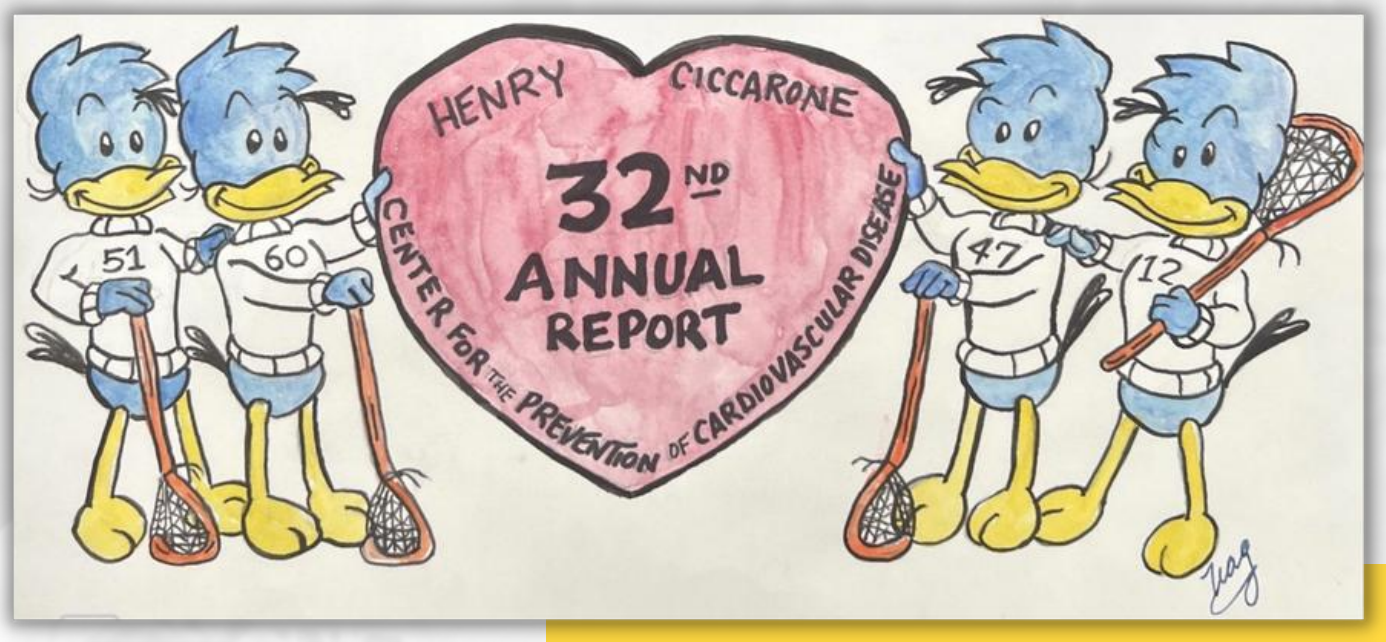
Johns Hopkins Ciccarone Center for the Prevention of Cardiovascular Disease



Annual Update 2022

Dedicated to Henry Ciccarone, Bob Scott, Fred Smith, Jerome Schnydman, & Simeon Margolis

FACING OFF AGAINST CARDIOVASCULAR DISEASE

JOHNS HOPKINS MEDICINE

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Staff and Fellows

Top Row: Ariel Abovich, MD, MPH; Hamied Alfaddagh, MD, MHS; Tala Al-Talib, MD; Marios Arvanitis, MD; Lili Barouch, MD; Michael J. Blaha, MD, MPH; Roger S. Blumenthal, MD; Eric Broni, MD, MPH

Second Row: Emily Brown, MGC, CGC; Kathy Byrne, CRNP; Miguel Caínzos-Achirica, MD, MPH, PhD; Oscar Cingolani, MD; Dorothy Davis, CRNP; Chloe Duvall, MD; Omar Dzaye, MD, PhD, MPH; Roberta Florido, MD, MHS

Third Row: Gary Gerstenblith, MD; Ty Gluckman, MD; Gowtham Grandhi, MD; Nino Isakadze, MD, MHS; Allison Hays, MD; Alan Jacobsen, MD; Michelle C. Johansen, MD; Trent Johnson, MD

Fourth Row: Steven Jones MD; Shireen Khoury, MD, MPH; Yaa Kwapong, MD, MPH; Thorsten Leucker, MD, PhD; Charles Lowenstein, MD; Cathy Handy Marshall, MD, MPH; Seth S. Martin, MD, MHS; Francoise Marvel, MD

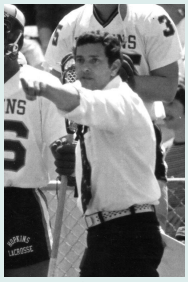
Fifth Row: Lena Mathews, MD, MHS; J. Bill McEvoy, MBBCh, MHS; Erin Michos, MD, MHS; Anum Minhas, MD, MHS; Hassan Mirbolouk, MD; Martin Mortensen, MD, PhD; Khurram Nasir, MD, MPH, MSc; Chiadi Ndumele, MD, MHS, PhD

Sixth Row: Jaideep Patel, MD; Wendy Post, MD, MS; Tanuja Rajan, MD, MPH; Elizabeth Ratchford, MD; Sudipa Sarkar, MD; Samantha Sender, CRNP; Garima Sharma, MD; Erin Spaulding, PhD, RN;

Seventh Row: Peter P. Toth, MD, PhD; Jeff Trost, MD; Seamus Whelton, MD, MPH; Katherine Wu, MD; Armin A. Zadeh, MD, PhD, MPH; Jelani Grant, MD; Matt Belanger MD; Ellen Boakye, MD, MPH

DIRECTOR'S LETTER

THE CICCARONE CENTER: A CHAMPIONSHIP TEAM UNITING A PROUD HOPKINS TRADITION



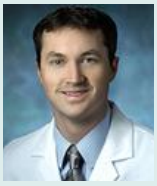
Over the past year, the Ciccarone Center team continued to do what we have been doing best for three decades: provide excellent clinical care and perform cutting-edge research. The Center was founded in 1990 to honor the legendary Hopkins Lacrosse Coach **Henry Ciccarone**, who died after his third heart attack at the age of 50. Coach Ciccarone's former players and friends, along with Hopkins physicians, sought to unite the proud traditions of Hopkins medicine and Hopkins lacrosse by creating a comprehensive clinical and research program to help prevent the disease that took his life.

This year's Annual Update is dedicated to four legendary contributors to the Hopkins lacrosse program: **Henry Ciccarone, Jerome Schnydman, Bob Scott,** and **Fred Smith**. We also dedicate this 32nd *Update* to the memory of another legendary Blue Jay, one who embodied the unity of Hopkins traditions: **Dr. Simeon Margolis**, a pioneer of Preventive Cardiology at Johns Hopkins and a former inductee to the Hopkins Athletic Hall of Fame based on his great basketball and baseball achievements. Interestingly, **32** is the number of my two favorite college lacrosse goaltenders of all time!

Simeon Margolis

Irene Pollin

The impact of the Ciccarone Center has steadily grown over the years, but in an unprecedented way since 2013, when heart disease prevention trailblazer Irene Pollin made a transformational $10 million gift to the Center. Her donation allowed me to become the inaugural Kenneth J. Pollin Professor of Cardiology, and we were able to greatly expand our clinical research and educational initiatives for faculty and trainees. Irene's gift also allowed us to establish the Pollin Cardiovascular Prevention Fellows program, and the list of distinguished recipients includes **Drs. Seth Martin, Bill McEvoy, Parag Joshi, Haitham Ahmed, Seamus Whelton, Roberta Florido, Rhanderson Cardoso, Hamied Alfaddagh, Kunal Jha, and Gowtham Grandhi.**



Michael Blaha

Once again, the Ciccarone Center team had many impressive accomplishments in the past year. For example, Ciccarone Center Co-Director **Dr. Michael Blaha**, an international leader in Epidemiology and Outcomes Research, received the Arthur Agatston Prevention Award for his pioneering research involving selective use of cardiac CT to improve cardiovascular risk prediction.

Dr. Blaha and Adjunct Faculty Member **Khurram Nasir, MD** – best known for their concept of the "Power of Zero," which they first developed as residents in 2009 – proposed that the absence of CAC identifies lower risk individuals who can focus on lifestyle modification and less stringent treatment goals. Until then, the presence of advanced CAC was primarily used to guide more aggressive risk factor management.

Their proposal that selective use of CAC in intermediate risk individuals should be a "decision-aid" rather than a screening tool was adopted by the 2019 ACC/AHA Primary Prevention of Cardiovascular Disease Guideline that I co-chaired with former AHA President **Dr. Donna Arnett.** This information can play a pivotal role in shared decision-making about management of cardiovascular disease risk with more flexible treatment targets.

Drs. Blaha and Gowtham Grandhi, and **Dorothy Davis, CRNP**, MSN, run our Cardiometabolic Clinic at Green Spring Station.

They focus on patients with diabetes, metabolic syndrome, and/or obesity to help them improve their glycemic control, body weight, and lifestyle habits to reduce their cardiovascular risk. We are very happy that Dorothy Davis has achieved her CRNP certification.

On the other hand, we are sad that **Dominique Ashen, CRNP,** retired at the end of 2021. She was an outstanding clinician and researcher who played a key role in the growth of the Ciccarone Center for two decades. Fortunately, we were able to recruit another former Blue Jay, **Samantha Sender, CRNP,** to the Ciccarone Center. She was a Phi Beta Kappa Graduate of Johns Hopkins who did her nurse practitioner training at Emory. Our Ciccarone Center CRNPs are invaluable resources in helping our patients to improve their lifestyle habits and better understand the rationale for their management. The cornerstone of Preventive Cardiology is optimization of exercise and dietary patterns and the cessation of smoking.

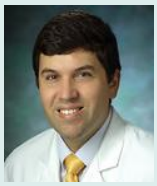
Last year, **Dr. Wendy Post,** the Director of Research for the Hopkins Division of Cardiology, along with Dr. David Kass, led the successful renewal of the longstanding Hopkins NIH T32 training program, which is now in its 47th consecutive year of funding. Dr. Post is the Director of Research for the Hopkins Division of Cardiology. She is an expert in the effects of HIV infection on cardiovascular disease risk and is one of the leaders in the Hopkins effort to study the long-term effects of COVID-19. In September, she was formally installed as the **Lou and Nancy Grasmick Professor of Cardiology,** becoming the first female cardiologist at Johns Hopkins to be awarded an endowed chair!


Erin Michos

The Center's Associate Director, **Dr. Erin Michos**, continued her unprecedented academic productivity in '22. She has mentored nearly 60 trainees and has received two prestigious Hopkins awards for mentoring. Dr. Michos also serves as Co-Editor-in-Chief of the *American Journal of Preventive Cardiology* and is an international leader in Preventive Cardiology. Additionally, she is the Director of Research for the Women's Cardiovascular Disease Program that has been funded by an extremely generous gift from long-term Ciccarone Center benefactors, **Richard and Katherine Amato.**

Dr. Seth Martin leads the Ciccarone Advanced Lipid Disorders Center, which includes **Drs. Steven Jones, Thorsten Leucker, Francoise Marvel, Marios Arvanitis, and Michos**, as well as **Kathy Byrne, CRNP**, genetics counselor **Emily Brown, MGC, CGC**, program manager **Sarah Lewis**, and colleagues in the specialty pharmacy. Their focus on patients with familial cholesterol disorders, statin intolerance, and elevated Lp(a) has been a model for others around the country.

