Reducing Variability of Fluid Management During the First Three Days of Life for Premature Infants in the Intensive Care Nursery (ICN)

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IRB Number (if applicable): N/A

Describe role of Submitting/Presenting Trainee in this project (limit 150 words):
I, Jacob Ward DO, am the primary investigator of this project and collaborated with a group to create a plan for data collection and its analysis.

Problem Statement/Question, Background/Project Intent (Aim Statement), Methods (include PDSA cycles), Results, Conclusions limited to 500 words

Problem Statement/Question:
At our institution we found wide variability in and a lack of an evidence-based standard for fluid management in premature infants.

Background/Project Intent (Aim Statement):
Excessive fluid intake in premature infants during the first week of life increases the risk of adverse events and overall mortality. Fluid restriction is recommended to help decrease morbidity and mortality in this patient population. We aimed to improve the fluid management of premature infants born < 29 weeks gestation admitted to our intensive care nursery (ICN) by implementing a fluid restriction protocol with the goal of >70% compliance over a 16-month period.

Methods (include PDSA cycles):
Institution of daily weights started at beginning of baseline period. In April of 2021, we implemented a fluid restriction protocol. Interventions during the 16-month implementation period included education, sharing of protocol with providers, and posting protocol on workstations. Outcome measures for day of life 1-3 (DOL1-3) were: 1) order compliance per protocol total fluid volume (TFV) restriction, and 2) if TFV protocol plus an additional 20ml/kg/day buffer was administered. Six process measures were like

our outcome measures but stratified by DOL 1, 2, and 3. Balancing measures were: 1) maximum percentage of birth weight lost, and 2) days required to return to birth weight. Control charts measured impact over time.

Results:

Sixty-three infants were included. Patients who died prior to DOL 3 and those admitted >6 hours of life were excluded. No patients met protocol for our outcome measures during baseline (n=6). During the implementation period, 24.6% (n=14) and 19.2% (n=11) met protocol for outcome measures 1 and 2, respectively. Outcome measures showed initial improvement which was not sustained (Fig. 1 & 2). Process measures identified worsening compliance each successive day. Days back to birth weight balancing measure was unchanged while maximum percentage birth weight lost worsened toward the end of the study when protocol compliance waned (Fig. 3a & 3b).

Conclusions:

We did not meet our goal of >70% compliance with the fluid restriction protocol. Future work will address waning compliance with each successive DOL and identify reasons for deviation from protocol. As compliance improves, we will explore associations between fluid management and patient outcomes.