



Annual Report 2024

*A collaborative consortium of health
care providers dedicated to improving
quality of care and outcomes for
cardiovascular patients across the
State of Michigan*



A NOTE FROM HITINDER GURM



Hitinder Gurm

“Cardiovascular patients are our purpose – the heart and the North Star of everything we do.” While these are the words of our new Associate Director of BMC2 Percutaneous Coronary Intervention (PCI), Dr. Eric Cantey, they ring true through the dedication and actions of our entire consortium. Improving quality of care and outcomes for patients is our guiding principle.

In 2024, this was evident in the increased number of patients who enrolled in cardiac rehab, received referrals to smoking cessation, and received image-guided stent optimization resulting from our goals.

It was reflected in the honors we received. We celebrated as BMC2 was awarded the prestigious 2023 John M. Eisenberg Patient Safety and Quality Award in the Local Level Innovation in Patient Safety and Quality category. Then again, as the State of Michigan issued a special tribute recognizing BMC2 as a pioneer in cardiovascular care and for our impact improving care across the state.

As we move forward, we remain committed to innovation, collaboration, and excellence in cardiovascular care. This includes supporting our consortium by fostering shared learning opportunities – welcoming renowned speakers, encouraging peer support, and embracing change to drive continuous improvement. Together, we will continue striving for safety and quality enhancement, ensuring that every patient receives the best possible care. Thank you for being a part of this journey – your dedication and expertise make these achievements possible.

Hitinder S. Gurm, MD
Program Director - BMC2

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NEW LEADERSHIP

ASSOCIATE DIRECTOR OF BMC2 PCI

Eric Cantey, MD

In the fall, Dr. Eric Cantey joined the Coordinating Center as associate director of BMC2 PCI. Dr. Cantey succeeds Dr. Devraj Sukul who, in December, joined our colleagues at Corewell Health West in Grand Rapids to focus on structural heart care. Dr. Cantey brings expertise in improving cardiovascular patient outcomes and a passion for working in the high-risk coronary disease and shock populations.



Eric Cantey

Dr. Cantey is an assistant clinical professor in the Department of Internal Medicine and an interventional cardiologist at Michigan Medicine and received his medical training at Tufts University School of Medicine and Northwestern University in Chicago, Illinois where he also obtained a Master of Science in Clinical Investigation.

He aims to harness Dr. Sukul's momentum and build from his successes, particularly those related to intravascular imaging and the impact that his efforts had in advancing BMC2's mission across Michigan.

BMC2 PROGRAM MANAGER

Mollie Bodin, MA

In late spring, we said goodbye to BMC2 Managing Director, Annemarie Forrest. Annemarie served BMC2 with attentive and innovative leadership and the consortium flourished during the four years she was with us. We look forward to this new chapter with Program Manager, Mollie Bodin, and her leadership in our continued commitment to collaboration in the spirit of improving patient care.



Mollie Bodin

Mollie holds a Master of Arts in history from the University of Wisconsin–Milwaukee. She cultivated her leadership, project management, and strategic advising skills within various fields, including history, consulting, law, neuroscience, pharma, and clinical research. She is skilled at leading strategic and organizational initiatives within and across institutions. For the last eight years, she was a fixture in the University of Michigan Medical School Office of Research, supporting the



BMC2 PROGRAM & MISHC CO-PROGRAM MANAGER, CONT.

\$30 million initiative to transform the clinical trial enterprise at the University of Michigan and leading strategic improvement projects within and beyond the Medical School.

Drawn to BMC2 by its passionate team and finding its collective vision to improve patient outcomes empowering, Mollie views BMC2 at an amazing intersection of collaboration, strategy, and innovation. She is excited to join the team and impact this space of transformative change and to further expand BMC2's efforts in health equity. Mollie also serves as co-program manager of the Michigan Structural Heart Consortium ([MISHC](#)).

MISHC CO-PROGRAM MANAGER

Melissa Clark, MSN, RN

MISHC Co-Program Manager Patty Theurer, MSN, RN celebrated her retirement in 2024. Patty had served as the program manager of the Michigan Society of Thoracic and Cardiovascular Surgeons Quality Collaborative since its inception in 2005. She organized decades of educational sessions and collaborative meetings, providing MISHC-participating teams with valuable resources to enhance patient care and improve outcomes. She fostered collaboration among hospitals to share best practices and helped establish processes to standardize and improve care. Patty's leadership and dedication have left a lasting impact on MISHC, and the quality of care delivered to patients statewide.

With Patty's retirement, Melissa Clark, MSN, RN, became the new program manager of the Michigan Society of Thoracic and Cardiovascular Surgeons Quality Collaborative and a MISHC co-program manager. Melissa has been deeply involved in MISHC's quality work for years, formerly serving as a QI Coordinator. She has extensive clinical experience in cardiothoracic surgery intensive care and has focused on data management and quality improvement throughout her career.



Melissa Clark

Melissa aims to focus on teamwork and believes in the value of listening and learning from others to find the best path forward.

We look forward to this new chapter working with Dr. Cantey, Mollie, and Melissa toward the consortium's commitment to collaboration in the spirit of improving patient care.



AWARDS

2023 JOHN M. EISENBERG SAFETY AND QUALITY AWARD

Local Level Innovation in Patient Safety and Quality Category

In 2024, BMC2 was recognized with the prestigious 2023 John M. Eisenberg Patient Safety and Quality Award in the Local Level Innovation in Patient Safety and Quality category.

The consortium was honored for its remarkable improvements in the documentation of radiation use, a decrease in high-dose radiation exposure, and reduction in opioid pill prescribing rates.

The Eisenberg Awards honor the late John M. Eisenberg, MD, MBA, and bring together the quality community to recognize groundbreaking initiatives in healthcare that are consistent with the aims of the National Quality Strategy: better care, healthy people and communities, and smarter spending.

The award, presented annually by The Joint Commission and the National Quality Forum, recognizes major individual, local and national achievements in healthcare that improve patient safety and healthcare quality.

The panel was inspired by BMC2's inclusive scope across so many clinicians, physicians, teams, and sites, acknowledging the collaborative is "working to improve care, at every institution, and for every patient. It's remarkable."

2023 JOHN M. EISENBERG PATIENT SAFETY AND QUALITY AWARDS

INNOVATION AT THE LOCAL LEVEL

Recognized for remarkable improvements in:



documentation of
radiation use



decreasing high-dose
radiation exposure



reducing opioid pill
prescribing rates



COMMENDATION FROM THE STATE OF MICHIGAN

BMC2 Recognized as a Pioneer in Cardiovascular Care

The State of Michigan recognized BMC2's "innovative spirit and unwavering dedication" as a pioneer in cardiovascular care with a special tribute presented during the BMC2 PCI Collaborative Meeting in May. The tribute outlines the profound impact BMC2 has on improving health care for patients in Michigan and is signed by 47th-District State Representative, Carrie Rheingans; 14th-District State Senator, Sue Shink; Lieutenant Governor, Garlin Gilchrist, II; and Governor, Gretchen Whitmer.



The tribute states that one of BMC2's most remarkable achievements "lies in the creation of a culture of trust and learning among its members. BMC2 fosters an environment where sharing successes and challenges in quality improvement is the norm. This collaborative spirit has united hospitals, physicians, and care teams, leading to the exchange of best practices and the formation of a cohesive learning network, optimizing statewide quality and safety in Michigan."

We celebrate this recognition with our patient advisors, consortium members, and our sponsors at Blue Cross Blue Shield. It is only possible because of our shared mission and collaboration.



Top - BMC2 Program Director, Dr. Hitinder Gurm, received the framed tribute from Legislative Assistant, Zac Ozormoor during the BMC2 PCI Collaborative Meeting on May 11, 2024 in East Lansing, MI. Bottom - Dr. Gurm introduces a video message from 47th-District State Representative, Carrie Rheingans during the BMC2 PCI Collaborative Meeting on Saturday, May 11, 2024 in East Lansing, MI.



HEALTH DISPARITIES DASHBOARDS

Consortium members provided input, testing, and refinement to help Coordinating Center staff create health disparities dashboards for each registry. Users can compare their own site's data to consortium-wide data and easily explore areas of potential patient inequalities. The dashboard facilitates comparisons between social groups on a wide variety of outcomes and allows users to identify areas which can be acted on to reduce disparity by creating performance goals and quality projects for more equitable health care.

