



MCSQI Annual Report | 2019

The Maryland Cardiac Surgery Quality Initiative's (MCSQI) Annual Report is a confidential report detailing the activities and achievements of MCSQI. It is intended for use by physicians, administrators, data managers and the cardiac surgery community for development and evaluation of quality improvement plans.

The source of statewide outcome metrics and calculations are from the MCSQI data warehouse. MCSQI member hospitals submit Society of Thoracic Surgeons (STS) Adult Cardiac Surgery data on a quarterly basis. STS exclusion criteria and Observed-to-Expected recalibration coefficients are applied.

All data in this report is protected from disclosure pursuant to the provisions of Maryland statutes as may be applicable.

Unauthorized disclosure or duplication is absolutely prohibited.

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Letter from the Chairman of the Board

Dear Colleagues,

The Maryland Cardiac Surgery Quality Initiative, now in our sixth year, continues to strive to fulfill our mission to *continuously improve the clinical quality of cardiac surgery provided in the state of Maryland through data analysis, research, and education*. Collaboration among surgeons, cardiovascular service line administrators, data managers, perfusionists and other providers from the ten cardiac surgery programs in the state is the backbone to our ongoing improvements. The passion and dedication of the cardiac surgery community in the state of Maryland is what makes the organization successful, and I want to extend my deep appreciation for all involved. Active engagement is critical to the ongoing accomplishments of MCSQI.

The Key Initiatives adopted for 2019 and 2020 through our strategic planning process include:

- Readmission Reduction
- Understanding Postoperative Atrial Fibrillation Variability
- Cost Analysis and Improving Value



Rawn Salenger, MD
University of Maryland
Saint Joseph Medical Center

We will continue to focus on these initiatives with the ultimate goal of researching best practices, developing recommendations, educating our members, and encouraging implementation. This past year significant progress was made in the area of Readmission Reduction under the leadership of Glenn Whitman, MD, Chair of the MCSQI Quality Committee, with adoption of critical process elements that distinguished top performing programs. Determining the key elements for reducing readmissions evolved as result of rigorous data analysis and sharing of individual program practice protocols. This report highlights progress made with this initiative and others.

Maryland's Total Cost of Care reimbursement model along with rapidly evolving cardiovascular technical innovations make it crucial to understand cost variability and the value of care. Through collaboration with the Maryland Health Care Commission we have been able to link state level cost data with our Society of Thoracic Surgeons (STS) clinical outcomes data. This has allowed us to make significant progress in identifying the drivers of cost variability among cardiac surgery programs. Efforts to identify areas of appropriate cost reduction allow us to work on normalizing cost while maintaining high quality of patient care.

This annual report provides supporting data that demonstrates the positive results of collaboration among key stakeholders and our commitment to MCSQI's mission that ultimately improves the lives of our patients. I hope you benefit from the information included and encourage you to share the report with your team.

Sincerely,



Rawn Salenger, MD
Chairman, MCSQI

MCSQI Overview

MCSQI's MISSION is to continuously improve the clinical quality of cardiac surgery provided in the state of Maryland through data analysis, research, and education.

Since 2013, MCSQI has brought surgeons, data managers and hospital administrators together to compare data, share best practices, perform outcome analyses and implement process improvements. MCSQI has become a trusted, credible leader building a culture of continuous quality improvement in the cardiac surgery community. Benefits include reduced costs, enhanced clinical effectiveness, increased accountability, fewer regional variations, and stronger alliances between heart team members.

Our group endorses the spirit and intent of the Maryland Health Care Commission's (MHCC) legislative charge to improve oversight and maintain high performance standards in Maryland hospitals' cardiac programs.

MCSQI's Key Strategic Goals

Improve Quality and Control Costs: MCSQI members collaborate to analyze hospital processes, work to identify opportunities for improvement and help implement relevant best practice protocols.

Enhance Communications and Education: MCSQI serves as the interface to communicate process of care information between member sites, eliminating decision making in silos and connecting clinical teams.

Inform MHCC Policy: MCSQI helps establish a voice within the state's healthcare legislation by providing MHCC committees and staff with ways to define and assess cardiac surgery performance.

Organizational Components

MCSQI is a non-profit consortium supported by all ten hospitals that perform cardiac surgery in the state of Maryland. The organization provides value to its stakeholders by improving the quality of care through data analysis and implementing best practice protocols led by the Board of Directors, Quality Committee and Research and Writing Committee.

Benchmarking and Reporting: MCSQI focuses on selecting quality indicators, establishing baseline data, designing scorecards, addressing privacy and confidentiality and using providers' commentary as context to better understand trends and variations. Data managers convene regularly to standardize coding practices, allowing for timely, sound and accurate interpretations of cardiac surgery performance reports.

MCSQI Overview

Quality and Cost Improvements: Identification of statistically significant performance variances based on quarterly analysis of key clinical indicators have resulted in the development of MCSQI best practice guidelines. Involvement in the analysis process and implementation of practice guidelines has improved individual hospital outcomes. As a group, members analyze and compare performance data, share clinical protocols, develop recommended guidelines, and provide quality assessment tools.

Communication and Education for Members: MCSQI's network of surgeons, data managers, clinical teams and administrators fosters statewide collaboration through in-person meetings, conference calls and site visits. Through dynamic communication MCSQI informs, motivates, builds trust and increases transparency; consequently, helping affect meaningful organizational change.

Regulatory / MHCC Policy Engagement: Informative and timely updates to MCSQI members about proposed MHCC projects, regulatory changes and comment periods are provided. MCSQI works collaboratively with MHCC and submits consensus recommendation statements representing all 10 cardiac surgery programs to both MHCC and the Maryland Hospital Association. Specific consensus statements and contributing results include:

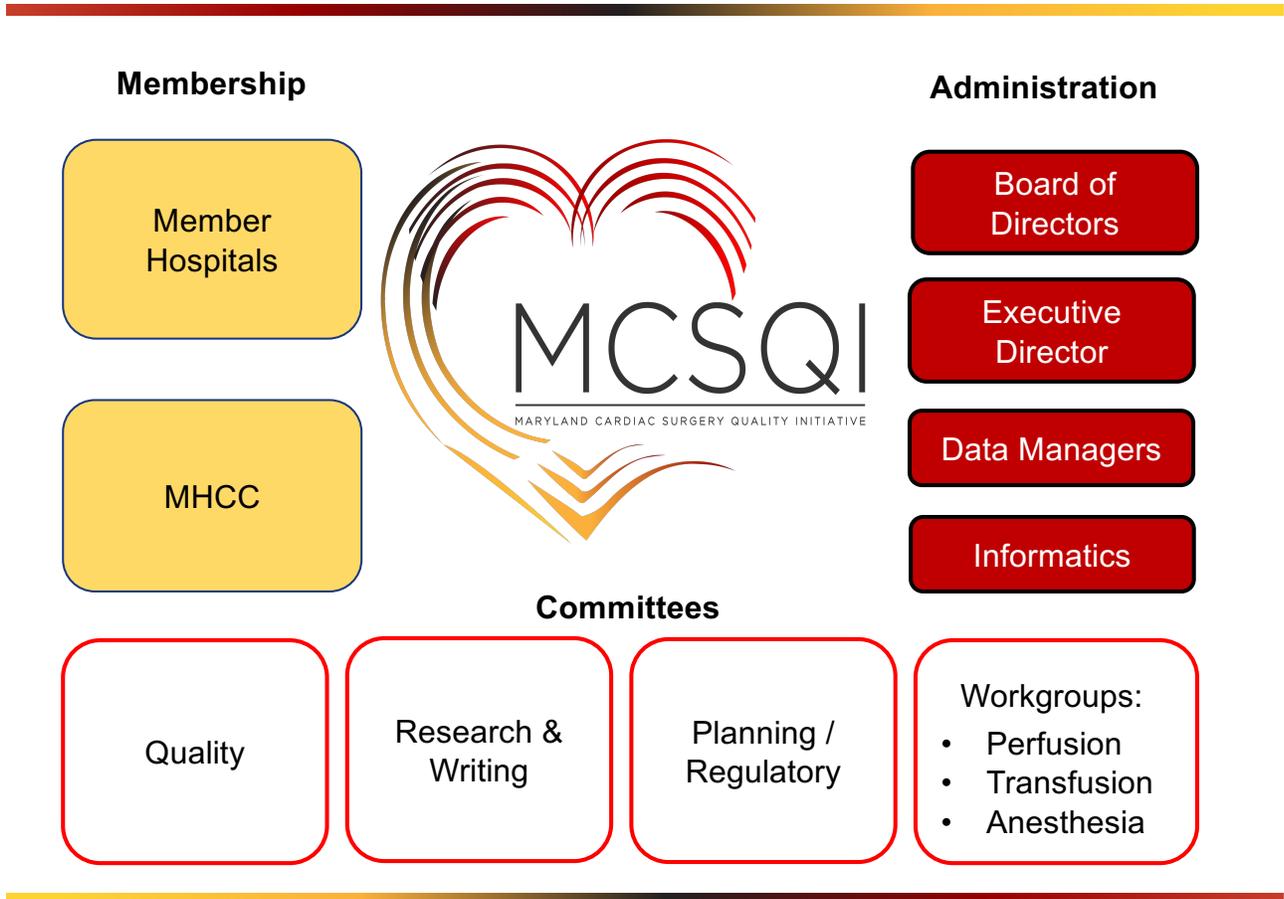
- **Revisions to COMAR 10.24.17: State Health Plan Chapter for Cardiac Surgery and Percutaneous Coronary Intervention Services to ensure meaningful, accurate and fair Certificate of On-going Performance metrics and quality assessment components.**
- **Determination and revision of ICD-9 / 10 procedure codes for defining cardiac surgery.**
- **Exclusion of five specific Potentially Preventable Complications (PPC) for cardiac surgical APR-DRGs under the Maryland Hospital Acquired Condition's Program.**
- **Successful linking of STS data with Health Services Cost Review Commission (HSCRC) charge data; thus, establishing a foundation for future projects focused on correlation of charges/costs to outcomes/quality performance.**

