PITTSBURGH HEART TEAM SUMMIT

A SYMPOSIUM ON CARDIOVASCULAR ALLIANCES

August 24-25, 2023

David L. Lawrence Convention Center

Co-Sponsored by:

St. Clair Health

AHN

UPMC

Welcome

The Annual Pittsburgh Heart Team Summit provides tools to physicians and physician extenders, including those in surgery and cardiology, which enables collaboration in the care of patients with cardiovascular diseases. The objectives remain to advance the team concept of patient care. Physicians infrequently have the opportunity to interactively discuss current guideline based care with surgeons and cardiologists. The summit encourages improved team dynamics and compare cooperative expertise while educating physicians and health care providers about ways to work together for improved patient safety and clinical efficiency.

In 2023 the Summit will integrate the cultures and expertise of cardiologists, cardiac surgeons, and affiliated specialties primarily from the Greater Pittsburgh Medical Community. Western Pennsylvania regional physicians, physician extenders and providers will interact with the speakers and faculty during the live, interactive discussion at the David L. Lawrence Convention Center. Learners may earn educational credits during this in-person event.

The target audience includes cardiologist, cardiac surgeons and physicians/providers caring for patients with cardiovascular diseases. Nurses, physician assistants, and perfusionists also find educational opportunities by attending the summit. Our needs assessment indicates the target audience benefits by the Summit's education as it relates to:

- Learning of the academic accomplishments of post-graduates in the region;
- Understanding the value of a team approach to cardiovascular diseases;
- Developing tools that help direct their patients towards appropriate therapies;
- Creating effective communication methods between specialties;
- Appreciating the most recent evidence based guidelines for cardiovascular care.

Barriers such as facility limitations and communication difficulties will be addressed during this seminar. Evidence-based recommendations and treatment guidelines will direct the educational presentations and provide attendees with key learning objectives for related application in their practices.

The educational activity will feature case and student/resident research presentations moderated by a panel of regional experts on topics covering:

Arrhythmias
Left Atrial Appendage Management
Pulmonary Embolism
Right Heart Failure
Cardiac Amyloidosis
Cardiovascular Imaging
Aortic Valve Disease
Mitral Valve Disease
Coronary Artery Disease
Women's Heart Disease
Tricuspid Valve Disease

Pittsburgh Heart Team Summit Steering Committee

Stephen Bailey, MD
Allegheny Health Network

Malamo Countouris, MD
University of Pittsburgh Medical Center

Andy Kiser, MD
St. Clair Health

David Lasorda, DO
Allegheny Health Network

Indu Poornima, MD
Allegheny Health Network

Christopher Pray, MD
St. Clair Health

Katherine Shreyder, MD
St. Clair Health

Prem Soman, MD
University of Pittsburgh Medical Center

Ibrahim Sultan, MD
University of Pittsburgh Medical Center

0723020KC

PITTSBURGH HEART TEAM SUMMIT

2023 Agenda

Thursday, August 24
Faculty and Administration Reception
Poster Presentations
5:00 - 7:00 PM.
David L. Lawrence Convention Center

Friday, August 25
Interactive Faculty Discussion Agenda
David L. Lawrence Convention Center

Time			
7:30 A.M.	Breakfast		
7:45 A.M.	Opening General Session (*Main ballroom)*		
8:00 A.M. - 9:20 A.M.	Shock *(Main ballroom)*	Coronary Artery Disease *(Room 301-302)*	Imaging for Valve *(Room 303-304)*
9:20 A.M. - 9:45 A.M.	Break		
9:45 A.M. – 11:05 A.M.	Cardiac Valve *(Main ballroom)*	CV Critical Care *(Room 301-302)*	Perfusion *(Room 303-304)*
11:05 A.M. – 11:40 A.M.	Lunch		
11:40 A.M. – 1:00 P.M.	Resident Presentations *(Main ballroom)* Moderator: Michael Mack		
1:00 P.M. – 1:20 P.M.	Break		
1:20 P.M. – 2:50 P.M.	Pulmonary Embolism *(Main ballroom)*	Vascular Disease *(Room 301-302)*	Atrial Fibrillation and LAA Management *(Room 303-304)*
2:50 P.M. – 3:10 P.M.	Break		
3:10 P.M. – 4:40 P.M.	Women's Heart Disease *(Main ballroom)*	Pacemakers and Lead Management *(Room 301-302)*	Cardiac Imaging *(Room 303-304)*

4:40 P.M. Meeting Adjourned; CME Adjournment at 4:30 P.M.

PITTSBURGH HEART TEAM SUMMIT

2023 Agenda

Main Ballroom

Session	Time	Speaker	Topic
Shock *Moderators:* Matthew Lander, MD David Lasorda, MD	8:00 – 8:10 AM	Rachel Ibrahim, MD	Shock in the Field and the ED
	8:10 – 8:20 AM	Matthew Lander, MD	How and When do we Transfer Shock?
	8:20 – 8:30 AM	Matthew Pesacreta, MD	The Role of Dialysis in Shock Management
	8:30 – 8:40 AM	David Lasorda, DO	AMI Shock National Registry
	8:40 – 8:50 AM	Muhammad Salman, MD	Right-Sided Cardiovascular Support
	8:50 – 9:00 AM	Ramzi Khalil, MD	Role of Impella in Shock Management
	9:00 – 9:10 AM	Karthikeyan Ranganathan, MD	When do we Need Mechanical Support?
	9:10 – 9:20 AM	Tyler VanDyck, MD	How long on ECMO? - Definitive Therapy
Cardiac Valve *Moderators:* Stephen Bailey, MD Conrad Smith, MD	9:45 – 9:55 AM	Derek Serna-Gallegos, MD	Percutaneous Valve Options
	9:55 – 10:05 AM	Dustin Kliner, MD	High Risk TAVR
	10:05 – 10:15 AM	Scott Halbreiner, MD	Where Does SAVR Fit Into the Algorithm?
	10:15 – 10:25 AM	Ryan Zuzek, MD	Coronary Management During and After TAVR
	10:25 – 10:35 AM	Thomas Caranasos, MD	Complications of TAVR/Clip
	10:35 – 10:45 AM	Condrad Smith, MD	Tricuspid Valve Therapies
	10:45 – 10:55 AM	Walter McGregor, MD	Is There a Percutaneous Mitral Valve Frontrunner?
	10:55 – 11:05 AM	Kyle Buchanan, MD	Alternative Access for TAVR
Pulmonary Embolism *Moderators:* Candice Lee, MD Catalin Toma, MD	1:30 – 1:40 PM	Catalin Toma, MD	Acute PE Interventions
	1:40 – 1:50 PM	David Kaczorowski, MD	Surgical Embolectomy
	1:50 – 2:00 PM	Tyler VanDyck, MD	Critical Care Management of Acute PE
	2:00 – 2:10 PM	Mithun Chakravarthy, MD	Pulmonary Artery Angioplasty
	2:10 – 2:20 PM	Candice Lee, MD	The Role of Pulmonary Endarterectomy
	2:20 – 2:30 PM	Mark Joseph, MD	Percutaneous Embolectomy and Beyond
	2:30 – 2:40 PM	Stephen Chan, MD, PhD	Chronic Right Heart Failure
Women's Heart Disease *Moderators:* Malamo Countouris, MD Katherine Shreyder, MD	3:15 – 3:25 PM	Katherine Shreyder, MD	Spontaneous Coronary Artery Dissection
	3:25 – 3:35 PM	Malamo Countouris, MD	Postpartum and Long-Term Cardiovascular Care After Hypertensive Disorders of Pregnancy
	3:35 – 3:45 PM	Agnes Koczo, MD	Heart Valve Disease in Pregnancy
	3:45 – 3:55 PM	Anita Radhakrishnan, MD	Disparities in CV risk and CV Care in Women
	3:55– 4:05 PM	Candice Lee, MD	Gender Differences in CABG Outcomes
	4:05 – 4:15 PM	Sarah Yousef, MD	Gender Differences in the Surgical Treatment of Aortic Disease
	4:15 – 4:25 PM	Indu Poornima, MD	Cardiovascular Imaging for Ischemic Heart Disease in Women

PITTSBURGH HEART TEAM SUMMIT

2023 Agenda

Breakout 1 (AM & PM)

Session	Time	Speaker	Topic
Coronary Artery Disease *Moderators:* Johannes Bonatti, MD Travis Wilson, MD	8:00 – 8:10 AM	Michael Bashline, MD	Left Main Stenting
	8:10 – 8:20 AM	Johannes Bonatti, MD	Robotic CABG
	8:20 – 8:30 AM	Aashish Dua, MD	Multivessel Disease: Stents?
	8:30 – 8:40 AM	Hazem El-Khatib, MD	Multivessel Disease: Surgery?
	8:40 – 8:50 AM	Mitsu Ogawa, MD	Radial Artery in CABG
	8:50 – 9:00 AM	David Garber, PA-C	Saphenous Veins in CABG
	9:00– 9:10 AM	John T. Wilson, MD	Impella During Coronary Intervention
Cardiovascular Critical Care *Moderators:* Mark Estes, MD Ricky Hansra, MD	9:45 – 9:55 AM	Mark Estes, MD	Post Operative AF Management
	9:55 – 10:05 AM	Alexis Steinberg, MD	Hypothermic Therapy for Cardiac Arrest
	10:05 – 10:15 AM	Max Hammer, MD	Management of Acute Stroke Post Procedure
	10:15 – 10:25 AM	Calin Gorun-Gorunescu, MD	Enhanced Recovery After CV Surgery
	10:25 – 10:35 AM	Adnan Khalif, MD	Contributions of the Bedside ECHO in the ICU
	10:35 – 10:45 AM	Alicia Topoll, MD	When to Say No -The Role of Hospice
	10:45 – 10:55 AM	James Brown, MD	The Value of a PA Catheter
Vascular Disease *Moderators:* Satish Muluk, MD Ibrahim Sultan, MD	1:30 – 1:40 PM	Jason Biggs, MD	ED Recognition and Management of Acute Aortic Dissection
	1:40 – 1:50 PM	Scott Halbreiner, MD	Hybrid Surgical and Endovascular Aneurysm Management
	1:50 – 2:00 PM	Matthew Suffoletto, MD	Bicuspid Aortopathy
	2:00 – 2:10 PM	Thomas Simone, MD	TCAR
	2:10 – 2:20 PM	Michael Brown, MD	When to Intervene for Lower Extremity Disease
	2:20 – 2:30 PM	Michael Gaglia, MD	A Collaborative Approach to Limb Salvage
	2:30 – 2:40 PM	Wissam Gharib, MD	Shock Wave: Indications and Update
	2:40 – 2:50 PM	Satish Muluk, MD	Vascular Complications of Percutaneous Valves
Pacemaker & Lead Management *Moderators:* Roger Carrillo, MD George Shaw, MD	3:15 – 3:25 PM	Wiley Nifong, MD	Indications for Lead Extraction
	3:25 – 3:35 PM	Roger Carrillo, MD	The Surgeon's Role in Lead Extraction
	3:35 – 3:45 PM	Katie Sheridan, DO	Controversies in CIED infection - Can Extraction be Avoided?
	3:45 – 3:55 PM	Samir Saba, MD	Leadless Pacemakers - Ready for Prime Time?
	3:55 – 4:05 PM	Krishna Kancharla, MD	Physiologic Conduction System Pacing - Is There a Role?
	4:05 – 4:15 PM	George Shaw, MD	Subcutaneous ICD - Is This the Future?

PITTSBURGH HEART TEAM SUMMIT

2023 Agenda

Breakout 2 (AM)

Session	Time	Speaker
Regional Echo Sonographer Breakout Session	8:00 AM – 9:20 AM	Christopher Pray, MD, Elliy Phillips, PA-C

Session	Time	Speaker	Topic
Perfusion Breakout Session	9:45 AM- 11:05 AM	Muhammad Salman	Hypothermic ECMO – Case Study
		David Palmer, EdD, CCP	Pediatric Perfusion Simulation
		Robert Stroud MS, CCP	The Mission Trip Perfusion Experience
		Shelley Dulik-Brown, CCP	Perfusion Licensing
		Emily Collins, MHA, CCP	ABCP Update
		Leadership in Perfusion - Roundtable Discussion: Pivoting in times of uncertainty. Healthcare curveballs	

Breakout 2 (PM)

Session	Time	Speaker	Topic
Atrial Fibrillation & LAA Management *Moderators:* Jeffrey Liu, MD Samir Saba, MD	1:30 – 1:40 PM	Jeffrey Liu, MD	Building a Comprehensive Multidisciplinary AF Program
	1:40 – 1:50 PM	Bill Belden, MD	AF - Should Ablation be the First Line Therapy?
	1:50 – 2:00 PM	Madhurmeet Singh, DO	AF and HF - Best Co-Management Strategies
	2:00 – 2:10 PM	Edward Soltesz, MD	When to Consider Convergent/Hybrid Procedure
	2:10 – 2:20 PM	Sandeep Jain, MD	LAA Percutaneous Closure Update - Amulet vs. Watchman
	2:20– 2:30 PM	Francis Ferdinand, MD	Open and MIS Management of the LAA
	2:30 – 2:40 PM	Amit Thosani, MD	Are PVC's Benign?
	2:40 – 2:50 PM	George Shaw, MD	VT Ablation-General Strategy
Cardiac Imaging *Moderators:* Blase Carabello, MD Prem Soman, MD	3:15 – 3:25 PM	George Cater, MD	The Role of MRI in assessing Valve Disease
	3:25 – 3:35 PM	Abdullah Azhar, MD	Equivocal PYP Scans- What do They Mean?
	3:35 – 3:45 PM	Brian Henry, MD	Contemporary Use of Echocardiography for Assessment of Tricuspid Valve Disease
	3:45 – 3:55 PM	Tim Wong, MD	The Role of CMR in Athletes with Genetic Heart Disease
	3:55– 4:05 PM	Blase Carabello, MD	Critical ECHO findings in Aortic and Mitral Disease
	4:05 – 4:15 PM	Victor Farah, MD	Imaging to Assess Safety and Efficacy of Cardiac Myosin Inhibitors

PITTSBURGH HEART TEAM SUMMIT

2023 Agenda

Main Ballroom

Session	Time	Speaker	Topic
Resident Presentations *Moderators:* Michael Mack, MD	11:40 – 11:50 AM	Danial Ahmad, MD	Comparison of self-expanding and balloon-expandable valves for valve-in-valve transcatheter aortic valve replacement
	11:50 - 12:00 PM	Alaa Sayed, MD	The Importance and Challenges Associated with the Development of a Curated Cardiogenic Shock Database in a Multihospital System
	12:00 – 12:10 PM	Sarah Yousef, MD	Outcomes of Transcatheter Aortic Valve Replacement in Patients With Concomitant Aortic Regurgitation
	12:10 – 12:20 PM	Nooruddin Pracha, MD	Quantifying Slow Release of Nitric Oxide from Microspheres
	12:20 – 12:30 PM	Joseph Ibrahim, MD	Permanent Pacemaker Following Alcohol Septal Ablation – Prevalence of Utilization at 1 Year?
	12:30 – 12:40 PM	Carlos E. Diaz-Castrillon, MD	Volume-Failure to Rescue Relationship After Surgery for Acute Type A Aortic Dissections: An Analysis of The Society of Thoracic Surgeons Adult Cardiac Surgical Database
	12:40 – 1:00 PM	Sarah Yousef, MD	Valve-in-valve Transcatheter Aortic Valve Replacement versus isolated redo Surgical Aortic Valve Replacement

Poster Presentations
Thursday Evening Reception

Jenna Skowronski, MD	Sex-based Differences in Intensity of GDMT Prescription Patterns on Admission & Discharge
Sarah Yousef, MD	Outcomes of Concomitant Coronary Artery Bypass during Acute Type A Aortic Dissection Repair
Takuya Ogami, MD	The Impact of Reoperative Surgery on Aortic Root Replacement in the United States
Takuya Ogami, MD	Acute Kidney Injury after Thoracic Endovascular Aortic Repair for Acute Type B Aortic Dissection
Takuya Ogami, MD	Minimally invasive versus conventional aortic valve replacement: The network meta-analysis
Mahnoor Imran, MD	Long-Term Outcomes of Total Arch Replacement with Bilateral Antegrade Cerebral Perfusion Using the "Arch First" Approach
Mahnoor Imran, MD	Self-Expanding Transcatheter Aortic Valves Optimize Transvalvular Hemodynamics Independent of Intra- vs. Supra-Annular Design
Joseph Ibrahim, MD	IV Diltiazem Use in Patients with Atrial Fibrillation and Systolic Dysfunction
Michaela Barry MD, Usnish Majumdar MD	Group B Streptococcal Endocarditis: Complications from Post-Termination Endometritis in a Patient with Tetralogy of Fallot
Shumail Fatima, MD	Exploring the Relevance of Ivabradine in the Era of Guideline-Directed Medical Therapy for Heart Failure through a Systematic Review and Meta-Analysis
Shumail Fatima, MD	Revascularization shows beneficial cardiovascular outcomes in severe ischemic cardiomyopathy: A systematic review and meta-analysis
Shumail Fatima, MD	Clinical Outcomes in Sepsis associated incident Atrial fibrillation: A meta-analysis of >350,000 patients.
Shumail Fatima, MD	Cardiovascular Outcomes of monotherapy with clopidogrel versus aspirin: A systematic review and meta-analysis
Danial Ahmad, MD	The impact of using home health care after transcatheter aortic valve replacement
Shumail Fatima, MD	"Timely PCI shows beneficial long-term outcomes in late presentation with STEMI: A systematic review and meta-analysis between 2012 and 2022."
Shumail Fatima, MD	Incidence of sepsis associated atrial fibrillation: A Meta-analysis of >60,000 patients
Danial Ahmad, MD	Reinterventions After Repair of Acute Type A Aortic Dissection: Incidence, Outcomes and Risk Factors
Danial Ahmad, MD	The long-term impact of diastolic dysfunction after routine cardiac surgery
Carlos E. Diaz-Castrillon, MD	Readmission-Mortality after TAVR: The combined effect of teaching status and cause of readmission
Carlos E. Diaz-Castrillon, MD	Resource Utilization After Cardiac Surgery In Adults With Congenital Heart Diseases: A Nationwide Analysis

Accreditation and Designation Statement

In support of improving patient care, the University of Pittsburgh is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC), to provide continuing education for the healthcare team.

Physician (CME)
The University of Pittsburgh designates this live activity for a maximum of 7.0 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Nursing (CNE)
The maximum number of hours awarded for this Continuing Nursing Education activity is 7.0 contact hours.

Physician Assistant (AAPA)
The University of Pittsburgh has been authorized by the American Academy of PAs (AAPA) to award AAPA Category 1 CME credit for activities planned in accordance with AAPA CME Criteria. This activity is designated for 7.0 AAPA Category 1 CME credits. PAs should only claim credit commensurate with the extent of their participation.

Social Work
As a Jointly Accredited Organization, University of Pittsburgh is approved to offer social work continuing education by the Association of Social Work Boards (ASWB) Approved Continuing Education (ACE) program. Organizations, not individual courses, are approved under this program. State and provincial regulatory boards have the final authority to determine whether an individual course may be accepted for continuing education credit. University of Pittsburgh maintains responsibility for this course. Social workers completing this course receive 7.0 continuing education credits.

Other health care professionals will receive a certificate of attendance confirming the number of contact hours commensurate with the extent of participation in this activity.

Diversity and Inclusion Statement

The Pittsburgh Heart Team Summit embrace the principles of diversity and inclusion. The collaborative nature of our educational program encourages equality among the faculty, participating learners and our industry partners. Together, we celebrate the cohesive nature of our profession and an unbiased care for our patients.

Faculty Disclosures

All individuals in a position to control the content of this education activity have disclosed all financial relationships with any companies whose primary business is producing, marketing, selling, re-selling, or distributing healthcare products used by or on patients.

All of the relevant financial relationships for the individuals listed below have been mitigated.

David Kaczorowski, Consultant: Abiomed, Medtronic; CE Speakers' Bureau: Abiomed
Other: Intellectual Property: ECMOTEK, LLC

Christopher Pray, Consultant: Pfizer

Andy Kiser, Consultant: Atricure, Angiodynamics, Edwards, Abbott

Prem Soman, Grant/Research Support: Astellas., Pfizer;Consultant: Specturm Dynamics, Alnylam, Pfizer, Bridgebio

Michael Mack, CO-PI: Abbott Coapt Trial, Edwards Partner 3; Study Chair: Medtronic Apollo Trial

Saurbh Sanon, Consultant: Medtronic, Boston Scientific, Abbott, Gore, Baylis, Jena Valve

Sandeep Jain, Grant/Research Support: Medtronic, Boston Scientific; Consultant: Medtronic

Krishna Kancharla, Consultant: BSC, Variant Medical Systems

Ibrahim Sultan, Grant/Research Support: Edwards, Atricure, Medtronic, Abbott, Artvion,Boston Scientific

Stephen Chan, Research: Baer, Woodnext Foundation, United Therapuetic; Consultant: United Therapuetics; Stockholder & Founder: Synhale Therapuetics
Srinivas Murali, Consultant: Impulse Dynamics; Speaker: Boehringer Ingelheim

Matthew Lander, Consultant: Abiomed
CE Speakers' Bureau: Abbott

Samir Saba, Grant/Research Support: Abbott, Boston Scientific; Consultant: Boston Scientific, Medtronic
Anita Radhakrishnan, Grant: BSC; Consultant:Ryan Farley

Ramzi Khalil, Grant/Research Support: Abiomed IC Fellowship support; Consultant: Edwards Life Sciences-Medtronic: Proctor; CE Speakers' Bureau: AstraZeneca

Ryan Zuzek, Consultant: Edwards, Corozon, Zoll
CE Speakers' Bureau: Amgen, Novartis, Pfizer, Regeneron

Walter McGregor, CE Speakers' Bureau: Abbott

Mithun Chakravarthy, Stockholder: Edwards Lifescience

Alexis Steinberg, Grant/Research: University of Pittsburgh Clinical and Translational Institute

Michael Brown, Stockholder: Greater Pittsburgh Vascular

Wiley Nifong, Consultant and Proctor: Intuitive Surgical

Roger Carrillo, Consultant: Medtronic, St. Jude, Tyco, Phillips

Jeffrey Liu, Consultant: Abbott

Edwards Soltesz, Consultant: Abiomed, Atricure, Abbott

Amit Thosani, Grant/Research: Medtronic, Biosense

Tim Wong, Grant/Research: Site Principal Investigator for Bristol Myers Squibb; Cytokinetics; Tenaya Therapeutics, Consultant: Advisory Board Member (unpaid) for both Bristol Myers Squibb and Cytokinetics

Victor Farah, CE Speakers: Bristol Myers Scquibb

Michael Mack, Co-PI: Abbott Coapt Trial , Edwards Partner 3; Study Chair: Medtronic Apollo Trial

No other members of the planning committee, speakers, presenters, authors, content reviewers and/or anyone else in a position to control the content of this education activity have relevant financial relationships with any companies whose primary business is producing, marketing, selling, re-selling, or distributing healthcare products used by or on patients.

