



Pressure Mapping with Visual Feedback to Enhance a Pressure Ulcer Prevention Program

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Abstract

Introduction: Pressure ulcers are physically debilitating, emotionally frustrating and financially burdensome. Our institution piloted a bedside pressure mapping system to determine ease of usability for both the patient and the caregiver. In addition, to its role in direct patient care, we identified its role in preventing high risk patient situations. We report here on a real time pressure sensing device which allowed us to identify and respond to numerous near-miss scenarios.

Methods: The institution obtained 20 bedside pressure mapping systems. Over a 6 month period, these were placed in various units. We collected data on 300 patients. Among this group, we identified 6 patients with high risk scenarios.

These cases illustrate examples of near-misses. The technology provided important feedback not easily available from the patient or other sources. We believe all these near-miss episodes represent potential pressure ulcers that did not form as a direct result of real time pressure mapping. Pressure mapping with real time feedback can improve patient outcomes.

Introduction

Pressure ulcers result in a significant emotional and financial burden to the healthcare system. They affect about 2.5 million patients annually in the acute care system. Approximately 60,000 patients die of complications of bed sores, including amputations, infections, prolonged hospitalizations and a generalized loss in quality of life. It is now considered a “never event” by CMS. A conservative estimate of 5.5 billion dollars is spent on bed sores annually. Most healthcare professionals are aware of prevention guidelines. The practicalities of care don’t always successfully accomplish this goal of prevention. There remains a need for innovation and research to assist the caregivers in this process.

Multiple monitoring systems exist for many patient vital parameters during hospitalizations. We introduced a bedside pressure mapping system via The M.A.P.™ System, Wellsense USA, Inc., Nashville TN. The system is able to display pressure distribution information for caregivers. The goal is to make the technology a natural part of the patient care experience. Towards this goal, we highlight immediate payoffs of the addition of this modality.

Patient M.T.

A 45 y.o. 95 kg female was placed on a standard 5 inch hospital mattress with a bedside pressure mapping system. The display monitor pressure was greater than 90 mmHg over the entire contact area of the supine patient (Figure 1). The patient was re-positioned multiple times without improvement. A new bed was ordered and the patient was placed on it. All contact areas on the new bed were green signifying 40-50 mmHg (Figure 2).

The patient later admitted that the first mattress was very uncomfortable. That mattress was scheduled to be replaced within the year.

Fig. 1

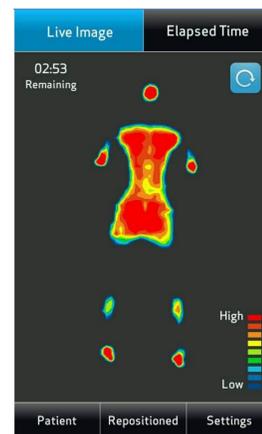
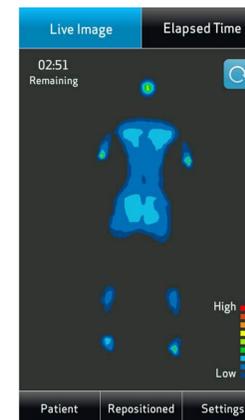


Fig. 2



Patient W.W.

A 75 y.o. male was admitted for UTI with lower extremity contractures.

Braden score was 11. He was admitted from a long term care facility with a left heel stage 3 ulcer, present on admission. With first repositioning, the bedside pressure mapping system revealed no change in pressure at the sacrum, implying that the contractures prevented straightforward sacral off-loading. The nurse recruited 2 assistants to lift, reposition and effectively maintain support in the new position. The pressure map confirmed effective patient re-positioning.

Conclusions

- Turning and repositioning patients to prevent pressure ulcers is the standard of care. Developing a multi - system approach for prevention of pressure ulcers is needed to assist the staff in understanding and use of the current technology available for prevention.
- Adding the real time technology of the bedside pressure mapping systems offers an opportunity to reduce pressure ulcer development and enhance prevention.
- This technology allows real time imaging and immediate feedback on the effectiveness of patient turns and repositioning. This allows staff to have better identification of the anatomical site of a potential pressure ulcer.
- In order to assist staff in avoiding near miss events, multiple interventions become very helpful. The ability to identify the potential for a DTI/pressure ulcer is needed to avoid the development and resolution of this problem.

Bibliography

1. <http://www.themapsystem.com/the-product/new-era-in-monitoring/> accessed 5/20/11
2. Bates-Jensen, B.M. 2001. Annals of Internal Medicine: 135. Quality indicators for prevention and management of pressure ulcers in vulnerable elders.
3. Boettger, J.E. 1997. Effects of a pressure-reduction mattress and staff education on the incidence of nosocomial pressure ulcers. J. Wound Ostomy Continence Nurs. 24(1):19-25.
4. National Pressure Advisory Panel & European Pressure Ulcer Advisory Panel 2009, International Guideline Prevention and Treatment of Pressure Ulcers: Clinical Practice Guideline
5. Cms never event resource
6. Pieper B. & Mattern J. C.(1997) Critical Care nurses' knowledge of pressure ulcer prevention, staging and description. Ostomy Wound Management, 43(2), 22-6, 28, 30-1

Pressure Mapping Technology