Dr. Leucker, who now directs the Cardiology Fellowship training program, serves as Director of the Ciccarone Center's Basic and Translational Biology subsection and works closely with Drs. Arvanitis and **Gary Gerstenblith**, an expert on cardiovascular aging, studying endothelial cell biology and the impact of PCSK9 (a cholesterol receptor controlling protein) on vascular function. They lead a collaborative research program in vascular genomics studying the genetics of atherosclerotic vascular disease.


Seth Martin

Drs. Martin and **Marve**l lead our Digital Health Innovation Laboratory, which is geared to Precision Medicine. Their Corrie mobile app was featured as a leading health innovation at Apple's Worldwide Developers Conference that reached 25 million people worldwide. Dr. Martin is Director and Principal Investigator of the Johns Hopkins Center for Mobile Technologies to Achieve Equity in Cardiovascular Health (mTECH), an American Heart Association (AHA) Strategically Focused Research Network Technology (SFRN) and Innovation Center. Dr. Martin is also President-Elect of the Greater Maryland Chapter of the American Heart Association Board.


Chiadi Ndumele

Dr. Chiadi Ndumele leads a separate AHA SFRN that is studying the role of adipokines (proteins secreted by fat cells and inflammatory cells) that affect metabolism. Drs. Ndumele, Florido, and Gerstenblith lead research related to links between diabetes, metabolic syndrome, overweight status, and heart failure. Thanks to an extremely generous donation from **Peter and Terry Nicholl**, Dr. Ndumele's team is focused on understanding why some overweight patients develop diabetes and heart failure, while others do not. **Dr. Michos** is now leading a 3rd AHA SFRN that will aim to improve participation among diverse populations in cardiovascular clinical trials!

Dr. Roberta Florido has directed our Cardio-Oncology Program and has published impactful articles on the prevention of heart failure with Dr. Ndumele. We are sad to report that Dr. Florido, her husband, Dr. Klitos Konstantinidis, and their

three children have recently relocated to Utah, but we will continue to collaborate with her.

We are pleased that **Dr. Tala Al-Talib**, the Medical Director of the Heart Vascular Institute at Green Spring Station, has joined our Ciccarone Center team and she will see Cardio-Oncology patients along with Dr. Kavita Sharma, and Kim Cuomo, CRNP. Dr. Blaha also collaborates with **Dr. Cathy Handy Marshall**, a Hopkins Oncologist with a special interest in Cardio-Oncology.


Lena Mathews

Dr. Lena Mathews, Director of Cardiac Rehabilitation, has worked closely with Drs. Marvel, Martin, and **Kerry Stewart** on a home-based cardiac rehabilitation program. **Dr. Garima Sharma** was recently promoted to Associate Professor of Medicine and is the Director of Cardio-Obstetrics and the American College of Cardiology (ACC) Governor of the Maryland Chapter. For the second straight year, Dr. Sharma was voted one of the Top Docs in *Baltimore Magazine*; this year, she was joined by Drs. Blaha and **Jeff Trost**, an Interventional Cardiologist who has led several Ciccarone Center manuscripts about optimal management of coronary heart disease.

Dr. Armin Zadeh, promoted to Professor of Medicine at Johns Hopkins in 2022, works with Drs. Blaha and Whelton to lead our research efforts in cardiac CT. Adjunct faculty **Drs. Miguel Cainzos-Achirica** and **Nasir** have worked closely with Dr. Blaha on innovative research regarding the use of CAC-based enrichment of randomized trials and cost-effective allocation of more expensive medications.

Dr. Jaideep Patel directs the Ciccarone Preventive Cardiology program at Greater Baltimore Medical Center (GBMC) and has established a unique clinic to evaluate the cardiovascular risk of South Asian adults and instruct them and their family members on how to lower their risk. **Dr. Stacey Schott** has a strong interest in improving quality of care and implementing cost-effective prevention strategies.


Allison Hays

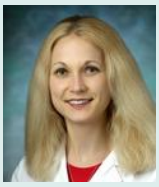
Drs. Allison Hays and **Kathy Wu** are national experts in echocardiography and cardiac MRI. Dr. Hays is a pioneer in the development of noninvasive cardiac MRI methods for measuring coronary endothelial function. She is the PI on two NIH RO1 grants and is evaluating the role of stress and vascular dysfunction in women with preeclampsia.

Dr. Kathy Wu's RO1 funded research focuses on personalized risk assessment for ventricular arrhythmias as a cause of sudden cardiac death.

Joining the Ciccarone Center faculty earlier this year, after serving as Chief Cardiology Fellow, **Dr. Anum Minhas**, focuses on adverse pregnancy outcomes, and she is working with Dr. Hays to evaluate endothelial function in postpartum women with a history of preeclampsia using innovative stress MRI techniques. Over the past year, she co-authored more than 20 impactful publications.


Lili Barouch

Dr. Lili Barouch is the inaugural Director of the Ciccarone Sports Cardiology program. An endurance athlete herself, she has a special interest in the cardiovascular conditions that affect competitive athletes. In addition, **Dr. Oscar Cingolani** leads our hypertension clinical and research program and excels in his many outpatient, inpatient, and educational duties.


Michelle Johansen

We are also fortunate to work with outstanding Adjunct Faculty, including **Drs. Ty Gluckman, Peter Toth, Bill McEvoy,** and **Martin Mortensen**. **Dr. Sudi Sarkar** and **Caitlin Nass, CRNP,** lead our collaborative work with the Johns Hopkins Diabetes Center and help train our fellows in Diabetes management. Dr. Blaha also collaborates with **Dr. Michelle Johansen**, a Neurologist who focuses on cerebrovascular disease.

Thanks so much to our many benefactors for making this possible. We have certainly put together a championship team that would make **Henry Ciccarone, Jerome Schnydman, Bob Scott, Fred Smith,** and **Simeon Margolis** very proud!

Roger S. Blumenthal, MD, FACC, FAHA, FASPC, FSCCT
The Kenneth Jay Pollin Professor of Cardiology
Director, Johns Hopkins Ciccarone Center for the Prevention of Cardiovascular Disease


Tammy Schnydman, Bob Scott, Jerome Schnydman

MORE THAN 500!

The Ciccarone Center publishes important original research articles, editorials, and review articles in many of the world's top Cardiology and Internal Medicine journals. From December 2021 through November 2022, the Center showed amazing. productivity, publishing more than 500 articles of significant basic and clinical research findings, commentaries, and review articles in many leading medical journals, including:

American Heart Journal: 5
American Journal of Cardiology: 14
American Journal of Medicine: 5
American Journal of Preventive Cardiology: 14
American Journal of Preventive Medicine: 6
Atherosclerosis: 11
ATVB: 3
Circulation: 9
Circ CV Quality Outcomes: 3
Circ CV Imaging: 4
Circ CV Arrhythmia & Electrophysiology: 2
Circ Heart Failure: 2
Circ Research: 4
Clinical Chemistry: 2
Diabetes Care: 1
European Heart Journal: 2
European Journal of Preventive Cardiology: 6
JACC: 19
JACC Advances: 2
JACC Basic Translational Science: 1
JACC Case Reports: 2
JACC CV Imaging: 14
JACC Heart Failure: 2
JACC CardioOncology: 1
JACC Clin Electrophysiology: 1
JAHA: 32
JAMA: 1
JAMA Cardiology: 5
JAMA Network Open: 3
Journal of Cardiovascular CT: 6
Journal of Clinical Investigation: 1
Journal of Clinical Lipidology: 5
Mayo Clinic Proceedings: 4
New Eng J of Med: 1
PLoS One: 4

Our Donors Make an Invaluable Difference

While our space here is limited, please know our gratitude is not. Philanthropic support of any amount has been greatly appreciated, but we'd like to take this opportunity to thank the following donors for their extraordinary investment in our clinical research and activities over the past year.

Make a Gift to the Ciccarone Center

Richard and Katharine Amato
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Joseph Popovich, Jr.
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Marshall Sashkin
Andrew Samet and Claudia Coenjaerts
Margaret and Benjamin Schapiro
Rosie and Donald Shepard
Eloise and Carter Shepherd
Edward St. John
Monica Uhlhorn
Dan Wagner
Karen Griswold

Nick and Suellen Paleologos + Jake Byrne in 2008

Wendy Post Becomes First Hopkins Female Cardiologist with an Endowed Professorship

Ed. Note: This is an excerpt of the speech delivered by Roger Blumenthal, MD, on September 8, at the ceremony naming Wendy Post, MD, MS, as the inaugural Lou & Nancy Grasmick Professor of Cardiology.

Drs. Anderson, DeWeese, Post, Grasmick, Daniels, & Lowenstein

This endowed Professorship is named for two very special Baltimoreans, **Dr. Nancy Grasmick** and her late husband Lou, both extraordinarily accomplished and generous people. **Lou Grasmick** needed to drop out of school to help support his family when his father died suddenly at a young age. Despite this, Lou built one of the largest lumber companies on the East Coast and he and Nancy became leading philanthropists.

Dr. Nancy Grasmick, the former Maryland superintendent of schools, is a close friend and fellow lacrosse enthusiast! Dr. Grasmick became a role model for women at a time when there were few women in leadership positions. Unfortunately, the number of women Cardiologists in the US has been small, and only three other women have been promoted to Professor in Cardiology at Johns Hopkins.

The first was the late Dr. Bernadine Healy, and subsequently Drs. Nisha Chandra and Pamela Ouyang. These women laid the groundwork for the path that Wendy has taken. Until Nancy Grasmick decided to partner with Wendy, no female Cardiologist at Hopkins had received a named Chair. Dr. Chandra recently wrote to her colleagues, "Finally the Promised Land for Women Cardiologists at Hopkins has been reached! We are all so immensely proud!"

Dr. Post completed her undergraduate education at Harvard, her medical school at Columbia, and her internal medicine residency at Harvard's Beth Israel Hospital. The residency director at Beth Israel, Dr. Rick Shannon, described her as a "Renaissance Woman," with many accomplishments in both science and music. Prior to starting her cardiology training, she completed a research fellowship at the Framingham Heart Study and received her Master's degree at the Harvard School of Public Health.

Innumerable Accomplishments

Dr. Shannon's characterization of Wendy was correct; her accomplishments have been innumerable since joining the faculty in 1997. Wendy is the Chair of the Steering Committee for the NIH-funded Multi-Ethnic Study of Atherosclerosis (MESA). She recently led an analysis in MESA, published in *Circulation*, which demonstrated continued mortality inequities among racial and ethnic minorities in our country. She described that common social disparities that are often linked to race, such as a person's neighborhood, education, income, and access to health care, explain many of these differences, thus emphasizing the need to act on these deeply rooted factors in our society that lead to marked differences in longevity.

