Assessing the Impact of Centralizing Data Abstraction at a Large Tertiary Care Center

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University of Michigan

Background

Quality improvement and research necessitates accurate and reliable data. From 1993-2014, we utilized over 40 clinical staff to abstract STS data. It became more difficult to educate staff with the increasing number of fields collected and increasing case volumes (Graphs 1 and 2). Unfortunately, audits of our center’s data in 2013 by our statewide quality collaborative revealed significant gaps in data quality. We evaluated efforts to redesign our data collection system, including centralizing data abstraction and conducting monthly audits, to improve our center’s data quality.

Methods

In June 2014, we centralized the data abstraction process to one dedicated nurse abstractionist, with an additional nurse abstractionist hired April 2015. A quality manager was hired in 2014 to oversee data quality.

Surgeons continued to abstract selective operative fields.

Data abstraction guidelines were created to specify consistent data sources from the electronic medical record (e.g. weight, risk factors, preoperative medications).

Graph 1

Graph 2

After the process change, a contracted auditor audited 100 charts (V2.81) to determine baseline discrepancies. Discrepant fields were discussed with local abstractors to achieve agreement on definitions.

In Fall 2015, the quality manager began monthly local audits of abstracted data, and providing feedback to the local abstractors.

Results

The contracted auditor identified performance gaps in several pre-operative and procedure fields. After discussion and agreement on definitions, the Risk Factors, Cardiac Status and Procedure sections improved the percent of zero discrepancies by 35%, 24% and 20% respectively (Graph 3).

Our statewide quality collaborative audit in 2015 also improved, with only 3.2 deductions per case (Table 1).

Table 1

<table>
<thead>
<tr>
<th>Statewide Quality Collaborative Audit</th>
<th>Avg # Deductions per Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>23</td>
</tr>
<tr>
<td>2013</td>
<td>24.7</td>
</tr>
<tr>
<td>2015</td>
<td>3.2</td>
</tr>
</tbody>
</table>

As a result, our STS national audit in 2016 revealed only 2.2 discrepancies per case.

Conclusion

The restructuring of our data abstraction process, including dedicated nurse abstractors, was associated with an improvement in data accuracy. Discrepancies continue to persist, albeit to a smaller degree.

Continued enhancement includes working with clinical staff to improve medical record documentation and the importance of capturing risk factors.

The support we receive from our statewide quality collaborative has been a key to improved data accuracy. This support includes quarterly meetings, audits and salary funding.

Efforts to maximize accuracy and reliability are challenged by the increased comprehensiveness of the STS Adult Cardiac Database.

Sponsored by The Gall Bell Memorial Fund
Two Model Comparison of the Predictive Ability of the 5 Meter Walk and Grip Strength Tests on Mortality and Morbidity after Cardiothoracic Surgery

Darlene Anderson, RN, Andrew Bilderback, MS, Stefanie Altieri Dunn, PhD, Douglas McGill, MS, Karan Moore, RN, Aimee Francart, CP
University of Pittsburgh Medical Center (UPMC)

METHODS

Study Population

The cohort consisted of 1026 patients undergoing coronary artery bypass or valve replacement or repair surgery (excluding TAVR) between 2011-2017 who completed the 5 meter walk and/or grip strength tests.

RESULTS

5M Walk & Grip Strength Tests

Slow gait speed was indicated by taking >6 seconds to walk 5 meters, while grip strength was considered to be weak if result was <25% of the patient’s body weight.

Statistical Analysis

Multivariable logistic regression models were employed as statistical approaches to test for associations between gait speed, grip strength and mortality and morbidity outcomes.

OUTCOMES

- More than half of the patients in this cohort had undergone isolated coronary artery bypass.
- The remainder of patients received valve replacement/repair or a combination of procedures.

Grip Strength

- Grip speed was not an independent predictor of mortality and major morbidity after adjusting for 7 core risk factors identified in the literature.
- Grip speed was an independent predictor of mortality and major morbidity when added to a previously published model using 7 core risk factors.

CONCLUSION

The 5 meter walk and grip strength tests added no predictive power to theSTS risk model. This suggests that the STS risk model alone continues to be a robust predictor of mortality and morbidity following cardiothoracic surgery.

SUMMARY

- Slow gait speed was a predictor of increased mortality and morbidity when added to a previously published model using 7 core risk factors.
- However, it did not add incremental value to a model with the STS risk score.
- Weak grip strength added no value as a predictor of mortality or morbidity in either model.

ACKNOWLEDGEMENTS

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Jonathan Ledyard, Director of UPMC Cardiopulmonary Rehabilitation

No Financial or Regulatory Disclosures
An Interdisciplinary Approach to 100% Medication Compliance

Stephanie Kish, RN, BSN, CPHQ; Michael Kuzman, MPA, PA-C; Bonnie Sutton RN, BSN, MHR; Kimberly Chipps RN, BSN

Abstract

Background
Specific evidence-base medications in patients undergoing coronary artery bypass grafting (CABG) procedures are measured and reported by The Society of Thoracic Surgeons (STS) Adult Cardiac database. An STS medication compliance review at a tertiary academic medical center noted performance of only 93.85% in Isolated CABG procedures. A strategy was developed to increase compliance to 100%.

Methods
Interventions began in stages beginning in October 2016 with concurrent preoperative reviews by the data manager. The data manager would notify the appropriate clinician based upon process failure. If a medication was ordered but not given, the bedside RN was contacted. If no medication was ordered the appropriate provider was notified depending on patient’s location. Mini root cause analyses were conducted with a mid-level provider on any near miss case. In December 2016, a checklist of evidence-based medications was added to the discharge summary. Order set revisions, including appropriate medications, were completed in March 2017.

Results
Pre-intervention review noted 93.85% (12/195) compliance. Post-intervention noted 100% (0/126) compliance. Utilizing Fisher’s exact test, a two-tailed P value equal to 0.0042 was noted.