The information presented at this program represents the views and opinions of the individual presenters, and does not constitute the opinion or endorsement of, or promotion by, the UPMC Center for Continuing Education in the Health Sciences, UPMC / University of Pittsburgh Medical Center or Affiliates and University of Pittsburgh School of Medicine. Reasonable efforts have been taken intending for educational subject matter to be presented in a balanced, unbiased fashion and in compliance with regulatory requirements. However, each program attendee must always use his/her own personal and professional judgment when considering further application of this information, particularly as it may relate to patient diagnostic or treatment decisions including, without limitation, FDA-approved uses and any off-label uses.

Faculty	Institution
Rachel Ibrahim, MD	St. Clair Health - Pittsburgh, PA
Matthew Lander, MD	AHN - Pittsburgh, PA
Matthew Pesacreta, MD	St. Clair Health - Pittsburgh, PA
David Lasorda, DO	AHN - Pittsburgh, PA
Muhammad Salman, MD	St. Clair Health - Pittsburgh, PA
Ramzi Khalil, MD	AHN - Pittsburgh, PA
Karthikeyan Ranganathan, MD	AHN - Pittsburgh, PA
Tyler VanDyck, MD	AHN - Pittsburgh, PA
Derek Serna-Gallegos, MD	UPMC - Pittsburgh, PA
Dustin Kliner, MD	UPMC - Pittsburgh, PA
Ryan Zuzek, MD	St. Clair Health - Pittsburgh, PA
Thomas Caranasos, MD	UNC – Chapel Hill, NC
Condrad Smith, MD	UPMC - Pittsburgh, PA
Walter McGregor, MD	AHN - Pittsburgh, PA
Kyle Buchanan, MD	St. Clair Health - Pittsburgh, PA
Catalin Toma, MD	UPMC - Pittsburgh, PA
David Kaczorowski, MD	UPMC - Pittsburgh, PA
Tyler VanDyck, MD	AHN - Pittsburgh, PA
Mithun Chakravarthy, MD	AHN - Pittsburgh, PA
Candice Lee, MD	AHN - Pittsburgh, PA
Mark Joseph, MD	Carilion Clinic - Roanoke, VA
Stephen Chan, MD, PhD	UPMC - Pittsburgh, PA
Katherine Shreyder, MD	St. Clair Health - Pittsburgh, PA
Malamo Countouris, MD	UPMC - Pittsburgh, PA
Agnes Koczo, MD	UPMC - Pittsburgh, PA
Anita Radhakrishnan, MD	AHN - Pittsburgh, PA
Sarah Yousef, MD	UPMC - Pittsburgh, PA
Indu Poornima, MD	AHN - Pittsburgh, PA
Michael Bashline, MD	UPMC - Pittsburgh, PA
Johannes Bonatti, MD	UPMC - Pittsburgh, PA
Aashish Dua, MD	AHN - Pittsburgh, PA
Hazem El-Khatib, MD	AHN - Pittsburgh, PA
Mitsu Ogawa, MD	Excela Health - Greensburg, PA
David Garber, PA-C	St. Clair Health - Pittsburgh, PA
John T. Wilson, MD	AHN - Pittsburgh, PA
Mark Estes, MD	UPMC - Pittsburgh, PA
Alexis Steinberg, MD	UPMC - Pittsburgh, PA
Max Hammer, MD	St. Clair Health - Pittsburgh, PA
Calin Gorun-Gorunescu, MD	St. Clair Health - Pittsburgh, PA
Adnan Khalif, MD	AHN - Pittsburgh, PA
Alicia Topoll, MD	UPMC - Pittsburgh, PA
James Brown, MD	UPMC - Pittsburgh, PA
Jason Biggs, MD	St. Clair Health - Pittsburgh, PA

Faculty	Institution
Scott Halbreiner, MD	AHN - Pittsburgh, PA
Matthew Suffoletto, MD	UPMC - Pittsburgh, PA
Thomas Simone, MD	St. Clair Health - Pittsburgh, PA
Michael Brown, MD	Jefferson Cardiology - Jefferson Hills, PA
Michael Gaglia, MD	St. Clair Health - Pittsburgh, PA
Wissam Gharib, MD	Mon Health Medical Center - Morgantown, WV
Satish Muluk, MD	AHN - Pittsburgh, PA
Wiley Nifong, MD	East Carolina University - Greenville, NC
Roger Carrillo, MD	University of Miami Hospital - Miami, FL
Katie Sheridan, DO	UPMC - Pittsburgh, PA
Samir Saba, MD	UPMC - Pittsburgh, PA
Krishna Kancharla, MD	UPMC - Pittsburgh, PA
George Shaw, MD	AHN - Pittsburgh, PA
Christopher Pray. MD	St. Clair Health - Pittsburgh, PA
Elliy Phillips, PA-C	Billings Clinic Hospital - Billings, MT
David Palmer, EdD, CCP	UPMC - Pittsburgh, PA
Robert Stroud MS, CCP	Maimonides Medical Center – Brooklyn, NY
Shelley Dulik-Brown, CCP	AHN - Pittsburgh, PA
Emily Collins, MHA, CCP	St. Clair Health - Pittsburgh, PA
Jeffrey Liu, MD	St. Clair Health - Pittsburgh, PA
Bill Belden, MD	AHN - Pittsburgh, PA
Madhurmeet Singh, DO	UPMC - Pittsburgh, PA
Edwards Soltesz, MD	UPMC - Pittsburgh, PA
Sandeep Jain, MD	UPMC - Pittsburgh, PA
Francis Ferdinand, MD	UPMC - Pittsburgh, PA
Amit Thosani, MD	AHN - Pittsburgh, PA
George Shaw, MD	AHN - Pittsburgh, PA
George Cater, MD	UPMC - Pittsburgh, PA
Prem Soman, MD, PhD	UPMC - Pittsburgh, PA
Brian Henry, MD	Banner Health - Loveland, CO
Tim Wong, MD	UPMC - Pittsburgh, PA
Blase Carabello, MD	ECHI - Greenville, NC
Victor Farah, MD	AHN - Pittsburgh, PA
Andy Kiser, MD	St. Clair Health - Pittsburgh, PA
Ibrahim Sultan, MD	UPMC - Pittsburgh, PA
Steven Bailey, MD	AHN - Pittsburgh, PA
Abdullah Azhar, MD	UPMC - Pittsburgh, PA
Alaa Sayed, MD	UPMC - Pittsburgh, PA

ABSTRACTS

Jenna Skowronski

Abstract 1: Sex-based Differences in Intensity of GDMT Prescription Patterns on Admission & Discharge

Purpose: We hypothesize that retrospective review of a hospital systems EMR for patients with HfrEF will establish that sex-based differences exist in the intensity of GDMT regimen by number of classes prescribed at time of hospital admission and discharge.
Methods: Retrospective observational data from across a single health system was extracted. Patients included were >18 years old, admitted for decompensated HFrEF, with LVEF ≤40%, alive at discharge without receiving heart replacement therapy from 2010-2022. Primary outcome is total number of GDMT regimen on admission, at discharge, and in follow up.
Results: 9849 patients were included, with 5452 male and 4397 female. There was a drop in GDMT intensity on admission across all drug classes with further decrease in number of prescribed BB and ACEi/ARB/ARNi on discharge. GDMT regimens on admission for males vs females were BB 69% vs 65%, ACEi/ARB/ARNi 53% vs 52%, and MRA 15% vs 14%. On discharge, for males vs females were BB 56% vs 59%, ACEi/ARB/ARNi 33% vs 38%, MRA 15% vs 16%, and SGLT2i 0.4% vs 2.8%. While females were prescribed more BB, ACEi/ARB/ARNi, and MRA on discharge, males were prescribed more of all drug classes by one year follow up.
Conclusions: Intensity of GDMT regimen by number of drug classes prescribed decreased on both admission and discharge in this single center retrospective observational study. Sex differences in intensity of GDMT regimen are present at discharge favoring females but this trend is reversed by twelve month follow up.

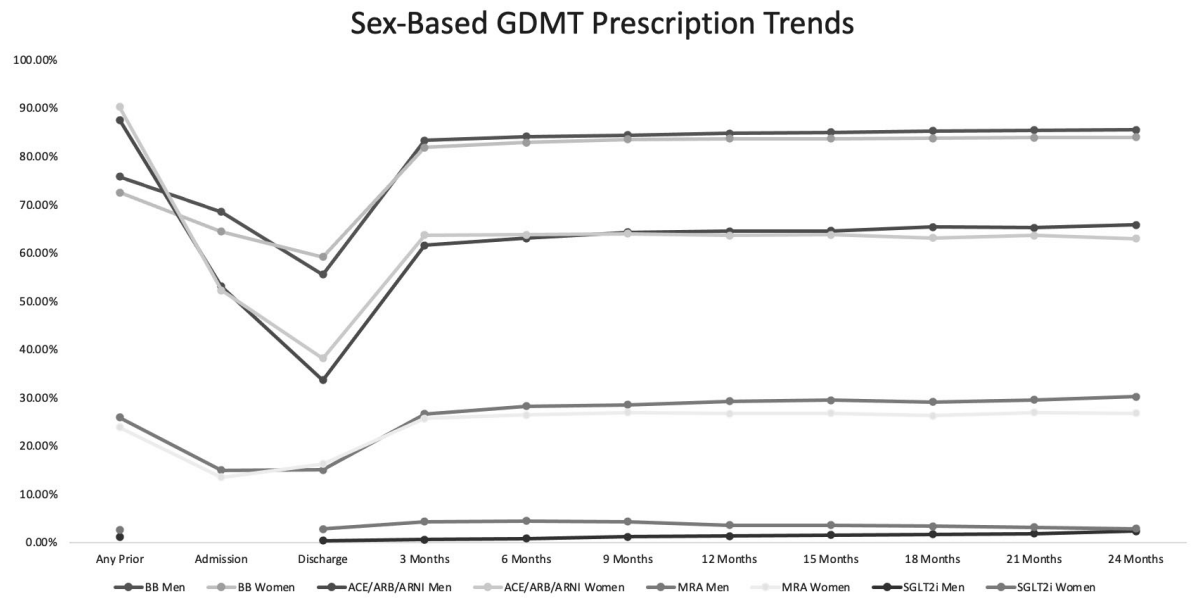
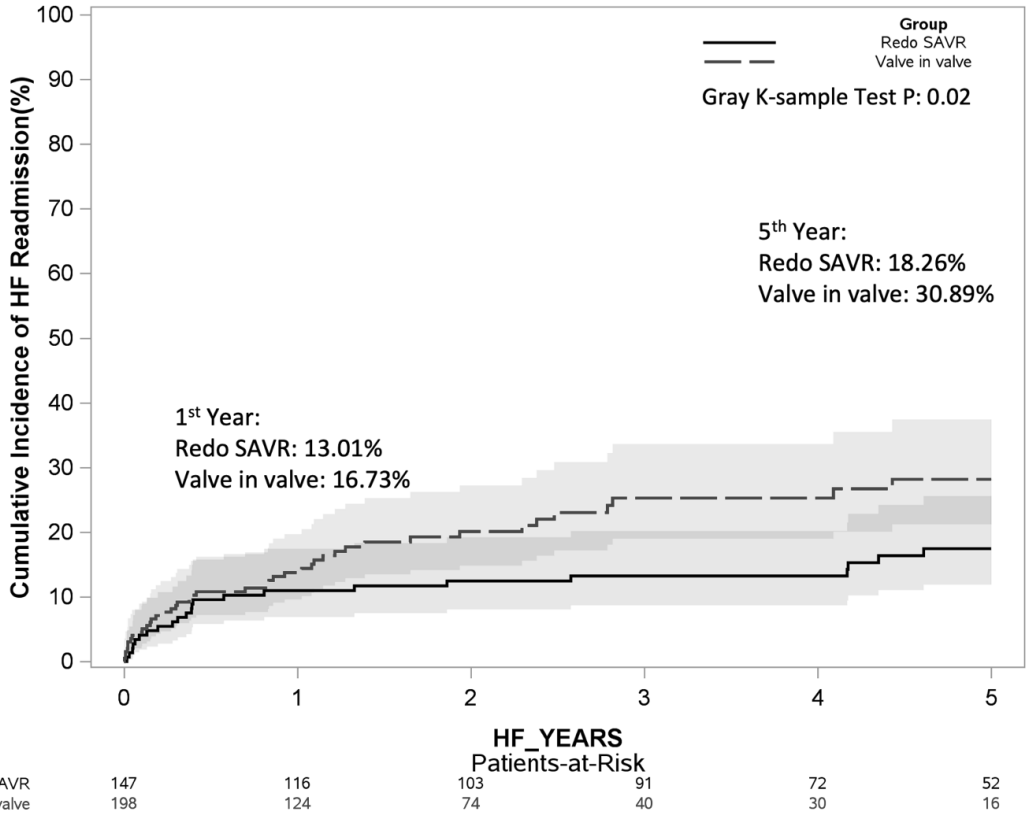


Figure 1: Sex-based GDMT prescription trends from pre-admission, admission, discharge, and post discharge follow up by percentage of each drug class(BB, ACEi/ARB/aRNi, MRA, & SGLT2i) prescribed.

Sarah Yousef

Abstract 2: Valve-in-valve Transcatheter Aortic Valve Replacement versus isolated redo Surgical Aortic Valve Replacement

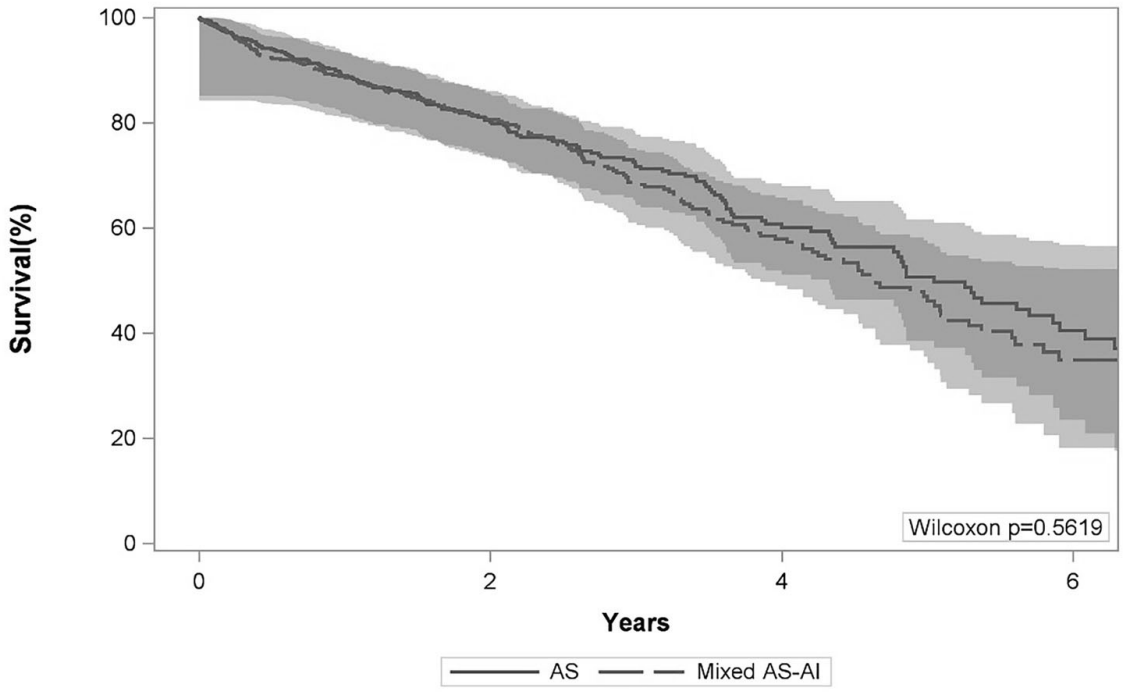
Purpose: To compare outcomes of patients undergoing valve-in-valve transcatheter aortic valve replacement (ViV TAVR) versus redo surgical aortic valve replacement (SAVR).
Methods: This was a retrospective study using institutional databases of transcatheter (2013- 59 2022) and surgical (2011-2022) aortic valve replacements. Patients who underwent ViV TAVR were compared to patients who underwent redo isolated SAVR. Clinical and echocardiographic outcomes were analyzed. Kaplan-Meier survival estimation and Cox regression were performed. Cumulative incidence functions were generated for heart failure readmissions.
Results: A total of 4,200 TAVRs and 2,306 isolated SAVRs were performed. Of these, there were 198 patients who underwent ViV TAVR and 147 patients who underwent redo SAVR. Operative mortality was 2% in each group, but observed to expected (O:E) operative mortality in the redo SAVR group was higher than in the ViV TAVR group (1.2 vs 0.32). Those who underwent redo SAVR were more likely to require transfusions and reoperation for bleeding, to have new-onset renal failure requiring dialysis, and to require a permanent pacemaker postoperatively than those in the ViV group. Mean gradient was significantly lower in the redo SAVR group than in the ViV group at 30 days and 1 year. Kaplan-Meier survival estimates at 1 year were comparable, and on multivariable Cox regression, ViV TAVR was not significantly associated with an increased hazard of death as compared to redo SAVR (HR 1.39, 95% CI 0.65-2.99, p=0.40). Competing-risk cumulative incidence estimates for heart-failure readmissions were higher in the ViV cohort.
Conclusions: ViV TAVR and redo SAVR were associated with comparable mortality. Patients who underwent redo SAVR had lower postoperative mean gradients and greater freedom from heart failure readmissions, but they also had more postoperative complications than the VIV group, despite their lower baseline risk profiles.



Sarah Yousef

Abstract 3: Outcomes of Transcatheter Aortic Valve Replacement in Patients With Concomitant Aortic Regurgitation

Purpose: This study sought to evaluate outcomes of transcatheter aortic valve replacement (TAVR) in patients with moderate or greater aortic regurgitation (AR).
Methods: This was an observational study using an institutional database of TAVRs from November 2012 to April 2022. The study compared outcomes of TAVR in patients with isolated aortic stenosis (AS) vs patients with AS and concomitant AR (moderate or greater). Those patients with trace or mild AR were excluded. Clinical and echocardiographic outcomes were compared, with end points established by the Valve Academic Research Consortium 3. Kaplan-Meier survival estimation and Cox regression for mortality were performed. Competing-risk cumulative incidence estimates for heart failure readmissions were also compared.
Results: Of 3295 patients, 605 (53.4%) had severe AS with no AR and 529 (46.6%) had severe AS with moderate or severe AR. There were no significant differences in in-hospital mortality, length of stay, stroke, myocardial infarction, permanent pacemaker requirement, transfusion requirement, minor or major vascular complications, or 30-day readmissions between the 2 groups ($P > .05$). There were also no significant differences in annular dissection or rupture, coronary obstruction, or device embolization. Mean gradient and paravalvular leak rates at 30 days and 1 year were similar between the groups. Survival estimates were comparable, and, on multivariable Cox regression, mixed aortic valvular disease was not associated with an increased hazard of death as compared with isolated AS (hazard ratio, 1.01; 95% CI, 0.81-1.25; $P = .962$). Cumulative incidence estimates for heart failure readmissions were comparable between groups.
Conclusions: TAVR can be safely performed in patients with mixed valvular disease, with outcomes comparable to those in isolated AS.



AS	595	257	92	26
Mixed AS-AI	523	251	99	23

Sarah Yousef

Abstract 4: Outcomes of Concomitant Coronary Artery Bypass during Acute Type A Aortic Dissection Repair

Purpose: This study sought to evaluate outcomes of coronary artery bypass grafting (CABG) during acute type A aortic dissection (ATAAD) repair.
Methods: All patients undergoing ATAAD repair at our institution from 2007 to 2021 were included. Patients who underwent concomitant CABG were compared to those who did not. Outcomes were compared further according to the indication for CABG: native coronary artery disease (CAD) versus acute indication (coronary dissection or post-bypass heart failure). Kaplan-Meier survival estimates were generated, and Cox regression was performed for mortality.
Results: 598 patients underwent ATAAD repair, 79 of whom underwent concomitant CABG and 519 of whom did not. Of those who underwent CABG, 26.6% had more than 1 vessel grafted. Right coronary circulation was grafted in 55.7% of cases, left in 21.5% of cases, and both in 22.8%. The indication for CABG was native CAD in 43.0% of patients, acute in 53.2%, and both in 3.8%. Operative mortality in patients who underwent CABG was significantly higher (17.7% vs 7.5%, p=0.003, Table 1). Operative mortality in patients who underwent CABG for acute pathology was higher than in those who underwent CABG for native CAD (23.8% vs 11.8%), though this did not reach statistical significance. Kaplan-Meier estimates demonstrated significantly lower survival in patients who underwent CABG (p<0.001, log-rank); however, on multivariable Cox regression, CABG was not associated with long-term mortality (HR 1.12; 95% CI 0.74-1.68, p=0.597).
Conclusions: CABG was performed in 13% of ATAAD repairs and was associated with high in-hospital mortality, particularly when performed for acute indications.

Postoperative Outcomes in Patients who underwent ATAAD repair with or without concomitant CABG

Variable	With CABG (n=79)	Without CABG (n=519)	p value
Operative mortality (STS definition)	14 (17.72)	39 (7.51)	0.003
Length of stay (days)	16.5 ± 16.1	11.7 ± 12.2	0.002
Stroke	6 (7.59)	20 (3.85)	0.129
New-onset renal failure requiring dialysis	13 (16.46)	55 (10.60)	0.127
Median mechanical ventilation time (hours)	15.62 [8.33-58.4]	10.97 [5.68-28.58]	0.013
Re-exploration for bleeding	8 (10.13)	45 (8.67)	0.671
Blood product transfusions	41 (51.90)	204 (39.31)	0.034

Takuya Ogami

Abstract 5: The Impact of Reoperative Surgery on Aortic Root Replacement in the United States

Purpose: Reoperative sternotomy (RS) is associated with poor outcomes after cardiac surgery. We aimed to investigate the impact of RS on the outcomes after aortic root replacement (ARR).
Methods: All patients who underwent ARR from January 2011 through June 2020 were identified using the Society of Thoracic Surgery Adult Cardiac Surgery Database. We compared outcomes between patients who underwent first-time ARR (FT ARR group) to those with a history of sternotomy undergoing RS ARR (RS ARR group) using propensity-score matching. Subgroup analysis was performed among the RS ARR group.
Results: A total of 56,447 patients underwent ARR. Among them, 14,935 (26.5%) underwent RS ARR. The annual incidence of RS ARR increased from 542 in 2011 to 2,300 in 2019. Aneurysm and dissection were more frequently observed in the FT ARR group while infective endocarditis was more common in the RS ARR group. Propensity-score matching yielded 9,568 pairs in each group. Cardiopulmonary bypass time was longer in the RS ARR group (215 min vs. 179 min, SMD = .43). Operative mortality was higher in the RS ARR group (10.8% vs. 6.2%, SMD = .17). In the subgroup analysis, logistic regression demonstrated that individual patient repetition of (second or more resternotomy) surgery and annual institutional volume of ARR were independently associated with operative mortality.
Conclusions: The incidence of RS ARR might have increased over time. Reoperative sternotomy is a significant risk factor for morbidity and mortality in ARR. Referral to high-volume aortic centers should be considered in patients undergoing RS ARR.

