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## Learning from the Past: A Novel Approach to Reducing Unplanned Extubations in the Neonatal ICU

Yonatan Kurland

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## Quality Improvement Abstract Title

**Submitting/Presenting Author (must be a trainee):** Yonatan Kurland  
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Medical Student  
 Resident/Psychology Intern  
 Fellow

**Primary Mentor (one name only):** Dena Hubbard, MD  
**Other authors/contributors involved in project:** Eugenia Pallotto, MD

**IRB Number (if applicable):**

**Describe role of Submitting/Presenting Trainee in this project (limit 150 words):**

Trainee collaborated with mentors to design intervention. Trainee was primarily responsible for implementation including collaboration with IT, designing and implementing changes to unit workflow, education of medical staff, monitoring of intervention. Trainee was primarily responsible for writing abstract.

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

**Problem Statement/Question:**

Unplanned extubations are the fourth most common adverse event in the NICU and can lead to airway trauma, intraventricular hemorrhage and cardiovascular collapse. In our unit, they are more common in neonates of low gestational ages.

**Background/Project Intent (Aim Statement):**

The objective of this quality improvement project is to decrease unplanned extubations in a Level IV NICU to an annual rate of <1 per 100 ventilator days by December 2020.

**Methods (include PDSA cycles):**

We hypothesized that increased awareness of historical ETT position would both prevent unnecessary ETT position adjustments and encourage prophylactic adjustments to adjust for significant weight gain or loss. In December 2019, we implemented a novel intervention to provide readily accessible graphs of historical ETT tube position in each neonate with corrected gestational age <32 weeks. In successive cycles, we provided education to all members of the multidisciplinary team, we enlisted the Information Technologies Department to create an online application to easily print the relevant information, and we collaborated with unit managers to devise a

sustainable and minimally disruptive change to unit workflow to ensure updated graphs were available at the bedside at every shift.

**Results:**

UPE rates in 2019 prior to the intervention were 1.0 events per 100 vent days. In the 12 months following the intervention and refinements, the overall UPE rate decreased to 0.7 per 100 vent days. Balancing measures included the frequency of tube position changes, tube re-taping or chest x-rays which did not change or showed a decrease over the study period.

**Conclusions:**

By providing ready access to information on historical ETT position, our unit fostered an environment of communication & safety with a sustained and decreasing rate of unplanned extubations. This intervention helped to identify neonates at high-risk before an unplanned extubation occurred so that medical providers could intervene preventively. By collaborating with Information Technologies and unit managers, we were able to devise an approach that is sustainable and with only minimal alterations to unit workflow.