A Model for Improving Pressure Ulcer and Nutritional Outcomes in the Adult Inpatient Population

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LEARNING OBJECTIVES
After reading this article the reader will be able to:
• Describe the prevalence of pressure ulcers in hospitalized adult patients.
• Identify the benefits of early nutritional assessment and intervention in adult hospitalized patients with/or at risk of pressure ulcers.
• Describe the S.K.I.N.® bundle and benefits of its use.

2011 JCAHO National Patient Safety Goals
• Identify patients correctly
• Improve staff communication
• Use medicines safely
• Prevent infection
• Check patient medicines
• Identify patient safety risks
• Prevent mistakes in surgery

Ascension Health, the nation’s largest Catholic and nonprofit health system, was founded in 1999 and has grown to include 68 acute-care facilities with nearly 16,500 inpatient beds and 113,000 associates. In 2003, Ascension Health set the goal of providing “Healthcare That Works, Healthcare That Is Safe And Healthcare That Leaves No One Behind, For Life.”1 The following priorities were targeted for action:
• Decreasing hospital mortality
• Lowering the number of adverse drug events
• Meeting Joint Commission National Patient Safety Goals and Core Measures
• Prevention of nosocomial infections
• Avoidance of falls and fall injuries
• Prevention and treatment of pressure ulcers
• Perinatal safety
• Minimization of surgical complications
This article focuses on Ascension Health’s initiatives in preventing pressure ulcers and on St. John Providence Health System’s additional steps to improve nutrition. Ascension Health conducted pilot programs at 9 of their inpatient facilities, which served as Alpha sites for their Priorities for Action.

**Pressure Ulcer Prevention**

It has been estimated that more than 1 million people in the United States develop pressure ulcers each year. The 2011 International Pressure Ulcer Prevalence Study reported the overall prevalence of pressure ulcers to be 15.2% and the hospital-acquired prevalence to be 7.3%. In 2006, The Agency for Healthcare Research and Quality reported that there were 503,300 total adult hospital admissions with pressure ulcers as a diagnosis — an increase of nearly 80% since 1993 — totalling $11 billion in hospital costs (Fig. 1). In 2000 and 2001, pressure ulcers were 1 of the top 3 inpatient errors that led to patient fatalities.

Ascension Health’s Alpha site for pressure ulcer elimination was St. Vincent HealthCare in Jacksonville, Florida. With 528 licensed beds it is the largest hospital for adult inpatients in this region of the state. St. Vincent HealthCare began their initiative in 2003 with a comprehensive approach that sought to establish a System-wide standard of care for patients with, or at risk of developing, pressure ulcers. They created a focused effort on patient safety that included:

- Creation and deployment of educational materials, including eLearning modules;
- Strategic partnerships with vendors to develop bedding and seating surfaces that would minimize risk of ulcer development;
- Ongoing review and evaluation to ensure products are state of the art and clinically effective.

**Figure 1: Pressure ulcers: common, costly and catastrophic**

- **2.5 million** pressure ulcers treated each year
- **900,000** patients affected
- **60,000** die from complications
- **12.1%** High prevalence in acute care

- In 2000 and 2001, pressure ulcers 1 of top 3 in-hospital errors leading to patient deaths

- Between 1993 and 2006, there was an **80% national increase** in pressure ulcers at an estimated cost of **$11 billion annually**.

**Figure 2: Pressure Ulcer Implementation Timeline**

- **2004**
  - February 2004 PFA Initial Meeting
  - June 2004 Expert Meeting Alpha
  - August 2004 Bundle Implementation Alpha
  - November 2004 Surfaces Replaced Alpha
- **2005**
  - March 2005 Prevalence Study
  - June 2005 Pressure Ulcer Summit
  - November 2005 Toolkit Implementation
- **2006**
  - March 2006 Ascension Health Prevalence Study
  - June 2006 Ascension Health Standardized Care and Measurement

**Etiology of Pressure Sores**

- **Pressure of bone against hard surface**
- **Pinching off of blood vessels**
- **Friction of skin against the surface**

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“The S.K.I.N.® bundle is a set of interventions that, when used consistently, has demonstrated improved outcomes in preventing pressure ulcers.”
Tissue injury can be more than... 

Assess patient needs and use evidenced-based... (Fig. 2). The team reviewed the current poli...

...leadership team and a timeline... for Predicting Pressure Sore Risk©, the team... the hospital already utilized the Braden Scale... Nurses Society members. Although... is incapable of self-repositioning, nurs...