Expansion to Multi-disciplinary Collaboration: MCSQI has expanded participation to include cardiac anesthesiologists, perfusionists, cardiac rehabilitation specialists, and interventional cardiologists. A multi-disciplinary approach expands opportunity for quality improvement through enhanced coordination and delivery of value-based care. This approach also provides opportunities to collaborate with payers.

Research and Writing Publications: Over 30 research posters, manuscripts, and presentations have been presented at national surgical society meetings. In addition to MCSQI's Director of Analytics, a biostatistician is contracted to assist MCSQI with committee-approved quality research projects and publications.

Regional and National Collaboration: MCSQI has entered into formal agreements and projects with other cardiac quality consortiums such as the Virginia Cardiac Services Quality Initiative and the National Cardiac Surgery Quality IMPROVE Network that represents seven regional collaboratives.

Organizational Model



Quality Committee

The Quality Committee, formally established in March 2014, is tasked with managing MCSQI's quality improvement agenda. Membership is comprised of clinicians at all ten MCSQI hospitals, including: surgeons, data managers, intensivists, pulmonologists, nurse practitioners and members of the cardiovascular team. During monthly conference calls the Quality Committee examines hospitals' clinical data from the statewide STS registry correlating results with practice variation.

Identification of statistically significant performance variances based on quarterly analysis of key clinical indicators have resulted in the development of MCSQI best practice guidelines. Involvement in the analysis process and implementation of practice guidelines has improved individual hospital outcomes. As a group, members analyze and compare performance data, share clinical protocols, develop recommended guidelines, and provide quality assessment.

2019 Quality Committee Highlights:

Early Extubation / Prolonged Ventilation	MCSQI Rates (Unadjusted)	2013 CAB Only	2019 CAB Only	Impact
	Early Extubation ↑	40%	73%	83% Improvement
	Prolonged Ventilation ↓	9.5%	6.0%	37% Reduction
Blood Utilization	Intra-operative Blood Transfusion ↓	39%	19%	51% Reduction
	Post-operative Blood Transfusion ↓	34%	26%	24% Reduction
	Any Blood Transfusion ↓	55%	34%	38% Reduction
MCSQI Statewide Quality Assessment Tool	<p><u>One Year Post-Implementation Assessment:</u></p> <ul style="list-style-type: none"> • 40% of programs demonstrated improvement! • Hospitals adopting 100% of the 27 tenets of quality ↑ from 67% to 82% • Specific performance measures that gained acceptance at all programs: <ul style="list-style-type: none"> - Blood conservation protocols - Review of Patient-Reported Outcome Measures - “>50% ICU Intensivist coverage” - “>76% of Surgeons participating in M&M Conferences” <p><i>IMPACT: programs joined together to assess their program based on a common set of performance measures to ensure high-quality care for cardiac surgery patients in Maryland!</i></p>			
Enhanced Recovery After Cardiac Surgery (ERACS)	<p><u>How Does Enhanced Recovery After Cardiac Surgery Enhance Recovery?</u> Lecture by Michael Grant, MD</p> <p><u>Transfusion: The Team Approach</u> Lecture by Rawn Salenger, MD</p>			
Atrial Fibrillation Initiative	<p>Statewide review of A-Fib protocols and STS A-Fib rates</p> <p><u>Prophylactic Use of Amiodarone for Postoperative Atrial Fibrillation Prevention</u> Study Design – Niv Ad, MD</p>			
Cost / Value Initiative	<ul style="list-style-type: none"> • Identified drivers of cost variability • Initiated Phase II Financial / Clinical Data linking in collaboration with MHCC 			

Quality Committee

2019 Quality Committee Highlights:

30-Day Readmission Reduction	<ul style="list-style-type: none"> • Conducted Readmission Assessment Survey to determine protocols and processes among programs with lower readmission rates. • Six of ten hospitals see patients within 10 days of discharge and their collective readmission rate is 8.2% (2018-2019). • Developed MCSQI Recommended Tenets for Readmission Reduction.
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Readmission reduction continues to be a key strategic initiative for MCSQI. This past year Readmission Reduction Tenets were developed based on the analysis of practice patterns among the 10 hospital members and identification of key differentiating protocols among top performing programs, as well as programs that made substantial improvements. As a result, MCSQI developed the following Readmission Reduction Tenets:

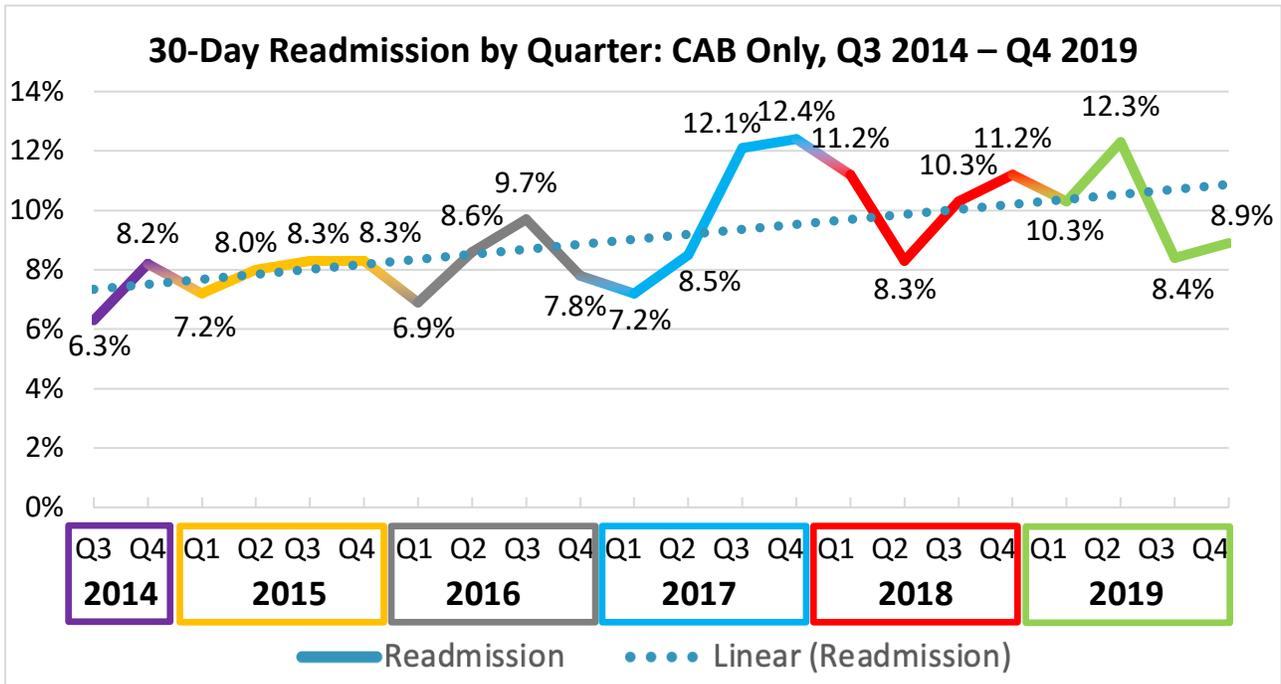


Readmission Reduction Initiative Recommended Tenets

1. See patient in clinic within 10 days post-discharge.
2. For patients being discharged to rehab: APP/MD calls provider at receiving facility to debrief about patient, establish rapport, and give provider the cardiac surgery team's 24/7 phone number.
3. Cardiac surgery team notified by ER before readmitting or placing a cardiac surgery patient in Observation.

