

# Implementing a Pressure Ulcer Prevention Program - Heels First

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## Introduction

The estimated prevalence of pressure ulcers (PUs) in Canada is 25.1% in acute care settings, 29.9% in non-acute care settings, and 15.1% in community-care settings,<sup>1</sup> with heel ulcers accounting for 25%<sup>2</sup> to 30.3% of PUs.<sup>3</sup>

PUs result from anoxia in the tissues caused by local pressure that exceeds the mean capillary closing pressure or by shearing forces that damage local microcirculation.<sup>4</sup> Heel skin is thin and located over a prominent bony surface, which prevents pressure dissipation and can lead to rapid full thickness necrosis.<sup>3,4</sup> Factors that increase risk of pressure ulceration include age, decreased sensory perception, local moisture, immobility, poor nutritional status, and friction and shear forces against the skin.<sup>5</sup>

Use of a risk assessment tool together with a device that keeps the heel off the bed surface can reduce the rate of heel ulceration and reduce treatment costs.<sup>6,7</sup> The cost of care per heel PU (hPU) is estimated at US\$15,760,<sup>8</sup> and hospitalization costs range from US\$22,734 to US\$50,669 for patients hospitalized with PUs.<sup>9</sup>

In 2004 Saskatchewan became the first province to require formal reporting of Stage 3 and 4 pressure ulcers acquired after admission to a regional health authority or health care organization. In 2006, a Saskatchewan Health Quality Council (HQC) committee, including key wound care clinicians from across the province, finalized provincial skin and wound care guidelines for the prevention and treatment of pressure ulcers. In response to the Saskatchewan Critical Incident Reporting Guideline, the HQC's initiative and to improve health system quality performance by supporting evidence-based standards in healthcare delivery<sup>10</sup>, the Regina Qu'Appelle Health Region (RQHR) Skin and Wound Care Committee decided to implement the HQC guidelines in increments. Recognizing that the RQHR does not have a risk assessment and heel pressure ulcer (hPU) prevention program and that the occurrence of pressure ulcers is often viewed as an indicator of poor quality of care, the committee chose to target heel ulcer prevention as one step toward implementing the guidelines.

## Objective

The primary goals were to prevent and treat PUs by maintaining heel suspension and to help prevent plantar flexion by maintaining the neutral position of the foot. This initiative had 4 objectives: 1) identify the prevalence of hPU, 2) establish a standardized hPU prevention protocol, 3) implement a practice intervention to improve patient outcomes, and 4) assess the effectiveness of the practice intervention (currently underway).

## Methods

The Ostomy and Wound Care Centre conducted a study to determine the baseline prevalence of hPUs. The hPU prevention protocol was developed by using evidence reported in the literature and the 2006 Saskatchewan Skin and Wound Care Guidelines.<sup>11</sup> A risk assessment tool was developed to help identify patients who would benefit from interventions for hPU prevention.

In January 2008, the staff was educated regarding the prevention initiative, assessment and care of heels, appropriate application of the heel protector device, and documentation necessary for the intervention. The risk identification and hPU prevention program was initiated by the end of January 2008. A post-intervention survey measured hPU prevalence relative to baseline to determine the effectiveness of the intervention.

## Results

A tool to identify patients at risk of pressure ulceration was developed (Table 1). This tool is based on the Braden score (Figure 1) and identifies patients at risk if they meet 3 criteria: have a score of 15, are non-ambulatory, and have 2 predetermined comorbidities. A heel protector boot is indicated in patients identified as "at risk," and the protocol used is detailed in Table 2.