Conclusions
An Interdisciplinary approach with concurrent review and technological interventions achieved 100% adherence to evidence-base medication administration.

Introduction

Evidence-based medication administration has been shown to decrease morbidity and mortality among patients undergoing isolated CABG procedures.

Aims

- Increase medication administration compliance.
- Institute process measures to ensure appropriate medications received.
- Increase reporting and communication of any missed opportunities or near misses.

Methods

Chart Review
- Morning of surgery data manager record review.
- RN contacted for any medication not documented including home medications taken day prior to procedure without time notation.
- Anesthesia notified if no beta-blocker received prior to arriving in the OR.

Order sets
- Order sets adjusted to include preoperative beta-blocker as a scheduled medication. Previously appeared on the PRN medication list.

Discharge Checklist
- During this hospitalization did the patient have an AMI, PCI/PTCA, STENT or Isolated CABG? Yes and is being discharged on the following regimen:
  - ASA: Yes/No/Contraindicated (reason)
  - Beta Blocker: Yes/No/Contraindicated (reason)
  - ACE1/ARB: Yes, No, No EF>=40%, Contraindicated (reason)
  - Statin: Yes, No, Contraindicated (reason)
  - Antiplatelet (Plavix, Brilinta, Effient): Yes, No, Contraindicated (reason)
  - Spironolactone Indicated (Heart Failure): Yes, No (reason)

Mini-Route Cause Analysis
- Data manager intervention took place.
- Conflicting documentation.
- Measurement of results
- Fisher’s exact test, two-tailed P value obtained.

Results

Considerations
Time and resources are two considerations when attempting concurrent intervention. Data managers must have the time to review and intervene prior to the procedure or discharge. Support by information technology for electronic medical health record interventions need to be available. An advanced practice professional champion is also important in order for route cause analysis to be meaningful and to assist with implementation of interventions.

Conclusion

- Medication compliance was achieved.
- Process measures were instituted to ensure appropriate medications were received.
- Communication and reporting of near misses increased.

Disclosure: Authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation.
Unlocking the Mystery of ‘Other’ Readmissions
Is v2.9 the Key?

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For the MSTCVS Cardiac Surgery Quality Collaborative

OBJECTIVE

An analysis of STS data revealed that the leading cause of hospital readmission following coronary artery bypass grafting in Michigan was ‘Other-Related’. With a statewide quality initiative to reduce readmissions after CAGB, we sought to understand the specific reasons associated with ‘Other-Related’ and ‘Other-NonRelated’ readmissions.

METHODS

1,089 CAGB readmissions from January 1, 2015 - December 31, 2016 were analyzed. 34% (378/1,089) were coded as either ‘Other-Related’ or ‘Other-NonRelated’ in our state database. Data Managers from all 33 cardiac surgery programs in Michigan provided specific reasons for the 378 ‘Other’ readmissions. Specific reasons were recategorized using new v2.9 readmission reason choices.

RESULTS

378/1,089 (34.7%) CAGB Readmissions coded as ‘Other’

- 269 = Related
- 109 = NonRelated

8/378 (2.1%) Incorrectly coded and changed to ‘No Readmission’

370/1,081 (34.2%) Readmissions remaining in ‘Other’ category

- 265 = Related
- 105 = NonRelated

231/338 (68.3%) Could be categorized more specifically with the addition of new v2.9 readmission reasons

- Sternal Wound Complications
- Pericarditis / Post Cardiotomy Synd
- Trauma / Fall
- Uric Acid
- Syncope
- Anemia
- GI Bleed
- Dysrhythmia
- Septic Shock
- ‘Other’
- ‘Other-NonRelated’

338/1,081 (31.3%) readmissions remaining in ‘Other’ category

- 242 = Related
- 96 = NonRelated

32/370 (8.6%) Changed from ‘Other’ to an existing v2.8.1 readmission reason after data manager education

CONCLUSIONS

31.3% of CAGB readmissions in Michigan are categorized as ‘Other’, making it difficult to focus quality improvement efforts.

68.3% (231/338) of ‘Other’ readmissions in Michigan could be specifically categorized with the addition of new v2.9 readmission reasons.

The largest percentage of ‘Other’ readmissions were due to sternal wound complications.

Sharing this information with cardiac surgery teams offers insight into areas of focus for reducing hospital readmissions following cardiac surgery.

This analysis identified areas of opportunities for data manager education and improved data abstraction.

With the addition of new v2.9 readmission reasons, our statewide ‘Other’ readmission rate could potentially decrease from 31.3% to 10%, providing more insight for focused quality improvement efforts.

*Indicates new v2.9 Readmission Reason

For more information about the MSTCVS Quality Collaborative, please contact the MSTCVS Coordinating Center: 734-998-5918

The authors of this poster have nothing to disclose.
Background:

- A key performance measure of the STS CABG Composite Quality Rating involves the administration of specific medications endorsed by the National Quality Forum. The scoring of the CABG Medications domain impacts the overall composite score for CABG, which is used in national analyses and benchmarking by STS as well as voluntary public reporting by individual participants. Historically, NewYork-Presbyterian/Columbia has earned one star for this domain, with a composite score of two stars.

Method:

- A multidisciplinary team of cardiac surgeons, analysts, quality specialists, software engineers, and senior hospital management worked together to identify potential solutions.
- Definitions for the data fields were identified and reviewed with the team. We identified the Discharge Summary as the best location for creating a structured change.
- The Discharge Summary note was redesigned and implemented. In-services were held with clinical providers to educate them on the changes.

Results:

- Providers are reminded of the discharge medication requirements upon entering the structured note and are now able to document exact reasons for contraindications.
- Our 2016 Harvest 4 report for Isolated CABGs awarded us two stars for Medications.
- Our composite is now three stars.