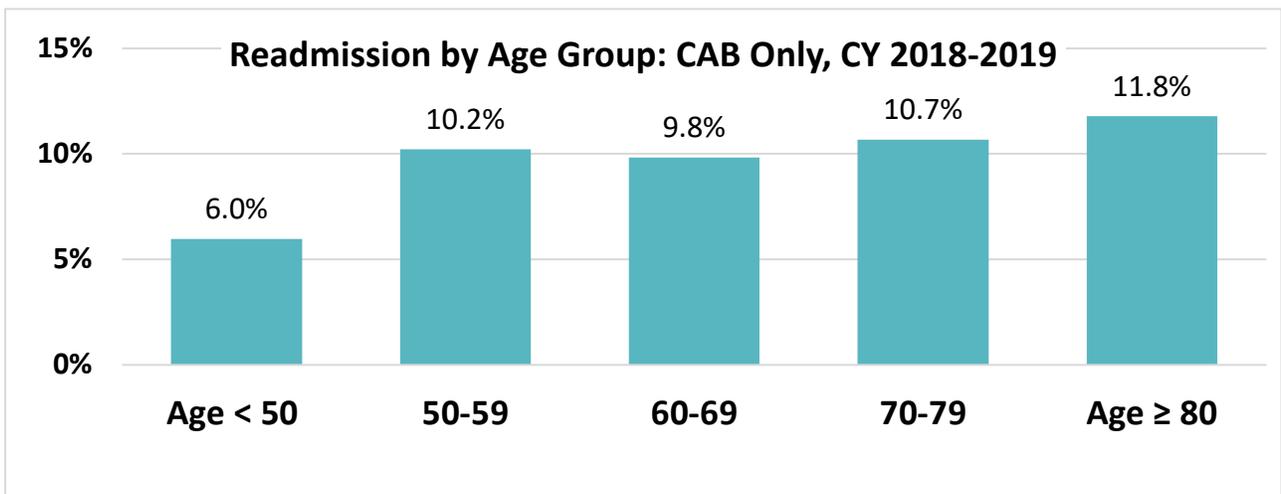
The above recommendations are in addition to other important and more common practices to minimize readmissions e.g. cardiac surgery nurses/APP provide patient education and participate in discharge planning, provision of comprehensive written discharge instructions, etc.

Quality Committee



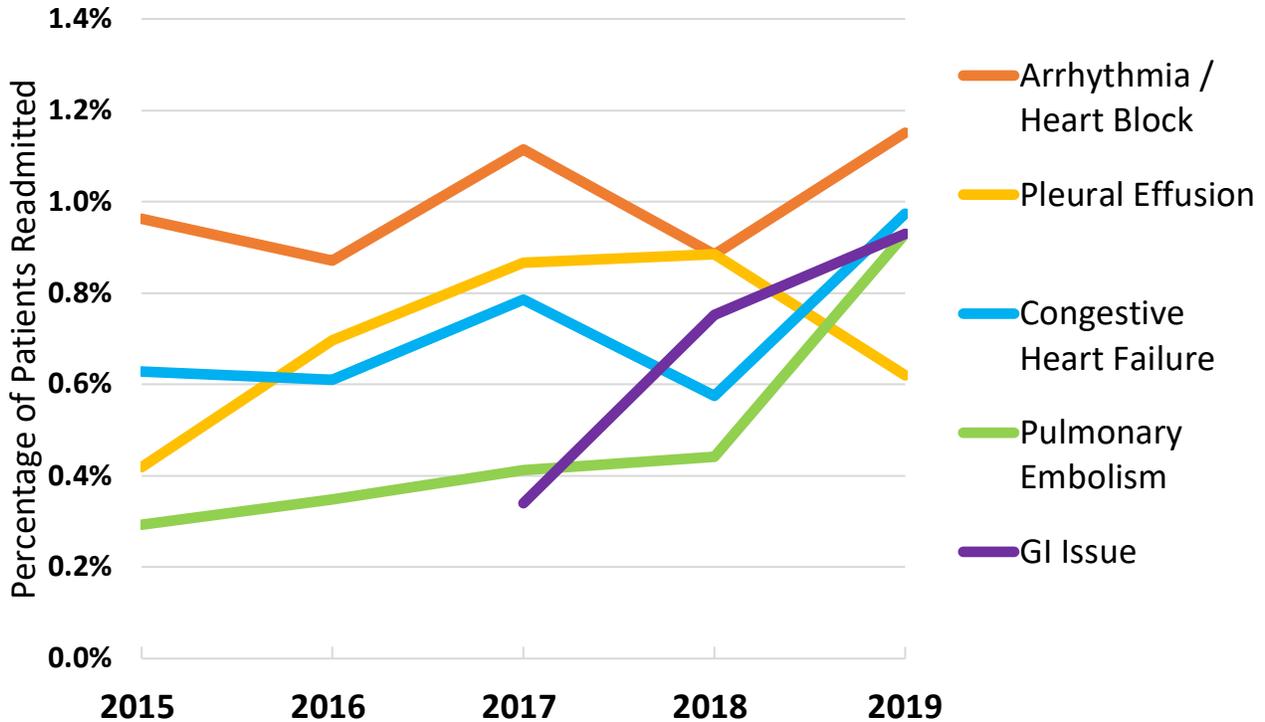
Readmission by Discharge Location: CAB Only CY 2018-2019

	Procedure Volume	Readmission Rate	Average Predicted Risk of Mortality
MCSQI Total	4,521	10.1%	1.66%
Home	3,361	8.3%	1.25%
Extended Care / TCU / Rehab	1,079	15.8%	2.81%
Other	81	9.9%	3.70%



Quality Committee

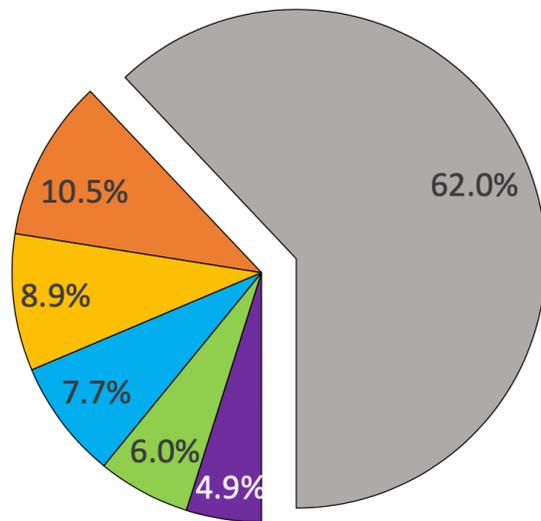
Top 5 Readmission Reasons: CAB Only, 2015-2019



Percentage of Readmissions by Reason Readmitted: CAB Only, 2017-2019

Nearly 40% of all readmissions can be attributed to these five reasons (265/698)

- Arrhythmia/Heart Block (N=73)
- Pleural Effusion (N=62)
- Congestive Heart Failure (N=54)
- GI issue (N=42)
- Pulmonary Embolism (N=34)
- Other Readmission Reason (N=433)



Percentage of Readmissions

Research and Writing Committee

In August 2015, the MCSQI Board of Directors voted to formally establish a committee tasked with overseeing and developing a research and publication process. This Research and Writing Committee is chaired by Dr. Niv Ad of Adventist HealthCare White Oak Medical Center / University of Maryland Medical Center. The group officially reviews and approves proposals for research. Committee members are excited for the opportunity to impact quality improvement and research on the state, regional and national levels.