Her most seminal genetics work, as a leader of an international research consortium, was the discovery that the levels of a protein, known as lipoprotein(a), and its common genetic variants lead to aortic valve calcification and aortic stenosis. Her work was published in the *New England Journal of Medicine.*

Wendy also is an international leader in the science and pathophysiology of cardiovascular disease in people living with HIV. She leads the Multicenter AIDS Cohort Study (MACS) cardiovascular disease sub-study and has been the PI for three R01 grants from NHLBI.

A Role Model for Many

Wendy is a role model for academic physicians throughout the country. But most importantly, to me and our son Ross, she is a wonderful and caring wife and mother. One of her true joys has been to attend nearly all of Ross's athletic events throughout his life. It has also been so much fun watching Ross excel on the lacrosse field as a goalkeeper and become a star, clutch Division I student-athlete.

Many of her colleagues and friends wrote to express their gratitude for Wendy's mentorship and leadership.

• **Allison Hays**: "Wendy has a unique skill of bringing out the best in her mentees. She has had a profound impact through her research, mentorship, leadership, and fundraising."
• **Kathy Wu**: "Wendy always strives to do what she feels is best for the team without self-interest. She is personally invested in my success. She's the quintessential unifier and coach, who motivates the team to achieve a common goal."
• **Chiadi Ndumele**: "Wendy is a true inspiration, as she brings together visionary science, outstanding leadership, generous mentorship, and clarity on how to move large initiatives forward. She is a role model for all of us at Hopkins and in the broader scientific community."
• **Dr. Clyde Yancy** referred to Dr. Post as "the exemplary endowed professor." He stated that such an honor is not awarded based on an aggregate receipt of RO1 awards and a threshold H index – instead, a true professorship requires both scholarship and character and both accomplishment and resolve. He characterized Wendy as "the prototypical triple threat in Academic Medicine with excellence in clinical care, research, teaching) and an ideal heir to the ethos of Medicine established at Johns Hopkins.

News & Highlights

Drs. Mukherjee, Hays, Minhas, Post, & Whelton

A Professor of Medicine and Epidemiology at Johns Hopkins and Director of Research for the Division of Cardiology, **Dr. Post** was also selected by the National Institutes of Health (NIH) to serve as the Chair of the Steering Committee of the Multi-Ethnic Study of Atherosclerosis (MESA).

Kudos to **Anum Minhas, MD, MHS**, who joined the Hopkins faculty in July 2022 and is helping build the women's cardiovascular health program together with **Drs. Garima Sharma, Erin Michos,** Sammy Zakaria, **Lili Barouch,** and Jason Vaught.

In January, **Drs. Roger Blumenthal** and **Armin Zadeh** participated in "What's Broken in Cardiology and How It Might Be Fixed," based on a paper they co-authored. The conversation, posted on "On Record with Shelly Wood," a podcast on TCTMD.com and produced by the Cardiovascular Research Foundation, addresses prioritizing prevention and prognostics. You can watch the recording here: https://tinyurl.com/2gfq4nwq.

Erin Michos, MD, MHS, Research Director of Women's Cardiovascular Health and Associate Director of Preventive Cardiology, presented "Female-specific Factors and Their influence on the Cardiovascular Health of Women Across the Lifespan" at the 8th Annual Healthy Hearts for Women Virtual Symposium, in early February.

Dr. Michos gave Cardiology Grand Rounds at numerous academic centers in February, including Intermountain Health, University of Kentucky, INOVA, University of Chicago, UCLA, University of Illinois at Chicago, and University of Pennsylvania. She also presented a Women's Health Symposium webinar, "Interconnection of Mind, Heart & Body," where she discussed how psychological factors affect women's heart health at Johns Hopkins Suburban Hospital and at an AHA-sponsored webinar for Heart Month in February. Thank you for your continued leadership on women's cardiovascular health, Dr. Michos!

Congrats to **Dr. Minhas**, the 2022 recipient of the Johns Hopkins Clinical Research Scholars KL2 Award. Dr. Minhas received the award to study the role of angiotensin type 1 receptor antibody in mediating microvascular and macrovascular endothelial function in postpartum women with preeclampsia. Her mentors for this project include **Drs. Allison Hays** and Josef Coresh, as well as **Drs. Michos, Chiadi Ndumele, Steve Schulman** and Jason Vaught.

Allison Hays

Congratulations are also in order for **Dr. Hays**, this year's recipient of the Frederick L. Brancati Excellence in Mentoring Award. The award honors an early or mid-career faculty member within the Department of Medicine who serves as a model for integrity and professionalism, helping mentees to select their career path by providing guidance, advancing their career through clinical and research opportunities, integrating them into research teams, developing academic skills, disseminating their work, and balancing career and personal life.

Lili Barouch, MD, was selected to be the first Director of the Sports Cardiology Program, a new Ciccarone Center subsection of multidisciplinary specialists who provide comprehensive care for athletes and highly active individuals. Dr. Barouch and her team provide care in the areas of Preventive Cardiology, Electrophysiology, Cardiomyopathy, multimodality imaging, and exercise performance testing.

Garima Sharma, MD, has been selected to serve as a member of the program committee for the American College of Cardiology 72nd Annual Scientific Session, together with the World Congress of Cardiology, in New Orleans, March 4-6, 2023. The committee develops the overall educational program for ACC.23, which is comprised of 10 clinical pathways.

Peter Toth

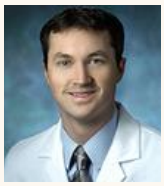
We're pleased to announce that **Peter P. Toth MD, PhD**, has been appointed to the Johns Hopkins Faculty as Adjunct Professor of Medicine. Dr. Toth serves as Director of Preventive Cardiology at CGH Medical Center in Sterling, Ill., and Professor of Clinical Family and Community Medicine at the University of Illinois College of Medicine in Peoria. He recently finished a highly productive term as President of the American Society of Preventive Cardiology.

News & Highlights

Roger Blumenthal

In May, **Roger Blumenthal, MD**, was awarded the 2022 Susan M. MacDonald Annual Sponsorship Award for Excellence in Sponsoring Career Advancement of Women Faculty. This award recognizes a Department of Medicine Faculty member who has demonstrated a commitment to supporting and advancing women faculty and fellows by acting as a sponsor. Sponsorship activities include nominating women for awards, editorial boards, meeting/session chairs, high profile institutional and national committees, as well as coaching women for leadership roles. Congrats, Dr. Blumenthal, on being the first member of the Cardiology Division to win this award.

Chiadi Ndumele, MD, PhD, MHS, was recently selected to serve as Vice Chair of the Leadership Committee of the Council on Lifestyle and Cardiometabolic Health of the AHA. The Council leadership guides and directs the group's objectives, strategic plan and programs to indicate priority areas to be addressed at conferences and in scientific initiatives. They also provide input into community programs, identify members for writing groups and editorial positions, and help integrate the Council operations with various other AHA activities.



Michael Blaha

Kudos to **Dr. Blaha**, who was named the 2022 Arthur S. Agatston Cardiovascular Disease Prevention Award winner in May. This award, presented by the Society of Cardiovascular Computed Tomography, recognizes individuals whose pioneering efforts have saved lives from the leading cause of death throughout the world, coronary artery disease. It's named in honor of the visionary pioneer in the field of noninvasive cardiac imaging and one of the world's leading Preventive Cardiologists, Dr. Arthur Agatston. Prior recipents of this prestigious award include **Drs. Roger Blumenthal** and **Khurram Nasir**.

Simeon Margolis, Dedicated Endocrinologist and Educator

Renowned endocrinologist Simeon "Moan" Margolis, MD, PhD, spent all but two of his more than 50-year career at Johns Hopkins. Margolis, a Professor of Medicine and Biological Chemistry, who dedicated his practice to management of diabetes and the prevention of coronary heart disease, died on May 16 at the age of 91 in Baltimore.

"A Hopkins icon, Dr. Margolis was one of the pioneers of Preventive Cardiology and aggressive cholesterol and risk factor management," said Hopkins cardiologist Roger Blumenthal. Margolis was a co-investigator on a 1984 study that showed that cholestyramine lowered cholesterol and decreased coronary heart disease events. This was three years before the first statin was on the market.

While working on his premed studies at Hopkins, Margolis played for the Johns Hopkins baseball and basketball teams. To this day, he holds the JHU basketball record for single-game scoring — 44 points. He was inducted into the Hopkins Athletic Hall of Fame in 1997.

After residency training in the Osler Medical Service and two years at the NIH, Margolis returned to Hopkins for his PhD in biochemistry in 1964, then served as Chief Osler Medical resident. He directed the Division of Endocrinology and Metabolism from 1968-82 and 1985-90 and served as the associate dean for academic affairs from 1984-90 and associate dean for faculty affairs from 1990–92.

From 1992-96, he was co-director of the Ciccarone Center for Prevention of Cardiovascular Disease, where he focused on lipid disorders, metabolic syndrome and diabetes. In working to educate the general public, Margolis was editor of *Johns Hopkins Medical Letter: Health After 50*, for more than 20 years. He also wrote a health column in the Baltimore Sun for 10 years and columns for Yahoo! Health for several years.

In 2013, in recognition of the scholarships that enabled him to attend Johns Hopkins, he and his wife established the Simeon G. Margolis, MD, PhD, and Mary A. Margolis Family Endowed Scholarship Fund to support school of medicine students. His late wife, who was his high school sweetheart, worked for The Johns Hopkins Hospital for more than 40 years as a budget administrator and secretary. A mentee of Margolis and school of medicine graduate, Charles Homcy, later established an endowed professorship of neuroscience in both of their names.
-- *Marc Shapiro*

News & Highlights

Sherita Golden, MD, MHS, received the 2022 Alumni Association President's Award from University of Maryland, her undergraduate alma mater. This prestigious honor celebrates noteworthy alumni who excel in their field. Dr. Golden was recognized at the Celebration of Terps event in April.


Garima Sharma

In May, **Dr. Garima Sharma** received an AHA "Research Goes Red" grant on health-related social needs of women at increased risk of hypertension. Entitled "The Social Determinants of the Risk of Hypertension in Women," the study aims to risk stratify women of reproductive age based on the "polysocial risk score" of the population in the inner city of Baltimore.

Dr. Sharma will be focusing on assessing and optimizing cardiovascular health and health literacy of women at increased lifetime risk of hypertension. Collaborators include **Dr. Yvonne Commodore-Mensah** from the Johns Hopkins School of Nursing, as well as colleagues from NIH, Duke, Columbia, Houston Methodist, and Ohio State.


Omar Dzaye

The German Roentgen Society awarded the 2022 Wilhelm Conrad Roentgen Prize to **Omar Dzaye, MD, MPH, PhD.** Dr. Dzaye received the award for his work on the use of radiological imaging in cardiovascular risk assessment and prevention of vascular disease. His research findings with **Dr. Blaha** have shown that the coronary calcium score could also be used more as a general health indicator and not just as a marker for the presence of obstructive coronary artery disease.

Cheers to **Armin Zadeh, MD, PhD, MPH**, the Director of Cardiac CT at the Johns Hopkins, who in June was named a full Professor of Medicine at the Johns Hopkins University School of Medicine. Dr. Zadeh and **Dr. Valentin Fuster** helped to conceive the paradigm of a risk continuum from atherosclerosis.

