: pressure ulcer showed no improvement but did not worsen as expected (hospice patient)
- Most impressive result reported by nursing staff: 99 y.o. dying patient admitted with 3 Stage I pressure ulcers; no fluid intake; hypotensive; Braden score declining daily; on MS drip for pain
- No worsening of existing pressure ulcers that were considered to be Kennedy Terminal Ulcers (KTUs) in hospice patients
- No new ulcers developed

Discharge Skin Assessment

- Did skin intact on admission remain so at discharge? *Yes, for 41 subjects with skin intact on admission*
- Was skin with altered integrity improved at discharge? *24.1% (13 patients) admitted with altered integrity; 10 of these improved at discharge*
- Did patient develop alteration in skin integrity while hospitalized? *None of 54 patients developed alteration in skin integrity during one-month trial*
- All patients reported positive comments regarding comfort. Staff reported greater ease of transfer, turning and improved patient mobilization/mobility as compared to traditional surfaces.

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CONCLUSION

Based on theoretical calculations in this group of patients, the VPF/SMT mattress used in this evaluation was at least as effective in preventing and managing pressure ulcers as the combination of a foam mattress plus static air overlay, the current standard of care for medical-surgical patients. The facility may expect significant cost reduction by eliminating static air overlays and using the VPF/SMT mattress. Because patients with existing pressure ulcers showed evidence of improvement, the new mattress may warrant classification as a Group 2 support surface. Further study is recommended.

NOTABLE FINDINGS

- 76% of patients had a Braden scale score of <18 and thus, were at risk.
- There was zero incidence of new pressure ulcers for all patients.
- More than 20% of the patients were admitted with altered skin integrity. 77% of these patients improved at discharge.
- Close to 10% of the patients had pressure ulcers on admission. 60% of these patients improved or healed; 40% remained unchanged.
- Hospital staff reported greater ease of turning and transfer and increased patient mobilization as compared to surfaces used under current protocol.
- P.T. reported improved patient compliance with physical therapy.
- All patients reported positively regarding comfort.

References

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- * BodyZone™ 500, FXI, Media, Pa. (Hercules Dream Gel™)
- A GM Associates, Inc
- B Connecticut Clinical Nursing Associates, LLC