Abstract 6: Acute Kidney Injury after Thoracic Endovascular Aortic Repair for Acute Type B Aortic Dissection

Purpose: Thoracic endovascular aortic repair (TEVAR) has evolved as the standard for treating complicated acute type B aortic dissection (ATBAD). Acute kidney injury (AKI) is a common complication in critically ill patients and is commonly observed in patients with ATBAD. The purpose of the study was to characterize AKI after TEVAR.
Methods: All patients who underwent TEVAR for ATBAD from 2011 through 2021 were identified using the International Registry of Acute Aortic Dissection. The primary endpoint was AKI. A generalized linear model analysis was performed to identify a factor associated with postoperative AKI.
Results: A total of 630 patients presented with ATBAD and underwent TEVAR. The indication of TEVAR was complicated ATBAD in 64.3%, high-risk uncomplicated ATBAD in 27.6%, and uncomplicated ATBAD in 8.1%. Of 630 patients, 102 patients (16.2%) developed postoperative AKI (AKI group) and 528 patients (83.8%) did not (non-AKI group). The most common indication for TEVAR was malperfusion (37.5%). In-hospital mortality was significantly higher in the AKI group (18.6% vs. 4%, $P < .001$). Postoperatively, cerebrovascular accident, spinal cord ischemia, limb ischemia, and prolonged ventilation were more commonly observed in the AKI group. Expected mortality was similar at 2 years between the two groups ($P = .51$). Overall, the preoperative AKI was observed in 95 (15.7% in the entire cohort) consisting of 60 (64.5% in the AKI group) and 35 (6.8% in the non-AKI group). A history of CKD (OR 4.6, 95%CI 1.5-14.1, $P = .01$) and preoperative AKI (OR 24.1, 95%CI 10.6-55.0, $P < .001$) were independently associated with postoperative AKI.
Conclusions: The incidence of postoperative AKI was 16.2% in patients undergoing TEVAR for ATBAD. Patients with postoperative AKI had a higher rate of in-hospital morbidities and mortality than those without. A history of CKD and preoperative AKI were independently associated with postoperative AKI.

Takuya Ogami

Abstract 7: Minimally invasive versus conventional aortic valve replacement: The network meta-analysis

Purpose: Outcome comparisons after surgical aortic valve replacement (SAVR) with minimally invasive approaches including mini-sternotomy (MS) and right mini-thoracotomy (RMT) and full sternotomy (FS) have been conflicting. Furthermore, the synthesis of mid-term mortality has not been performed.
Methods: MEDLINE and EMBASE were searched through April 2022 to identify propensity score matched (PSM) studies or randomized controlled trial (RCT) which compared outcomes following SAVR among three incisional approaches: FS, MS, or RMT. The network analysis was performed to compare these approaches with random effects model. Mid-term mortality was defined as 1-year mortality.
Results: A total of 42 studies met the inclusion criteria enrolling 14,925 patients. RCT and PSM were performed in 13 and 29 studies, respectively. The operative mortality was significantly lower with MS compared to FS (risk ratio [RR]: 0.60, 95% confidence interval [CI]: 0.41-0.90, p = .01, I2 = 25.8%) or RMT (RR: 0.51, 95% CI: 0.27-0.97, p = .03, I2 = 25.8%). RMT had significantly higher risk of reoperation for bleeding compared to MS (RR: 1.65, 95% CI: 1.18-2.30, p = .003, I2 = 0%). Hospital length of stay was significantly shorter with MS compared to FS (mean difference: -0.89 days, 95% CI: -1.58 to -0.2, p = .01, I2 = 95.5%) while it was equivocal between FS and RMT. The mid-term mortality was similar among the three approaches.
Conclusions: While mid-term mortality was comparable among approaches, MS may be a safe and potentially more effective approach than FS and RMT for SAVR in the short term.

Abstract 8: Long-Term Outcomes of Total Arch Replacement with Bilateral Antegrade Cerebral Perfusion Using the "Arch First" Approach

Purpose: To report outcomes of total arch replacement (TAR) with hypothermic circulatory arrest and bilateral antegrade cerebral perfusion (bACP) using an "arch first" approach. To compare outcomes of TAR under this cerebral protection strategy across acute aortic dissection (AAD) and aneurysmal disease.
Methods: This was an observational study using institutional data of all open proximal aortic surgeries from 2010 to 2021. All patients who underwent TAR with bACP were included and dichotomized by underlying aortic disease: aneurysm vs. dissection. TAR using an "arch first" approach involved debranching of the brachiocephalic vessels and non-anatomic reconstruction with a custom trifurcate graft, while providing interrupted ACP. Revascularization of the arch branch vessels was performed prior to lower body circulatory arrest, while the patient was cooling. Kaplan-Meier survival estimation and multivariable Cox proportional hazards analysis were performed to identify variables associated with survival after TAR with bACP.
Results: A total of 315 patients undergoing TAR with bACP were identified, of which 100 (31.7%) had aneurysmal disease and 215 (68.3%) had an acute aortic dissection. Patients with AAD were younger (59 [49-67] vs 65 [54-71] years). There were more root replacements in the AAD group, compared to the aneurysm group (34% vs 17%). The remaining operative characteristics were similar across each group. There were no differences in short-term postoperative outcomes across each group. 49 patients (15.6%) had operative mortality (STS definition), 26 (8.3%) had a new stroke, 112 (35.6%) had prolonged mechanical ventilation (>24 hours), 46 (14.6%) had acute renal failure (by RIFLE criteria), and 185 (58.7%) had blood product transfusions. One-year survival was 76.1% for the entire cohort, while 5-year survival was 65.2%. There was no difference in long term survival across each group ($p=0.438$, log-rank test). On multivariable Cox analysis, dissection was not associated with an increased hazard of death, compared to aneurysm (HR 1.16, 95% CI:0.58, 2.32, $p=0.670$).
Conclusions: Short-term postoperative outcomes and long-term survival after TAR with bACP are acceptable and equally advantageous for patients with AAD and thoracic aortic aneurysms.

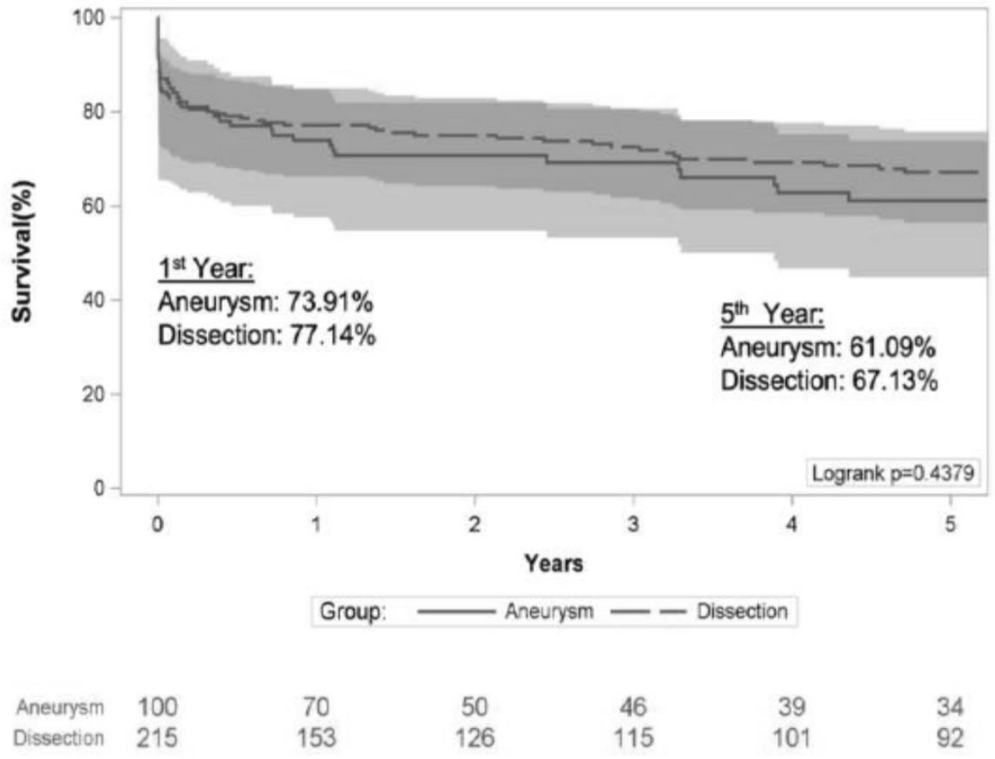


Figure 1 Kaplan Meier survival comparison of patients with aortic aneurysms and aortic dissections

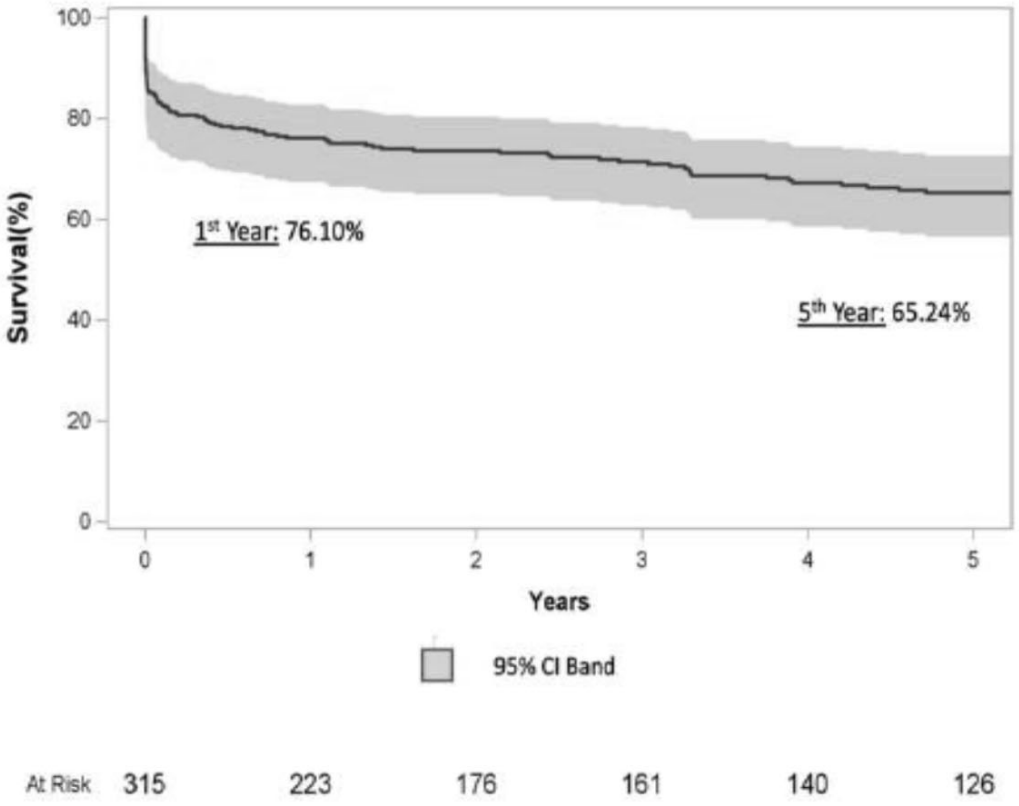


Figure 2 Kaplan Meier survival estimate for all patients who underwent TAR with bACP

Abstract 9: Self-Expanding Transcatheter Aortic Valves Optimize Transvalvular Hemodynamics Independent of Intra- vs. Supra-Annular Design

Purpose: To characterize transvalvular hemodynamics during the first 30 days after transcatheter aortic valve implantation (TAVI) across various transcatheter heart valves (THV), while adjusting for annular dimensions.
Methods: This was an observational study of TAVIs from 09/2021 to 10/2022. The primary outcome was mean transalvular pressure gradient (TVPG), measured via transthoracic echocardiography at day 0, day 1, and day 30 post-TAVI, and were compared across three THV, including the self-expandable intra-annular Portico valve, the balloon-expandable Sapien 3 Ultra, and the self-expandable supra-annular Evolut Pro+.
Results: A total of 560 patients undergoing TAVI were identified, of which 106 (18.9%) received a Portico THV, 176 (31.4%) received a SAPIEN THV, and 278 (49.6%) received an Evolut THV. For Portico THV, the TVPG on day 0 increased from 6.0 [4.7-9.0] to 7.0 [6.0-10.0] by day 30 ($p=0.009$). For SAPIEN THV, the TVPG on day 0 increased from 6.5 [5.0-8.0] to 12.0 [9.0-15.0] by day 30 ($p<0.001$). For Evolut THV, the TVPG on day 0 increased from 6.0 [5.0-9.0] to 7.2 [5.0-10.0] by day 30 ($p=0.001$). Adjusting for time and annular diameter in a multivariable mixed effects model, the SAPIEN group had a significantly greater increase in TVPG over time compared to the Evolut reference group ($p<0.001$), while there was no difference in the change of TVPG over time for the Portico group versus the Evolut group ($p=0.874$).
Conclusions: Compared to balloon-expandable valves, self-expanding THV may optimize transvalvular hemodynamics across all annular diameters, independent of their supra-annular and intra-annular design.

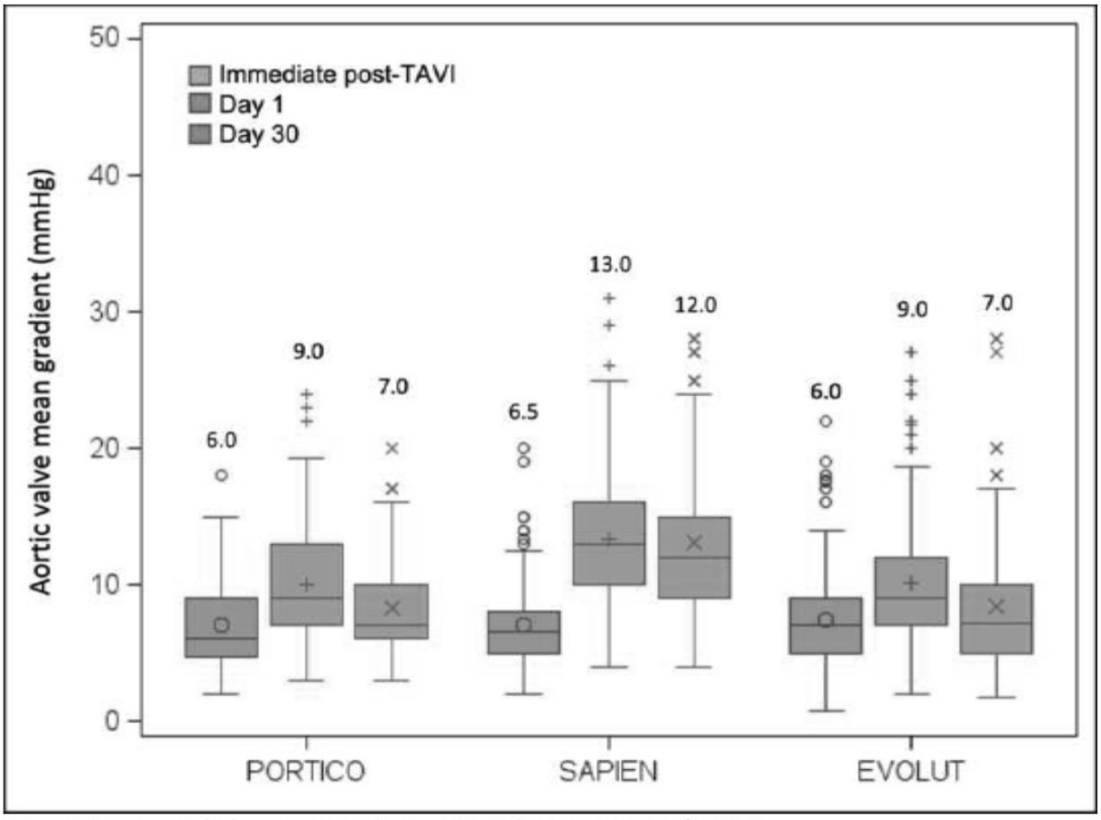


Figure 1 Mean transvalvular pressure gradients at day 0, day 1, and day 30 after TAVI

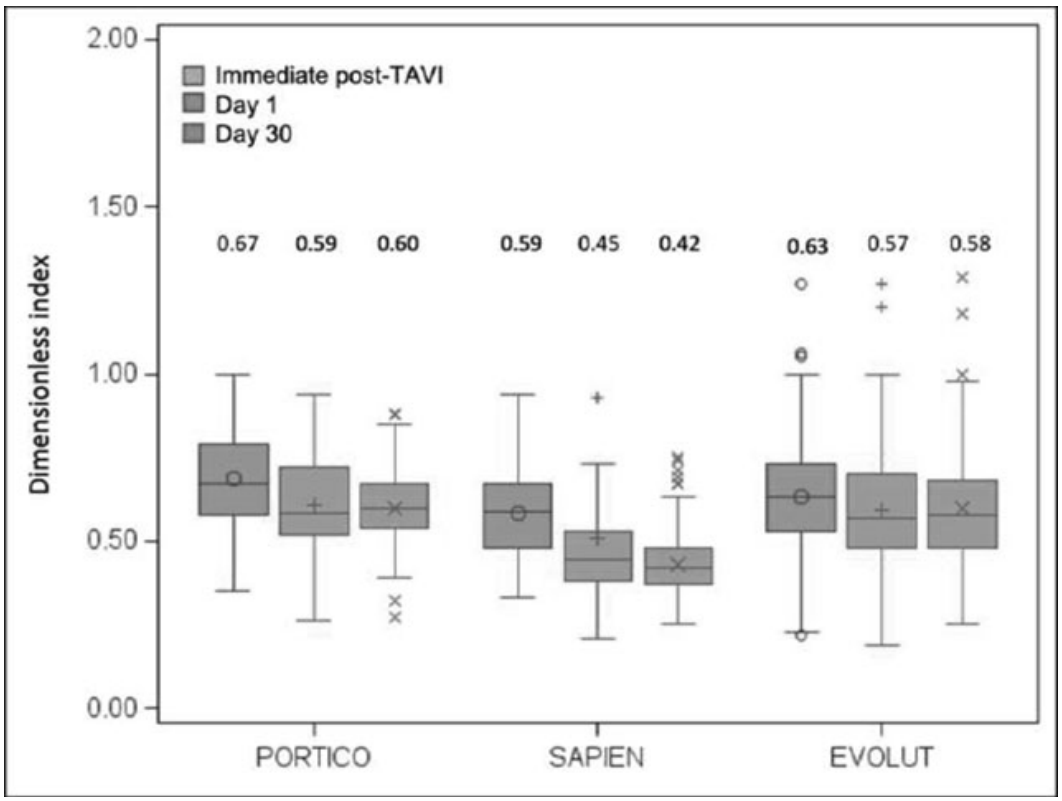


Figure 2 Dimensionless index at day 0, day 1, and day 30 after TAVI

Joseph Ibrahim

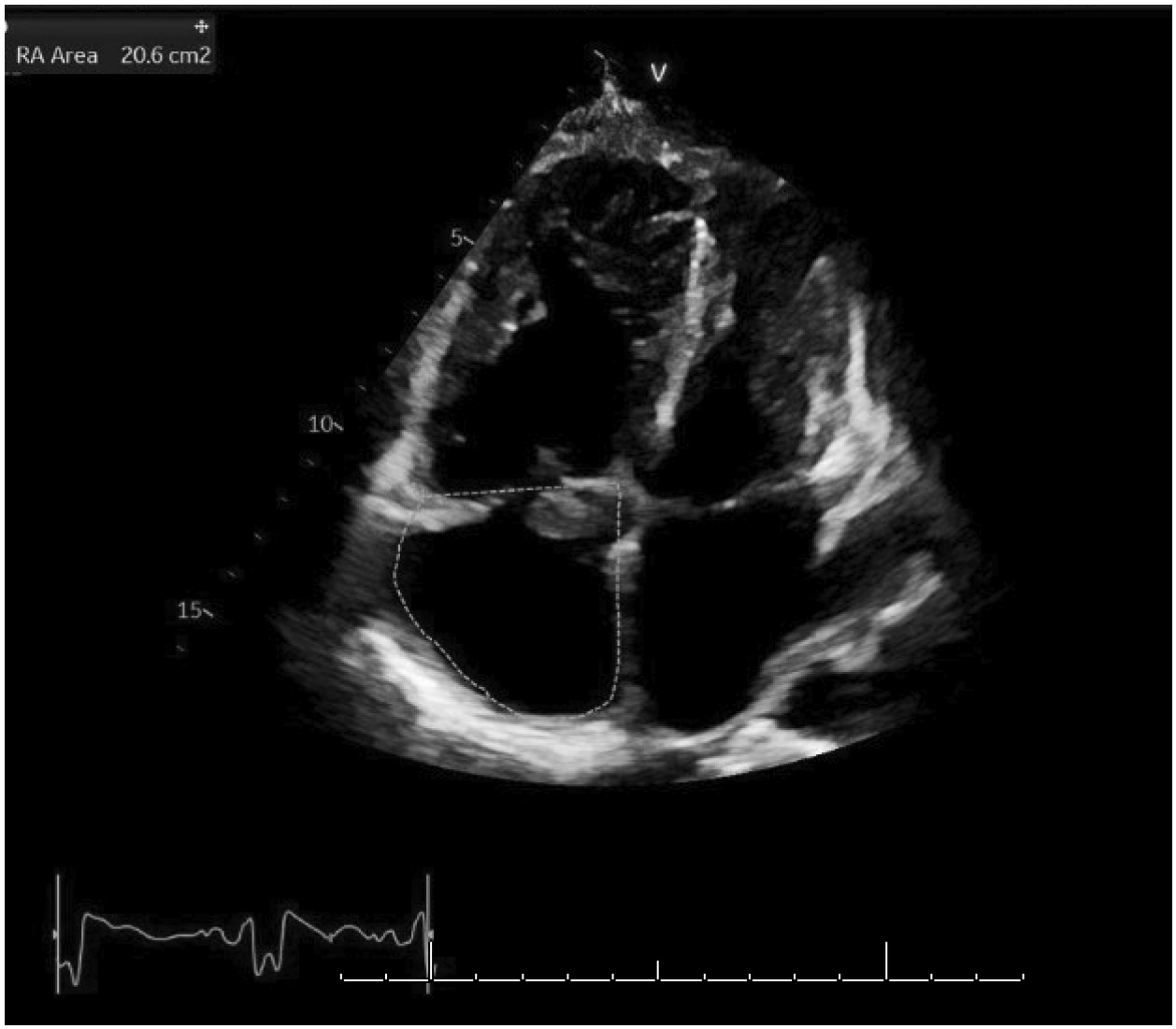
Abstract 10: IV Diltiazem Use in Patients with Atrial Fibrillation and Systolic Dysfunction

Purpose: In patient with heart failure (HF) and systolic dysfunction, IV diltiazem use is advised against due to its negative inotropic and chronotropic effects. [3] We aim to compare the effects of diltiazem use in patients with ejection fractions (EF) < 40% and EF > 40%.
Methods: In this retrospective single-center study, we included patients who presented to the University of Pittsburgh Medical Center with atrial fibrillation with rapid ventricular rate and received IV diltiazem during the admission between 2014-2023. Baseline demographics, medication administration, MCS use, length of stay and all-cause mortality were collected from the electronic medical record. Patients were divided into two cohorts: patients with EF < 40% and patients with EF > 40%.
Results: Out of a total of 19,404 patients, there were 846 patients with EF < 40% and 18,558 patients with EF > 40%. There was a higher rate of dobutamine use following IV diltiazem administration in the EF < 40% cohort when compared with the EF > 40% cohort (0.31% vs. 4.13%). Milrinone had a similar increased use in the EF < 40% cohort (0.47% vs. 7.92%). IV pressor use was also noted to be higher in the EF < 40% cohort with Norepinephrine (7.6% vs. 16.1%), Epinephrine (1.46% vs. 7.44%) and dopamine (0.63% vs. 4.13%). In addition, the rates of MCS were 10.67% in patients with EF > 40% as compared to 15.95% in those with EF < 40%. Lastly, the EF < 40% group had a longer length of stay (11.5 days vs. 8.6 days) and increased all-cause mortality (50.5% vs. 46%).
Conclusions: Patients with EF < 40% demonstrated an increased requirement for IV pressor, IV inotropic support and MCS post IV diltiazem administration as well as longer LOS and increased all-cause mortality. This likely reflects an increased risk of developing cardiogenic shock and end organ dysfunction.

