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

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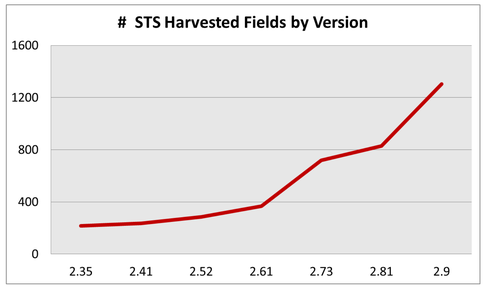
FRANKEL CARDIOVASCULAR CENTER
MICHIGAN MEDICINE

Background

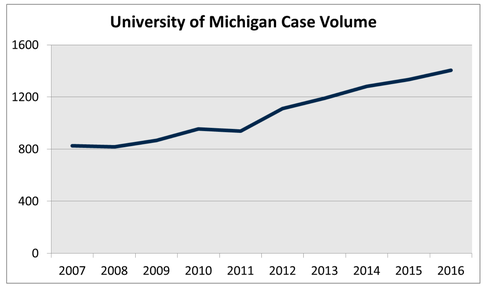
Quality improvement and research necessitates accurate and reliable data. From 1993- 2014, we utilized over 40 clinical staff to abstract STS data. It became more difficult to educate staff with the increasing number of fields collected and increasing case volumes (Graphs 1 and 2). Unfortunately, audits 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.

Graph 1



Graph 2



Methods

In June 2014, we centralized the data abstraction process to one dedicated nurse abstractor, with an additional nurse abstractor 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).

V2.81 Data Abstraction Guidelines

2.8 SeqNo	Short Name	Field - CVIS	Source #1	Source #2	Source #3	Abstraction
335	WeightKg	Weight	Centricity Anesthesia Record	Ribbon		Digtial Feed
330	HeightCm	Height	Centricity Anesthesia Record	Ribbon		Digtial Feed
355	FHCAD	Family History CAD	Senice Admission H&P	Referring H&P		Datamanager
360	Diabetes	Diabetes	Senice Admission H&P	Referring H&P	Lab values	Datamanager
365	DiabCtrl	Control	Senice Admission H&P	Referring H&P		Datamanager
585	CreatLst	Creatinine	Results Review-Lab values	Referring H&P		Datamanager
375	Dialysis	Renal Failure - Dialysis	Senice Admission H&P	Referring H&P		Datamanager
380	Hypertn	Hypertension	Senice Admission H&P	Referring H&P		Datamanager
390	InfEndTy	Infectious Endocarditis Type	Senice Admission H&P	Referring H&P	Results Review-Lab values	Datamanager
400	TobaccoUse	Tobacco Use	Senice Admission H&P	Referring H&P	IP Nursing Adm Summary	Datamanager
405	ChrLungD	Lung Disease	Senice Admission H&P	Results Review-PFT	Referring H&P or Media-PFT	Datamanager
410	ChrLungDType		Results Review-PFT	Senice Admission H&P	Pulmonary Consult	Datamanager
415	PFT	PFT	Results Review-PFT	Media-OSH PFT		Datamanager
420,425	FEV1, DLCO	FEV1, DLCO	Results Review-PFT			Datamanager
460	SlpApn	Sleep Apnea	Senice Admission H&P	Referring H&P		Datamanager
465	Pneumonia	Pneumonia	Senice Admission H&P	Referring H&P		Datamanager
470	IVDrugAb	IV Drug Use	Senice Admission H&P	Referring H&P	IP Nursing Adm Summary	Datamanager
475	Depression	Depression	Senice Admission H&P	Referring H&P		Datamanager
480	Alcohol	Alcohol Use	Senice Admission H&P	Referring H&P	IP Nursing Adm Summary	Datamanager
485	LiverDis	Liver Disease	Senice Admission H&P	Referring H&P		Datamanager
490	ImmSupp	Immunocompromise	Senice Admission H&P	Referring H&P	MAR	Datamanager
495	MediasRad	Mediastinal Radiation	Senice Admission H&P	Referring H&P	Consults	Datamanager
500	Cancer	Cancer	Senice Admission H&P	Referring H&P	Consults	Datamanager
505	PVD	Peripheral Arterial Disease (PAD)	Senice Admission H&P	Referring H&P	DVU or CT	Datamanager
525	CVD	Cerebrovascular Disease	Senice Admission H&P	Referring H&P	Consults	Datamanager
530/540/56	CVA/CVDTIA	CVA/TIA/carotid stent	Senice Admission H&P	Referring H&P		Datamanager
545	CVDCarSten	CVD Carotid Stenosis	Results Review-DVU	Media-Carotid dopplers		Datamanager
565-640		Labs	Results Review-Lab Values	Media -Labs		Datamanager
775-795	POCPCI	Previous PCI	Senice Admission H&P	Referring H&P	Cath report (Media)	Datamanager
805	POC	Other Previous Cardiac	Senice Admission H&P	Referring H&P	Operative Note (Media)	Datamanager
885-890	PrevMI	Previous MI	Senice Admission H&P	Referring H&P	Progress notes	Datamanager
			Consults	Results Review-Lab Values	Results Review-EKG	Datamanager

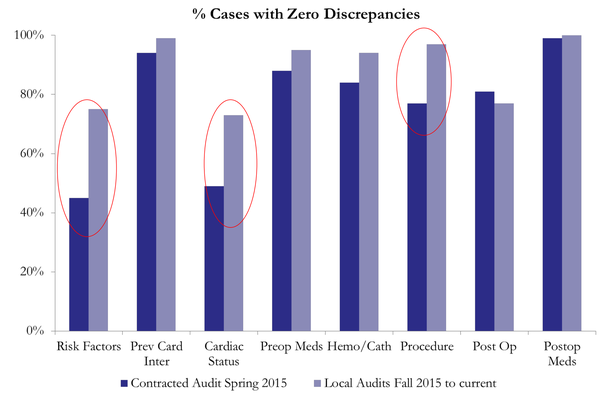
After the process change, a contracted auditor audited 100 charts (V2.81) to determine baseline discrepancies. Discrepant fields were discussed with local abstractors to achieve agreement on definitions.

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).

Graph 3



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

Table 1

Statewide Quality Collaborative Audit	Avg # Deductions per Case
2008	23
2013	24.7
2015	3.2

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

Conclusion

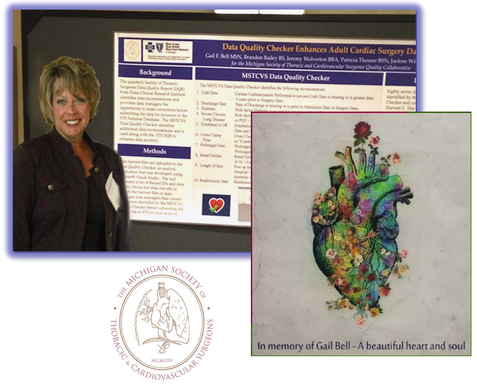
The restructuring of our data abstraction process, including dedicated nurse abstractors, was associated with an improvement in data accuracy. Discrepancies continue to persist, albeit to a smaller degree.

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 Gail 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

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BACKGROUND

- UPMC Is a quaternary referral academic institution with high co-morbid risk profiles.
- The Society of Thoracic Surgeons (STS) encourages collection of 5 meter walk tests on patients undergoing cardiothoracic surgery.
- UPMC implemented a bilateral grip strength test as an additional measure of frailty.

OBJECTIVE

- Our goal was to determine if there was an association between the above frailty measures and major postoperative outcomes.
- We hypothesized that slow gait speed and weak grip strength are predictive of increased mortality and morbidity.

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.

Table 1. ***Summary of Patient Characteristics***

Patient Factors	Overall (N=1026)
Age, Mean (S.D.)	66.9 (11.7)
Male, Vol. (%)	698 (68%)
BMI, Mean (S.D.)	30.1 (6.3)
Comorbid conditions, Vol. (%)	
Diabetes	467 (46%)
Hypertension	907 (88%)
Dyslipidemia	882 (86%)
Prior MI	537 (52%)
Prior CHF, N=501*	147 (29%)
EF<40%	176 (17%)
LM Native Stenosis	224 (22%)
CVA, N=608*	86 (14%)
Previous cardiac surgery	134 (13%)
Chronic lung disease	280 (27%)
Depression, N=501*	110 (22%)

5M Walk & Grip Strength Tests

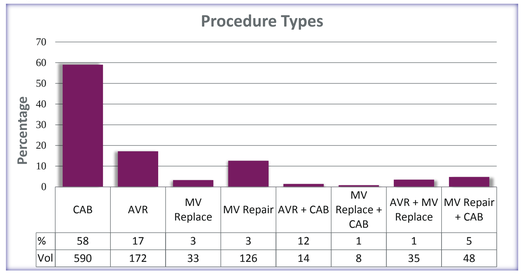
Slow gait speed was indicated by taking >6 seconds to walk 5 meters, while grip strength was considered to be weak if result was <25% of the patient's body weight.

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.

RESULTS

Figure 1



- 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.

