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Abstract Title:

Optimizing Placental Transfusion Benefit by Targeting Three Minutes of Delayed Cord Clamping at Birth

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Abstract Description:

Background: Anesthesia and surgery place significant stress on neonatal physiology. Lack of timely recognition and management may contribute to adverse outcomes.

Aim: Increase the percentage of infants returning to neonatal intensive care unit from operating room (OR) with all postoperative management scores (POMS) within target range from baseline median of 33% to 85% by December 2018 and sustained this improvement for 12 months (December 2019).

Methods: We enrolled in the Children's Hospital Neonatal Consortium STEPP IN Next STEPPs project in April 2017. Baseline data including post-op temperature, pH, pCO2 and blood glucose levels (within an hour of returning to NICU from operating room) were collected from March to June 2017. Credit was given if all four measurements were within target range (temperature 36.1-38 C, pH 7.2-7.5, pCO2 31-75mm Hg, glucose 46-200mg/dl). A multi-disciplinary team helped create a perioperative improvement bundle (PIB). Key processes were tested in multiple PDSA cycles beginning in July 2017. The first PDSA cycle (P1) focused on structured perioperative handoffs (POH) with anesthesiologists receiving real time feedback. Focus changed to glucose control in P2 and uniform adoption of PIB in P3. P4-6 focused on efficiencies in PIB application and data collection.

Results: From baseline median POMS of 33%, significant improvement to new median of 57% was achieved as a result of P1 interventions (Figure) with decreased post-op hypothermia and acidosis contributing to gains. This gain was sustained during P2 with decreased post-op hyperglycemia as a result of new perioperative intravenous fluids guideline. Further gains with

median improving to 76% was reached during P4 with improvements in all four POMS. These gains were sustained during P5 and 6.

Discussion: Addressing four physiologic variables was a challenge since these could be affected by multiple factors. Understanding the importance of postoperative stability was key in aligning multiple disciplines in NICU and OR. POH tool provided structured communication and real time feedback. Multi-center collaboration with intraoperative glucose infusion guideline led to improved glucose control. We struggled with audit sheets completions and returns. Nurse education and process mapping led to improvement. While we have not reached our goal of 85% (POMS within range), we are encouraged to see significant improvements

Next steps: Continue emphasizing importance of perioperative physiologic stability during POH. We will refine PIB in a variety of surgical conditions in infants with different levels of maturity with appropriate guideline modifications. Our next focus will include optimizing postoperative pain in infants.