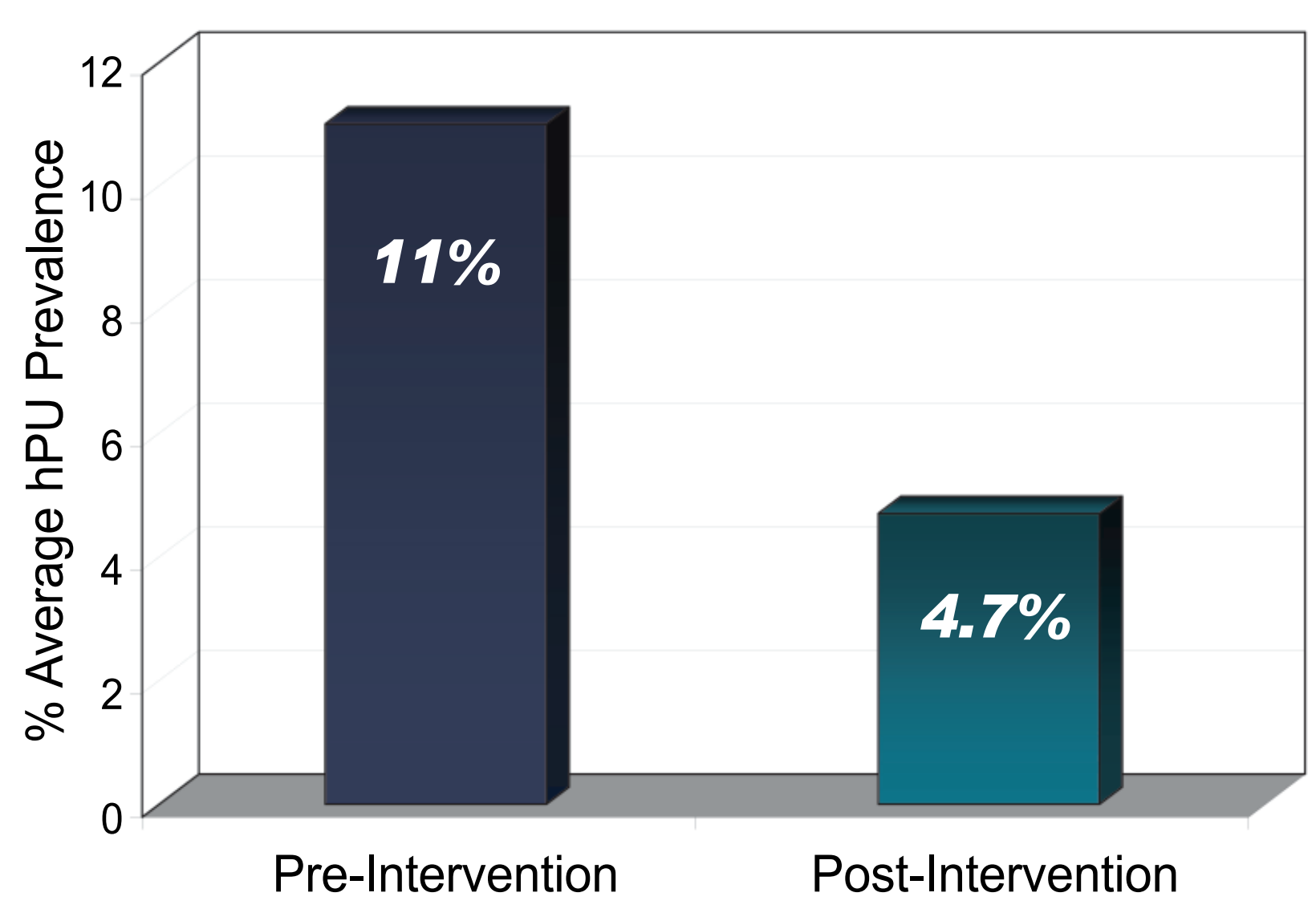
In November 2007, 11% (19/169) of patients at Pasqua Hospital, 3% (5/193) at Regina General Hospital, and 19% (44/234) at Wascana Rehabilitation Center had hPUs. The post-intervention survey (June 2008) indicated a decrease in prevalence at 2 of the 3 facilities: 3% (3/120) for Pasqua, 5% (7/144) for Regina General Hospital, and 6% (13/209) for Wascana. The average prevalence (all 3 facilities) decreased from 11% before the intervention to 4.7% by June 2008 (Figure 2).