...goals are facilitated by St. Vincent HealthCare and System-wide policy of making hourly rounds on all patients.

Figure 3: 
Selection of Appropriate Support Surfaces 
Keep Patients Moving 
Manage Incontinence 
Manage Nutrition and Hydration

Development of The S.K.I.N.® “Bundle” 
St. Vincent HealthCare established a Pressure ulcer leadership team and a timeline... (Fig. 2). The team reviewed the current policies and procedures, reviewed the best-practice literature, and participated in meetings involving expert representatives from the Institute... April 2010. In July 2004 (Figs. 3-7). The S.K.I.N.® bundle is a set of interventions that, when used consistently, has demonstrated improved outcomes in preventing pressure ulcers.

Figure 4 
• Assess patient needs and use evidenced-based criteria for surface selection 
• Use pressure reduction surfaces on beds and chairs 
• Keep heels elevated off surfaces 
• Utilize pressure reduction surfaces and devices during operative procedures

NOTE: Pressure reduction/relief devices are adjuncts and not replacements for repositioning

S: Surface Selection. Using the appropriate surface for mattresses, seating, and padding depending on patient variables is critical. The fragile skin of patients at risk of developing pressure ulcers can be irritated and disrupted by such things as wrinkled bedding, IV tubing, or other equipment. Away from the patient’s room, appropriate surfaces in other hospital areas should be considered as well, such as during operative or radiological procedures that require the patient to sit or lie down for extended periods of time.

Figure 5 
• Ensure turning and prevent prolonged sitting for all at-risk patients regardless of their ability to move self independently 
• Schedule regular and frequent turning and repositioning for bed- and chair-bound patients 
• Turn patients at least every 2 hours 
• Avoid continuous sitting 
• Instruct patient to shift weight every 15 minutes if able, if not reposition patient in chair every hour

K: Keep Patients Moving. Avoiding the same position for prolonged periods of time is essential for pressure ulcer prevention. Patients who are able to move themselves should be educated and reminded about shifting their weight/repositioning themselves every 15 minutes when in a chair and in bed. If the patient is incapable of self-repositioning, nursing staff should turn bed-bound patients every 2 hours and chair-bound patients every hour. These goals are facilitated by St. Vincent HealthCare and System-wide policy of making hourly rounds on all patients.

Figure 6 
• Consider the etiology of urinary and fecal incontinence 
• Gently clean and dry the skin after every incontinent episode 
• Avoid hot water and use a mild cleansing agent to minimize irritation and drying of the skin 
• Minimize force and friction applied to skin 
• Use protective skin barriers to protect and maintain skin integrity 
• Utilize under pads that are absorbent and wick moisture away from the skin 
• Limit use of containment garments except for uncontaminated liquid stool, inconsistent ambulatory patients, and patient request 
• Consider use of indwelling catheter for short period of time when incontinence has contributed to or may contaminate pressure ulcer 
• Consider fecal collection device to contain stool and protect skin

NOTE: Use of Foley catheters is contraindicated for use as fecal collection device

I: Incontinence Management. The skin of patients with, or at-risk of, pressure ulcers is extremely vulnerable to irritation, feces, and urine moisture. The S.K.I.N.® bundle guidelines direct staff to “offer” toileting assistance to continent patients every 2 hours and provide incontinence care, including gentle cleansing and application of a moisture barrier every 2 hours, as well.

N: Nutritional Monitoring and Support. Nursing staff should request a consult from a Registered Dietitian for all patients they deem to be in, or at-risk of, poor/malnutrition after their initial assessment. Nutritional consult includes development of a nutritional and hydration program for each individual patient that may include oral nutritional supplements, if necessary. Nutritional support also includes monitoring laboratory parameters (i.e., pre-albumin, albumin, and total lymphocyte count) that may be indicative of nutritional status, and blood glucose management.

Assuring Success 
To assure success, it is important to tie clinical and patient safety results to a strategic plan. A multidisciplinary team should be established, team goals should be developed, and a “champion” should be identified. It is also critical to align the goals with clinical metrics in order to measure success.

Staff education was a critical component of assuring the success of this effort, and included newsletters, self-study modules regarding assessment and ulcer prevention, a S.K.I.N.® bundle poster placed in nursing units, and Braden scale pocket reminder cards. The nursing documentation... developed, tested, and implemented an evidence-based program to eliminate pressure ulcers.
“Culture change was an important component of the pressure ulcer initiative, as was staff empowerment, which increased as the staff realized their importance in improving patient outcomes...”
Tissue injury can be more than a review of pressure ulcer cases, treatments, and outcomes. Staff nurses assessed and documented a pressure ulcer as a result of the pressure ulcer initiative, as was the selection of appropriate support surfaces.