Conclusion/Next Steps:

- A multi-disciplinary approach that elicits the cooperation and engagement of multiple team members working together to identify a solution is an effective tool for Quality Improvement. Having clear communication and a template with hard stops not only helps with data abstraction, but acts as a reminder for documentation requirements.
- Data managers will now focus on consistent reinforcement of documentation needs to ensure that providers continue to adhere to quality charting. Furthermore, quarterly efforts will be made to educate new staff on the importance of clinically accurate medication documentation.

Table:

<table>
<thead>
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<td>Isolated CABG</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td>Preoperative Beta Blockade Therapy:</td>
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<tr>
<td>Percent of isolated CABG patients who received Beta Blockers within 24hrs preceding surgery. (NOF)</td>
<td>96.2%</td>
<td>78.6%</td>
<td>85.6%</td>
<td>88.0%</td>
<td>91.4%</td>
<td>98.9%</td>
<td>86.5%</td>
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<tr>
<td>Percent of isolated CABG patients who were discharged on Beta Blockers. (NOF)</td>
<td>98.6%</td>
<td>96.3%</td>
<td>98.9%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>97.1%</td>
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<td>Anti-platelet @ Discharge:</td>
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<tr>
<td>Percent of isolated CABG patients who were discharged on ASA and/or ADP inhibitor. (NOF)</td>
<td>98.3%</td>
<td>97.8%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>99.1%</td>
<td>98.1%</td>
</tr>
</tbody>
</table>

*The authors have no disclosures*
Introduction

- Obesity is discussed using the patient’s current body mass index (BMI) during screening for bridge to transplant (BTT) and destination therapy (DT) for left ventricular assist device (LVAD) implantation
- Medical community assumes patients with BMIs >35 are at an increased risk for complications post implantation

Project Purpose:
To analyze the relationship of pre-operative BMI on post-operative outcomes during 12-month follow-up at a large transplant center

Methods

Design: Retrospective review
Sample: N=182
Included: Primary implantation of LVAD between October 2010 to September 2016 with a 12-month follow-up review
Excluded: Pediatric patients; LVAD exchange patients
Data Source: INTERMACS, Society of Thoracic Surgeons Adult Cardiac database, and implanting institution’s electronic medical record

Data Collection:
- BMI, demographics, post-operative & post-discharge outcomes
- Patients were grouped according to their pre-operative BMI classification defined by the World Health Organization:
  - underweight (<18.5)
  - normal weight (18.5-24.9)
  - overweight (25.0-29.9)
  - obesity-class 1 (30.0-34.9)
  - obesity-class 2 (35.0-39.9)
  - severe obesity-class 3 (>40.0)

Statistical analyses: Chi-square and Fisher’s exact tested for relationship between BMI and categorical post-operative outcomes (neurological events, device malfunction, driveline exit site infection); Level of significance α=0.05, 2-tailed; Kaplan Meier used for survival rate analysis.

Results

1. Highest percentage of neurological events, 22% was in normal weight patients (n=51)
2. Highest percentage of device malfunction, 40% was in obese-class 2 patients (n=15)
3. All classes had a rate of 12% or less for driveline exit site infections, except obese-class 3 (n=2) with 50%
4. 1-year survival for normal weight patients was 71%, while obese-class 2 and obese-class 3 were 93% and 100% respectively
5. All BMI classifications demonstrated a median weight gain range of 5.6%-12.1% at 12-month follow-up
6. 22% of normal weight patients (n=51) went on to heart transplantation, while only 7% from obese-class 2, and 0% from obese-class 3

The percentage of postoperative outcomes did not differ by BMI group (p>0.05)

Demographic Data:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Underweight</th>
<th>Normal Weight</th>
<th>Overweight</th>
<th>Obese Class 1</th>
<th>Obese Class 2</th>
<th>Obese Class 3</th>
<th>Total</th>
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<tbody>
<tr>
<td>Age, yr median</td>
<td>50.5</td>
<td>55.0</td>
<td>57.0</td>
<td>54.0</td>
<td>43.0</td>
<td>38.5</td>
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<td>Male (%)</td>
<td>1 (50%)</td>
<td>39 (76%)</td>
<td>52 (78%)</td>
<td>27 (60%)</td>
<td>9 (60%)</td>
<td>0 (0%)</td>
<td>128</td>
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<td>Race (%)</td>
<td>1 (50%)</td>
<td>18 (35%)</td>
<td>33 (49%)</td>
<td>21 (47%)</td>
<td>7 (47%)</td>
<td>2 (100%)</td>
<td>82</td>
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<tr>
<td>Black</td>
<td>1 (50%)</td>
<td>22 (43%)</td>
<td>35 (52%)</td>
<td>24 (53%)</td>
<td>8 (53%)</td>
<td>1 (50%)</td>
<td>90</td>
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<td>White</td>
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<td>1 (2%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
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<tr>
<td>Device Type (%)</td>
<td>41%</td>
<td>22%</td>
<td>35%</td>
<td>40%</td>
<td>25%</td>
<td>10%</td>
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<tr>
<td>Heartmate III</td>
<td>1 (50%)</td>
<td>9 (18%)</td>
<td>6 (9%)</td>
<td>3 (7%)</td>
<td>4 (27%)</td>
<td>0 (0%)</td>
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<tr>
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<td>1 (50%)</td>
<td>41 (80%)</td>
<td>61 (91%)</td>
<td>41 (91%)</td>
<td>11 (73%)</td>
<td>2 (100%)</td>
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<td>0 (0%)</td>
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<td>0 (0%)</td>
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<td>0 (0%)</td>
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<td>Syncardia</td>
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<td>1 (2%)</td>
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<td>1 (2%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
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<td>BTT</td>
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<td>22 (43%)</td>
<td>35 (52%)</td>
<td>34 (59%)</td>
<td>11 (70%)</td>
<td>1 (50%)</td>
<td>90</td>
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<tr>
<td>DT</td>
<td>2 (100%)</td>
<td>29 (57%)</td>
<td>32 (48%)</td>
<td>21 (47%)</td>
<td>7 (47%)</td>
<td>1 (50%)</td>
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<tr>
<td>Heartmate I</td>
<td>0 (0%)</td>
<td>18 (35%)</td>
<td>27 (40%)</td>
<td>25 (56%)</td>
<td>11 (71%)</td>
<td>21 (60%)</td>
<td>83</td>
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</tbody>
</table>