Key: CAB=coronary artery bypass, AVR=aortic valve replacement, MV=mitral valve

Gait Speed | **Grip Strength**

Core Risk Factor Model[a]

Table 2 . Incremental Value of Gait Speed to Core Risk Factors on Outcomes of Mortality and Major Morbidity

	Model without Gait Speed		Model with Gait Speed	
Variable	OR (95% CI)	P-Value	OR (95% CI)	P-Value
Age ≥ 80 yrs	2.10 (1.31,3.36)	0.002	1.95 (1.07, 2.36)	0.032
Male	.80 (.55,1.17)	0.252	.90 (.60,1.33)	0.586
Previous cardiac surgery	1.48 (.90,2.42)	0.123	1.45 (.88,2.38)	0.143
LVEF < 40%	1.71 (1.11,2.64)	0.016	1.66 (1.07, 2.57)	0.023
Left main stenosis ≥ 50	.71 (.44,1.13)	0.148	.68 (.42,1.09)	0.109
Urgent vs. Elective	1.67 (1.09,2.55)	0.018	1.50 (.97, 2.32)	0.065
Nonisolated CABG	1.88 (1.23,2.87)	0.004	1.81 (1.18,2.78)	0.006
Gait speed≥6s	-	-	1.59 (1.07,2.36)	0.021

- Gait speed was an independent predictor of mortality and major morbidity after adjusting for 7 core risk factors identified in the literature.

Table 4 . Incremental Value of Grip Strength to Core Risk Factors on Outcomes of Mortality and Major Morbidity

	Model without Grip Strength		Model with Grip Strength	
Variable	OR (95% CI)	P-Value	OR (95% CI)	P-Value
Age ≥ 80 yrs	1.79 (.89,3.59)	0.101	1.80 (0.90, 3.63)	0.097
Male	0.74 (0.45, 1.22)	0.235	0.86 (.49,1.54)	0.617
Previous cardiac surgery	1.16 (.55,2.47)	0.698	1.18 (0.55,2.51)	0.671
LVEF < 40%	1.93 (1.12, 3.31)	0.017	1.91 (1.11,3.29)	0.019
Left main stenosis ≥ 50	0.81 (0.45,1.47)	0.495	0.79 (.435,1.43)	0.439
Urgent vs. Elective	1.74 (0.90,3.34)	0.097	1.76 (0.91,3.38)	0.092
Nonisolated CABG	1.68 (0.94,3.03)	0.082	1.67 (0.93,3.00)	0.089
Grip<25% body weight	-	-	1.35 (.76,2.38)	0.307

- Grip strength was not an independent predictor of mortality and major morbidity after adjusting for 7 core risk factors identified in the literature.

[a]Core risk factors were previously identified in Afilalo et al. (2010) Journal of the American College of Cardiology, 56(20):1668-76.
Key: OR=Odds Ratio, CI=Confidence Interval, LVEF=left ventricular ejection fraction

STS Risk Model

Table 3 . Incremental Value of Gait Speed to STS Risk on Outcomes of Mortality and Major Morbidity

	Model without Gait Speed		Model with Gait Speed	
Variable	OR (95% CI)	P-Value	OR (95% CI)	P-Value
STS Risk Score	79.67 (26.63,239.29)	<.001	63.19 (19.60,204.77)	<.001
Gait speed ≥6s	-	-	1.25 (.83,1.86)	0.283

- Gait speed was not an independent predictor of mortality and major morbidity after adjusting for the STS risk score.

Table 5 . Incremental Value of Grip Strength to STS Risk on Outcomes of Mortality and Major Morbidity

	Model without Grip Strength		Model with Grip Strength	
Variable	OR (95% CI)	P-Value	OR (95% CI)	P-Value
STS Risk Score	83.96 (19.46,362.27)	<.001	79.57 (17.98,352.1)7	<.001
Grip<25% body weight	-	-	1.11 (.67,1.84)	0.695

- Grip strength was not an independent predictor of mortality and major morbidity after adjusting for the STS risk score.

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.

CONCLUSION

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

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An Interdisciplinary Approach to 100% Medication Compliance

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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.
Raw rates were reviewed and compared for 12 rolling months prior to October 1, 2016 and 6 months post. Medication failures were defined as any individual undergoing a CABG who did not receive all of the required perioperative medications (preoperative beta blockade, discharge anti-platelet, anti-lipid and beta blockade).

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.
- Multiple disciplines are responsible for appropriate medication administration.

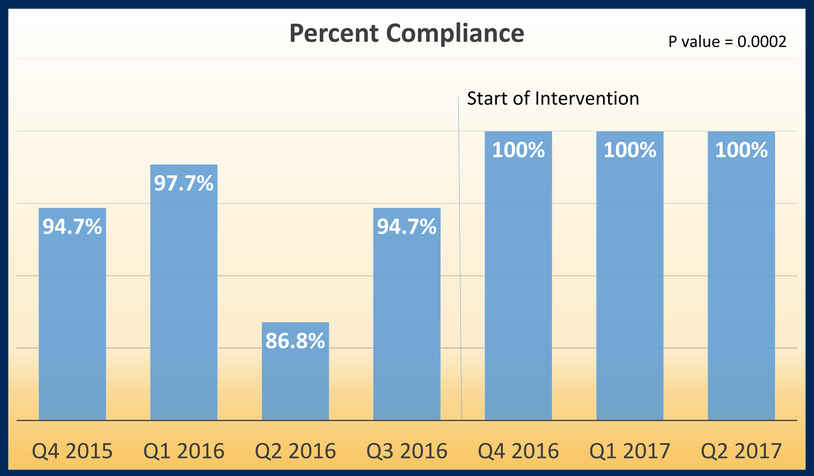
Aims

- 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.

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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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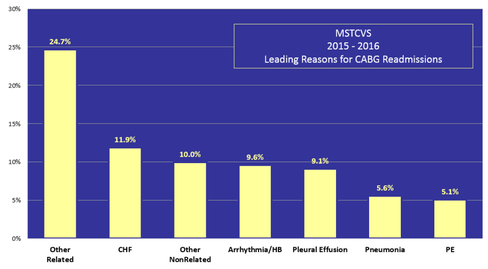
For the MSTCVS Cardiac Surgery Quality Collaborative

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 CABG, we sought to understand the specific reasons associated with 'Other-Related' and 'Other-NonRelated' readmissions.



METHODS

1,089 CABG readmissions from January 1st, 2015 - December 31st, 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%)
CABG Readmissions coded as 'Other'
269 = Related
109 = NonRelated

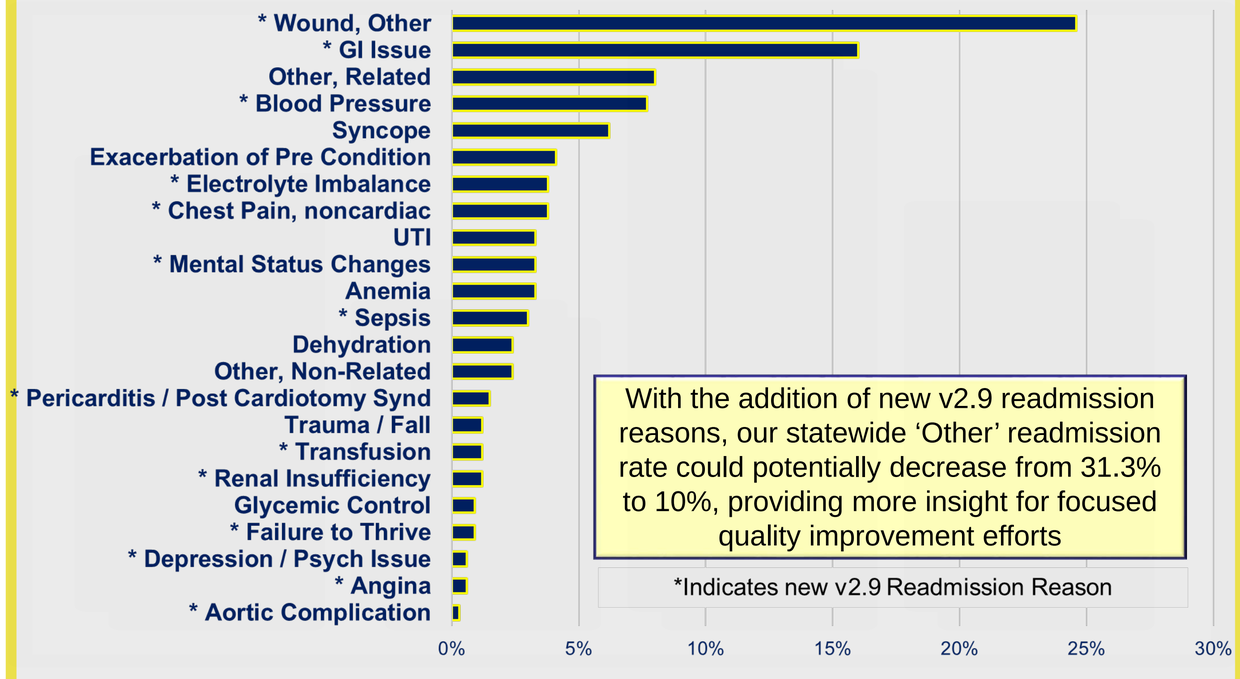
→ 8/378 (2.1%)
Incorrectly coded and changed to 'No Readmission'

→ 370/1,081 (34.2%)
Readmissions remaining in 'Other' category
265 = Related
105 = NonRelated

↓ 32/370 (8.6%)
Changed from 'Other' to an existing v2.81 readmission reason after **data manager education**

← 338/1,081 (31.3%)
readmissions remaining in 'Other' category
242 = Related
96 = NonRelated

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



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

CONCLUSIONS

31.3% of CABG 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.

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

The authors of this poster have nothing to disclose

Isolated CABG Discharge Documentation Improvement

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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.