Culture change was an important component of the pressure ulcer initiative, as was staff empowerment, which increased as the staff realized their importance in improving patient outcomes that ultimately would result in a national model for best practice. With leadership from the Chief Nursing Officer, key institutional partners were engaged (e.g., finance, supply chain, physicians, C-suite, allied health, risk management, and legal). In collaboration with supply chain, St. Vincent HealthCare began to evaluate products with an eye toward changing to products less likely to cause skin breakdown, such as compression stockings, adult disposable briefs, and pads. Following further analysis of the trend of pressure ulcer development, another contributing factor was replacement of beds and surfaces, such as changes to carts and tables in the operating rooms and emergency departments. The pressure ulcer initiative resulted in Ascension Health achieving a 94% reduction from the national average pressure ulcer rate to less than 1 per 1000 patient days (Figs. 8, 9).

Enhancing the “N” in the S.K.I.N.® Bundle

Poor nutrition (i.e., malnutrition) has been reported to be as high as 53% among inpatients in a 2011 report. A 2010 report from Australia stated that malnutrition doubles the risk of pressure injuries. Somanchi, et al. collected demographic data, anthropometric measurements, length of stay, and serum albumin levels from 400 hospitalized patients. They conducted the study to determine whether early nutritional intervention would have an affect on length of stay, diagnosis coding of malnutrition, calculating case mix index, and reducing delays in implementing nutritional support. The study showed that early nutritional intervention among malnourished patients reduced the mean length of stay by 3.2 days and reduced delays in implementing nutritional support by 47%.

At the 7-hospital St. John Providence Health System (SJPHS), review of the nutrition screening found that in August 2010, just 46.2% of patients were screened for nutritional status within 24 hours of admission. Further evaluation found that each site had its own policy and practices regarding pressure ulcer prevention and management and that nutrition was not...
well addressed in any of the policies. Nursing and nutritional services were found to be operating in “silos” and nutritional recommendations were not always included in the patient’s plan of care. Furthermore, laws concerning licensing of dietitians vary by state, and in Michigan, dietitians are not licensed; therefore, a dietitian may prepare a plan of care but it must be prescribed by a licensed independent practitioner in order to be implemented.

After identifying these gaps, SJPHS began a systematic approach toward achieving its goal of ZERO pressure ulcers. The approach engaged key players: system leaders in wound care, clinical nutrition managers, and nursing representatives, who all agreed that the nutrition policy needed to be improved and that prevention is the cornerstone to success. An aggressive timeline was established (Fig. 10).

**Maintaining and Building Strength through Nutrition**

Malnutrition and loss of lean body mass (i.e., body weight minus weight of body fat) can accelerate throughout a patient’s hospitalization. Loss of lean body mass occurs more rapidly in older individuals; studies of healthy adults confined to bed rest found that the older participants lost approximately 3 times more lean leg muscle mass than younger participants.\(^9\)\(^10\) Hospitalized patients who are malnourished or have low lean body mass are at increased risk for complications, including pressure ulcers. Ensuring proper nutrition helps reduce the risk of developing pressure ulcers and also plays a role in pressure ulcer healing. Evidence-based guidelines support the use of oral nutritional supplements in addition to the usual diet, to reduce pressure ulcers and improve healing.\(^11\)

St. John Providence Health System adopted a new policy to institute early nutritional intervention by encouraging nurses to supplement diet with oral nutritional supplements (ONS) according to a decision tree that had been created as a guideline for supplement ordering (Fig. 11). In addition, job-aids were created to make it easy for nursing staff to enter
Develop Tools for Nursing to Ease Order Entry

- Order sentences for supplements were built

Nutritional information and requests for supplements, and communicate the need for nutritional consultation into the patient’s electronic medical record (Figs. 12, 13). On the Nutritional Screen (Fig. 14) in the patient’s electronic medical record, the nurse can check “yes” if the patient has nutritional risk factors, and a nutrition consult is initiated automatically. In addition, early nutrition intervention allows the nursing staff to supplement with tissue-building additive in order to protect against loss of lean muscle mass (Fig. 15).

