

The VersaCare A.I.R.™ Mattress Aids in Reducing Facility Acquired Pressure Ulcers

Submitted by:

Melanie Johnson, RN, BSN, CWOCN*
Catherine VanGilder, BS, MT, CCRA**

The reduction in facility acquired pressure ulcers has become a key quality indicator for acute care facilities. The Joint Commission on Accreditation of Healthcare Organizations 2006 patient safety goal #14 is to prevent health care associated pressure ulcers;¹ while the American Nursing Association lists facility-associated pressure ulcers as a Nursing Quality Indicator in the National Database of Nursing Quality Indicators.² The goal "Clinical Practice Guideline Number 3" listed in the Agency for Health Care Policy and Research (AHCPR) is the prevention of pressure ulcers in adults at risk.³ These entities along with the American legal system have encouraged acute care facilities to be more proactive in providing better pressure ulcer prevention practices.

Risk factors for pressure ulcer development have been identified as reduced mobility, age related changes in the skin, poor hydration, poor nutrition, fecal and urinary incontinence which all lead to increased susceptibility to skin breakdown.⁴ Patients who are admitted into acute care facilities commonly have at least one of the above conditions that cause them to have increased risk of pressure ulcer formation. High acuity and multiple compromised body systems of the acute care patient increase the likelihood that the patient will be at risk for pressure ulcer development.

WakeMed Health and Hospitals is a 752 bed private, not for profit, health care system in the Raleigh, North Carolina area. WakeMed Health and Hospitals have 629 acute beds, 68 rehab beds, and 55 skilled nursing beds (SNF). WakeMed averages more than 37,000 acute care discharges per year. Because over half of the patients admitted to the med/surg, critical care, rehab and SNF beds are classified at risk for skin breakdown, the health system decided it would be prudent to place all of these patients on a pressure redistribution surfaces as soon as they entered the hospital setting. The ICU's had recently been equipped with the TotalCare SpO₂RT® pulmonary bed system (Hill-Rom, Batesville, Indiana) with a pressure redistribution surface, so those were left in place. Wake Raleigh Acute Care and Rehabilitation hospital beds were replaced with the VersaCare A.I.R.™ system (Hill-Rom).

VersaCare A.I.R.™ system uses an integrated pressure sensing system within the surface that redistributes pressure to the largest surface area possible for the patient without having the patient bottom out. This redistribution of pressure takes the normally high

pressure loads from the weight-bearing bony prominences, like the sacrum and heels, and loads the areas like the lower back, the calves of the legs, and other areas of the body that normally do not bear weight when the patient is in the bed.

A key element in instituting a house-wide change to a powered pressure redistribution system is patient education. A pressure redistribution surface is different from normal mattresses that patients have at home, and what they may have experienced previously in a hospital setting. The readjustment that the surface performs to reduce pressure is felt by the awake patient, and the noise created by the outflow and influx of air can be heard. It is important to explain this change in mattresses to the patients, and help them anticipate some noise and motion in order to help them understand their care and the benefit of this type of bed. Also, the "sleep mode" feature allows less frequent adjustments and can be used for the lower risk patient population while they sleep.

As a result of a well established pressure ulcer prevention program, WakeMed had a 3% pressure ulcer incidence rate, which is well below the national average. These results were documented in March 2005 by participation in an annual prevalence and incidence program.⁵ National pressure ulcer incidence rates reported for 2002, 2003, and 2004 were 9%, 7%, and 7% respectively.⁶ The Wake Wound Care team felt that they were experiencing a further decrease in the number of nosocomial ulcers at the end of 2005. To quantify this hypothesized reduction, an analysis was performed on all Wound Team consults over the year preceding VersaCare A.I.R.™ system implementation (2004) and compared to the year following bed delivery (2005). The consults were separated into all nosocomial ulcers, and then a specific analysis on heel and sacral ulcers was performed. (Table 1)

Since the VersaCare A.I.R.™ system has been implemented, the Wound Care Team has seen a reduction in overall nosocomial pressure ulcers of 57% ($p > 0.001$, Student's t-test), a 64% reduction in nosocomial sacral ulcers ($p < 0.001$), and a reduction in heel ulcers of 71% ($p = 0.014$). (Figure 1).