Outcomes	STS Benchmark 2016	Q3 2015	Q4 2015	Q1 2016	Q2 2016	Q3 2016	Q4 2016
Isolated CABG							
		86	99	119	117	109	106
Preoperative Beta Blockade Therapy: Percent of Isolated CABG patients who received Beta Blockers within 24hrs preceding surgery. **(NQF*)**	95.2%	78.6% 66	85.6% 77	88.0% 95	91.4% 96	98.9% 91	86.5% 83
Beta Blockers @ Discharge: Percent of Isolated CABG patients who were discharged on Beta Blockers. **(NQF)**	98.6%	96.3% 78	98.9% 93	100.0% 113	100.0% 111	100.0% 104	97.1% 102
Anti-lipid Treatment @ Discharge: Percent of Isolated CABG patients who were discharged on a statin. **(NQF)**	97.7%	91.5% 75	98.9% 91	100.0% 113	100.0% 111	100.0% 105	99.0% 104
Anti-platelet @ Discharge: Percent of Isolated CABG patients who were discharged on ASA and/or ADP inhibitor. **(NQF*)**	98.3%	97.6% 81	100.0% 95	100.0% 117	100.0% 116	99.1% 106	98.1% 103

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.

**The authors have no disclosures*

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

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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 device 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:

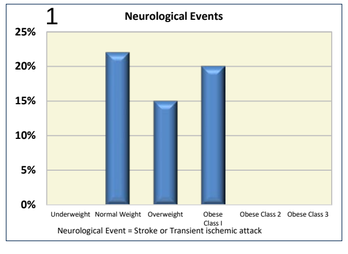
Parameter	Underweight	Normal Weight	Overweight	Obese Class I	Obese Class 2	Obese Class 3	Total
n	2	51	67	45	15	2	182
BMI, median	17.2	22.7	27.6	32.2	36.5	38.5	28.0
Age, yr median	50.5	55.0	57.0	54.0	43.0	38.5	55
Male (%)	1 (50%)	39 (76%)	52 (78%)	27 (60%)	9 (60%)	0 (0%)	128 (70%)
Race (%)							
White	1 (50%)	32 (63%)	34 (51%)	24 (53%)	8 (53%)	0 (0%)	99 (54%)
Black	1 (50%)	18 (35%)	33 (49%)	21 (47%)	7 (47%)	2 (100%)	82 (45%)
Other	0 (0%)	1 (2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (1%)
Device Type (%)							
HeartMate II	1 (50%)	41 (80%)	61 (91%)	41 (91%)	11 (73%)	2 (100%)	157 (86%)
Heartware	1 (50%)	9 (18%)	6 (9%)	3 (7%)	4 (27%)	0 (0%)	23 (13%)
Syncardia	0 (0%)	1 (2%)	0 (0%)	1 (2%)	0 (0%)	0 (0%)	2 (1%)
Initial VAD Indication (%)							
BTT	0 (0%)	22 (43%)	35 (52%)	24 (53%)	8 (53%)	1 (50%)	90 (49%)
DT	2 (100%)	29 (57%)	32 (48%)	21 (47%)	7 (47%)	1 (50%)	92 (51%)
Diabetes	0 (0%)	18 (35%)	27 (40%)	25 (56%)	11 (73%)	2 (100%)	83 (46%)
Pre-op A1C% (median)	6.3	6.0	6.0	6.2	6.5	7.2	6.5
Pre-op Creatinine (mg/DL)	1.5	1.2	1.2	1.2	1.4	1.3	1.2

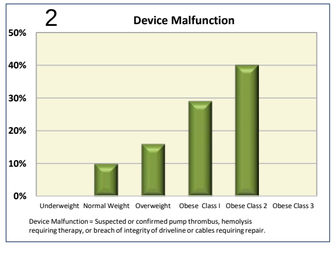
Inpatient Outcomes:

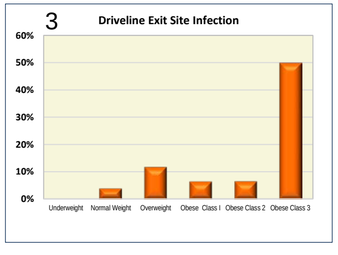
Parameter	Underweight	Normal Weight	Overweight	Obese Class I	Obese Class 2	Obese Class 3
n	2	51	67	45	15	2
Initial Intubation Days, median	6.3	2.8	1.9	3	1.3	6.7
Total ICU Days, median	26	11	9	9	6	16
Total LOS	30	26	22	21	17	37
Renal Failure*	1 (50%)	13 (25%)	11 (16%)	8 (18%)	2 (15%)	1 (50%)
Re-Operation for Bleeding	1(50%)	13 (25%)	15 (22%)	8 (18%)	1 (7%)	0 (0%)
Timing: Acute**	1(50%)	6 (12%)	6 (9%)	3 (7%)	0 (0%)	0 (0%)

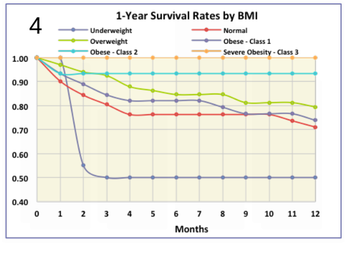
ICU = Intensive Care Unit; LOS = Length of Stay; *Renal failure requiring dialysis or CRRT as inpatient; **Re-Operation for bleeding within 24 hours of the end of the case

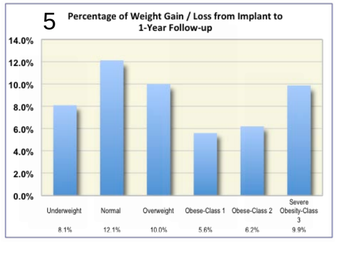
Results (continued)

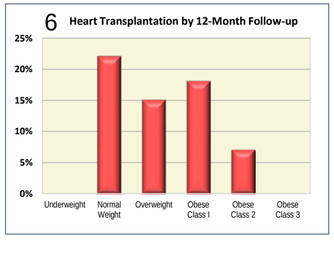












Conclusions

- 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, Tandem Life; Speakers Bureau/Honoraria, Abbott, Tandem Life
S. V. Desai: Consultant/Advisory Board, Abbott; Speakers Bureau/Honoraria, Abbott

LIVING IN THE MOMENT: REAL-TIME DATA ABSTRACTION

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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!

LIVING IN THE MOMENT TECHNIQUES

Knowledge of concurrent abstraction process is key!

Day Planner Purpose

- OR Schedule has been reviewed
- Episode has been created… and completed

Patient Name if Risk model
Patient Name if "other" case
Abstraction has been started
Abstraction completed

Temporary Note Field in Third Party Vendor Tool

- Any outstanding clarifications
- Date and time patient care notes last reviewed

FINANCIAL AND REGULATORY DISCLOSURE: NONE

A Multidimensional Approach to Improving the STS CABG Medication Star Rating

Chloe Davidson Villavaso, MN, APRN, ACNS-BC
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.

Methods

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.

CABG Discharge Medication Checklist

Do not discharge CABG patient unless all three classes of medication are ordered OR a contraindication is documented in COMPAS.

Check/Write In Name of Med Ordered	Document Contraindication per MD under Orders in COMPAS
Beta Blocker or Beta Blocker Combo Name Ends in **"lol"** ☐ **Sotalol** ☐ **Metoprolol** ☐ _____	**Search "Reason Beta Blocker not Prescribed at Discharge"** Choose appropriate contraindication in order details drop-down menu: ☐ Allergy ☐ Bradycardia ☐ Hypotension(SBP<90) ☐ 2nd or 3rd Degree Heart Block w/o Pacemaker ☐ COPD ☐ Recent IV positive Inotrope treatment ☐ Other-Enter "Other reason details" _____
Antiplatelet ☐ **Aspirin** ☐ **Clopidogrel** (Plavix) ☐ **Prasugrel** (Effient) ☐ **Ticagrelor** (Brilliant) ☐ _____ *Coumadin, Pradaxa, Eliquis, Xarelto, Savaysa are not antiplatelet drugs	**Search "Reason Antiplatelet/Aspirin not Prescribed at Discharge"** Choose appropriate contraindication in order details drop-down menu: ☐ Allergy ☐ Other-Enter "Other reason details" _____ *If contraindication is needed for an antiplatelet other than aspirin, enter "Antiplatelet contraindication-_____" under "Other"
Statin or Statin Combo Name Ends in **"statin"** ☐ _____	**Search "Reason Statin not Prescribed at Discharge"** Choose appropriate contraindication in order details drop-down menu: ☐ Allergy ☐ Liver Disease ☐ Statin Intolerance ☐ Other-Enter "Other reason details" _____

Figure 1

Cerner

ADD REASON NOT PRESCRIBED ORDER

The record shows that **E. J. PATIENT** does not have Reason Statin not Prescribed at Discharge order.

