“Skinsational Skin Care” to Reduce the Incidence and Severity of Pressure Ulcers in Hospitalized Patients

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Abstract

- **Objective:** To describe the design and implementation of a performance improvement project to reduce the incidence and severity of pressure ulcers.
- **Setting:** Emory Healthcare, a multihospital system comprising 2 acute care hospitals, an extended care facility, and a geriatric hospital.
- **Methods:** The FOCUS-PDCA (Find, Organize, Clarify, Understand, Select and Plan-Do-Check-Act) methodology was used. A team was appointed to review current processes and develop a systematic approach to evaluating patients at risk for developing pressure ulcers. A skin care algorithm, skin assessment flowsheet, and wound care flowsheet were created and piloted for 1 month on selected nursing units and then rolled out to all inpatient units in September 2004.
- **Results:** After 9 months, relative risk for incidence of pressure sores decreased by 3% and 5% at the acute care hospitals and 6% at the extended care hospital. The geriatric hospital rate remained at 0%. The average adherence rate among the 9 pilot units for using wound prevention tools was 85%.
- **Conclusion:** The use of standardized tools and documentation practices for evaluating patients at risk for developing pressure ulcers resulted in a reduction of incidence of pressure ulcers in a high-risk patient population.

Pressure ulcers represent a common problem and significant patient safety issue. Prevalence of pressure ulcers in hospitalized patients ranges from 3% to 11% [1]. In addition to being associated with increased morbidity and mortality [1], pressure ulcers result in increased length of hospital stay and hospital costs [2]. The annual direct treatment costs for hospital-acquired pressure ulcers have been estimated between $400,000 and $700,000, and the total national costs for treatment range between $1.3 and $3.5 billion [3].

To address the problem of pressure ulcers, we implemented a project to improve the care and prevention of pressure ulcers in our health care system. In this article, we describe our process and results.

**Methods**

**Setting**

Emory Crawford Long Hospital, Emory University Hospital, Wesley Woods Geriatric Hospital, and the Emory Center for Rehabilitation Medicine are the principal hospital components of Emory Healthcare, a large tertiary academic health care system in Atlanta, GA. Performance improvement is integral to the management of the hospitals.

In 2003, the Emory Healthcare clinical safety steering committee identified the reduction of incidence and severity of pressure ulcers as an important component of the overall organizational process improvement plan. A 12-member interdisciplinary process improvement team was appointed by the chief quality officer of Emory Healthcare and charged with reducing the incidence and progression of pressure ulcers.

As a part of a service agreement, KCI, a San Antonio, Texas–based medical technology company specializing in advanced and therapeutic surfaces, assists clients with evaluating the efficacy of their pressure ulcer prevention programs, including measuring prevalence and incidence. In 2002, Emory Healthcare’s prevalence and incidence study revealed the following wound incidence rates at our facilities: 6% and 7% at the acute care hospitals, respectively; 6% at the extended care facility, and 0% at the geriatric hospital. Although the Emory acute care hospitals’ rates were lower than the national KCI average of 8% for academic hospitals, we aspired to greater improvement and set a 12-month goal of 3% in the hospitals. The extended care facility presented the greatest opportunity for improvement since the national average incidence for similar institutions was 3% [4]. We set a 12-month goal for our extended care facility of 3%. The goal for the geriatric hospital was to maintain 0% incidence.

From Emory Healthcare, Atlanta, GA.
Chart #:________________________________________
Date of admission: ____________________________ Date of discharge: ____________________________
Discharge diagnoses:________________________________________________________________________

Skin status on admission:
• Was there any notation regarding skin breakdown on admission? Yes No
  (Check nursing admission assessment & H&P)
If yes, record exact documentation and discontinue data retrieval:______________________________

Ulcer development:
• When was ulcer/breakdown first documented?
  Date: _______________ Site: ___________________ Stage: ___________________
  Specific documentation: ___________________________________________________________________
  Documented interventions (circle all that apply):
    Support surface for bed    Support for chair    Use of heel elevation devices
    Turning/repositioning program    Nutrition consult    Nutritional interventions
    Use of moisture barrier products    Routine skin assessment    Topical therapy
    for incontinent patient

Review record for week prior to ulcer development:
• Was Braden Scale completed? Yes No
  If yes, indicate score:  < 12  12–18  > 18
  When was last Braden Scale completed?
    < 24 hrs prior to breakdown  24–48 hrs prior to breakdown  48–72 hrs prior to breakdown
    > 72 hrs prior to breakdown
• Did any of the following occur in the week prior to breakdown? (circle all that apply)
  Emergency department admission Yes No
  If yes, # hrs in ED: __________________________
  Surgical/radiologic procedures Yes No
    Date: ________ # hrs in OR/PACU or radiology: ______________
    Date: ________ # hrs in OR/PACU or radiology: ______________
    Date: ________ # hrs in OR/PACU or radiology: ______________
    Date: ________ # hrs in OP/PACU or radiology: ______________
• Indicate any additional risk factors:
  Morbid obesity Yes No
  Diabetes mellitus Yes No

