Improving Pressure Ulcer Prevention through Electronic Medical Record Redesign

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Cincinnati Children’s Hospital Medical Center

- 511 Registered Beds
- 11,000 Employees; Over 3,000 RN’s
- Ranked 2nd in NIH Pediatric Funding
- Received the 2008 Picker Award for Excellence in honor of significant achievements in family-centered care
- Awarded Magnet Designation February 2009
Objectives

• Describe EMR redesigns to improve skin assessments and reduce the patient risk of pressure ulcers.

• Describe how EMR alerts help nurses add a skin plan of care for patients at risk for pressure ulcers.
How will we know that a change is an improvement?

What are we trying to accomplish?

What changes can we make that will result in improvement?
What are we trying to accomplish?

How will we know that a change is an improvement?

What changes can we make that will result in improvement?

The Improvement Model

Act

Plan

Study

Do
Aim Statements

To increase compliance with skin assessments to 90% or higher through redesign of the EMR and staff education

Overall to reduce pressure ulcer prevalence to ≤ 2.7%
How will we know that a change is an improvement?

What changes can we make that will result in improvement?

What are we trying to accomplish?

The Improvement Model

Act

Plan

Study

Do
Admission Process Metrics

• Compliance with documenting Braden Q score
• Compliance with documenting a Skin Assessment
• Compliance with documenting a Medical Device Assessment

Quarterly Outcome Metrics

• Facility Acquired Pressure Ulcer Prevalence
Medical Devices found to be related to pressure ulcer development
The Improvement Model

What are we trying to accomplish?

How will we know that a change is an improvement?

What changes can we make that will result in improvement?
An Outline of Design Concepts for Improving Reliability

Level 1. Vigilance and hard work
(1, or 2, failures out of 10 opportunities or 90%)

- Awareness and training
- Feedback of data
- Personal reminders by an expeditor
- Standardization (broad, general)

Level 2. Human factors and reliability engineering
(5, or less, failures out of 100 opportunities or 95%)

- Redundancy
  - Checklists and reminders (built into the process)
  - Differentiation such as color coding
  - Real time identification of failures such as drug interactions
  - The default is the desired action, for example standard order sets
  - Standardization of essential tasks

Level 3. Sophisticated behavioral designs
(5, or less, failures out of 1,000 opportunities or 99%)

- Take advantage of habits and patterns
- Make the system visible
  - Clear and unambiguous communication
- High reliability organization Weick
  - Preoccupation with failure
    - Example - Study the circumstances leading to each hospitalization for an asthma exacerbation
  - Reluctance to simplify
    - "Dangerous until proven safe rather than safe until proven dangerous"
  - Sensitivity to operations
    - Moment by moment monitoring of the front line rather than the big picture;
      - Example - Red/yellow/green system for monitoring stress levels in patient care units
  - Commitment to resilience
    - Example - Contingency plans for maintaining access, scheduling of unpredictable surgery cases into separate rooms, or code teams
  - Deference to expertise wherever it can be found
    - Example - Patient or parent involvement in design
OLD EMR
OLD EMR
OLD EMR
By clicking on these the nurse could see the interventions & bundle.
### OLD EMR

#### Interventions for the Modified Braden Q
- **Mild Risk (22-25)**
  - Check diapers Q2hrs, change as needed
  - Do not use chux or other products with a plastic backing
  - Add moisture barrier to diaper area as necessary
  - With diaper change, no need to completely remove barrier
  - Completely remove barrier once a day

- **Moderate and High Risk**
  - Follow all interventions & add:

#### Device Protection and Assessment
- Check under G-tubes, Trachs and other devices for moisture
- Use 1 finger rule for trach ties
- Prop tubing off patient
- Do not lay patient on tubes and wires
- Check ID band site with assessment
- Change and evaluate aximeter site at least every 12 hours

#### Splints, Casts, Collars, Braces
- Keep skin dry and clean
- Use all straps
- Petal with molest skin as needed
- Assess often for redness, irritation, or tightness
- Evaluate pain for potential skin compromise

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#### Interventions for the RNDC Patients ≤28 Days

<table>
<thead>
<tr>
<th>Area</th>
<th>Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Skin Care</strong></td>
<td>• Minimize use of adhesives</td>
</tr>
<tr>
<td><strong>Manage Moisture</strong></td>
<td>• Check diapers Q2 to 4 hrs, change as needed</td>
</tr>
<tr>
<td></td>
<td>• Do not use chux or other products with a plastic backing</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td></td>
<td>• Evaluate pain for potential skin compromise</td>
</tr>
<tr>
<td><strong>Reposition</strong></td>
<td>• Only need a 10% shift to make a difference in a neonate</td>
</tr>
<tr>
<td></td>
<td>• Supplement with small shifts in position</td>
</tr>
<tr>
<td></td>
<td>• Document position change</td>
</tr>
<tr>
<td></td>
<td>• Don't forget the head</td>
</tr>
</tbody>
</table>