ACTION REQUIRED:

-Select the Reason Statin not Prescribed Order below and ignore, then OK

OR

-Select Cancel and OK to navigate the Depart Medication Reconciliation and either continue the current home medication or enter a new prescription

Alert Action:

☐ Cancel
☐ Ignore

Add Order for:

☐ Reason Statin Not Prescribed at Discharge

Figure 2

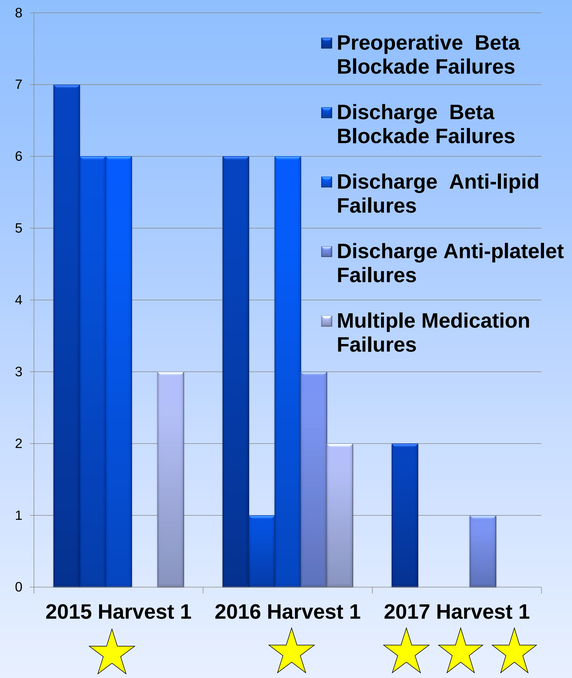
From: Discern_Expert@ejgh.org [mailto:Discern_Expert@ejgh.org]
Sent: Thursday, September 14, 2017 8:16 AM
To: Villavaso, Chloe D
Subject: CAB Alert

The following patient had a CABG during this encounter and a discharge order was placed, ignoring the alert for Beta Blockers. Please follow-up with person placing discharge order.
Patient: E. Jones. MRN: 012340801. Room: 0272. Date/Time of Discharge Order: September 14, 2017 08:15:43 CDT. Signer: John Morton, MD

Figure 3

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

NQF: Home. (n.d.) Retrieved September 18, 2017, from http://www.qualityforum.org/Home.aspx

* The author has no financial or regulatory disclosures.

Are Bounce-backs To The Cardiac ICU And Hospital Readmissions In Cardiac Surgery Preventable?

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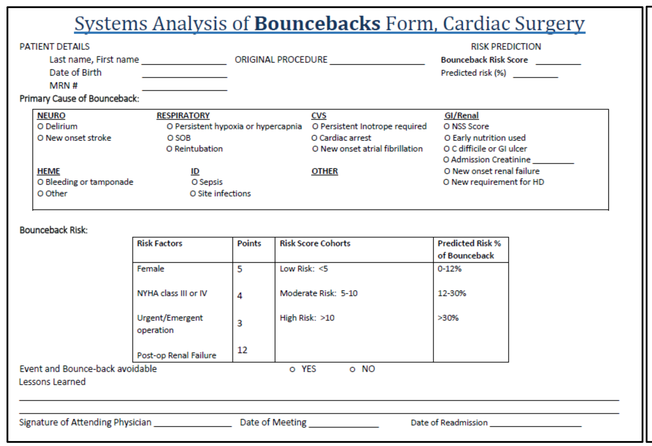
Institution(s): Johns Hopkins University School of Medicine[1]; Johns Hopkins Hospital[2]

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 the 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.



Systems Analysis of **Bouncebacks** Form, Cardiac Surgery

PATIENT DETAILS
Last name, First name _____ ORIGINAL PROCEDURE _____
Date of Birth _____
MRN # _____

RISK PREDICTION
Bounceback Risk Score _____
Predicted risk (%) _____

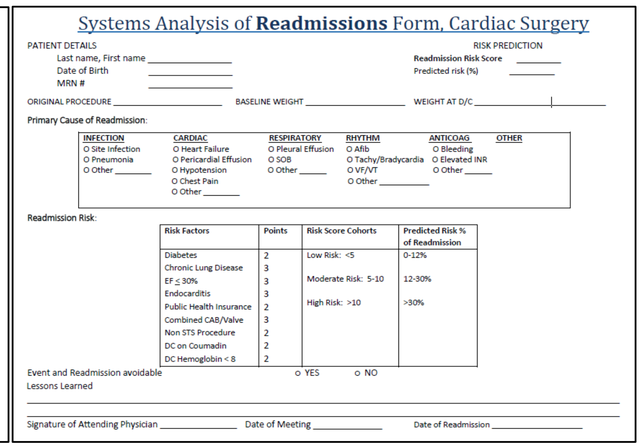
Primary Cause of Bounceback:

NEURO	RESPIRATORY	CVS	GI/Renal
O Delirium	O Persistent hypoxia or hypercapnia	O Persistent Inotrope required	O NSS Score
O New onset stroke	O SOB	O Cardiac arrest	O Early nutrition used
	O Reintubation	O New onset atrial fibrillation	O C difficile or GI ulcer
			O Admission Creatinine _____
HEME	ID	OTHER	O New onset renal failure
O Bleeding or tamponade	O Sepsis		O New requirement for HD
O Other	O Site infections		

Bounceback Risk:

Risk Factors	Points	Risk Score Cohorts	Predicted Risk % of Bounceback
Female	5	Low Risk: <5	0-12%
NYHA class III or IV	4	Moderate Risk: 5-10	12-30%
Urgent/Emergent operation	3	High Risk: >10	>30%
Post-op Renal Failure	12		

Event and Bounce-back avoidable O YES O NO
Lessons Learned
_____
_____
Signature of Attending Physician _____ Date of Meeting _____ Date of Readmission _____



Systems Analysis of **Readmissions** Form, Cardiac Surgery

PATIENT DETAILS
Last name, First name _____
Date of Birth _____
MRN # _____

RISK PREDICTION
Readmission Risk Score _____
Predicted risk (%) _____

ORIGINAL PROCEDURE _____ BASELINE WEIGHT _____ WEIGHT AT D/C _____

Primary Cause of Readmission:

INFECTION	CARDIAC	RESPIRATORY	RHYTHM	ANTICOAG	OTHER
O Site Infection	O Heart Failure	O Pleural Effusion	O Afib	O Bleeding	
O Pneumonia	O Pericardial Effusion	O SOB	O Tachy/Bradycardia	O Elevated INR	
O Other _____	O Hypotension	O Other _____	O VF/VT	O Other _____	
	O Chest Pain		O Other _____		
	O Other _____				

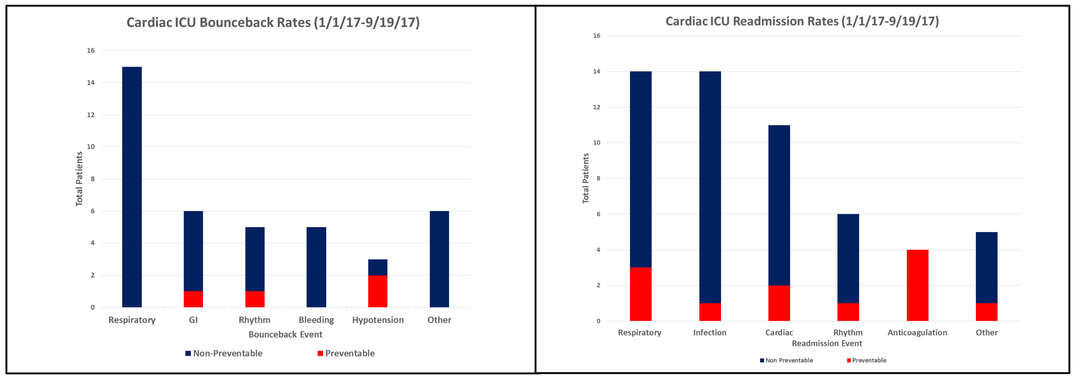
Readmission Risk:

Risk Factors	Points	Risk Score Cohorts	Predicted Risk % of Readmission
Diabetes	2	Low Risk: <5	0-12%
Chronic Lung Disease	3		
EF ≤ 30%	3	Moderate Risk: 5-10	12-30%
Endocarditis	3		
Public Health Insurance	2	High Risk: >10	>30%
Combined CAB/Valve	3		
Non STS Procedure	2		
DC on Coumadin	2		
DC Hemoglobin < 8	2		

Event and Readmission avoidable O YES O NO
Lessons Learned
_____
_____
Signature of Attending Physician _____ Date of Meeting _____ Date of Readmission _____

1 Magruder J, et al. A Predictive Model and Risk Score for Unplanned Cardiac Surgery Intensive Care Unit Readmissions. J Card Surg. 2015 Sep;30(9):685-90
2 Kilic A. et. al. Development and Validation of a Score to Predict the Risk of Readmission After Adult Cardiac Operations. Ann Thorac Surg. 2017 Jan;103(1):66-73

RESULTS



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.

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

Readmissions for respiratory problems are frequently due to volume overload. Similarly, readmissions due to over-anticoagulation were often the result of inadequate monitoring. Both problems lend themselves to a systems approach to improvement. Daily weights and daily INR, respectively, along with daily provider oversight might be effective preventive interventions.

Disclosures: The authors have no relevant financial disclosures or conflicts of interest to report.

Sternal Wound Care Practices in Maryland Cardiac Surgery Programs

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[1] University of Maryland Medical Center, [2] Johns Hopkins University School of Medicine, [3] Maryland Cardiac Surgery Quality Initiative, [4] Washington Adventist Hospital, [5] MedStar Union Memorial Hospital, [6] Western Maryland Health System, [7] University of Maryland St. Joseph Medical Center, [8]Peninsula Regional Medical Center.

