Do You Know the Skin's Peak Pressure Tolerance? We Know Thanks to Real Time Pressure Monitors

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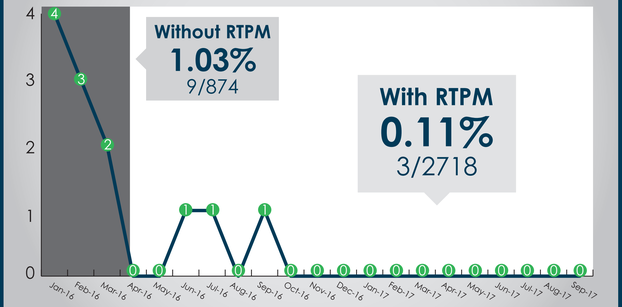
Purpose

Despite advanced technology with pressure injury prevention, there remains no one tool to provide clinicians with the amount of peak pressure skin can tolerate before causing tissue injury.

Methods

Real time pressure monitors* (RTPM) were placed on every critical care support surface for a clinical trial. Patient rounding was performed by clinical staff to obtain peak pressures prior to and after small interventions such as microshifts, foot elevation, and decreasing head of bed elevation. The results of the clinical trial showed a statistically significant reduction in the incidents of Hospital Acquired Pressure Injuries (HAPI) integrating the use of the RTPM with a p-value = 0.008. Before the RTPM the HAPI incidence rate was 1.03% (9/874). After the RTPM, the HAPI incidence rate was 0.11% (3/2718). However, this did not yield the magic number the skin can tolerate so further data exploration was required. The Lean Six Sigma department provided further analysis to determine the skin's peak pressure prior to injury.

Hospital Acquired Pressure Injury Rates

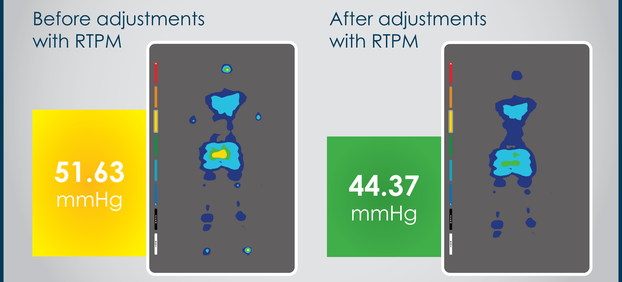


Critical Care Patient Demographics

Demographic factors for HAPIs	HAPI rate with factor	HAPI rate without factor	p value
Cardiovascular disease*	1.59%	5.56%	0.037
Incontinence*	4.59%	0.49%	0.011
Vasoactive medications*	6.40%	1.00%	0.004
1+ visits to the OR*	8.10%	1.40%	0.005
Anemia	2.19%	2.72%	1.000
Sepsis	6.35%	1.96%	0.066
Albumin <3.6g	3.66%	0%	0.128

Statistically Significant

Average Peak Pressures



Statistical Significance p= 0.0, n=526

The use of RTPM allowed clinicians to keep peak pressures **less than 45 mmHg**, resulting in a statistically significant reduction in HAPI rates.

Results

There were 526 RTPM patient encounters when adjustments were made. The average peak pressure for pre-adjustment was 51.63, and the average peak pressure for after-adjustment was 44.37. After running a paired t-test, the adjustments resulted in peak pressure difference of 7.26, which is statistically significant with a p-value of 0.000. The 95% confidence interval shows the true, but unknown difference between pre-adjustment and after-adjustment peak pressure is between 6.88 and 7.64. There were 353 RTPM patient encounters when adjustments were not made. The average peak pressure for those patients was 38.68 with standard deviation of 4.79.

Conclusion

Understanding the skin's tissue tolerance related to specific peak pressure points has been a difficult healthcare challenge. This research study gives us a skin assessment tool that guides interventions based on the skin's peak pressure range of 40-45 mmHg.

References

1. Tillery T and Floyd T. Real-Time Pressure Visualization Guides Repositioning to Reduce Hospital-Acquired Pressure Injuries. Presented at WOCN Annual Conference, Salt Lake City, Utah. May 19-23, 2017.
2. Walia G et al. Efficacy of Monitoring Devices in Support of Prevention of Pressure Injuries: Systematic Review and Meta-analysis. Advances in Skin & Wound Care. 29(12): 567-574.
3. Gunningberg L. Carli C. Reduced pressure for fewer pressure ulcers: can real-time feedback of interface pressure optimise repositioning in bed? Int Wound J 2014; doi: 10.1111/iwj.12374

*Wellsense, Birmingham, MI

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