The PCI Dashboard allows the ability to view participating sites' data against the data of the collaborative and choose measures including:

- Cardiac rehab liaison
- Cardiac rehab referral
- Aspirin prescribed at discharge
- Dual anti-platelet therapy at discharge
- Guideline medications at discharge
- Beta blocker at discharge – all patients
- Beta blocker if prior MI or LVEF <40
- Lipid lowering agent at discharge
- ACE/ARB if LVEF <40%
- ACE/ARB in DM/HTN

The Vascular Surgery dashboard provides summaries of measures including:

- Vascular surgery 30-day all cause readmission
- Readmission reasons for elective procedures
- Carotid composite 30-day mortality/MI/TIA-stroke
- Elective open AAA major morbidities
- Elective EVAR major morbidities new opioid prescriptions ≤ 4 Pills
- EVAR 1-year surveillance imaging performed
- Smoking cessation rates
- Smoking cessation trends

The MISHC dashboard provides summaries of measures related to structural heart procedures that can be stratified by:

- Race
- Age
- Society of Thoracic Surgeons (STS) risk score
- Sex
- Residence in a distressed community – as defined by the Distressed Communities Index, a composite measure of economic well-being based on the U.S. zip code

The BMC2 Coordinating Center will partner with and support participants as they use the dashboards to identify potential opportunities to create quality improvement initiatives and reduce disparities across Michigan.



SUCCESS STORY

Increasing Patient Access to Cardiac Rehab

Statistics from the [Centers for Disease Control and Prevention](#) show that one person dies from cardiovascular disease every 33 seconds in the U.S. In 2022, 702,880 people died from heart disease – the equivalent of one in every five deaths.

Lowering the Risk of Death

From 2019 to 2020, heart disease – including cost of health services, medicines, and lost productivity due to death – cost about \$252.2 billion (about \$780 per person in the US).

High-quality evidence shows cardiac rehab is beneficial to patients who experience cardiac-related events or procedures including coronary artery disease, percutaneous coronary intervention (PCI), coronary artery bypass graft (CABG) surgery, heart valve repair/replacement such as aortic valve replacement, and heart failure.

Patients who complete a full program of 36 cardiac rehab sessions experience:



Reduced chance of future cardiac events



Reduced hospital readmissions



Up to a 47% lower risk of death from all causes

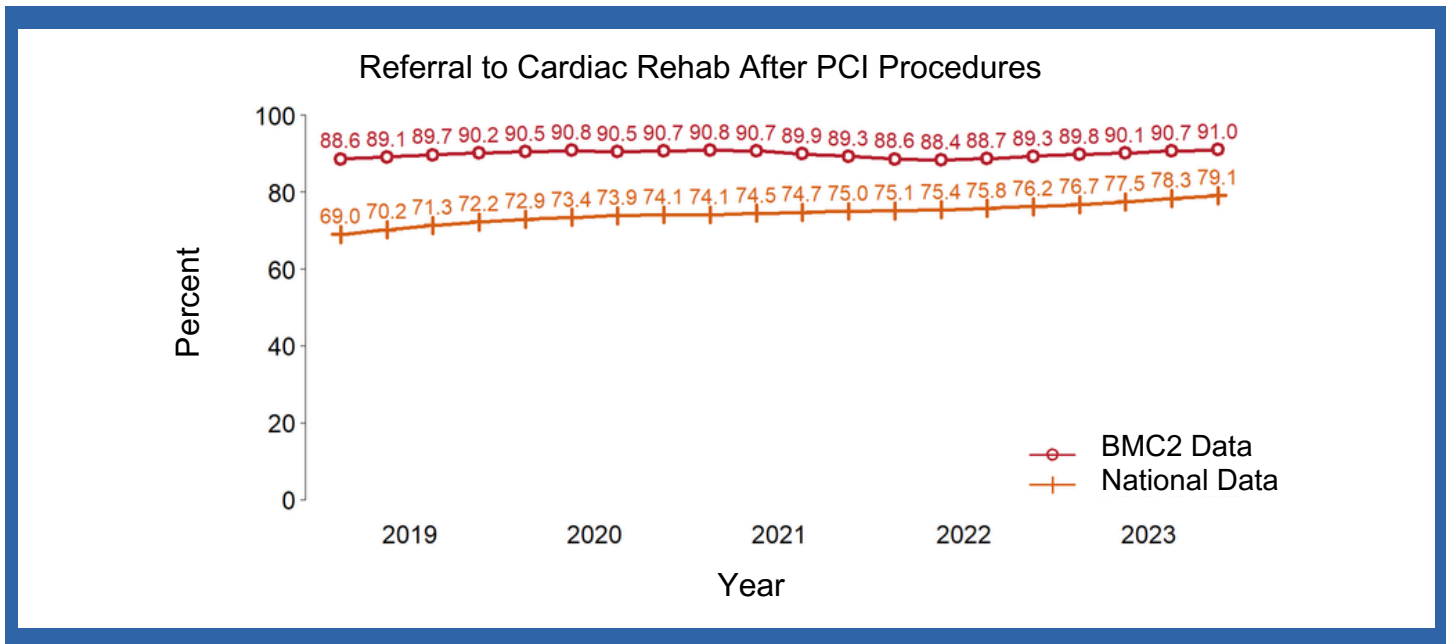


Benefits even if they are already physically active at home



SUCCESS STORY, CONT.

BMC2 surpasses the nation's rate for referral to cardiac rehabilitation after PCI procedures. For Q4 2023, BMC2's rate was 91% while the national rate was 79.1%. This translates to approximately 24,000 patients referred to cardiac rehab by BMC2-participating hospitals in 2023. These interventions contribute to improved long-term health outcomes and reductions in hospital readmissions.



LISA'S SUCCESS THROUGH CARDIAC REHAB

In 2017, Lisa Cardillo was a 36-year-old mother of three celebrating her 15th wedding anniversary when she experienced a spontaneous coronary artery dissection, cardiac arrest, cardiogenic shock, and heart failure.

She spent 96 hours in a medically induced coma at what is now Corewell Health West Michigan. Lisa was hospitalized for nine days and sent home with a referral to cardiac rehab at a center near her home.



Lisa Cardillo

Once home, Lisa spent six weeks recovering from her injuries and trauma. She needed assistance walking and showering. She wore a defibrillator vest 24 hours a day, seven days a week and needed supervision around the clock. A healthy heart's ejection fraction – a measurement of how well the heart pumps blood – is 50 - 70%. Lisa's was just 41%.



LISA’S SUCCESS THROUGH CARDIAC REHAB, CONT.

Lisa’s mental health deteriorated quickly. She was scared to feel her own heart beating. One month after leaving the hospital, she attended her cardiac rehab orientation. Two weeks after orientation, she completed the first of 36 cardiac rehab sessions and began her journey toward recovery.

The Beat Goes On

On her first day of cardiac rehab, Lisa Cardillo was terrified. She had not been able to stand for 30 minutes without taking a break. By her last day, she was no longer scared. She was confident and able to exercise for a full hour without breaking.

Her ejection fraction had improved to a healthy rate of 55-60%. She was strong enough to undergo surgery to have a permanent (ICD) placed. Lisa felt like she able to get back to being a fun existing to thriving.

Since that time, Lisa has had and anniversaries. She is now a member and cardiac rehab advocate. 100 times and trained 1000+ individuals



implantable cardioverter-defibrillator had reclaimed her life. She was and active mom – from simply seven “bonus years” of birthdays [BMC2 Patient Advisory Council](#) She has shared her story more than in hands-only CPR.

Most importantly – Lisa says – her three kids still have their mom and her husband has his best friend, and cardiac rehab played an integral role in achieving all of this.

Goal Spotlight			
PCI - Use of IVUS/OCT for stent optimization (all cases)			
Goal	Q1 2023	Q3 2024	% change
≥ 45%	39.6%	56.4%	42.4%
PCI - Use of IVUS/OCT for stent optimization (cases involving the left main coronary artery, in-stent restenosis, or in-stent thrombosis)			
Goal	Q1 2022	Q2 2023	% change
≥ 45%	53%	67.7%	27.7%

Intravascular ultrasound (IVUS) and optical coherence tomography imaging (OCT) help interventional cardiologists guide and place stents during percutaneous coronary intervention.



BEST PRACTICES

In 2024, BMC2 PCI released the Best Practice Protocol, "[Planning for Anaphylaxis in the Catheterization Laboratory](#)."