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:

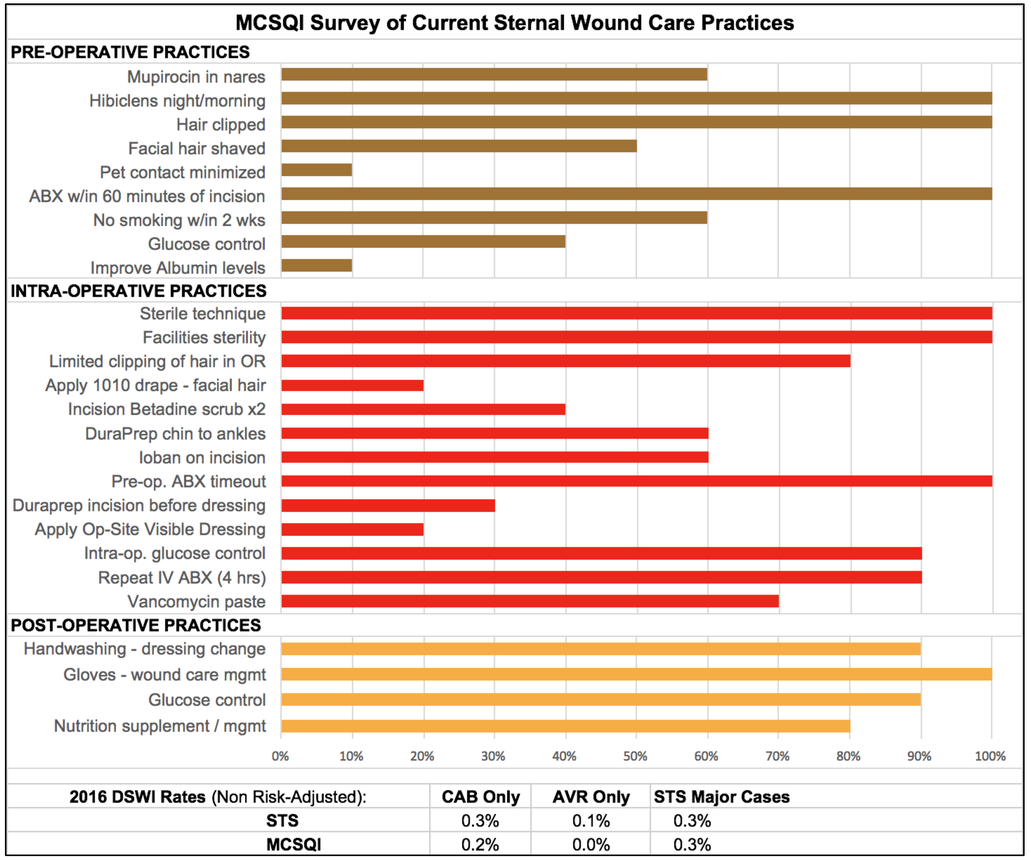
- In March 2017, all 10 MCSQI sites were surveyed to assess pre, intra and post-operative wound care practices.
- Multiple practitioners in cardiac surgery were consulted for their initiatives in each phase of wound care and a survey was developed.

Results

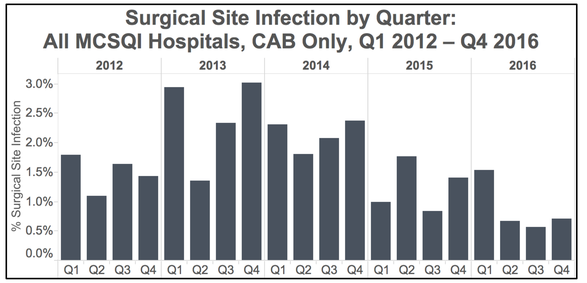
- 100% response rate (10/10) from all cardiac surgery programs in the state of Maryland

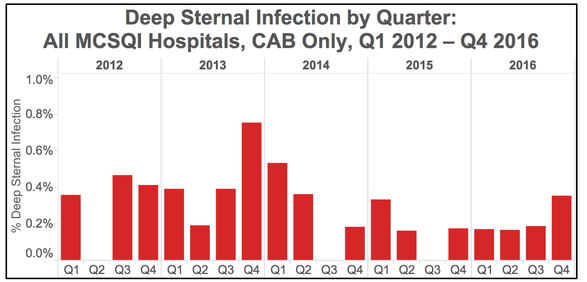
Conclusions

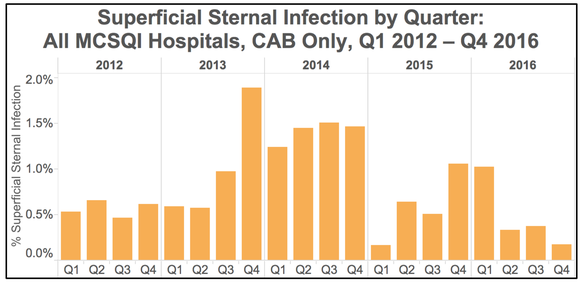
- Wound care practices in all 3 phases of care are critical for infection prevention.
- Results of our survey demonstrated the variation of practices among sites in spite of low DSWI rates.
- This project promoted discussion and debate regarding the variation.
- Next steps are to determine if selected 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.



2016 DSWI Rates (Non Risk-Adjusted):	CAB Only	AVR Only	STS Major Cases
STS	0.3%	0.1%	0.3%
MCSQI	0.2%	0.0%	0.3%







Disclosures: The authors have no relevant financial disclosures or conflicts of interest to report.

Phase of Care Mortality Analysis (POCMA) in Pediatric Cardiac Surgery

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N Hibino MD[1], L Vricella MD[1], K Nelson McMillan MD[1]

Institution(s): Johns Hopkins University School of Medicine[1]; Johns Hopkins Hospital[2], Children's Hospital of Philadelphia[3], William Beaumont Hospital[4], Johns Hopkins School of Nursing[5]

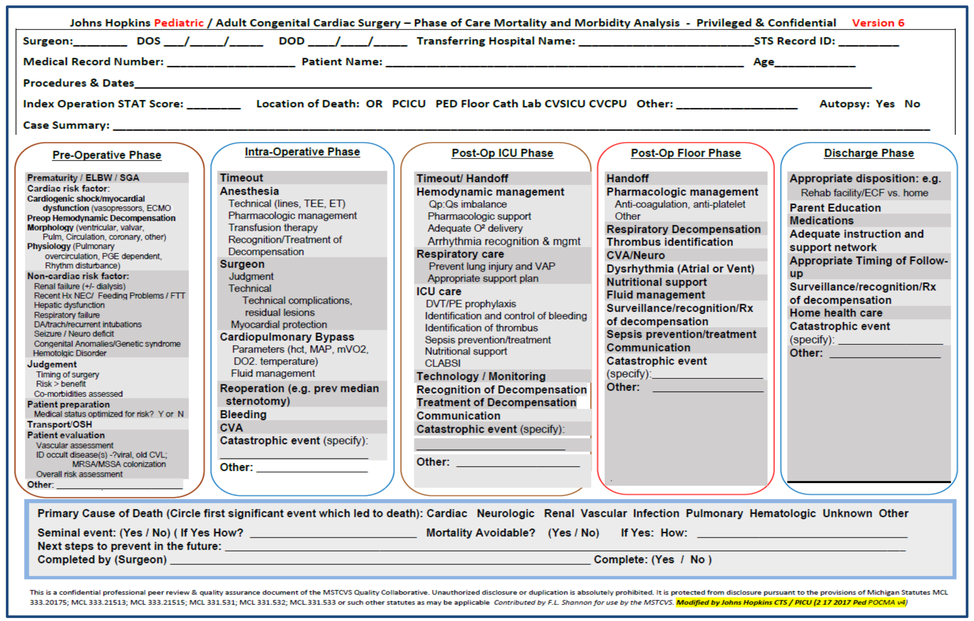
INTRODUCTION

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.



Johns Hopkins Pediatric / Adult Congenital Cardiac Surgery – Phase of Care Mortality and Morbidity Analysis - Privileged & Confidential Version 6

Surgeon:_____ DOS ___/____/____ DOD ___/___/____ Transferring Hospital Name: _____STS Record ID: _____

Medical Record Number: _____ Patient Name: _____ Age_____

Procedures & Dates_____

Index Operation STAT Score: _____ Location of Death: OR PCICU PED Floor Cath Lab CVSICU CVCPU Other: _____ Autopsy: Yes No

Case Summary: _____

Pre-Operative Phase

Prematurity / ELBW / SGA
Cardiac risk factor:
Cardiogenic shock/myocardial dysfunction (vasopressors, ECMO
Preop Hemodynamic Decompensation
Morphology (ventricular, valvar, Pulm, Circulation, coronary, other)
Physiology (Pulmonary overcirculation, PGE dependent, Rhythm disturbance)
Non-cardiac risk factor:
Renal failure (+/- dialysis)
Recent Hx NEC/ Feeding Problems / FTT
Hepatic dysfunction
Respiratory failure
DA/trach/recurrent intubations
Seizure / Neuro deficit
Congenital Anomalies/Genetic syndrome
Hemotolpic Disorder
Judgement
Timing of surgery
Risk > benefit
Co-morbidities assessed
Patient preparation
Medical status optimized for risk? Y or N
Transport/OSH
Patient evaluation
Vascular assessment
ID occult disease(s) -?viral, old CVL; MRSA/MSSA colonization
Overall risk assessment
Other: _____

Intra-Operative Phase

Timeout
Anesthesia
Technical (lines, TEE, ET)
Pharmacologic management
Transfusion therapy
Recognition/Treatment of Decompensation
Surgeon
Judgment
Technical
Technical complications, residual lesions
Myocardial protection
Cardiopulmonary Bypass
Parameters (hct, MAP, mVO2, DO2, temperature)
Fluid management
Reoperation (e.g. prev median sternotomy)
Bleeding
CVA
Catastrophic event (specify):
_____
Other: _____

Post-Op ICU Phase

Timeout/ Handoff
Hemodynamic management
Qp:Qs imbalance
Pharmacologic support
Adequate OP delivery
Arrhythmia recognition & mgmt
Respiratory care
Prevent lung injury and VAP
Appropriate support plan
ICU care
DVT/PE prophylaxis
Identification and control of bleeding
Identification of thrombus
Sepsis prevention/treatment
Nutritional support
CLABSI
Technology / Monitoring
Recognition of Decompensation
Treatment of Decompensation
Communication
Catastrophic event (specify):
_____
Other: _____

