

Reductions in Unplanned Extubations

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Introduction

Many infants admitted to the NICU require invasive ventilation through the use of an endotracheal tube. Unplanned or accidental extubation (UE) can be associated with airway injury including scarring and stenosis. The literature suggests that there are many contributing factors for UE such as method of securing the airway, weighing an infant and staffing levels. UE is one quality indicator that is being monitored in our NICU.

Aim

Our aim was to reduce unplanned extubations with a goal of achieving less than 1 UE per 100 ventilated days.

Setting

Penn State Hershey is a Level IV, regional quaternary NICU with outborn infants accounting for 40-45% of annual admissions.

Methods

Data were collected for each UE event including: event date/time, patient weight, patient care activity, and any other comments related to the event. UE rates were also calculated monthly.

An interdisciplinary team (RNs, MDs, & RTs) analyzed the data and developed the following interventions:

- 1. A bundle of potentially better practices
- 2. The use of a commercially available product to secure the ETT
- 3. Increasing the use of noninvasive ventilation







Figure 2 demonstrates which causative factors resulted in approximately 80% of the UE.



Results

The Statistical Process Control Chart (Fig. 1) demonstrates how each intervention affected our UE rate and process variation. A special cause signal prompted a Pareto analysis (Fig. 2) which guided the team to the next area of focus. The recent apparent increase in UE rate may be related to under-sedation of agitated infants, which has prompted staff education and awareness.

Discussion

While the VON network's recently recommended goal of having fewer than 2 UEs per 100 ventilator days has been achieved, our philosophy is that unplanned extubations should be a "never event."

The staff directly caring for the patient who had a UE have begun using real time analysis immediately following the event to facilitate communication, education and identify process improvement opportunities. The Root Cause Analysis Team additionally reviews each event for future staff education.

References

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