Breaking Through the WALL to Pain
Assessment Quality Improvement

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Session Summary

This presentation discusses the quality improvement project of an NICU interdisciplinary evidenced-based practice committee of a Level III NICU in northeast Florida using Six Sigma methodology.

Session Objectives

Upon completion of this presentation, the learner:

- will understand the five key stages of Six Sigma methodology;
- will understand the benefits of process flowcharting and performing SWOT analyses in defining a research problem;
- will understand ways to implement change.

References


The Joint Commission: personal email communication April 14, 2009.


**Session Outline**

See handout on the following pages.
Breaking Through the Wall to Pain Assessment

Quality Improvement

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THE WALL

Pain in Infants

- Inherent quality that serves as a signaling system for tissue damage as it is protective and crucial for survival (Stevens and Franck, 2001)

Background Study

- Simons et al documented 20,000 pain-producing procedures of a sample of 151 neonates during the first 14 days of life in a neonatal intensive care unit (NICU). This averaged 196 procedures per infant, or between 12 and 15 procedures per day and less than 35% of these procedures were associated with some form of analgesia (Simons, van Dijk, Anand, Rofhoof, vanLingen, & Tibboel, 2003).

Pain Assessment and Management Guidelines for Practice, 2nd edition

- According to NANN (National Association of Neonatal Nurses):
  - Guideline II-Pain is assessed and reassessed at regular intervals throughout the infant’s hospitalization
  - Guideline V-Pain assessment and management practices should be documented in a manner that facilitates regular reassessment and follow-up intervention
  - (Walden & Gibbins, 2008)

Assessment to Management

- Pain assessment is an essential component of pain management (Walden & Gibbins, 2008)
- Reliable and valid pain assessment is the CORNERSTONE to effective pain management!
**Goal**

- To effectively assess and manage postoperative, procedural, and disease-related pain in hospitalized infants (Walden, 2001; Walden & Gibbins, 2008)

**How?**

- There is currently NO GOLD STANDARD BIOLOGICAL MEASURE FOR INFANT PAIN!

**The Focus for Pain Assessment**

- Physiological indicators of pain (VS, O2 sats, ICP, MAP, HR variability, skin color)
- Biochemical indicators of pain (cortisol, epinephrine, norepinephrine, glucagon, aldosterone, insulin)
- Behavioral indicators of pain (cry, muscle tone, behavioral state changes, body movements, facial expression)
  - (Warnock & Lander, 2004)

**Clinical Question**

- For an infant in a level III NICU in Northeast Florida, is the current pain assessment tool, the Neonatal Infant Pain Score (NIPS), the most appropriate and evidence-based infant pain assessment tool when compared to other tools recommended by the National Association of Neonatal Nurses?

**Framework**

- Six Sigma methodology uses 5 key stages:
  - Define
  - Measure
  - Analyze
  - Improve
  - Control
Define Phase

- **Objective:** To identify and/or validate the improvement opportunity
- **Activities:**
  - Committee survey on pain assessment in our NICU
  - PowerPoint presentation of history of pain and the development of the pain pathways in the infant
  - Development of an overall theme aim statement for the project

Committee Survey

- Do infants experience pain?
- How do you know that an infant is experiencing pain? (List factors that you use to determine if an infant is in pain)
- At what point(s) during the NICU stay do you witness an infant experiencing pain? (List specifically)
- What pain scale is currently used in our NICU?
- What are the individual parameters of the NICU pain scale?
- How does one interpret the total pain score?
- How often do you do a pain assessment in a shift?
- What guides how many pain assessments that you do in a shift?
- Do you consistently report an abnormal pain score to a Neo NNP or PA-C?
- What are your results of reporting an abnormal pain score?
- Do you currently teach our NICU parent(s) or caregivers about pain?

Results

- 19 surveys completed
- All agreed infants experience pain
- Both behavioral and physiologic signs were known by nursing
- Understood when an infant may experience pain
- 74% knew name of current pain scale used
- No consistency in knowledge of parameters of pain scale
- Extreme variability in how to interpret pain score
- Pain assessments only done once per shift
- 79% of RNs consistently report an abnormal pain score
- Extreme variability outcomes of reporting abnormal score
- No consistency in parent teaching

Theme Aim Statement

- We aim to improve the accuracy, functionality, and consistency of pain assessment of the neonate.
- The process will end with a recommendation of a pain assessment tool to the NICU Steering Committee.
- It is important to work on this now because we will then be one step closer to providing appropriate pain management for the critically ill neonate.

Measure Phase

- **Objective:** Map process
- **Activities:**
  - Workflow analysis of the current process for pain assessment in our NICU
  - SWOT analysis of current process

Current Pain Assessment Process Flowchart
**SWOT Analysis of Current Process**

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse care</td>
<td>Current pain assessment tool</td>
</tr>
<tr>
<td>Good assessment skills</td>
<td>Lack of pain management protocol</td>
</tr>
<tr>
<td>Realization of the importance of pain assessment</td>
<td>Some physicians not engaged in pain management</td>
</tr>
<tr>
<td>Some physicians are proponents of pain management</td>
<td>AIR audits reveal high scores</td>
</tr>
<tr>
<td>AIR audits reveal high scores</td>
<td>Lack of knowledge of specific pain medications and the pharmacokinetics of pain medications</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>TJC initiative for pain assessment/management</td>
<td>Lack of buy-in of staff, physicians, parents</td>
</tr>
<tr>
<td>Empower NICU interdisciplinary team to develop standardized process for pain assessment</td>
<td>Possible increase of time infant on a ventilator</td>
</tr>
<tr>
<td>Performance improvement</td>
<td>Perception of addiction</td>
</tr>
<tr>
<td>Improve parent satisfaction scores</td>
<td>Nurses not taking time to correctly score</td>
</tr>
<tr>
<td>Increase reporting of abnormal pain scores</td>
<td>THE INTERPRETATION OF THE SCORE IS SUBJECTIVE!</td>
</tr>
</tbody>
</table>

