High Yields Result from a Pressure Ulcer Prevention Program

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Introduction

As part of a wound prevention process improvement program, the 2 West Medical unit of Yuma Regional Medical Center decided to purchase the VersaCare A.I.R.™ bed system in October of 2004. By carefully selecting features, 2 West Medical has achieved benefits that exceeded their expectations. 2 West Medical is a 52 bed medical floor, primarily admitting renal failure, diabetic, and oncology patients. 2 West Medical had one of the highest pressure ulcer prevalence rates within Yuma hospital. This unit receives many complex cases with patients who are stepping down from the ICU, have multi-system failure, and may have just undergone ventilator weaning or some other milestone allowing transfer from the ICU. The unit also receives patients from the community who may already be facing nutritional and physical challenges impacting their risk for skin breakdown.

Capital had been approved to replace the beds for 2 West Medical. The decision regarding which system to purchase for this medically complex unit was made by the Wound Care Team, facilitated by Director Marla Moore, RN, BSN, MA. The team, faced with a number of challenges including: a high pressure ulcer prevalence; a high rate of patient falls when compared to the national average; and caregiver injuries that affected the knowledgeable experienced staff, chose to purchase the VersaCare A.I.R.™ bed system. This bed offered a pressure redistribution mattress, a flexible bed exit alarm system, and the Intellidrive® feature. Intellidrive® is a powered transport feature that allowed the staff to transport patients on the bed with just a touch of the bed's handles. This reduced the need to pull and push patients on stretchers, or to have to transfer these patients into wheelchairs and then transport them through the hospital. The combination of features made the VersaCare A.I.R.™ bed system their first choice. Following the incorporation of these features of the VersaCare A.I.R.™ bed system into ongoing programs, there has been a reduction in pressure ulcer prevalence, patient falls, caregiver hours lost for injury, and an unexpected benefit in the reduction of linen utilization.

Pressure Ulcer Prevalence

Facility acquired pressure ulcers represent a major concern for today's acute care facilities. Factors that increase the risk for pressure ulcer development include advanced age, decreased mobility, incontinence, protein-calorie malnutrition, dehydration, cognitive or sensory impairment, increased friction and shear, and increased moisture to the skin and multi-system failure. The overall prevalence of pressure ulcers in acute care facilities has been reported by VanGilder, et al (2005) at 14.6% (N=74,401), with facility acquired prevalence at 7.3% for all patients. When considering only patients in Step Down/Transition units (N=3235), overall prevalence rises to 16% with 9.7% facility acquired, of which 4.9% are staged at greater than Stage I. The 2 West Medical unit of Yuma Regional Medical Center had an average overall pressure ulcer prevalence of 24% (quarterly results of 33%, 18%, 16%, 26%, 24%, 27%) and facility acquired prevalence of 19% (quarterly surveys yielded 29%, 15%, 11%, 12%, 24%, and 23%) prior to VersaCare A.I.R.™ bed system implementation. These rates were above the national averages (as reported above). The unit's prior surfaces consisted of foam mattresses with standard washable surfaces. VersaCare A.I.R.™ bed system was selected for this unit because of the pressure redistribution properties of the air surface. The bed incorporates an integrated pressure sensing system 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, heels, etc., 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.

Since the implementation of a pressure redistribution surface, the average overall prevalence of pressure ulcers in 2 West Medical is now (October 2004 to present ) 10%, with quarterly prevalence at 18%, 12%, 5%, 13%, 4%, and facility acquired prevalence averaging 6% (quarterly prevalence surveys: 9%, 12%, 5%, 5%, 2%, and 4%) See Figure 1. This decrease in prevalence has translated into an estimated annual cost savings of $8,400 for this unit (Table 1).
Patient Falls

The incidence rate of falls in hospitals and nursing homes are almost three times the rates for community dwelling persons age > 65 years (1.5 falls per bed annually). Injury rates are also considerably higher with 10% to 25% of institutional falls resulting in fracture, laceration, or the need of additional hospital care. Studies have identified the intrinsic risk factors for falls to be lower extremity weakness, poor grip strength, balance disorders, functional and cognitive impairment. Extrinsic risk factors include “polypharmacy” or patients having more than four prescribed drugs, and environmental factors, which may be poor lighting, loose carpets, lack of bathroom safety equipment, etc. Patients who had periods of hypotension, who were on sedatives, psychotropic medications, or anti-arrhythmic medications were at greater risk, especially during the first 2 weeks of medication changes. Tinetti et al., surveyed community dwelling elderly persons and reported that the percentage of persons falling increased from 27% for those with no, or one risk factor, to 78% for those with four or more risk factors.

Fuller reports (2000) that major injuries including head trauma, soft tissue injuries, fractures and dislocations occur in 5-15% of all falls associated with the elderly. Patients who have injuries associated with falls have almost twice the length of stay when compared to elderly patients admitted for another reason. In addition elderly patients who fall often experience fear of repeat falling which may lead to institutionalization following falls for physiological or physical limitations caused by the fall.

With a large population of post ICU, elderly, medically complex, and renal failure patients, the typical 2 West Medical patient has many of the fall risks listed above. In fiscal year 2003-2004, the unit had an average of 5.85 falls per 1,000 patient days, (82 total falls) which was above the national average reported by the National Database of Nursing Quality Indicators for this type of unit in that same time period (4.63 falls / 1,000 patient days). With this in mind, the director of the unit, Marla Moore, RN, BSN, MA, decided to enhance the existing falls prevention program by utilizing the newly purchased VersaCare A.I.R.™ bed system's bed exit alarms.

