NICU Skin Care

Bringing Practice Guidelines and Injury Prevention Strategies to the Bedside

Marliese Dion Nist, BSN, RNC-NIC
C4B Acute Care NICU Clinical Leader
Objectives

• Explain the impact of skin injury on neonatal ICU patient outcomes.

• Analyze the skin injury risk assessment tools available for the neonatal population.

• Identify the implications of standardized skin rounds for nursing practice and neonatal skin care.
Why Does It Matter?

• Skin injury is a common iatrogenic injury
• Skin injuries are painful
• Pressure injury incidence is a nursing quality indicator
• Medicare and Medicaid have designated pressure injuries as “Never Events”
  • no reimbursement for treatment of these injuries
• Skin injury may contribute to complications:
  – Increased risk for infection
  – Functional abnormalities
  – Permanent scarring
Risk Assessment

Risk Assessments Should…

1) have diagnostic accuracy.
2) have good reliability.
3) be generalizable to the population of interest.
4) be clinically useful.
Risk Assessment Scales for Neonates

- Neonatal Skin Risk Assessment Scale (NSRAS)
  - Measures risk for “skin breakdown” (unspecified)
- Braden Q
  - Measures risk for pressure ulcers (Stage II-IV)
- Neonatal Skin Condition Score (NSCS)
  - Measurement of skin condition, risk could be inferred
# NSRAS and Braden Q

<table>
<thead>
<tr>
<th></th>
<th>Diagnostic Accuracy</th>
<th>Reliability</th>
<th>Generalizability</th>
<th>Clinical Utility</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NSRAS</strong></td>
<td>Sensitivity=83%</td>
<td>r=0.97 for 3 of 6</td>
<td>32 infants GA 26-40 weeks</td>
<td>???</td>
</tr>
<tr>
<td></td>
<td>Specificity=81%</td>
<td>subscales, 3 of 6</td>
<td>84% caucasian</td>
<td>???</td>
</tr>
<tr>
<td></td>
<td>PPV=50%</td>
<td>subscales excluded</td>
<td></td>
<td>???</td>
</tr>
<tr>
<td></td>
<td>NPV=95%</td>
<td></td>
<td></td>
<td>???</td>
</tr>
<tr>
<td><strong>Braden Q</strong></td>
<td>Sensitivity=88%</td>
<td>not measured</td>
<td>322 PICU pts 21 days – 8 yrs avg LOS=6 days</td>
<td>???</td>
</tr>
<tr>
<td></td>
<td>Specificity=58%</td>
<td></td>
<td></td>
<td>???</td>
</tr>
<tr>
<td></td>
<td>PPV=15%</td>
<td></td>
<td></td>
<td>???</td>
</tr>
<tr>
<td></td>
<td>NPV=98%</td>
<td></td>
<td></td>
<td>???</td>
</tr>
</tbody>
</table>

***risk due to medical devices not included in either scale***
Medical Device-Related Injuries (MDR)

- Most common in neonates and very young children
- Staging is same for other pressure injuries, includes mucosal injuries
- Interventions to prevent MDR injuries very different
- Materials to secure medical devices can damage the skin
NSCS

• Measures current skin condition based on erythema, dryness, breakdown (unspecified)

• Validity:
  – Smaller babies were more likely to have poorer skin condition (higher skin scale scores)
  – Babies with higher skin scores had more frequent assessments (i.e. increased LOS)
  – Babies with higher skin scores were more likely to develop an infection

• Inter-rater reliability 65.9%-89% for subscales
Bottom Line:

ALL NICU Patients Are Considered HIGH Risk For Skin Breakdown
Skin Team

Early *Assessment, Intervention, and Reporting* and the Implementation of *Evidence-Based Practices* are key to preventing skin injury!!!!
Why Establish a Skin Team?
Evidence for Skin Teams

• 5 articles describing skin teams
• 17-bed adult SICU, 44-bed adult ICU, PICU, 14-bed neuro ICU/18-bed neuro inpatient unit, 30-bed rehab and med/surg unit

• Purpose:
  – weekly rounds to engage/educate staff (3)
  – assess patients (4)
  – provide PU reports (2)
Evidence for Skin Teams

• Outcomes

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>PU incidence/prevalence</td>
<td>↓</td>
<td>↓</td>
<td></td>
<td>↓</td>
<td>↓</td>
</tr>
<tr>
<td>Use of prevention strategies</td>
<td>↑</td>
<td>NR</td>
<td></td>
<td>NR</td>
<td>NE</td>
</tr>
<tr>
<td>PU documentation compliance</td>
<td>NE</td>
<td>NR</td>
<td></td>
<td>NE</td>
<td>↑</td>
</tr>
</tbody>
</table>

LEGEND 1=Kelleher et al. (2012); 2=Ballard, et al. (2008); 3=Pasek, et al. (2008); 4=McGuinness, et al. (2012); 5=Revello & Fields (2012)

PU=pressure ulcer; NR=not reported; NE=not evaluated
Our Journey Begins

• Jan 2011 – meeting of key players to create a unit-based skin team
  – Nurse Manager
  – Respiratory Manager
  – Neonatal Nurse Practitioner Manager
  – Medical Director
  – WOCN
  – QIS
  – Skin Team Clinical Leader