As Director of the Advanced Lipid Disorders Program and Digital Health Lab, **Seth Martin, MD, MHS,** added another title beginning July 1, 2022: President-Elect for the 2022-23 Campaign Year of the AHA's Greater Maryland Division Board. As President of the local AHA chapter, Dr. Martin will provide overall direction, with a particular emphasis on advancing the health of the community and serving as a champion of health equity and addressing the evolving needs of our increasingly diverse communities.


Francoise Marvel

Francoise A. Marvel, MD, has been selected to serve on the National Atrial Fibrillation Systems of Care Advisory Group. Dr. Marvel, an Assistant Professor, is the co-creator with Dr. Martin of the medical app Corrie, aimed at improving the recovery of heart attack patients. They are leading a team of physicians, nurses, designers and engineers who are collaborating with Apple on the tool. The Advisory Group's primary focus is the strategic development, implementation, direction, and evaluation of quality improvement programs.

Congratulations **Dr. Martin** and colleagues for winning the PCORI In-person and Telehealth CR Application Award. Entitled "Comparative effectiveness of in-person and telehealth cardiac rehabilitation," the primary goal of this research is to study the comparative effectiveness of in-person cardiac rehabilitation (CR) and telehealth CR in diverse patients with chronic heart disease at multiple health systems. This research will study factors influencing implementation of and participation in telehealth CR.

Dr. Martin continued his winning streak at the European Society of Cardiology's (ESC) annual meeting in Barcelona in August: the abstract/poster that he presented in collaboration with **John Kastelein, MD, PhD**, and team was ranked the #1 poster at ESC Congress 2022. The poster showed that, in European patients with dyslipidemia receiving a CETP inhibitor, there was improved LDL-C accuracy using contemporary equations versus the Friedewald equation, and the greatest accuracy was observed by the Martin/Hopkins equation that was developed by Drs. Martin and **Steve Jones.**

Big congratulations to **Thorsten Leucker, MD, PhD,** a Preventive and Critical Care cardiologist with the Ciccarone Center, who was recently named Director of the Johns Hopkins Cardiovascular Diseases Fellowship Program. Dr. Leucker has played a major role in fellow development in the program for many years.


Elizabeth Ratchford

Dr. Elizabeth Ratchford, associate professor in the Division of Cardiology and Director of the Johns Hopkins Center for Vascular Medicine, was chosen as President-Elect of the Society for Vascular Medicine (SVM) at the Annual Business Meeting in Denver on October 1, 2022. Her two-year term as president-elect and chair of the Scientific Program Committee will begin

following the 2023 Vascular Scientific Sessions in Washington, D.C. Dr. Ratchford has been active as a leader in the SVM during her 18 years of membership, having served on the Board of Trustees since 2015 and on the Executive Board as Secretary since 2019. Since 2014, she has also been on the editorial board for the Society's journal, *Vascular Medicine*, serving as editor of the Vascular Disease Patient Page.


Nino Isakadze

Dr. Marvel is leading, in close collaboration with **Drs. Nino Isakadze and Dr. Martin,** an ACC grant to help extend access to digital health cardiovascular prevention to young adults in the Baltimore community by teaming with CardioNerds and Morgan State University. Dr. Marvel and Dr. Martin presented together at the national AHA Research Leaders Academy on "Digital Health Tools vs. Digital Divide."

Drs. Martin, Marvel, and Mathews, in collaboration with colleagues at University of California San Francisco, University of Michigan, and University of Pittsburgh, have received a $5M award from the Patient-Centered Outcomes Research Institute (PCORI) for a project entitled "Comparative effectiveness of in-person and telehealth cardiac rehabilitation." The primary goal is to study the comparative effectiveness of in-person cardiac rehabilitation vs. home-based, technology-enabled telehealth cardiac rehabilitation in diverse patients with chronic heart disease at multiple health systems. The team will also study factors influencing implementation of and participation in cardiac rehabilitation.


Alan Jacobsen

Drs. Alan Jacobsen and J. Bill McEvoy, MBBCh, MHS led a featured review in the *American Journal of Preventive Cardiology* about climate change and Preventive Cardiology. Their goal was to inspire clinicians to invest more time in communication to their patients about this most important public health issue. They also led an analysis of the strengths and weaknesses of the data linking isolated diastolic hypertension to future cardiovascular events.

Seeking to Reduce Myocardial Infarctions and Strokes and Their Consequences

Considerable progress has been achieved in the implementation of strategies and therapies to address the known atherosclerotic risk factors of hypertension, dyslipidemia, current cigarette use, and others. Nevertheless, millions of Americans continue to experience myocardial infarctions and strokes each year, and the consequences of those events, including heart failure and lifelong significant disability.

Drs. Gary Gerstenblith, Director of Clinical Trials for Cardiology, and **Thorsten Leucker, MD, PhD**, Director of Basic and Translational Vascular Biology Research in the Ciccarone Center, are seeking to understand what additional, "residual" risk factors account for this discordance and how that knowledge can be used to more effectively prevent first, and recurrent, atherosclerotic events. Vascular dysfunction is an important driver of the development of atherosclerosis and of many of the accompanying clinical events. This year they completed enrollment in a 160-patient clinical trial of an inhibitor of proprotein convertase subtilisin/kexin Type 9 (PCSK9) administered during the hospitalization in patients with acute myocardial infarction that will provide important data that will improve secondary prevention approaches. Among several questions they are addressing in the program are:

- Whether PCSK9 inhibition decreases myocardial and vascular inflammation. This question is based, in part, on prior work indicating that PCSK9 mediates inflammation-induced dysfunction in isolated endothelial cell preparation. Decreasing myocardial inflammation is expected to decrease adverse remodeling and subsequent cardiac dysfunction, as well as slow progression of atherosclerosis.
- Their published results on PCSK9 inhibitors demonstrated the early impact, over and above that of high dose statins, on lipid levels in the high-risk peri- and early post-infarction time points.
- Whether platelet activation, important in the development of arterial thrombi, is increased in the peri-infarction period despite currently available, dual, anti-platelet therapies. Histology studies of vascular specimens obtained during coronary bypass operations in patients previously enrolled in this study indicate PCSK9 interactions with platelets and vascular endothelial cells in the placebo-administered patients, but not in those who received the PCSK9 inhibitor; this suggests an important role of PCSK9 in mediating endothelial cell/platelet interaction in the peri-infarct period.

Drs. Gerstenblith and Leucker also are co-editing a new book, *Cardiovascular Disease in the Elderly* and are contributing a chapter on vascular aging.

News & Highlights


J. Bill McEvoy

Dr. McEvoy recently co-wrote a high-profile editorial on the use of aspirin for primary prevention in the *Annals of Internal Medicine*. Moreover, he was a co-author on the 2021 ESC Guidelines on cardiovascular prevention in clinical practice. **Drs. Glenn Levine** and McEvoy recently led an AHA Scientific Statement in Circulation on the management of patients with a left ventricular thrombus or those at increased risk for it.

A collaborative team of Ciccarone faculty, including **Drs. Marvel, Mathews,** and **Martin**, as well as fellows **Dr. Isakadze** and **Dr. Kim**, working with patients, caregivers, engineers, and others, submitted an application that earned Johns Hopkins Hospital a CDC "Million Hearts Recognition Program" designation in four key areas: Keeping People Healthy, Optimizing Care, Improving Outcomes for Priority Populations, and Innovating for Health. The program honors institutions working to improve the cardiovascular health of the population and communities they serve.

The year-long application process began with a presentation by Dr. Martin to the CDC Million Hearts group about the Corrie Hybrid Virtual Cardiac Rehab program. Additional Ciccarone partners were invited to contribute to the application from Johns Hopkins Employee Health, led by **Dr. Rich Safeer**, and the Johns Hopkins Center for Health Equity, led by **Dr. Lisa Cooper**.

On World Heart Day, **Dr. Jaideep Patel** and others were invited to speak on novel concepts for risk prediction, detection, and prevention on myocardial infarction in South Asians by The American Association of Physicians of Indian Origin. Dr. Patel spoke on the use of coronary artery calcium to aid risk stratify alongside **Dr. Sekar Kathiresan**, chief executive officer and co-founder of Verve Therapeutics). This was the highest attended CME session in the organization's history.


Ty Gluckman

In February, **Dr. Ty Gluckman** led an important paper in JACC with **Drs. Aparna Sajja**, **Blumenthal**, and **Martin**. They found that clinically meaningful differences in estimated LDL-C exist among commonly used equations, particularly at TG levels of ⩾150 mg/dL and/or lower LDL-C levels. They concluded that reliance on the Friedewald and Sampson equations may result in the underestimation and undertreatment of LDL-C in those at increased risk. Because the Martin/Hopkins equation is easy to implement and has no additional cost to patients, they concluded that it is the most practical approach to estimate LDL-C.

Congratulations to **Dr. Lena Mathews**, who gave birth to her first baby, Benjamin, on May 14, 2022.

Kudos to **Drs. Martin Tibuakuu and Seth Martin**, who are working to create a digital platform/smartphone app that will enable patients in Ghana and other parts of Africa to keep track of their cardiovascular health indices, such as physical activity level, weight, blood pressure readings, and blood cholesterol levels. The team submitted a proposal to Google and were awarded $30,000 in funding and an additional $5,000 in Cloud Credits. For health intervention to be successful in low- and middle-income countries like Ghana, there is an absolute need for an effective and cost-efficient modality for tracking healthy behaviors in large populations.

Drs. Martin and **Tibuakuu** identified that using Fitbit technology in an intervention has the potential to promote healthy lifestyles, like increasing physical activity, and will also serve as a great resource for clinicians in terms of patient monitoring and guiding/initiating discussions regarding cardiovascular risk factor modification. They plan to educate physicians in Ghana on Fitbit capabilities and determine if this facilitates physician-patient discussions regarding healthy life choices in Ghana.

Baltimore Magazine recognized close to 100 Johns Hopkins physicians as "Top Doctors" of 2022, including **Drs. Blaha, Sharma, Jeff Trost, and Rani Hasan**. This acknowledgement comes from an annual peer survey in which thousands of the metro area's physicians vote on which doctor they would send a friend or member of their family to.

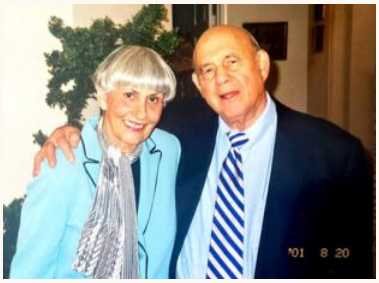

Erin Spaulding

Congrats to **Erin Spaulding, PhD, RN,** Assistant Professor at Johns Hopkins School of Nursing and longstanding collaborator on Ciccarone Center digital health programs, who received a New Nursing Faculty Fellowship from The Maryland Higher Education Commission for $50,000, over a five-year period. This award supports new nursing faculty to continue increasing Maryland's academic capacity to educate nurses and address the nursing shortage.