**Guidelines Reviewed**

- The Joint Commission
- The International Evidence-Based Group for Neonatal Pain
- American Academy of Pediatrics
- WCH Policy regarding pain assessment
- 2008 NANN Guidelines

**Infant Pain Assessment Tools**

- Neonatal, Pain, Agitation, and Sedation Scale (N-PASS)
- Pain Assessment Tool (PAT)
- Scale for Use in Newborns (SUN)
- Bernese Pain Scale for Neonates (BPSN)
- Premature Infant Pain Profile (PIPP)
- CRIES: Neonatal Postoperative Pain Assessment
- Neonatal Infant Pain Scale (NIPS)

**Weaknesses of Current Tool-NIPS**

- The pain score is NOT adjusted for the gestational age of the infant
- It does not address sedation
- Its primary use is for procedural pain only
- THE INTERPRETATION OF THE SCORE IS SUBJECTIVE!

**Analyze Phase**

- Objective: Identify specific problem(s)
- Activities:
  - Review Pain Assessment and Management, Guideline for Practice, 2nd edition (NANN, 2008)
  - Group assignments to research the literature for information from our local, national, and international governing bodies and recommended infant pain assessment tools
  - Presentation by each group of info, including SWOT analysis
  - Development of matrix of all SWOT analyses
  - Review of matrix by committee

**Improve Phase**

- Objective: Evaluate and select solution
- Activities:
  - Committee recommended further review of N-PASS and PIPP tools
  - Research protocol for comparison of ease of use of N-PASS and PIPP received IRC approval and NICU Steering Committee approval
Comparison Study

• Purpose: To compare ease of use of the PIPP and the N-PASS
• Sample: 32 NICU RNs, not currently working on the project
• Research Plan:
  - Each participant was presented information regarding each pain assessment tool, then assign pain scores for 2 case studies
  - Completed questionnaire rating ease of use for each tool

Results

<table>
<thead>
<tr>
<th>Question</th>
<th>Mean PIPP</th>
<th>Mean N-PASS</th>
<th>Test statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.055</td>
<td>1.969</td>
<td>t(62)=1.34, p=0.1861</td>
</tr>
<tr>
<td>2</td>
<td>1.656</td>
<td>2.094</td>
<td>t(62)=1.65, p=0.1047</td>
</tr>
<tr>
<td>3</td>
<td>1.406</td>
<td>1.500</td>
<td>t(62)=0.52, p=0.6019</td>
</tr>
<tr>
<td>4</td>
<td>1.344</td>
<td>1.677</td>
<td>t(61)=1.43, p=0.1566</td>
</tr>
<tr>
<td>5</td>
<td>1.563</td>
<td>1.452</td>
<td>t(61)=-0.59, p=0.5552</td>
</tr>
</tbody>
</table>

The results are quite similar. Statistically, neither instrument is significantly different. All the means are between 1 and 2. Statistically, there would be no large difference if we continued to collect data. (Question presented to statistician)

N-PASS vs PIPP

Please rate each statement below on a scale of:
1=strongly agree
2=somewhat agree
3=undecided
4=somewhat disagree
5=strongly disagree

• This pain scale was easy to use.
• This pain scale was not time consuming.
• This pain scale is appropriate to assess pain.
• This pain scale is able to differentiate the level of pain

Final Question

• Now that you have sampled using both tools, which tool would you like to see used in our NICU?
Final Decision

- The RNs preferred the N-PASS
  - calculate both a pain AND a sedation score
  - pulls into play more assessment skills, therefore giving a more comprehensive picture of the infant EVEN THOUGH they stated it may take MORE time to use, require MORE in-depth training, and have a GREATER learning curve.

Control Phase

- Objective: Implement change
- Activities:
  - Presentation of recommendation to NICU Steering Committee for approval
  - Development of eLearning module for staff training
  - Staff training
  - Audits on use of tool after Go-Live
  - Development of tool for EMR use

Go-Live for N-PASS

- Approval for change of tool on current flowsheet on downtown campus
- Go-Live was November 16, 2010 for Level III NICU on downtown campus
- Began working with IS department for EMR development
- Audits:
  - Are pain assessments being done with every set of vital signs?
  - Does overall scoring seem appropriate?

Further Work

- Continued audit
  - For those with N-PASS scores >3 during FY 2012 in NICU, average 66.4% received pharmacologic intervention
  - Re-inservicing re: calculation of sedation score
  - Introduce staff to N-PASS tool in the EMR
  - Overall hospital policy change for pain assessment to be considered 5th vital sign
  - Audit NICU FY 2012- 93.2% completed
- Compare cost of pain/sedation meds used in the NICU before implementation with after implementation of N-PASS