Preventive measures*
• Pressure-reducing mattress (other than standard support surface) Yes No
  If yes, specify type: ________________________________________________
• Pressure-reducing chair cushion Yes No N/A
  (Record as N/A if pt not up in chair)
• Heel elevation devices in use Yes No
• Temp & pulse documentation Q 2 hrs 75%–100% 50%–75% 25%–50% < 25%
• Nutritional assessment Yes No
• Nutritional interventions ____________________________
  (Based on nutr recommendations)
• Skin assessment documentation at least QD 75%–100% 50%–75% 25%–50% < 25%
  *Focus review on 7 days prior to ulcer development.

Figure 1. Data retrieval form for pressure ulcer prevention project.
**Introductory statement:**
You are probably aware that we have an ongoing project focused on pressure ulcer prevention. As part of that project, we are reviewing the records of any patient who develops breakdown while under our care to try and determine what the causative factors are and if there are things we can do to improve our outcomes.

I have just reviewed the records for _______________________, who has developed a pressure ulcer on the ______________________ (anatomical location); I wanted to get your input on factors that may have contributed to his (her) breakdown. In looking at the chart, it appears that our care may have been deficient in the following areas: (list)

1. Do you think that the care documented in the chart accurately reflects the care given? Yes  No
   If no, how do you think the care given differs from the care documented?

2. What additional factors do you identify that may have contributed to this patient’s breakdown?

3. Do you have any suggestions for us as we proceed with our efforts to prevent skin breakdown in our high-risk patients?

**Figure 2.** Structured interview guide.

**Review of Current Processes**
The team reviewed current processes. Admission nursing assessment included skin and risk assessment using the Braden Scale [5], used to predict pressure ulcer formation and guide subsequent preventive measures. The 6 subscales of the Braden Scale measure sensory perception, skin moisture, activity level, mobility, nutrition, and friction and shear forces. Protocols existed for patients at risk for skin breakdown (Braden score $\leq 18$) or with altered skin integrity, but we did not have a standardized method for assessing ongoing risk for skin breakdown and were lacking a comprehensive wound prevention model. In addition, tools for wound documentation and tracking needed improvement.

As part of our review of current processes, we reviewed the charts of 100 patients who had pressure ulcers at discharge (ICD-9 707.00–707.09). Patients with documentation of a pressure ulcer at the time of admission were excluded ($n = 97$). For the remaining 3 patients, the following data were collected (Figure 1): time of initial skin breakdown, documentation of Braden Scale score prior to breakdown, patient comorbidities that could impair blood flow (eg, diabetes, morbid obesity), and preventive measures implemented as indicated. Inconsistent documentation of initial skin breakdown and risk assessment was found. In addition, existing treatment and prevention protocols were not followed. A concurrent chart review of 30 patients treated by wound ostomy continence nurses for newly developed pressure ulcers was also done. Results were similar to those found in the postdischarge review.

**Staff Interviews**
Staff nurses caring for patients who developed pressure ulcers were interviewed using a structured format (Figure 2) for the purpose of determining their perceptions regarding factors involved in pressure ulcer development. Responses reinforced information gleaned from the chart reviews and helped the team to identify barriers to best practice.

**Environmental Assessment**
Inpatient mattresses were found to be approximately 6 years old and in need of replacement. The operating room suites did not have optimal pressure reduction support surfaces in place. Skin care supplies were available through central supply but were not immediately available on the units.

**Improvements**
To address the environmental findings, inpatient mattresses were replaced with state-of-the-art pressure reduction mattresses. Pressure reduction support surfaces were placed in the operating room suites. Skin care supplies and equipment, such as wound measuring guides, waffle boots, barrier creams, foam wedges, and chair cushions, were made available as standard items on the unit supply carts, giving nurses easy and immediate access to items needed to implement preventive measures.

The team had identified the need for a systematic approach to evaluating patients at risk for developing pressure ulcers that included the components of patient assessment, planning, intervening, documenting, and evaluating skin and wound care. We conducted a review of the literature to identify information that was evidence-based and current.

We developed a skin care algorithm (Figure 3) based on the Agency for Healthcare Research and Quality’s clinical guideline on pressure ulcers [6]. This algorithm provides the
1. On admission, complete the Skin Assessment and the Braden Scale on the nursing admission assessment form.