The document reviews choosing contrast for patients with prior anaphylaxis with and without results from prior allergy testing. It includes a chart outlining classification of severity and management of immediate hypersensitivity reactions, steps to take when patients are not responsive to epinephrine, a pre-procedure checklist, and guidance on team member roles in the case of an allergic reaction. Challenges to safe and effective care are also reviewed. Best Practice Protocols are based on consortium-wide consensus at the time of publication, updated regularly, and do not replace the professional opinion of the treating physician.

PUBLICATIONS

The PCI registry had four publications in 2024 covering topics including machine learning, shared decision making, reducing patient radiation doses, in-hospital mortality, and use of cardiac rehab liaisons. The publications garnered media attention from outlets including *TCTMD* and *Healio*.

1

Merging Machine Learning and Patient Preference: Patient-Centered Tool for Predicting Risk of Percutaneous Coronary Intervention

European Heart Journal

2

Cause and Preventability of In-Hospital Mortality After PCI: A Statewide Root-cause Analysis of 1,163 Deaths

PLOS ONE

3

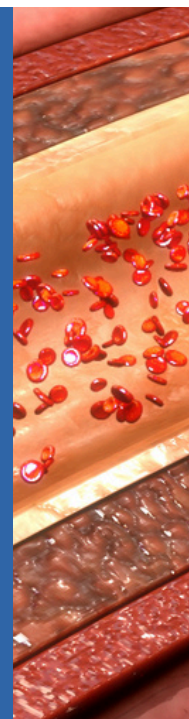
Use of a Liaison-Mediated Referral Strategy and Participation in Cardiac Rehabilitation After Percutaneous Coronary Intervention

Circulation: Cardiovascular Quality Outcomes

4

Statewide Initiative To Reduce Patient Radiation Doses During Percutaneous Coronary Intervention

Circulation: Cardiovascular Interventions



PRESENTATIONS

BMC2's work was featured nationally during ACC 2024 in Atlanta, GA; the 2024 ACC Quality Summit in San Antonio, TX; TCT 2024 in Washington, DC; and internationally during the ESC Congress 2024 in London.

ACC 2024 - Dr. S. Nabeel Hyder presented the moderated poster "[Same-day Discharge After Elective PCI – Why Put Off to Tomorrow What Can Be Done Today? Insights From the BMC2 Registry.](#)" Co-authors are Milan Seth, MS; Michael Thompson, PhD; Eric Thomas Walchak, DO; Abdulfatah Abdelkarim Osman, MD; Ryan Madder, MD; Devraj Sukul, MD, MSc, FACC, FSCAI; and Hitinder S. Gurm, MD.

2024 ACC Quality Summit - The BMC2 Coordinating Center's PCI Quality Lead, Kathleen Frazier, BSN, RN presented the poster "[Using Intravascular Imaging To Optimize Percutaneous Coronary Intervention Treatment.](#)" Additional authors are Annemarie Forrest, RN, MS, MPH and Milan Seth, MS.

ESC Congress 2024 - Dr. S. Nabeel Hyder presented "[SGLT2-'Eyes' on the Reno-Protection Prize: Reduction of Post-PCI Contrast-Associated AKI in Diabetic Patients Using SGLT2 Inhibitors.](#)" Additional authors are Milan Seth, MS; David E. Hamilton, MD; Joseph Chattahi, MD; Vishal Gupta, MD, MPH; Carlo Briguori, MD, PhD, FSCAI; Michael Rudnick, MD; Devraj Sukul, MD, MSc, FACC, FSCAI; and Hitinder S. Gurm, MD.

TCT 2024 - Thomas Basala, MS presented "[Safety of Image-Guided Percutaneous Coronary Intervention in Contemporary Practice: Insights From BMC2](#)" and "[Effectiveness of Image-Guided Percutaneous Coronary Intervention in Contemporary Practice: Insights From BMC2.](#)" Co-authors are Milan Seth, MS; Ryan Madder, MD; Brett Wanamaker, MD; Brittany Fuller, MD; Evan Shlofmitz, DO; Edouard Daher, MD; Michael Tucciarone, MD; Chadi Alraies, MD; Amir Kaki, MD; Sunil V. Rao, MD; Hitinder S Gurm, MD; and Devraj Sukul, MD, MSc, FACC, FSCAI.

Dr. Eric P. Cantey presented, "[Prevalence of Mechanical Circulatory Support Usage for the Treatment of Acute Myocardial Infarction Cardiogenic Shock \(AMI-CS\): Insights From the BMC2 Registry.](#)" Co-authors are Milan Seth, MS; Brett Wanamaker, MD, FACC, FSCAI; Edouard Daher, MD; Mir B. Basir, Amir Kaki, MD; Ryan Madder, MD, FSCAI; Devraj Sukul, MD, MSc, FACC, FSCAI; and Hitinder Gurm, MD.

Ryan D. Madder, MD, FACC, FSCAI presented "Initiative To Increase Intracoronary Imaging Optimization in PCI: A Report From the BMC2 Registry." Co-authors are Devraj Sukul, MD, MSc; Prasanthi Yelavarthy, MD; Milan Seth, MS; Elizabeth Pielsticker, MD; John Gribar, MD; Brett Wanamaker, MD, FACC, FSCAI; and Hitinder Gurm, MD.



PCI ADVISORY COUNCIL

The BMC2 PCI Advisory Council is a diverse group of partners – including representative interventional cardiologists and a BMC2 PCI program director, strategic advisor, primary site coordinator, quality or cath lab manager, and patient representative – who represent the varied interests and priorities across Michigan. The council allows the consortium to better serve its members and ensure BMC2 focuses on high-impact high-value initiatives. In 2024, the council worked to strengthen the organization by reviewing the consortium’s performance goals. They also looked at ways to expand BMC2’s reach and foster awareness by increasing opportunities to engage and educate cath lab staff and c-suite members.

Chadi Alraies

Interventional Cardiologist
DMC Heart Hospital

Elizabeth Pielsticker

Interventional Cardiologist
Henry Ford Jackson

Linda Kline

Quality Manager
Ascension Borgess

Dilip Arora

Interventional Cardiologist
Corewell Health
Lakeland Hospital

Anwar Zaitoun

Interventional Cardiologist
Covenant Healthcare

Hal Morgenstern

Patient Representative
BMC2 PCI
Patient Advisory Council

Joseph Chattahi

Interventional Cardiologist
Corewell Health
Dearborn Hospital

Carol Peters

Primary Site Coordinator
McLaren Flint

Ryan Madder

BMC2 PCI Strategic Advisor
Corewell Health
Grand Rapids Hospitals

PCI INTENSIVE CARE LIAISON

The Coordinating Center also welcomed Davy Hamilton, MD who will serve as an intensive care liaison. Dr. Hamilton will focus on optimizing the transition of patients from their PCI procedure to the intensive care unit by building a robust network of cardiac intensive care providers within BMC2. His efforts will emphasize improving care for patients in cardiogenic shock, particularly those utilizing advanced temporary mechanical support devices.



Davy Hamilton

Through this initiative, Dr. Hamilton aims to elevate patient care, reduce costs, and enhance outcomes through standardizing care pathways, advancing intensive care training, developing quality metrics, fostering communication amongst a network of critical care providers, and establishing a publication collaborative.



PCI PATIENT ADVISORY COUNCIL

The BMC2 PCI Patient Advisory Council welcomed three new members in 2024. The consortium is extremely fortunate to have an engaged group of patients who offer insight through sharing their lived experiences with cardiac procedures and events. These perspectives inform and shape BMC2's work as we create projects to improve quality of care and outcomes for Michigan cardiovascular patients.