**Table 1: How to Determine if a Prevalon™ Pressure-Relieving Heel Protector is Indicated**

<b>Key Indicators:</b>		
1. Total Braden Score of 15 or less (includes Activity &/or Mobility score 1 or 2)	Yes	No
2. Non-ambulatory patient	Yes	No
3. Have 2 of the following co-morbidities (below)	Yes	No

<b>Key Co-morbidities:</b>	
Diabetes Mellitus	Malnutrition: Braden Nutrition Score 1 or 2
Peripheral Vascular Disease	Age 65 or older
Spinal Cord/Head Injury	Leg Compartment Syndrome
Stroke	Unconscious
Hemiparesis or Quadriparesis	Existing hPU
Comatose	Surgery that limits motion of leg(s):
On paralytic or vasopressor meds	Hip fracture
Congestive Heart Failure	Total hip replacement
Decreased Sensation	Total knee replacement
Leg or other trauma	Unilateral amputation

**Figure 2: Pre- and Post-Intervention Average hPU Prevalence**



## Conclusions

The prevalence rate for hPUs in this study patient population at baseline was 11%. The risk assessment tool and intervention protocol using a heel protector boot was developed based on evidence in the medical literature and these appeared to reduce the incidence of hPUs to 4.7%. This demonstrates that interventions are useful in reducing hPU rates and improving patient care.

### References

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**Figure 1: Braden Scale for Predicting Pressure Ulcer Risk**

Complete within 24 hours of admission and whenever client's condition deteriorates\*  
Please indicate score of each subscale under date of assessment

DATE: \_\_\_\_\_

<b>SENSORY PERCEPTION</b> - Ability to respond meaningfully to pressure related discomfort				
<b>Score:</b>	<b>1. Completely Limited:</b> Unresponsive (does not moan, frown or grasp to painful stimuli, due to diminished level of consciousness or sedation. OR limited ability to feel pain over most of body surface.	<b>2. Very Limited:</b> Responds only to painful stimuli. Cannot communicate discomfort except by moaning or restlessness. OR has a sensory impairment which limits ability to feel pain or discomfort over 1/2 of body.	<b>3. Slightly Limited:</b> Responds to verbal commands, but cannot always communicate discomfort or need to be turned. OR has some sensory impairment which limits ability to feel pain or discomfort in extremities.	<b>4. No Impairment:</b> Responds to verbal commands, has no sensory deficit which would limit ability to feel or voice pain or discomfort.
<b>MOISTURE</b> - Degree to which skin is exposed to moisture				
<b>Score:</b>	<b>1. Constantly Moist:</b> Skin is kept moist almost constantly by perspiration, urine, etc. Dampness is detected every time patient is moved or turned.	<b>2. Very Moist:</b> Skin is occasionally moist, moist. Linen must be changed at least once a shift.	<b>3. Occasionally Moist:</b> Skin is occasionally moist, requiring an extra linen change approximately once a day.	<b>4. Rarely Moist:</b> Skin is usually dry; linen only changes in position at routine intervals.
<b>ACTIVITY</b> - Degree of physical activity				
<b>Score:</b>	<b>1. Bedfast:</b> Confined to bed.	<b>2. Chair fast:</b> Cannot bear own weight and/or must be assisted into chair or wheelchair.	<b>3. Walks Occasionally:</b> Ability to walk severely limited on or off bed. Cannot bear own weight and/or must be assisted into chair or wheelchair.	<b>4. Walks Frequently:</b> Walks outside the room at least twice a day and inside room at least once every 2 hours during waking hours.
<b>MOBILITY</b> - Ability to change and control body position				
<b>Score:</b>	<b>1. Completely Immobile:</b> Does not make even slight changes in body or extremity position without assistance.	<b>2. Very Limited:</b> Makes occasional slight changes in body or extremity position but unable to make frequent or significant changes independently.	<b>3. Slightly Limited:</b> Makes frequent though light changes in body or extremity position changes independently.	<b>4. No Limitations:</b> Makes major and frequent changes in position without assistance.
<b>NUTRITION</b> - Usual food intake pattern				
<b>Score:</b>	<b>1. Very Poor:</b> Never eats a complete meal. Rarely eats more than 1/3 of any food offered. Eats 2 servings or less of protein (meat or dairy products) per day. Takes fluids poorly. Does not take a liquid dietary supplement. OR is NPO and/or is maintained on clear liquids or IV's for more than 5 days.	<b>2. Probably Inadequate:</b> Rarely eats a complete meal and generally eats only about 1/2 of any food offered. Protein intake includes only 3 servings of meat or dairy products per day. Occasionally will take a dietary supplement OR receives less than optimum amount of liquid diet or tube feeding.	<b>3. Adequate:</b> Eats over half of most meals. Eats a total of 4 servings of protein (meat, dairy products) each day. Occasionally will refuse a meal, but will usually take a supplement if offered. OR is on a tube feeding or TPN regimen which probably meets most of nutritional needs.	<b>4. Excellent:</b> Eats most of every meal. Never refuses a meal. Usually eats a total of 4 or more servings of meat and dairy products. Occasionally eats between meals. Does not require supplementation.
<b>FRICION AND SHEAR</b>				
<b>Score:</b>	<b>1. Problem:</b> Requires moderate to maximum assistance in moving. Complete lifting without sliding against sheets is impossible. Frequently slides down in bed or chair, requiring frequent repositioning with maximum assistance. Spastically, contractures or agitation lead to almost constant friction.	<b>2. Potential Problem:</b> Moves feebly or requires minimum assistance. During a move skin probably slides to some extent against sheets, chair, restraints, or other devices. Maintains relatively good position in chair or bed most of the time but occasionally slides down.	<b>3. No Apparent Problem:</b> Moves in bed and in chair independently and has sufficient muscle strength to lift up completely during a move. Maintains good position in bed or chair at all times.	
<b>TOTAL SCORE:</b> _____				
<b>ASSESSORS' INITIALS</b> _____				

