Xtrawise™

A publication by the Sizewise Clinical Support Team

PREVENTING PRESSURE INJURIES IN THE ACUTE BURN POPULATION: THE ROLE OF LOW AIR LOSS

Erica Thibault, RN, MS, CNS, CWON

A review of recent burn care text outlines the risk of complications for patients in the acute phase as well as rehabilitation. While risks include seemingly more critical issues such as permanent disfigurement, disability, and serial surgeries for skin grafts and contractures, a pressure injury (PI) is a serious complication that many burn patients may develop. The *Braden Scale for Predicting Pressure Sore Risk* tells us that burn patients are often at high risk of PI development due to poor nutrition, immobility, and excessive moisture.[1] Recently, the use of a high-volume low air loss (LAL) therapeutic mattress has been found to reduce the incidence of PI in the acute burn population.[2]

Burn Incidence in the United States

In 2016, the American Burn Association (ABA) reported that 486,000 burn injuries received medical treatment.[3] There were 3,275 deaths from residential fires, 310 from vehicle crash fires, and 220 from other sources.[3] Burn injuries accounted for 40,000 hospitalizations, and of these, 30,000 were treated at hospital burn centers. More than 60 percent of the estimated US acute care hospitalizations related to burn injury were admitted to 128 burn centers.[3]

In 2014, Hop et al. performed a systematic review of literature that had been published internationally from 1950 to 2012[4] and reported that burn care is typically expensive: the mean total healthcare cost per burn patient in high-income countries was $88,218.[3] In addition to these costs, the average hospital-acquired pressure injury (HAPI) can cost a facility as much as $70,000.[5] This amount may be higher in the burn population due to multiple comorbidities, such as immobility and protein loss.

Caring for the Acute Burn Patient

While it has been reported in the past that risk factors and incidence of PI in the acute care burn population are not well known,[6] there is some data to suggest that burn patients are particularly at risk of developing PIs based on admission Braden Scale scores.[7] A support surface is a critical tool in care of the acute care burn patient. Air fluidized therapy (AFT) has been used in the past but may be hot and noisy, and can cause unnecessary dryness for the patient—thus, nurse and patient satisfaction with AFT has been low.

What is Low Air Loss?

LAL support surfaces provide airflow to assist in managing the heat and humidity (microclimate) of the skin[5], as well as remove excess moisture when a

KEY TOPICS: Burn Care • Pressure Injury Prevention • Wound Care

Continued

BURN TREATMENT RESOURCES

Find a local certified burn center:
bit.ly/americanburnassoc

First Aid for burns:
bit.ly/firstaidforburns

World Health Organization International Society for Burn Injuries fact sheet:
bit.ly/BurnInjuryFacts

Burn education resources:
bit.ly/ameriburn

burn patient's wounds excrete fluid. Excess moisture and increased temperature are risk factors for PI formation.

Knight et al.[2] conducted a pilot study examining incidence of PIs in 18 patients admitted to an acute burn unit whose therapy included use of a high-volume LAL therapeutic mattress. Patients presented with a wide range of severity of burns from first to third degree, as well as different types. Using a high-volume LAL mattress resulted in an incidence rate of 5.5 percent—much lower than the 38 percent typically experienced in an intensive care unit.[5] These study results are promising for planning future care of the acute care burn population.

Conclusion

Development of a PI can greatly increase the already significant cost of treatment of the burn patient. Preventing PIs will reduce overall costs and improve outcomes for this population. A high-volume LAL mattress may improve patient and nurse satisfaction compared to traditional care used in this population.

	AIR FLUIDIZED THERAPY	HIGH-VOLUME LOW AIR LOSS
Weight Capacity	350 lbs.	1,000 lbs.
Full-body Support	No	Yes
How it Works	• Mattress filled with fluid and beads • Heated air pushes through beads to control mattress firmness	• Immersion mode promotes proper envelopment • Airflow vents directly through top cover to manage patient microclimate
Ergonomics	• Difficult to move patient out of bed • Weighs 1,630 lbs.	• Mattress can be placed on multiple bed frames, helping patient and staff ergonomics • Weighs 55 lbs.
Patient Comfort	• Patients often complain of heat and noise • May dehydrate the patient and their skin • Bed capacity (weight and height) is limited	• Bed is cool and quiet, and vented air manages patient microclimate • Bed accommodates a wide variety of patient sizes

INTERVIEW WITH AN EXPERT: WILLIAM C. LINEAWEAVER, M.D., FACS

Tell us about the unique challenges of treating acute burn patients.

There are two major problems we face generally. The first is the initial assessment, resuscitation, and the treatment planning of any given burn patient—every burn patient is different. The second is how to organize the burn center itself in order to help clinics, floors, intensive care units, and operating rooms deal with burn patients as quickly, efficiently, safely, and productively as possible.