• Development of the Key Driver Diagram
Establishing the Skin Team

Specific Aim

- Capture J4 Unit skin assessment data with a 90% accuracy between audit sheets and Epic charting by June 30, 2011

Sub-Aim

- Complete integration roll-out schedule for remaining Neoservices units by June 30, 2011

Key Drivers

- Cultural acceptance of skin injury
- Variability in assessment of skin injury
- Variability in reporting of skin injury
- Reporting consistency across all units
- Interdisciplinary assessment approach

Design Changes / Interventions

- Develop training and education on neonatal skin injury
- Determine optimal frequency of assessment activities
  - Develop training for team
    - Assessment
    - Documentation
  - Develop neonate standards to monitor and assess skin condition
  - Create tools to assist the assessment team (Check Lists, Pictures, Process, Etc)
- Develop reporting tools and structure for non-Epic units
- ID interdisciplinary skin team
  - Develop communication plan to inform those not directly on the assessment team
  - Family member participation
Skin Team Goals

1) Create a unit culture that focuses on skin care.
2) Determine the types of skin injuries affecting NICU patients.
3) Increase early recognition of skin injuries.
4) Develop a means for bringing skin education, practice guidelines, and injury prevention strategies to the bedside.
How Do We Accomplish These Goals?

Weekly Skin Rounds!!!!
Establishing the Skin Team

• Team Formation
  – April-June 2011 – identification of team members

• Education
  – April-June 2011 – NDNQI on-line in-service
  – June 28, 2011 – educational Webinar for key players on Neonatal Skin Injury and Pressure Ulcers

• Rounds
  – July 12, 2011-Aug 4, 2011 – training rounds with the WOCN
  – Aug 11, 2011 – Skin Team begins weekly rounds on all admitted patients
## Identified Barriers

<table>
<thead>
<tr>
<th>Obstacle</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived disruption of rounds to nursing routine</td>
<td>1) Standardized time and day for rounds</td>
</tr>
<tr>
<td></td>
<td>2) Staff education on importance of pressure injury prevention</td>
</tr>
<tr>
<td></td>
<td>3) Support from administration and unit leadership</td>
</tr>
<tr>
<td>Knowledge deficits: pressure injury identification and reporting</td>
<td>1) Staff education</td>
</tr>
<tr>
<td></td>
<td>2) Real-time support from skin team members</td>
</tr>
<tr>
<td>Inconsistencies in Documentation</td>
<td>1) Standardized documentation expectations</td>
</tr>
<tr>
<td></td>
<td>2) Staff education</td>
</tr>
<tr>
<td></td>
<td>3) Audits</td>
</tr>
</tbody>
</table>
Methods to Engage Staff

• Regular education
  – “Updates” presentation for all staff
  – Orientation presentation
  – Orientation skin rounds

• In-services

• Bulletin boards

• Emails

• Bedside communication

• Participation in rounds

• Audits
Neonatal Services Skin Audit

- 9 items related to bedside care and documentation

Documentation Audit:
- Skin assessment
- Inspection of skin around respiratory devices with cares
- Sat probe rotation
- Turning schedule
- WOCN consult for Stage II or greater pressure injuries

Bedside Audit/Interview:
- Inspection of skin around medical devices
- Pressure reduction surface
- Occipital pressure relief
- Barrier cream
Skin Team Tasks

- Patient assessment
- Bedside education for staff
- Recommendations for patient care
- Audits
- Documentation and consult orders
- Injury follow-up and reporting
- Enhance Communication among care providers
Keys to Success

• Designated team members
  – NNPs, RNs, Physician, RTs
• Formal training
• Routine, standardized rounds
• Standardized documentation, tracking of injuries, and reporting
## Skin Injuries Record – Prevalence

<table>
<thead>
<tr>
<th>Date</th>
<th>Patients Assessed</th>
<th># Pts w/ Pressure Injuries</th>
<th>Stage of Pressure Injuries</th>
<th># Pts w/ Other Skin Injuries</th>
<th># Other Skin Injuries</th>
<th>Other Skin Injuries</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/19/11</td>
<td>47/47</td>
<td>2</td>
<td>Stage II</td>
<td>8</td>
<td>9</td>
<td>skin tear</td>
<td>stat lock, R foot</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) mask CPAP, R lateral bridge of nose (2) R medial nare</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Stage I/Stage II</td>
<td></td>
<td></td>
<td></td>
<td>R groin</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>skin tears</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>skin tears</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>skin tears</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>erythema w/induration</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>lumbar punctures</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>erythema</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CPAP, R nare</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>IV infiltrate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>R wrist</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>IV infiltrate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) skin tear (2) skin tear</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(1) R arm (2) R foot</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>IV infiltrate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>PAL</td>
</tr>
</tbody>
</table>

---

Nationwide Children's

When your child needs a hospital, everything matters.
### Pressure Injury Record – Incidence