2019 Highlights

6 Presentations:

American Association of Thoracic Surgery (AATS) Annual Meeting

- Does the Number and Type of Blood Products Transfused Negatively Impact Patient Outcomes Following Open Heart Surgery?
- Racial Disparity, Preoperative Morbidity and Surgical Outcome: A Report from a State-Wide Cardiac Surgery Working Group

American Heart Association (AHA) Quality of Care and Outcomes Research Scientific Sessions

- Center-specific Variation in Use of Dual Antiplatelet Therapy Prior to Coronary Surgery: An Outcome Analysis from the Maryland Cardiac Surgery Quality Initiative

Eastern Cardiothoracic Surgical Society (ECTSS) 57th Annual Meeting

- Modifiable Inter-Hospital Cost Variability in Coronary Artery Bypass Surgery

Society of Thoracic Surgeons (STS) 55th Annual Meeting

- Blood Utilization: Tale of Two Metrics – Improvement and Variability
- Mitigating the Risk: Transfusion or Reoperation for Bleeding After Cardiac Surgery

2 Posters:

Society of Thoracic Surgeons Advances in Quality and Outcomes Conference

- The Value and Impact of A Statewide Quality Collaborative
- Complementing Society of Thoracic Surgeons (STS) Adult Registry Data with Financial Data – A First Pass

3 Publications:

- Variation in Platelet Transfusion Practices in Cardiac Surgery (*Innovations*)
- Predictors of Operative Mortality Among Cardiac Surgery Patients with Prolonged Ventilation (*Journal of Cardiac Surgery*)
- Mitigating the Risk: Transfusion or Reoperation for Bleeding After Cardiac Surgery (*Annals of Thoracic Surgery*)

Data Manager Committee

MCSQI's STS Data Manager Committee, co-chaired by Kimberly Behrens of Johns Hopkins Hospital and Dawn Roach of University of Maryland St. Joseph Medical Center serves as the backbone of the organization. The data managers each share vital details related to data abstraction with their internal teams, which allows for more accurate and consistent data collection. Collaboration amongst the group is instrumental in ensuring that all data abstractors across the state are collecting data with the same understanding of STS definitions. MCSQI Data Managers also interface with counterparts in Virginia, Michigan and Texas. Data Managers serve alongside surgeons on various committees and task forces within MCSQI. They participate in research and quality improvement to enhance cardiac surgery care in Maryland.

2019 Highlights

Data Managers convene at bi-annual workshops to review challenging cases and confirm all members are up-to-date with the latest STS definition clarifications. STS surgeons have also participated in these workshops.

Semi Annual Meetings

At the MCSQI Spring 2019 Meeting, Dr. Rawn Salenger, of the University of Maryland Saint Joseph Hospital gave a presentation on "Mitral Valve Surgery." At the MCSQI Fall 2019 Meeting, Dr. Parijat Didolkar, of Sinai's Life Bridge Cardiovascular Institute, presented on the topic "Bentall and Valve Sparing Aortic Surgery." A representative from the STS conducted a question and answer sessions regarding definitions to ensure accurate data collection.

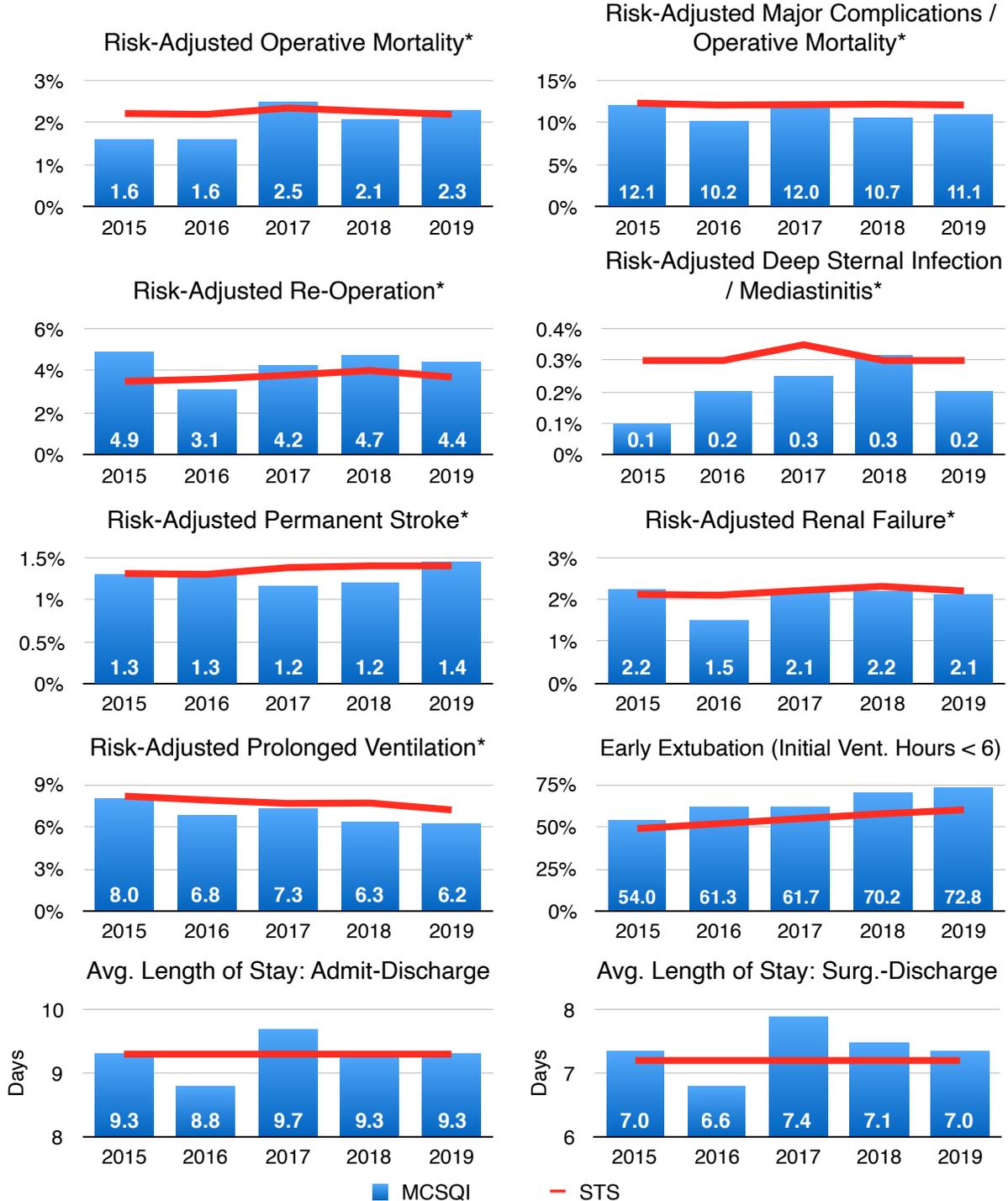
Conference Posters - Society of Thoracic Surgeons Advances in Quality and Outcomes

- *The Value and Impact of A Statewide Quality Collaborative*
- *Complementing Society of Thoracic Surgeons (STS) Adult Registry Data with Financial Data – A First Pass*



