Pain Management in the NICU: An Interdisciplinary Quality Improvement Approach Yields Lasting Effects

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Problem: Pain management in the neonatal intensive care unit (NICU) remains inadequate despite advocacy and education for improvement.

Purpose: To study the impact of an interdisciplinary team approach to improving post-operative pain management in a large tertiary NICU.

Methods: The study followed the Plan, Do, Study, Act model for improvement (PDSA). We identified a need to improve post-operative pain management in the NICU. We predicted that implementing a plan to educate staff and standardize management would result in better assessment and treatment of pain. A real-time chart audit was conducted to collect data on a convenience sample of 50 post-operative cases in the NICU. The team met weekly to review cases and consider ideas for improving pain management. Following the initial audits of care, the team devised a post-operative pain management guideline utilizing pre-emptive pain management as a continuum from intra-operative anesthesia/analgesia. Recommendations included continuous intravenous fentanyl infusion, "prn" boluses of fentanyl for breakthrough pain, scheduled acetaminophen, and regular pain assessment and re-assessment using the N-PASS scale.

Results: Following the initial 50 cases, 2 more sets of 50 charts were reviewed at 6 month intervals as the team continued to target education and standardization. The project has produced a number of clinically useful tools (a physician computer order-entry set for nursing assessment and prescriptive use of fentanyl and acetaminophen), an Expected Duration of Pain Table (describing the anticipated duration and severity of pain management for 17 common operative procedures in NICU patients), and a data collection tool for ongoing chart audits. Improvement has been noted in a number of areas including documentation, use of acetaminophen, and a decrease in the use of anxiolytics. Resistance to change has been overcome as improvement has been sustained for 2 years. Additional derivative effects have included the revision of a pre-operative checklist and creation of a post-operative checklist for NICU nurses, and the establishment of a procedural pain management protocol for the use of topical anesthetics (+/- a systemic opioid adjunct) for intramuscular injections, percutaneous central lines, lumbar punctures, and peripheral arterial lines.

Conclusions & Implications: We conclude that a collaborative interdisciplinary team approach results in better post-operative pain management. The consistent use of the PDSA model has yielded desirable and lasting results. This experience is part of an ongoing quality improvement process within the Children's Hospital with generalizability to a number of other clinical settings. Further attention to yet unanswered questions (e.g. the impact on post-operative ventilator time) is being addressed in ongoing work.

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Learner Objectives:
1. Recognize the need to study pain management in the NICU in a rigorous manner.
2. Understand the benefit provided by the use of an interdisciplinary team.
3. Understand the quality improvement PDSA approach to inquiry and change.