Device-related Complications:

1. Neurological Events: 22%
2. Device Malfunction: 40%
3. Driveline Exit Site Infection: 12%

Five-year Review of Post Left Ventricular Assist Device Outcomes in Relation to Body Mass Index

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Underweight</th>
<th>Normal Weight</th>
<th>Overweight</th>
<th>Obese Class 1</th>
<th>Obese Class 2</th>
<th>Obese Class 3</th>
<th>Total</th>
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<tbody>
<tr>
<td>Total LOS</td>
<td>30</td>
<td>26</td>
<td>22</td>
<td>21</td>
<td>17</td>
<td>57</td>
<td>175</td>
</tr>
<tr>
<td>Renal Failure</td>
<td>1 (50%)</td>
<td>13 (25%)</td>
<td>13 (25%)</td>
<td>8 (18%)</td>
<td>1 (7%)</td>
<td>0 (0%)</td>
<td>28</td>
</tr>
<tr>
<td>Re-Operation for Bleeding</td>
<td>10 (50%)</td>
<td>10 (22%)</td>
<td>10 (22%)</td>
<td>13 (29%)</td>
<td>7 (47%)</td>
<td>0 (0%)</td>
<td>37</td>
</tr>
</tbody>
</table>

Conclusions

- No significant relationship between pre-operative BMI and postoperative outcomes (p>0.05) during 12-month follow-up was identified in this cohort.
- Common myth that obese LVAD patients demonstrate worse outcomes was not validated from our experience.
- Limitations: Retrospective review from single center; less than 1% of cohort in underweight and severe obesity-class 3 groups.
- Recommendations: Multi-center studies are needed to follow longitudinal outcomes in the LVAD population. Future research in nutritional support, cardiac rehab or exercise programs, or bariatric surgery for post implantation.

Disclosures
A. Bansal: Consultant/Advisory Board, Abbott, ABIOMED, Tandum Life; Speakers Bureau/Honoraria, Abbott, Tandum Life
S. V. Desai: Consultant/Advisory Board, Abbott; Speakers Bureau/Honoraria, Abbott
LIVING IN THE MOMENT: REAL-TIME DATA ABSTRACTION
Cindy Spears, RN; Lisa Berryman, RN, BSN
OSF HealthCare Saint Francis Medical Center Peoria, Illinois

BACKGROUND
Standard Retrospective Data Abstraction
- Outdated data (6 month lag)
- Decreased ability to identify opportunities to make positive change in a timely manner

METHODS
Concurrent Data Abstraction
OR schedule reviewed daily to identify eligible cases
- Post-op Day 1
  - Episode opened in third party vendor
  - Patient entry created in day planner for visual cues on progress
  - Data entered to date using temporary note fields as a reference for future abstraction
  - Data abstraction clarifications sent to physician for review
- Post-op Day 2 and beyond
  - Episodes completed for discharges in the past week
  - Data abstraction clarifications sent to physician for review
- Day planner updated on discharge

RESULTS
Documentation opportunities identified real-time
- Pre-op Beta Blocker contraindications not documented
- Reasons for no Internal Mammary Artery use
- Bypass graft location for abstraction

CONCLUSION
Data is readily available to the team. Monthly workgroup meetings review current data while the cases are still fresh to surgeon and staff involved in the care of the patient. The very success of our workgroup is based on the concurrent abstraction and living in the moment!

FINANCIAL AND REGULATORY DISCLOSURE: NONE
A Multidimensional Approach to Improving the STS CABG Medication Star Rating

Chloe Davidson Villavaso, MN, APRN, ACNS
East Jefferson General Hospital

Background

The STS coronary artery bypass graft surgery (CABG) star rating includes a medication quality domain which addresses four National Quality Forum (NQF)-endorsed medications. Failure to prescribe any of the NQF-endorsed medications can reflect negatively on the CABG star rating. After receiving one out of three stars, one community hospital implemented a multidimensional performance improvement project.

Methods

The aim of the project was to decrease the number of NQF-endorsed medication prescription failures. Two hundred seven patients undergoing elective or urgent isolated CABGs from May 2015 to December 2016 were included. The process improvement team included cardiothoracic surgeons, cardiologists, hospitalists, telemetry nurses, anesthesia, clinical nurse specialists, and same day surgery, telemetry, and presurgery evaluation nurses. All members of the team were educated on the 2015 Harvest 1 medication star rating and their role in decreasing prescription failures. The presurgery evaluation nurse reviewed the home medication orders and notified the surgeon of any patient not on a beta blocker.

The same day surgery nurses informed anesthesia of patients that did not take a beta blocker the morning of surgery. As part of the time-out, the surgical team checked for documentation of a beta blocker taken within 24 hours. The clinical nurse specialist performed daily medication reviews, including the NQF-endorsed medications. A nursing discharge medication checklist (Fig. 1) was completed by the discharging telemetry nurse while a discharge medication alert (Fig. 2) was built within the electronic medical record. This alert fired if any of the three NQF-endorsed medications were not ordered at discharge. If the discharging clinician chose to ignore the alert, an email (Fig. 3) was sent to the cardiac program clinical nurse specialists and the telemetry supervisor, quality nurse, and charge nurse to initiate follow-up.