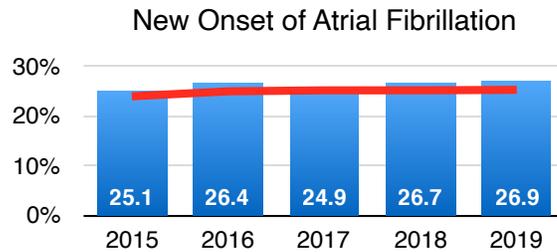
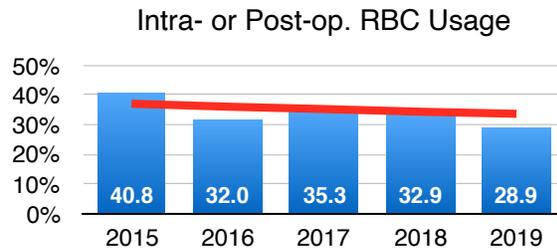
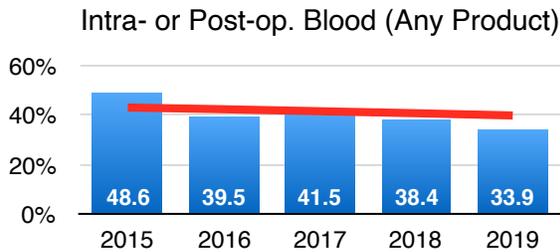
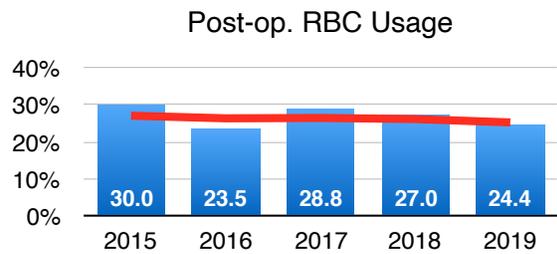
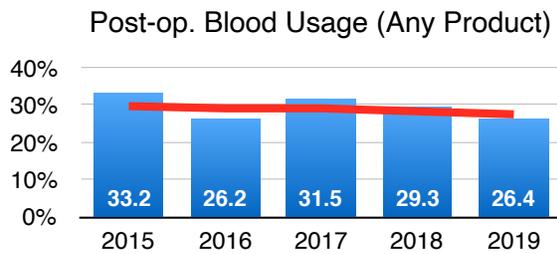
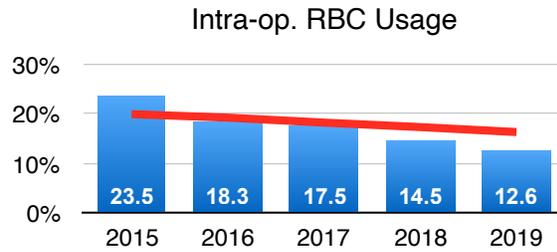
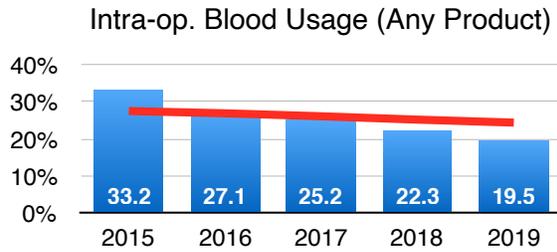
MCSQI attendees at the 2019 STS AQO conference in New Orleans, LA

Clinical Quality Indicators – Isolated CABG



***STS Risk-adjusted Rates.** These calculations involve two steps: 1) Calculation of the O/E ratio, which divides the percentage of an observed morbidity by the rate predicted by the STS risk calculator, and 2) Multiplication of the O/E ratio by the STS national rate of the observed morbidity. All O/E ratios apply STS Recalibration coefficients, which normalize the national benchmark value to exactly 1.0. All Risk-adjusted Rates apply Recalibration coefficients from the CY 2018 STS report.

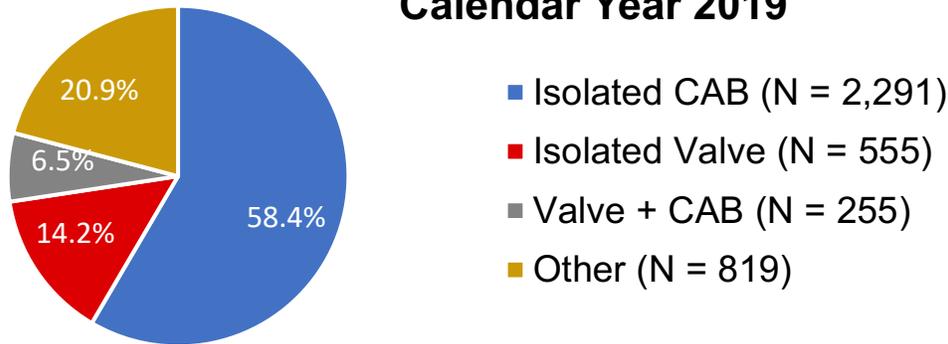
Clinical Quality Indicators – Isolated CABG



■ MCSQI - STS

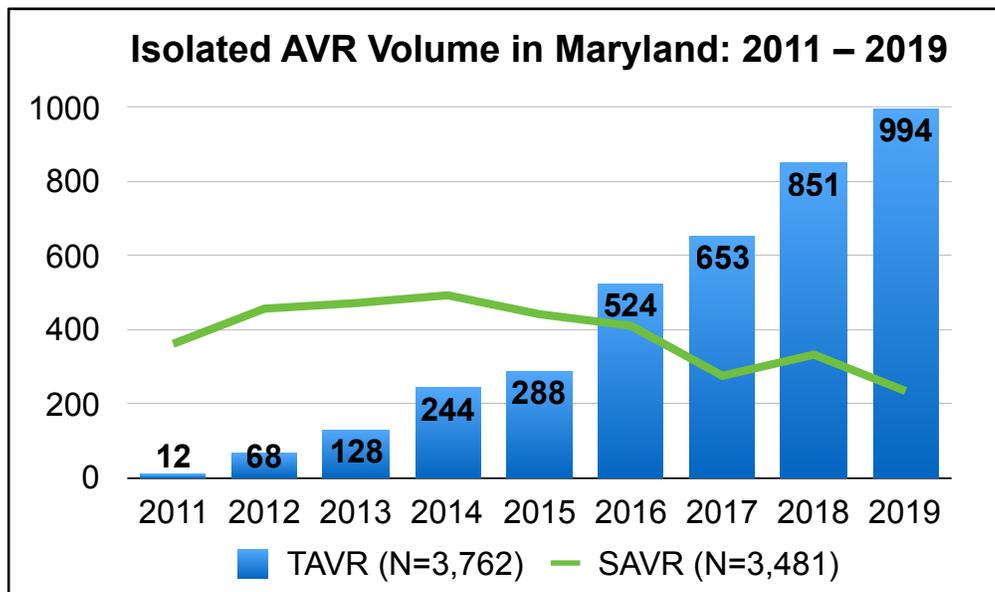
Procedure Volumes

**Statewide Procedure Volume by STS Category:
Calendar Year 2019**



MCSQI Procedure Volume	2015	2016	2017	2018	2019
Isolated CABG	2,424 (52.8%)	2,324 (53.4%)	2,460 (58.5%)	2,300 (55.6%)	2,291 (58.4%)
Isolated AVR (SAVR)	442	411	276	333	235
AV Replacement + CABG	262	262	207	186	180
Isolated MVR	87	84	89	128	98
MV Replacement + CABG	34	22	29	29	29
Isolated MV Repair	173	165	221	253	222
MV Repair + CABG	59	49	53	50	46
Total: STS Major Procedures	3,481 (75.8%)	3,317 (76.2%)	3,335 (79.4%)	3,279 (79.2%)	3,101 (79.1%)
Other Procedures*	1,113 (24.2%)	1,035 (23.8%)	867 (20.6%)	860 (20.8%)	819 (20.9%)
Total: All Procedures	4,594	4,352	4,202	4,139	3,920

* Includes other cardiac surgery for ex: CABG or Valve + Other procedures, Transplants, VAD, Aortic Surgery. Excludes Transcatheter Procedures.