Had you tried high-volume LAL before? How did it go?

The principal bed prior to our current Sizewise Immerse™ was the Hill-Rom Clinitron® Rite Hite®; it has the bags for the lower half of the body, and then cushions for the upper half. It provided flexibility in terms of sitting up, eating, etc. We had pretty satisfactory experience with it in terms of prevention of pressure injuries and maintenance of reconstructed tissue such as skin grafts and flaps. It was very hard to get patients in and out of it, conversion to any kind of emergency platform was difficult, and it was incredibly hard to move.

What was your final grade on Immerse?

Based on the experience we've had with the Immerse bed—experience that continues now long past the pilot study, I'd give Immerse an "A" for patient support/clinical and an "A" for operational ease of use. From the nurse perspective, you might even get an "A+" on operational ease of use. Immerse seems very intuitive to use, very easy to control, and easy to move around and take back and forth from surgery. I also think it is very straightforward to convert Immerse to a critical platform for emergencies.

Tell us about your Immerse pilot study.

We selected patients who needed substantial bed support and began to watch them very closely to see how well [Immerse] supported them, and how well it adapted to nursing and other operational aspects. The study included 18 patients over 18 months. The study outcomes were excellent. There was only one patient that developed a pressure injury, arguably while hospitalized on the bed, but that patient may well have had the initial portions of that injury before he/she arrived. Either way, one out of 18 is very good. That's 5.5 percent. And in these high-risk patients, there could be a much higher rate of expected pressure injuries.

What are your recommendations for this product?

I would recommend Immerse for any patient who has a potential for developing a pressure injury. That recommendation can be extended into a remarkable list, including some patients that we often don't think about. For example, an elderly patient with a hip fracture who is waiting be operated on and the waiting time extends 18 to 24 hours after the fracture. That patient is at risk for a PI while waiting to go to surgery. Each specialty and each practice may have its own subset of patients that can be considered high risk and of the population for whom this bed is recommended.

Looking forward, if you are going to continue to publish, what would your data points be?

Great question. I think, at some point going forward, we'll break out our burn patients and our non-burn patients. We also have a new colleague here who will be doing more micro-surgery—operations such as a free flap to the scalp after a skull resection. We are going to want to have that patient sitting up, in effect, so that we can position his head so there is no pressure on the flap. This case is just one example of the types of procedures we can start utilizing the bed for.

I would also just stress that with so many of our product utilizations, an absolutely invaluable element is our relationship with the representative supporting the product. Our Sizewise representative has been able to explain the bed to us, in-service the nurses, follow up its use, and answer all questions. This is exactly the kind of relationship we need to have for a new product.

Dr. Lineaweaver is medical director of the Joseph M. Still Burn and Reconstructive Center in Jackson, Miss. He is a board-certified plastic surgeon, fellowship trained in hand and microsurgery, and has extensive experience caring for acute burn patients.

References

1. Bergstrom N, Braden BJ, Laguzza A, Holman V. The Braden Scale for Predicting Pressure Sore Risk. *Nursing Research* 1987;36(4):205-210.

2. Knight A, Lineaweaver W, Thibault E. *Low Air Loss for the Prevention of Pressure Injury in Acute Burn Patients: A Pilot Study*. Poster session presented at the National Pressure Ulcer Advisory Panel (NPUAP) Biennial Conference, New Orleans, LA, March 2017.

3. American Burn Association. 2016 Burn Center Verifications Guide. Available at: http://www.ameriburn.org/verification_verifiedcenters.php. Access date: Feb. 9, 2017.

4. Hop MJ, Polinder S, van der Vlies CH, Middelkoop E, van Baar ME. Costs of doing burn care: a systematic review. *Wound Repair Regeneration* 2014;22(4):436-450.

5. National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. *Prevention and Treatment of Pressure Ulcers: Clinical Practice Guideline*. Emily Haesler (Ed.). Cambridge Media: Osborne Park, Western Australia; 2014.

6. Redelings MD, Lee NE, Sorvillo F. Pressure ulcers: more lethal than we know. *Adv Skin Wound Care* 2005;18(17):367-372.

7. Lewis GM, Pham TN, Robison E, Otto O, Honari S, Heimbach DM, Gibran NS. Pressure ulcer and risk assessment in severe burns. *J Burn Care* 2012;33(5):619-623.

ABOUT THE AUTHOR

Erica Thibault, RN, MS, CNS, CWON

Erica is the Clinical Manager at Sizewise, as well as a registered nurse, a certified wound, ostomy and continence nurse (WOCN), and a clinical nurse specialist (CNS).

SIZEWISE

Find past issues and additional resources: sizewise.com/clinical

PUB-0011-0317-19.2