



Decreasing Postoperative Prolonged Ventilation Rates in Michigan: A Quality Improvement Initiative Implemented by the Michigan Society of Thoracic and Cardiovascular Surgeons (MSTCVS) and Blue Cross Blue Shield of Michigan (BCBSM) Quality Collaborative

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BACKGROUND

The Michigan Society of Thoracic and Cardiovascular Surgeons (MSTCVS) and Blue Cross Blue Shield of Michigan (BCBSM) Quality Collaborative is a statewide physician led “pay for participation” quality collaborative partially funded by Blue Cross Blue Shield of Michigan. Thirty three adult cardiac surgery programs throughout the state voluntarily participate in this collaborative.

The quality improvement collaborative method brings together a group of participating (“collaborating”) health care delivery organizations and guides them in studying a specific health care quality problem, designing and implementing specific solutions, evaluating and refining these solutions, and disseminating findings to other organizations.

Eight National Quality Forum (NQF) quality indicators for coronary artery bypass surgery including post operative prolonged ventilation have been selected by the MSTCVS Quality Collaborative as the focus of its quality improvement initiatives. Evidence has emerged suggesting that early extubation after cardiac surgery reduces the length of intensive care unit (ICU) and hospital stay, minimizing costs without compromising patients’ clinical outcomes.¹

Seven MSTCVS Quality Collaborative participants were above both the Michigan as well as the National STS mean for post operative prolonged ventilation in 2005. These seven programs were the focus of aggressive quality collaborative processes intended to reduce the prolonged ventilation rates in their coronary artery bypass patients.

METHODS

Using regional data from the Society of Thoracic Surgeons (STS) Adult Cardiac Surgery Database, “best practice” programs with low prolonged ventilation rates were identified. An analysis of the processes and extubation guidelines and protocols from these programs resulted in a set of recommended quality improvement interventions intended to encourage timely postoperative extubation of coronary artery bypass patients thus reducing prolonged ventilation rates.

The following is a list of MSTCVS recommended interventions for all cardiac surgery patients, some or all of which were implemented at the seven prolonged ventilation sites:

1. Internal focused review of baseline data with cardiac surgery team including physicians, physician assistants, nurse practitioners, intensive care unit staff and respiratory care staff
2. Education of cardiac surgery team members about the reasons for/importance of decreasing prolonged ventilation rates
3. Internal review and update of approaches to intra operative anesthesia management
4. Internal review and update of approaches to post operative pain management
5. Internal review and update of current extubation guidelines and protocols
6. Establishment of extubation criteria with emphasis on documentation when patients do not fit established criteria
7. Ongoing data collection
8. Regular review of the data collected with entire team
9. Analysis and evaluation of effectiveness of interventions
10. Revision of interventions, protocols and guidelines as indicated based on progress or lack of progress made
11. Ongoing data collection
12. Ongoing review of the data collected with entire team

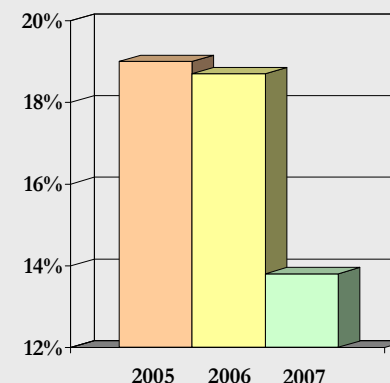
RESULTS

The calendar year 2005 combined baseline prolonged ventilation rate for the seven programs was 19.0%. Individual baseline prolonged ventilation rates ranged from 13.7% to 35.8% among the programs. The calendar year 2007 combined prolonged ventilation rate was 13.8% with individual program rates ranging from 13.1% to 15.2%.

Figure 2: Isolated CABG Prolonged Ventilation Rates Before and After CQI Implementation

Hospital	Cal Year 2005	Cal Year 2006	Cal Year 2007	P for Trend
Hospital 1	14.4% 86/597	20.0% 96/480	13.8% 65/470	0.95
Hospital 2	21.3% 39/183	18.3% 35/191	15.2% 25/165	0.1388
Hospital 3	35.8% 87/243	20.1% 47/234	15.2% 36/230	<0.0001
Hospital 4	17.6% 22/125	13.0% 25/193	14.5% 23/159	0.5
Hospital 5	13.7% 38/278	22.2% 61/275	13.1% 28/214	0.94
Hospital 6	15.4% 21/136	14.2% 28/197	13.6% 20/147	0.66
Hospital 7	20.5% 59/288	19.4% 62/319	11.2% 32/285	0.0034
Hospitals 1-7 Combined	19.0% 52/1850	18.7% 354/1889	13.8% 74/1260	0.0004

Figure 3: Isolated CABG Prolonged Ventilation Rates 2005 - 2007



CONCLUSION

These data reveal improvement at all seven sites with an overall seven site statistically significant improvement rate.

Through analysis of STS data, identification of “best practice” can occur. Using quality collaborative methodology, development and implementation of recommended interventions or guidelines based on best practice results in improved processes and outcomes in the adult cardiac surgery population.

Reference:
Rajakaruna C, Rogers CA, Angelini GD, Ascione R. Risk Factors for and economic implications of prolonged ventilation after cardiac surgery. *J Thorac Cardiovasc Surg.* 2005;130:1270-7.

For more information about the MSTCVS/BCBSM Quality Collaborative and its quality initiatives, please contact Gail F. Bell or Patty Theurer at:
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