# Ventilator Length of Stay Reduction After Isolated Coronary Artery Bypass Grafting: Phase I

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## PURPOSE

To reduce the postoperative total ventilation time by implementing a multidisciplinary post-operative process for patients undergoing isolated coronary artery bypass grafting (CABG).

## BACKGROUND

The Society of Thoracic Surgeons (STS) is a long-standing organization that supports continuous improvement in patient safety and quality (www.sts.org)

The STS Adult Cardiac Surgery Database is used throughout the world to monitor clinical outcomes. The University of Tennessee Medical Center's (UTMC) cardiothoracic surgeons and multidisciplinary team are dedicated to improving overall clinical outcomes. One area of improvement noted was morbidity.

Morbidity is defined in the STS as the absence of the following:

- Cerebrovascular Accident
- Reoperation
- Deep sternal wound infections
- Renal failure, postoperative
- Prolonged Ventilation (greater than 24 hours)

UTMC determined that the prolonged ventilation metric was the area for improvement.

## METHODS

- All isolated CABG patients were evaluated in comparison to established inclusion and exclusion criteria
  - Normothermia, greater than 96◦F
  - Controlled postoperative bleeding, less than 100 mL/hour
  - Acid/Base Balance, minimal pH 7.30
  - Absence of Cardiogenic Shock
  - Absence of Respiratory Failure
- Implementation of tracking tool to facilitate real-time data collection
- Modification of Fitch et al study, multidisciplinary communication board to include goal extubation times and enable visual cueing (Figure 1).
- Extubation 6 hours post surgery end time was utilized as an in-process measure based off of previous recommendations from the STS.

## Figure 1: Communication Board Weaning to Extubation

INITIAL VENT DATE AND TIME_____

IS THE PATIENT A FAST-TRACK CANDIDATE? YES or NO

HAS THE PATIENT BEEN REVERSED? YES or NO
Time of Reversal_____

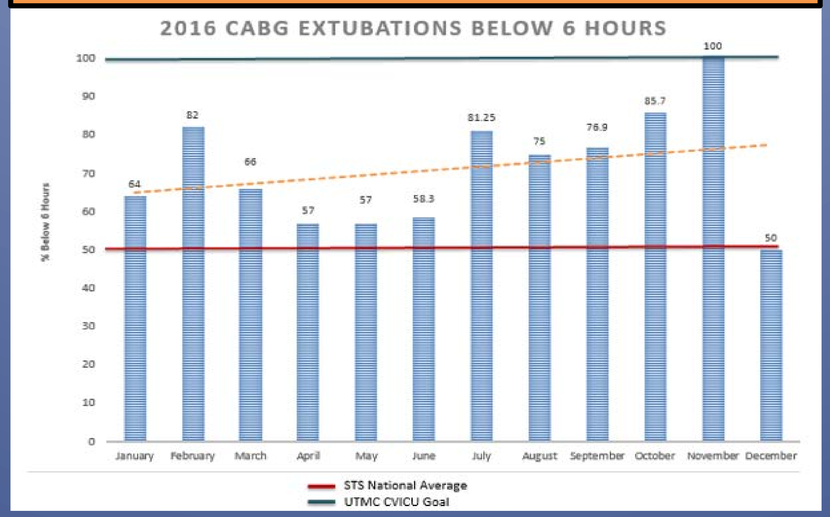
TIME SEDATION STOPPED_____

4 HOURS POST-ARRIVAL_____

*6 HOUR POST-ARRIVAL*_____

- Modified tool from Fitch et al 2014

## Figure 2: Study Results Pre and Post Intervention




## Table: Statistical Results Pre and Post Intervention

| | Mean | Median | Interquartile Range |
|---|---|---|---|
| Pre-Intervention | 27.8 | 5.9 | 8.5 |
| Post-Intervention | 12.5 | 5.2 | 6.3 |

Mann-Whitney U statistical test found significant decrease in Extubation from pre-intervention to post-intervention p= 0.047

## RESULT SUMMARY

- Goal-driven postoperative process assists multidisciplinary team in the delivery of patient-centered care
- Real-time data collection helps to conduct ongoing gap analyses and perform quality improvement initiatives

## CONCLUSIONS

- Multidisciplinary team has improved relationships and increased communication enabling them to develop postoperative plans of care that are patient focused.
- Visual cueing with communication board is an influential reminder of patient's postoperative extubation goals.
- Adding visual cueing assisted in an increase of patients extubated in less than six hours postoperatively from 64% to 78% in 2016.
- Although the percentage of patients extubated in less than six hours increased, the number of patients who experienced prolonged ventilation did not improve.
- It is appropriate to maintain goals of less than six hours as an in-process measure for isolated CABG patients meeting inclusion criteria.
- Future work to mirror six hour process, targeting patients approaching 24 timeframe may prove beneficial to the reduction of prolonged ventilation.

## REFERENCE

1. Society of Thoracic Surgeons (STS), (2017). http://www.sts.org/quality-safety/performance-measures/descriptions#CABGCompositeScore
2. Fitch, Z. W., Debesa, O., Ohkuma, R., Duquaine, D., Steppan, J., Schneider, E. B., & Whitman, G. J.R. (2014). A protocol-driven approach to early extubation after heart surgery. *Journal of Thoracic and Cardiovascular Surgery.* April, 2014; (147)4: 1344-1350.

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