Post-Op Floor Phase

Handoff
Pharmacologic management
Anti-coagulation, anti-platelet
Other
Respiratory Decompensation
Thrombus identification
CVA/Neuro
Dysrhythmia (Atrial or Vent)
Nutritional support
Fluid management
Surveillance/recognition/Rx of decompensation
Sepsis prevention/treatment
Communication
Catastrophic event (specify):_____
Other: _____

Discharge Phase

Appropriate disposition: e.g. Rehab facility/ECF vs. home
Parent Education
Medications
Adequate instruction and support network
Appropriate Timing of Follow-up
Surveillance/recognition/Rx of decompensation
Home health care
Catastrophic event (specify): _____
Other: _____

Primary Cause of Death (Circle first significant event which led to death): Cardiac Neurologic Renal Vascular Infection Pulmonary Hematologic Unknown Other

Seminal event: (Yes / No) (If Yes How? _____ Mortality Avoidable? (Yes / No) If Yes: How: _____

Next steps to prevent in the future: _____

Completed by (Surgeon) _____ Complete: (Yes / No)

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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

BACKGROUND

Monthly workgroup meeting:

- ~ Ineffective Team Structure
- ~ Data Sharing Only
- ~ Lacked Action

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

ACTIONS

Blood Utilization

- ~ Culture change
  - ~ Blood only ordered by CV Surgeon
  - ~ One unit vs. previous standard of two units ordered at a time

New onset post op atrial fibrillation

- ~ Work in progress

Pre-op beta blocker (BB) within 24 hours of incision

- ~ Collaboration with Cardiology to have patient placed on BB at time of consult
- ~ Pre-op RN notifies surgeon if patient has not received dose of BB within 24 hours
- ~ OR staff verifies pre-op BB administration time prior to incision
- ~ Data abstractor reviews pre-op BB compliance daily and notifies surgeon of opportunity for improvement

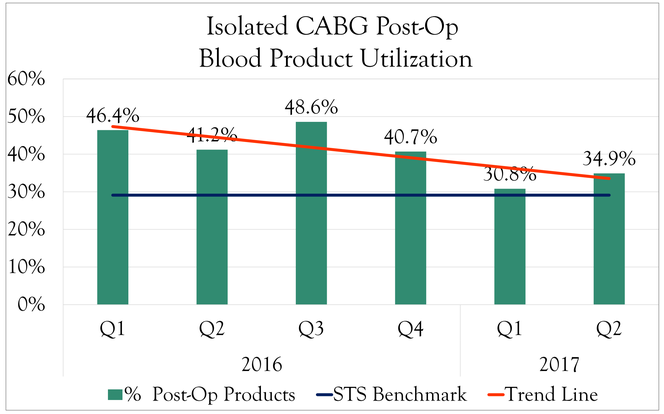
Prolonged Ventilation

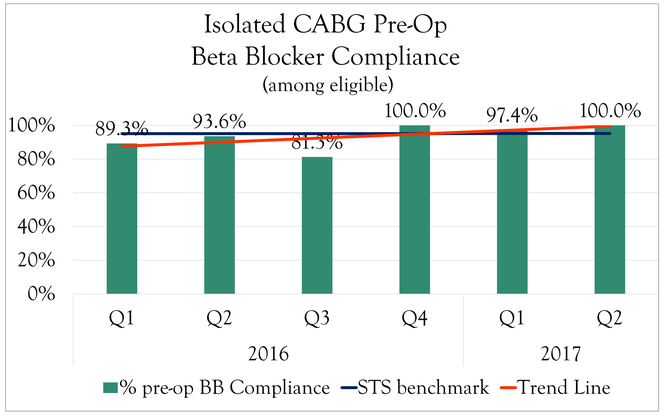
- ~ Fallouts reviewed by Advanced Practice Provider for opportunity
- ~ CV Intensivist designing pulmonary protocol for identification of high risk patients

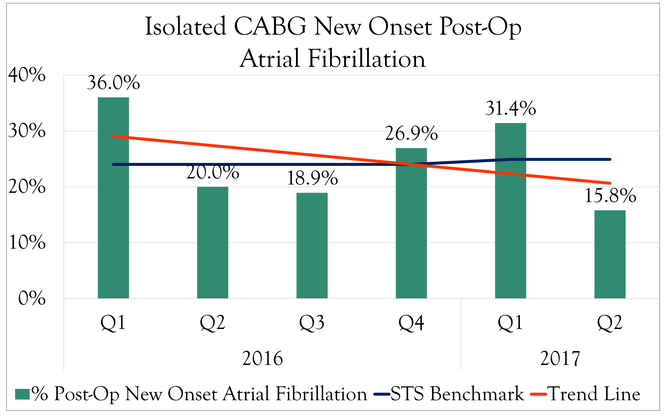
CONCLUSION

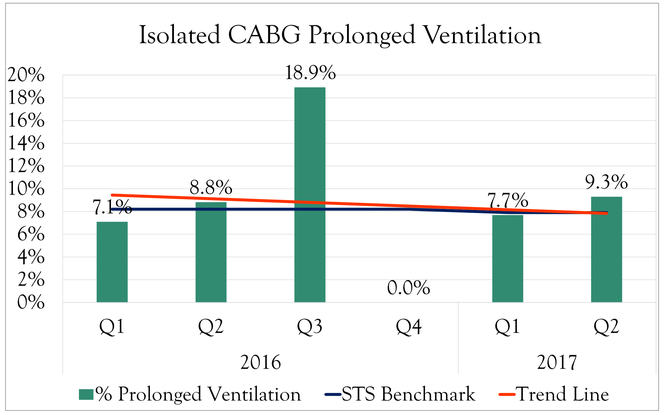
Our new workgroup structure allows us to combine the right team with the right data at the right time to implement the right actions and achieve the right results.

RESULTS









OSF HEALTHCARE

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.

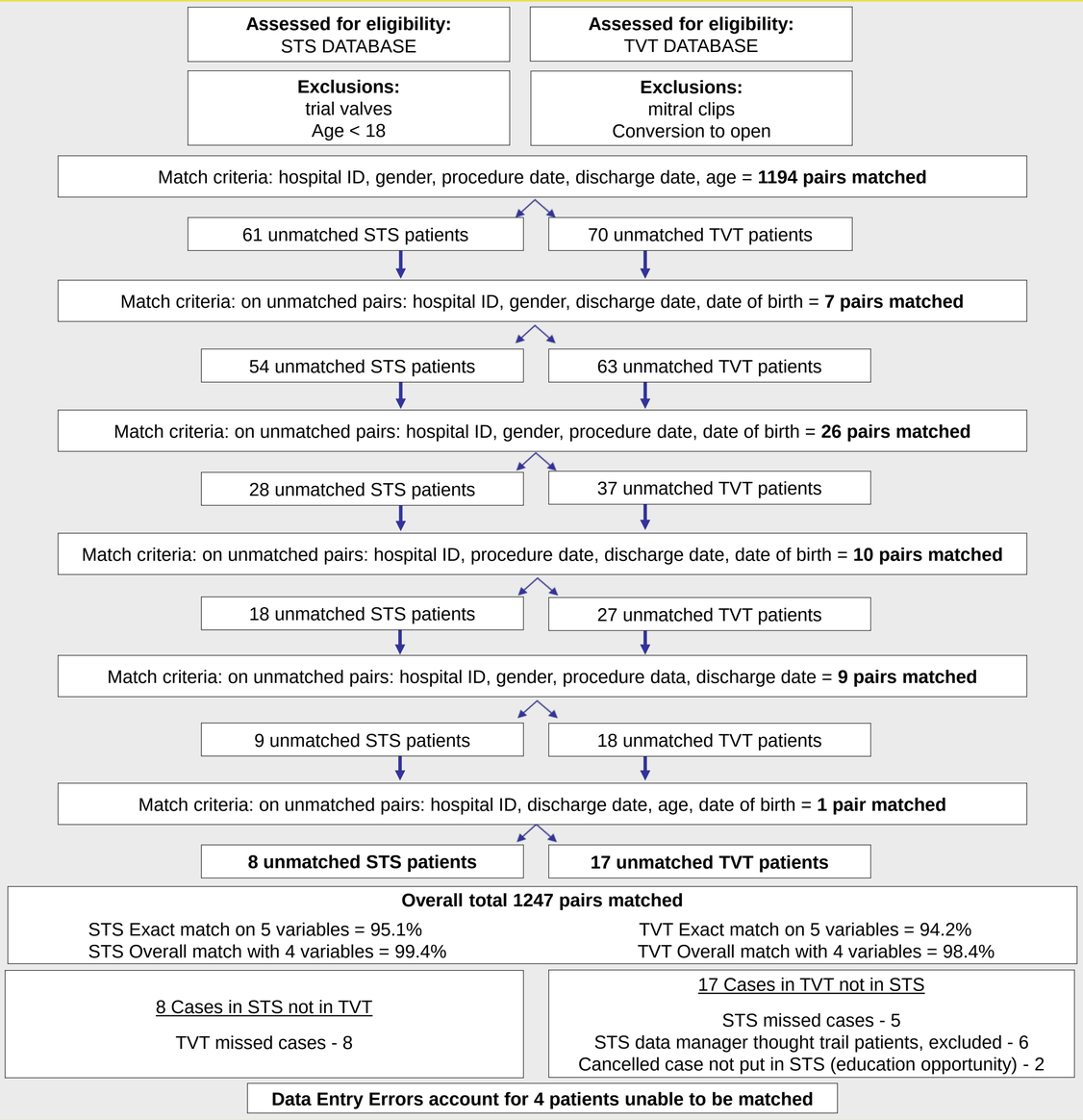
Michigan TAVR, a collaboration between the Michigan Society of Thoracic and Cardiovascular Surgeons, (MSTCV) and The Blue Cross Blue Shield of Michigan Cardiovascular Consortium (BMC2) cardiologists includes nineteen centers working together to develop quality improvement strategies for the treatment 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. After exclusion criteria were applied, a match algorithm was created using a combination of variables to determine case match rates between registries: Variables used for matching: hospital ID, gender, surgery/procedure date, discharge date, age and/or date of birth.