Stanley L. Blumenthal, MD, Cardiology Research Awards

Since 2004, the annual Stanley L. Blumenthal, MD, Cardiology Research Awards have been presented to the Hopkins postdoctoral fellows, graduate students, or housestaff submitting the best abstracts to major research meetings. The awards were established in 2003 by the family and friends of the late **Stanley L. Blumenthal**, MD, a Phi Beta Kappa graduate of Johns Hopkins University and the School of Medicine. Dr. Blumenthal began his Pediatrics training at Hopkins before moving to the University of Michigan to be a senior resident and then to Harvard's Boston Children's Medical Center to do Pediatric Cardiology training. He then worked at the National Children's Medical Center in DC and George Washington University, and he had a large clinical practice in Silver Spring, MD.

The awards are bestowed following the yearly Johns Hopkins Cardiovascular Research Retreat, which this year was held on November 1 at the Mt. Washington Conference Center. Cash prizes and certificates were awarded to the following outstanding young cardiovascular disease researchers.



Anita and
Dr. Stanley L. Blumenthal

First Place

- **Richard Carrick, MD,** "Use of ECG Deep-Learning to Identify Hypertrophic Cardiomyopathy Patients with Imaging-Based High-Risk Features." Mentor: **Katherine Wu, MD**
- **Jana Lovell, MD,** "Mechanistic Analysis of Sex Differences in the Cardiosplenic Axis of Chronic Heart Failure." Mentor: **Luigi Adamo, MD, PhD**
- **Tess Peterson, PhD,** "Gene Expression in Circulating Monocytes and Myocardial Strain: The Multi-Ethnic Study of Atherosclerosis (MESA)." Mentors: **Katherine Wu, MD, & Wendy Post, MD**
- **Edwin Yoo, MD, PhD**, "Non-viral Myocardial Gene Delivery To Revolutionize Heart Failure Therapy." Mentor: **David Kass, MD**

Second Place

- **Deepthi Ashok, PhD**, "Role of Viral RNA-triggered Innate Immune Activation on Cardiac Arrhythmias Associated with COVID-19." Mentor: **Brian O'Rourke, PhD**
- **Joseph Goldenberg, MD**, "Energetic Basis of Diastolic Dysfunction in HIV Infection." Mentor: **Robert Weiss, MD**
- **Axel Fenwick, PhD**, "HFpEF Animal Models Display Differences in Myofibril Mechanics." Mentor: **Anthony Cammarato, PhD**
- **Sean Murphy, PhD**, "Regulators of Cell Fate Stability in Cardiac Reprogramming." Mentor: **Chulan Kwon, PhD**
- **Mariam Meddeb, MD**, "ATP Citrate Lyase; A Guardian of the Cardiac Mitochondrial Metabolism." Mentor: **David Kass, MD**
- **Iman Hassani, PhD,** "Engineering Obese Cardiac Microenvironment to investigate Adipocyte-Cardiomyocyte Interactions." Mentor: **Deok-Ho Kim, PhD**
- **Omar Dzaye, MD,** "Polygenic Score and Extreme Coronary Artery Calcium Phenotypes (CAC=0 and CAC >1000) in Adults >75 Years Old: The Atherosclerosis Risk in Communities Study." Mentor: **Michael Blaha MD, MPH**
- **Kimberly Ferrero, PhD,** "Mitochondrial CaMKII as a Driver of Cardiometabolic Dysfunction." Mentor: **Mark Anderson, MD, PhD**

Providing Specialized Cardiovascular Care for Athletes

Lili Barouch

Once focused narrowly on healthcare delivery to elite athletes, Sports Cardiology, an emerging subspecialty of cardiology, now encompasses the burgeoning number of people who are physically active. The Sports Cardiology Program was recently established by the inaugural director, **Dr. Lili Barouch,** Associate Professor of Medicine, as a part of the Ciccarone Center for Preventive Cardiology and the Johns Hopkins Heart and Vascular Institute. The program is staffed by cardiovascular experts and other multidisciplinary team members focused on providing specialized cardiovascular care for athletes and highly active individuals.

RESEARCH PUBLICATIONS

Antiplatelet/Antithrombotic

Al-Abdouh A…**Michos ED…**Paul TK. P2Y12 Inhibitors versus aspirin monotherapy for long-term secondary prevention of ASCVD Events: systematic review & meta-analysis. *Curr Probl Cardiol*. 2022 Oct;47(10):101292**.**
Conclusion: Use of P2Y12 inhibitor monotherapy is associated with lower rates of MI & stroke in ASCVD patients without any significant difference in mortality or bleeding compared to aspirin monotherapy.

DeFilippis AP…**Post WS**…Tsimikas S. **A**therothrombotic factors & ASCVD events: MESA. *Eur Heart J*. 2022 Mar 7;43(10):971-981.
Conclusion: Two atherothrombotic factors (Factors 1 & 2), one representative of thrombotic propensity & the other of fibrinolytic propensity, were significantly & complementarily associated with incident ASCVD events after controlling for traditional risk factors; they have promise for identifying patients at high ASCVD risk due to their atherothrombotic profile.


Alan Jacobsen

Jacobsen AP, Lim ZL…. **Blumenthal RS, Martin SS, McEvoy JW.** Contextualizing national policies regulating access to low-dose aspirin in America & Europe using the full report of a transatlantic patient survey of aspirin in preventive cardiology. *J Am Heart Assoc*. 2022 Apr 19;11(8):e023995.
Conclusion: Many patients have poor insight into their 10-year CVD risk & do not know the role of aspirin in prevention; aspirin is mainly obtained OTC in America, while most European countries restrict access to aspirin.

Amin AP…**Gluckman T**….Rao SV. The bleeding risk treatment paradox at the physician & hospital level: implications for reducing bleeding in patients undergoing PCI. *Am Heart J.* 2022;243:221-231.
Conclusion: Bleeding risk-treatment paradox (RTP) is a strong & independent predictor of bleeding.

Mathews L… Ndumele CE, Crews DC. Prevalence of guideline-directed medical therapy (GDMT) for CVD among Baltimore city adults in the HANDLS Study. *J Racial Ethn Health Disparities.* 2022;9(2):538-545.
Conclusion: Among adults in Baltimore City, the use of secondary prevention of CVD was low, with lower aspirin & combination GDMT for Black participants with CAD.

Almagal N, **Cainzos-Achirica M, McEvoy JW.** Mind the gap: primary prevention aspirin & the danger of suboptimal implementation of contemporary guidelines into clinical practice. Circ *Cardiovasc Qual Outcomes.* 2022;15(3):e008799.
Conclusion: In primary prevention, aspirin should be restricted to the highly select group of asymptomatic individuals at high absolute ASCVD risk and low risk of bleeding.

Weze KO, **Obisesan OH, Dardari ZA, Cainzos-Achirica M, Dzaye O, Graham G… DeFilippis AP, Nasir K, Blaha MJ, Osei AD.** Interplay of race/ethnicity & obesity on the incidence of venous thromboembolism. *Am J Prev Med.* 2022 Jul;63(1):e11-e20.
Conclusion: Obesity confers an increased risk for venous thromboembolism among non-White women compared with other groups.

Arrhythmias

Minhas AMK…**Michos ED**, Fudim M. Trends & inpatient outcomes of primary atrial fibrillation hospitalizations with underlying iron deficiency anemia. *Curr Probl Cardiol*. 2022 Oct;47(10):101001.
Conclusion: Among hospitalized patients with atrial fibrillation, there was no difference in all-cause mortality between those with & without iron deficiency anemia.

Ma Y…**Post WS, Michos ED**, Heckbert SR. Life's Simple 7 (LS7) Cardiovascular health score in relation to arrhythmias on extended ambulatory EKG monitoring (MESA). *Am J Cardiol*. 2022 May 1;170:63-70.
Conclusion: There was little evidence of association of the LS7 cardiovascular health score with subclinical cardiac arrhythmias, but a more favorable LS7 score & a lower BMI were associated with fewer PVCs.

Pezel T…**Post WS**…Lima JAC. Change in left atrioventricular coupling index to predict incident atrial fibrillation: MESA. *Radiology.* 2022 May;303(2):317-326.
Conclusion: Left atrioventricular coupling index [LACI]) & coupling change (annual change in LACI) were strong predictors of atrial fibrillation.

Austin TR…**Post WS**…Heckbert SR. Left atrial (LA) function & arrhythmias in relation to small vessel disease on brain MRI: MESA. *J Am Heart Assoc*. 2022 Oct 18;11(20):e026460.
Conclusion: In individuals without a history of CVA/TIA, alterations of LA structure & function, including enlargement, reduced strain, frequent PACs, & intermittent atrial fibrillation, were associated with increased markers of small vessel disease; detailed assessment of LA structure & function & extended ECG monitoring may enable early identification of individuals at greater risk of small vessel disease.

As an Assistant Professor in the Division of Cardiology, **Anum Minhas, MD**, focuses on cardiovascular disease in women, particularly as it relates to pregnancy complications, such as adverse pregnancy outcomes. She completed a Master's degree in Epidemiology in Cardiovascular Disease at the Bloomberg School of Public Health as an NHLBI T32 postdoctoral fellow and served as the Chief Cardiology Fellow prior to joining as a faculty member. Dr. Minhas was selected as a recipient of an NIH Clinical Research Scholars KL2 award in July 2022, and her current research is also supported through a Preeclampsia Foundation Vision Grant and an AMAG Pharmaceuticals Preeclampsia and Prematurity Grant.

Her research focuses on evaluating endothelial function in postpartum women with a history of preeclampsia using innovative coronary stress MRI techniques, guided by her primary mentors **Drs. Allison Hays** and **Josef Coresh**. Dr. Minhas is also exploring the associations of cardiovascular risk factors with pregnancy complications using large national cohort studies and registries.

Over the past year she has coauthored more than 20 impactful publications, notably using data from the NIH-sponsored Boston Birth Cohort, to show that consuming a healthier Mediterranean-style diet during pregnancy may reduce the risk of preeclampsia. Additionally, Dr. Minhas and her colleagues demonstrated an increased risk of cardiovascular complications among women with preeclampsia at the time of delivery.

She hopes to use her research to provide insights into biological manifestations of racial and social disparities and promote equity in maternal health. Dr. Minhas is passionate about medical education, designing and completing a dedicated year of Cardio-Obstetrics clinical and research training, one of the first of its kind nationally. Along with her mentors, she has published a curriculum for this unique subspecialty training so that future trainees may benefit from similar training. She is also the recipient of a grant from the Johns Hopkins Alumni Association and is working to create more mentoring opportunities for Cardiology fellows and women trainees.

Michos ED, Honigberg MC. Sex-specific factors associated with atrial fibrillation (AF) in women - rhythm of reproductive health. *JAMA Netw Open*. 2022 Sep 1;5(9):e2229723.
Conclusion: The time has come for health care professionals to get "into the rhythm" of routinely assessing reproductive history as part of standard CVD & AF risk assessment.

Refaat MM…**Blumenthal RS**…Mora S. Exercise-induced ventricular ectopy & cardiovascular mortality in asymptomatic individuals. *J Am Coll Cardiol*. 2021 Dec 7;78(23):2267-2277.
Conclusion: PVC's occurring only during exercise were not associated with increased risk, but high-grade PVCs during recovery were associated with long-term risk of CVD mortality.

