

# ‘Turning Down the Pressure’ – Using Standardized Testing to Guide Clinic

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## Background

Despite widespread adoption of prevention strategies, pressure injuries remain a significant problem across all healthcare settings. While the majority of pressure injuries heal without the need for surgical intervention, a significant number of full-thickness injuries (e.g. a Stage 4 sacral pressure injury) require surgical repair using a muscle or fasciocutaneous flap or skin graft. This cohort can present particular care challenges and are at higher risk for developing additional pressure injuries due to reduced mobility and postoperative limitations for positioning.<sup>1</sup>

Vigilant postoperative care including a specialty support surface and a positioning regime is essential for positive patient outcomes. Support surfaces using air fluidized or immersion technologies have historically been accepted modalities for post-operative care of ‘flaps and grafts’ patients, but can be expensive and challenging to care practices. While it has been long recognized that alternative care options are available<sup>2</sup>, they are now becoming more widely used by clinicians. An example being a multi-zone integrated patient therapy system combined with a microclimate coverlet (Figure 1).

In order to assess the suitability for these patients it is beneficial to measure the performance characteristics of the support surface using standardized testing. According to the International Pressure Injury Guideline<sup>1</sup> support surface features to consider for the postoperative care of flaps and grafts include pressure redistribution properties (e.g. immersion and envelopment) and the management of friction, shear forces and microclimate.

## Purpose

A laboratory study was undertaken to demonstrate support surface suitability for this critical patient cohort using a set of accepted standardized performance tests<sup>3</sup>. The study was intended to demonstrate suitability of a patient therapy system (PTS) for wider clinical use and to compare against a well-established Low Air Loss (LAL) surface that is commonly used in a range of care environments for this patient group.

## Methodology

A new care solution, combining an integrated patient therapy system fitted with a microclimate coverlet was evaluated in comparison to a well established high risk LAL support surface using the US national test standard for support surfaces SS-1.<sup>3</sup> Using these recently established standardized tests allows comparison based on key performance parameters. The range of test methods utilized are shown in Figure 2.

As a primary comparison goal, a standardized indenter was used to measure the pressure interface effects at a localized region equivalent to a sacral wound site. The surface and indenter were loaded based on a 50<sup>th</sup> percentile equivalent patient weight and distribution. Multiple test runs were performed using the manual pressure adjustments (Figure 3) for the trunk / pelvic area to identify optimal support surface modes<sup>4</sup> and pressure settings in order to achieve performance enhancements. The data was captured over a 12 minute window to accommodate the 10 minute alternating cycle.

As a secondary comparison goal, additional tests measured aspects of the shear and microclimate performance across the support surface.

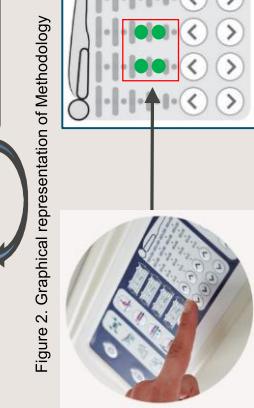
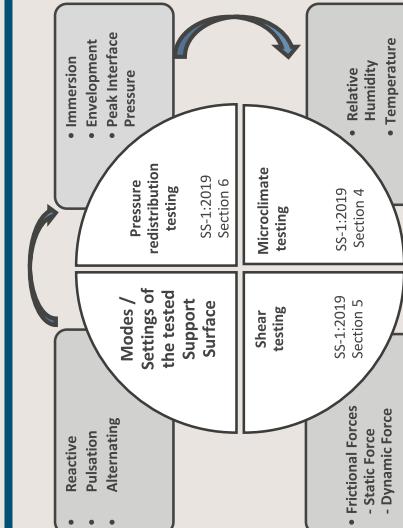


Figure 2. Graphical representation of Methodology

Figure 7. Humidity control of the patient therapy system (PTS). Time(min)

## Secondary Results: Microclimate

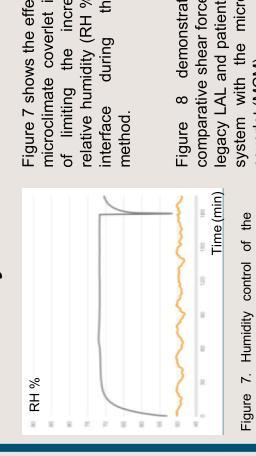


Figure 7 shows the effect

microclimate coverlet of limiting the increase in relative humidity (RH %) at the interface during the method.

## Discussion

Pressure redistribution of a support surface can be described by intermediate terms such as immersion, envelopment and intumescence. These identify measurable performance differences and similarities between radically different reactive surfaces such as a Low Air Loss (LAL) system with the microclimate coverlet (MCM).

Figure 8 demonstrates comparative shear force performance of the microclimate coverlet LAL and patient system with the microclimate coverlet (MCM).

## Conclusion

The use of SS-1 and its methods does not implicitly provide a comparative characterization of support surface performance measurements can aid the clinical decision process by identifying and communicating equivalent pressures to both clinicians and their patients.

The results indicate that different therapeutic mode settings can be used to reduce the interface pressure as part compared to the reactive mode. The use of the microclimate (AP) which provides periods of offloading. Clearly demonstrating the potential to translate into better patient outcome.

Since the published SS-1 test standard does not mandate pressure redistribution of a support surface can be described by intermediate terms such as immersion, envelopment and intumescence. These identify measurable performance differences and similarities between radically different reactive surfaces such as a Low Air Loss (LAL) system with the microclimate coverlet (MCM).

This is believed to be an early example of a published study surfaces using multiple sections of the SS-1 test standard with risk patient cohort. Wider usage of this methodology is warranted to demonstrate support surface performance settings can be used to reduce the interface pressure located anatomical areas – thus providing an achievable means to Turn Down the Pressure.

## Primary Results: Pressure Redistribution

Testing results for immersion and envelopment are displayed graphically in Figures 4 and 5. By manually selecting the available support surface mode and adjusting the air pressure setting, a range of immersion and envelopment levels were achieved. By turning down the air pressure setting while in the alternating pressure mode, a range of peak sacral pressures (AP1-AP3) can be obtained (Figure 6) allowing tailored care within the simulated sacral wound site.

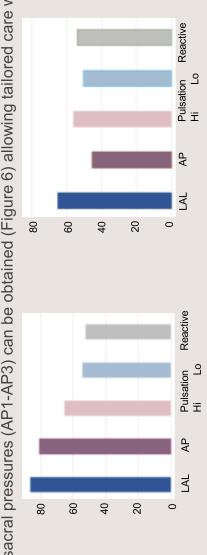


Figure 4. Immersion Depth (%)

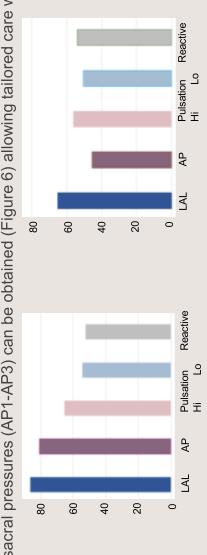


Figure 5. Envelopment (%)



Scan this code for MCM coverlet information.



Scan this code for support surface information.



Figure 1. Example of the combination of patient care therapy system with a microclimate coverlet as evaluated for use with flaps and grafts patients.

## References

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This poster is industry initiated.  
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The products referenced are the Kinair MedSurge Pulse (LAL) and Skin IQ™ Integrated Patient Therapy System (PTS).  
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Further information