Reducing Unintended Extubations in a Surgical NICU

Amy McKenzie[1], BSc, RRT, Valerie Levesque[1], RN MN, Maria Lefebvre[1], RN MN, Chloe Joynt[1,2], MD, MSc
[1]Stollery Children's Hospital, Alberta Health Services, Edmonton AB; [2]Department of Pediatrics, University of Alberta

Aim

A multidisciplinary team in a surgical NICU aimed to decrease the rate of unintended extubations (UE) by employing a multimodal and collaborative approach to preventing, tracking, and responding to UE events in the NICU.

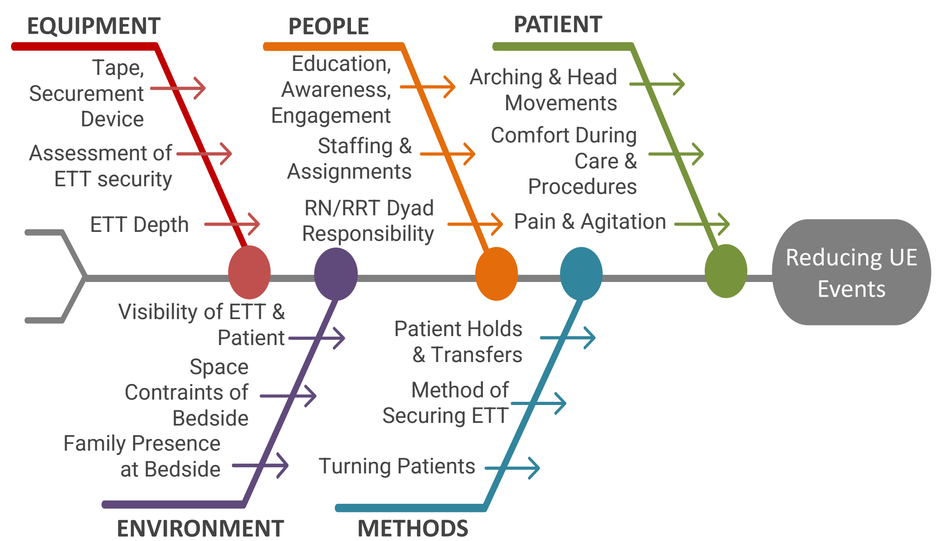
Importance

Unintended extubations in the Neonatal Intensive Care Unit (NICU) are a severe adverse event that may result in negative outcomes for NICU patients, including hypoxia, bradycardia, increased pain and stress, the potential for structural airway damage, and increased ventilator days.

Methods

- A multidisciplinary team consisting of a Registered Respiratory Therapy (RRT) Clinical Lead, Clinical Nurse Specialist, and Neonatologist used quality improvement methodology to guide improvement efforts
- Plan-Do-Study-Act cycles were utilized
- Four main project priority areas:
  - Data accuracy & transparency
  - Standardization where possible
  - Targeted education
  - Timely systems-based review of UE events

Fishbone Diagram



Methods

2017 — Staff Education/Launch
- ETT security – RN hourly check, collaborate with RRT
- RRT presence during patient repositioning
- Patient ETT visibility
- Standing transfers
- Supportive boundaries
- Appropriate mouth care
- # of days since last UE posted in public location
- UE awareness posters
- Report UE events in patient safety reporting system

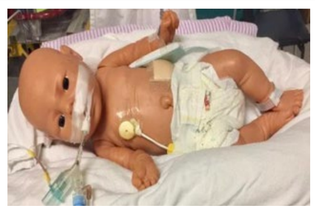
2018 — Reinforce/Revamp Staff Education
- Two person care
- Standardize method of holding ETT/Circuit for repositioning
- ETT placement verification (Last CXR date)
- Reinforcing teamwork
- Alternative Touch Methods
- Document post-event debrief

2019 — Maintenance on New Unit
- Custom positioning aids
- Standardized ETT securement procedure & videos
- UE strategies on QI checklist
- UE RRT Champion Education (Solutions for Patient Safety (SPS))

2020 — Reevaluation and Standardization
- Apparent Cause Analysis (ACA) form created and rolled out
- Post Event Huddles formalized with identified learning points
- Patient Safety Reports required for all UE's
- "Pod chat" RN/RRT discuss ETT concerns beginning of each shirt

2021 — New Single Rooms: Revamping Established Processes (Again)
- Single & double inpatient rooms
- Family bedside poster: Safety During Holds
- Visibility of Patient during care team handover
- Introduction of At-Risk Airway Sign & Information
- RN assignment & break coverage
- Data used to increase baseline RN staffing

Education Highlights



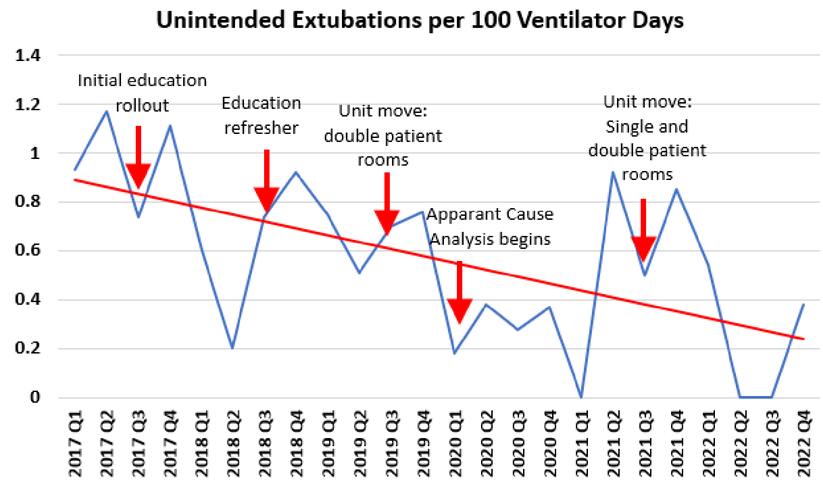
Supportive boundaries and ETT visualization

Hand containment with procedures

RRT/RN dyad with shared responsibility to prevent UE

Standing transfers and Safety during holds

Results



Final evaluation data indicated that annual UE rates decreased 75% from 2017 to 2022

NICU	2017	2018	2019	2020	2021	2022
UE Rate/100 Vent Days	1	0.64	0.68	0.3	0.6	0.25 (75% decrease from project start)

Lessons Learned & Next Steps

LESSONS LEARNED
- Prioritize timely extubation
- Tracheostomy airway care needed to be standardized
- Safety during holds and transfers

Next Steps
- Risk of UE scoring tool
- Standardized bronchoscopy procedure
- Standardized taping method for NJ/NG's with ETT
- Evaluate neck braces for chest x-rays
- Create a patient hold video for caregivers and staff

Acknowledgements: Decreasing the rate of UEs in our surgical NICU was made possible by the diligence and hard work of many of our NICU team members. We would like to highlight the significant efforts that our Solutions for Patient Safety UE Hospital Acquired Condition (HAC) team, clinical nurse educators, and frontline respiratory therapy and nursing staff have put into our UE prevention quality improvement project.