<table>
<thead>
<tr>
<th>MRN</th>
<th>Pressure Injury</th>
<th>Date Assessed</th>
<th>Pt Care Summary Documentation</th>
<th>Wound Consult</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stage II</td>
<td>8/9/11</td>
<td>no</td>
<td>8/11/2011</td>
<td>R temporal scalp r/t EEG electrode</td>
</tr>
<tr>
<td></td>
<td>Stage II</td>
<td>8/23/11</td>
<td>no</td>
<td>8/23/2011</td>
<td>R lateral nare r/t CPAP</td>
</tr>
<tr>
<td></td>
<td>suspected deep tissue injury</td>
<td>9/6/11</td>
<td>no</td>
<td>9/6/2011</td>
<td>L occiput</td>
</tr>
<tr>
<td></td>
<td>suspected deep tissue injury</td>
<td>9/6/11</td>
<td>no</td>
<td>9/6/2011</td>
<td>midline occiput</td>
</tr>
<tr>
<td></td>
<td>Stage I</td>
<td>9/18/11</td>
<td>*</td>
<td>not needed</td>
<td>L elbow</td>
</tr>
<tr>
<td></td>
<td>suspected deep tissue injury</td>
<td>9/20/11</td>
<td>*</td>
<td>9/21/2011</td>
<td>R forehead</td>
</tr>
<tr>
<td></td>
<td>suspected deep tissue injury</td>
<td>9/20/11</td>
<td>*</td>
<td>9/21/2011</td>
<td>L cheek</td>
</tr>
<tr>
<td></td>
<td>Stage II</td>
<td>9/20/11</td>
<td>no</td>
<td>9/21/2011</td>
<td>R lower nare</td>
</tr>
<tr>
<td></td>
<td>suspected deep tissue injury</td>
<td>9/20/11</td>
<td>*</td>
<td>9/21/2011</td>
<td>L forehead</td>
</tr>
<tr>
<td></td>
<td>suspected deep tissue injury</td>
<td>9/22/11</td>
<td>*</td>
<td>9/22/2011</td>
<td>R knee</td>
</tr>
</tbody>
</table>
Rounds Summary 4/15/2014

Unit Census: 38

Patients Assessed: 37 or 97.3%

Pressure Injuries Found: 3

Patients Affected: 2

Pressure Injury Prevalence on: 5.4%

Description of Pressure Injuries:

<table>
<thead>
<tr>
<th>Date</th>
<th>Stage</th>
<th>Location</th>
<th>Cause</th>
<th>Comment/Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>PU XXXX, photo 4/3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PU YYYY/1, PU YYYY/2, photos 4/9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pressure Injury Prevalence for 4/9/14-4/15/14

New Pressure Injuries: 0
Skin Rounding Data

• Determined PU incidence in the neonatal population

• Established stable platform on which to build PU Prevention Program
C4B Pressure Ulcer Incidence

Dates

0 1 2 3 4 5 6 7 8 2009 2010 2011 2012 2013 2014

*Centerlines reflect specified baselines. Some data points in baseline period(s) were explicitly excluded. So plotted centerline(s) will not reflect these points.
The biggest challenge for Neonatal Services = CPAP!!!!
**SMART AIM**

Reduce the incidence of Stage II or greater pressure injuries among C4B NICU patients from 2.6/1000 patient days in 2013 to 2.08/1000 patient days in 2014 (20% decrease)

**GLOBAL AIM**

Improve C4B NICU Skin Care and Prevent Skin Injury

---

**KEY DRIVERS**

- 100% compliance with PU Prevention Bundle
- Consistent patient repositioning with cares
- Early identification of skin compromise r/t CPAP
- Prevention of skin compromise r/t CPAP
- Constant staff focus on skin care and injury prevention
- Appropriate allocation of resources for “at risk” patients

**INTERVENTIONS**

- Revised method for non-compliant follow-up to include verbal and written expectations for improvement
- Staff education on turning, including fresh trach patients and patients with silo’s
- Targeted chart audits of patient repositioning for “at risk” patients
- Improved assessment of skin condition around respiratory devices with cares
- Identification and implementation of injury prevention strategies: Mepilex, Marathon, CPAP mask/prong rotation
- Development of skin newsletter for staff
- Development of a risk assessment tool for neonates

---

**Next Steps**
Interventions to Decrease CPAP Injuries

• Mepilex

• Angel frames to support CPAP tubing
• CPAP rounds (aka “CPAP patrol”)
• Respiratory assessments with every care
Interventions to Decrease IV/Stat Lock Injuries

- stat locks
- armboards, footboards
- trial of different securement devices
- possible re-design of current stat lock
Interventions to Decrease Positioning Injuries

- fresh trach rounds
- turning education
- prophylactic WOCN consults
- ECMO huddle
Implications of the Skin Team to Nursing Practice

• Empowers nurses
• Aligns with the nursing of goal of providing holistic care
• Increases interdisciplinary collaboration
• Functions as a means to provide bedside education and mentoring to staff
• Improved communication with families
Journey to “Zero”

- Neonatal-specific risk assessment
- Trials of various barriers for CPAP
- CPAP survey
- Summer re-education
- CPAP assessment video
- Skin care guidelines
The goal of NICU skin care is......

......beautiful baby skin at discharge!
References