NQF Measures

Calendar Year 2019 Isolated CABG Procedures (unless otherwise indicated)

		MCSQI	STS
Procedure Volume	Isolated CABG	2,291 (58.1%)	120,098 (56.1%)
	Isolated Valve	555 (14.7%)	33,470 (15.6%)
	CABG + Valve	255 (6.5%)	16,736 (7.8%)
	Other	819 (20.8%)	43,793 (20.5%)
Pre-Operative	Timing of Antibiotic Administration	96.7%	99.1%
	Selection of Antibiotic Administration	97.0%	99.4%
	Duration of Prophylaxis	97.0%	99.2%
	Pre-operative Beta Blockers	99.2%	96.4%
Operative	Use of Internal Mammary Artery	99.6%	99.3%
Complications**	Risk-Adjusted Prolonged Ventilation	6.2%	7.2%
	Risk-Adjusted Deep Sternal Infection	0.2%	0.3%
	Risk-Adjusted Permanent Stroke	1.4%	1.4%
	Risk-Adjusted Renal Failure	2.1%	2.2%
	Risk-Adjusted Re-Operation	4.4%	3.7%
Discharge	Anti-Platelets	99.4%	98.2%
	Beta Blockers	99.9%	98.8%
	Anti-Lipids	99.6%	98.4%
Mortality**	Risk-Adjusted Inpatient Mortality: Isolated CABG	1.7%	1.8%
	Risk-Adjusted Operative Mortality: Isolated CABG	2.3%	2.2%
	Risk-Adjusted Operative Mortality: AV Replacement, 2017-2019	2.4%	1.8%
	Risk-Adjusted Operative Mortality: AV Replacement + CABG, 2017-2019	3.4%	3.5%
	Risk-Adjusted Operative Mortality: MV Replacement, 2017-2019	6.0%	4.6%
	Risk-Adjusted Operative Mortality: MV Replacement + CABG, 2017-2019	14.8%	8.5%
	Risk-Adjusted Operative Mortality: MV Repair, 2017-2019	0.6%	1.0%
	Risk-Adjusted Operative Mortality: MV Repair + CABG, 2017-2019	4.7%	5.0%
Readmissions	30-Day Readmission Rate: Isolated CABG	10.1%	10.1%

** MCSQI Risk-Adjusted Rates are not statistically significantly different from STS National Rates.

STS Data Specifications

Operative Mortality O/E*: Any death during patient hospitalization or within 30 days of surgery	Inpatient Mortality O/E*: Any death during patient hospitalization
Prolonged Ventilation O/E*: Post-operative pulmonary ventilation greater than 24 hours	Permanent Stroke O/E*: Post-operative stroke that did not resolve within 24 hours
Renal Failure O/E*: Increase in post-operative serum creatinine greater than 3 times baseline, serum creatinine greater or equal to 4 mg/dL, or new requirement for dialysis post-operatively	Mediastinitis O/E*: Any post-operative deep sternal wound infection or mediastinitis during patient hospitalization or within 30 days of surgery
Re-Operation O/E*: Return to the operating room for bleeding, valve dysfunction, graft occlusion, aortic intervention, or other cardiac reasons (the NQF definition does not include 'other non-cardiac reasons')	Morbidity/Mortality O/E*: Any patient incurring operative mortality or any of the five major STS morbidities
Readmissions within 30 Days: Any patient who was readmitted for inpatient stay at an acute care facility within 30 days of discharge	Re-Operation for Bleeding: Re-exploration for mediastinal bleeding either in the ICU or return to operating room
Length of Stay (LOS) Admit-Discharge: Total number of days from patient admission to discharge	Length of Stay (LOS) Surgery-Discharge: Total number of days from surgery to discharge
Post-Operative Ventilation Time: Total amount of time from operating room exit to initial extubation, plus any additional time spent on pulmonary ventilation	Early Extubation: Initial Ventilation Hours less than 6; excludes patients who were extubated in the operating room
Intra-Operative Blood Products: Any patient who was transfused any time intra-operatively during the initial surgery.	Post-Operative Blood Products: Any patient who was transfused any time post-operatively
New Onset of Atrial Fibrillation: Any patient with post-operative Atrial Fibrillation; excludes patients with pre-operative history of atrial fibrillation.	*The Observed-to-Expected Ratio (O/E). These calculations divide the percentage of an observed morbidity by the rate predicted by the STS risk calculator. All O/E ratios apply STS Recalibration coefficients, which normalize the national benchmark value to exactly 1.0.

Posters, Manuscripts and Presentations

Posters

The Value and Impact of A Statewide Quality Collaborative

Alejo D, Fonner CE, Bobbitt J, Lunnan C, Ruhl C, Ruff J, Haber T, Dukovcic A, Brown JM, Fiocco M, Nelson M, Taylor BS, Ad N, Schena S, Matthew TL, Whitman G, Conte J, Wehberg K, Massimiano P, Salenger R, and the Maryland Cardiac Surgery Quality Initiative Collaborative.
Society of Thoracic Surgeons Advances in Quality and Outcomes, 2019.

Complementing Society of Thoracic Surgeons (STS) Adult Registry Data with Financial Data – A First Pass

Alejo D, Fonner CE, Haber T, Ad N, Schena S, Whitman G, Massimiano P, Salenger R, Maryland Cardiac Surgery Quality Initiative (MCSQI) Collaborative.
Society of Thoracic Surgeons Advances in Quality and Outcomes, 2019.

Predictors of Operative Mortality in Cardiac Surgery Patients with Prolonged Ventilation.

Suarez-Pierre A, Fraser CD, Zhou X, Crawford TC, Lui C, Metkus TS, Whitman GJ, Higgins RS, Lawton JS.
American College of Surgeons Clinical Congress, 2018.

Government Based Insurance is Associated with Fewer Arterial Conduits in CABG.

Zhou X, Fraser CD, Suarez-Pierre A, Lui C, Sanchez JA, Taylor BS, Conte JV, Higgins RS.
American College of Surgeons Clinical Congress, 2018.

Contemporary Outcomes Comparing Mitral Valve Repair and Replacement in the Elderly in a Statewide Registry.

Zhou X, Fraser III CD, Suarez-Pierre A, Lui C, Sanchez JA, Taylor BS, Conte JV, Mandal K.
Heart Valve Society Scientific Meeting, 2018.

Off-pump Coronary Artery Bypass in Octogenarians: Results of a Statewide, Matched Comparison.

Suarez-Pierre A, Crawford TC, Fraser III CD, Lui, C, Zhou, Alejo, D, Fonner CE, Kwon CC, Taylor, B, Wehberg K, Conte JV, Fiocco, M, Whitman GJ, Salenger R, behalf of the MCSQI Collaborative.
Society of Thoracic Surgeons Annual Meeting, 2018.

Variations in Perfusion Practice during Adult Cardiac Surgery: A Statewide Survey.

Suarez-Pierre A, Wierschke C, Crawford TC, Zhou X, Fraser CD III, Alejo D, Fonner CE, Salenger R, Whitman GJ, Conte JV.
Eastern Cardiothoracic Surgical Society (ECTSS) Annual Meeting, 2017.

Sternal Wound Care Practices in Maryland Cardiac Surgery Programs.

Demirci F, Alejo D, Fonner CE, Bobbitt J, Hanna G, Fiocco M, Getson K, Nelson M, Conte JV, Whitman GJ, Salenger R, Todd J, Wehberg K and the MCSQI Collaborative.
Society of Thoracic Surgeons Advances in Quality and Outcomes Meeting, 2017.

Posters, Manuscripts and Publications

Posters (continued)

STS Data Managers & Surgeons Enhancing Quality Measurement – Statewide Review of Reasons for Prolonged Ventilation. Alejo D, Bobbitt J, Costantini F, Brogan M, Getson K, Toro A, Romine H, Hanna G, Kakellos M, Roach D, Behrens K, Fonner CE.

Society of Thoracic Surgeons Advances in Quality and Outcomes Meeting, 2016.

Are Surgeons Discussing STS Predicted Risk Scores? A Look across Maryland Hospitals. Alejo D, Bobbitt J, Costantini F, Brogan M, Getson K, Toro A, Romine H, Hanna G, Kakellos M, Roach D, Behrens K, Fonner CE.

Society of Thoracic Surgeons Advances in Quality and Outcomes Meeting, 2016.

The Maryland Cardiac Surgery Quality Initiative: Collaborating to Improve Outcomes Statewide. Alejo D, Horvath KA, Salenger R, Conte JV, Whitman GR, Bobbitt J, Fonner CE.

Society of Thoracic Surgeons Advances in Quality and Outcomes Meeting, 2015.

Manuscripts

Racial Disparity in Cardiac Surgery Risk and Outcome: Report From a Statewide Quality Initiative.

Mazzeffi M, Holmes SD, Alejo D, Fonner CE, Ghoreishi M, Pasrija C, Schena S, Metkus T, Salenger R, Whitman G, Ad N, Higgins RSD, Taylor B, MCSQI

Annals of Thoracic Surgery 2020 Jan 18. DOI: 10.1016/j.athoracsur.2019.11.043 PMID: 31962111

Mitigating the Risk: Transfusion or Reoperation for Bleeding After Cardiac Surgery.

Pasrija C, Ghoreishi M, Whitman G, Ad N, Alejo DE, Holmes SD, Schena S, Salenger R, Mazzeffi MA, Fonner CE, Taylor B; Investigators for the Maryland Cardiac Surgery Quality Initiative.