Xie E…**Post WS**…Ambale-Venkatesh B. Intermediate markers underlying electrocardiographic predictors of incident atrial fibrillation: MESA. *Circ Arrhythm Electrophysiol.* 2021 Dec;14(12):e009805.
Conclusion: Machine learning was used to identify ECG predictors of atrial fibrillation.

Chen M…**Mathews L**…**Matsushita K.** Growth differentiation factor 15 & the subsequent risk of atrial fibrillation (AF): ARIC. *Clin Chem*. 2022;68(8):1084-1093.
Conclusion: In this biracial cohort, higher concentrations of GDF-15 were independently associated with incident AF, supporting its potential value as a clinical marker of AF risk.

Vakil RM…**Wu KC**. Association of clustered ventricular arrhythmia & cycle length with scar burden in cardiomyopathy. *JACC Clin Electrophysiol.* 2022;8(8):957-966.
Conclusion: Patients with nonischemic cardiomyopathy & scar were at the highest risk for ventricular arrhythmia.

Daimee UA,…**Wu KC**, Chrispin J. Association of tissue heterogeneity & intramyocardial fat on CT with ventricular arrhythmias (VA) in ischemic cardiomyopathy. *Heart Rhythm O2*. 2022;3(3):241-247.
Conclusion: In ischemic cardiomyopathy patients, contrast-enhanced CT-derived LV tissue heterogeneity was independently associated with VAs & may represent a novel marker useful for risk stratification.

Isakadze N…Hays AG…Barth AS. C-reactive protein elevation Is associated with QTc interval prolongation in patients hospitalized with COVID-19. *Front Cardiovasc Med.* 2022;9:866146.
Conclusion: QTc interval prolongation is observed with a marked elevation in CRP levels in patients with COVID-19.

Xie E…**Wu KC**, Chrispin J. Advanced imaging for risk stratification for ventricular arrhythmias & sudden cardiac death (SCD). *Front Cardiovasc Med*. 2022;9:884767.
Conclusion: The authors highlight the role of advanced imaging, namely cardiac MRI, SPECT, & PET, & its application to risk stratification for SCD including applications of machine learning.

Carrick RT…**Hays A**…**Wu KC**. Longitudinal prediction of ventricular arrhythmic risk in patients with ARVC. *Circ Arrhythm Electrophysiol*. 2022;e011207.
Conclusion: Ventricular ectopy, including both burden of PVCs & prevalence of NSVT decreased between time of diagnosis & 5-year follow-up, while structural & functional risk factors including RV function remained static.


Kathy Wu

Wu KC, Chrispin J. More than meets the eye: cardiac magnetic resonance image entropy & ventricular arrhythmia risk prediction. *JACC Cardiovasc Imaging*. 2022;15(5):793-795.
Conclusion: Whereas LVEF & LGE scar metrics pose clear risk factors for adverse outcomes, there is the opportunity to improve individualized risk prediction by integration of automated metrics, such as LV entropy, that are part of the rich structural & tissue characterization data embedded in CMR.

Popescu DM…**Wu KC**…Trayanova NA. Arrhythmic sudden death survival prediction using deep learning analysis of scarring in the heart. *Nat Cardiovasc Res*. 2022;1(4):334-343.
Conclusion: Deep learning approach with only raw cardiac images as input outperforms standard survival models constructed using clinical covariates.

Brancato SC…**Gluckman TJ**. Temporal trends and predictors of surgical ablation for atrial fibrillation across a multistate healthcare system. *Heart Rhythm O2*. 2021;3(1):32-39.
Conclusion: Wide variability in rates of surgical ablation for AF exist, underscoring the need for greater preoperative collaboration between cardiologists, electrophysiologists, & cardiac surgeons.

Jain V…**Cainzos-Achirica M, Nasir K,** Khan SU. Cardiac arrest (CA) in young adults with ischemic heart disease in the US, 2004-2018. *Curr Probl Cardiol.* 2022;47(11):101312.
Conclusion: While increased CA-related hospitalizations may reflect improved pre-hospital care, greater efforts are needed to address improve in-hospital survival in CA among young adults with IHD.

Assessment of CV Risk

Shea S, **Blaha MJ**. Long-term risk prediction for heart failure, disparities, & early prevention. *Circ Res*. 2022 Jan 21;130(2):210-212.
Conclusion: Traditional risk factors predict heart failure as well as ASCVD.


Martin Mortensen

Mortensen MB, Dzaye O…**Blaha MJ,** Nørgaard BL. Interplay of risk factors & CAC for CHD risk in young patients. *JACC Cardiovasc Imaging*. 2021 Dec;14(12):2387-2396.
Conclusion: In young patients, there is a strong interplay between CAC & risk factors for predicting the presence of obstructive CAD & for future CHD risk; in the presence of risk factors, even a low CAC score is a high-risk marker.

Aminorroaya A…**Mirbolouk M, Blaha M,** Farzadfar F. Global, regional, & national quality of care of ischaemic heart disease from 1990 to 2017: systematic analysis for the Global Burden of Disease Study. *Eur J Prev Cardiol*. 2022 Mar 11;29(2):371-379.
Conclusion: The quality of care index of ischemic heart disease has improved, but there are remarkable disparities between countries, genders, & age groups that should be addressed.

Mortensen MB, Gaur S…**Blaha MJ, Dzaye O**…Jensen JM. Association of age with the diagnostic value of CAC score for ruling out coronary stenosis in symptomatic patients. *JAMA Cardiol*. 2022 Jan 1;7(1):36-44.
Conclusion: The presence of obstructive vs nonobstructive CAD among those with 0 CAC was associated with a multivariable adjusted hazard ratio (HR) of 1.51 for MI & death; however, this HR varied from 1.80 in those who were <60 y/o to 1.24 in those who were >60 y/o.

Schuijf JD, Lima JAC…**Arbab-Zadeh A**. CT imaging with ultra-high-resolution: opportunities for cardiovascular imaging in clinical practice. J *Cardiovasc Comput Tomogr.* 2022;16(5):388-396.
Conclusion: This new technology may contribute to the better understanding of both macro- & microvascular disease.

Mortensen MB. Recalibrating 10-year risk models using population-based data: not without caveats. *JACC.*2022;90(14):1343-5
Conclusion: After recalibration of risk models using population-based data, subsequent validation analyses in independent populations are necessary before implementation in clinical practice to fully understand its impact on calibration, risk prediction, and statin allocation.

RESEARCH PUBLICATIONS

Grandhi GR…**Cainzos-Achirica M, Rajan T, Blaha MJ**…**Nasir K.** Coronary calcium to rule out obstructive CAD in patients with acute chest pain. *JACC Cardiovasc Imaging*. 2022 Feb;15(2):271-280.
Conclusion: In a large population presenting to ED with chest pain at low to intermediate risk, CAC = 0 was common; CAC=0 ruled out obstructive CAD & need for revascularization in more than 99% of the patients, and <5% with CAC = 0 had any CAD.

Nasir K…Blaha MJ…**Cainzos-Achirica M,** Mehta NN. Inflammatory bowel disease & ASCVD in US adults. *Am J Prev Cardiol*. 2022 Jan 17;9:100316.
Conclusion: There is an independent association between IBD & ASCVD in the US, particularly among young adults.

Cainzos-Achirica M…**Dardari Z**… **Blumenthal RS, Blaha MJ, Nasir K**. Long-term prognostic implications & role of further testing in adults aged ≤55 years with a CAC score of zero (MESA). *Am J Cardiol*. 2021 Dec 15;161:26-35.
Conclusion: There is a favorable long-term prognosis of CAC=0 among adults ≤55 yrs, particularly among nonsmokers; carotid IMT testing could be considered for further risk assessment in adults ≤55 yrs with CAC=0 & uncertain management.


Omar Dzaye

Dzaye O, Razavi AC…**Obisesan OH, Boakye E, Nasir K**… **Mortensen MB, Whelton SP, Blaha MJ**. Mean versus peak coronary calcium density on non-contrast CT: calcium scoring & ASCVD risk prediction. *JACC Cardiovasc Imaging*. 2022 Mar;15(3):489-500.
Conclusion: Mean calcium density performs better than peak calcium density factor when combined with plaque area for ASCVD mortality prediction among persons with mild CAC.

Okunrintemi V…**Blaha MJ**…**Michos ED, Nasir K.** Shared decision making (SDM) & patient reported outcomes among adults with ASCVD. *Am J Prev Cardiol*. 2021 Nov 10;8:100281.
Conclusion: Those with optimal SDM were more likely to report statin & aspirin use, have a positive perception of their health & healthcare related quality of life, & less likely to visit the ED.

Chatterjee D...**Arbab-Zadeh A**. Perivascular fat attenuation for predicting adverse cardiac events in stable patients undergoing invasive coronary angiography. *J Cardiovasc Comput Tomogr.* 2022 May 24.
Conclusion: Pericoronary adipose tissue attenuation did not predict cardiac events during long-term follow-up.

Al Rifai M, **Blaha MJ**…**Michos ED, Blumenthal RS…Nasir K**… **Post WS**, Virani SS. Determinants of incident atherosclerotic CVD events among those with absent CAC: MESA. *Circulation*. 2022 Jan 25;145(4):259-267.
Conclusion: Current cigarette smoking, diabetes, & hypertension are independently associated with incident ASCVD over 16-year follow-up among those with CAC=0.


Mike Blaha

Dzaye O, Razavi AC, Michos ED, Mortensen MB, Dardari ZA, Nasir K, Osei AD, Peng AW… **Blaha MJ**. CAC scores indicating secondary prevention level risk: Findings from CAC consortium & FOURIER. *Atherosclerosis.* 2022 Apr;347:70-76.
Conclusion: Primary prevention individuals with increased CAC burden have annualized ASCVD mortality rates equivalent to persons with stable secondary prevention-level risk; there is a risk continuum between higher risk primary prevention & stable secondary prevention patients, as their ASCVD risks overlap.

Razavi AC…**Nasir K, Blumenthal RS, Mortensen MB, Whelton SP, Blaha MJ, Dzaye O.** Evolving role of calcium density in coronary artery calcium scoring & ASCVD Risk. *JACC Cardiovasc Imaging.* 2022 Sep;15(9):1648-1662.
Conclusion: Calcium density is inversely associated with lesion vulnerability & ASCVD risk in population-based cohorts when accounting for age & plaque area.

Mirbolouk H, Blumenthal RS. Whelton SP. Provocative Findings of the DANCAVAS trial should inform future cardiovascular screening trials. *ACC.org*, November 2022.
Conclusion: The DANCAVAS trial supports strong consideration of selective measurements of CAC in men less than age 70.

Lin FY…**Nasir K, Rumberger J, Whelton SP, Blaha MJ**, Shaw LJ. Mortality impact of low CAC density predominantly occurs in early atherosclerosis: explainable ML in the CAC consortium. *J Cardiovasc Comput Tomogr*. 2022;S1934-5925(22)00288-X.
Conclusion: CAC & CAC density are more important for mortality prediction than the number of diseased vessels, & improve prediction of CVD but not total mortality; explainable ML techniques are useful to describe granular relationships in otherwise opaque prediction models.

