Innovation Profile: Using Six Sigma™ to reduce hospital acquired pressure ulcers

Snapshot

Summary: Presbyterian Hospital in Albuquerque, NM reduced pressure ulcers using rigorous Six Sigma™ process improvement methodologies. A multidisciplinary team tracked defects in Braden score completion and overall pressure ulcer incidence. Four root causes were identified and addressed:

- Inconsistent Braden score completion
- Inaccurate Braden scores
- Cumber some nurse access to pressure ulcer prevention information
- Prevention Interventions not consistently applied

Changes in electronic documentation, staff training, and new bedding materials (pressure redistribution surfaces and disposable underpads for moisture reduction) combined with visual identification led to an increase in Braden score completion and a reduction in pressure ulcer incidence.

Hospital Background:
- Not for Profit

Date first Implemented: 10/2008

What They Did

Origins

- In the last quarter of 2007 the hospital intensified its efforts to reduce pressure ulcers in preparation for new CMS rules denying payment for any pressure ulcers that were hospital acquired. A pressure ulcer reduction project was launched as a Six Sigma™ project, with a nurse manager using the project for Green Belt certification working with team led by a Six Sigma™ Black Belt candidate.

Description of the Intervention

- Project Aim: The project goal was to reduce the hospital acquired pressure ulcer incidence rate from 18% to 5% or less. To reach that goal the team also tracked Braden score completion as an in-process measure.
- Forming a team: A multidisciplinary team was formed including nursing leadership, staff nurses, wound care, Information Services, physicians and finance.
- **Data analysis and risk identification**: The team carried out observations and numerous interviews with nurses, patients and stakeholders in the initial phase to identify the “voice of the customer” – ultimately, the needs of patients for prevention of pressure injuries.

- **Identifying root causes**: The EHR used a single box to indicate the total Braden score, without subscale detail and without mention of appropriate interventions for each risk level. A Braden scale card attached to the staff name badge was falling into disuse, as many had been lost – many staff were doing the Braden from memory, resulting in inconsistent scoring and/or failure to enter a Braden score.

- **Training**: In 2008 the team decided to create a comprehensive training approach they called the “House of Braden”. Nursing staff came into a laboratory training environment with a manikin showing each pressure ulcer stage for identification. Staff trainers would ask them, “How would you treat this kind of wound?” Presented with various scenarios, trainers asked “How would you stage this pressure ulcer?” Trainers provided details on Braden scoring, EHR documentation and interventions linked to each risk level.

- **SOS Committee**: The pressure ulcer prevention committee adopted the name “Save our Skin” or SOS. Nursing units have SOS champions. Signage for Pressure Ulcer risk uses the SOS logo.

- **Measurement**: Using the Six Sigma™ DMAIC model, a control plan was developed and the following were tracked:
  - Hospital acquired pressure ulcer incidence rate- target 5% or less
  - Braden score completed within 8hrs of admission- target no greater than 10% defects
  - Braden score not completed during length of stay (LOS) - target no greater than 10% defects

- An ongoing quarterly prevalence survey is also conducted according to NDNQI specifications. The team is led by would care specialists accompanied by staff nurses with training in pressure ulcer identification and staging.

- **Development of interventions**: The team organized their interventions around three main problems:

<table>
<thead>
<tr>
<th>Problem</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Braden risk score was not completed within eight hours of admission to trigger prevention interventions for at risk patients</td>
<td>• Revised wound care policy with explicit expectations for pressure ulcer prevention and management</td>
</tr>
<tr>
<td></td>
<td>• Incorporated the Braden risk assessment tool by subscale detail into the electronic documentation patient assessment</td>
</tr>
<tr>
<td></td>
<td>• Developed a Charge Nurse Combo report for each nursing unit with patient information that included Braden scores and pressure ulcers that were charted so that the Charge Nurse could assure interventions were in place.</td>
</tr>
<tr>
<td>Problem</td>
<td>Intervention</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| • Nurses didn’t have easy access to appropriate knowledge intervention | • The approved pressure ulcer prevention interventions were added to the electronic documentation based on Braden risk score.  
• Developed a one page reference sheet with high points from wound care policy for all nursing staff.  
• Current nursing staff was trained on pressure ulcer staging and pressure ulcer prevention. Training was added to new hire orientation going forward. |
| • Interventions for pressure ulcer prevention not applied consistently   | • Purchased new pressure redistribution mattresses to eliminate the need for a waffle mattress.  
• Housekeeping agreed to manage 5 pillows per patient so that patients had enough pillows for repositioning.  
• Eliminated linen chux and replaced with a disposable breathable under pad.  
• Added visual cues (doorway signs) to assist nursing staff with identifying at-risk” patients.                                                                 |

**Did it Work?**

Braden scores were assessed more consistently and pressure ulcers were reduced, as shown in the charts below.
Control Chart: No Braden Documented During LOS
Report Period: 1-10-2010 to 5-31-2010

Control Chart: Braden > 8 hrs

Special Cause: Braden risk assessment tool was placed in a different location in the EMR.

Low is Better
Lessons Learned and Factors Important to Success

- The EHR was modified to accommodate a separate Braden scoring section, and allowing data entry and tracking of separate subscale scores.
- Pressure redistribution mattresses were purchased.
- Linen chux were replaced with disposable underpads that wick moisture away from the skin.
- The Save our Skin campaign and staff training in the simulation labs upgraded staff assessment and intervention knowledge.

Future Directions

- Some staff have a tendency to implement prevention efforts only if the Braden score reaches a required risk level. Work is needed to make sure that any sub-scale risk factors (e.g., moisture, friction and shear) are addressed, regardless of overall score.

If you would like additional information about this success story please contact: admin@HENlearner.org