

Real Time Positioning Using Innovative Technology

Barbara Barrett, BSN, RN, CMSRN¹, Julie Arcand-Kogen, BSN, RN, CMSRN,¹ Sandra Fahmy, APN, MSN, CWOCN²
Ruth Tupper, MS RN-BC², Sandra Dudziak, RN, BScN³, MSe, Sakeena I. Haq, DPM³, M.Ed, Denis Drennan, MD³

(1) 5 South Nursing Unit, Amita Health Saint Francis Hospital, Evanston, IL, (2) Nursing Education, Amita Health Saint Francis Hospital, Evanston, IL, (3) Walgreen Health Solutions, Evanston, IL.

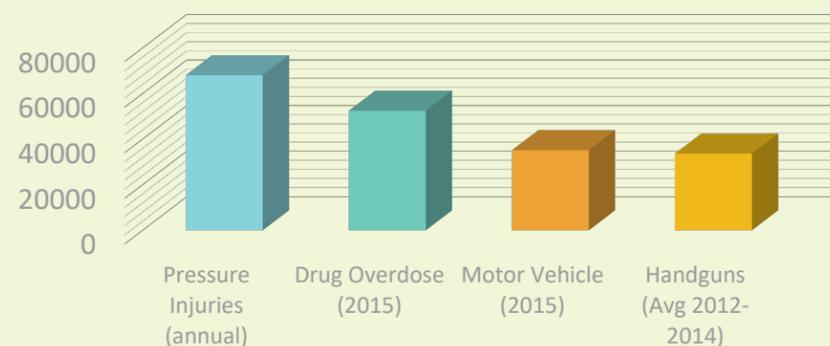
Abstract

- Pressure injuries (PIs) are painful, costly, deadly, but often preventable.
- New technology which alerts patients and clinicians to excessive time on at-risk pressure areas was evaluated.
- 34% of existing wounds improved in the experimental group and no new PIs developed.

Research Questions

1. What is the impact of the technology on the incidence of pressure injuries for adult patients with a Braden score of 18 or less?
2. What is the impact of the technology on pre-existing pressure injuries?
3. What are the perceptions of the technology by nursing staff and patients?

Preventable Deaths



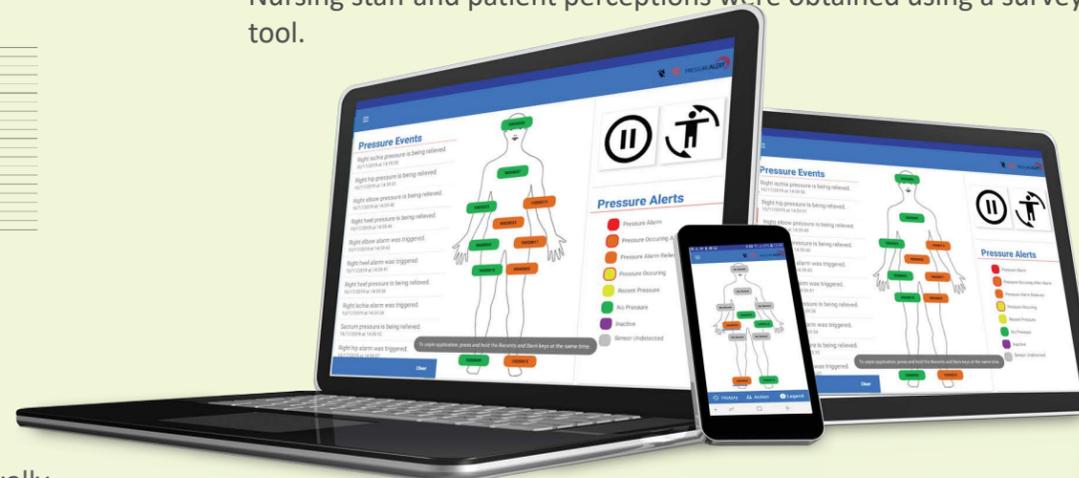
Significance

Problem: 2.5 million Americans are affected by pressure injuries annually, leading to 60,000 deaths and 68,000 amputations. The 2014 International Guidelines for Prevention and Treatment of Pressure Ulcers recommend frequent repositioning to relieve pressure over bony prominences.

Solution: Technology that monitors time on bony prominences needs to be developed to alert the patient and clinician when tissue interface pressure rises greater than capillary closing pressure for an excessive period, thus creating a risk of injury. The pressure alert system is such technology.

Methods

- Research Design: Randomized Control Trial
- Setting : Med-Surg Nursing Unit, Presence (now Amita Health) Saint Francis Hospital, Evanston, Illinois.
- 96 patients were randomized to either control (n=48) or experimental (n =48) groups.
- All usual skin care protocols were implemented by the clinical staff based on the patient’s condition for both groups.
- Wireless sensors embedded in foam dressings were placed on the sacrum and heels of the experimental group for at least 24 hours.
- Computer tablets at the bedside and nurses station displayed ‘time on pressure’ findings for each monitored body site alerting patients and staff when prolonged pressure was occurring.
- Nursing staff and patient perceptions were obtained using a survey tool.



Decrease in wound size with PressureAlert®



Results

- 34% of existing wounds improved in the experimental group.
- Of 31 pre-existing PIs in the experimental patients, six had a 50 % decrease in wound size, with four showing improvement in physical characteristics related to peri-wound and wound bed appearances; one wound ‘s tissue integrity improved.
- For experimental patients , decreases in size of pre-existing PIs (n = 10) were significant (p < 0..05) using the paired t test, but in controls no observable healing occurred for pre-existing PIs (n = 15).
- No new hospital- acquired pressure injuries (PIs) were found in either experimental (n = 48) or control (n = 48) patients.
- **Staff Surveys:** (n= 16): 94% of nursing staff perceived the new technology as beneficial to patients.
- **Patient Surveys:** (n=23): 92% found it helpful to them, 90% found the device comfortable and the dressing stayed in place. 78% stated they believed it was helpful to the nursing staff.

Clinical Implications

The technology created a new bedside assessment parameter which enabled patients and clinicians to provide effective offloading and timely individualized repositioning.

References

- Castner J, Sullivan SS, Titus AH & Klingman KJ. Strengthening the role of nurses in medical device development. J Prof Nurs. 2016. 32(4)/300-305.
- Coleman S, Nixon J, Keen J et al. A new pressure ulcer conceptual framework. J Adv Nurse 2014 70(10). <https://doi.org/10.1111/jan.12405>
- Karahan A, Abbasoglu A, Isik SA et al. Factors affecting wound healing in individuals with pressure ulcers: A retrospective study. Ost Wound Manage 2018;64(2),32-39.
- 2014 NPUAP and EPUAP International Guidelines for the Prevention and Treatment of Pressure Ulcers.
- <https://www.ahrq.gov/professionals/systems/hospital/pressureulcertoolkit/index.html>

Acknowledgments

The authors thank Lydia Dacenko-Grawe, MSN, RN, CVRN and Joe Drennan, MBA for their support and expertise.

This study was funded by:

- Jean Psotka Memorial Fund for Nursing Education and Research
- Irene Mandock Fund for Nursing Education
- Consulting/Equipment/Software: Digital Health Solutions (now Walgreen Health Solutions)