Michaela Barry MD, and Usnish Majumdar MD

Abstract 11: Group B Streptococcal Endocarditis: Complications from Post-Termination Endometritis in a Patient with Tetralogy of Fallot

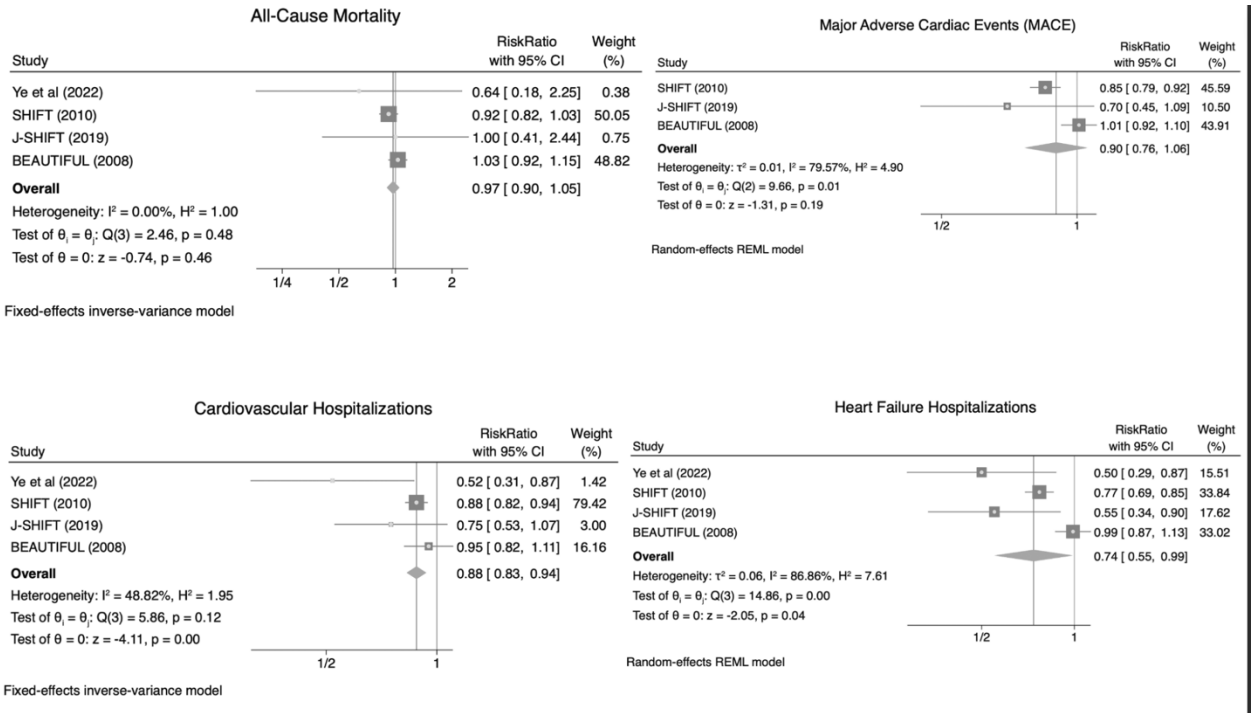
Purpose: 1) To describe how anatomic differences in patients with surgically-corrected congenital hearts can contribute to risk for right-sided infective endocarditis (IE), and pulmonary and systemic septic embolic phenomena 2) To consider the importance of Group B Streptococci (GBS) species as the etiologic agent of endocarditis in obstetric patients
Methods: A woman in her 30s with history of Tetralogy of Fallot (TOF) status post remote complete repair via transannular patching with known pulmonic regurgitation and patent foramen ovale (PFO) was found to have Streptococcus agalactiae tricuspid valve endocarditis after a recent vaginal misoprostol termination of pregnancy. Her course was complicated by septic pulmonary and splenic emboli, and multiorgan failure with development of shock and acute hypoxic respiratory failure requiring mechanical ventilation. Her multisystem organ failure improved with appropriate antibiotic management and achievement of source control following extensive dilatation and curettage (D&C) to evacuate retained products of conception (RPOC), ultimately achieving clinical stability for discharge home. She completed her definitive penicillin G therapy outpatient, with plan to pursue tricuspid and pulmonic valve replacement with the patient's congenital heart surgeon soon thereafter.
Results: While all patients with congenital heart disease (CHD) are at increased risk of IE, TOF patients are among the highest risk group due to structural malformations causing altered flow dynamics regardless of correction. A Danish observational study of all 1,164 TOF patients born over a 41-year period found that lifetime risk of IE for TOF patients nears 3% (0.1% risk among the general population), and that this risk triples to nearly 9% among TOF patients who have received pulmonic valve replacement (PVR). Potential predisposing factors for IE among TOF patients include underlying structural malformations, surgical proceduralization, removal or abscence of the childhood thymus, and the frequent use of prosthetic valves and patches. Furthermore, it is presumed that right-sided IE is common in patients with TOF in light of elevated right-sided filling pressures, contributing to decreased forward flow dynamics past the tricuspid and pulmonic valves, which may increase likelihood of bacterial attachment to valvular endothelium. Impaired right heart function may also contribute to splenic congestion, which may in turn impair splenic function. Impaired splenic function then increases susceptibility to infection, especially from encapsulated organisms including our patietn's GBS and Pseudomonas aeruginosa.
Conclusions: -TOF s/p repair likely contributed to impaired flow dynamics that may have increased risk for right-sided IE.
-Septic pulmonary emboli are expected with large right-sided vegetations, though splenic emboli were presumed paradoxical given known PFO.
-While splenic congestion and infarction may have contributed encapsulated infection risk, RPOC were the original source.


RA Area 20.6 cm2
V
5
10
15

Shumail Fatima

Abstract 12: Exploring the Relevance of Ivabradine in the Era of Guideline-Directed Medical Therapy for Heart Failure through a Systematic Review and Meta-Analysis

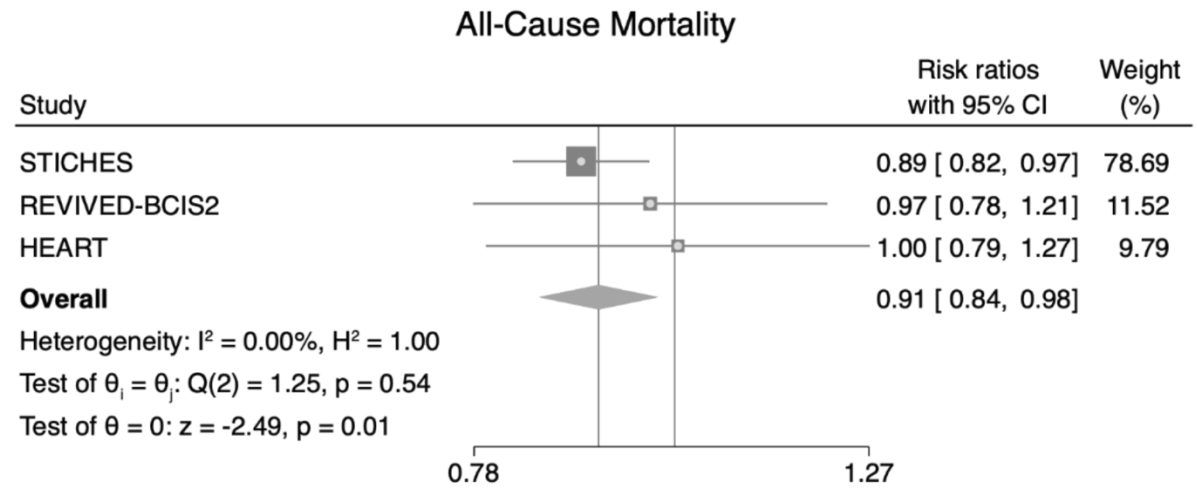
Purpose: The advent of guideline-directed medical therapy (GDMT) has heralded a paradigm shift in the management of heart failure with reduced ejection fraction (HFrEF), establishing it as the universally accepted first-line approach. Despite this, adjunctive therapies such as ivabradine, a selective sinus node inhibitor, continue to be prescribed. This abstract explores a comprehensive systematic review and meta-analysis that assesses the comparative cardiovascular outcomes of ivabradine and GDMT in efforts to answer the research question: can ivabradine offer superior cardiovascular outcomes in patients with HFrEF when compared to GDMT?
Methods: PubMed, Embase, Cochrane, CT.gov, ICTRP were searched from their inception until May 2023 using the search terms "Ivabradine" or "If channel blocker" or "GDMT" and "(HFrEF)". Included studies compared all-cause mortality and hospitalizations, cardiovascular mortality and hospitalizations, HFrEF related deaths and hospitalizations and major adverse cardiac events (MACE). Data were synthesized using risk ratios (RR) and analyzed with fixed-effects or random-effects model based on level of heterogeneity.
Results: 4 studies (n= 18089, Ivabradine = 9026 and OMT = 9001) met our inclusion criteria. The follow-up period ranged from 6-22.9 months. While no differences were observed in risks of all-cause mortality, cardiovascular mortality and MACE between ivabradine and OMT groups, Ivabradine was noted to reduce all-cause hospitalizations (RR 0.91, 95% CI 0.86-0.96, p= 0.00, I2 0%, N= 2 studies) cardiovascular disease associated hospitalizations (RR 0.88, 95% CI 0.83-0.94, p=0.00, I2 48.82%, N= 4 studies) HF hospitalizations (RR 0.73, 95% CI 0.54-0.99, p= 0.04, I2 87.75%, N= 4 studies) and HF related death (RR 0.74, 95% CI 0.58-0.94, p= 0.01, I2 48.38%, N= 2 studies).
Conclusions: The addition of ivabradine to GDMT shows promise in reducing all-cause hospitalizations, cardiovascular disease-associated hospitalizations, HF hospitalizations, and HF-related deaths in patients with HFrEF. Further research is needed to validate these findings and identify the patient population that can derive the maximum benefits from this adjunctive therapy.


All-Cause Mortality
Study
RiskRatio with 95% CI
Weight (%)
Ye et al (2022) 0.64 [0.18, 2.25] 0.38
SHIFT (2010) 0.92 [0.82, 1.03] 50.05
J-SHIFT (2019) 1.00 [0.41, 2.44] 0.75
BEAUTIFUL (2008) 1.03 [0.92, 1.15] 48.82
Overall 0.97 [0.90, 1.05]
Heterogeneity: I² = 0.00%, H² = 1.00
Test of θi = θj: Q(3) = 2.46, p = 0.48
Test of θ = 0: z = -0.74, p = 0.46
1/4
1/2
1
2
Fixed-effects inverse-variance model
Major Adverse Cardiac Events (MACE)
Study
RiskRatio with 95% CI
Weight (%)
SHIFT (2010) 0.85 [0.79, 0.92] 45.59
J-SHIFT (2019) 0.70 [0.45, 1.09] 10.50
BEAUTIFUL (2008) 1.01 [0.92, 1.10] 43.91
Overall 0.90 [0.76, 1.06]
Heterogeneity: τ² = 0.01, I² = 79.57%, H² = 4.90
Test of θi = θj: Q(2) = 9.66, p = 0.01
Test of θ = 0: z = -1.31, p = 0.19
1/2
1
Random-effects REML model
Cardiovascular Hospitalizations
Study
RiskRatio with 95% CI
Weight (%)
Ye et al (2022) 0.52 [0.31, 0.87] 1.42
SHIFT (2010) 0.88 [0.82, 0.94] 79.42
J-SHIFT (2019) 0.75 [0.53, 1.07] 3.00
BEAUTIFUL (2008) 0.95 [0.82, 1.11] 16.16
Overall 0.88 [0.83, 0.94]
Heterogeneity: I² = 48.82%, H² = 1.95
Test of θi = θj: Q(3) = 5.86, p = 0.12
Test of θ = 0: z = -4.11, p = 0.00
1/2
1
Fixed-effects inverse-variance model
Heart Failure Hospitalizations
Study
RiskRatio with 95% CI
Weight (%)
Ye et al (2022) 0.50 [0.29, 0.87] 15.51
SHIFT (2010) 0.77 [0.69, 0.85] 33.84
J-SHIFT (2019) 0.55 [0.34, 0.90] 17.62
BEAUTIFUL (2008) 0.99 [0.87, 1.13] 33.02
Overall 0.74 [0.55, 0.99]
Heterogeneity: τ² = 0.06, I² = 86.86%, H² = 7.61
Test of θi = θj: Q(3) = 14.86, p = 0.00
Test of θ = 0: z = -2.05, p = 0.04
1/2
1
Random-effects REML model

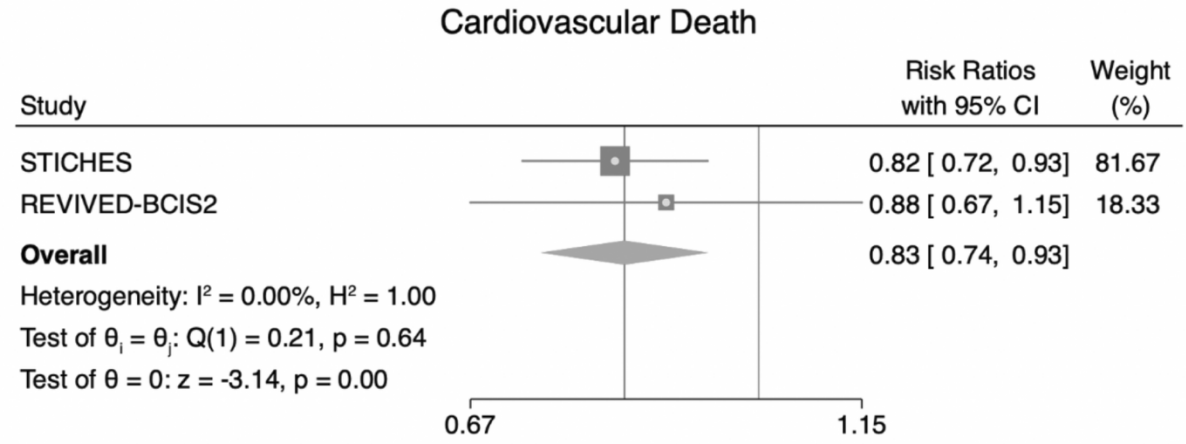
Shumail Fatima

Abstract 13: Revascularization shows beneficial cardiovascular outcomes in severe ischemic cardiomyopathy: A systematic review and meta-analysis

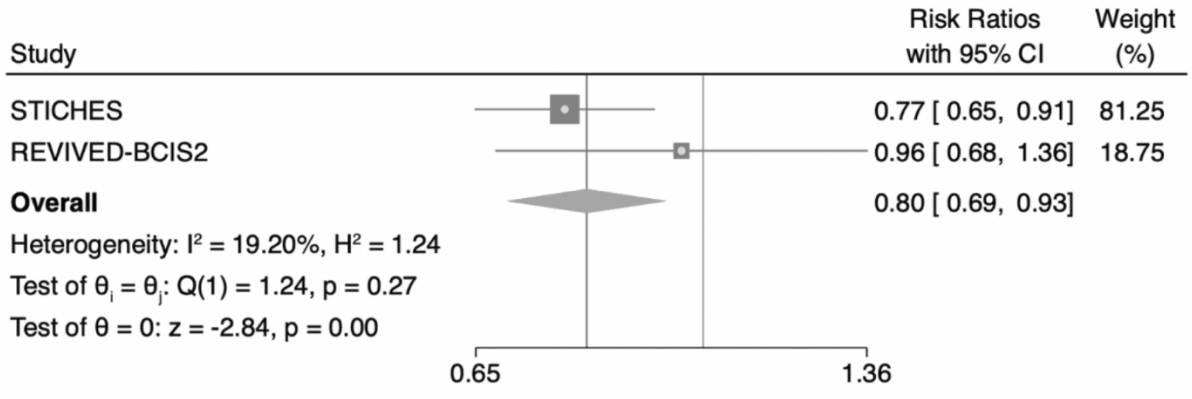
Purpose: Revascularization approach is historically prioritized over optimal medical therapy (OMT) for patients with severe stable ischemic cardiomyopathy (ICM) with ejection fraction < 35%. However, with advancement in OMT, recent studies have shown similar cardiovascular outcomes between the two strategies. Herein, we present a systematic review and meta-analysis examining the cardiovascular outcomes of revascularization strategies compared to OMT to answer the question that is revascularization associated with improved cardiovascular outcomes in patients with severe stable ICM compared to OMT alone?
Methods: PubMed, Embase, Cochrane, CT.gov, ICTRP were searched using the search terms "coronary artery bypass grafting (CABG)" or "percutaneous coronary intervention (PCI)" versus "OMT" and "ICM" or "heart failure (HF)". Included studies compared all-cause mortality, cardiovascular mortality, HF-related deaths, acute myocardial infarction (AMI), stroke and HF hospitalization. Data were pooled into risk ratios (RR) using fixed-effects model.
Results: 3 studies (n= 2050, Revascularization = 1026 and OMT= 1024) met our inclusion criteria. Revascularization strategies had protective effects for all-cause mortality (RR 0.91, 95% CI 0.84-0.98, p= 0.01, I2 0%, N= 3 studies), cardiovascular death (RR 0.83, 95% CI 0.74-0.93, p=0.00, I2 0%, N= 2 studies) and HF hospitalizations (RR 0.80, 95% CI 0.69-0.93, p= 0.00, I2 19.20%, N= 2 studies). No significant differences were observed in risks of HF related deaths, AMI and stroke between the two strategies.
Conclusions: Revascularization primarily through CABG reduces all-cause and cardiovascular mortality as well as HF hospitalizations in severe stable ICM. Further studies are warranted to determine which patients can derive the greatest advantages from revascularization.