The first month after the beds (October 2004) were delivered, the bed exit alarms were set 24 hours a day for those patients deemed “at risk” for falls, and from 10:00 p.m. to 7:00 a.m. for all other patients. In November, it was decided that bed exit alarms would be set for all 2 West Medical patients only during the evening hours. In December 2004, the staff determined that the bed exit alarms would be constantly on for high risk patients, and from 7:00 p.m. until 7:00 a.m. for all other patients, regardless of risk.

Following the incorporation of the bed exit alarms into the falls prevention program, there was an overall decrease of patient falls from an average of 5.85 falls per 1,000 patient days to 2.81 falls per 1,000 patient days. (see Figure 2.) Bates (1995) estimates the average cost per patient fall of $4,233. At this rate, the 27 less falls in the study period would result in annual cost savings of $114,291 (Table 1). In addition to fall reduction, the facility was able to reduce the reliance on “sitters” or patient attendants, who previously stayed in the rooms of high risk patients, from an average of over 23,000 hours per year (which is a cost of $155,183 in salary) to 14,500 hours (an annual cost of $96,860) representing a cost reduction of greater than $58,000 per year (Table 1).
Caregiver Injury

According to the July 2001 report from the General Accounting Office of the U.S. Government, there is a 2% national decline per capita in the number of registered nurses in the United States, and the average age of nurses has shifted from 30-39 years in 1980 to 40-49 in 2000. This trend is expected to continue with the relatively small number of nurses entering the workforce. Inadequate staffing, heavy workloads, and increased use of overtime are frequently cited as key reasons for job dissatisfaction.\[^8\]

Occupational-related back injuries affect 38 percent of all nurses, according to Slattery (1998),\[^9\] and healthcare workers in general sustain 4.5 times more overexertion back injuries than any other type of worker.\[^10\] Six of the top 10 professions at greatest risk for back injury are: nurses aides, licensed practical nurses, registered nurses, health aides, radiology technicians, and physical therapists. Greater than one-third of the back injuries among nurses are attributed to handling patients and the frequency with which they are required to manually move patients.\[^10\]

With this in mind the Wound Care Team decided, with administrative approval, to purchase the Intellidrive\[^\]® system option with the bed purchase in October 2004. Intellidrive\[^\]® allows nurses and other staff members to move patients throughout the hospital by “driving” the patient in the bed with steering handles. “The bed is a tool, you just have to know how to use it”, states Marla Moore, “Not only do the unit staff now transport patients in the bed, but the X-ray technicians have also found out how to take PA and lateral chest films without having to transfer the patients in and out of the bed.”

The marked decrease in patient transfers to gurneys and the manual pushing of those gurneys are, in Marla’s opinion, the main reasons for the decrease in hours lost from work due to injury by the 2 West Medical staff. In fiscal year 2003-2004, there were 249 hours lost, and in 2004-2005, only 132 hours, a 57% reduction. This does not attempt to quantify reductions in worker’s compensation benefit cost.

The other cost savings that was apparent after the implementation of the “bed transport” was the decrease noted in linen usage. For every patient transport that is done in their bed rather than a gurney, there is a savings of two sheets and a pillow case. The overall calculated savings was in excess of $20,000 for this unexpected benefit.

Summary

The implementation of a new bed system that provides: a pressure redistribution surface; a bed exit system; and powered patient transport in their bed, has helped improve clinical outcomes and reduced cost. The program changes following the purchase of VersaCare A.I.R.\[^\]® bed systems have been estimated to save the Yuma Regional Medical Center facility greater than $200,000 per year (see Table 1). The benefits that were achieved above involved a mandatory systematic application of the process improvement program designed to utilize the bed features.

There was much time and energy spent getting the staff educated and prepared to use the beds when they arrived. Mandatory in-services were held at a variety of times to meet each shift’s needs. Co-workers re-validated that their teammates knew how to properly utilize the beds. There was also extensive information sharing regarding the positive outcomes that would be seen by patients, if the beds were utilized to their maximum potential. In order to achieve continuing momentum, clinical and financial outcomes were shared frequently with the staff. Clear expectations that the staff use all the functions of the bed were communicated. Marla Moore, RN, BSN, MA took an active role in the education process, including taking the beds on “rounds” to the different departments that would interface with the patients and beds from her unit to assure that the department staff was inserviced on the use of the bed.

The combination of the right equipment and training has enabled 2 West Medical to achieve excellent wound care results while providing safer care for this elderly, high-risk patient population and their caregivers, at an overall cost savings.

Table 1.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Oct-Sept 04</th>
<th>Oct 04-Sept 05</th>
<th>Variance</th>
<th>Dollars Saved</th>
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<tr>
<td>Patient Attendant hours (at $6.68/hour)</td>
<td>23,311 hours</td>
<td>14,500 hours</td>
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<td>Patient Falls</td>
<td>82</td>
<td>55</td>
<td>-27 falls</td>
<td>$114,291</td>
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<td>(YRMC est avg cost/fall @ $4,233)</td>
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<td>Employee Injury</td>
<td>249.4</td>
<td>132.8</td>
<td>-116.6</td>
<td>2,273</td>
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<td>(hours from work due to work injury/figured at $19.50/hr rate)</td>
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<td>Facility Acquired pressure ulcers</td>
<td>11</td>
<td>7</td>
<td>-4</td>
<td>8,400</td>
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<td>(avg $2,100 cost to treat per wound)</td>
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<td>Linen usage</td>
<td>$78,982</td>
<td>$58,806</td>
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<td>Total savings</td>
<td></td>
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<td>$203,459</td>
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References:


7) Yuma Regional Medical Center Quarterly Report, The National Database of Nursing Quality Indicators, American Nurses Association.