\* Total score indicates risk: At risk (15-18), Moderate (13-14), High (10-12), Very High (< 9).  
If deficit (risk) noted in any of the subscale scores, refer to other side for Suggested Nursing Interventions  
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Braden Subscale Score	Suggested Nursing Interventions
<b>Sensory perception:</b> Completely limited.....1 Very limited.....2 Slightly Limited.....3	<b>Nursing interventions to prevent injury related to impaired sensory perception</b> o Turning schedule o Protect extremities/feet/boots – shoes on when up o Assess skin daily for actual or potential impaired skin integrity o Protect from extremes of heat and cold o Ensure foods and fluids are at a safe temperature
<b>Mobility:</b> Completely limited.....1 Very limited.....2 Slightly Limited.....3	<b>Nursing interventions to prevent skin injury related to impaired mobility</b> o Request consult to Occupational Therapy to maximize repositioning o Request consult to Physiotherapy to maximize repositioning o Turning schedule at bedside o Assess skin daily for actual or potential impaired skin integrity o Elevate heels of off bed or chair: <b>Prevalon Heel Protector</b> , if indicated o Consider specialty mattress if total Braden score < 13
<b>Activity:</b> Bedfast.....1 Chairfast.....2 Walks occasionally.....3	<b>Nursing interventions to prevent skin injury related to altered activity</b> o Request consult to occupational therapy to maximize repositioning o Request consult to physiotherapy to maximize repositioning o Turning schedule at bedside o ≤ 30° side-lying position using pillows/foam wedges as necessary o 90° sitting position when up in chair to avoid pressure on coccyx/ischium o Head of bed ≤ 30° unless up for meals o Assess skin daily for actual or potential impaired skin integrity o Elevate heels of off bed or chair: <b>Prevalon Heel Protector</b> , if indicated o Consider pressure redistribution mattress if total Braden score < 13
<b>Moistures:</b> Constantly moist.....1 Very moist.....2 Occasionally moist.....3	<b>Nursing interventions to protect from injury related to moisture</b> o Apply absorbent pads and diapers that wick and contain moisture o Clean skin using <b>Baza Cleanse and Protect</b> or <b>Sproam</b> after each episode of soiling o Apply moisture barrier: <b>Proshield Plus, Baza Cleanse and Protect</b> OR <b>Critical Care</b> to inner thighs, groins and buttocks daily and after cleaning o Address cause of excess moisture, if possible o Offer bedpan/bowel and glass of water in conjunction with turning schedule
<b>Nutrition</b> Very poor.....1 Probably inadequate.....2 Adequate.....3	<b>Nursing interventions to prevent skin injury related to impaired nutritional status</b> o Request consult to Dietician o Request Occupational Therapy consult if problems with self-feeding o Request consult to Speech Language Pathologist if problem with swallowing o Assist with feeding, if necessary o Nutritional supplements as ordered
<b>Friction &amp; Shear</b> Problem.....1 Potential problem.....2	<b>Nursing interventions to prevent skin injury related to friction and shear</b> o Protect bony prominences if exposed to friction with <b>Opsite Flexifix</b> OR <b>Tegasorb Thin</b> o Head of bed ≤ 30° unless up for meals o Use tripod, when indicated o Use lift sheet to move/reposition patient