Results

The 2015 Harvest 1 CABG medication one star rating was based on 82 patients with 22 failures to prescribe the NQF-endorsed medications. Following full implementation of the project, the 2017 Harvest 1 medication three star rating was based on 109 patients with 3 NQF-endorsed medication prescription failures.

Conclusion

A multidimensional approach to decreasing medication prescription failures is an effective way to improve care. This form of process improvement can be used in various settings to improve quality and patient outcomes.

Reference


* The author has no financial or regulatory disclosures.
Are Bounce-backs To The Cardiac ICU And Hospital Readmissions In Cardiac Surgery Preventable?

M Sussman MD1, D Alejo BA1, S Owens ACNP-BC PhD1,2, D Law ACNP-BC MSN1, S Smith BA1, T Madeira MS RN2, R Makam, MD1, G Whitman MD1

Institution(s): Johns Hopkins University School of Medicine1; Johns Hopkins Hospital2

INTRODUCTION

Bounce-backs to the ICU and readmissions to the hospital represent significant morbidity for patients. Furthermore, they are expensive and put hospitals at financial risk, especially in the current reimbursement model in the state of Maryland. The Johns Hopkins (JH) cardiac surgery team developed processes to elucidate the reasons for these events and determine whether they were preventable.

METHODS

We evaluated open heart surgery patients (excluding transplant and VAD) from 1/1/17 to 9/19/17. Each bounce-back to the ICU and 30 day readmission to JH was discussed at a weekly multidisciplinary meeting using systematic assessment tools to determine the cause of the event and calculation of risk scores (1,2). A bounce-back or readmission was classified as preventable if an omission in standard care, either as an inpatient or outpatient, resulted in the event.

CONCLUSIONS

Weekly reviews of bounce-backs and readmissions provide an opportunity for the multi-disciplinary team to identify common reasons, re-evaluate our decision making and our protocols, and implement strategies for prevention.

Defining and analyzing recurrent preventable events provides valuable targets for quality improvement. Analysis of preventable bounce-backs suggests that offsetting the time of administration of beta blockers and diuretics might decrease the risk of hypotension

Respiratory complications were the most common cause of bounce-backs 15/40 (30%). For readmissions respiratory problems and infections were equally common and the most frequent causes, each 14/54 (26%).

Four of 40 (10%) bounce-backs and 12/54 (22%) hospital readmissions were preventable. A careful review of the preventable bounce-backs showed that hypotension played an important role in three of the four patients. Regarding readmissions, all four related to anticoagulation were preventable. The other most common preventable readmission category was respiratory, where management of volume overload is critical.

Disclosures: The authors have no relevant financial disclosures or conflicts of interest to report.
Objectives:
• To determine scope of sternal wound practices, variation and potential correlation with deep sternal wound infection (DSWI) rates.
• Although DSWI rates are low (0.3% [0.0-0.6%] in STS Major Cases [2012-2016]), we have selected a systematic approach to evaluate a need for statewide guidelines.

Methods:
• In March 2017, all 10 MCSQI sites were surveyed to assess pre, intra and post-operative wound care practices.
• Multiple practitioners in cardiac surgery were consulted for their initiatives in each phase of wound care and a survey was developed.

Results
• 100% response rate (10/10) from all cardiac surgery programs in the state of Maryland

Conclusions
• Wound care practices in all 3 phases of care are critical for infection prevention.
• Results of our survey demonstrated the variation of practices among sites in spite of low DSWI rates.
• This project promoted discussion and debate regarding the variation.
• Next steps are to determine if selected wound practices should be recommended statewide.
• Other factors such as surgeon skin closure technique may have a role in reduction of sternal wound infection and will be assessed in a future study.

Disclosures: The authors have no relevant financial disclosures or conflicts of interest to report.
INTRODUCTION
Phase Of Care Mortality Analysis (POCMA) developed in Michigan to enhance understanding of mortality and potentially avoidable deaths associated with Adult Cardiac Surgery (Shannon et al, The Annals of Thoracic Surgery, 2012). We have modified POCMA for application to pediatric patients.

POCMA was designed to examine identifiable dimensions of care and clinical events that contribute to a patient’s mortality within five phases of care for review.

METHODS
Providers from Pediatric cardiac ICU, cardiology, cardiac surgery, and safety experts developed the Pediatric POCMA through an iterative process. Revisions were made to enhance situational multidisciplinary awareness, identify avoidable events and promote system changes. Pre-operative factors, patient-level abnormalities, and peri-operative processes and events corresponding to the STS CHSD fields were considered in each phase of care. A primary provider completed the Pediatric POCMA form during case review at multidisciplinary morbidity and mortality (M&M) conferences. Mortalities were aggregated by STAT Category. POCMA forms were then reviewed to assess their utility and to identify potentially avoidable adverse outcomes.

RESULTS
Surgical mortalities (n=43; 2010-2016) were reviewed with the POCMA form. The Pediatric POCMA identifies 5 phases of care: pre-operative, intraoperative, post-operative ICU, post-operative floor and discharge. We identified 14 categories of evaluation within the phases. Examples include: judgement, bypass-related complications, equipment specifications and timely recognition of low cardiac output state. Potentially avoidable events were identified and procedural mortality rates were compared with national norms. Indications for system changes were reviewed and implementation plans were proposed.

