AAP DISTRICT VIII SECTION ON NEONATAL PERINATAL MEDICINE

2021 ANNUAL CONFERENCE **QUALITY IMPROVEMENT** ABSTRACT SUBMISSION FORM

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Signature: ___ Rebecca Shay _____ Date: __3/2/2021____

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DEADLINE FOR RECEIPT OF ABSTRACT IS FEBRUARY 19, 2021. Submissions will be accepted for either poster or oral presentation. Authors will be notified of acceptance and format for presentation (poster or poster symposium) by **March 12, 2021.**

Title: A Quality Improvement Initiative to Standardize Premedication for Non-Emergent Neonatal Tracheal Intubations in a Tertiary and Quaternary Care Neonatal Intensive Care Unit

Authors: Dr. Rebecca Shay, Ms Blair Weikel, Dr. James Barry, Dr. Theresa Grover

Institution: University of Colorado Hospital and Childrens Hospital Colorado

Background: Adverse events are common during neonatal tracheal intubation (TI) and may be related to inexperience of the intubating provider, clinical urgency of the procedure, breakdown in multidisciplinary communication, inadequate premedication and multiple intubation attempts. A standardized premedication approach can diminish pain and discomfort, lessen physiologic instability, and assist in a timely and successful procedure.

Aim/Objective: The primary aim for the project was to increase the use of standardized, evidence-based premedication for non-emergent neonatal TI by 30% from baseline over a six-month period and sustain for six-months. The secondary aim was to reduce the incidence of physiologic instability associated with non-emergent neonatal TI in our units.

Planning/studying the intervention (PDSA cycles): At the University of Colorado Hospital (UCH) NICU and Children's Hospital Colorado (CHCO) NICU, we recognized, after literature and internal baseline data review, that we were not optimizing our approach to non-emergent neonatal TI. In both institutions, non-emergent neonatal TI were defined as intubations in which the infant is documented to have vital signs within normal limits (>90% oxygen saturation and >100 heart rate) prior to the first procedural attempt. An informal survey of all provider groups demonstrated that administration of premedication for non-emergent neonatal TI was inconsistent and that standardization was universally desired. A retrospective chart review was conducted to obtain baseline data on non-emergent neonatal TI at both NICUs from January 1, 2018 through June 30, 2019. At baseline, there was significant variability in the use of medications for non-emergent neonatal TI. The most frequently used medications were atropine and fentanyl at UCH and atropine with either fentanyl or propofol at CHCO. Use of propofol was reserved for older, larger infants. For the purpose of this study, these evidence-based premedication regimens were termed our 'preferred regimens'. In addition, our number of attempts necessary to successfully intubate and rates of physiologic instability associated with neonatal intubation appeared higher than reported national data. Beginning July 1, 2019, we initiated the project intervention phase by implementing standardized guidelines for non-emergent neonatal TI that included standardized medication protocols that were unique for each unit. We created and implemented tools including 1) laminated intubation guidelines that were placed in airway boxes and code carts at each institution and 2) TI medication order sets for the electronic medical record system (Figure 1). We held monthly meetings to educate providers on the purpose of the project and to share progress. These meetings provided a dedicated format to elicit and provide feedback with all providers.

Measures (Process and outcomes indicators): Outcome measures included compliance with standardized premedication, number of intubation attempts, and occurrence and severity of bradycardia and desaturation. Medication side effects of chest wall rigidity and normal saline provision for hypotension within twenty-four hours from the time of the procedure were included as balancing measures.

Analysis/Outcomes/results (run or control charts, changes in delivery process, outcomes, balancing measures): 387 intubations were reviewed. Provision of recommended premedication increased by 36% and 75% at the level III and IV units, respectively. Decreased frequency of bradycardia during intubation (p=0.0003) occurred in the level III unit. A reduction of intubation attempts (p=<0.001), improvement in first-attempt intubation success (*p*=<0.001), and decreased frequency of bradycardia (p=0.01) and desaturation (p=0.02) during intubation occurred in the level IV unit.

Summary/Discussion: This study demonstrates the ability to improve compliance with a standardized premedication approach for non-emergent neonatal intubation and the potential for improved patient safety outcomes. Our study adds the realistic component of feasibility as well as challenges faced while simultaneously attempting to improve care at more than one academic affiliated NICU.