In 2024, the council:

- Worked to develop concepts and content for patient-facing pages on BMC2.org.
- Shared testimonials on cardiac rehab for a MiCR email campaign for American Heart Month.
- Shared their stories through patient spotlight interviews and presentations at consortium meetings

The council's 2024 members were:

Thomas Arehart

Greg Merritt

Hal Morgenstern

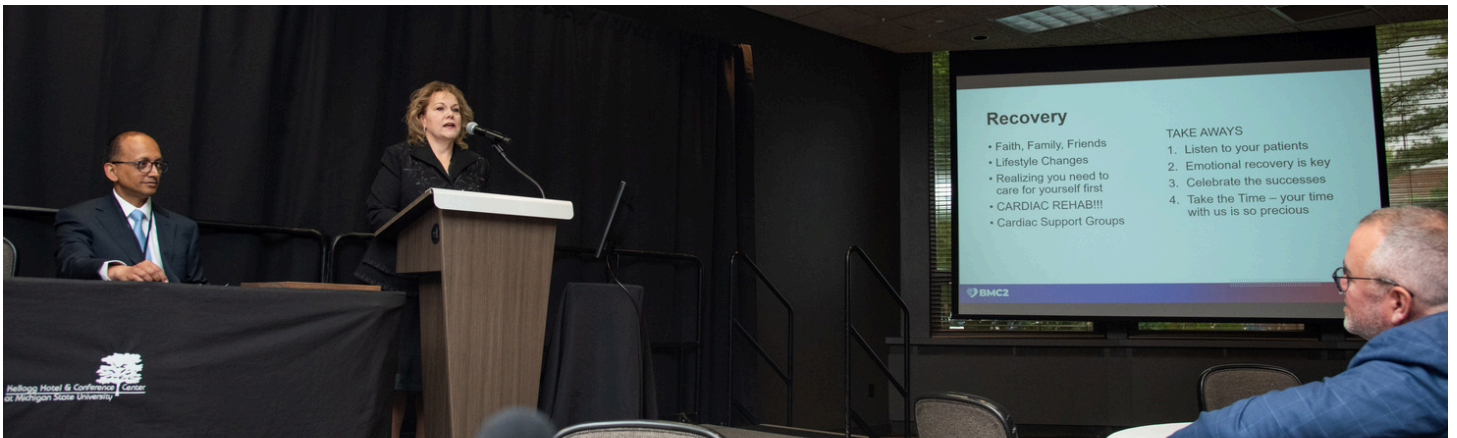
Lisa Cardillo

Carol Miller

Kevin Palczynski

Brian Tell

New members are always welcome as we continue to strive for the council to represent the depth and breadth of diversity across the state.



PCI Patient Advisory Council member, Carol Miller, presents during the PCI Collaborative Meeting in East Lansing on May 11, 2024. She shared her story and challenged members of the consortium to take good care of themselves so they can take good care of their patients across Michigan.

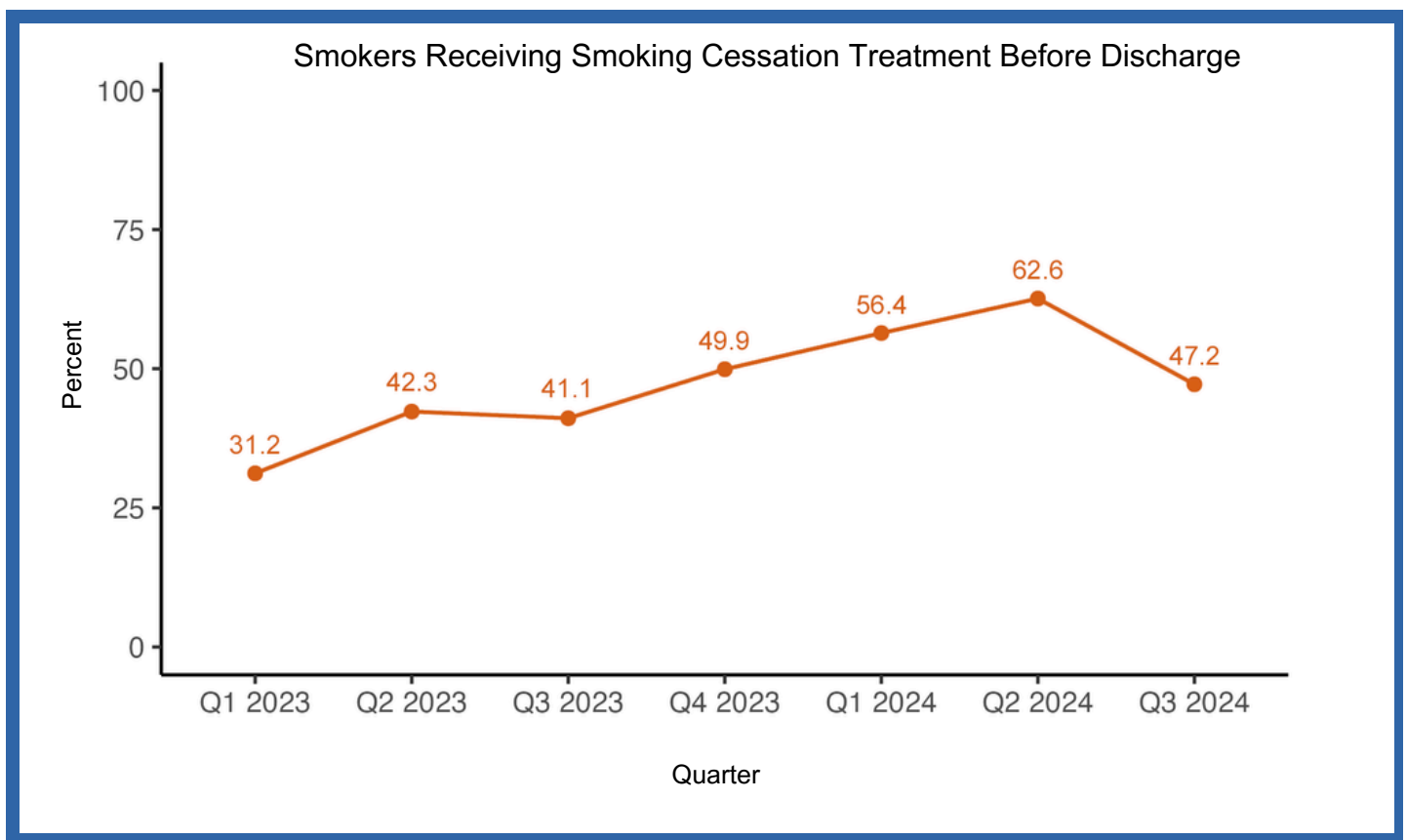


VASCULAR SURGERY

NEW GOALS FOR SMOKING CESSATION

Quitting smoking can prevent and slow the progression of cardiovascular disease. A vascular procedure, especially an emergency one, is an ideal opportunity to promote smoking cessation; surgeons can leverage a patient's motivation to quit caused by an event like surgery. BMC2 Vascular Surgery uses three components with the goal of promoting smoking cessation at the time of surgery – physician-delivered advice, referral to smoking cessation counseling, and pharmacology – including nicotine replacement therapy.

The consortium set a goal to increase the number of vascular surgery patient smokers receiving smoking cessation treatment before discharge. A higher quit rate among patients in Michigan leads to cost savings, increased quality of life, and more years of experiences and memories for patients, their friends, and families.



GOAL SPOTLIGHT

Documentation of EVAR Imaging Performed on the 1-Year Follow-up Form

BMC2 Vascular Surgery established the quality improvement incentive goal “Documentation of 1-Year Endovascular Aneurysm Repair (EVAR) Surveillance Imaging.”

With this goal, providers performed and documented surveillance imaging more regularly, allowing them to catch and address problems before they resulted in life-threatening aneurysm ruptures.

Sites in Michigan improved surveillance imaging documentation by over 21% from Q1 2023 to Q3 2024.

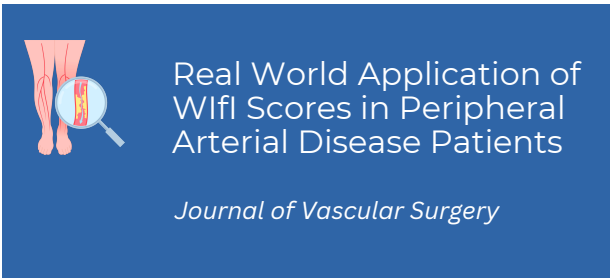
Goal Spotlight			
Documentation of EVAR* imaging performed on the 1-year follow up form			
Goal	Q1 2023	Q3 2024	% change
≥ 80%	69.1%	84%	21.56%

PUBLICATIONS

The *Journal of Vascular Surgery* published BMC2 Vascular Surgery’s [Real World Application of Wifl Scores in Peripheral Arterial Disease Patients.](#)"

A review of BMC2 data found that the Society for Vascular Surgery Wound, Ischemia, and foot Infection (Wifl) clinical stage is significantly associated

with one-year amputation rates in patients with chronic limb-threatening ischemia following lower extremity revascularization. As nearly 55% of stage four patients require a major amputation within one year of intervention, this study supports the use of the Society for Vascular Surgery Wifl classification system in clinical decision-making for patients with chronic limb-threatening ischemia. The publication authors are Margaret E. Smith, MD; Drew J. Braet, MD; Jeremy Albright, PhD; Matthew A. Corriere, MD, MS; Nicholas H. Osborne, MD; and Peter Henke, MD.



