



PATIENT TURNING AND REPOSITIONING SYSTEM BREATHABILITY AND ABSORPTION



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Lori is an Enterostomal therapy nurse with over 20 years of clinical healthcare experience. She currently works in clinical practice and as an independent clinical consultant to healthcare organizations throughout Florida. Her role often requires collaboration with stakeholders from interdisciplinary teams to implement pressure injury prevention and wound care programs. Lori is a long-term staff and patient advocate passionate about achieving positive outcomes. She understands the importance of implementing programs that utilize cost-effectively, evidenced-based products, tools, and strategies to change practice and meet patient care goals.

BACKGROUND

Enterostomal therapists, wound, ostomy, and continence nursing professionals (ET/WOC/WOCN), are continuously challenged with recommending products and safe practices to assist healthcare facilities to ensure they provide superior standards of care and effective treatment for patients with wound, ostomy, and continence issues.

Annually, more than 2.5 million people in the US develop pressure injuries.¹ For this reason, many wound care professionals focus on research, education, and prevention of pressure injury to improve the quality of care.

A pressure injury is defined by the National Pressure Injury Advisory Panel (NPIAP) as localized damage to the skin and underlying soft tissue usually over a bony prominence or related to medical or other devices. The injury can present as intact skin or an open ulcer and may be painful. The injury occurs as a result of intense pressure, prolonged pressure, or pressure in combination with shear. The tolerance of soft tissue for pressure and shear may also be affected by microclimate, nutrition, perfusion, co-morbidities, and condition of the soft tissue.

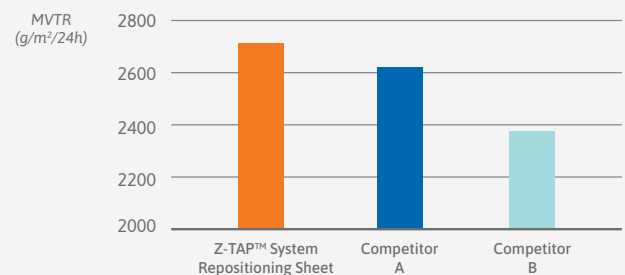
According to the NPIAP pressure injury prevention points, bedfast and chairfast individuals are at risk for developing a pressure injury. **A plan of care should be developed based on patient risk. For immobile patients, this plan should include turning, repositioning, and support surfaces.**² Pressure injury prevention is complex, but several best practices can effectively reduce their occurrence.

Patient repositioning systems provide the product solutions needed for healthcare professionals to safely and easily support turning and positioning protocols. These systems typically contain three components: a positioning sheet, positioning wedges, and a disposable underpad used in combination. **It is important to understand the individual system components to assess overall system performance. This includes the breathability of the sheet, absorbency of the underpad, the level of friction, and repositioning support used to offload pressure and minimize skin moisture.**³

RESULTS

Research shows the level of breathability and moisture absorption of patient repositioning systems differ due to the materials used. The breathability of the repositioning system is dependent on the breathability of both the positioning sheet and disposable underpad. Moisture Vapor Transmission Rate (MVTR) is an indicator of breathability. MVTR is equal to the amount of water vapor that passes through a material in a given time period. A higher MVTR represents a more breathable material.⁴

Figure 1: Breathability as measured by Moisture Vapor Transmission Rate



Z-TAP™ System Repositioning sheet is **PROVEN more breathable** when compared to other repositioning sheets, helping to **maintain patient skin integrity**

Moisture Vapor Transmission Rate (MVTR) is an indicator of breathability. MVTR is equal to the amount of water vapor that passes through a material in a given time period. A higher MVTR represents a more breathable material.

Breathability data refers to the repositioning sheets only. Breathability of the underpad is independent from the repositioning sheet. The Z-SORB underpad shows the same or greater absorbency than leading underpads available on the market.

The test of breathability was performed on the SANDEL® Z-TAP™ patient repositioning sheet and compared to two leading repositioning sheets already on the market, noted as A and B. **The results as shown in Figure 1 indicate superiority of breathability or MVTR for the Z-TAP™ sheet.**⁵

Additional tests were performed on the disposable underpads using the SANDEL® Z-SORB™ underpad in comparison to two commonly used underpads in the market, noted as A and B. This testing measured horizontal wicking and water absorption.

Table 1: Horizontal Wicking

Repositioning Sheet	Water		Simulated Sweat	
	Average Time to Absorb (Sec)	Average Spread (cm)	Average Time to Absorb (Sec)	Average Spread (cm)
SANDEL® Z-SORB™ Underpad	2.33	3.17	2.67	3.33
Competitor A	2.67	1.67	2.00	1.50
Competitor B	2.67	2.33	2.00	2.33

To determine product absorption, horizontal wicking was measured by time to absorb in seconds and the spread of the liquid in centimeters. Results with a faster time and wider horizontal wicking are preferred.

Testing results (See Table 1) shows the Z-SORB™ underpad achieved a more favorable outcome when compared to Competitor A and B on most measures.⁵

Table 2: Water Absorption

Repositioning Sheet	Water (ml)	Simulated Sweat (ml)
	Average Liquid Absorbed	Average Liquid Absorbed
SANDEL® Z-SORB™ Underpad	159.67	168.00
Competitor A	153.67	157.33
Competitor B	158.00	165.33

Water absorption was measured in liquid absorbed in milliliters (ml). A higher number indicates better absorption. **Testing results (See Table 2) shows the Z-SORB™ underpad achieved a more favorable outcome when compared to Competitor A and B on all measures.⁵**

The moisture absorbency of a disposable underpad is an important factor in the prevention of Incontinence-Associated Dermatitis (IAD). Moisture Associated Dermatitis (MASD) is an umbrella term used to describe skin damage occurring when moisture comes in contact with skin.^{6,7}

Types of MASD include:⁷

- Incontinence-Associated Dermatitis (IAD) caused by urine and/or stool
- Intertriginous Dermatitis (ITD) caused by moisture (perspiration) in skin folds
- Peristomal Moisture-Associated Dermatitis (PMAD) caused by stomal effluent
- Periwound Moisture-Associated Dermatitis (PWMAD) caused by wound exudate

CONCLUSION AND APPLICATION TO PRACTICE

The literature suggests there is growing evidence between the relationship between MASD and pressure injury development.⁷ Moisture from any source along with pressure, friction, and shear can induce significant damage to the skin.^{5,7} **Turning and repositioning protocols are not just for patient comfort but are an important part of the patient's care plan to prevent skin injuries.^{2,6}**

While some pressure injuries are unavoidable, most can be prevented using proper techniques to move and reposition patients.^{1,2} In addition, the moisture vapor management and aeration capabilities of support system materials affect the mechanical properties of the protective skin layer. **Selecting a repositioning system made of highly breathable and absorbent materials will decrease the level of friction and increase the shear resistance of the skin to help prevent moisture-associated skin damage and maintain skin integrity.⁷**

The unique combination of highly breathable and absorbent materials used in the Ansell SANDEL® Z-TAP™ Patient Repositioning System makes it an ideal product to help prevent skin injury. Highly controlled laboratory studies have shown the SANDEL® Z-TAP™ system, even when left in place under the patient, improves the overall microclimate due to its high breathability which prevents heat build-up or interference with the performance and benefits of the therapeutic support surface.⁵

References:

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