Razavi AC, Uddin SMI, Dardari ZA…Osei AD, Obisesan OH, Nasir K…**Whelton SP**, **MortensenMB, Blaha MJ, Dzaye O**. Coronary artery calcium for risk stratification of sudden cardiac death (SCD): CAC Consortium. *JACC Cardiovasc Imaging.* 2022 Jul;15(7):1259-1270.
Conclusion: Higher CAC burden strongly associates with incident SCD beyond traditional risk factors, particularly among primary prevention patients with low-intermediate risk; SCD risk stratification through the measurement of CAC identifies patients most likely to benefit from more intensive risk factor management.

Cardoso R… **Blumenthal RS, Nasir K, Ferraro R**, Maron DJ, **Blaha MJ**…Blankstein R. Preventive cardiology advances in the 2021 AHA/ACC chest pain guideline. A*m J Prev Cardiol*. 2022 Jun 30;11:100365.
Conclusion: Comprehensive risk factor modification is crucial whether one pursues angiography or other diagnostic testing.

Blaha MJ, Dzaye O. Subthreshold coronary artery calcium - redefining the coronary artery calcium score of zero? *Cardiovasc Comput Tomogr*. 2022 Mar-Apr;16(2):155-157.
Conclusion: CAC scores < 1 are associated with a very low event rate of the next 5 years.

Hollenberg EJ…**Blaha MJ**…Shaw LJ. Relationship between coronary calcium & atherosclerosis progression among patients with suspected coronary artery disease. *JACC Cardiovasc Imaging*. 2022 Jun;15(6):1063-1074.
Conclusion: Patients with CAC scores of ≥400 exhibited disproportionate growth in calcified plaque with a volumetric increase 16-fold that of noncalcified plaque.


Aamir Javaid

Javaid A, Dardari ZA….**Whelton SP, Dzaye O**…**Nasir K**…**Blaha MJ.** Distribution of coronary artery calcium by age, sex, & race among patients 30-45 years old. *JACC.* 2022 May17;79(19):1873-1886.
Conclusion: Estimated percentiles help interpretation of CAC scores among young adults relative to their age-sex-race matched peers & should be included in CAC score reporting.

Osei AD, Mirbolouk M, Dardari Z…Dzaye O, Nasir K, Blumenthal RS, Blaha MJ. A simple approach to the identification of guideline-based CAC score percentiles (MESA). *Am J Cardiol.* 2022 Sep 15;179:18-21.
Conclusion: Men <50 years & women <60 years with any CAC as well as men <60 years & women <70 years with CAC >100 identifies persons with CAC >75th percentile; these individuals should receive comprehensive, aggressive risk factor modification.

RESEARCH PUBLICATIONS

As the Director of Cardiac CT at the Johns Hopkins Hospital in the Division of Cardiology, and a Professor of Medicine, **Armin A. Zadeh, MD, PhD,** MPH, has dedicated his career to understanding and treating coronary heart disease. Together with **Valentin Fuster, MD**, Dr. Zadeh has shaped current understanding of acute coronary event pathophysiology and the paradigm of a risk continuum from atherosclerosis.

Dr. Zadeh changed his focus from invasive to noninvasive coronary imaging with the rise of CT coronary angiography almost 20 years ago. He was a key investigator of the landmark CORE-64 international study, which established the diagnostic accuracy of CT coronary angiography. A member of the Society of Cardiovascular Computed Tomography (SCCT) soon after its formation, Dr. Zadeh has served on numerous SCCT committees over the past decade, including writing panels for early guidelines on the acquisition and interpretation of cardiac CT. Since 2008, he has directed the annual SCCT board review and comprehensive topics review. Dr. Zadeh co-directs the Johns Hopkins Cardiac CT Practicum and is the interim editor-in-chief of *JCCT* as well as the editor-in-chief of a forthcoming textbook on cardiovascular CT.

Agha AM…**Grandhi GR**…**Blaha MJ**…**Cainzos-Achirica M**…**Nasir K**. The prognostic value of CAC zero among individuals presenting with chest pain: meta-analysis. *JACC Cardiovasc Imaging*. 2022 Oct;15(10):1745-1757.
Conclusion: Absence of CAC was associated with a very low prevalence of obstructive CAD, a low prevalence of nonobstructive CAD, & a low annualized risk of major cardiac events; this supports the role of CAC=0 as a "gatekeeper" for advanced imaging among patients presenting with low risk chest pain.

Goldsborough E 3rd, Osuji N, **Blaha MJ**. Assessment of cardiovascular disease risk: 2022 update. *Endocrinol Metab Clin North Am*. 2022 Sep;51(3):483-509.
Conclusion: Risk assessment begins with the use of a traditional 10-year risk calculator, with refinement through the consideration of risk-enhancing factors & CAC testing.

Razavi AC…**Dzaye O, Michos ED**…**Post WS, Blumenthal RS, Blaha MJ**…**Whelton SP**. Risk factors for incident coronary artery calcium in younger (age 32 to 45 years) versus intermediate (46 to 64 years) versus older (65 to 84 Years) persons. *Am J Cardiol*. 2022 Sep 23:S0002-9149(22)00896-7.
Conclusion: Traditional risk factors more strongly predict incident CAC in young compared to older adults, underlining the importance of primordial prevention through middle age while identifying the challenges of risk assessment in older persons.

Ogunmoroti O, Osibogun O, Mathews L… Ndumele CE…**Blumenthal RS**…**Michos ED**. Favorable cardiovascular health (CVH) is associated with lower prevalence, incidence, extent, & progression of extracoronary calcification: MESA. *Circ Cardiovasc Imaging*. 2022 Mar;15(3):e013762.
Conclusion: Favorable CVH was associated with a lower risk of extracoronary atherosclerosis.

Minhas AMK…**Michos ED**, Fudim M. Most common causes of hospitalization associated with inpatient mortality in the US between 2005-2018. *Am J Med Sci*. 2022 May;363(5):459-461.
Conclusion: The authors identify the most common primary hospital discharge diagnoses associated with inpatient mortality using the National Inpatient Sample (NIS) database.

Budoff MJ…**Toth PP**…**Michos ED**…**Nasir K**…**Blaha M**. Cardiac CT angiography (CCTA) in current practice: American Society for Preventive Cardiology clinical practice statement. *Am J Prev Cardiol*. 2022 Jan 20;9:100318.
Conclusion: This expert consensus explores the role of CCTA as a tool in cardiovascular prevention - applicable to risk assessment & early diagnosis & management; it also discusses potential areas for future investigation.

Khurram Nasir

Nasir K, Cainzos-Achirica M… Blaha MJ…Cury RC. Coronary atherosclerosis in an asymptomatic US Population: Miami Heart Study at Baptist Health South *JACC Cardiovasc Imaging*. 2022 Sep;15(9):1604-1618.
Conclusion: Half of asymptomatic middle-age participants had any degree of coronary plaque, 6% had stenosis ≥50%, & 7% had plaques with at least 1 high-risk feature; these proportions were 16%, 1%, & 2%, respectively, among those with CAC = 0.

Gao Y, **Isakadze N, Duffy E…MacFarlane ZT…Martin SS**. Secular trends in risk profiles among adults with CVD in the US. *J Am Coll Cardiol*. 2022 Jul 12;80(2):126-137.
Conclusion: Trends in cardiovascular risk factor profiles in U.S. adults with CVD were suboptimal from 1999 through 2018, with persistent racial/ethnic disparities.

Wong ND…**Michos ED**…**Toth PP**. ASCVD risk assessment: An ASCVD clinical practice statement. *Am J Prev Cardiol*. 2022 Mar 15;10:100335.
Conclusion: This statement provides guidance & tools for assessment of ASCVD risk to appropriately target treatment approaches for prevention of ASCVD events.

Ogunmoroti O…**Ferraro RA**…**Blumenthal RS**…**Michos ED**. Hepatocyte growth factor (HGF) is associated with greater risk of extracoronary calcification: MESA. *Open Heart*. 2022 May;9(1):e001971.
Conclusion: Higher HGF levels were significantly associated with a greater risk of calcification at some extracoronary sites, suggesting an alternate biological pathway that could be targeted to reduce risk.

Smith BM…**Michos ED**…Heckbert SR. Upper & lower airway dysanapsis & airflow obstruction among older adults. *Am J Respir Crit Care Med*. 2022 Oct 1;206(7):913-917.
Conclusion: Dysanapsis (mismatch between airway caliber & lung size) of the lower airway & its association with airflow obstruction does not extend to the upper airway.

Seamus Whelton

Whelton SP, Post WS. Importance of traditional cardiovascular risk factors for identifying high-risk persons in early adulthood. *Eur Heart J*. 2022 Aug 7;43(30):2901-2903.
Conclusion: Traditional ASCVD risk factor measurement in young adulthood can predict midlife risk.

Tsao CW, Aday AW…**Martin SS**.. Heart disease & stroke statistics-2022 Update: report from AHA. *Circulation*. 2022 Feb 22;145(8):e153-e639.
Conclusion: The prevalence of obesity & severe obesity in youth 2 to 19 years of age increased from 14% to 19% & 3% to 6% between 1999 to 2000 & 2017 to 2018.

Blumenthal RS, **Alfaddagh A**. THE ABCDE'S OF PRIMARY PREVENTION OF CARDIOVASCULAR DISEASE. *Trans Am Clin Climatol Assoc*. 2022;132:135-154
Conclusion: This is an excellent review of comprehensive primary prevention assessment & management.

RESEARCH PUBLICATIONS

Arbab-Zadeh A, Zeger SL, **Blumenthal RS**, Weintraub WS, Boden WE. The rising urgency to pivot back toward Hippocratic medicine. *Am J Med*. 2022 Jan;135(1):49-52.
Conclusion: More attention needs to be placed on optimizing lifestyle factors & medical therapy.

Bradley SM, **Gluckman TJ.** If the fates allow: the zero-sum game of ISCHEMIA-EXTEND. *Circulation*. 2022;10.1161
Conclusion: An early invasive strategy was associated with reduction in CVD mortality that was offset by an absolute increase in non-cardiovascular mortality over the same timeframe.

Anugula D, **Cardoso R, Grandhi GR**, Blankstein R, **Nasir K**…**Cainzos-Achiricia M**. Extra-coronary calcification and CVD events: what do we know & where are we heading? *Curr Atheroscler Rep*. 2022;24(10):755-766
Conclusion: Future guidelines might consider including these features as risk-enhancing factors.

Knowles KA…**Ratchford EV**,…Silber HA. A novel operator-independent noninvasive device for assessing arterial reactivity. I*nt J Cardiol Heart Vasc*. 2022;39:100960.
Conclusion: Flow-mediated compliance response (FCR), was inversely associated with established CVD risk indices, & lower cardiorespiratory fitness.

Ashen MD, Carson KA, **Ratchford EV**. Coronary calcium scanning & cardiovascular risk assessment among firefighters. *Am J Prev Med.* 2022;62(1):18-25.
Conclusion: Sudden cardiac death is the leading cause of death & disability for firefighters, but those at increased risk for CVD may be identified early & medically managed to reduce their risk of death & disability.

Jia X,..**Ndumele C**…**McEvoy JW**…Ballantyne CM. Midlife determinants of healthy cardiovascular aging: ARIC study. *Atherosclerosis.* 2022;350:82-89.
Conclusion: Lower systolic BP, pulse pressure, HbA1c, & BMI measurements in middle age were significantly associated with lower odds for subclinical disease & clinical CVD in later life.