PRESENTATIONS

SAVS 2024 – Brian T. Fry, MD, MS presented the rapid-fire talk, “[A Novel Risk Calculator for Nonhome Discharge After Lower Extremity Bypass](#),” during the Southern Association for Vascular Surgery (SAVS) Annual Meeting in Scottsdale, AZ. Co-authors are Jeremy Albright, PhD; Shukri H.A. Dualeh, MD; Nicolas J. Mouawad, MD, MPH, MBA; Andrew Kimball, MD; Jordan Knepper, MD, MSc; Eugene W. Laveroni, DO; Chandu Vemuri, MD; Peter K. Henke, MD.

VASCULAR SURGERY ADVISORY COMMITTEE

The BMC2 Vascular Surgery Advisory Committee meets regularly to discuss high-level BMC2 strategic directions and priorities. This group of diverse partners representing varied interests and priorities across Michigan serves to strengthen the organization, better serve consortium members, and ensure we focus on high-impact, high-value initiatives.

In 2024, the committee reviewed the health disparities dashboard and chose invited speakers to elevate the quality of consortium-wide learning opportunities. Advisory Committee members included:

Constantinos Constantinou
Vascular Surgeon
MyMichigan Health

Ryan Kim
Vascular Surgeon
Covenant HealthCare

Eanas Yassa
Vascular Surgeon
Corewell Spectrum

Joshua Greenberg
Vascular Surgeon
Trinity Health
Grand Rapids

Michelle Kosovec
Vascular Surgeon
U-M Health West

Nicholas Osborne
Director of BMC2 Vascular Surgery
Michigan Medicine

Peter Henke
Vascular Surgeon
Michigan Medicine

Judith Lin
Vascular Surgeon
McLaren Greater Lansing

Loay Kabbani
BMC2 VS Strategic Advisor
Henry Ford Health



VASCULAR SURGERY PUBLICATION AND STRATEGY COMMITTEE

The Vascular Surgery Publication and Strategy Committee aims to identify priorities and opportunities for engagement in presenting and publishing BMC2 data. The team strives to secure authors and co-authors from diverse backgrounds and offers opportunities for trainee mentoring throughout the publication process.

Topics prioritized in 2024 included:

- Treatment of smokers vs non-smokers for asymptomatic carotid disease, looking at repeat procedures and all major outcomes
- Impact of smoking cessation for non-limb threatening ischemia patients
- Rural-urban differences across all collected procedure types

The committee is working to define metrics for successful publication projects, including standardizing milestones and timeline expectations, and will continue increasing consortium member engagement. 2024 members included:

Constantinos Constantinou
Vascular Surgeon
MyMichigan Health

Loay Kabbani
BMC2 VS Strategic Advisor
Henry Ford Health

Ash Mansour
Vascular Surgeon
Corewell Health
Grand Rapids Hospitals

Peter Henke
Vascular Surgeon
Michigan Medicine

Andris Kazmers
Vascular Surgeon
McLaren Northern Michigan

Nicolaus Mouawad
Vascular Surgeon
McLaren Bay Region

Greg Gaborek
Vascular Surgeon
McLaren Macomb

Ryan Kim
Vascular Surgeon
Covenant HealthCare

Nicholas Osborne
Director of BMC2 Vascular Surgery
Michigan Medicine

Below, left to right. Grace Djapri, NP, MyMichigan Health; Cindy Noack, BS, Primary Site Coordinator, MyMichigan Health; Ara Pridjian, MD, Physician Champion, UM Health Sparrow



TAILORING GOALS TO IMPROVE QUALITY BY SITE

In 2024, MISHC added site-specific goals, fostering a personalized approach to quality and encouraging sites participating centers to create milestones and measures that address challenges specific to their site.

Goal topics included:

- Shared decision making
- Reducing the total contrast/estimated glomerular filtration rate ratio contrast usage amount to ≤ 3
- Improving Kansas City Cardiomyopathy Questionnaire, 5-meter walk, and risk score document scanning processes
- Increasing the number of TAVR patients attending their 1-year follow-up appointment
- TAVR Prehydration
- New York Heart Association functional classification documented at 30-day follow up
- Increase documentation of the degree of aortic valve calcification prior to TAVR
- Transition from dual anti-platelet therapy to single anti-platelet therapy
- Data distribution
- 1-Year Kansas City Cardiomyopathy Questionnaire completion

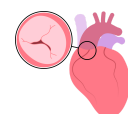
Spotlight - Trinity Health Oakland

Trinity Health Oakland Hospital chose to increase documentation of the degree of aortic valve calcification prior to TAVR. The site's baseline performance from Q1 2023 was 69% and they set a target performance for Q2 2024 of 86%.

To achieve this goal, computed tomography angiography of the chest, abdomen, and pelvis was performed on all patients pre TAVR procedure. A calcium score of the Aortic Valve Administrator was calculated and physicians worked with the radiology department to report the aortic valve Agatston score for quantification of the degree of calcification on the pre-TAVR computed tomography angiography. Additionally, the image containing the score is maintained in the Picture Archiving and Communication system

A smart phrase – a commonly used phrase to help quickly add patient information to an electronic health record – was added to the operative note template requiring the surgeon to enter the calcification information.

Trinity Health Oakland's site-specific goal performance in 2024 was 100%, resulting in safer TAVR procedures and better outcomes for patients.



TAILORING GOALS TO IMPROVE QUALITY BY SITE, CONT.

Spotlight - Ascension Borgess

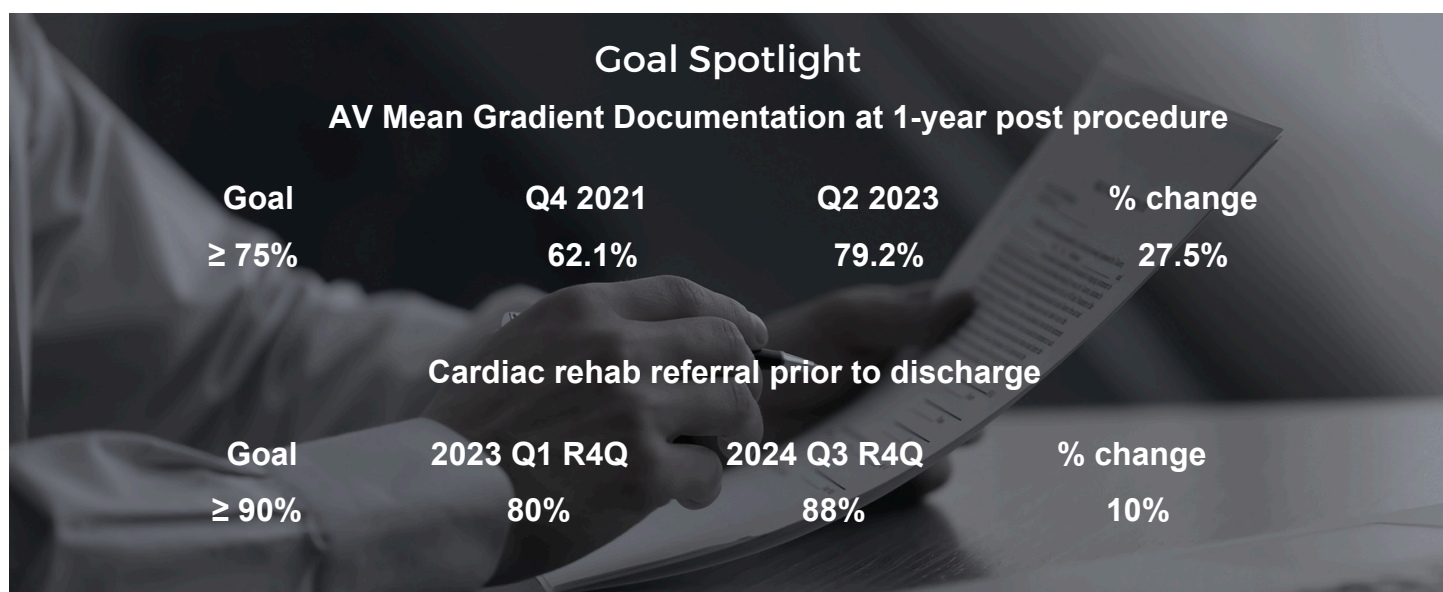
Ascension Borgess set their focus on 3ML per Kg or 250ML maximum hydration before TAVR procedures.