Annals of Thoracic Surgery. 2019 Dec 19. pii: S0003-4975(19)31895-8. doi: 10.1016/j.athoracsur.2019.10.076. [Epub ahead of print] PMID: 31866482

Predictors of Operative Mortality Among Cardiac Surgery Patients with Prolonged Ventilation.

Suarez-Pierre A, Fraser CD, Zhou X, Crawford TC, Lui C, Metkus TS, Whitman GJ, Higgins RS, Lawton JS.

Journal of Cardiac Surgery. 2019 Jul 3. doi: 10.1111/jocs.14118. [Epub ahead of print] PMID: 31269299

Posters, Manuscripts and Publications

Manuscripts (continued)

Variation in Platelet Transfusion Practices in Cardiac Surgery

Zhou X, Fraser CD 3rd, Suarez-Pierre A, Crawford TC, Alejo D, Conte JV Jr, Lawton JS, Fonner CE, Taylor BS, Whitman GJR, Salenger R.

Innovations (Phila). 2019 Apr;14(2):134-143. doi: 10.1177/1556984519836839. Epub 2019 Mar 18.

Bilateral Internal Mammary Artery Use in Diabetic Patients: Friend or Foe?

Crawford TC, Zhou X, Fraser III CD, Magruder JT, Suarez-Pierre A, Alejo D, Bobbitt J, Fonner CE, Wehberg K, Taylor B, Kwon C, Fiocco M, Conte JV, Salenger R, Whitman GJ; Investigators for the Maryland Cardiac Surgery Quality Initiative.

Annals of Thoracic Surgery. 2018 Oct; 106(4):1088-1094. doi:10.1016/j.athoracsur.2018.04.030. Epub 2018 Jun 20.

Off-Pump Coronary Artery Bypass in Octogenarians: Results of a Statewide, Matched Comparison.

Suarez-Pierre A, Crawford TC, Fraser III CD, Zhou X, Lui C, Taylor B, Wehberg K, Conte JV, Whitman GJ, Salenger R; MCSQI Collaborative.

General Thoracic and Cardiovascular Surgery. 2018 Oct 19. doi:10.1007/s11748-018-1025-8.

Less is More: Results of a Statewide Analysis of the Impact of Blood Transfusion on CABG Outcomes.

Crawford TC, Magruder JT, Fraser III CD, Suarez-Pierre A, Alejo D, Fonner CE, Canner J, Horvath K, Wehberg K, Taylor B, Kwon C, Whitman GJ, Conte JV, Salenger R.

Annals of Thoracic Surgery. 2018 Jan; 105(1):129-36.

Variation in Red Blood Cell Transfusion Practices During Cardiac Surgery Among Centers in Maryland: Results from A State Quality Improvement Collaborative.

Magruder JT, Blasco-Colmenares E, Crawford TC, Alejo D, Conte JV, Salenger R, Fonner CE, Kwon CC, Bobbitt J, Brown JM, Nelson MG, Horvath KA, Whitman GR.

Annals of Thoracic Surgery. 2017 Jan; 103(1):152-160. Epub 2016 Aug 20.

Posters, Manuscripts and Publications

Podium Presentations:

Dual Antiplatelet Therapy at Discharge is Safe after Acute Myocardial Infarction Treated with Coronary Artery Bypass Grafting yet Practice Variation Exists Within a Statewide Quality Collaborative

Metkus TS, Alejo D, Fonner CE, Mazzeffi M, Schena S, Salenger R, Ad N, Whitman GJ, on behalf of MCSQI.

Society of Thoracic Surgeons (STS) 55th Annual Meeting, 2020.

Evaluating the Role of Failure to Rescue on Mortality after Cardiac Surgery - A National Experience

Likosky DS, Strobel RJ, Wu X, Whitman, GJR, Kramer RS, Hamman BL, Paone G, Brevig J, Thompson MP, Ghaferi AA, Zhang M, Lehr EJ. Likosky DS, on behalf of the National Cardiac Surgery Quality IMPROVE Network.

Society of Thoracic Surgeons (STS) 55th Annual Meeting, 2020.

Maxwell Chamberlain Memorial Paper Award

A Maryland Cardiac Surgery Statewide Analysis of the Impact of Extubation in the Operating Room Following Routine Cardiac Surgery

Etchill EW, Giuliano K, Zhou X, Lui C, Fraser III C, Crawford T, Suarez-Pierre A, Alejo D, Schena S, Fonner CE, Wehberg K, Conte JV, Lawton JS, Ad N, Salenger R, Whitman G, on behalf of the Maryland Cardiac Surgery Quality Initiative.

Society of Thoracic Surgeons (STS) 55th Annual Meeting, 2020.

Modifiable Inter-Hospital Cost Variability in Coronary Artery Bypass Surgery

Salenger R, Fonner CE, Alejo D, Suarez-Pierre A, Zhou X, Lui C, Schena S, Mazzeffi M, Whitman G, Taylor BS, Ad N.

Eastern Cardiothoracic Surgical Society (ECTSS) 57th Annual Meeting, 2019.

Does the Number and Type of Blood Products Transfused Negatively Impact Patient Outcomes Following Open Heart Surgery?

Holmes SD, Taylor B, Schena S, Alejo D, Fonner CE, Salenger, R, Whitman, G, Metkus, TS, Pasrija C, Ghoreishi M, Massimiano P, Rongione AJ. MCSQI Collaborative.

American Association of Thoracic Surgery (AATS) Annual Meeting, 2019.

Racial Disparity in Cardiac Surgery Risk and Outcome: Report From a Statewide Quality Initiative

Mazzeffi M, Holmes SD, Alejo D, Fonner CE, Ghoreishi M, Pasrija C, Schena S, Metkus T, Salenger R, Whitman G, Ad N, Higgins RSD, Taylor B, on behalf of MCSQI.

American Association of Thoracic Surgery (AATS) Annual Meeting, 2019.

Posters, Manuscripts and Publications

Podium Presentations: (continued)

Center-specific Variation in Use of Dual Antiplatelet Therapy Prior to Coronary Surgery: An Outcome Analysis from the Maryland Cardiac Surgery Quality Initiative

Metkus TS, Alejo D, Holmes SD, Fonner CE, Mazzeffi M, Schena S, Salenger M, Lawton J, Ad N, Whitman G, MCSQI.

American Heart Association (AHA) Quality of Care and Outcomes Research Scientific Sessions, 2019.

Mitigating the Risk: Transfusion or Reoperation for Bleeding After Cardiac Surgery.

Pasrija C, Ghoreishi M, Whitman GJ, Ad N, Alejo D, Holmes SD, Schena S, Salenger R, Mazzeffi MA, Fonner CE, Taylor B.

Society of Thoracic Surgeons (STS) 55th Annual Meeting, 2019.

Blood Utilization: Tale of Two Metrics – Improvement and Variability.

Zhou X, Fonner CE, Suarez-Pierre A, Lui C, Alejo D, Whitman GJ, Taylor B, Ad N, Salenger R.

Society of Thoracic Surgeons (STS) 55th Annual Meeting, 2019.

Recent Antiplatelet Therapy Does Not Affect Short Term Outcomes Following Non-CABG Cardiac Surgery.

Lui C, Zhou X, Suarez-Pierre A, Fraser III CD, Zehr KJ, Choi CW, Kilic A.

Southern Thoracic Surgical Association (STSA) 65th Annual Meeting, 2018.

Bilateral Internal Mammary Artery Utilization in Diabetics: Friend or Foe?

Crawford TC, Zhou X, Fraser III CD, Suarez-Pierre A, Alejo D, Fonner CE, Bobbitt J, Salenger R, Wehberg K, Kwon C, Taylor B, Fiocco M, Conte JV, Whitman G.

Society of Thoracic Surgeon (STS) 54th Annual Meeting, 2018.

Variation in Platelet Transfusion Practices During Cardiac Operations Among Centers in Maryland: Results from a State Quality-Improvement Collaborative.

Zhou X, Fraser III CD, Suarez-Pierre A, Crawford TC, Lui C, Alejo D, Conte J, Lawton J, Fonner CE, Taylor B, Whitman GJ, Salenger, R.

Society of Thoracic Surgeon (STS) 54th Annual Meeting, 2018.