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*change the outcome*
# Pediatric Pressure Ulcer Prevention Bundle

## Comprehensive Assessment

**Risk Assessment**
- > 28 days of age, use modified Braden Q upon admission and daily
- ≤ 28 days of age, treat as high risk
  - All NICU/CIC patients, treat as high risk

**Skin Assessment**
- Daily head-to-toe

**Device Protection Assessment**
- Every shift

## Interventions

<table>
<thead>
<tr>
<th>Positioning</th>
<th>Moisture</th>
<th>Surface</th>
<th>Nutrition</th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on the modified Braden Q assessment, reposition patients at moderate to high risk a minimum of every 2 hours. Reposition patients at low risk a minimum of every 4 hours.</td>
<td>Manage and minimize moisture by checking common moisture sites every 2 to 4 hours, and intervening as needed.</td>
<td>Use pressure reduction surfaces for beds and chairs.</td>
<td>Good nutrition is the first line of defense for prevention of pressure ulcers.</td>
<td>Involve and educate families in pressure ulcer prevention strategies and treatments.</td>
</tr>
</tbody>
</table>

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# EMR Skin Documentation

<table>
<thead>
<tr>
<th>Old</th>
<th>vs</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Each type of assessment on a separate screen</td>
<td>• All three assessments on same flow sheet (screen)</td>
<td></td>
</tr>
<tr>
<td>• Not part of the body system assessment screens</td>
<td>• All are a part of the body systems assessments flow sheet (screen)</td>
<td></td>
</tr>
<tr>
<td>• Unable to view previous assessments on same screen</td>
<td>• Can view multiple assessments from previous times on same screen</td>
<td></td>
</tr>
<tr>
<td>• Limited # of characters for description of skin issues</td>
<td>• Ability to add comments and more room for detailed descriptions</td>
<td></td>
</tr>
<tr>
<td><strong>EMR Skin Documentation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Old</strong></td>
<td><strong>vs</strong></td>
<td><strong>New</strong></td>
</tr>
<tr>
<td>• Two separate areas of the EMR, one to document skin problems &amp; another for other skin assessments</td>
<td></td>
<td>• One area to document all skin findings</td>
</tr>
<tr>
<td>• Perceived as double documentation</td>
<td></td>
<td>• Satisfied nurses who were documenting it all at one time &amp; place</td>
</tr>
<tr>
<td>• Interventions appeared by manually clicking on buttons</td>
<td></td>
<td>• A high risk assessment automatically generated a “Best Practice Alert” that would visually prompt the nurse to consider adding the Skin Care Plan</td>
</tr>
</tbody>
</table>
### NEW EMR

#### Doc Flowsheets

- **Blood Pressure**: 1143
- **Weight**: 1510
- **Height**: 1649

**Skin**
- **Description**: X

**Skin (WNL)**
- **Temperature / Condition**: Warm
- **Pressure**: Pressure Ulcer
- **Bila heels**: Bila heels
- **Mepilex in...**: Mepilex intact

**Braden Q > 28 Days of Age (If < 29 days Treat as High Risk)**
- **Mobility**: Very limited
- **Activity**: Chairfast
- **Sensory Perception**: Slightly limited
- **Moisture**: Occasionally m...
- **Friction Shear**: Potential probl...
- **Nutrition**: Adequate
- **Tissue Perfusion & Oxygenation**: Adequate

**Admission (Current) 10/05/10**
- **Date**: 11/17/10
- **Last Filed Value**:

**Device Assessment 1**

**Device Assessment 2**

**Device Assessment 3**

**Device Assessment 4**

**Device Assessment 5**

**Interventions**

**Wound / Incision # 1**

**Wound / Incision # 2**

**Wound / Incision # 3**

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*change the outcome*

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*Cincinnati Children's*
# NEW EMR

**Admission (Current) 11/05/10**

<table>
<thead>
<tr>
<th>Value</th>
<th>Comment</th>
<th>Time Taken</th>
<th>Time Recd</th>
<th>User Taken</th>
<th>User Recd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensory Perception</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moisture</td>
<td></td>
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</tr>
<tr>
<td>Friction Shear</td>
<td></td>
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<tr>
<td>Tissue Perfusion &amp; Oxygenation</td>
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<tr>
<td>Score</td>
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</tr>
</tbody>
</table>

**Braden Q > 28 Days of Age (If < 29 days Treat as High Risk)**

### Braden Skin Assessment 1

- Skin Assessment (WNL): X
- Skin Assessment Location 1: Heels
- Problem Area Due to Pressure: Yes
- Is the area moist?: No