Fixed-effects inverse-variance model



Fixed-effects inverse-variance model

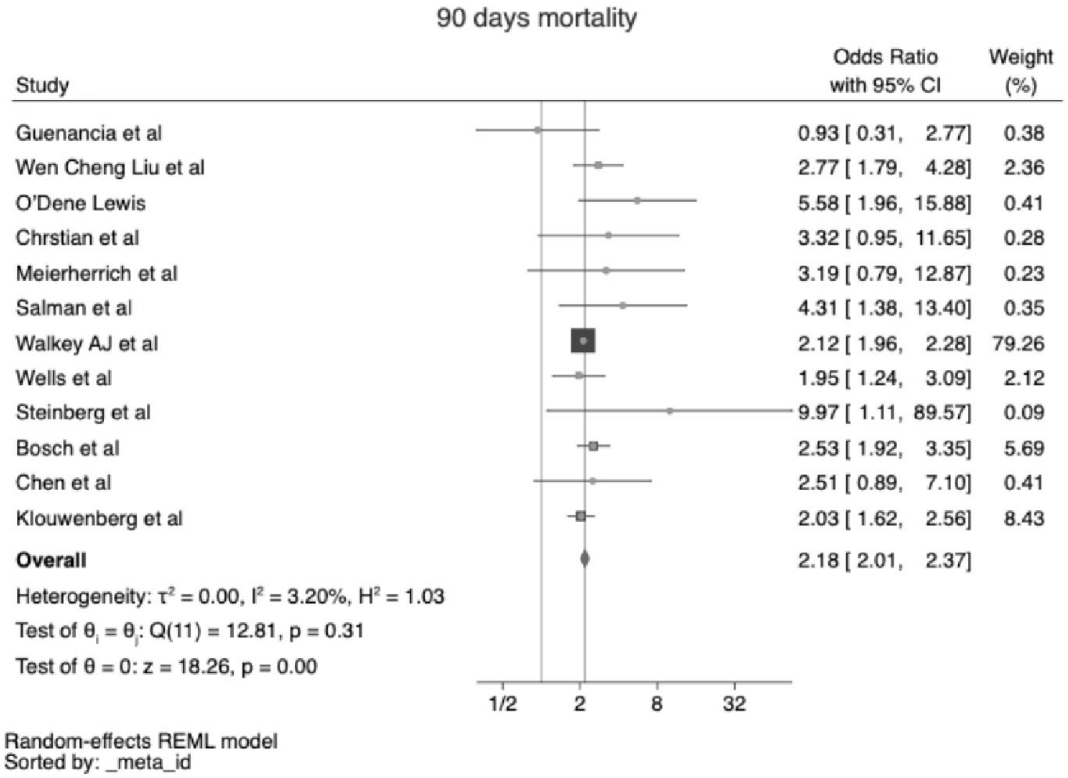


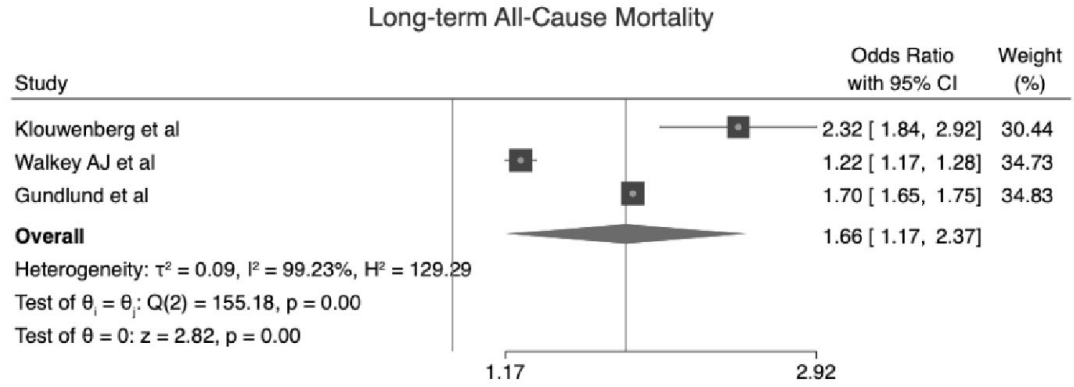
Fixed-effects inverse-variance model

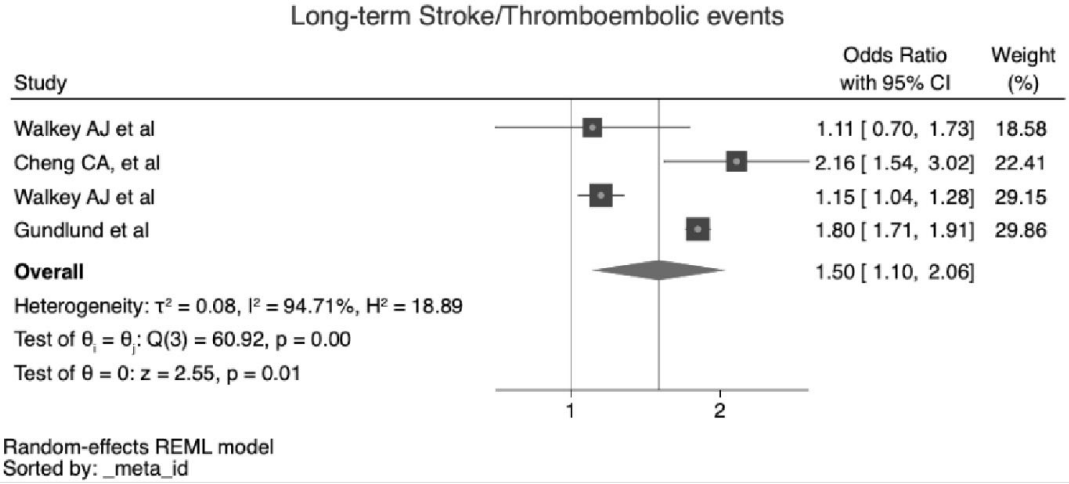
Shumail Fatima

Abstract 14: Clinical Outcomes in Sepsis associated incident Atrial fibrillation: A meta-analysis of >350,000 patients.

Purpose: The incidence of new-onset atrial fibrillation (NOAF) in sepsis is estimated to be 6-20%. Yet, there is limited data on short and long-term outcomes. Accordingly, herein, we report 90-days and long-term outcomes in sepsis-driven NOAF.
Methods: PubMed/Medline, Cochrane, Embase, and Clinicaltrials.gov databases were searched by using the search terms "atrial fibrillation (AF) in sepsis/infection and outcomes". Included studies compared 90-days and long-term all-cause mortality, stroke/thromboembolic events, and recurrent AF between septic patients with NOAF and normal sinus rhythm (NSR). Data were pooled into odds ratio (OR) using random effects model.
Results: 15 studies (n=394576, NOAF n=45202, and NSR n=234558) were included in the analysis. NOAF showed higher rates of 90-day mortality (OR 2.18, 95% CI 2.01-2.37, I2 3.20%, n= 12 studies), and 90-day stroke (OR 2.18, 95% CI 2.01-2.37, I2 3.20%, n= 1 study) compared to the NSR group. Median follow-up was 21.6 months. The elevated risk of all-cause mortality and stroke/thromboembolism also persisted on longer-term follow-up in the NOAF group (OR 1.66, 95% CI 1.17-2.37, I2 99.23%, and OR 1.50, 95% CI 1.10-2.06, I2 94.71%, respectively). NOAF was also associated with a higher rate of recurrent AF (OR 14.80, 95%CI 3.58-61.31, I2=99.94%, n= 2 studies).
Conclusions: Our study suggests poor 90-day and long-term outcomes in patients with sepsis-associated NOAF. Further studies are warranted to evaluate an early rhythm-control strategy and long-term anticoagulation in this population.


90 days mortality
Study
Odds Ratio with 95% CI
Weight (%)
Guenancia et al 0.93 [0.31, 2.77] 0.38
Wen Cheng Liu et al 2.77 [1.79, 4.28] 2.36
O'Dene Lewis 5.58 [1.96, 15.88] 0.41
Chrstian et al 3.32 [0.95, 11.65] 0.28
Meierherrich et al 3.19 [0.79, 12.87] 0.23
Salman et al 4.31 [1.38, 13.40] 0.35
Walkey AJ et al 2.12 [1.96, 2.28] 79.26
Wells et al 1.95 [1.24, 3.09] 2.12
Steinberg et al 9.97 [1.11, 89.57] 0.09
Bosch et al 2.53 [1.92, 3.35] 5.69
Chen et al 2.51 [0.89, 7.10] 0.41
Klouwenberg et al 2.03 [1.62, 2.56] 8.43
Overall 2.18 [2.01, 2.37]
Heterogeneity: τ^2 = 0.00, I^2 = 3.20%, H^2 = 1.03
Test of $\theta_i = \theta_j$: Q(11) = 12.81, p = 0.31
Test of θ = 0: z = 18.26, p = 0.00
1/2
2
8
32
Random-effects REML model
Sorted by: _meta_id

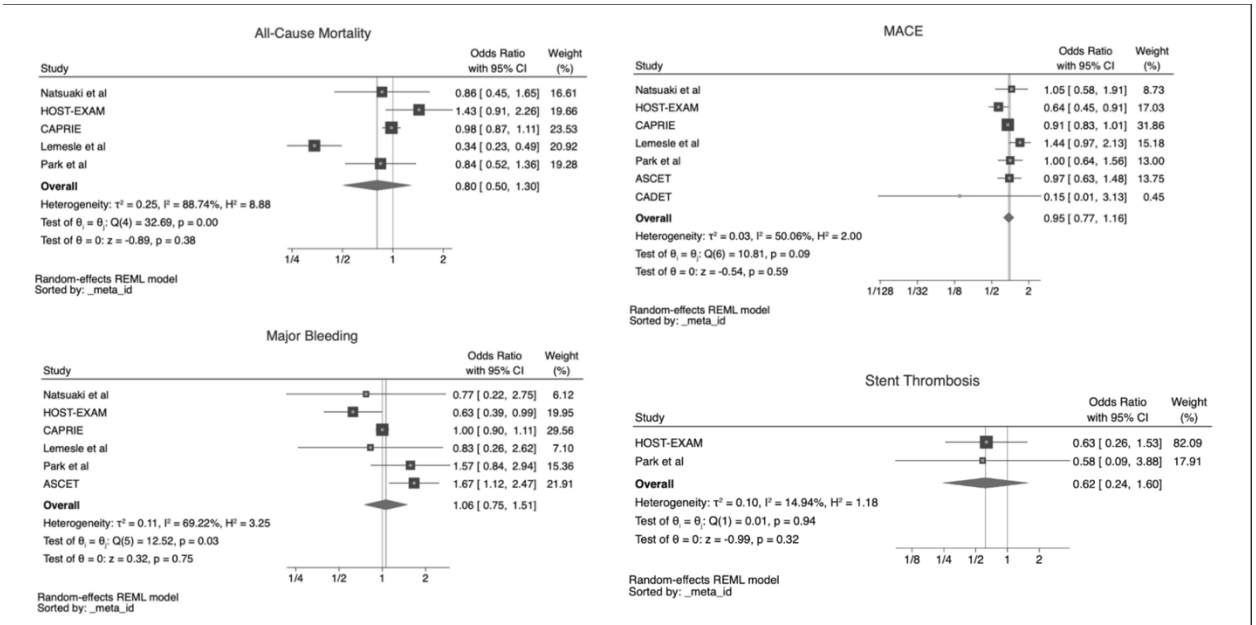

Long-term All-Cause Mortality
Study
Odds Ratio with 95% CI
Weight (%)
Klouwenberg et al 2.32 [1.84, 2.92] 30.44
Walkey AJ et al 1.22 [1.17, 1.28] 34.73
Gundlund et al 1.70 [1.65, 1.75] 34.83
Overall 1.66 [1.17, 2.37]
Heterogeneity: τ^2 = 0.09, I^2 = 99.23%, H^2 = 129.29
Test of $\theta_i = \theta_j$: Q(2) = 155.18, p = 0.00
Test of θ = 0: z = 2.82, p = 0.00
1.17
2.92
Random-effects REML model
Sorted by: _meta_id


Long-term Stroke/Thromboembolic events
Study
Odds Ratio with 95% CI
Weight (%)
Walkey AJ et al 1.11 [0.70, 1.73] 18.58
Cheng CA, et al 2.16 [1.54, 3.02] 22.41
Walkey AJ et al 1.15 [1.04, 1.28] 29.15
Gundlund et al 1.80 [1.71, 1.91] 29.86
Overall 1.50 [1.10, 2.06]
Heterogeneity: τ^2 = 0.08, I^2 = 94.71%, H^2 = 18.89
Test of $\theta_i = \theta_j$: Q(3) = 60.92, p = 0.00
Test of θ = 0: z = 2.55, p = 0.01
1
2
Random-effects REML model
Sorted by: _meta_id

Shumail Fatima

Abstract 15: Cardiovascular Outcomes of monotherapy with clopidogrel versus aspirin: A systematic review and meta-analysis

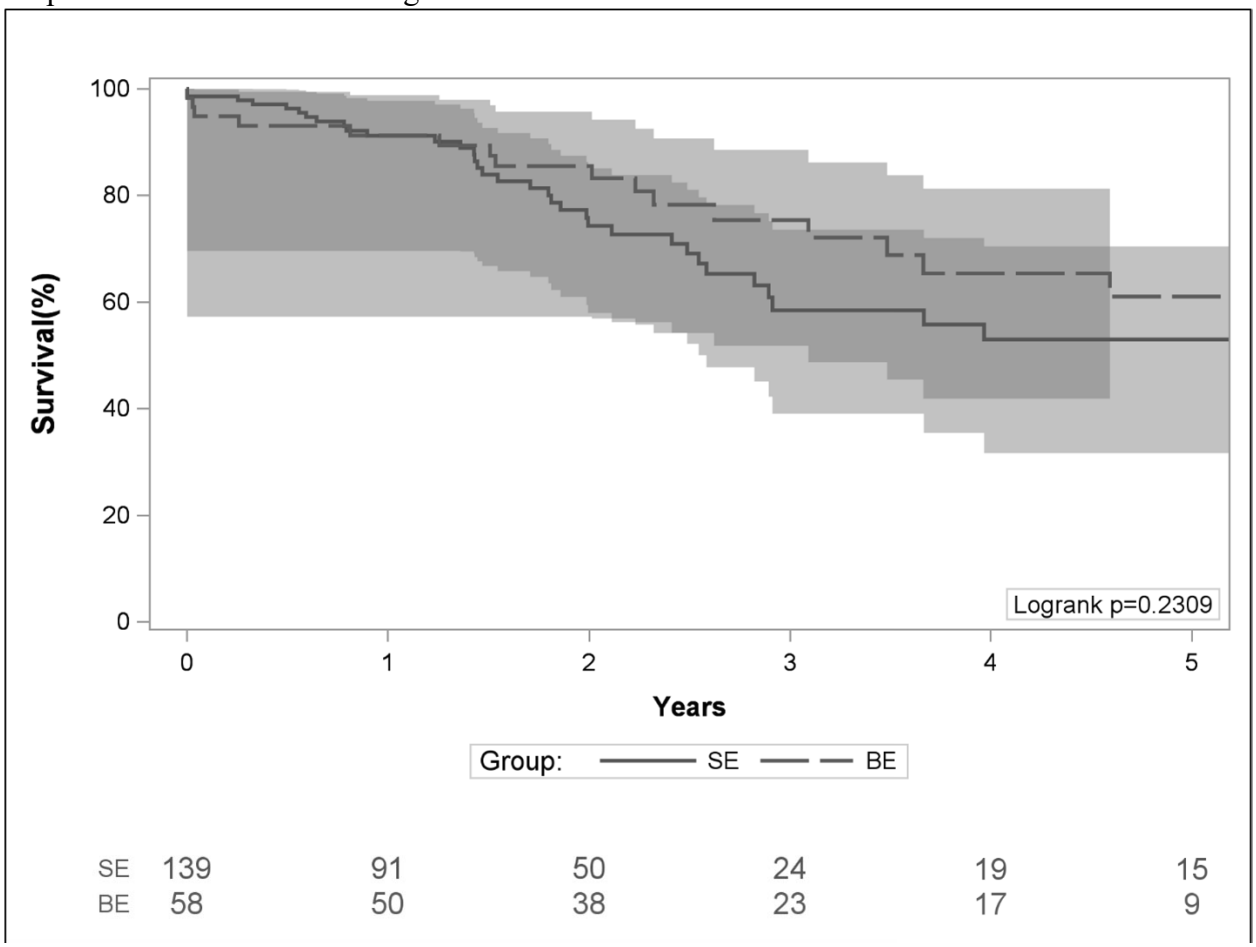
Purpose: Despite limited outcome data, monotherapy with aspirin has been preferred over clopidogrel for primary and secondary cardiovascular prevention. Utilizing an updated systematic review and meta-analysis, we compared long-term cardiovascular outcomes of monotherapy with clopidogrel and aspirin.
Methods: PubMed/Medline, Cochrane, Embase, and Clinicaltrials.gov databases were searched from inception through 2022 using the search terms "monotherapy with clopidogrel versus aspirin" and "cardiovascular outcomes of clopidogrel versus aspirin". Included studies reported all-cause mortality, a composite of cardiovascular death, reinfarction, stroke or major adverse cardiac events (MACE), stent thrombosis, and major bleeding. Data were pooled into Odds Ratio (OR) using random effects model.
Results: Seven studies (n=36445, clopidogrel n=15929, and aspirin n=18764) were included in our analysis. The median follow-up was 21 months (6-36 months). All-cause mortality in the clopidogrel group was similar to the aspirin group (OR 0.80, 95% CI 0.50-1.30, I2 88.74%, p=0.00). Similarly, MACE (OR 0.95, 95% CI 0.77-1.16, I2 50.06%, p= 0.09), rates of stent thrombosis (OR 0.62, 95% CI 0.24-1.60, I2 14.94%, p=0.94) and major bleeding (OR 1.06, 95% CI 0.75-1.51, I2 69.22%, P=0.03) were not different between the two groups.
Conclusions: Our study shows similar long-term cardiovascular outcomes with the use of clopidogrel compared to aspirin without an increase in the risk of bleeding.



Danial Ahmad

Abstract 16: Comparison of self-expanding and balloon-expandable valves for valve-in-valve transcatheter aortic valve replacement

Purpose: Self-expanding (SE) and balloon-expandable (BE) bioprosthetic heart valves (BHVs) have not been extensively studied in valve-in-valve transcatheter aortic valve replacement (ViV-TAVR). We sought to compare outcomes of SE and BE BHV for ViV-TAVR.
Methods: This retrospective analysis of institutional data (2013-2022) included all patients undergoing ViV-TAVR (TAVR in previous surgical AVR). Clinical and echocardiographic outcomes were compared for SE and BE valves along with Kaplan-Meier survival analysis
Results: Out of 4208 TAVR patients, 198 underwent ViV-TAVR of which 71% received a SE BHV. Median age was 79 years and women comprised 42.6% of the population. Implanted aortic valve size was greater in the SE group (26 mm [23-29] vs. 23mm [23-26], p<0.001). At 30 days post-TAVR, the SE group had a lower mean aortic valve gradient (10 mmHg [8-15] vs. 18 mmHg [14-25], p<0.001) and a larger aortic valve area (1.6 cm2[1.2-1.8] vs. 1.0 cm2 [0.8-1.2], p=0.065). At one-year follow-up, the SE group still had a lower aortic valve gradient (11 mmHg [8-15] vs. 18 mmHg [14-25], p<0.001) and a larger aortic valve area (2.1 cm2 [1.7-2.5] vs. 1.0 cm2 [0.9-1.5], p=0.002) compared to the BE group. The 30-day mortality was 2.5% while overall mortality was 26.4% at a follow-up of 1.8 years (0.9-2.9). Kaplan-Meier survival analysis showed no difference in survival between the groups (p=0.23) (Figure).
Conclusions: Both SE and BE BHVs had comparable outcomes post-TAVR. The higher aortic valve gradients in the BE valves are likely due to valve design and warrant long-term evaluation for potential structural valve degeneration.



Danial Ahmad

Abstract 17: The impact of using home health care after transcatheter aortic valve replacement

Purpose: Home health care (HHC) may help reduce the burden on patients and families after interventions and potentially reduce hospital length of stay (LOS). We sought to assess outcomes of patients undergoing transcatheter aortic valve replacement (TAVR) who were discharged with or without HHC services
Methods: This was a retrospective analysis, using the Nationwide Readmissions Database (NRD), of TAVR patients (2010 to 2018) who were categorized based on disposition at discharge into either the HHC cohort or the routine cohort. Propensity matching was utilized to compare the cohorts in addition to stepwise-weighted logistic regression.
Results: Of the 94,491 TAVR patients included, 67% were routinely discharged while 33% were discharged to HHC. Median age was higher in the HHC cohort (83 vs. 81 years, $p<0.01$) which also comprised more women patients (48.7% vs 41.8%, $p<0.01$). Post-TAVR rates of myocardial infarction (MI) (4% vs. 1.7%, $p<0.001$), arrhythmia (38.4% vs. 26.5%, $p<0.01$), stroke (1.01% vs. 0.33%, $p<0.001$) and acute kidney injury (14.4% vs. 6.2%, $p<0.01$) were higher in the HHC cohort. The LOS for the index admission was greater in the HHC cohort (4 days [3-8] vs. 2 days [1-3], $p<0.001$) as were the 30-day readmission (20% vs.14.4%, $p<0.001$) and mortality (0.44% vs. 0.19%, $p<0.001$) rates. These differences persisted despite weighted comparison. After propensity matching, LOS remained longer in the HHC cohort (4 days [2-7] vs. 3 days [2-5], $p<0.001$). The 30-day readmission (19.9% vs. 15.8%, $p<0.01$) and mortality (0.39% vs. 0.26%, $p=0.007$) rates also remained higher in the HHC cohort. On logistic regression, HHC status (OR: 1.3 [95% CI: 1.3-1.4], $p<0.001$), female gender (1.03 [1.0-1.1], $p=0.01$), LOS (0.995 [0.992-0.998], $p<0.001$), MI (1.24 [1.15-1.13], $p<0.001$), paraplegia (2.1 [1.3-3.4], $p=0.002$), bowel ischemia (1.42 [1.1-1.9], $p=0.02$), and acute kidney injury (1.27 [1.22-1.39], $p<0.001$) were associated with 30-day readmission
Conclusions: Post-TAVR utilization of HHC services was likely due to higher in hospital complications and was associated with increased odds of 30-day readmissions. Optimization for routine discharge and refining the criteria for HHC may improve outcomes.

Shumail Fatima

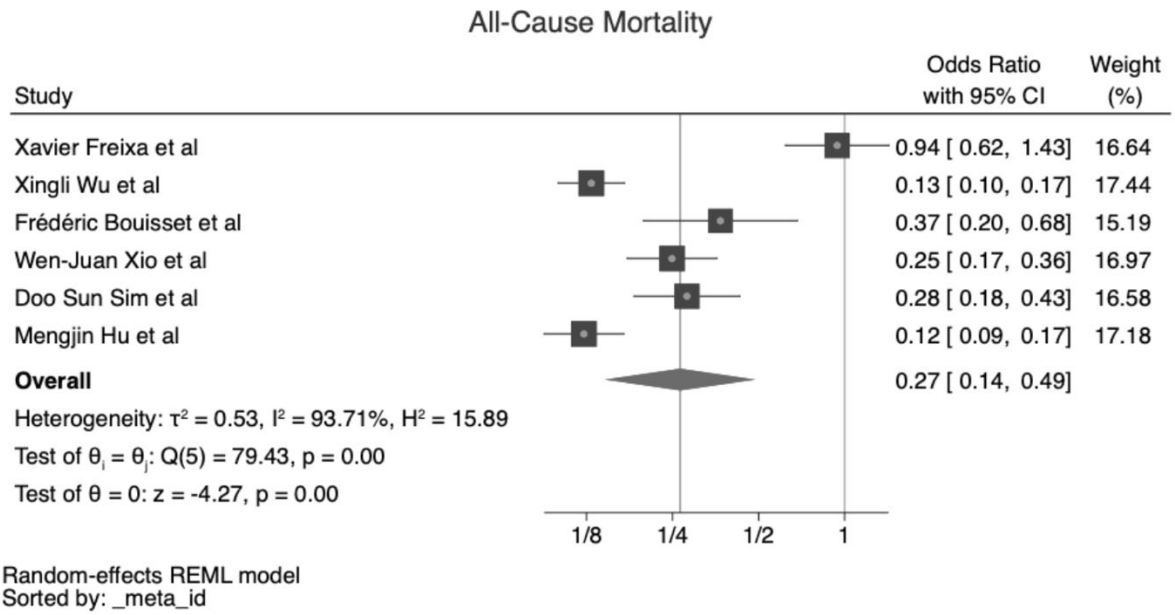
Abstract 18: Timely PCI shows beneficial long-term outcomes in late presentation with STEMI: A systematic review and meta-analysis between 2012 and 2022.

