

**Abstract Title:**

Sustained Reduction in Unplanned Extubation: A Neonatal Intensive Care Quality Improvement Initiative

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**Introduction:** Unplanned extubation (UPE) in the neonatal intensive care units (NICUs) is a well-recognized phenomenon that poses significant patient safety, quality control, and financial issues. Although UPE's have been described as common, there has been little research to help identify the patients at highest risk and possible preventable measures.

**Methods:** An ongoing quality improvement (QI) project that spanned a six-year time was performed in a tertiary-quaternary level NICU from May 2008 through April 2014. Data was collected prospectively from bedside staff through interviews in addition to using a report form as part of the QI process. The collected data included: the patient weight (current and birth) and chronological age, corrected gestational age, the mode of ventilation, number of days on the ventilator, time of the event, staff involved and witnesses, circumstances during which the extubation occurred, the need for re-intubation, and several other factors. Data analysis was divided into three time periods: May 2008 –

April 2009 (Baseline, Phase 1), May 2009 – April 2012 (Identification of causes and risk factors with subsequent implementation to standardize care at the bedside and apply quality improvement processes with regard to staff awareness, Phase 2) and May 2012 – April 2014 (All interventions were fully implemented, continued data collection to ensure sustainability, Phase 3). Our interventions were multifactorial and included: a new ETT fixation device (March 2009), mandatory two person attendance for high risk bedside procedures (May 2009), discontinuation of in-line suction (July 2010), and the development of a UPE team lead by a respiratory therapist and a registered nurse that drove the increased awareness among the staff (2011).

**Results:** The project resulted in a consistent and sustainable decline in the rate of UPE; from a baseline of 3.3 to 1.1. The decline was more impressive among extremely low birth weight infants (<1000g) where the UPE rate dropped from 4.3 to 1.2. The low UPE rate was sustained during phase 3. UPE causes included: mechanical issues (24%), handling during routine care (20%), UPE during procedures (8%), or unknown (45%). The formation of the UPE team seemed to have the most significant impact on lowering UPE rate. In terms of re-intubation rate, it decreased from 75% during phase 1, to as low as 25% during the latter part of phase 2 and 45% during phase 3.

**Conclusion:** UPEs can be reduced by identifying and addressing the causes, increasing staff awareness of the associated risk factors and implementing standardized quality improvement processes. Some infants who experience UPEs are stable enough to stay extubated.