Reducing Unplanned Extubations in the NICU

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Background

- Endotracheal (ET) tube provides a stable airway for critically ill neonates on mechanical ventilation.
- Unplanned extubation (UE) is the unintended removal or dislodgement of the ET tube.
- UEs are a common occurrence in critical care patients of all ages, with incidences reported from 0.14 to 6.6 per 100 ventilator days.
- Neonatal intensive care units (ICU) have a higher rate than those in pediatric or adult critical care units, likely due to anatomical differences in very small infants.
- Recent studies have set a target of ≤1.0 UEs per 100 ventilator days as a reasonable goal for institutions working to improve their UE rates.
- Our institution's baseline UE rate across the children’s hospital was above this benchmark at 2.5 per 100 ventilator days.

Reducing Unplanned Extubations in a Level IV Neonatal Intensive Care Unit: The Elusive Benchmark

Malharbhar Mahavatch, MD, RN; Eunice Wolff, RN, CN; Mary Ellen Zajac, RN; Brando Navarro, RN; Jennie Basurco, RN; Girija Natanaj, MD

Reducing Unplanned Extubations Across a Children’s Hospital Using Quality Improvement Methods

Sarah S. Kandi, MD; Beth L. Emerson, MD; Michael Hooper, MD; Rebecca Cauberry, RN; Christine J. Bruno, DO; Nancy Commins, RRT; Virginia DeFilippo, RRT; Beth Melachich, MSN, APRN, NNP-BC; Adrienne Loth, APRN; Matthew Grossman, MD

A Quality Improvement Approach to Reduce Unplanned Extubation in the NICU While Avoiding Sedation and Restraints

C. Brian Bortol, MD, MSOF; Thomas Butman, MD, PhD; Gregory Kofenh, MS, MBA; Brandon Kamm, RT, MRA1; Marissa Lavers, MRA, BSN, RN; Leslie Thomas, MSN, APRN, NNP, BC; Ecco Washofsky, BSN, CNP; Edward Shepherd, MD; Julie O'Hara, MD; Louise R. Pinter, MD; Mohammad Wadlow, MD

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Aim is to decrease the unplanned extubation rate from 2.11 to 1.5 per 100 endotracheal tube device days within 6 months.

Unplanned extubation committee (Providers, Nursing, RT’s) March 2023

Best practice interventions
Methods

- Multiple plan-do-study-act cycles were performed to address key drivers.

- Important interventions focused on:
  - Airway cards were placed at the bedside of all patients (Staff education regarding 2 providers during bedside activities)
  - Standardized documentation with anatomic identifier “at the gum” for ETT placement
  - Implementation of an AM/PM shift change airway checks by the respiratory therapist
  - New securing measures of the ETT to the Neobar

- Process measures included immediate root cause analyses for UE events and using the endotracheal tube new securing technique.

- The primary outcome was the UE rate per 100 intubated days.
Results: Unplanned Extubations in the NICU

PDSA 1 - Airway Cards at Bedside
- Standardized anatomic identifier

PDSA 2 - Airway Checks per Shift by RT

PDSA 3 - New Securing Technique for ETT
Conclusion

- **Safety Intelligence:** PSN Reports

- **Multidisciplinary Team Review of All Events:** monthly meetings to review the details of each UE and opportunities to improve practice.

- UE events have decreased from **29 to 19** in the last six months.

- Infants born less than <28 weeks gestational age on high-frequency ventilation had a higher incidence of UE. Specific interventions are needed to mitigate this risk.

- **Future Directions:** Merge with Timely Extubation Guidelines QI