Reducing Serious Airway Events Related to Anesthesia: A Quality Improvement Project

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Background

Although serious complications during pediatric anesthesia are less common than twenty years ago, serious airway events continue to occur and lead to patient morbidity, unplanned hospital admission, and escalation of care. Analysis of data for Quality Improvement (QI) purposes indicated that serious airway events were common (2 per 1000 anesthetics) in our practice. Common factors identified included not using muscle relaxants for intubation in infants younger than 3 years of age, and failure to aggressively identify and treat airway obstruction.

Objectives

The smart aim of this QI project was to reduce the incidence of anesthesia related serious airway events by 50% (0.2% to 0.1%). A serious airway event was defined as an airway event related to anesthetic care which led to an unplanned intubation/reintubation, admission to the hospital or ICU, or cardiac arrest.

Methods

A Key Driver Diagram was developed based on departmental feedback. (Figure 1) Three interventions were implemented at our base campus, and an additional intervention was implemented at our outpatient facility (ensuring that “at risk” patients were awake in PACU at the end of anesthesia). Data was collected monthly on the success of each intervention (process outcomes) and the number of serious airway events (outcome measure).

Results

The percentage of cases where atropine and succinylcholine were immediately available increased from 55% to 91% by September 2012 at our base campus, and from 89% to 100% at our outpatient facility. The use of non-depolarizing muscle relaxants for intubation in children <3 years for procedures > 30 minutes increased from 52% to 74% and 14% to 80% at our base and outpatient facilities respectively. The percentage of “at risk” patients that were awake following PACU handoff increased from 79% to 100% at our outpatient facility. During this time period the incidence of serious airway events was successfully reduced to less than 1 per 1000 anesthetics (0.096%).

Conclusion

The use of quality improvement methods was instrumental in identifying factors which might be impacting our incidence of serious airway events and designing interventions to reduce these events. We believe these interventions played a major role in reducing the incidence of anesthesia related serious airway events by >50%.