The standard of practice prior to VersaCare A.I.R.™ system introduction required that patients who were deemed at risk for pressure ulcer development (scoring above 8 on a skin breakdown

* WakeMed Health and Hospitals, 3000 New Bern Avenue, Raleigh, NC 27610

** Hill-Rom, 4349 Corporate Road, Charleston, SC 29405

risk assessment tool), were placed on a rented static air overlay. Patients with Stage II or Stage III pressure ulcers on more than one turning surface were placed on a rented low air loss overlay and patients with a Stage IV on a rented low air loss specialty bed. After VersaCare A.I.R.™ system introduction, static air overlay and low air loss overlay rentals were eliminated.

In order to estimate the financial savings that were achieved due to the bed purchase, the number of patient days that the facility rented a specialty mattress from January through May 2004 was compared that to the number of patient days in January through May 2005. WakeMed rented 2883 patient days of specialty mattresses in the 5 months studied in 2004, or 577 patient days per month, and in those same months in 2005 only 949 patient days were rented, or 190 days per month, which represented a 67% reduction in rental days. (Figure 2)

Discussion

Many patients who are admitted to acute care facilities have significant risk for pressure ulcers. From a 2005 national survey of 74,401 patients in acute care facilities for prevalence of pressure ulcers revealed that 7.3% of patients surveyed had facility acquired pressure ulcers.⁷ The Advisory Board reports that costs associated with treatment of these pressure ulcers for an average hospital in the United States is estimated at \$400,000 to \$700,000 per year.⁸ Lyder reports the costs of pressure ulcer treatment to be between \$500 to \$40,000 per ulcer and there is a significant risk of litigation associated with facility acquired pressure ulcers.⁹ Brem and Lyder report that the costs of one hospital admission for a pressure ulcer often exceeds \$200,000.¹⁰ Therefore, a significant decrease in facility acquired pressure ulcers, results in immediate cost savings for both the direct costs in providing care, and a decrease in litigation risk.

A pressure redistribution surface, provided at the time of admission to all patients is an integral component of the WakeMed pressure ulcer prevention program. "In our facility, we have seen a significant change in the number of nosocomial pressure ulcers presenting to our Wound Care team after the VersaCare A.I.R.™ system was introduced. Specifically, we have noted a decrease in sacral and heel pressure ulcers, which can be extremely debilitating and costly to treat once they are present," states Melanie Johnson, RN, BSN, CWOCN. "We are also able to minimize the costs and efforts in acquiring rental surfaces, which has led to operational cost reduction and staff satisfaction. Having a pressure redistributing surface on all beds upon admission automates the pressure ulcer prevention program and reduces the likelihood of possible tissue injury during the time required for clinical assessment, ordering and delivery of a rental bed for at risk patients. All are money, time, and skin savers."

It is important to note that the only other change during the studied period relevant to the pressure ulcer prevention protocol was establishing a "standing order" for the skin protocol implementation. (No changes were made to the skin protocol itself.)

Conclusions

A first line pressure redistributing surface has significantly reduced the number of facility acquired pressure ulcers at WakeMed. There has been a significant reduction in number of patient days for therapy rental as well as increased staff satisfaction in providing care. It is estimated that WakeMed has had a reduction in costs associated with both direct patient care and reduced litigation risk associated with the reduction of facility acquired pressure ulcers.

