Support Surface Selection Steps: Using Standards to Choose Wisely

Rachel Moseley, MS, BSN, RN, CWON, APHN[a], Stephanie Slayton, PT, DPT, CWS, CLT-LANA[b], Kristen Thurman, PT, CWS[c], Jackie Todd, MBA, BS, BSN, RN, CWCN, DAPWCA[d]
Clinical Translation Small Working Group Members, Support Surface Standards Initiative, National Pressure Injury Advisory Panel

S3I SUPPORT SURFACE STANDARDS INITIATIVE
NATIONAL PRESSURE INJURY ADVISORY PANEL

Purpose

To provide clinicians guidance in selecting appropriate support surfaces for patient population needs, based on standardized test results.

Background

Clinicians are often asked to collaborate with administration in selecting support surfaces for the patients in their health care setting. In the past, decisions were made based largely upon vendor input, expert opinion and price, rather than objective test results. Standardized testing has been developed to assist clinicians and administrators in selecting surfaces that are ideal for specific patient populations.

Methods

Support surface performance tests include measures related to microclimate, immersion and envelopment, and horizontal stiffness. While there are no recommendations as to what is an ideal value or range for each test, the measures allow for surface comparison, and can guide selection. Support surface selection should be based upon a specific patient population's needs; such as, a patient in an intensive care unit will likely have different immersion and envelopment needs than a patient in a rehabilitation unit. Another example is that the focus may be on microclimate for patients with major moisture issues, such as those on a burn unit.

When choosing support surfaces for specific patient populations:

(1) Carefully consider the patient population and needs

(2) Determine the type of surface (*i.e. mattress*) that will be evaluated

Common Surface Types	Characteristics	Relevant Standardized Tests
Foam	A flexible, cellular material structure, often incorporating multiple constructs with different characteristics, which work reactively to provide pressure redistribution by spreading the load across the whole patient interface surface area.	Immersion, envelopment, horizontal stiffness
Gel	A semisolid system consisting of a network of solid aggregates, colloidal dispersions or polymers which may exhibit elastic properties. Gels can range from hard to soft.	Immersion, envelopment, horizontal stiffness
Low air loss	A feature of a support surface that uses a flow of air to assist in managing the heat and humidity (microclimate) of the skin.	Immersion, envelopment, horizontal stiffness, microclimate (Sweaty Guarded hotplate, body analog, heated water bladder method)
Air Fluidized	A feature of a support surface that provides pressure redistribution by forcing air through a granular medium (e.g. beads) producing a fluid state.	Immersion, envelopment, horizontal stiffness, microclimate (Sweating Guarded hotplate, body analog, heated water bladder method)

(3) Request relevant testing data for the chosen surface from the manufacturers

Test Results	Considerations	
	Pros	Cons
↑ Immersion and envelopment	Greater pressure redistribution	Too much can make it difficult for patients to reposition or get out of bed
↓ Horizontal Stiffness	Less potential for friction and shear stress and strain	Can contribute to patients sliding down in the bed, or even contribute to falls
↑ Microclimate	Greater heat and moisture removal	Too much can cause patients to feel cold or even have electrolyte imbalances

(4) Compile a chart with the data for Evaluation

Low Air Loss Mattress Comparisons For an ICU
**These are simulated results and are not from specific products*

Mattress Type	A	B	C	D
Surface Height	7"	7"	12"	6"
Performance Characteristics				
Immersion	52%	47%	50%	20%
Envelopment *(Peak Pressure)*	127 mmHg	140 mmHg	138 mmHg	102 mmHg
Horizontal Stiffness	30N	50N	40N	40N
Sweaty Guarded Hotplate *(Evaporative Capacity)*	20 g/m2/hr	20 g/m2/hr	30 g/m2/hr	N/A
Body Analog	70%	75%	80%	50%
Heated Water Bladder Method	35 g/m2/hr	35 g/m2/hr	38 g/m2/hr	N/A
Cost & Overall Ranking				
Cost	$2,500	$1,500	$7,000	$1,000
Overall Ranking	*Based upon MICROCLIMATE as a priority*			
	3	2	1	4
Overall Ranking	*Based upon IMMERSION & ENVELOPMENT as a priority*			
	1	3	2	**4**

(5) Compare results and determine which support surface would be the most appropriate for patient population

Once information is compiled and results compared, healthcare facilities may decide to evaluate a product and receive feedback from patients and bedside clinicians. All of this information can then be used as part of the decision-making process on which surface will be purchased.

(6) Collaborate with Administration regarding procurement of recommended surface

In the example, support surface C had the highest overall ranking for microclimate, however the administration reported it was not an option due to the high cost. Support surfaces A and B were trialed and evaluations (patient and bedside clinicians) were more favorable for support surface A (which also had higher immersion/envelopment), which was ultimately the selected surface.

Discussion

Utilizing these tests, clinicians are able to compare results for specific categories that will be most impactful for target patient populations, rather than relying on a one-sized-fits-all model. These test standards are not intended to be the sole consideration in product selection, but they can serve as a useful tool when used appropriately. Support surfaces are a crucial investment for facilities in the prevention of pressure injuries and for maintaining skin health. Utilizing performance standardized tests will allow for a more robust selection process. The utilization of appropriate support surfaces for specific patient populations can decrease pressure injuries and may decrease institutional costs.

References

- National Pressure Ulcer Advisory Panel. "Terms and Definitions Related to Support Surfaces." https://cdn.ymaws.com/npuap.org/resource/resmgr/s3i_terms-and-defs-feb-5-201.pdf Accessed on 10-1-19.
- Stone A, Brienza D, Call E, Fontaine R, Goldberg M, Hong HZ, Jordan R, Lachenbruch P, Lafleche P, Sylvia C (2015). Standardizing Support Surface Testing and Reporting; A National Pressure Ulcer Advisory Panel Executive Summary. *Journal of Wound, Ostomy, Continence Nursing.* 42 (5): 445- 449.