Working Under Pressure: Evidence-Based Risk Assessment and Pressure Injury Prevention in the Pediatric Intensive Care Unit

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The Braden QD Scale better predicts pressure injury risk in critically-ill children than the Braden Q Scale

**Background**

- **Global problem:**
  - Up to 43% prevalence
  - Up to 27% incidence
  - Significant costs (financial, physical, emotional)

- **Milieu problem:**
  - PICU patients > 2.5 times at risk than other wards
  - Task-heavy setting

- **Population problem:**
  - Physiology: Smaller head size in younger children & immature dermatologic physiology
  - Compromised tissue perfusion & nutrition status
  - Neuromuscular blockade, sedation, exposure to technology and devices (medical and respiratory-related)

**Local Problem**

- **Project Site-specific:**
  - 20-bed general PICU in urban free-standing children’s hospital
  - Upward trend in hospital-acquired pressure injuries (HAPIs) in 2021, 2022, & 2023
  - Upward trend in device-related pressure injuries (nearly 50% injuries in 2023 caused by medical devices)

- **Current practice:**
  - Risk assessment according to policy (Braden Q Scale within 24 hours of admission and once every 24 hours)
  - Wound Ostomy Continence Nurse (WOCN) consult for Braden Q scores ≥ 15
  - “Evidence based” bundled care for those at risk

**Methods**

- **Project framework:** Evidence-based Practice Improvement process model
- **Literature search, critical appraisal, and synthesis congruent with need for pressure injury reduction, highlighting utilization of the Braden QD Scale as best tool for HAPI risk assessment
- **Braden QD Scale utilized in parallel with Braden Q Scale (current practice) in series of PDSA cycles over period of 3 months from October 23, 2023, to January 23, 2024**

**Interventions**

- **Facility IRB guided project to focus on tool utilization rather than directing patient care**
- **Primary intervention:**
  - Implementation of Braden-QD Scale into practice
  - Rationale: Growing body of evidence pointing to medical devices as emerging etiology of pressure injuries
  - Congruent with unit-specific and hospital initiatives
  - Validity & reliability established in pediatric patients (preterm – 21 years)

- **Intervention Process:**
  - Risk assessment per policy (minimal disruption of workflow)
  - Side-by-side comparison of Braden-Q Scale and Braden-QD Scale
  - Risk scoring paradigm shift (Braden-Q ≤ 15 vs Braden-QD ≥ 13)
  - Device tally included in score (Maximum of 8 devices)

**Results**

- **Data from 60 patients (Ages 3 days to 17 years) collected over 90-day period**
- 162 side-by-side measurements:
  - Braden-Q cut-off met 21 times (6 patients)
  - Braden-QD cut-off met 100 times (24 patients)

- McNemar’s Test utilized
  - \( p < 0.001 \) where \( p = 0.05 \)
  - Clinical significance showing Braden QD Scale is a better predictor of PI risk over Braden Q Scale

**Conclusions**

- **Use of most recent evidence-based risk assessment tool for pressure injury reduction should be standard practice along with evidence-based mitigation bundle**
- **Low cost associated with Braden QD incorporation as facility standard of care**
- Work with nursing leaders and stakeholders to implement Braden-QD into system-wide practice
- **Expand collaborative efforts with newly formed skin task force including RN skin champions to change practice based on Braden-QD risk stratification**

**The Braden Q and Braden QD Cut-Off Points**

<table>
<thead>
<tr>
<th>Pressure Injury Present</th>
<th>All</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>Braden Q Cutoff at ≤ 15 or at Risk</strong></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>51</td>
</tr>
<tr>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td><strong>Braden QD Cutoff at ≥ 13 or at Risk</strong></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>36</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>All</td>
<td>57</td>
</tr>
</tbody>
</table>

**McNemar’s Test**

<table>
<thead>
<tr>
<th>Chi-Square</th>
<th>DF</th>
<th>Pr &gt; ChiSq</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.0000</td>
<td>1</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

**Note:** Pressure injury present: 0 = response of no, 1 = response of yes. Col = column.