- 31/43 (72%) of the cardiac patient mortalities were either STAT 4 or 5.
  - Implication: Can we improve provider vigilance and recognition of decompensation for highest-risk patients?
- 32/43 (74%) of mortalities occurred >1 week after the procedure
  - Implication: Can we improve prevention of secondary complications?
- Majority of mortalities occur in the PICU in the post-op ICU phase of care. Initial events, however, often occur elsewhere, such that impact of events can cross phases
  - Implication: Multidisciplinary review of contributing factors is essential
- Detailed “within phase” review may be even more revealing about factors contributing to mortality
  - Implication: if arrhythmia -> hypotension -> arrest, was the original problem provider recognition of arrhythmia or inability to perform atrial EKG?
  - Technical problem root cause: pacer box or wires?
- Review of these mortalities has led to multiple systems-level changes
  - Development Cardiac Resource Attending (CRA) Call – dedicated attending for the first post-op night
  - Development of a pediatric massive transfusion protocol and changes to blood bank policies in the cardiac OR
  - Dedicated group of experts evaluating quality CPR management in this complex population
  - Development of standard monitoring in post-op cardiac patients
  - Development of cardiac specific objective scoring system to enhance team communication
  - Development of blood culture checklist to standardize evaluation of infection and develop plan for appropriate treatment

CONCLUSIONS
For this complex population receiving multidisciplinary care, Phase of Care Mortality Analysis has helped us refine M&M reviews. POCMA provides a structured forum for discussion, adjudication, and education, and facilitates recognition of opportunities for quality improvement.

Disclosures: The authors have no relevant financial disclosures or conflicts of interest to report
CREATING AN ACTIONABLE WORKGROUP:
RIGHT TEAM + RIGHT DATA + RIGHT TIME + RIGHT ACTIONS = RIGHT RESULTS
Lisa Berryman, RN, BSN; Cindy Spears, RN

METHODS
Restructured TEAM Membership
- Membership focus on personnel able to make real time decisions on actionable items
Reorganized Meeting Structure
- Focus on 4 metrics in Isolated CABG population
- Blood utilization (intra-op and post-op)
- New onset post-op atrial fibrillation
- Pre-op beta blocker within 24 hours of incision
- Prolonged ventilation
- DATA sent to team one week prior to monthly meeting for review and meeting discussion preparation
- Published STS data
- REAL TIME performance of focus metrics
- New initiatives supported by evidence based literature and historical STS data

RESULTS

CONCLUSION
Our new workgroup structure allows us to combine the right team with the right data at the right time to implement the right actions and achieve the right results.

FINANCIAL AND REGULATORY DISCLOSURE: NONE
Results from Michigan TAVR
STS ACSD and STS/ACC TVT Registry Case Matching

Patty Theurer RN, Chang He MS, Melissa Clark RN, Jaelene Williams RN, David Grix CCP, Sheryl Fielding RN, Andrea Jensen MA, Richard L. Prager MD
For the MSTCVS Cardiac Surgery Quality Collaborative and the Blue Cross Blue Shield of Michigan Cardiovascular Consortium

BACKGROUND
In Michigan, a transcatheter approach was used for 56.5% of Isolated aortic valve procedures in 2016. Michigan TAVR, a collaboration between the Michigan Society of Thoracic and Cardiovascular Surgeons, (MSTCV) and The Blue Cross Blue Shield of Michigan Cardiovascular Consortium (BMC2) cardiologists includes nineteen centers working together to develop quality improvement strategies for the treatment of aortic valve disease in our state. This analysis determines the case match rate between the Society of Thoracic Surgeons (STS) adult cardiac surgery database and the STS/ACC TVT registry used by these groups to identify the effectiveness of the STS database to capture transcatheter aortic valve replacement (TAVR) procedures.

METHODS
1,255 TAVR cases were entered in the STS database and 1,267 cases in the TVT Registry used by these groups to identify the effectiveness of the STS database to capture transcatheter aortic valve replacement (TAVR) procedures.

RESULTS

<table>
<thead>
<tr>
<th>Match criteria: hospital ID, gender, procedure date, discharge date, age</th>
<th>1194 pairs matched</th>
</tr>
</thead>
<tbody>
<tr>
<td>61 unmatched STS patients</td>
<td>70 unmatched TVT patients</td>
</tr>
<tr>
<td>Match criteria: on unmatched pairs: hospital ID, gender, discharge date, date of birth</td>
<td>7 pairs matched</td>
</tr>
<tr>
<td>54 unmatched STS patients</td>
<td>63 unmatched TVT patients</td>
</tr>
<tr>
<td>Match criteria: on unmatched pairs: hospital ID, gender, procedure date, discharge date, age of birth</td>
<td>26 pairs matched</td>
</tr>
<tr>
<td>28 unmatched STS patients</td>
<td>37 unmatched TVT patients</td>
</tr>
<tr>
<td>Match criteria: on unmatched pairs: hospital ID, procedure date, discharge date, date of birth</td>
<td>10 pairs matched</td>
</tr>
<tr>
<td>18 unmatched STS patients</td>
<td>27 unmatched TVT patients</td>
</tr>
<tr>
<td>Match criteria: on unmatched pairs: hospital ID, gender, procedure date, discharge date, age of birth</td>
<td>9 pairs matched</td>
</tr>
<tr>
<td>9 unmatched STS patients</td>
<td>18 unmatched TVT patients</td>
</tr>
<tr>
<td>Match criteria: on unmatched pairs: hospital ID, discharge date, age, date of birth</td>
<td>1 pair matched</td>
</tr>
<tr>
<td>8 unmatched STS patients</td>
<td>17 unmatched TVT patients</td>
</tr>
</tbody>
</table>

Overall total 1247 pairs matched

| STS Exact match on 5 variables | 95.1% |
| STS Overall match with 4 variables | 99.4% |
| TVT Exact match on 5 variables | 94.2% |
| TVT Overall match with 4 variables | 98.4% |

8 Cases in STS not in TVT
TVT missed cases - 8

17 Cases in TVT not in STS
STS missed cases - 5

Data Entry Errors account for 4 patients unable to be matched

FINDINGS
The overall match rate between the STS Adult Cardiac Surgery Database and the STS/ACC TVT data registries in our state is 98.9%. 1,194 pairs of patients matched on five variables while 53 pairs matched on various combinations of four variables.