RESULTS



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.

Support for the Michigan Society of Thoracic and Cardiovascular Surgeons Quality Collaborative and BMC2 is provided by Blue Cross and Blue Shield of Michigan and Blue Care Network as part of the BCBSM Value Partnerships program. Although Blue Cross Blue Shield of Michigan works collaboratively with MSTCVS QC and BMC2, the opinions, beliefs and viewpoints expressed by the author do not necessarily reflect the opinions, beliefs and viewpoints of BCBSM or any of its employees.

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The authors of this poster have nothing to disclose

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

Orlando Health® Orlando Regional Medical Center

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

STSCategory	CAB 2.8			AVR 2.8			AVR + CAB 2.8		
January-December 2016 NQF Metrics	Num	Den	Rate	Num	Den	Rate	Num	Den	Rate
Pre-Operative Beta Blocker	375	380	98.7%	57	57	100.0%	54	54	100.0%
Use Of IMA	404	404	100.0%	0	0		58	58	100.0%
Prolonged Intubation	17	404	4.2%	3	60	5.0%	3	58	5.2%
Deep Sternal Wound Infection	1	404	0.2%	1	60	1.7%	0	58	0.0%
Stroke/CVA	9	404	2.2%	0	60	0.0%	0	58	0.0%
PostOp Renal Failure	6	404	1.5%	1	60	1.7%	0	58	0.0%
Renal Failure req Dialysis	3	404	0.7%	1	60	1.7%	0	58	0.0%
Surgical Re-Exploration Any	7	404	1.7%	2	60	3.3%	2	58	3.4%
Surgical Re-Exploration NQF	4	404	1.0%	2	60	3.3%	1	58	1.7%
Surgical Re-Exploration for Bleeding	3	404	0.7%	2	60	3.3%	0	58	0.0%
Antiplatelets at Discharge	395	400	98.8%	55	58	94.8%	55	56	98.2%
Aspirin at Discharge	387	388	99.7%	54	56	96.4%	54	54	100.0%
ADP Inhibitors at Discharge	1	396	0.3%	0	58	0.0%	0	55	0.0%
Beta Blockers at Discharge	390	390	100.0%	57	57	100.0%	54	55	98.2%
Anti Lipid Treatment at Discharge	399	400	99.8%	47	58	81.0%	56	56	100.0%
30 Day Readmissions	44	400	11.0%	6	58	10.3%	7	56	12.5%
Mortality (Observed)	8	404	2.0%	2	60	3.3%	3	58	5.2%
**Indicates Public Reporting*									
**Indicates Fallouts*									

Our Team

**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**

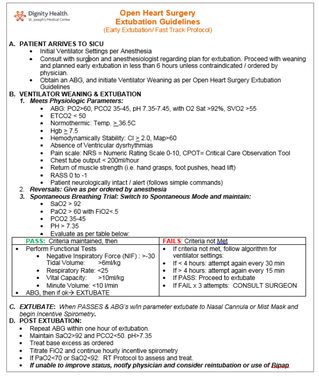
BACKGROUND

- 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 reversals.
- 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 bed-side 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.

METHODS Cont'd



Dignity Health. St. Joseph's Medical Center

Open Heart Surgery Extubation Guidelines
(Early Extubation/ Fast Track Protocol)

A. PATIENT ARRIVES TO SICU
- Initial Ventilator Settings per Anesthesia
- Consult with surgeon and anesthesiologist regarding plan for extubation. Proceed with weaning and planned early extubation in less than 6 hours unless contraindicated / ordered by physician.
- Obtain an ABG, and initiate Ventilator Weaning as per Open Heart Surgery Extubation Guidelines

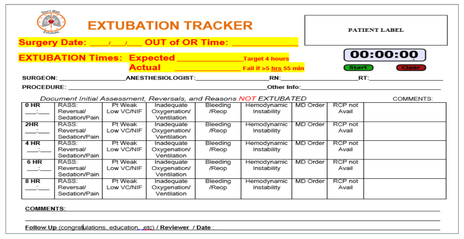
B. VENTILATOR WEANING & EXTUBATION
1. ***Meets Physiologic Parameters:***
   - ABG: PO2>60, PCO2 35-45, pH 7.35-7.45, with O2 Sat >92%, SVO2 >55
   - ETCO2 < 50
   - Normothermic: Temp ≥ 36.5C
   - Hgb ≥ 7.5
   - Hemodynamically Stability: CI ≥ 2.0, Map<60
   - Absence of Ventricular dysrhythmias
   - Pain scale: NRS = Numeric Rating Scale 0-10, CPOT= Critical Care Observation Tool
   - Chest tube output < 200ml/hour
   - Return of muscle strength (i.e. hand grasps, foot pushes, head lift)
   - RASS 0 to -1
   - Patient neurologically intact / alert (follows simple commands)
2. ***Reversals: Give as per ordered by anesthesia***
3. ***Spontaneous Breathing Trial: Switch to Spontaneous Mode and maintain:***
   - SaO2 > 92
   - PaO2 > 60 with FiO2 < 5
   - PCO2 35-45
   - PH > 7.35
   - Evaluate as per table below:

PASS: Criteria maintained, then	FAILS: Criteria not Met
• Perform Functional Tests • Negative Inspiratory Force (NIF) : >-30 • Tidal Volume: >5ml/kg • Respiratory Rate: <25 • Vital Capacity: >10ml/kg • Minute Volume: <10 l/min	• If criteria not met, follow algorithm for ventilator settings: • If < 4 hours: attempt again every 30 min • If > 4 hours: attempt again every 15 min • If PASS: Proceed to extubate • If FAIL x 3 attempts: CONSULT SURGEON

- ABG, then if ok→ EXTUBATE

C. EXTUBATE: *When PASSES & ABG's w/in parameter extubate to Nasal Cannula or Mist Mask and begin Incentive Spirometry.*

D. POST EXTUBATION:
- Repeat ABG within one hour of extubation.
- Maintain SaO2>92 and PCO2<50, pH>7.35
- Treat base excess as ordered
- Titrate FiO2 and continue hourly incentive spirometry
- If PaO2<70 or SaO2<92: RT Protocol to assess and treat.
- ***If unable to improve status, notify physician and consider reintubation or use of Bipap.***



EXTUBATION TRACKER

PATIENT LABEL

Surgery Date: ___/___/___ **OUT of OR Time:** _____

EXTUBATION Times: Expected _____ **Target 4 hours**
Actual _____ **Fail if >5 hrs 55 min**

00:00:00

SURGEON: _____ ANESTHESIOLOGIST: _____ RN: _____ RT: _____

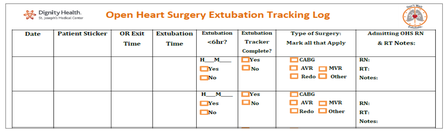
PROCEDURE: _____ Other Info: _____

Document Initial Assessment, Reversals, and Reasons NOT EXTUBATED

								COMMENTS
0 HR ___/___	RASS: Reversal/ Sedation/Pain	Pt Weak Low VC/NIF	Inadequate Oxygenation/ Ventilation	Bleeding /Reop	Hemodynamic Instability	MD Order	RCP not Avail	
2HR ___/___	RASS: Reversal/ Sedation/Pain	Pt Weak Low VC/NIF	Inadequate Oxygenation/ Ventilation	Bleeding /Reop	Hemodynamic Instability	MD Order	RCP not Avail	
4 HR ___/___	RASS: Reversal/ Sedation/Pain	Pt Weak Low VC/NIF	Inadequate Oxygenation/ Ventilation	Bleeding /Reop	Hemodynamic Instability	MD Order	RCP not Avail	
6 HR ___/___	RASS: Reversal/ Sedation/Pain	Pt Weak Low VC/NIF	Inadequate Oxygenation/ Ventilation	Bleeding /Reop	Hemodynamic Instability	MD Order	RCP not Avail	
8 HR ___/___	RASS: Reversal/ Sedation/Pain	Pt Weak Low VC/NIF	Inadequate Oxygenation/ Ventilation	Bleeding /Reop	Hemodynamic Instability	MD Order	RCP not Avail	

COMMENTS: _____

Follow Up (consults/ations, education, etc) / Reviewer / Date: _____



Dignity Health. St. Joseph's Medical Center

Open Heart Surgery Extubation Tracking Log

Date	Patient Sticker	OR Exit Time	Extubation Time	Extubation <6hr?	Extubation Tracker Complete?	Type of Surgery: Mark all that Apply	Admitting ORS RN & RT Notes:
				H___M___ Yes No	Yes No	CABG AVR MVR Redo Other	RN: RT: Notes:
				H___M___ Yes No	Yes No	CABG AVR MVR Redo Other	RN: RT: Notes:

Anesthesia Guidelines for Intraoperative Management During Cardiovascular Surgery

Goal:
Extubation following cardiac surgery in less than 6 hours in patients who are hemodynamically stable and with no ongoing significant bleeding.

