

“DRIVE TO ZERO”:

USING WEARABLE TECHNOLOGY FOR PRESSURE ULCER PREVENTION ON A MEDICAL-SURGICAL UNIT

Margaret Doucette, DO, Director of Wound Care and Physical Medicine, Stephanie Adams, RN, Clinical Coordinator; Kelsey Cosdon, RN, Kattie Payne RN PhD, Nursing Research Evidence Based Coordinator. VA Medical Center, Boise Idaho.

Plan

Patient turning and appropriate off-loading are the mainstay of pressure ulcer prevention. Literature shows that compliance to turn protocols varies from 15%-66%^{i ii iii iv v}. As part of nationwide VA quality improvement initiative, we sought to identify trends, characteristics and track resource effectiveness of our patient turning practice.

We utilized a novel technology for wireless, wearable monitoring of patient position and movement on a busy, 27-bed medical-surgical unit, which uses a two-hour turn protocol on all patients.

Do

An FDA-cleared monitoring system (Leaf Healthcare, Pleasanton CA) was installed for use on the medical-surgical unit. Wearable patient sensors transmit data about the patient's position to a central computer where it is analyzed and displayed. Nurses easily identify at a glance on large hallway mounted displays when a patient is about to be due, or is overdue for a turn.

The system automatically logs patient self turns that meet the prescribed turn angle and tissue decompression time thresholds, allowing turning resources to be directed toward only those patients who need assistance.

Study

Sixty-nine patients with mean Braden score of 19.4 (min 13, max 23) were monitored over 31 days. A total of 3287 hours of monitoring data was collected. Average monitoring time per patient was 47 hours (min 2.8, max 172).

Compliance to turn protocol was calculated as the sum of total time in compliance per patient divided by the sum of total time monitored per patient.

The average compliance to the two-hour turn protocol was 88.5% (min 82%, max 99%). There were a total of 292 turn alerts. Twelve patients (17%) never had a turn alert, ten of whom had Braden scores above 18.

Number of turn alerts and compliance to the two-hour turn protocol varied by time of day, and by day of the week. Periods with the lowest compliance coincided with medication delivery times, shift changes and typical admission/discharge times and/or days of the week.

Act

This project focused on use of new technology to identify unit turn practice by obtaining automatically measured objective physiological data. Our plan is to utilize the findings to shape targeted clinical training to support the implementation of a sustainable pressure ulcer prevention program.

The results allowed Nursing Management to provide improvement measures by addressing staffing levels and education. The data also prompted a review of the Unit's turn protocol, specifically as it relates to risk assessment, patient selection for monitoring, and documentation of patient turn refusals.

Second phase of the quality improvement initiative will consist of a comprehensive clinical training academy, implementation of a revised unit protocol and adopting the Leaf System to ensure sustained, highly compliant turn practice. System data will be utilized for ongoing quality metric monitoring.

A continuing analysis of the relationship between turn alerts and Braden Scale will provide valuable data for possible consideration of varying turn schedules based on individual patient risk assessments.

ⁱ Agency for Healthcare Research and Quality, Rockville, MD. Are We Ready for This Change? Preventing Pressure Ulcers in Hospitals: A Toolkit for Improving Quality of Care. April 2011. <http://www.ahrq.gov/professionals/systems/long-term-care/resources/pressure-ulcers/pressureulcertoolkit/putool1.html>

ⁱⁱ AHRQ, Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project, HCUPnet, Nationwide Inpatient Sample, 1993-2006

ⁱⁱⁱ Lyder CH, Preston J, Grady JN, Scinto J, Allman R, Bergstrom N et al. Quality of care for hospitalized medicare patients at risk for pressure ulcers. *Arch Intern Med* 2001;161:1549-54.

^{iv} Gunningberg L. Are patients with or at risk of pressure ulcers allocated appropriate prevention measures? *Int J Nurs Pract* 2005;11:58-67

^v Bours GJJ, Halfens RJG, Abu-Saad HH, Grol RTP. Prevalence, prevention, and treatment of pressure ulcers: Descriptive study in 89 institutions in The Netherlands. *Research in Nursing and Health* 2002; 25: 99–110.