Their baseline performance in Q1 2023 was 0% and their target performance for Q2 2024 was 75%. The team updated their order sets to include giving patients 3ML/Kg pre-hydration, up to 250ML. They provided documentation education to the CVL/Cardiac Short Stay manager who educated nursing staff.

The group also discovered discrepancies between previously recorded weight and weight at the time of procedure, which could result in the incorrect amount of pre-hydration being dispensed. Pre-op orders were changed so patients were weighed on admission for proper dosing.

Ascension Borgess surpassed their 75% goal and achieved a 95.1% performance, leading to lower patient risk of acute kidney injury.

These are just two examples of the impacts made across the state as the result of collaboration and commitment to quality improvement.



The AV mean gradient measures the pressure range across the aortic valve and is a key indicator in measuring the severity of the narrowing or thickening of the aortic valve which can lead to reduced blood through throughout the body. It can also measure how effective treatment for aortic stenosis has been. Documenting the AV Mean Gradient at 1-year can help manage a patient's health over time, leading to improved outcomes. Completing 36 sessions of cardiac rehab reduces the chance of hospital readmission as well as the chance of future cardiac events and the risk of death from all causes.



BEST PRACTICE PROTOCOLS

Lifetime Management of Aortic Stenosis

With the approval of low risk transcatheter aortic valve replacement, a shift to lifetime management has now gained focus. This is because younger and healthier patient populations are more likely to outlive their first surgical or transcatheter bioprosthetic aortic valve.

The [Aortic Valve Lifetime Management Best Practice Protocol](#) covers multiple considerations for heart teams and patients as they engage in shared decision making.

These include:

- The mechanism of aortic stenosis
- The presence of concomitant coronary artery
- Disease and other pathologies
- Individual patient anatomy and suitability for both surgical and/or transcatheter approaches.

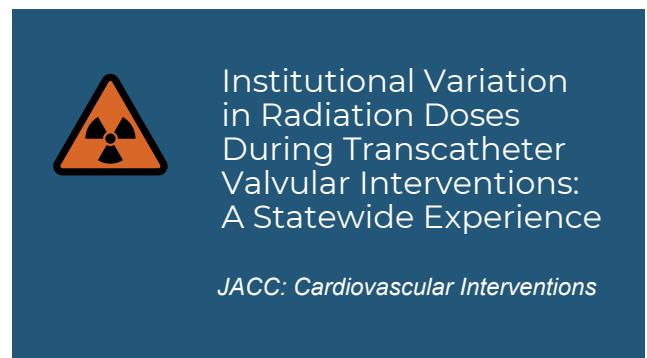
The protocol covers guidelines for aortic valve replacement including current trends in SAVR and TAVR, British and U.S. data, and experiences from MISHC.

SAVR-first and TAVR-first considerations are outlined, as are unknowns including valve durability and valve differences. MISHC Best Practice Protocols are based on consortium-wide consensus at the time of publication and do not replace the professional opinion of the treating physician.

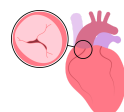
PUBLICATIONS

[“Institutional Variation in Radiation Doses During Transcatheter Valvular Interventions: A Statewide Experience”](#) was published by JACC

Cardiovascular Interventions. Data from MISHC-participating hospitals showed wide variability in radiation doses with the performing hospital having more impact on a patient receiving high-dose radiation than any patient or procedural factors.



Future interventions are warranted to reduce procedural-related variation in radiation doses. The publication by David McNamara, MD, MPH; Jeremy Albright, PhD; Devraj Sukul, MD, MSc, FSCAI; Stanley Chetcuti, MD; Annemarie Forrest, MS, MPH; Paul Grossman, MD; Raed M. Alnajjar, MD; Himanshu Patel, MD; Hitinder S. Gurm, MBBS; and Ryan D. Madder, MD can be found on [PubMed](#).



PRESENTATIONS

MISHC increased its presence at national conferences in 2024 with presentations at New York Valves 2024 in New York City, the SCAI Scientific Sessions in Long Beach, CA, and TCT 2024 in Washington, DC.

New York Valves 2024 – Dr. Collin Brooks presented "[Quality of Life After Mitral Valve Transcatheter Edge-to-Edge Repair According to Baseline Tricuspid Regurgitation Severity.](#)" Co-authors are Neal Duggal, MD; Milan Seth, MS; Megan Joseph, MD; and Andrew Harris, MD.

SCAI Scientific Sessions – Dr. David A. McNamara presented the poster, "[Institutional Variation in Patient Radiation Doses During Transcatheter Valve Interventions: A Statewide Experience.](#)" Co-authors are Jeremy Albright, PhD; Devraj Sukul, MD, MSc; Stanley Chetcuti, MD; Annemarie Forrest, MSN, MPH; P. Michael Grossman, MD; Raed M. Alnajjar, MD; Himanshu Patel, MD; Hitinder S. Gurm, MD; and Ryan D. Madder, MD.

TCT 2024 – Dr. Pedro Villablanca presented the moderated abstract, "[Valve In Valve BE vs. SE.](#)" Co-authors are Omar Abdelhai, MD; Laith Alhuneafat, MD; Luai Madanat, MD; Ivan Hanson, MD; Brian Renard, MD; and Amr Abbas, MD.

NEW COORDINATING CENTER STAFF

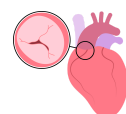
Welcome, Alondra Dorsey

Clinical Information Analyst Senior Alondra Dorsey, MS joined MISHC in June 2024. She previously worked with Michigan Medicine's Center for Circulatory Support (LVAD) team, where she held progressive roles such as, a medical assistant, research coordinator, and a clinical information analyst. Her responsibilities included overseeing process improvements, data analysis, and ensuring compliance with Joint Commission standards. Alondra works with Clinical Quality Improvement Lead, Sheryl Fielding, to develop MISHC reports, registry and VBR goals, educational meetings, and relevant tools for our participating sites for quality improvement. Through chart reviews and site visits, Alondra works to ensure MISHC sites meet all CMS and TVT requirements.



Alondra Dorsey

We look forward to this new chapter working with Alondra and Co-Program Managers Melissa and Mollie toward the consortium's commitment to collaboration in the spirit of improving patient care.



AIMING TO EQUITABLY INCREASE PARTICIPATION IN CARDIAC REHAB FOR PATIENTS IN MICHIGAN

The Michigan Cardiac Rehab Network ([MiCR](#)) marked the completion of its second year in 2024. Born out of the combined efforts of BMC2 and the Michigan Value Collaborative ([MVC](#)), MiCR aims to equitably increase participation in cardiac rehab for all eligible patients in Michigan. To do this, MiCR offers opportunities for stakeholder networking, clinical practice sharing, and dissemination of resources. The Michigan Structural Heart Consortium ([MISHC](#)) – a collaboration between BMC2 and the Michigan Society of Thoracic and Cardiovascular Surgeons ([MSTCVS](#)) Quality Collaborative – also partners with MiCR and utilizes its resources to enhance the quality of care and outcomes for Michigan patients undergoing transcatheter valve procedures.