Techniques:

Pharmacology:
- Limit narcotics to less than 1000mcg of fentanyl (less than 1500mcg for chronic narcotic user or those with high tolerance due to drug use).
- Consider sufentanyl if they require more narcotic. Consider less narcotic in elderly or those with liver dysfunction. Limit narcotic use post pump run.
- Limit benzodiazepines to less than 5mg versed unless indicated to give more and consider using 2-3mg total if elderly.
- Limit muscle relaxants in the last hour of case to avoid residual NM blockade in ICU. Reverse before leaving the ICU or write for reversals with clear instructions when to give.

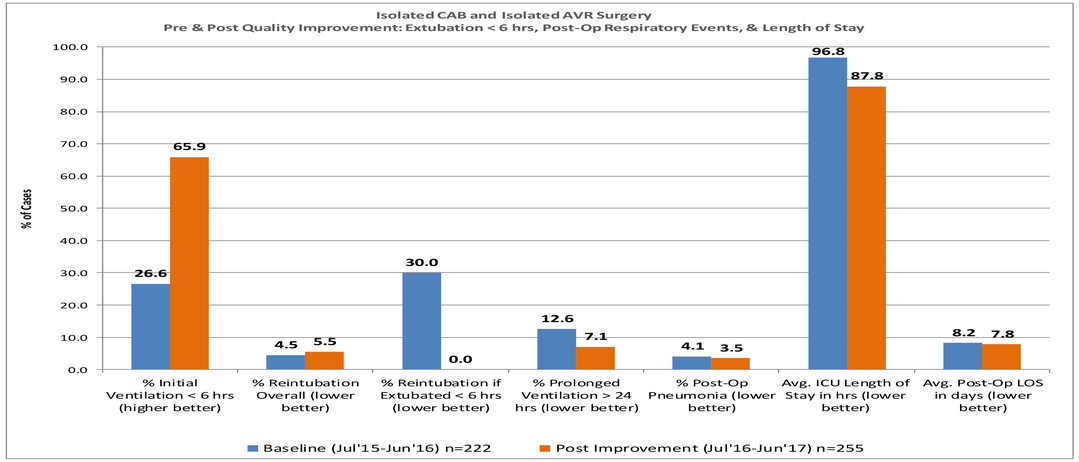
Fluids:
- Limit total fluid (crystalloid and colloid) for pump cases to less than 2L unless indicated by CVP or other assessment of fluid status. Off pump cases may require more fluid but should be based on a subjective assessment tool (CVP vs respiratory variation in BP).

Transition to ICU:
- Consider starting Propofol if BP stable in the OR to transition to ICU.
- Consider Precedex if patient likely will not tolerate Propofol drip.
- The goal is a calmly sedated patient arriving to ICU with a medication that is very short acting with no long term sedative effects.

ICU management:
- Limit the use of morphine and benzodiazepines in ICU and use Propofol or Precedex to keep patient sedated until ready to be extubated.
- Consider IV Tylenol and small doses of fentanyl to control pain until patient is extubated.

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%.**



For their dedication to clinical excellence and caring, a special thanks to: Dr. J.D. Morrissey, Dr. A. Tendulkar, Cardiovascular Surgeons; Dr. J. DeBooy, Anesthesiologist; Dr. M. Herrera, Quality Medical Director; Julie Pontarolo-Evans, Director Respiratory Therapy & the R. R.T' team; Martha Engaling, Nursing Director Critical Care; Audea Preyer & Iniobong Ekong, Nursing Supervisors SICU & the SICU R.N.s; Pamela George, Nursing Director Surgical Services; and the CVOR PA's, Nurses, Techs & Perfusionists; Joann Marks, Nursing Director Cardiovascular Services and the Cardiovascular Data& Quality Department team.

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.

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Wanted Dead or Alive, ~~Not Un~~ Known Update

Cathy Knoff[1, 3], Morley Herbert[1,2], Syma Prince[1,3], Baron Hamman[1]

[1]Texas Quality Initiative [2]Medical City Dallas Hospital [3]HCA, North Texas Division

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

Table 1 STS National Database (7/1/2014-2/15/2017)

Response	Records with Response	% of Total
All Responses	754,549	
Alive	699,531	92.7%
Dead	26,778	3.6%
Unknown	25,693	3.4%
Missing	2,547	0.3%

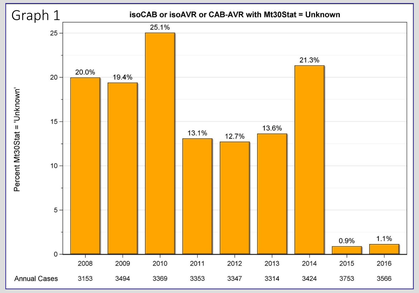
METHODS

- 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 TQI 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

- Graph1 shows the trend of "Status at 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

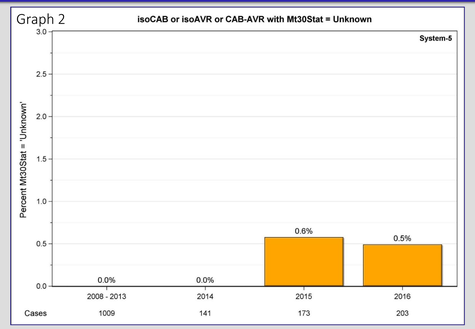
Graph 1



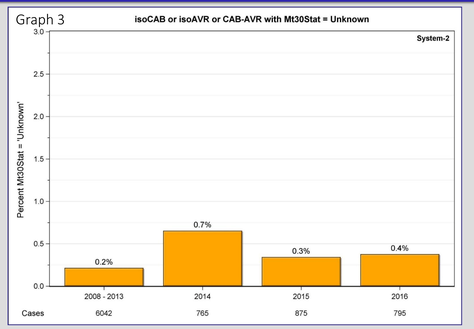
UNKNOWNS BY HOSPITAL SYSTEM

- There are a total of 5 hospital systems participating in TQI, ranging from 1 hospital to 11 hospitals per system
- Further analysis by hospital system demonstrates hospital system-5 and sytem-2 (Graphs 2 & 3) who already have an existing process in place to collect the Operative Mortality 30-day status information, therefore missing very few patients and meeting the STS target thresholds
- Graphs 4 & 5 show hospital system-1 and system-4, who required a major reconfiguration of and/or additional resources for their data collection processes to accurately collect the Operative Mortality 30-day status follow-up data
- Hospital systems achieved this by:
  - New 30-day phone calls
  - New access to outpatient clinic records
  - Encourage surgeons/offices to communicate patient follow-up visits
  - TQI REMPI data matching
- Graph 6 shows hospital system-3, who is still struggling to change processes to meet or exceed the minimum threshold for collection of Operative Mortality 30-day status

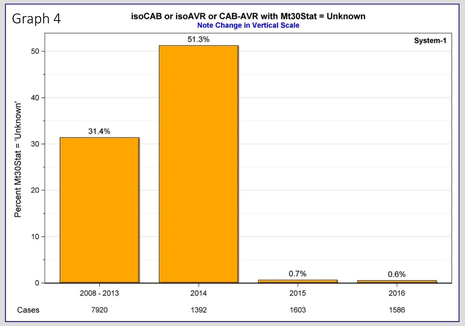
Graph 2



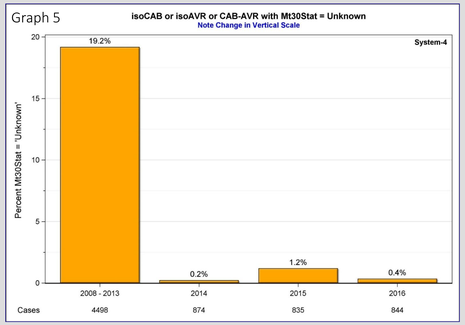
Graph 3



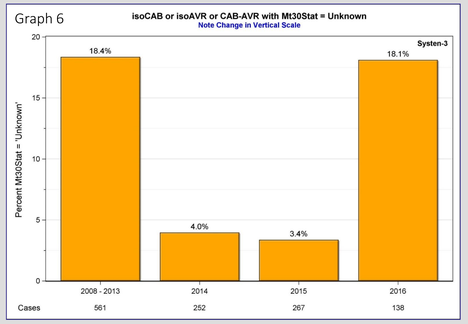
Graph 4



Graph 5



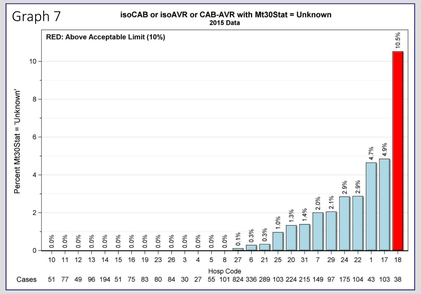
Graph 6



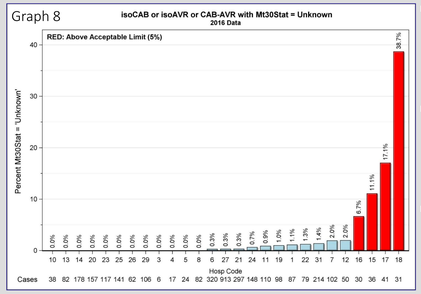
STS TARGET THRESHOLDS ACHIEVED?

- 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

Graph 7



Graph 8



- The red shaded bars are sites that do not meet the STS required percentage to achieve a star rating
- Lower volume programs may have difficulty meeting the threshold as there is less tolerance for missing cases
- It is difficult but not impossible to achieve the new STS mandated requirements

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

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