In order for these policies to be effective, educational programs were conducted for registered nurses, technicians, Health Unit Coordinators, and registered dietitians throughout SJPHS in classroom settings and as “road shows” (Fig. 16). Skin care nurses, educators, and dietitians served as “champions”; preceptors, practice councils, and management forums were targeted, and nutritional components were added as part of nursing orientation system wide. Specific educational initiatives included:

- Increase awareness of the importance of lean body mass
  - acknowledge effects of aging on nutrition,
  - recognize that loss of lean body mass leads to poor patient outcomes,
  - stress importance of protein in building/maintaining lean body mass.

- Identify patients vulnerable to loss of lean body mass
  - review nutritional risk factors,
  - reinforce importance of screening patients.

- Intervene with required nutrition
  - identify malnutrition early to allow for early intervention,
  - attempt to provide all required nutrition via meals,
  - supplement diet with oral nutritional supplements,
  - involve staff,
  - institute taste testing.
Actions and Results

A new system-wide Pressure Ulcer Prevention, Management and Treatment Policy was created that includes enhanced nutrition care as part of the S.K.I.N.® bundle. Nursing staff can now request selective oral nutritional supplements and/or additives per protocol for at risk patients using the policy/decision tree, including: standard supplement, diabetic supplement, renal supplement, protein additive, and tissue-building additive. Nurses can initiate a nutritional consult for patients who have potential or actual risk, based on Braden scale risk scores and clinical judgment for all non-healing wounds. Nursing staff encourage patients to eat their meals and supplements, and offer supplements during hourly support visits.

Figure 14

Building Strength Through Nutrition

- Nutrition risk triggers

Figure 15

Maintaining and Building Strength Through Nutrition

<table>
<thead>
<tr>
<th>Date</th>
<th>Room Number</th>
<th>Patient</th>
<th>The product below has been recommended for this patient due to their medical nutritional needs</th>
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<table>
<thead>
<tr>
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<th>350 Cals</th>
<th>13g Pro</th>
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</thead>
<tbody>
<tr>
<td>Diabetic Formula</td>
<td>8oz</td>
<td>220 Cals</td>
<td>9.9g Pro</td>
</tr>
<tr>
<td>Renal Formula</td>
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<td>Tissue Building Additive</td>
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<td>70/80 Cals</td>
<td>14g AA</td>
</tr>
<tr>
<td>Protein Additive</td>
<td>1 Pkt</td>
<td>25 Cals</td>
<td>6g Pro</td>
</tr>
</tbody>
</table>

Support patients across the care continuum

- establish a nursing plan of care,
- distribute discharge kits,
- make recommendations for home care,
- provide discharge planning;
- educate physician groups.

Figure 16

You Have The Power!

To prevent pressure ulcers through great nutrition!

- Do you know how often poor nutrition is a contributing cause of pressure ulcers?
- Are you doing everything within your power to optimize your patients nutrition?
- Did you know nurses will be able to order supplements for patients at nutritional risk?
- Ever wonder what that supplement really tastes like?

Get “empowered”! Make plans now to attend an upcoming inservice on the latest news related to nutrition & pressure ulcer prevention.
rounds and at the time of 2-hour patient turns, in an effort to increase patients’ protein intake.

After increased awareness of the importance of nutrition in March 2011 nursing protocols for nutritional assessment and management of pressure ulcers were implemented. By September 2011, the percentage of nutrition screening completed within 24 hours of admission had improved from 53.6% to 81.2%. Emphasis on improved nutrition and nutritional supplementation also played a role in the hospital’s decline in pressure ulcer rate from 1.4/1000 patient days in July 2010 to 0.8/1000 patient days in July 2011 (Fig. 17).6

Conclusions
St. John Providence Health System developed, tested, and implemented an evidence-based program to improve the nutritional status in an effort to eliminate pressure ulcers for hospitalized adult patients. By utilizing a team approach involving multiple healthcare disciplines, Nutrition Services and nursing were able to improve the rate of compliance in nutritional screening for all patients within 24 hours of admission. Nutritional and nursing staff also worked to engage patients, families, and ancillary staff in meeting the patients’ nutritional needs. A multidisciplinary approach to these programs led staff to realize that resources are available within their own health care system that can be revised, refined, and improved to create an effective program with measurable results.

Note: The S.K.I.N.® bundle is a copyrighted program of Ascension Health and is available for use by other healthcare systems with permission from Ascension Health. Contact drapp@ascensionhealth.org.

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REFERENCES