PressureGuard®
Air Therapy Series

Clinical Proof Sources

Span-America Medical Systems, Inc.
PressureGuard® Air Therapy Surfaces

Clinical Proof Sources

The PressureGuard Series incorporates several innovative technologies developed by Span-America, a recognized industry leader in pressure management, patient positioning, and specialty support surface development.

These proprietary designs address essential aspects of support surface function, including microclimate management ("low air loss"), immersion, envelopment, shearing management, patient and caregiver safety, and both powered and non-powered pressure redistribution.

The efficacy of the technologies incorporated into the PressureGuard Series is documented by multiple sources, including published clinical articles, clinical posters, internal bench testing data, and independent customer studies.

Representative samples of these sources are summarized in the document below, supporting use of the PressureGuard models for:

- Patients requiring treatment of Stage I-IV pressure ulcers;
- Patients whose skin integrity is compromised by excessive perspiration;
- Patients who cannot be repositioned frequently or will not reposition themselves frequently;
- Patients at high risk for pressure ulcer development.
PROOF SOURCES: MICROCLIMATE MANAGEMENT

*Understanding Moisture Removal with Support Surfaces*, Jim O’Reagan, MSME; Joseph Lazich, BEEE. Poster presented at SAWC 2015


**Therapy/Feature Reviewed:** Microclimate Management

**Summary:** Support surfaces supplying low air loss were compared using a new standardized testing method. Demonstrated differences in effectiveness of traditional LAL and new microclimate management systems

**Results:** In both posters, the microclimate management design used in the PressureGuard Series demonstrated the highest moisture vapor transmission rate of the products tested.
## Quantifying Support Surface Moisture Removal

**James O’Reagan, MSME; Joseph Lazich, BSEE**  
Span America Medical Systems, Greenville, SC

### ABSTRACT

Low-air loss therapies are commonly used for the treatment and prevention of pressure ulcers. These therapies are based on the principle that reducing airflow over the skin surface in contact with the support surface will allow moisture generated by the skin to accumulate on the skin surface and be evaporated. This study investigated the potential for support surfaces to significantly reduce airflow rates while maintaining adequate ventilation. The experimental setup consisted of a support surface placed in a specially designed climatic chamber. Airflow rates were measured with a hot wire anemometer in the absence and presence of the support surface. The results showed a significant reduction in airflow rates when the support surface was present.

### METHODS

1. **Experimental Setup:**  
   - Support surface placed in a climatic chamber.  
   - Airflow rates measured with a hot wire anemometer.

2. **Testing:**  
   - Airflow rates measured in the absence and presence of the support surface.
   - Support surface material type and dimensions.

3. **Analysis:**  
   - Statistical analysis of airflow rate data.

### RESULTS

**Moisture Removal Comparison of Support Surfaces**

![Moisture Removal Comparison of Support Surfaces](image)

**GRAPH:**

- **X-axis:** Time (hours)  
- **Y-axis:** Moisture Removal Efficiency (%)

### DISCUSSION

This study investigated the potential for support surfaces to significantly reduce airflow rates while maintaining adequate ventilation. The results showed a significant reduction in airflow rates when the support surface was present. The study suggests that support surfaces can be effective in preventing moisture accumulation on the skin surface, thereby reducing the risk of pressure ulcers.

**REFERENCE:**

1. Span America Medical Systems, Greenville, SC.

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**Span America pioneered the laboratory testing of moisture removal in conjunction with the launch of the first microclimate management product.**

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**A Proposed Method for Quantifying Low-Air-Loss Mattress Performance by Moisture Transport, Richard S. Figliola, PhD, PE, Clemson University, Clemson, SC. Ostomy/Wound Management. 2003;49(1):32-41.**
PROOF SOURCES: SAFE PATIENT HANDLING


**Therapy/Feature Reviewed:** Firm perimeter design (“Safety Edge”)

**Method:** The poster describes a pilot study using laboratory simulation to measure the stability of the edges of five different mattress technologies: viscoelastic foam, standard foam, air-filled, air-filled with air-filled bolsters, and air-filled with foam-filled bolsters. Multiple tests were combined to arrive at an overall safety value.