References

- 1) Joint Commission on Accreditation of Healthcare Organizations 2006 National Patient Safety Goals, <http://www.jcaho.org/about+us/news+letters/this+month+/state+hospital+assoc+edition/may+2005.htm#2006>, downloaded January 18, 2006.
- 2) National Database of Nursing Quality Indicators (NDNQI), <http://www.nursingquality.org/Default.aspx>, downloaded January 18, 2006
- 3) Agency for Health Care Policy and Research <http://www.ncbi.nlm.nih.gov/books/bv.fcgi?rid=hstat2.chapter.4409>, downloaded January 18, 2006.
- 4) Allman RM, Pressure Ulcers Among the Elderly, *NEJM*, 320(13), March 30, 1989, p 850-853.
- 5) Whittington K, Briones R, National Prevalence and Incidence Study: 6-Year Sequential Acute Care Data. *Advances in Skin & Wound Care*. 2004, 17(9):490-494.
- 6) The Prevalence and Incidence Program, Kinetic Concepts, Inc., San Antonio TX.
- 7) VanGilder C, Washienko C, Eckstein A, Decker S, Young J and MacFarlane G. 2005 International Pressure Ulcer Prevalence™ Survey Results in Acute Care, Poster presented at the Clinical Symposium for the Advances in Skin and Wound Care, October 23-26, 2005, Las Vegas, NV.
- 8) Diamond D, "Effective strategies to reduce pressure ulcer rates". Washington, DC: The Advisory Board Company, May 5, 2004.
- 9) Brem H, Lyder C. Protocol for the successful treatment of pressure ulcers. *Am J Surg*. 2004;188(Suppl):9S-17S.
- 10) Lyder C. Pressure ulcer prevention and management. *Ann Rev Nurs Res*. 2002;20:35-61.

Table 1

Wound Team Consults	Nosocomial Sacral Ulcers	Nosocomial Heel Ulcers	All Nosocomial Pressure Ulcers
2004	97	31	157
2005	35	9	68

Figure 1

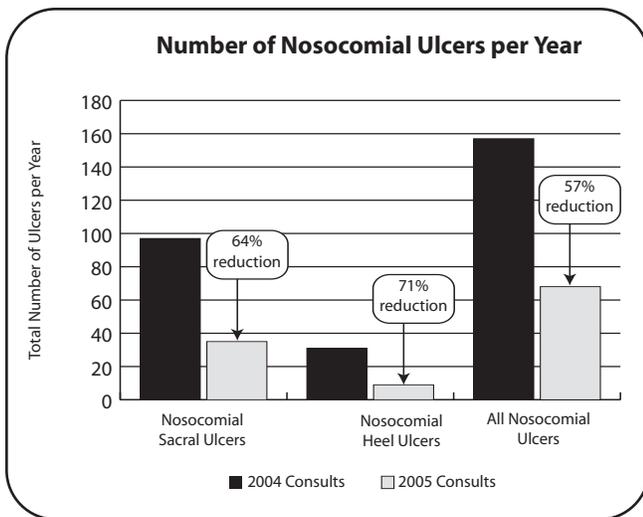
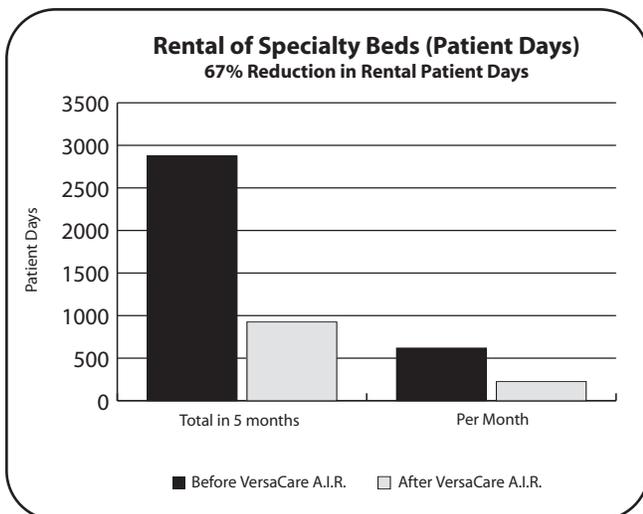


Figure 2



© 2006 Hill-Rom Services, Inc.
ALL RIGHTS RESERVED.

142664 4/05/06

Reprint requests:

USA • 800-445-3730 • Fax 812-934-8189
Canada • 800-267-2337 • Fax 905-206-0561
International • 812-934-8173 • Fax 812-934-7191
www.hill-rom.com

Hill-Rom[®]
A HILLENBRAND INDUSTRY