

THE IMPACT OF AN EARLY EXTUBATION ALGORITHM AND BEDSIDE HUDDLES ON MECHANICAL VENTILATION IN CARDIOVASCULAR SURGERY PATIENTS

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Background

Over 200,000 coronary artery bypass grafting (CABG) surgeries occur in the United States each year. This high-cost procedure consumes more healthcare dollars than any other single surgical procedure in cardiovascular medicine. Throughout the 1960s, routine overnight ventilation was the standard of care for cardiac surgery patients. Over the last 10 years early extubation, specifically ventilation lasting less than six hours, has been established as both safe and cost effective. It is well documented that the use of standardized protocols has the potential to double the number of patients extubated within six to eight hours. In addition to the use of standardized protocols, bedside huddles have been utilized as a means to facilitate coordination of care amongst frontline staff and providers. Bedside huddles have also been shown to be important tools used to improve patient safety and identify variables that lead to adverse outcomes.

Objectives

Through a quality improvement initiative, an early extubation protocol coupled with multidisciplinary bedside huddles, was implemented in an effort to increase the rate of early extubation, identify barriers to early extubation and decrease the rate of prolonged mechanical ventilation.

Methods

This quality improvement initiative involved the creation of an early extubation algorithm for cardiac surgery patients, which was implemented in conjunction with multidisciplinary bedside huddles. These huddles, implemented in July 2016 sought to: confirm previously identified barriers to early extubation, promote communication within the multidisciplinary team, and aid in the development of plans of care to overcome identified barriers. We retrospectively reviewed the charts of patients who underwent CABG surgery at the facility from 02/2015 to 06/2016, which we considered baseline charts and from 07/2016 to 09/2017, which we consider post-implementation.

Results

Preliminary results revealed that the most commonly identified barriers to early extubation were consistent throughout the baseline and post-implementation phase (hemodynamic instability and sedation). Interestingly, in both the baseline and post-implementation phase, about 60% of cases were identified as having no barriers to early extubation. Preliminary review of the post-implementation data shows a reduction in the mean ventilation time as well as an increase in the rate of < 6 hour ventilation and a decrease in the rate of > 24 hour ventilation. Full statistical analysis is pending and will be completed by 03/2018.

Discussion

Full statistical analysis will soon be completed, but preliminary analysis has revealed positive findings. Analysis thus far indicates that after the implementation of an early extubation algorithm and multidisciplinary bedside huddles there was an increase in the number of CABG patients who were extubated in less than 6 hours and a decrease in the number of patients who were extubated in more than 24 hours. These preliminary findings are encouraging as they indicate a move to safer, more effective, quality care for patients receiving CABG. Additionally, there was a decrease in overall mean ventilation hours noted post-implementation. Further analysis is needed to determine why early extubation rates were not consistent with the percentage of cases that were identified as having no barriers to early extubation in bedside huddles. Additional statistical analysis will focus on correlating these findings with other safety indicators, such as reintubations, readmissions to ICU and mortality.

The impact of an early extubation algorithm and bedside huddles on mechanical ventilation in cardiovascular surgery patients

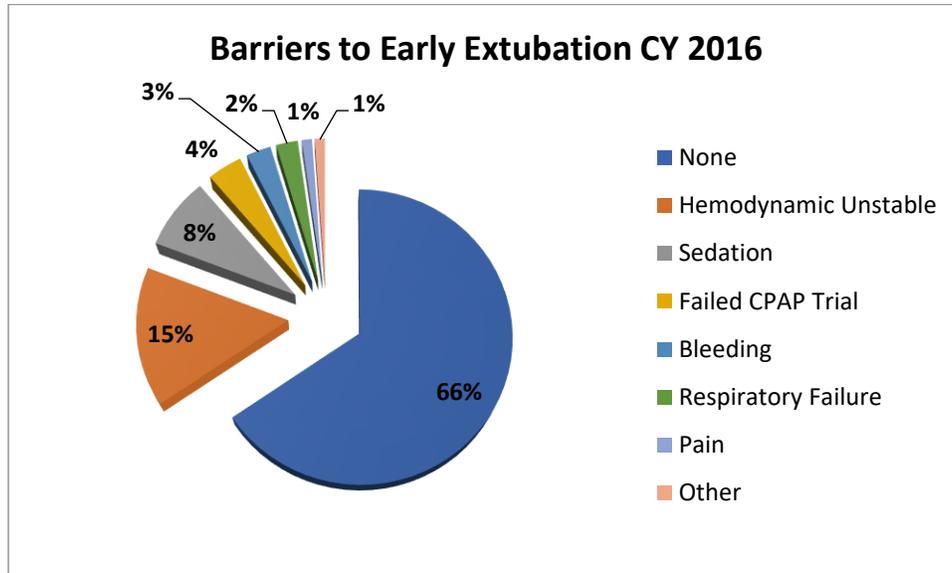


Figure 1. Identified Barriers to extubation in Calendar Year 2016

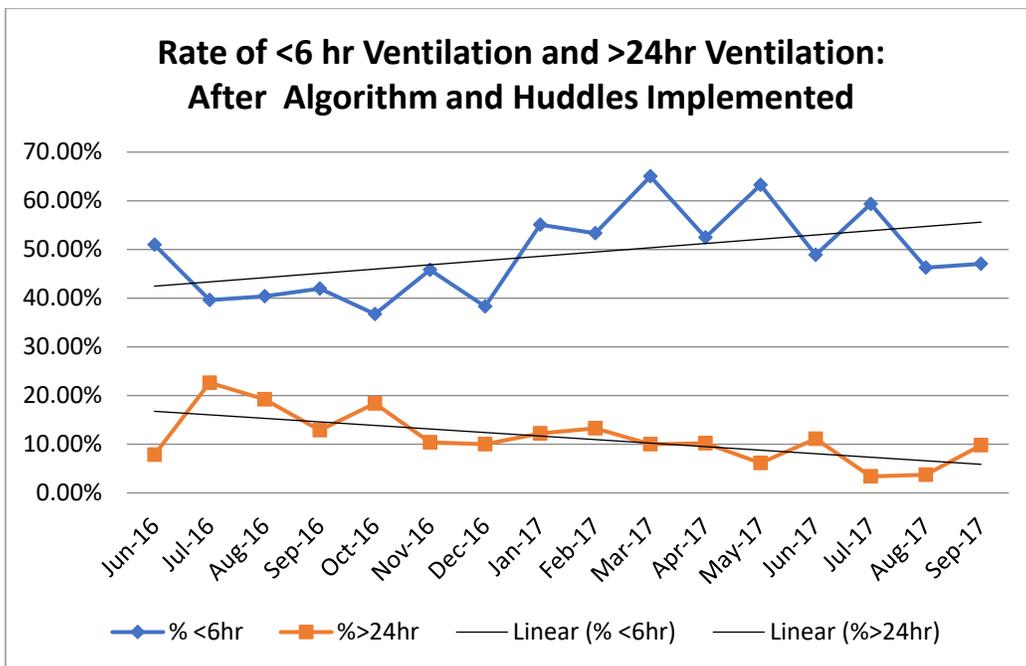


Figure 2. Rate of less than 6 hours ventilation and greater than 24 hours Ventilation after implementation of early extubation algorithm and bedside huddles