Why Cardiac Rehab Matters:

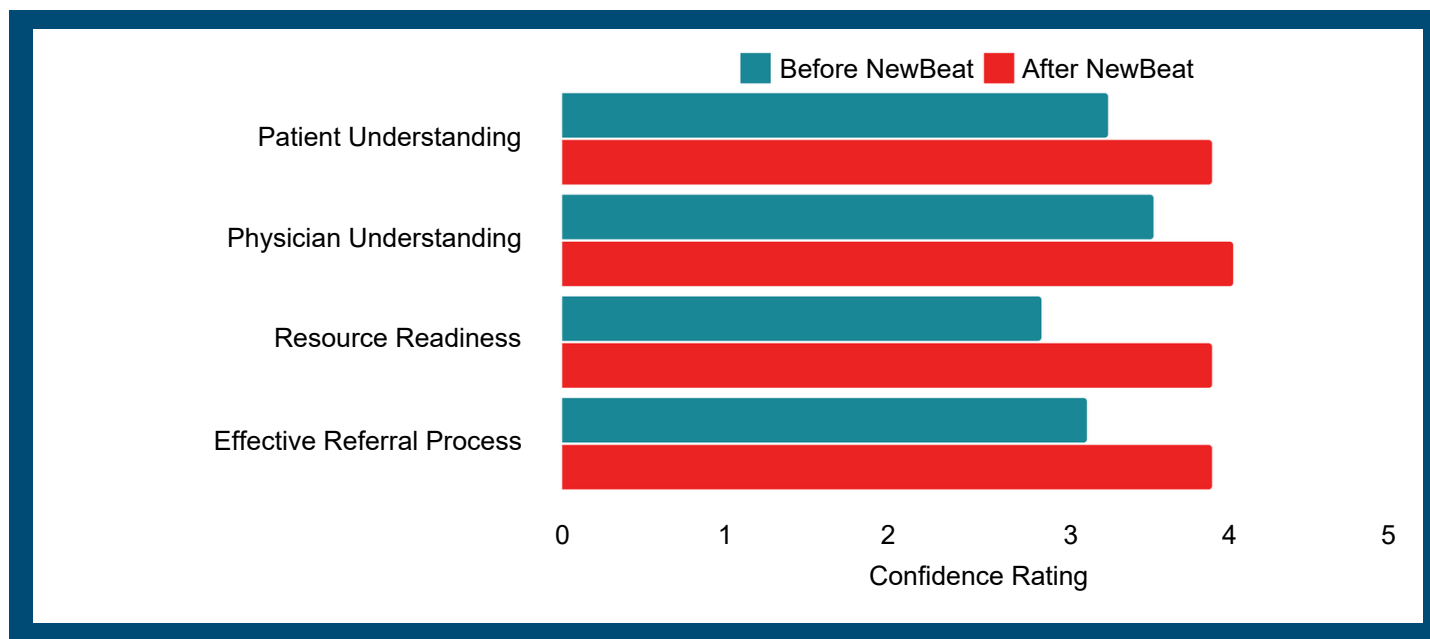
- **Better Health:** Restores strength and confidence while reducing future heart problems.
- **Expert Guidance:** Offers support from cardiac specialists, dietitians, and care teams.
- **Healthy Habits:** Builds a foundation for a healthier lifestyle through up to 36 sessions.
- **Community Support:** Connects patients with others for shared understanding and encouragement.

NewBeat

In 2024, a second round of printed copies of NewBeat materials was provided at no cost to partner centers and hospitals upon request, bringing the total number of NewBeat materials to 33,000 across participating facilities statewide. NewBeat is a multi-component intervention designed to improve cardiac rehab enrollment and includes provider- and patient-facing resources such as educational fliers, cardiac rehab referral stickers to affix to discharge folders, and cardiac rehab liaison postcards – cards delivered to patients from their physician endorsing cardiac rehab. The materials are also available as [digital downloads](#) on the MiCR website.

NewBeat, Cont.

MiCR partnered with Healthy Behavior Optimization of Michigan ([HBOM](#)) for the development and launch of NewBeat in 2023. A survey of NewBeat users after six months revealed that the materials helped increase sites' confidence that they have the tools and resources they need to improve rates of referral and enrollment. The materials also helped patients and physicians understand the importance of cardiac rehab, which was a major barrier reported by members throughout the development process.



Cardiac Rehab Mini Grants

MiCR established the Cardiac Rehab Utilization Quality Improvement Award – a new mini-grant opportunity designed to empower local problem-solving and provider-driven innovation in cardiac rehab quality improvement. This \$30k-grant fund was made possible through Collaborative Quality Initiatives Operations pooled funds matched by MiCR-collaborating CQIs –BMC2, MVC, and MSTCVS.



Cardiac Rehab Mini Grants, Cont.

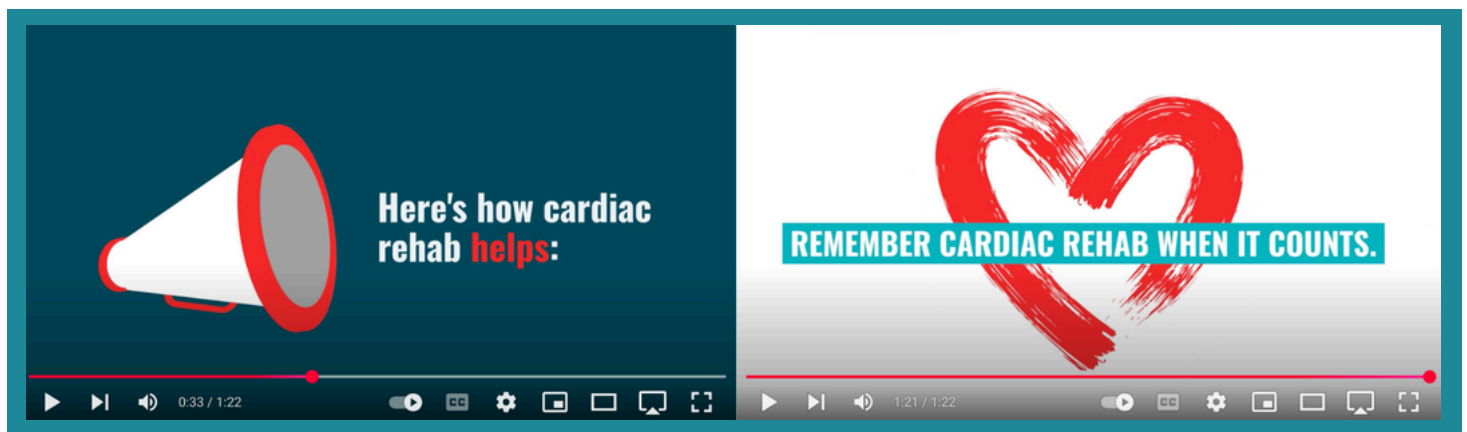
Participating sites were invited to apply for up to \$5000 to fund innovative programs aimed at improving cardiac rehab utilization across Michigan. Mini grants totaling more than \$13k funded the following projects for 2024:

- Heart Failure University
MyMichigan Midland
- Let's "Walk It Out": An Exercise Initiative
Ascension Rochester
- The Weight of Heart Failure
Corewell East

Grant awardees will present their QI projects at upcoming MiCR meetings and webinars. In early 2025, the third and final round of funding will increase the possible funding level to \$15k for competitive quality improvement proposals.

Patient-Facing Cardiac Rehab Video

MiCR utilized ideas from a 2023 stakeholder meeting to create the video "What Is Cardiac Rehab?" This patient-facing resource provides education about cardiac rehab's importance and components and encourages patients and their families to request a referral upon discharge.



Cardiac Rehab Advocacy

MiCR partnered with the Michigan Society for Cardiovascular and Pulmonary Rehabilitation (MSCVPR) to advocate for critical legislation that improves access to cardiac rehabilitation. The aim is to build a strong grassroots coalition to advance policies that protect and expand cardiac rehab access across Michigan and beyond.



Cardiac Rehab Advocacy Cont.

Legislative priorities were aligned with the American Association for Cardiopulmonary Rehabilitation (AACVPR) and included the Sustaining Outpatient Services (SOS) Act, ensuring Medicare payments for cardiac rehab and other services provided by off-campus outpatient departments, and the Telehealth Modernization Act of 2024, which would permanently extend telehealth options for CR access first introduced during the COVID-19 pandemic.

In early 2025, MiCR will provide supportive resources for sites who wish to host a legislative site visit. Resources will include an updated legislative action packet with a site visit planning checklist, sample site-visit agenda, and a policy brief one-pager.

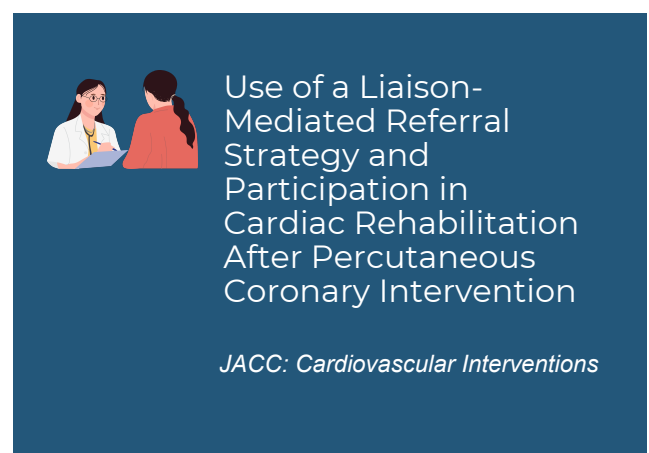
Presentations

BMC2's Mary Casey, MPA; MVC's Mike Thompson, PhD; and HBOM's Larrea Young, MDes presented "Leveraging the Collaborative Quality Improvement Model for Coalition Building, Benchmarking, and Intervention Support in Michigan" during the American Association of Cardiovascular and Pulmonary Rehabilitation 39th Annual Conference in Anaheim, CA in September.