**Exceptions to...**

- Heels
- Yes
- No
### Device Assessment 1

- **Device Assessment (WNL)**: WNL
- **Device 1**
  - Problem Area Due to Pressure: No
  - Is the area moist?: No
  - Blanches?: Yes
- **Device Assessment 2**
  - **Device Assessment (WNL)**: WNL
  - **Device 2**
    - Problem Area Due to Pressure: No
    - Is the area moist?: No
    - Blanches?: Yes
- **Device Assessment 3**
  - **Device Assessment (WNL)**: WNL
  - **Device 3**
    - Problem Area Due to Pressure: No
    - Blanches?: No

### Admission Information

- **Admission (Current)**: 10/05/10
- **Last Filed Value**: 11/17/10
- **Last Filed Values**: 1143, 1510, 1649
# NEW EMR

## Doc Flowsheets

<table>
<thead>
<tr>
<th>Flowsheet:</th>
<th>Body System Assess</th>
<th>Vital Signs</th>
<th>Body System Assessment</th>
<th>IV Fluid/Med Intake</th>
<th>Intake/Output</th>
</tr>
</thead>
</table>

### Admission (Current) 10/05/10

<table>
<thead>
<tr>
<th>Date</th>
<th>Value</th>
<th>Last Filed Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/17/10</td>
<td>1143</td>
<td></td>
</tr>
<tr>
<td>1510</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1649</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Interventions

<table>
<thead>
<tr>
<th>Location</th>
<th>Orientation</th>
<th>Wound / Incision Type</th>
<th>Pressure ulcer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foot</td>
<td>Left</td>
<td>Foot</td>
<td>Pressure ulcer</td>
</tr>
</tbody>
</table>

### Wound / Incision #1

<table>
<thead>
<tr>
<th>Site Closure Method</th>
<th>None</th>
</tr>
</thead>
</table>

## Change the Outcome

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NEW EMR

Based on the Modified Braden Q assessment OR the patient is less than 29 days of age, patient is considered to be at Moderate / High risk for developing pressure ulcers. Consider adding the Skin Care Plan template.

Acknowledge Reason:

[Buttons: Acknowledge, Deferred]

Jump to Patient Plan of Care

[Buttons: Accept & Stay, Accept, Cancel]
Actual/potential impaired skin integrity

Goal: Patient will develop or maintain clean and intact skin.

Indicators of Progress Towards Goal:
Skin is clean and intact, with lack of redness, excoriation, or lesions

1 = Unstable; immediate intervention(s) required
2 = Variable; frequent intervention required
3 = Manageable; requires close monitoring
4 = Stable; with current therapy
5 = Normal/at baseline; problem resolved

Initial Rating: 1 = Unstable; immediate intervention(s) required
Outcome Target Rating: 4 = Stable; with current therapy

Interventions

1. Identify contributing factors
2. Utilize Braden interventions as appropriate
3. Minimize injury from friction
4. Reposition patient as needed
5. Keep skin dry
6. Refer to specialty skin resources as needed
7. Assess need for pressure relieving devices
NEW EMR

- (Neuro-rehab) Receptive Language Impairment
- (Neuro-rehab) Expressive Language Impairment
- (Neuro-rehab) Secondary Language Impairment

**IP Speech: Older Feeding**
- (Older Feed) Swallowing Dysfunction

**Skin**
- Actual/potential impaired skin integrity
  - Patient will develop or maintain clean and intact skin.
    - Assess circulation and sensation of restrained body part
    - Assess skin around devices (i.e. cooling blanket, tubes, splints, restraints) (2)
    - Perform routine skin assessments utilizing Braden and/or Braden Q as (2)
    - Utilize Braden interventions as appropriate (2)
    - Assess incisions/wounds for signs/symptoms of infection
    - Minimize injury from friction (2)
    - Reposition patient as needed (2)
    - Keep dressings intact.
    - Measure wound changes daily as indicated.
    - Assess need for pressure relieving devices (2)

**OT - IP**
- (OT - IP) RANGE OF MOTION IMPAIRMENT
- (OT - IP) Abnormal Muscle Tone
NEW EMR

Goal: Patient will develop or maintain clean and intact skin.
Outcome: Goal Ongoing
Mepilex border to both heels-dry and intact. Up in wheelchair throughout day, being turned at night. Mepilex also on right achilles intact and no drainage noted.

Goal: Patient will develop or maintain clean and intact skin.
Outcome: 3=Progress towards goal
Patient has 2 pressure ulcers at this time, to bilateral heels. Mepilex border dressings intact and will continue to be monitored.

Goal: Patient will develop or maintain clean and intact skin.
Outcome: 4=Progress towards goal
Pt. Has no further skin breakdown to date. Monitoring bilateral pressure ulcer heels by keeping heels floated, changing dressing everyday, turning q2hrs, minimize injury from friction and using pressure relieving devices.

Goal: Patient will develop or maintain clean and intact skin.
Intervention: Assess need for pressure relieving devices
z flo's positioned to float heels off bed
Sharing Housewide Process Measures with Unit Leaders & Staff

Skin Assessment on Admission Run Chart
January 2009 thru November 2010

EPIC Implementation
1/10/10
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