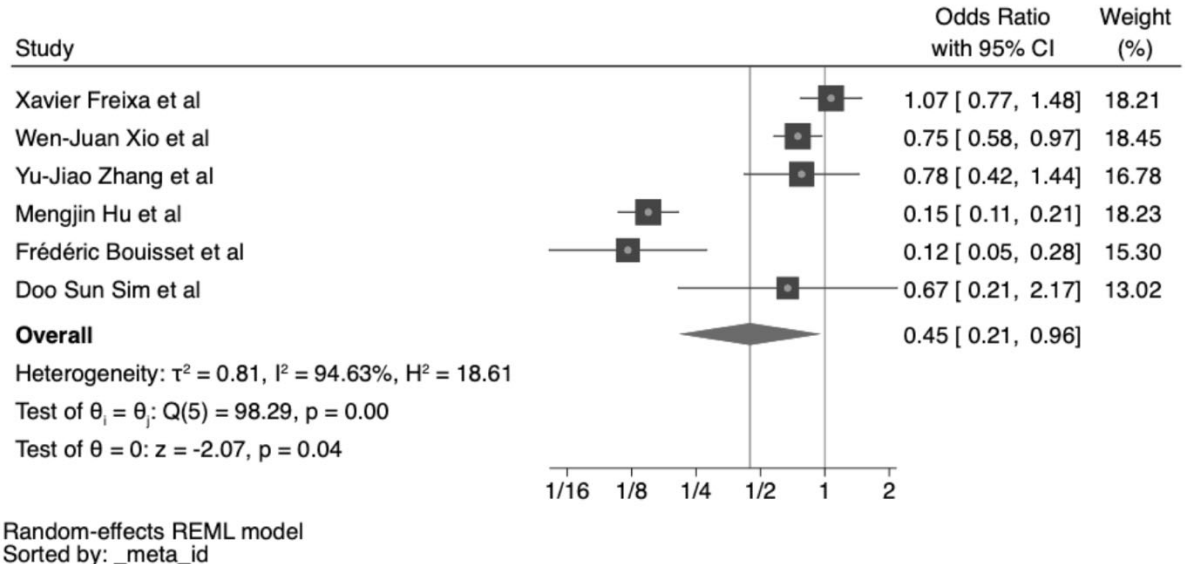
Purpose: Approximately 8-40% of ST-elevation Myocardial Infarction (STEMI) present later than 12 hours after symptom onset. Current ACC/AHA guidelines recommend primary percutaneous coronary intervention (PCI) for STEMI after 12 hours of symptom onset only in the setting of cardiogenic shock or severe acute heart failure, (Class Ia, LOE B) or persistent ischemic symptoms (Class IIa, LOE B). There are limited data comparing long-term outcomes among patients with a late STEMI presentation managed with PCI versus medical therapy (MT).Herein, we compared long-term outcomes among patients treated with PCI versus MT who have a late presentation of STEMI through a systemic review and meta-analysis of relevant literature between 2012 and 2022.

Methods: We followed Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines to extract data from PubMed/Medline, Cochrane, Embase, and Clinicaltrials.gov databases by using the search terms “late” or “delayed” or “>12 hours” presentation with STEMI from 01/2012 through 12/2022. Included studies reported at least one of the following outcomes: all-cause mortality, reinfarction, heart failure, major adverse cardiac events (MACE), and stroke. Studies reporting delays in PCI due to COVID-19 positive status or COVID-19 enforced protocols were excluded to prevent the impact of pragmatic barriers on treatment. Relative risk (RR) was calculated using random effects model.

Results: Seven studies (n=11,576, delayed PCI n=6,248, and medical therapy n=5,319) were included in our analysis. The median follow-up was 12 months (1-60 months). Overall, among patients with STEMI and PCI >12 hour after presentation had lower incidence of MACE (27% vs. 30%, RR 0.85, 95% CI 0.76-0.69, I2=30%, p=0.007) compared to MT alone, which was driven by a significantly reduced all-cause mortality with PCI (4.4% vs. 17%, RR 0.38, 95% CI 0.17-0.85, I2=95%, p=0.01). No significant differences were observed in the incidence of recurrent MI and heart failure hospitalizations.

Conclusions: Our study suggests favorable outcomes of PCI in STEMI with presentation >12 hours compared with medical therapy. Further prospective studies are needed to validate our findings.

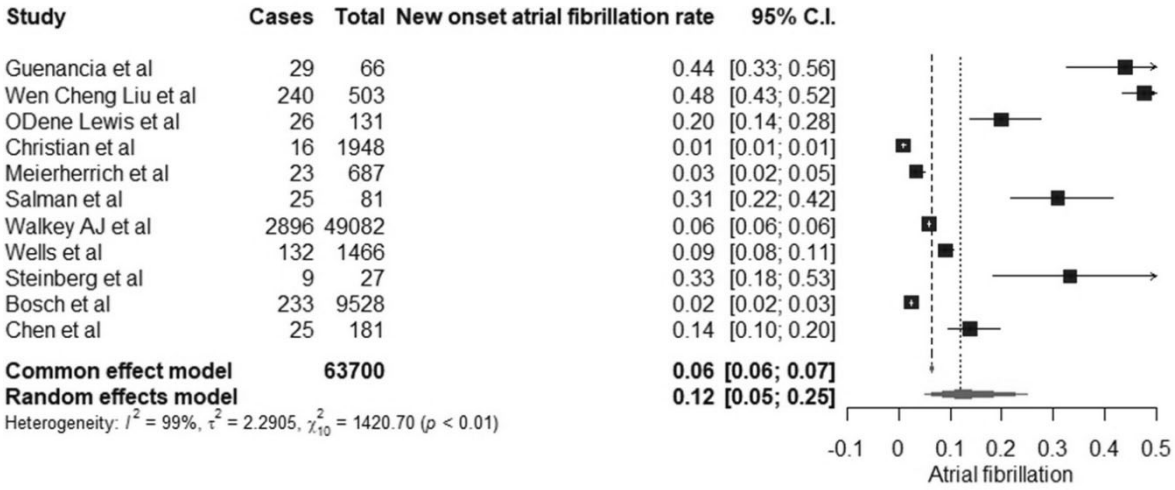

All-Cause Mortality
Study
Odds Ratio with 95% CI
Weight (%)
Xavier Freixa et al
0.94 [0.62, 1.43] 16.64
Xingli Wu et al
0.13 [0.10, 0.17] 17.44
Frédéric Bouisset et al
0.37 [0.20, 0.68] 15.19
Wen-Juan Xio et al
0.25 [0.17, 0.36] 16.97
Doo Sun Sim et al
0.28 [0.18, 0.43] 16.58
Mengjin Hu et al
0.12 [0.09, 0.17] 17.18
Overall
0.27 [0.14, 0.49]
Heterogeneity: τ² = 0.53, I² = 93.71%, H² = 15.89
Test of θi = θj: Q(5) = 79.43, p = 0.00
Test of θ = 0: z = -4.27, p = 0.00
1/8
1/4
1/2
1
Random-effects REML model
Sorted by: _meta_id


MACE
Study
Odds Ratio with 95% CI
Weight (%)
Xavier Freixa et al
1.07 [0.77, 1.48] 18.21
Wen-Juan Xio et al
0.75 [0.58, 0.97] 18.45
Yu-Jiao Zhang et al
0.78 [0.42, 1.44] 16.78
Mengjin Hu et al
0.15 [0.11, 0.21] 18.23
Frédéric Bouisset et al
0.12 [0.05, 0.28] 15.30
Doo Sun Sim et al
0.67 [0.21, 2.17] 13.02
Overall
0.45 [0.21, 0.96]
Heterogeneity: τ² = 0.81, I² = 94.63%, H² = 18.61
Test of θi = θj: Q(5) = 98.29, p = 0.00
Test of θ = 0: z = -2.07, p = 0.04
1/16
1/8
1/4
1/2
1
2
Random-effects REML model
Sorted by: _meta_id

Shumail Fatima

Abstract 19: Incidence of sepsis associated atrial fibrillation: A Meta-analysis of >60,000 patients

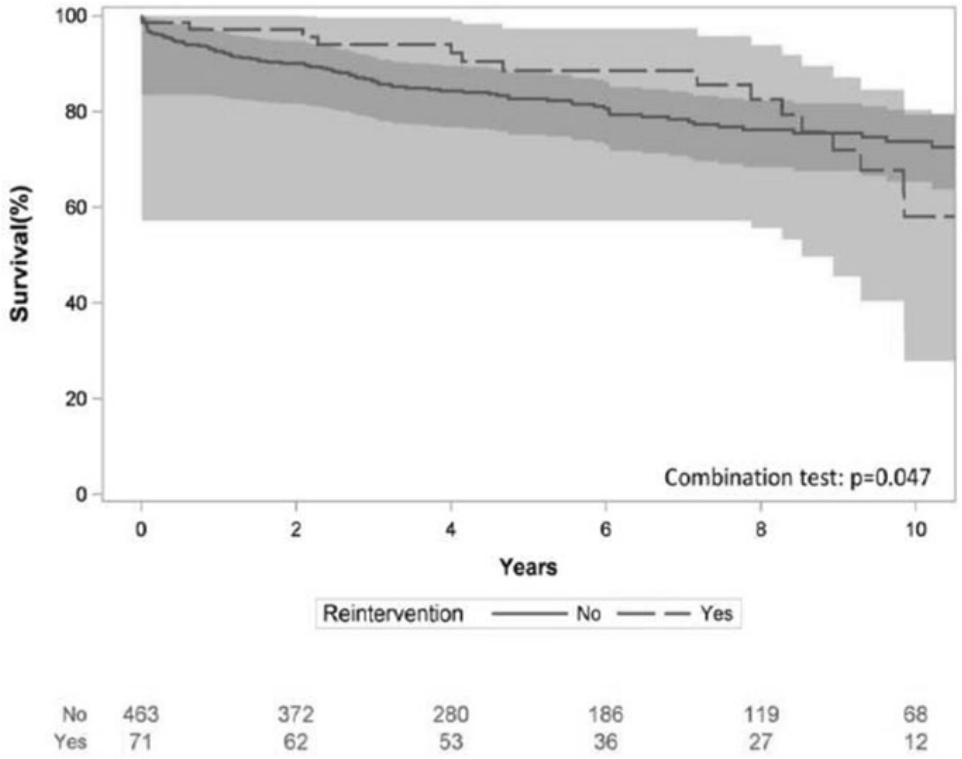
Purpose: Sepsis is associated with an increased adrenergic drive which has been proposed to cause atrial arrhythmias including atrial fibrillation. Variable incidence of sepsis associated atrial fibrillation has been reported. We conducted this systematic review and meta-analysis to study the incidence of sepsis driven new-onset atrial fibrillation.
Methods: PubMed, MEDLINE, The Cochrane Library, EMBASE, EBSCO, Web of Science, and CINAHL databases were searched from inception through 2022 using the keywords "sepsis", "atrial fibrillation". All non-human studies, case reports, conference presentations, studies in non-English language were excluded. The primary endpoint was proportion of patients with incident atrial fibrillation in patients with sepsis.
Results: Eleven studies met criteria for inclusion with a total of 63,700 patients. The overall incidence of atrial fibrillation among patients admitted for sepsis was 12% (95% CI 5%-25%, I2=99%, 95% CI 99.1% to 99.8%). Significant heterogeneity was observed.
Conclusions: Given the limitation of cohort studies, the incidence of atrial fibrillation in patients with sepsis appears to be high and needs further evaluation of long-term clinical outcomes.



Danial Ahmad

Abstract 20: Reinterventions After Repair of Acute Type A Aortic Dissection: Incidence, Outcomes and Risk Factors

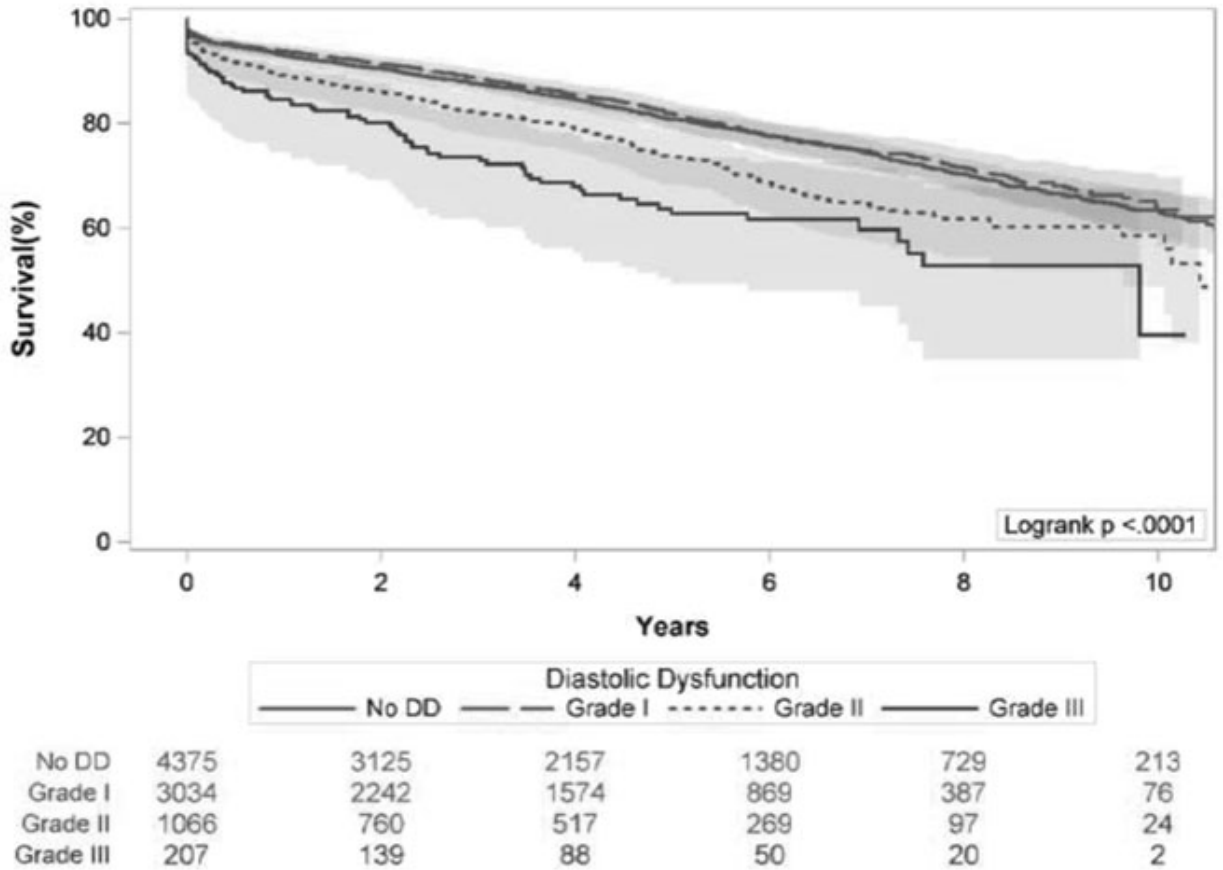
Purpose: To report the incidence, outcomes, and risk factors for aortic reinterventions after repair of acute Type A aortic dissection (ATAAD).
Methods: This was an observational study of aortic surgeries from 2010 to 2021. All patients with ATAAD undergoing open aortic arch reconstruction were included. Patients were dichotomized by the need for reintervention, which included reinterventions proximal to or distal to the index aortic repair. The cumulative incidence function for reintervention was estimated and multivariable Fine Gray analysis was performed to identify variables associated with reintervention, treating death as a competing event.
Results: A total of 601 patients undergoing surgery for ATAAD were identified. 71 (11.8%) required an aortic reintervention, of which 12 had a proximal reintervention, 56 had a distal reintervention, and 3 had both. The cumulative incidence of reintervention was 11.6% (95% CI:8.9, 14.6) at 5-years, while it was 16.0% (95% CI: 12.2, 20.3) at 10-years, with a median time to reintervention of 4.0 [IQR: 0.9, 7.5] years. On multivariable analysis using the Fine Gray method to account for death as a competing event, no operative variables were associated with reinterventions. Finally, unadjusted Kaplan-Meier survival estimates were significantly different across each group (p=0.047, weighted log-rank statistics), with the need for reintervention having a significant adverse association with survival among patients with ≥7 survival (HR 5.12, 95% CI: 2.15, 12.2, p<0.001).
Conclusions: While the cumulative reintervention rate was reasonably low in this study, reintervention after ATAAD repair is a serious adverse event that may portend reduced overall survival.



Danial Ahmad

Abstract 21: The long-term impact of diastolic dysfunction after routine cardiac surgery

Purpose: To determine the impact of diastolic dysfunction (DD) on survival after routine cardiac surgery.
Methods: This was an observational study of consecutive cardiac surgeries from 2010 to 2021. at a single institution. Patients undergoing isolated coronary, isolated valvular, and concomitant coronary and valvular surgery were included. Patients with a transthoracic echocardiogram (TTE) greater than 6 months prior to their index operation were excluded from analysis. Patients were categorized as having no DD, grade I DD, grade II DD, or grade III DD via preoperative TTE.
Results: A total of 8,682 patients undergoing a coronary and/or valvular operation were identified, of which 4,375 (50.4%) had no DD, 3,034 (34.9%) had grade I DD, 1,066 (12.3%) had grade II DD, and 207 (2.4%) had grade III DD. The median [IQR] time of the TTE prior to the index operation was 6 [2-29] days. Operative mortality was 5.8% in the grade III DD group versus 2.4% for grade II DD, 1.9% for grade I DD, and 2.1% for no DD (p=0.001). Atrial fibrillation, prolonged mechanical ventilation (>24 hours), acute kidney injury, any pRBC transfusion, reexploration for bleeding, and length of stay were higher in the grade III DD group, compared to the rest of the cohort. Median follow-up was 4.0 [IQR: 1.7-6.5] years. Kaplan-Meier survival estimates were lower in the grade III DD group than the rest of the cohort.
Conclusions: These findings suggest that DD may be associated with poor short-term and long-term outcomes.



Abstract 22: Volume-Failure to Rescue Relationship After Surgery for Acute Type A Aortic Dissections: An Analysis of The Society of Thoracic Surgeons Adult Cardiac Surgical Database

Purpose: To determine the relationship between volume of cases and failure to rescue (FTR) rate after surgery for Acute Type A Aortic Dissection (ATAAD) across the US
Methods: The STS adult cardiac surgery database was utilized to review outcomes of surgery after ATAAD between June 2017 and December 2021. Mixed-effect models and restricted cubic splines were used to determine the risk-adjusted relationships between ATAAD average volume and FTR rate. FTR calculation was based on the STS operative mortality and complications: venous thromboembolism/Deep venous thrombosis, stroke, renal failure, mechanical ventilation>48 hrs., sepsis, gastrointestinal complications, cardiopulmonary resuscitation, and unplanned reoperation.
Results: 18,192 patients underwent surgery for ATAAD in 800 centers. The included hospitals' median volume was 2.2 cases/year (IQR 0.9-5.8). Quartiles' distribution was: 594 centers in the 1st (1.3 cases/year, IQR 0.4–4.2); 118 centers in the 2nd (8 cases/year, IQR 6.7–10.2); 62 centers in the 3rd (15.6 cases/year, IQR 14.2–18.4); and 26 centers in the 4th quartile (29.3 cases/year, IQR 28.8–46.0). 4th quartile hospitals performed more extensive procedures. Overall complication, mortality and FTR rates were 52.6%, 14.2%, and 21.7%, respectively. Risk-adjusted analysis demonstrated increased odds of FTR when the average volume was less than 10 cases per year.
Conclusions: Although high-volume centers performed more complex procedures than low-volume centers, their operative mortality was lower, perhaps reflecting their ability to rescue patients and mitigate complications. An average of <10 cases per year at an institution is associated with increased odds of failure to rescue patients who present with ATAAD.

Tables

Table 1. Baseline and operative characteristics according to hospitals' average volume quartiles.

	1st Quartile N=4,724	2nd Quartile N=4,383	3rd Quartile N=4,634	4th Quartile N=4,451	p-value
Age	61.5 (51-71)	61 (51-71)	61 (50-70)	60 (50-70)	0.07
Female	1,628 (32.5%)	1,537 (33.1%)	1,568 (32.3%)	1,552 (33.2%)	0.72
Race/Ethnicity					<0.001
White	3,082 (67.4%)	2,710 (65.0%)	2,701 (60.9%)	2,494 (59.8%)	
Black	813 (17.8%)	862 (20.7%)	1,128 (25.4%)	1,120 (26.9%)	
Latino	336 (7.3%)	315 (7.6%)	281 (6.3%)	240 (5.8%)	
Asian	194 (4.2%)	153 (3.7%)	182 (4.1%)	123 (3.0%)	
BMI	28 (25 -33)	29 (25-33)	29 (25 -33)	29 (25-33)	0.82
HTN	3,760 (80.6%)	3,627 (83.8%)	3,853 (84.0%)	3,830 (86.7%)	<0.001
Diabetes	527 (11.3%)	473 (11.0%)	557 (12.2%)	529 (12.1%)	0.21
Chronic Lung Disease	1,131 (23.9%)	1,023 (23.3%)	965 (20.8%)	832 (18.7%)	<0.001
History of Smoking	1,426 (31.3%)	1,334 (31.8%)	1,329 (30.1%)	1,333 (31.3%)	0.34
Creatinine	1.1 (.9-1.38)	1.1 (.9-1.4)	1.1 (.9-1.4)	1.1 (.8-1.4)	0.68
Dialysis	91 (1.9%)	85 (2.0%)	110 (2.4%)	138 (3.1%)	<0.001
PVD	983 (21.1%)	896 (20.9%)	1,032 (22.7%)	1,074 (24.5%)	<0.001
CVD	701 (16.0%)	626 (15.1%)	708 (16.0%)	726 (16.8%)	0.17
Liver Disease	118 (2.6%)	135 (3.1%)	139 (3.1%)	161 (3.7%)	0.021
History of HF	579 (12.6%)	625 (14.6%)	707 (15.5%)	660 (15.2%)	<0.001
Previous MI	617 (13.3%)	477 (11.1%)	485 (10.7%)	472 (10.8%)	<0.001
Previous Cardiac Int.	734 (15.7%)	753 (17.3%)	925 (20.2%)	921 (20.9%)	<0.001
Total Comorbidities	2 (1-3)	2 (1-3)	2 (1-3)	2 (1-3)	<0.001
Presentation					
Mal-perfusion	1,104 (23.3%)	1,003 (23.0%)	972 (22.3%)	1,123 (25.2%)	0.01
Cardiogenic Shock	484 (10.3%)	483 (11.0%)	461 (10.0%)	306 (6.9%)	<0.001
CPR	123 (2.6%)	120 (2.7%)	101 (2.2%)	90 (2.0%)	0.08
Unresponsive	86 (1.7%)	95 (2.1%)	88 (1.8%)	77 (1.7%)	0.46
Surgical Procedure					
Central Cannulation	518 (18.9%)	541 (21.1%)	709 (25.9%)	1,005 (36.4%)	<0.001
Repair Type					<0.001
Hemiarch	3,997 (84.6%)	3,618 (82.5%)	3,735 (80.6%)	3,013 (67.7%)	
Partial Arch	449 (9.5%)	493 (11.2%)	550 (11.9%)	935 (21.0%)	
Total Arch	278 (5.9%)	272 (6.2%)	349 (7.5%)	503 (11.3%)	
Ao Valve Replacement	1,389 (29.4%)	1,230 (28.1%)	1,377 (29.7%)	1,367 (30.7%)	0.05
Ao Root Replacement	1,765 (37.4%)	1,724 (39.3%)	2,026 (43.7%)	2,298 (51.6%)	<0.001
Valve-Sparing	545 (30.9%)	614 (35.6%)	774 (38.2%)	1,027 (44.7%)	<0.001
Frozen Elephant Trunk	116 (2.9%)	156 (4.1%)	509 (12.1%)	783 (18.1%)	<0.001
Endovascular Procedure	128 (2.8%)	130 (3.0%)	332 (7.5%)	465 (10.5%)	<0.001
Additional CABG	554 (11.7%)	384 (8.8%)	384 (8.4%)	345 (7.8%)	<0.001

Table 2. Risk-Standardized failure to rescue estimations according to hospitals' average volume of cases.