In December, MVC's Jana Stewart, MPH, MS, presented the poster "Using the Collaborative Quality Improvement Model To Improve Cardiac Rehab Utilization in Michigan" during the Institute for Healthcare Improvement Forum in Orlando. Additional poster authors included Larrea Young, MDes; Noa Kim, MSI; Mary Casey, MPA; and Mike Thompson, PhD, MPH.

Publications

MiCR data was published in "[Use of a Liaison-Mediated Referral Strategy and Participation in Cardiac Rehabilitation After Percutaneous Coronary Intervention](#)" in *Circulation Cardiovascular Quality Outcomes*. Authors are Alexandra I. Mansour, MD; Milan Seth, MS; Michael P. Thompson, PhD, MPH; Mary Casey, MPH; Steven Keteyian, PhD; Frank A. Smith, MD; Hitinder S. Gurm, MD; and Devraj Sukul, MD, MSc, FACC, FSCAI.



The Impact

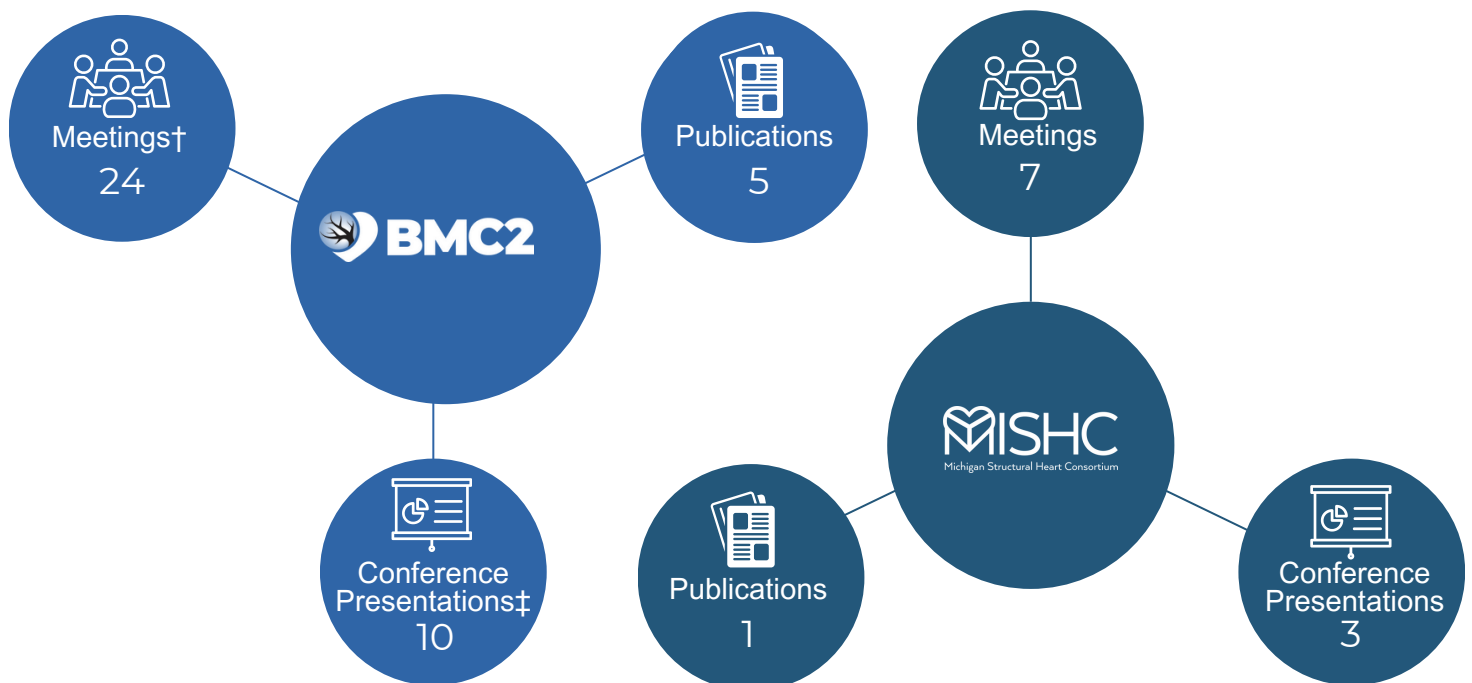
MiCR's initial goal was to increase eligible patient enrollment in cardiac rehab from 30% to 40% by 2024 among patients treated for AMI, CABG, PCI, SAVR, and TAVR. According to 2023 Q4 claims*, the most recent available at the time of publication, the statewide average for cardiac rehab utilization was 34%.

BMC2 surpasses the nation's rate for referral to cardiac rehabilitation after PCI procedures. For Q4 2023, BMC2's rate was 91% while the national rate was 79.1%. This translates to approximately 24,000 patients referred to cardiac rehab by BMC2-participating hospitals in 2023. These interventions contribute to improved long-term health outcomes and reductions in hospital readmissions.

MiCR is excited to continue pursuing its mission and goals and take on new challenges to lower payor costs, improve quality of care, and improve patient outcomes in 2025.

RESOURCES BY THE NUMBERS

Over the last year BMC2 has created myriad resources to support cardiovascular quality improvement in Michigan and around the world, with high volume access across a broad range of our cardiovascular materials.



*The claims data included in this cardiac rehab utilization analysis includes index admissions occurring in 2023 Q4 for BCBSM/BCN Commercial, BCBSM/BCN Medicare Advantage, Medicare Fee-for-Service, and Michigan Medicaid.

†Includes 8 MiCR meetings. ‡Includes 2 MiCR conference presentations.



MEETING HIGHLIGHTS

Consortium meetings brought opportunities for education and networking as we offered a mix of virtual events and in-person gatherings around Michigan. Presentations given by consortium members allowed sites to learn from each other, a valuable element of our mission. We also welcomed national and international speakers:

Dr. Tara Lagu of Northwestern University presented “Increasing Use of CR for Patients With Heart Failure: A Case Study in Implementation”

Dr. Robert. E. Lee of the U.S. Food and Drug Administration presented “Ensuring Safe Medical Device Use: FDA’s Responsibility in Product Regulation, Your Role as a Device User”

Dr. Quinn Pack of Baystate Medical Center and University of Massachusetts Chan Medical School – Baystate presented “Cardiac Rehab at Baystate Hospital”

Dr. Sunil Rao, Director of NYU Langone Health System and Editor-in-Chief Circulation Cardiovascular Interventions presented “Contemporary Saphenous Vein Graft PCI”

Dr. Sean Roddy of Albany Medical College presented “Health Economics of Vascular Surgery”

Dr. Jennifer Rymer, of Duke Clinical Research Institute, presented “Restenosis and Management of Stent Failure”

Dr. Jo Shapiro of Harvard Medical School presented “Peer Support: When ‘Walking It Off’ Is Not a Sustainable Strategy”

Dr. Muthiah Vaduganathan of Brigham and Women’s Hospital, Harvard Medical School presented “What Cardiologists Need To Know About Obesity Medicine in 2024”

LOOKING TO THE FUTURE

BMC2 is working through the process of reimagining reports, drawing from research, lessons from fellow CQIs, and feedback from consortium members to improve the content of reports and how users interact with them. In 2025, we will use our health disparities dashboards to create quality projects focusing on improving health care outcomes for every cardiovascular patient across the state. We will create a systematic workflow for publications focused on improving the scientific rigor of our designs while decreasing the time to publication. We will form a Vascular Patient Advisory Council to work with patients for vascular care improvements and formalize the long-standing MISHC Coordinator/Abstractor mentorships.

Consortium members’ commitment to our mission enhances the quality of care and patient outcomes both nationally and internationally, solidifying Michigan’s reputation as one of the safest states for cardiovascular treatment. As we move into 2025, we look forward to setting new goals and achieving further advancements in patient care through continued collaboration.



OUR COORDINATING CENTER TEAM



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BMC2 data include all relevant patients regardless of their insurance type or status, and the interventions are focused on improving outcomes for every person across the state.

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