**Results:** The edge design used in PressureGuard Series (“air with foam bolsters”) received the highest value and was significantly more stable in both edge sitting and rolling than the other product designs tested.
PROOF SOURCES: PRESSURE REDISTRIBUTION

**Achieving Clinically Efficacious Pressure Redistribution without the Use of Low Air Loss**, Julie Ho RN, MS, CWCN, Poster Presentation, NPUAP Bi-Annual Conference, 2015

**Therapy/Feature Reviewed:** Pressure Redistribution; Alternating Pressure

**Method:** 125 patient charts were reviewed retrospectively to determine prevention and treatment effectiveness of a pressure redistributing support surface with alternating pressure therapy (Custom Care® Convertible with control unit).

**Results:** The data showed: only three hospital-acquired pressure ulcers (HAPUs) developed and resolved, all incontinence associated dermatitis issues (IADs) resolved, and no low air loss (LAL) products were rented with an estimated savings of $92,500.00 over five years.

![Achieving Clinically Efficacious Pressure Redistribution Without the Use of Low Air Loss](image)

Facility outcomes study: **Unity Health Care White County Medical Center, Searcy, AR**, internal white paper, non-published, 2015.

**Therapy/Feature Reviewed:** Pressure Redistribution (non-powered)

**Method:** The Incidence/Hospital-Acquired pressure ulcer rate was 3.3 percent of 6168 patients in 2014 prior to implementation of a new support surfaces and 2.9 percent of 8707 patients in 2015 post-implementation of non-powered air therapy surfaces (Custom Care Non-Powered). The Incidence/Hospital-Acquired rate decrease showed a positive effect on prevention of pressure ulcers using the new support surfaces, even with a higher census (8707 vs 6168).

**Span America introduced the industry’s first non-powered treatment surface. Its design was documented to outperform traditional low air loss surfaces, and became the precursor to the company’s subsequent non-powered systems.**

Therapy/Feature Reviewed: Pressure Redistribution, various models

Summary: In internal bench testing, subjects representing three typical body types were placed on the PressureGuard Series and computerized pressure imaging was performed using standardized testing methodology.

Results: All body types showed effective pressure redistribution over bony prominences on the PressureGuard Series, (examples below).
Span-America Medical Systems, Inc. designs and manufactures a complete line of ergonomically enhanced bed frames and a series of therapeutic support surfaces – both powered and non-powered – with clinically-proven pressure management features. Other offerings include wheelchair cushions, therapeutic overlays, patient positioners, and Selan® skin care products.

- Span-America is a member of the National Pressure Ulcer Advisory Panel (NPUAP). With memberships from clinical, scientific and manufacturing communities, the NPUAP serves as the authoritative voice for improved patient outcomes in pressure ulcer prevention and treatment through public policy, education and research.

- Span-America is a member of the S3i research task force created to develop uniform terminology, test methods and reporting standards for support surfaces.

- Span-America’s environmentally controlled laboratory is approved for the performance of microclimate, immersion and envelopment testing of support surfaces using the ANSI/RESNA approved testing methods.

- Product innovation continues to be a strategic imperative for Span-America. More than 25% of our sales are from products we have introduced within the last four years.

- Founded in 1970, Span-America is a publicly-owned corporation, [Symbol NASDAQ: SPAN].

- In support of our customers’ clinical and financial requirements, we field a national team of sales representatives who are committed to providing technical support and reducing expenditures through effective product utilization management.

- With manufacturing facilities in Greenville, SC, and Beamsville, Ontario, Canada, and an additional distribution center in Salt Lake City, UT, Span-America employs more than 250 people.

- Span-America's manufacturing facility is certified under ISO 13485 and 9001 for the manufacture of powered support surfaces. All electronic components for beds and surfaces are certified to electrical safety test IEC 60601-1-1 and EMC test IEC 60601-1-1-2.

- Span-America provides e-learning clinical and product training modules through its online education portal, Span-Academy.