Average Volume (cases/year)	Observed deaths	Expected deaths	Crude FTR	Risk-Standardized FTR	95% CI
<1	101	42.0	33.4	52.8	43.1 – 64.2
1	133	75.6	27.3	38.6	32.3 - 45.9
3	112	85.9	22.7	28.6	23.5 – 34.4
5	126	101.3	25.8	27.3	22.7 – 32.5
8	84	86.5	18.6	21.3	17.1 – 26.4
10	106	97.1	23.2	23.9	19.6 - 29.1
12	56	80.1	19.2	19.2	14.9 – 24.2
15	63	64.9	20.9	21.3	16.3 - 27.2
20	12	15.8	12.2	16.6	8.5 – 29.0
25	48	48.3	21.8	14.8	10.9 - 19.6
30	21	35.6	31.8	12.9	8.1 – 19.7
35	26	53.8	16.4	10.6	6.9 – 15.5
40	26	38.9	34.2	14.6	9.5 - 21.5

Figures

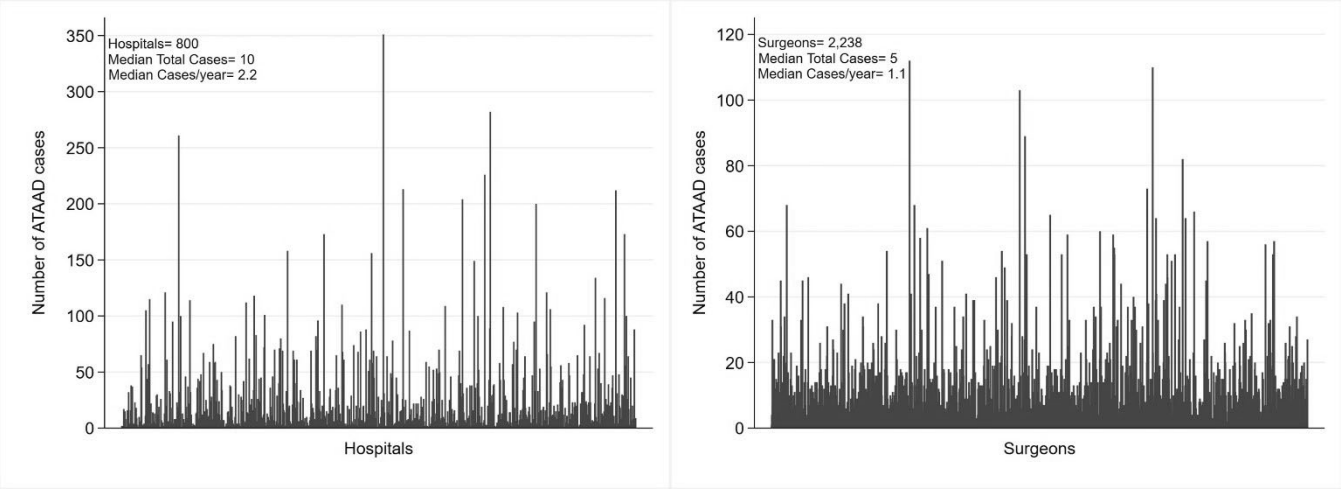
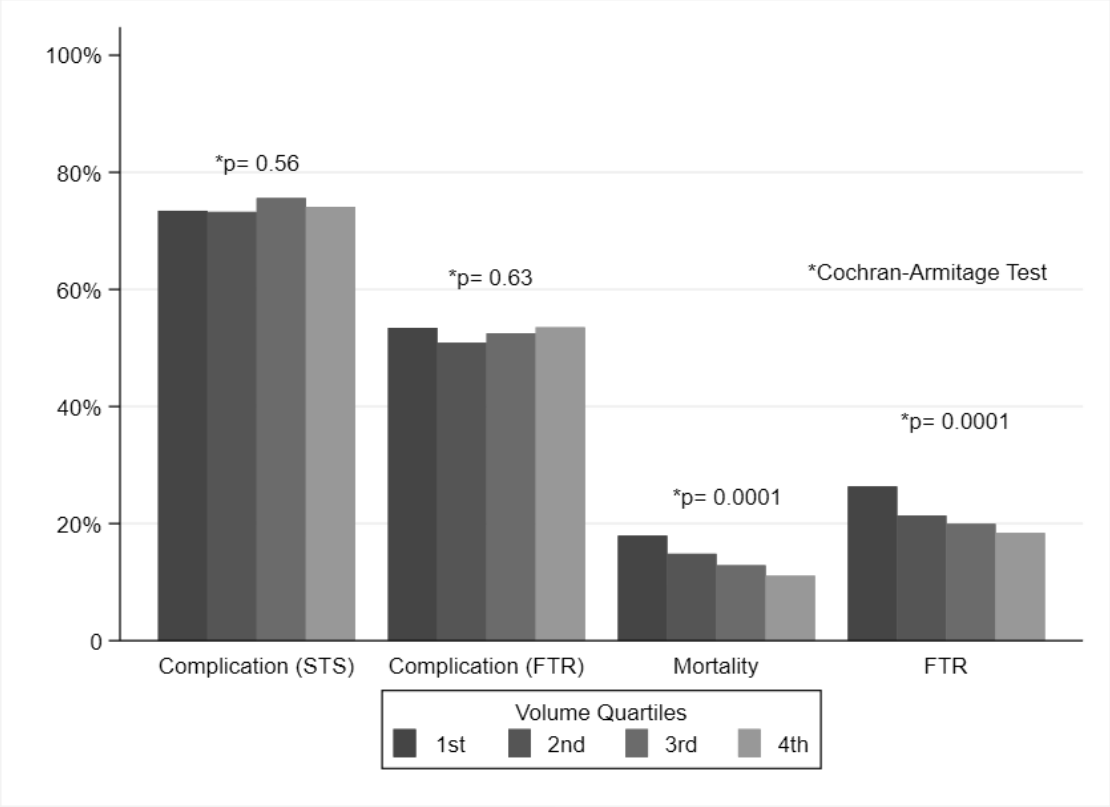


Figure 1. Bar graph showing the cumulative ATAAD cases by hospitals and surgeons over the study period.

Figure 2. Bar graph showing trend analysis of complications according to The STS(*73.8% vs. 73.5% vs. 75.7% vs. 74.2%*), major complications (FTR) (*53.8% vs. 51.1% vs. 52.7% vs. 53.8%*), mortality (*18.2% vs. 15.0% vs. 13.0% vs. 11.2%*) and failure to rescue (*26.9% vs. 21.6% vs. 20.2% vs. 18.6%*) between hospitals' average volume quartiles.



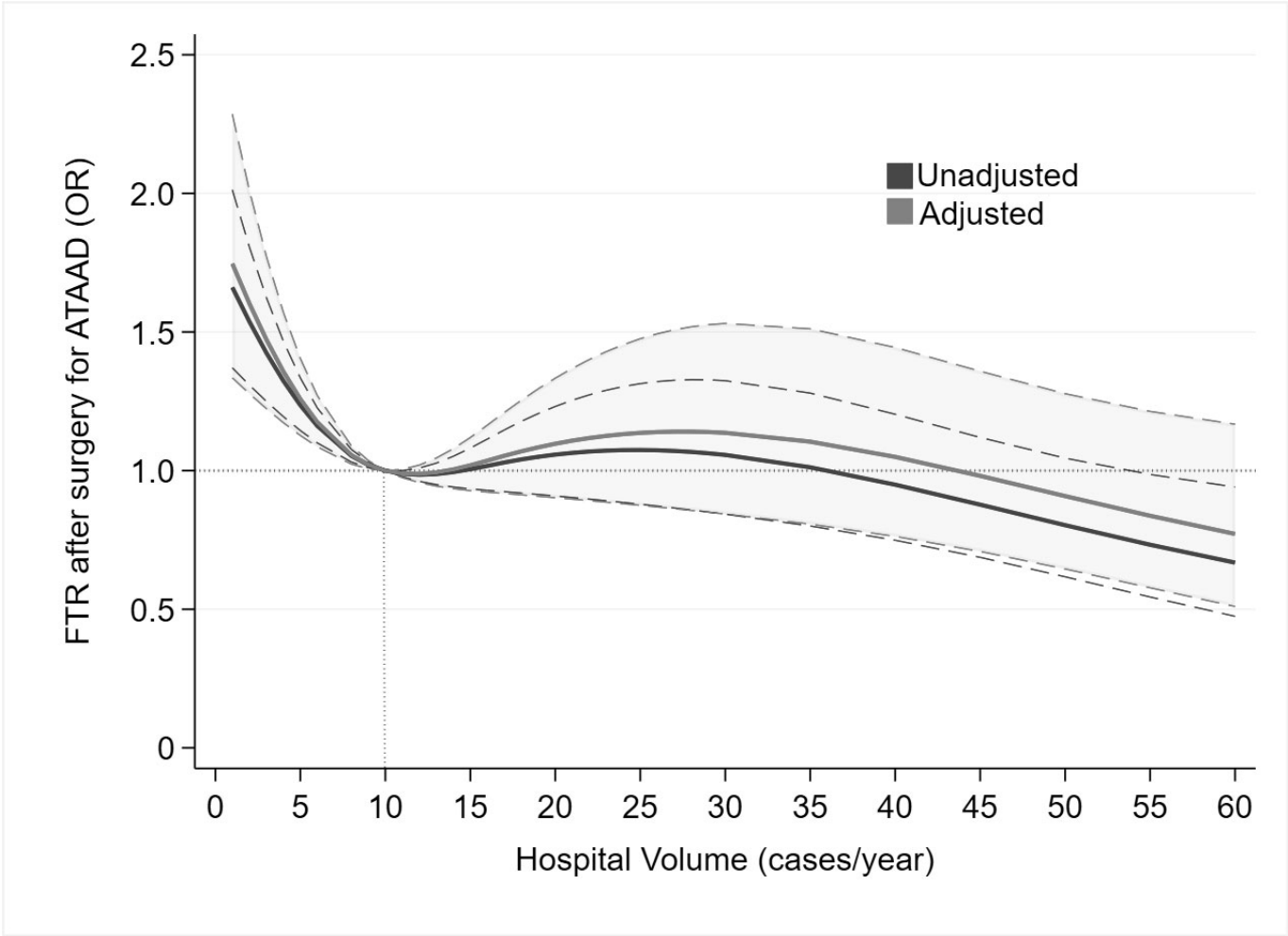


Figure 3. Adjusted (red) and unadjusted (blue) restricted cubic splines demonstrating the ORs for FTR according to the average ATAAD cases per year. The color-shaded areas denote approximate 95% confidence intervals. Splines knots were 1.6, 8, 17.1, and 53. Higher risk-adjusted odds of FTR were observed among hospitals that performed <10 cases/year during the study period.

Carlos E. Diaz-Castrillon

Abstract 23: Readmission-Mortality after TAVR: The combined effect of teaching status and cause of readmission

Purpose: To determine the relationship between hospital teaching status and the cause of readmission on 90-day readmission mortality following transcatheter aortic valve replacement (TAVR).
Methods: Using the National Readmissions Database (NRD), we identified 63,360 TAVR admissions from 2012 to 2017. We compared non-elective 90-day readmission between teaching and non-teaching hospitals, including causes of readmission. We used a mixed-effects regression model to evaluate the interaction between teaching status, cause of readmission, and readmission-related mortality.
Results: Overall, 21.7% (n= 13,761) patients had a non-elective readmission within 90- days. Non-elective readmissions were higher in teaching hospital compared to nonteaching hospitals (23.6% vs 21.5%; p<0.001). No differences were observed in the distribution of cardiac (44.2% vs. 43.9%; p= 0.84) and non-cardiac (55.7% vs. 56.1%; p= 0.84). Unadjusted 90-day readmission mortality was higher in a non-teaching hospital (5.2% vs. 3.9%; p= 0.02). Multivariable analysis showed an interaction effect of teaching status and cause of readmission; non-cardiac readmission to a teaching hospital was associated with increased odds of death (OR 1.51, 95% CI 1.2 – 1.8; p<0.001) compared to non-teaching hospitals, whereas cardiac readmission was associated with decreased odds of dying (OR 0.66, 95% CI 0.5 – 0.8; p<0.001).
Conclusions: Our findings suggest that there is a differential association between teaching status and 90-day readmission mortality depending on the cause of readmission after adjusting for other clinical factors. Alternative metrics, such as failure to rescue, could help to better understand the relationship between patient-level variables and hospital teaching status.

Tables

Table 1. Baseline characteristics of Readmitted patients after TAVR by hospital teaching status

Variables	Total N= 13,575	Non-Teaching Hospital N=1,355	Teaching Hospital N= 12,220	P-Value
Age	83 (76-87)	83 (77-88)	83 (76-87)	0.39
Female, n (%)	46.9% (6,369)	46.2% (626)	47.0% (5,743)	0.57
TAVR Discharge Location				<.001
Routine	38.3% (5,200)	45.3% (615)	37.5% (4,585)	.
Short-term Hospital	0.66% (89)	0.66% (9)	0.65% (80)	.
SNF, ICF, or Other	27.90% (3,788)	27.08% (367)	28.0% (3,421)	.
Home Health Care (HHC)	33.05% (4,487)	26.79% (363)	33.75% (4,124)	.
Insurance				0.07
Medicare	92.12% (12,505)	94.02% (1,274)	91.91% (11,231)	.
Medicaid	1.28% (174)	1.40% (19)	1.27% (155)	.
Private	4.85% (658)	3.54% (48)	4.99% (610)	.
Comorbidities				
Diabetes Mellitus	41.91% (5,689)	39.34% (533)	42.19% (5,156)	0.04
Dyslipidemia	64.57% (8,765)	63.25% (857)	64.71% (7,908)	0.28
Hypertension	86.20% (11,701)	85.76% (1,162)	86.24% (10,539)	0.62
CAD	72.61% (9,857)	70.18% (951)	72.88% (8,906)	0.03
Congestive Heart Failure	79.15% (10,745)	77.86% (1055)	79.30% (9,690)	0.21
Cerebral Vascular Disease	11.95% (1,622)	12.47% (169)	11.89% (1,453)	0.53
PVD	22.73% (3,085)	20.37% (276)	22.99% (2,809)	0.02
COPD	29.75% (4,038)	31.07% (421)	29.60% (3,617)	0.26
Chronic Kidney Disease	43.77% (5,942)	43.62% (591)	43.79% (5,351)	0.90
County of the hospital				<.001
Large metropolitan areas	70.53% (9,575)	50.41% (683)	72.77% (8,892)	.
Small metropolitan areas	29.47% (4,000)	49.59% (672)	27.23% (3,328)	.
Hospital bed size				<.001
Small	3.91% (531)	5.76% (78)	3.71% (453)	.
Medium	18.67% (2535)	11.88% (161)	19.43% (2374)	.
Large	77.41% (10,509)	82.36% (1,116)	76.87% (9,393)	.

Table 2. In-hospital outcomes for 90-day non-elective readmissions by teaching status

Variables	Total N= 13,575	Non-Teaching N=1,355	Teaching N= 12,220	P-Value
30-day Readmissions	61.31% (8,323)	59.04% (800)	61.56% (7,523)	0.07
Mortality 30-day Readmission	2.37% (322)	2.92% (40)	2.31% (282)	0.13
Costs 30-day Readmission	$11,050 (5,810-23,500)	$9,700 (5,190-19,800)	$11,250 (5,880-23,900)	<.001
90-day Readmissions				
In-Hospital Mortality	4.08% (554)	5.24% (71)	3.95% (483)	0.02
Redo TAVR	0.88% (119)	0.52% (7)	0.92% (112)	0.13
Surgical Intervention	0.04% (5)	0.00%	0.04% (5)	0.45
Readmission costs	$10,030 (5,440-20,800)	$9,060 (4,950-18,400)	$10,130 (5,490-21,000)	<.001
Length of Stay	5 (3 - 10)	4 (3 - 8)	5 (3 - 11)	<.001
Complications				
Myocardial Infarction	5.58% (758)	4.58% (62)	5.70% (696)	0.08
Heart Failure	41.38% (5,618)	44.35% (601)	41.06% (5,017)	0.01
Pneumonia	4.07% (552)	3.47% (47)	4.13% (505)	0.24
Respiratory Failure	4.66% (632)	5.09% (69)	4.61% (563)	0.42
Acute Kidney Injury	20.10% (2,728)	16.97% (230)	20.44% (2,498)	0.002
Urinary Tract Infection	12.39% (1,682)	10.92% (148)	12.55% (1,534)	0.08
Stroke	1.64% (223)	1.03% (14)	1.71% (209)	0.06
Sepsis	1.41% (192)	1.11% (15)	1.45% (177)	0.31
Hemorrhage	25.31% (3,436)	19.26% (261)	25.98% (3,175)	<.001

Table 3. Mixed-Effect Logistic Regression evaluating combined effect of teaching status and cause of 90-day non-elective readmissions.

Effect	Point Estimate	95% CI	P-value
Cardiac readmission Non-Teaching hospital (ref) vs Teaching	**0.66**	**0.5 – 0.8**	**<.0001**
Non-Cardiac readmission Non-Teaching hospital (ref) vs Teaching	**1.51**	**1.2 – 1.8**	**<.0001**
NCHS urban-rural counties classification	***Central Metro Area as reference***		
"Fringe" counties of Metro Areas (> 1 million)	0.88	0.6 – 1.1	0.0005
Counties 250,000-999,999 population	1.46	0.9 – 2.01	0.22
Counties 50,000-249,999 population	1.25	0.8 – 1.8	0.85
Micropolitan	1.54	0.9 – 2.2	0.19
Rural	1.81	1.1 – 2.7	0.02
Comorbidities			
Diabetes Mellitus	0.80	0.6 – 0.9	0.02
Dyslipidemia	0.88	0.7 – 1.1	0.20
Hypertension	0.78	0.6 – 1.0	0.04
Congestive Heart Failure	1.09	0.8 – 1.4	0.53
Peripheral Artery Disease	1.41	1.1 – 1.7	0.0008
Age	1.01	1.01 – 1.02	0.02
Length of Stay	1.02	1.01 – 1.03	0.001

Other non-significant variables included: Index TAVR Discharge Location, complications such as Myocardial Infarction, Pneumonia, Sepsis, Heart Failure, Acute Kidney Injury, Hemorrhage, Respiratory Failure.

Figure 1. Non-elective 90 day readmission and readmission mortality over the study period by
teachin status

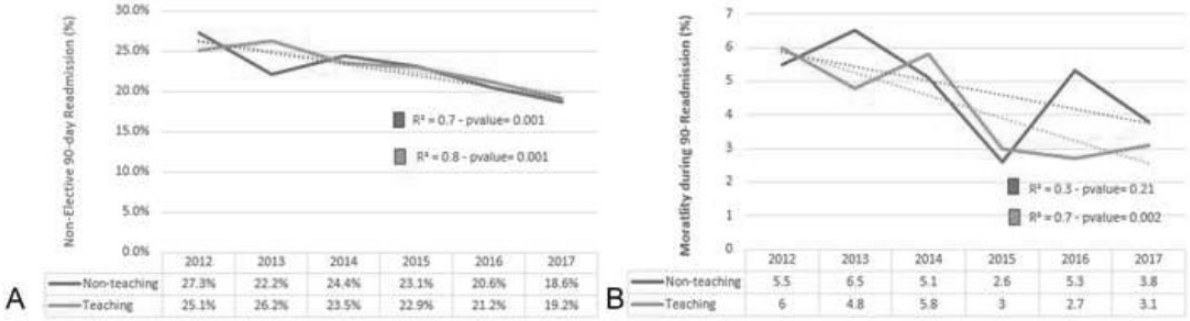
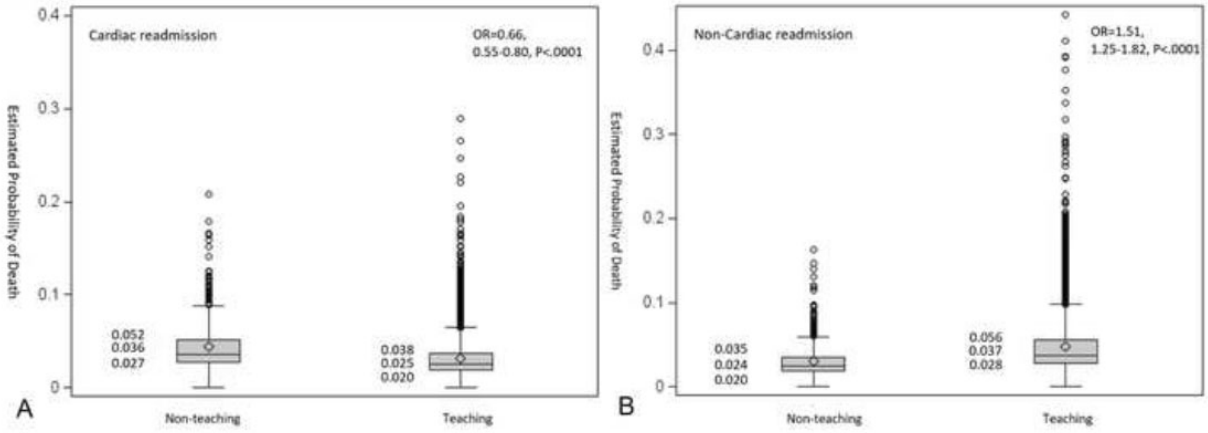


Figure 2. Predicted 90-day readmission mortality according to hospital teaching status and
cause of readmission



Abstract 24: Resource Utilization After Cardiac Surgery In Adults With Congenital Heart Diseases: A Nationwide Analysis

Purpose: This study examined resource utilization following cardiac surgery among ACHD patients.
Methods: We used the NIS (2012-2018) to identify >18yo admissions with TOF, Pulmonary valve anomalies/Congenital Pulmonary Stenosis, cTGA, DORV, TGA, HLHS, and Ebstein's anomaly and Open-heart valve or Great Vessels\Conduit replacement procedures. Hospitalization costs were adjusted for inflation to 2022 US dollars using the medical care component of the US Consumer Price Index. A mixed-effect linear regression model was used to identify factors associated with increased costs.
Results: Out of 91,565 admissions, 4,578 involved one of the procedures of interest. The median age was 32 (IQR 34 - 46), and 46.6% were females. The median hospitalization cost was $54,400 (IQR 40,990 - 74,520). Valve procedures were the most common (79%). Overall, 19% of admissions had multiple HRU codes, with Blood transfusions (12.5%) and ICD/pacemakers (7.2% being the most common. The high and low tercile group had a median hospitalization cost of $92,370 (IQR 74,850 - 120,900) and $36,300, IQR 31,180 - 40,930). Hospital-level factors, complications, and the need for HRU services significantly increased hospitalization costs. Notably, in-hospital mortality was associated with a 58% cost increase.
Conclusions: Although the proportion of ACHD admissions requiring cardiac surgery is relatively low, the economic burden is significantly high, particularly those with in-hospital mortality. On average, higher hospitalization costs are associated with complications, the utilization of HRU procedures, the type of hospital providing care, and the US region.