MCSQI Membership / Leadership

Hospitals

Johns Hopkins Hospital

MedStar Union Memorial Hospital

Peninsula Regional Medical Center

Sinai Hospital

Suburban Hospital

University of Maryland Capital Region Health

University of Maryland St. Joseph Medical Center

University of Maryland Medical Center

Adventist HealthCare White Oak Medical Center

University of Pittsburgh Medical Center Western Maryland

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Michael Fiocco, MD	MedStar Union Memorial Hospital
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Peter Cho, MD	Sinai Hospital
Thomas Matthew, MD	Johns Hopkins Suburban Hospital
Jamie Brown, MD	UM Capital Region Health
Rawn Salenger, MD, Chair	UM St. Joseph Medical Center
Brad Taylor, MD	University of Maryland Medical Center
Paul Massimiano, MD	Adventist HealthCare White Oak Medical Center
Mark Nelson, MD	UPMC Western Maryland
Terri Haber, MPH, Executive Director	MCSQI
Diane Alejo, BA	MCSQI
Clifford E. Fonner, BA	MCSQI
Eileen Fleck, MPP	Maryland Health Care Commission

Treasurer

Thomas Matthew, MD	Johns Hopkins Suburban Hospital
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Director of Analytics

Clifford E. Fonner, BA	MCSQI
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Biostatistician

Sari D. Holmes, PhD	MCSQI
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Co-founders:

Edwin Fonner Jr, DrPH
Clifford E. Fonner, BA
John V. Conte, MD
Diane Alejo, BA

MCSQI Committee Leadership

Data Manager Committee

Kimberly Behrens RN, BSN, Chair	Johns Hopkins Hospital
Dawn Roach, RN, Co-chair	UM St. Joseph Medical Center
Terri Haber, MPH	MCSQI
Diane Alejo, BA	MCSQI / Johns Hopkins Hospital
Clifford E. Fonner, BA	MCSQI

Planning Committee

Rawn Salenger, MD, Chair	UM St. Joseph Medical Center
Thomas Matthew, MD, Treasurer	Johns Hopkins Suburban Hospital
Terri Haber, MPH, Executive Director	MCSQI
Clifford E. Fonner, BA, Director of Analytics	MCSQI
Diane Alejo, BA, Advisor / Co-Chair R&W	MCSQI / Johns Hopkins Hospital
Paul Massimiano, MD	Adventist White Oak Medical Center
Niv Ad, MD, Chair Research and Writing	Adventist White Oak Medical Center
Glenn Whitman, MD, Chair of Quality	Johns Hopkins Hospital
Kimberly Behrens RN, BSN, Chair Data Mgr	Johns Hopkins Hospital

Quality Committee

Glenn Whitman, MD, Chair	Johns Hopkins Hospital
Rawn Salenger, MD, Co-Chair	UM St. Joseph Medical Center
Terri Haber, MPH	MCSQI
Jennifer Bobbitt, RN, BSN	Adventist HealthCare White Oak Medical Center
Diane Alejo, BA	MCSQI / Johns Hopkins Hospital
Clifford E. Fonner, BA	MCSQI

Regulatory Committee

Paul Massimiano, MD	Adventist HealthCare White Oak Medical Center
Terri Haber, MPH	MCSQI
Eileen Fleck, MPP	Maryland Health Care Commission (MHCC)
Clifford E. Fonner, BA	MCSQI
Diane Alejo, BA	MCSQI / Johns Hopkins Hospital

Research & Writing Committee

Niv Ad, MD, Chair	Adventist HealthCare White Oak Medical Center
Diane Alejo, BA, Co-Chair	MCSQI / Johns Hopkins Hospital
Rawn Salenger, MD	UM St. Joseph Medical Center
Sari Holmes, PhD	MCSQI
Terri Haber, MPH	MCSQI

MCSQI Committee Leadership

Perfusion Task Force

Paul Massimiano, MD, Chair

Holly Tannehill, CCP

Terri Haber, MPH

Adventist HealthCare White Oak Medical Center

Adventist HealthCare White Oak Medical Center

MCSQI

Cardiac Anesthesia Task Force

Jaspreet Singh, MD, Co-Chair

Charles Brown, MD, Co-Chair

Peninsula Regional Medical Center

Johns Hopkins Hospital



MCSQI Leadership at the Fall 2019 Meeting; Baltimore, MD

Resources and Affiliates

RESOURCES:

MCSQI Website	https://mcsqi.org
Maryland Health Care Commission (MHCC)	https://mhcc.maryland.gov
MHCC Quality Reports	https://healthcarequality.mhcc.maryland.gov
Maryland Health Services Cost Review Commission (HSCRC)	http://www.hscrc.state.md.us
Society of Thoracic Surgeons (STS)	https://www.sts.org
STS Public Reporting	https://publicreporting.sts.org/acsd
National Quality Forum (NQF)	http://www.qualityforum.org

AFFILIATES:

 ARMUS Corporation	https://www.armus.com
IMPROVE Network	http://www.improvenetwork.org
 Virginal Cardiac Services Quality Initiative	http://vcsqi.org

MCSQI Member Hospitals



Testimonials

“The MCSQI has demonstrated that by working together on important clinical questions we can improve important quality metrics in the care of Maryland Cardiac Surgery patients and by rotating the leadership positions we can make sure that all of our state cardiac surgery programs are well represented and empowered to participate.”

~ John V. Conte, MD, Co-founder MCSQI

“The MCSQI state collaborative has been a successful collaboration of all the cardiac surgery centers in Maryland and is taking quality of care for cardiac surgery patients to an even higher level. The multidisciplinary interaction provides resources, networking, and sharing of best practices and ideas that has already demonstrated positive outcomes and has set the basis for future quality initiatives in cardiac surgery.”

~ Chrissy Ruhl, UPMC Western Maryland Health System

“It is gratifying to see Maryland's cardiac surgery programs working together to improve services for cardiac surgery patients. MCSQI's collaborative efforts bode well for future patients.”

~ Eileen Fleck, Maryland Health Care Commission

“In this day and age with so much confrontation and dissension, it is comforting to note that the Maryland Cardiac Surgery Quality Initiative stands for just the opposite. Through the sharing of experience and data, collegiality and cooperation, MCSQI has a vision to improve the care that this state gives its cardiac patients. There are not many collaboratives throughout the country like this, and Maryland can count itself among those few that recognize the importance of this kind of united effort, where the only thing that matters is one common goal, better treatment for our patients.”

~ Dr. Glenn Whitman, Johns Hopkins Hospital

Testimonials

“Following the pioneering efforts of Dr. Alfred Blalock at Johns Hopkins Hospital in the 1940’s and Dr. Joseph McLaughlin at University of Maryland in the 1970’s, the development of the Maryland Cardiac Surgery Quality Initiative (MCSQI) is probably the single most important advancement in the history of organization of cardiovascular medicine in the state of Maryland. The future of cardiac surgery in Maryland is dependent on statewide hospital and physician collaboration and sharing of “best practices.”

~Dr. Kurt Wehberg, Peninsula Medical Regional Center

“MCSQI provides the framework for an ongoing unprecedented level of collaboration between cardiac surgery programs in Maryland. By learning from experiences at other high quality programs, UM Saint Joseph Medical Center has been able to augment our own quality initiatives, and ultimately improve care for our patients.”

~ Dr. Rawn Salenger, St. Joseph Medical Center

“In 2013 Maryland created a statewide cardiovascular quality initiative providing a platform for in depth review of the care our patients receive who undergo heart surgery. Success of a program is measured by its outcomes. The Society of Thoracic Surgery (STS) sets the ‘National’ benchmarks to measure this success. The data managers in MCSQI are committed to ensuring Maryland programs succeed in data integrity, as this is the core of meaningful data. Data Managers at all ten sites in Maryland work collaboratively, review patient scenarios/data definitions, etc. to ensure STS registry data is accurate, complete, reproducible, and reflect the quality of care for patients in Maryland. The data managers play a vital role in supporting the quality improvement goals of MCSQI at a regional level and align themselves with other regional STS collaboratives at a national level! This collaborative and supportive approach is the key to MCSQI’s success in reporting surgical outcomes among the 10 programs in our State.”

~ Jennifer Bobbitt, Adventist HealthCare White Oak Medical Center