Reasons for cases not matching include:
- Missed cases
- Data entry errors
- Cancelled cases not being entered
- Uncertainty regarding whether to include patients participating in studies or trials

CONCLUSIONS
The STS database provides valuable clinical data regarding the treatment of aortic valve disease by including both percutaneous and open surgical valve procedures, promoting comparative effectiveness research.

Education and collaboration opportunities exist for data managers abstracting for both the STS and STS/ACC TVT Registries.
A PROCESS IMPROVEMENT INITIATIVE: A COLLABORATIVE TEAM APPROACH AT ORLANDO HEALTH TO IMPROVE PATIENT OUTCOMES AS REFLECTED BY THE SOCIETY OF THORACIC SURGERY STAR RATING SYSTEM

Pamela Aleck MSN, RN Clinical Quality Specialist
Joanna Gerry DNP ARNP, Jeffrey Bott MD, Mark Sand MD, Steven Hoff MD

Background

- Orlando Health (OH) has a cardiothoracic (CT) program and performed 753 surgeries in 2016
- In our continuous effort to provide quality patient care, our cardiothoracic surgeons (CTS) have participated in the Society of Thoracic Surgeon (STS) Registry since 1989
- Participation in the registry qualifies an institution to be recognized for their exemplary outcomes through a three star rating system
- STS introduced the star rating recognition for quality based on mortality, morbidity, use of Internal Mammary Artery (IMA) in 2008
- Compliance require prescribing specific medications for our Coronary Artery Bypass (CAB) patients pre operatively and at discharge (Table 1)
- Participation allows OH to benchmark with other STS participating CT programs
- To track patient outcomes, monthly review of CT patient data were conducted to identify fallout metrics, areas for enhancement and solutions to improve our process and results
- Our Aim was to streamline our processes of reviewing our outcome data, reporting results and determining solutions for improvement

Methodology

- Use of a long standing multi-disciplinary collaborative team consisting of our CTS and, advance practice providers (APP’s), Cardiovascular (CV) Intensive Care Unit and CV Step Down Unit team members and managers, respiratory, Operating Room team members, Pre-Admission Testing, Clinical Quality Specialist (CQS), and administration
- In 2012, Created an internal report to look at Morbidity, Mortality, Use of IMA, Pre-Operative Beta Blocker, and Discharge medications, as well as 30-Day All Cause Readmission for all STS Categories (Table 1)
- Used National Quality Forum (NQF) measures/definitions for all the STS categories
- The CQS ran internal reports and a patient lists from the monthly completed chart abstractions
- The CQS reviewed and provided a summary of the fallout cases that included the surgeons name
- Fallout cases that were unable to be verified by the CQS were sent back to the abstraction team for further review and correction as appropriate
- Once the corrections were made, a final report was run and presented in our monthly collaborative team meetings
- Fallouts of the chart reviews were discussed in our meetings
- STS definition were incorporate in the fallout discussions as needed
- Process deficits, trends, and the reasons contributing to the fallouts were discussed
- The collaborative team discussed and individual departments volunteered to assume ownership and solutions to prevent fallouts
- Educational in-services for documentation regarding the registry definitions/criteria were provided to the committee, team members, discharging physicians, surgeons and APP’s

Results

- Established a structure in our process of reviewing, reporting and adhering to the STS guidelines
- Department and team members ownership allowed for hard stop to be placed to prevent fallouts from occurring
- An example of a hard stop was the concurrent double verification process which ensured that the required medications were prescribed at discharge or a reason for not prescribing was documented in the medical records by physicians, surgeons, or APP’s
- 2008 through June 2014 we received a two star rating for CAB overall program and all measures
- With the buy in and support from the collaborative team we saw an improvement from December 2014 through current date, we maintained a three star rating for CAB in all measures except mortality, where we remain a two star program
- By applying our process to all STS categories, Aortic Valve Replacement (AVR) and CAB+AVR rating also rose to a three star program

Conclusion

- Having chart reviews completed prior to data submission allowed us to correct abstraction errors
- Understanding of the STS definition aided in documentation requirements for exclusions
- By collaborating and giving ownership to the respective departments and teams allowed for standardization for a sustainable processes
- Setting an internal process of reviewing and reporting our outcome metrics allows for continuous monitoring

Table 1

<table>
<thead>
<tr>
<th>STS Category</th>
<th>CAB 2.8</th>
<th>AVR 2.8</th>
<th>AVR + CAB 2.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>January-December 2016</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NQF Metrics</strong></td>
<td><strong>Num</strong></td>
<td><strong>Den</strong></td>
<td><strong>Rate</strong></td>
</tr>
<tr>
<td>Use of IMA</td>
<td>217</td>
<td>217</td>
<td>100.0%</td>
</tr>
<tr>
<td>Pre-Operative Beta Blockers</td>
<td>217</td>
<td>217</td>
<td>100.0%</td>
</tr>
<tr>
<td><strong>NQF Metrics</strong></td>
<td><strong>Num</strong></td>
<td><strong>Den</strong></td>
<td><strong>Rate</strong></td>
</tr>
<tr>
<td>Surgical Re-Exploration for Aortic Dissection</td>
<td>3</td>
<td>217</td>
<td>1.4%</td>
</tr>
<tr>
<td>Antithrombotic Medications at Discharge</td>
<td>217</td>
<td>217</td>
<td>100.0%</td>
</tr>
<tr>
<td><strong>NQF Metrics</strong></td>
<td><strong>Num</strong></td>
<td><strong>Den</strong></td>
<td><strong>Rate</strong></td>
</tr>
<tr>
<td><strong>NQF Metrics</strong></td>
<td><strong>Num</strong></td>
<td><strong>Den</strong></td>
<td><strong>Rate</strong></td>
</tr>
<tr>
<td>Antithrombotic Medications at Discharge</td>
<td>217</td>
<td>217</td>
<td>100.0%</td>
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<tr>
<td>Antithrombotic Medications at Discharge</td>
<td>217</td>
<td>217</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