2. Perform Braden Scale every Monday and Thursday.

3. For every shift thereafter, inspect skin from head to toe and follow Skin Care Algorithm.
   The following may be high-risk indicators:
   a. Reddened skin
   b. Redness and absence of blanching (to test capillary refill)
   c. Bony areas exposed to friction
   d. Braden score of 18 or less
   e. Patients with diabetes, ESRD, ESLD, or vascular disease

4. Within 8 hours of admission, initiate Skin Assessment Flowsheet (see Figure 4).
   Implement prevention measures as follows:
   a. Remove dressing and assess wounds and document: size, exudate, odor and character of drainage, wound bed, and surrounding tissue
   b. Document and notify attending physician to obtain initial wound care orders
   c. Consult WOC nurse
   d. If unable to obtain physician order initially, apply normal saline gauze or refer to altered skin protocol on Lotus Notes. Then obtain MD order.
   e. If a new pressure ulcer develops in the hospital, notify the department director and MD and document the event

6. Evaluate need for specialty bed (see decision tree on clinical Web page)

Figure 3. Skin care algorithm.
bedside nurse with instructions for implementing preventive measures to minimize risk of pressure ulcer development. For example, if there is nutritional deficit, the nurse is directed to consult a dietitian, feed the patient if needed or set up the patient tray for self-feeding, and offer liquids and appropriate supplements as needed. In addition, a skin assessment flowsheet (Figure 4) was developed. Nurses completing the form must note the condition of the skin and also the preventive measures implemented. This form includes the Braden Scale, which is used for risk reassessment. Use of the skin assessment flowsheet is required on every shift. If a wound develops, the wound care flowsheet (Figure 5) is utilized to document wound treatment during hospitalization.

### Pilot
The team named the program “Skinsational Skin Care” and designed a logo to be used on communication documents (Figure 6). Kick-off sessions were held in each hospital to introduce the new procedures and forms to clinical leadership. Education for nursing staff was conducted by the wound ostomy continence nurses and included a 1-hour

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### Skin Assessment Flowsheet

**Directions:** Skin Assessment Flowsheet to be completed on every patient every shift and with change in patient skin status. Braden Scale Reassessment to be completed every Monday and Thursday.

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Skin Assessment</th>
<th>Preventive Equipment and Intervention</th>
<th>Notified</th>
<th>RN Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A = No red, blue, or purple areas, no broken skin</td>
<td>1. N/A&lt;br&gt;2. Repositioning every 2 hours&lt;br&gt;3. Positioning pillows/foam wedges&lt;br&gt;4. Pull sheets/transfer boards&lt;br&gt;5. Waffle boots/multi-podus splints&lt;br&gt;6. Chair cushions&lt;br&gt;7. Therapeutic bed: __________&lt;br&gt;8. Other: __________</td>
<td>1. N/A&lt;br&gt;2. MD&lt;br&gt;3. Food/nutrition&lt;br&gt;4. WOCN/ET&lt;br&gt;5. Dept. director</td>
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<td></td>
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<td>B = No red, blue, or purple areas, no broken skin; refer to skin care algorithm</td>
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<td>C = Red, blue, or purple area. No broken skin; refer to skin care algorithm</td>
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<td>D = Altered skin integrity:&lt;br&gt;1. Implement wound care flowsheet&lt;br&gt;2. Make appropriate referral&lt;br&gt;If C or D, document location</td>
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**Figure 4. Skin assessment flowsheet.**

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<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Sensory Perception</th>
<th>Moisture</th>
<th>Activity</th>
<th>Mobility</th>
<th>Nutrition</th>
<th>Friction &amp; Shear</th>
<th>Total Score</th>
<th>RN Initials</th>
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<td></td>
<td>Ability to respond meaningfully to pressured-related discomfort&lt;br&gt;1 = Completely limited&lt;br&gt;2 = Very limited&lt;br&gt;3 = Slightly limited&lt;br&gt;4 = No impairment</td>
<td>Degree to which skin is exposed to moisture&lt;br&gt;1 = Constantly moist&lt;br&gt;2 = Very moist&lt;br&gt;3 = Occasionally moist&lt;br&gt;4 = Rarely moist</td>
<td>1 = Bedfast&lt;br&gt;2 = Chairfast&lt;br&gt;3 = Walks occasionally&lt;br&gt;4 = Walks</td>
<td>Ability to change &amp; control body position&lt;br&gt;1 = Completely immobile&lt;br&gt;2 = Very limited&lt;br&gt;3 = Slightly limited&lt;br&gt;4 = No limitation</td>
<td>Usual food intake pattern&lt;br&gt;1 = Very poor&lt;br&gt;2 = Probably inadequate&lt;br&gt;3 = Adequate&lt;br&gt;4 = Excellent</td>
<td>1 = Problem&lt;br&gt;2 = Potential problem&lt;br&gt;3 = No apparent problem</td>
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The emory initiatives