Figure 1. Baseline characteristics according to admission costs.

Variables	Low Percentile Costs $36,300 (31,180 – 40,930)	Intermediate Percentile Costs $54,400 (49,340-59,150)	High Percentile Costs $92,370 (74,850 – 120,900)	P-Value
Age	33 (24-45)	32 (23-47)	31 (23-46)	0.87
Female	800 (54.98%)	700 (46.82%)	580 (40.00%)	<.001
Diagnosis				
Tetralogy of Fallot	320 (21.99%)	355 (23.75%)	445 (30.69%)	<.001
Pulmonary Valve Anomalies	820 (56.36%)	840 (56.19%)	680 (46.90%)	<.001
Congenital Pulmonary Stenosis	330 (22.68%)	320 (21.40%)	225 (15.52%)	<.001
Complete Transposition of Great Vessels	70 (4.81%)	60 (4.01%)	80 (5.52%)	0.15
Double Outlet Right Ventricle	80 (5.50%)	65 (4.35%)	60 (4.14%)	0.17
L- Transposition of Great Vessels	40 (2.75%)	40 (2.68%)	70 (4.83%)	0.001
Hypoplastic Left Heart Syndrome	5 (0.34%)	0 (0.00%)	35 (2.41%)	<.001
Ebstein's Anomaly	160 (11.00%)	205 (13.71%)	195 (13.45%)	0.05
Surgical Procedures				
Open Heart Valve procedures	1095 (75.26%)	1295 (86.62%)	1085 (74.83%)	<.001
Great Vessels/Conduit procedures	275 (18.90%)	185 (12.37%)	350 (24.14%)	<.001
Septal Defect related procedures	225 (15.46%)	145 (9.70%)	155 (10.69%)	<.001
CHD complete Repair Codes	140 (9.62%)	165 (11.04%)	160 (11.03%)	0.35
Primary Payer				
Medicare	160 (11.00%)	160 (10.70%)	210 (14.48%)	<.001
Medicaid	275 (18.90%)	250 (16.72%)	275 (18.97%)	
Private Insurance	895 (61.51%)	1005 (67.22%)	825 (56.90%)	
Self-pay	45 (3.09%)	20 (1.34%)	55 (3.79%)	
Other	70 (4.81%)	55 (3.68%)	70 (4.83%)	
High Resource Utilization Procedures				
Mechanical ventilation>96hrs	0 (0.00%)	0 (0.00%)	75 (5.17%)	<.001
Tracheostomy	0 (0.00%)	0 (0.00%)	10 (0.69%)	<.001
Cardiopulmonary Resuscitation	45 (3.09%)	20 (1.34%)	95 (6.55%)	<.001
Renal Replacement Therapy	5 (0.34%)	0 (0.00%)	15 (1.03%)	<.001
Mechanical Support	0 (0.00%)	0 (0.00%)	8 (0.44%)	<.001
Diagnostic Catheterization	80 (5.50%)	50 (3.34%)	110 (7.59%)	<.001
Pacemaker implantation	15 (1.03%)	95 (6.35%)	215 (14.83%)	<.001
Blood Transfusion	65 (4.47%)	155 (10.37%)	305 (21.03%)	<.001
>1 High Resource Utilization procedure	80 (5.50%)	215 (14.38%)	510 (35.17%)	<.001
Complications				
Heart Failure	90 (6.19%)	115 (7.69%)	260 (17.93%)	<.001
Arrhythmias	435 (29.90%)	625 (41.81%)	735 (50.69%)	<.001
Pneumonia	20 (1.37%)	35 (2.34%)	100 (6.90%)	<.001
Respiratory Failure	5 (0.34%)	30 (2.01%)	100 (6.90%)	<.001
Acute Kidney Injury	25 (1.72%)	40 (2.68%)	240 (16.55%)	<.001
Stroke	0 (0.00%)	5 (0.33%)	20 (1.38%)	<.001
Sepsis	0 (0.00%)	0 (0.00%)	40 (2.76%)	<.001
Hemorrhage	375 (25.77%)	380 (25.42%)	495 (34.14%)	<.001
Hospital Region				
Northeast	375 (25.77%)	335 (22.41%)	260 (17.93%)	<.001
Midwest	395 (27.15%)	400 (26.76%)	360 (24.83%)	.
South	475 (32.65%)	440 (29.43%)	480 (33.10%)	.
West	210 (14.43%)	320 (21.40%)	350 (24.14%)	.
Length of Stay, days	4 days (3 - 5)	5 days (4 - 6)	8 (5 - 14)	<.001
In-Hospital Mortality	0 (0.00%)	5 (0.33%)	25 (1.72%)	<.001

Figure 2. Mixed-Effect Regression on Adjusted admission costs. Coefficients represents percentages changes in adjusted costs.

Variable	Estimates in %	95% CI		P value
Age	-0.41	-0.63	-0.19	**0.0003**
Female	**-5.43**	-10.31	-0.29	**0.03**
Elective vs non-elective	**-7.59**	-15.32	0.83	**0.07**
Hospital Bed-size	***Small as reference***			
Large	+29.83	19.06	41.58	**<0.0001**
Hospital Region	***Northeast Region as reference***			
South	+13.26	2.99	24.58	**0.01**
West	+29.52	16.71	43.74	**0.001**
Discharge Location	***Routine as reference***			
Transfer to SNF, ICF or other skilled Facility	+36.98	14.60	63.72	**<0.0001**
Died	+58.83	9.7	129.82	**0.01**
Complications	***No complication as reference***			
Heart failure	+14.36	4.37	25.29	**0.004**
Respiratory failure	+22.40	3.3	37.4	**0.01**
Acute Kidney Injury	+16.16	3.42	30.44	**0.01**
HRU procedures				
Mechanical ventilation>96hrs	+8.26	-16.20	39.81	0.54
Tracheostomy	-22.26	-60.60	53.37	0.46
CPR	+4.03	-9.98	20.23	0.59
Renal Replacement Therapy	26.11	-18.60	95.38	0.22
Mechanical Support	+21.40	14.21	29.03	**<0.0001**
Diagnostic catheterization	+12.89	-0.12	27.60	**0.052**
Pacemaker implantation	+37.19	23.02	53.00	**<0.0001**
Blood transfusion	+13.68	4.32	23.87	**0.003**
LOS	+3.0	2.633	3.43	**<.0001**

Joseph Ibrahim

Abstract 25: Permanent Pacemaker Following Alcohol Septal Ablation – Prevalence of Utilization at 1 Year?

Purpose: Alcohol Septal Ablation has been commonly associated with an increased risk of high-degree atrioventricular block (AVB) leading to permanent pacemaker (PPM) implantation. In this study, we aimed to retrospectively analyze the pacing needs for patients who underwent PPM implantation post ASA.
Methods: This is a single-center retrospective study which included HCM patients who underwent ASA at the University of Pittsburgh Medical Center between 2015-2023. Baseline demographics and PPM device interrogations were collected from the electronic medical records. Patients were divided between three groups: patients who had a PPM prior to ASA, patients who did not have a PPM prior to ASA and did not require one after, and patients who required PPM placement post ASA. Pacing percentages were compared between cohorts at 1 month, 6 months and 12 months.
Results: Out of 49 patients who underwent ASA, 14 patients received a PPM and 29 did not (an additional 6 patients had pre-existing PPM). There were no significant differences between baseline demographics of all three cohorts including age, BMI, sex, hypertension, diabetes, RBBB, LBBB or 1st degree AV block (AVB) and prior atrial fibrillation/flutter. In the prior PPM group, at 6 months, only 1 patient had a significant increase of pacing needs from 1% to 99% post ASA. In the de-novo PPM group, half had > 50% pacing rates at 1 month, but only 3 required this degree of pacing at 6 and 12 months. Of the 3 patients requiring high pacing rates, 1 patient had a 1st degree AVB and LBBB at baseline and 1 patient had only a first degree AVB, with the other patient having a normal baseline EKG.
Conclusions: Our study demonstrates that most patients who undergo PPM implantation post ASA for high degree AVB ultimately have low pacing needs at 6-12 months. Further investigation is warranted to understand alternative approaches of AVB management in this patient population.

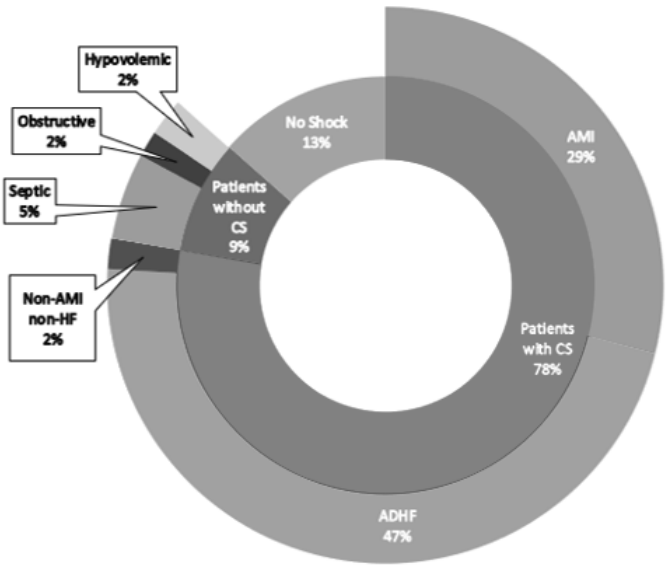
Brad Very

Abstract 26: The Importance and Challenges Associated with the Development of a Curated Cardiogenic Shock Database in a Multihospital System

Purpose: Cardiogenic shock (CS) is associated with high mortality. There is a need for multi-hospital centers to develop statistical algorithms to understand the state of CS. The heterogeneity and complexity of CS render ICD codes ineffective for identifying patients to develop curated datasets from which statistical models can be built.
Methods: A retrospective review was performed on 453 patients admitted to UPMC hospitals with ICD codes 785.51 and R57.0 between 2018 and 2020. Patient electronic health records (EHR) were assessed for clinical, hemodynamic, and lab data. Criteria for CS included a primary cardiac disorder characterized by low cardiac output, evidence of tissue hypoperfusion, systolic blood pressure ≤90mmHg for ≥30 minutes, use of pharmacological or mechanical circulatory support, or depressed cardiac index ≤2.2. Patients were then categorized as "not in shock", "confirmed CS" with known etiology, or "multifactorial shock". Patients with shock attributable to non-cardiogenic etiology were classified into "distributive", "hypovolemic", or "obstructive shock".
Results: Of the 453 patients reviewed, there were 352 confirmed cases of CS. Of these, 131 had CS due to acute myocardial infarction (AMI), 213 had CS due to acute decompensated heart failure (HF), and 8 patients had non-AMI non-HF CS. Of the 101 patients identified not to have CS, etiologies included 23 distributive, 7 obstructive, and 10 hypovolemic. Notably, 61 patients did not have evidence of shock (Table 1).
Conclusions: Curated datasets from which complex statistical algorithms can be trained are needed. Patient and disease complexity and variations in resources and practice patterns including invasive hemodynamic monitoring, likely reduce traditional methodologies' ability to accurately identify patients. High-quality data is required for ongoing research and the advancement of CS care.

Table 1. Retrospective Review of Patients with ICD Codes for Cardiogenic Shock

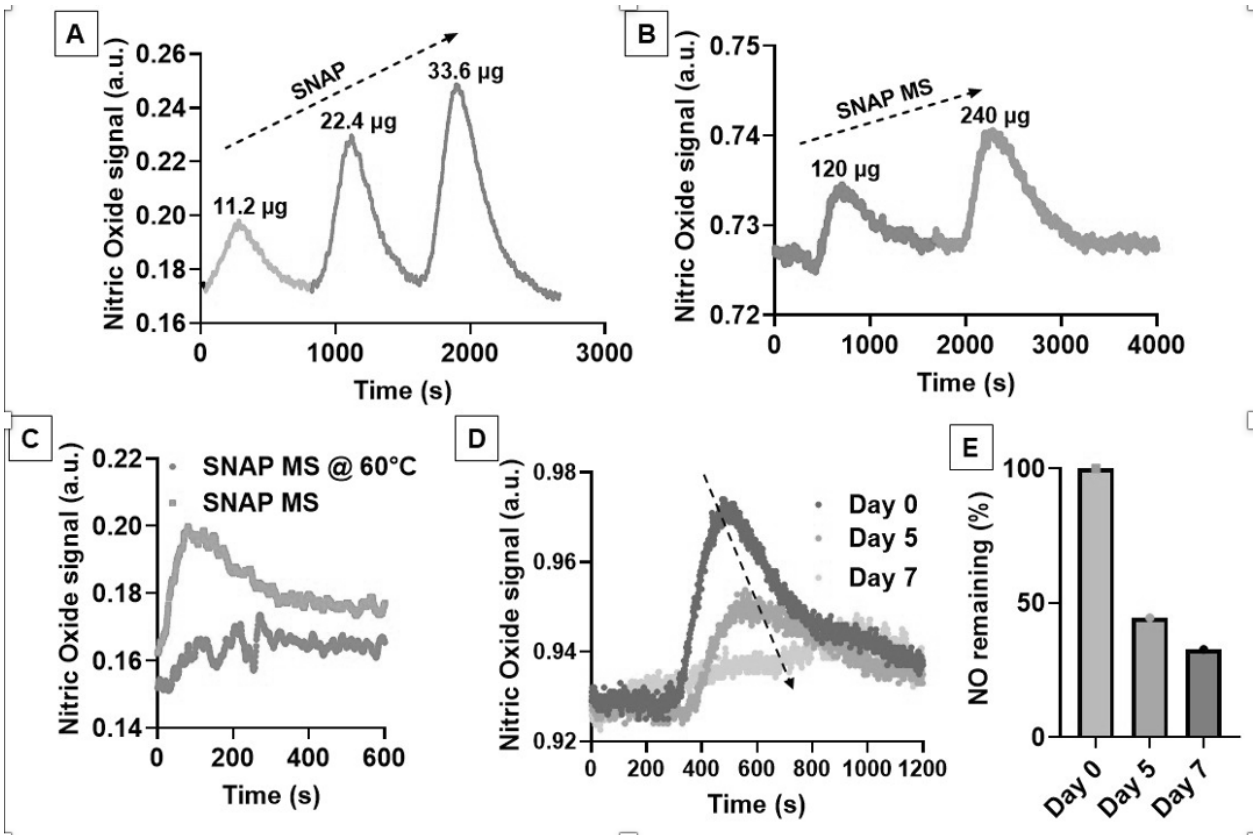
Total Patients	453
Patients in CS	352
AMI	131
ADHF	213
Non-AMI non-HF	8
Patients without CS	101
Reason for r/o	
Sepsis	23
Obstructive	7
Hypovolemic	10
No Shock	61
Mixed	78
Cardiogenic + Distributive	56
Cardiogenic + Obstructive	8
Cardiogenic + Hypovolemic	10
Cardiogenic, Hypovolemic, Distributive	3
Cardiogenic, Hypovolemic, Obstructive	1

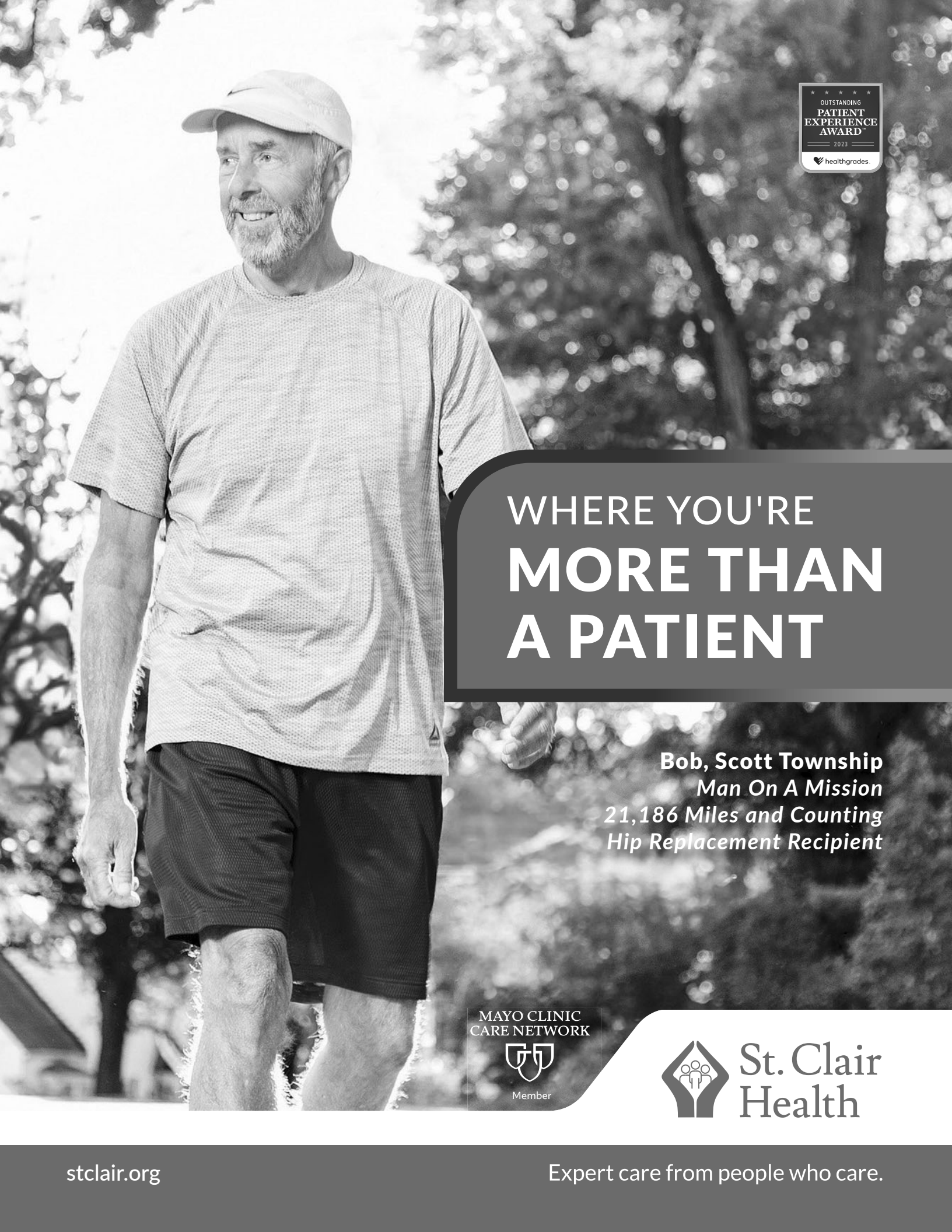


Nooruddin Pracha

Abstract 27: Quantifying Slow Release of Nitric Oxide from Microspheres

Purpose: Heart disease is one of the leading causes of death in the United States and throughout the world. While there are different techniques for reducing or preventing the impact of heart disease, nitric oxide (NO) administered through nitroglycerin, is one of the most well-known methods of reversing angina or chest pain. Unfortunately, due to its gaseous and short-lived half-life, NO can be difficult to study or even administer. Therefore, controlled delivery of NO is desirable for therapeutic use.
Methods: In the current study the goal was to fabricate NO-releasing microspheres (MS) using a donor molecule, S- Nitroso-N-Acetylpenicillamine, and encapsulating it in poly(ε-caprolactone) (PCL) using a single emulsion technique that can provide a sustained amount of NO to cells over time without posing any toxicity risks. Optimization of the fabrication process was performed by varying the duration of homogenization (5, 10, and 20 min) and its effect on entrapment efficiency and size. We developed a modified method for NO detection by using NO microsensors to detect the NO signal from SNAP MS which showed a sustained release behavior.
Results: We sought to evaluate the stability of SNAP when subjected to the formulation conditions like high-speed homogenization. This was performed by following the conventional NO detection method using NO microprobes. There was a gradual increase in the NO signal with the subsequent addition of SNAP. Similarly, a stock solution of SNAP was divided into two, and one of the samples was subjected to high-speed homogenization at 20,000 RPM for 20 min while the non-homogenized sample was placed at 4 ˚C for the same duration. After homogenization both the samples were tested by creating similar standard curves.The magnitude of NO signals generated were similar. These results confirmed that the SNAP when subjected to fabrication conditions like high-speed homogenization didn't undergo degradation. After confirming the stability we sought to evaluate the release of NO from SNAP MS by following the same conventional method, surprisingly, when SNAP MS produced a strong signal that plateaued instantly and showed no decline even after 24 h of continuous monitoring. This suggested that the SNAP MS altered the sensitivity of microsensors and the signal generated was an artifact.
Conclusions: This study focused on developing PCL microspheres loaded with SNAP and assessing the sustained release behavior by employing a modified NO detection method. By adopting the new method we were able to eliminate the interferences from additives and stabilized and detect NO in real-time.


A
Nitric Oxide signal (a.u.)
0.26
0.24
0.22
0.20
0.18
0.16
SNAP
11.2 µg
22.4 µg
33.6 µg
0
1000
2000
3000
Time (s)
B
Nitric Oxide signal (a.u.)
0.75
0.74
0.73
0.72
SNAP MS
120 µg
240 µg
0
1000
2000
3000
4000
Time (s)
C
Nitric Oxide signal (a.u.)
0.22
0.20
0.18
0.16
0.14
SNAP MS @ 60°C
SNAP MS
0
200
400
600
Time (s)
D
Nitric Oxide signal (a.u.)
0.98
0.96
0.94
0.92
Day 0
Day 5
Day 7
0
200
400
600
800
1000
1200
Time (s)
E
NO remaining (%)
100
50
0
Day 0
Day 5
Day 7


OUTSTANDING
PATIENT EXPERIENCE AWARD™
2023
healthgrades
WHERE YOU'RE
MORE THAN A PATIENT
Bob, Scott Township
Man On A Mission
21,186 Miles and Counting
Hip Replacement Recipient
MAYO CLINIC CARE NETWORK
Member
St. Clair Health
stclair.org
Expert care from people who care.