*No Financial or regulatory disclosures*
Improving Early Extubation (Less than Six Hours) in Cardiovascular Surgery without Increasing Adverse Respiratory Events (Reintubation, Prolonged Extubation or Pneumonia)

Karen G. McNickle, RN, MSN, Dignity Health St. Joseph’s Medical Center, Stockton California*

BACKGROUND
• Early extubation may enhance patient comfort and has been shown to increase early mobility, avoid post-operative respiratory complications and reduce length of stay.
• The goal of this project was to increase the rate of early extubation without increasing adverse respiratory events (compared to STS National benchmarks).

METHODS
• Based on review of STS data, a multidisciplinary team convened and implemented evidence based and hospital system best practice improvement strategies, including: Reduced intraoperative fluid; Reduced end-of-case narcotics; Increased use of reusables.
• Protocols and order sets were updated and staff trained.
• All case types were included as potential for early extubation, subject to meeting defined clinical criteria.
• Rapid cycle change was facilitated by: Use of a Bedside tracking tool; Targeted extubation times; Concurrent case review; Prompt feedback to staff; Weekly data sharing.
• Isolated CABG and Isolated AVR cases were selected for measuring improvements. Non-risk adjusted rates for extubation < 6 hours (un-blinded by surgeon and anesthesiologist), reintubation, prolonged intubation > 24 hours, and post-operative pneumonia were tracked and reported monthly.

RESULTS
• Early extubation increased from 26.6% (222 cases from July 2015-June 2016) to 65.9% (255 cases from July 2016-June 2017), representing an improvement of 145%.

METHODS Cont’d
• Ventilation < 6 hrs
• Reintubation
• Prolonged Extubation > 24 hrs

RESULTS Cont’d
• The reintubation rate was 4.5% compared to 5.5% (pre to post). None of the patients’ extubated early required reintubation (post).
• Additional improvements: Prolonged ventilation was reduced by 44%; Post-op pneumonia decreased by 15%; ICU length of stay was reduced an average of 9 hours and Post-Op length of stay was reduced by 0.4 days.

CONCLUSIONS
• A reduction in clinical process variation successfully improved early extubation without an increase in adverse post-operative respiratory events. These results support published evidenced based literature.
• To maintain improvements, ongoing measurement and reporting of outcomes is recommended.
• Evaluation of the impact on patient satisfaction and calculation of potential cost savings would enhance study findings. To increase study significance, future analysis could include larger study group sample sizes, risk adjustment and formal statistical analysis.

REFERENCES
6. For more information please contact: Karen.McNickle@DignityHealth.org

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For their dedication to clinical excellence and caring, a special thanks to: Dr. J.D. Morrissey, Dr. A. Tendulkar, Cardiovascular Surgery; Dr. J. DeBooy, Anesthesiologist; Dr. M. Herrera, Quality Medical Director; Julie Evans, Director Respiratory Therapy; Karen G. McNickle, RN, MSN, Dignity Health St. Joseph’s Medical Center, Stockton California.*
INTRODUCTION

- Operative Mortality 30-day status helps determine the STS star rating (81% of the score)
- STS National Database summary for Operative Mortality 30-day status from July 1, 2014 – February 15, 2017 (Table 1)
- STS rule change for 30-day status requires ≤10% “missing plus unknown” in 2015 data ≤5% “missing plus unknown” in 2016 data ≤2% for “missing plus unknown” in 2017 and forward data

METHODS

- A review of all Adult Cardiac surgery cases in 28 participating hospitals in DFW (45,000+ cases) between January 1, 2008 and December 31, 2016
- STS data cross-matched with claims data from 90 hospitals in North Texas to detect patient activity using the Regional Enterprise Master Patient Index (REMPI) as linkage

RESULTS

- Graph 1 shows the trend of “Status 30 days-Unknown” over 9 years
- Patients listed as “Unknown” dropped from 17.9% prior to matching to 1.1% afterwards
- The matching process allowed us to track patients even when subsequent encounters were at different hospitals
- Graphs 7 & 8 reveal individual hospital rates of “missing plus unknown” for 2015 & 2016 respectively
- The blue shaded bars are sites that meet or exceed the STS required percentage to achieve a star rating

CONCLUSION

- Achieving the STS mandated rate of 10% in 2015 and 5% in 2016 for “Status 30 days-Unknown” was difficult but achievable
- Meeting the new 2% in 2017 and beyond for “Status 30 days-Unknown” is achievable for many, but may require a complete culture change for others
- Data Managers struggle to find 30-day status and require the support of surgeons, hospital administration, and other support staff and services to locate patient information
- The lower the hospital volume the greater the opportunity to miss the STS mandated threshold and thus losing a star rating

For more information contact Cathy Knoff at Cathy.Knoff@MedicalCityHealth.com

**Table 1**

<table>
<thead>
<tr>
<th>Response</th>
<th>Records with Response</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Responses</td>
<td>754,549</td>
<td>92.7%</td>
</tr>
<tr>
<td>Alive</td>
<td>699,531</td>
<td>92.7%</td>
</tr>
<tr>
<td>Dead</td>
<td>26,778</td>
<td>3.6%</td>
</tr>
<tr>
<td>Unknown</td>
<td>25,693</td>
<td>3.4%</td>
</tr>
<tr>
<td>Missing</td>
<td>2,547</td>
<td>0.3%</td>
</tr>
</tbody>
</table>

**Figure 1**: graphical representation of data matching process.