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didactic presentation in a classroom and on patient care units. This education was conducted on all shifts to provide maximum opportunity for staff participation. Content included project goals and objectives and instruction on how to use the new forms. A focus was placed on identifying risks for pressure ulcers and implementing the appropriate interventions. Wound care also was reviewed. Educational media included informational posters, pocket guides, and “turning clocks,” plastic devices displaying a clock face with movable hands that can be used to indicate when the patient was last

**Figure 5.** Wound care flowsheet.
turned and therefore serve as a guide as to when the patient should be turned again. The new process was piloted for 1 month on 9 nursing units at 4 inpatient facilities. The units represented medical, surgical, intensive care unit, rehabilitation, and geriatric acute care areas. Unit representatives selected by their department managers were partnered with team members and identified as “champions” who could serve as resources for the staff. During the pilot, the pressure ulcer incidence rate by unit ranged from 0 to 6%, with an aggregate rate of 1.88%.

A sample of 31 charts from the pilot units was reviewed to assess compliance with interventions recommended in the skin care algorithm (Figure 3). For these 31 patients, there was a total of 273 recommended interventions that could be applied; 224 were implemented, resulting in an 85% overall compliance rate. In cases where an individual chart reflected less than 80% compliance, further education and training of that patient’s nurse(s) was provided to ensure optimum future performance.

The skin assessment and wound care flowsheets were evaluated for ease of use during the pilot. Evaluation included recommendations from nursing staff for changes in both structure and content of the forms. The forms underwent a revision that resulted in the final forms that were implemented throughout the system.

At the end of the pilot, the success of the project was celebrated, teamwork and motivation were recognized, and participation was rewarded. All nurses received an e-card thanking them for partnering and inviting them to a pizza party.

Current Status and Next Steps
In September 2004, the Skinsational Skin Care program was rolled out to inpatient units at all 4 hospitals with in-services held for nursing staff. Educational videos summarizing the program and providing instruction on the use of the program tools were provided to all nursing units for new staff education and reinforcement among current staff as needed. As in the pilot, the structure for unit support was provided by teaming a “champion” from each unit with a “buddy” from the team. A monthly status review meeting was held with all nursing unit champions and team members to discuss questions and concerns. From these meetings, a “frequently asked questions” document was created for unit champions to have as a resource and to post on their units as a staff reference.

A monthly chart audit is completed on every inpatient unit to determine compliance with completion of the Braden Scale within 8 hours of admission and for reassessment of risk every Monday and Thursday. If the Braden score is 18 or less, the chart is audited for implementation of preventive measures. Ongoing measurement of wound incidence continues monthly, and aggregate data of Braden Scale utilization, implementation of preventative measures, and wound incidence are shared at unit staff meetings. The wound incidence rate is a quality indicator that has been incorporated into the ongoing organizational process improvement plan. We plan to continue participation in the annual KCI/Novation Prevalence and Incidence study.

Our results suggest that the use of a systematic and comprehensive process can improve the care and prevention of pressure ulcers. Current measurement of average wound incidence by nursing division reveal the following rates: medical, 0.14%; surgical, 0.13%; mixed medical/surgical, 0.19%; and geriatric and rehabilitation, 0.12%.

The use of preventive measures in patients who had a Braden score of 18 or less overall aggregate score shows a directionally correct trend. Units not achieving a goal of 90% receive individualized attention by a wound ostomy continence nurse.

Program content and additional educational needs are reviewed annually. Continued tests of change will include revision of chart documents as continued input from users is received. The team maintains a list of user suggestions for consideration in this revision process. Emory Healthcare is currently implementing an electronic medical record system; the wound prevention program components have been integrated into the electronic medical record documentation format as a standard of care.

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References
3. Courtney BA, Ruppman JB, Cooper HM. Save our skin:
initiative cuts pressure ulcer incidence in half. Nurs Manage
2006;37:36, 38, 40.
4. Pressure ulcers in America: prevalence, incidence, and im-
implications for the future. An executive summary of the Na-
tional Pressure Ulcer Advisory Panel monograph. Adv Skin
5. Braden BJ. Clinical utility of the Braden Scale for predicting
6. Panel for the Prediction and Prevention of Pressure Ulcers
in Adults. Pressure ulcers in adults: prediction and preven-
tion. Clinical practice guideline, number 3. Rockville (MD):
Agency for Health Care Policy and Research, Public Health
AHCPR Pub. No. 92-0047.