Nasir K, Khan SU. Power of zero as gatekeeper for stable chest pain patients: minimizing losses and maximizing gains. *J Amer Coll Cardiol.* 2022;80(21):1978-1980.
Conclusion: The absence of coronary artery calcification in patient with low risk chest pain is very reassuring.

Araki M…**Arbab-Zadeh A**…Fuster V, Jang IK. Optical coherence tomography (OCT) in coronary atherosclerosis assessment and intervention. *Nat Rev Cardiol*. 2022.19(10):684-703.
Conclusion: We summarize the state of the art in cardiac OCT & facilitate the uniform use of this modality in coronary atherosclerosis.

In addition to serving as an adjunct faculty at the Johns Hopkins Ciccarone Center, **Miguel Cainzos-Achirica, MD, MPH, PhD,** recently joined the Hospital del Mar in Barcelona as Director of Research in Cardiology, leading a Preventive Cardiology clinic with a focus on high-risk primary prevention patients. Dr. Cainzos-Achirica has led multi-cohort studies that have helped further define the potential role of the coronary artery calcium (CAC) score in the allocation of multiple preventive interventions in primary prevention.

He has been a key contributor to the dissemination of the results of the Miami Heart Study (the PI for which is Ciccarone Center Adjunct Faculty member Khurram Nasir, MD, at Houston Methodist). Other research areas where Dr. Cainzos-Achirica has been particularly active include South Asian cardiovascular health and studying the role of social determinants of health in cardiovascular disease.

He has served as a reviewer for the NIH and a consultant in a recently awarded NIH grant that will study lipid metabolism in South Asian individuals in the US and UK. He recently received a grant from the European Society of Cardiology/European Heart Academy to train in cardiovascular clinical trial design in the prestigious University of Oxford MSc part-time program.

Al-Kindi S…**Cainzos-Achirica M, Nasir K**… Rajagopalan S. Impact of low/no-charge CAC scoring on statin eligibility & outcomes in women: CLARIFY study. *Am J Prev Cardiol.* 20222;12:100392.
Conclusion: CAC scoring primarily served to downgrade statin eligibility in women compared with men; women had similar CAC risk-guided reductions in LDL-C compared with men.

Gowtham Grandhi

Cainzos-Achirica M…**Grandhi G**…**Blaha MJ, Blumenthal RS**…**Nasir K**. Rationale & pathways forward in the implementation of CAC based enrichment of randomized trials. *Am Heart J.* 2022 Jan;243:54-65.
Conclusion: Given the potential benefits in terms of sample size, cost reduction, & overall RCT feasibility of a CAC-based enrichment strategy, we discuss approaches that may help maximize its advantages.

Dzaye O, Razavi A, Mortensen MB. Coronary artery calcium scoring in the young: a continuum risk? *JACC Cardiovasc Imaging.* 2022;15(11):2017-8.
Conclusion: The future in risk stratification among youth selectively involves imaging for subclinical disease using both noncontrast CT & CCTA among higher-risk patients to guide optimal care, therapeutics, and follow-up.

Biomarkers/ Inflammation

Sweeney T, Ogunmoroti O, Ndumele CE, Zhao D, Varma B…**Michos ED**. Associations of adipokine levels with the prevalence & extent of valvular & thoracic aortic calcification: MESA. *Atherosclerosis*. 2021 Dec;338:15-22.
Conclusion: There are significant associations between select adipokines & specific markers of extra-coronary calcification; adipokines may play a role in the development of systemic atherosclerosis.

Zeb I…**Blumenthal RS**…**Blaha MJ**…**Nasir K**, Budoff MJ. Association of inflammatory markers & lipoprotein particle subclasses with progression of coronary calcium: MESA. *Atherosclerosis.* 2021 Dec; 339:27-34.
Conclusion: Inflammatory markers & lipoprotein particles were not associated with CAC incidence & progression after adjustment for traditional risk factors.

Osibogun O, Ogunmoroti O, Ferraro RA, Ndumele CE…**Michos ED.** Favorable cardiovascular health (CVH) is associated with lower hepatocyte growth factor (HGF) levels in MESA. *Front Cardiovasc Med*. 2022 Jan 3;8:760281.
Conclusion: Favorable CVH was significantly associated with lower HGF levels; interventions aimed at promoting CVH may reduce the risk of endothelial injury as indicated by lower serum HGF levels.

Sweeney T, Quispe R, Das T…**Martin SS, Michos ED.** Use of blood biomarkers in precision medicine for primary prevention of ASCVD: Review. *Expert Rev Precis Med Drug Dev.* 2021;6(4):247-258.
Conclusion: Future studies should focus on whether biomarker-directed management strategies can improve clinical outcomes.

Molinsky RL…**Ndumele CE**…Demmer RT. Periodontal status, C-reactive protein, NT-proBNP, & incident heart failure (HF): ARIC Study. *JACC Heart Fail*. 2022;10(10):731-741.
Conclusion: Periodontal status was associated with incident HF, HFpEF, & HFrEF, as well as unfavorable changes in CRP and NT-proBNP.

Tcheugui JB…**McEvoy JW, Ndumele CE**… Selvin E. Elevated NT-ProBNP as a CVD risk equivalent: evidence from ARIC study. *Am J Med.* 2022; 135(12):1461-7.
Conclusion: The elevated CVD risk in persons with high NT-proBNP >450 pg/ml & no history of CVD was similar to, or higher than, the risk conferred by a history of CVD.

Dr. Allison Hays has special expertise in testing and refining new cardiac magnetic resonance (MR) methods, with a focus on coronary and vascular imaging. She is a pioneer in the development of noninvasive MR imaging methods for measuring coronary endothelial function; she published the first report of noninvasive measures of coronary endothelial function which previously required invasive catheterization. Dr. Hays has studied the mechanisms of early coronary atherosclerotic disease in people with HIV and found that abnormal fat redistribution, increased body inflammation, and early endothelial activation contribute to abnormal endothelial function in persons with HIV.

She has led several mechanistic clinical trials, including one using PCSK9 inhibition that found LDL cholesterol-independent improvement in vascular function occurred rapidly in people living with HIV (PLWH). This study influenced the design of larger randomized clinical trials using PCSK9 inhibitors in PLWH and has led to new approaches in lipid management in this population.

Dr. Hays is a leader in novel applications of advanced imaging techniques, focused on better understanding early cardiovascular disease in women and men with HIV. She is the Principal Investigator on two NIH RO1 grants and has won research mentorship awards.

She is the Medical Director of Echocardiography, a member of the Department of Medicine promotions committee, and a member of the editorial board at *Circulation: Cardiovascular Imaging*. She has participated in national guidelines formation and has organized several national and international cardiovascular imaging conferences. She is a leader in clinical and translation research using novel cardiovascular imaging to study the pathogenesis of health disease in young and high-risk populations.

Dr. Hays has a strong interest in dissecting pathways contributing to early vascular disease in women with HIV, as well as women with a history of preeclampsia. Her work focuses on the intersection between vascular inflammation, sex differences in pathophysiology of heart disease, and impaired coronary function using novel MR techniques that she helped to develop and validate together with biomedical engineers.

Her latest NIH grant will evaluate the role of stress (both environmental and physiologic) and vascular dysfunction in women at high risk for heart disease to determine future therapeutic targets in high-risk women. Dr. Hays is also very interested in examining the heart and mind connection to better understand the role of different types of stress and their effects on the heart.

Blood Pressure/Renal Disease

Lau ES, **Michos ED**. Blood pressure trajectories through the menopause transition: different paths, same journey. *Circ Res*. 2022 Feb 4;130(3):323-325.
Conclusion: Control of blood pressure throughout the life cycle is important in reducing CVD.

Rao S…**Michos ED**…Pandey A. Association of polypill therapy with CVD outcomes, mortality, & adherence: systematic review & meta-analysis. *Prog Cardiovasc Dis*. 2022 Jul-Aug;73:48-55.
Conclusion: The use of polypill formulations is associated with significant reductions in CVD risk factors & the risk of total mortality, particularly in the low-risk primary prevention population.

Blazoski C, Sharma G, Blumenthal RS. An analysis of ISCHEMIA & ISCHEMIA-CKD outcomes by chronic kidney disease stage. *ACC.org*. October 2022
Conclusion: An initial conservative approach with an emphasis on aggressive risk factor modification is comparable to an early invasive approach.

Vinson AJ…**Michos ED**…Matas A. Premature death in kidney transplant (KT) recipients: The time for trials is now. *J Am Soc Nephrol*. 2022 Apr;33(4):665-673.
Conclusion: There is an urgent need to develop strategies to determine the risk-benefit ratio in KT recipients of new cardiorenal preventive therapies that improve survival in other at-risk populations.

Hussain A…**Gluckman TJ**,…Maddox TM. Potential Impact of 2017 ACC/AHA hypertension guideline on contemporary practice: cross-sectional analysis from NCDR PINNACLE Registry. *J Am Heart Assoc.* 2022;11(11):e024107.
Conclusion: With the implementation of the 2017 ACC/AHA hypertension guideline, many more people, particularly younger people and those with lower cardiovascular risk, will be diagnosed with hypertension & warrant antihypertensive treatment.


Aarti Thakkar

Thakkar A, Rabb H, Thakkar M, **Blumenthal RS**. New Perspectives on CV Risk Assessment of Prospective Kidney Recipients & Donors. *Healio.com*. Jan 12, 2022.

Juraschek SP…**Michos ED**…Miller ER 3rd. Comparison of supine & seated orthostatic hypotension (OH) assessments & their association with falls & orthostatic symptoms. *J Am Geriatr Soc.* 2022 Aug;70(8):2310-2319.
Conclusion: Supine OH was more frequent, associated with orthostatic symptoms, & potentially more predictive of falls.

Austin TR…**Post WS**…Heckbert SR. Association of brain volumes & white matter injury with race, ethnicity, & cardiovascular risk factors: MESA. *J Am Heart Assoc*. 2022 Apr 5;11(7):e023159.
Conclusion: Older age, current smoking, hypertension, & diabetes were strongly associated with white matter injury.

Mustapha A…**Post WS.** Hypertension & socioeconomic status in south central Uganda: population-based cohort study. *Glob Heart.* 2022 Jan 13;17(1):3.
Conclusion: Hypertension is common in rural Uganda among individuals with higher SES & is mediated by BMI; targeted interventions could focus on lifestyle modification among highest-risk groups

Zhan J…**Hays A**…Kutty S. Left ventricular myocardial work indices in pediatric hypertension: correlations with conventional echo assessment and subphenotyping. *Eur J Pediatr*. 2022;181(7):2643-2654.
Conclusion: Myocardial work is a novel tool that shows a good correlation with conventional markers of LV function & combines non-invasive estimates of LV systolic pressure with myocardial deformation analysis.

Srivastava S, Coresh J…**Martin SS**, Shin JI. Kidney function & lipid levels in older adults: ARIC. *Kidney Med*. 2022 May 27;4(7):100494.
Conclusion: Low HDL-C & high TG levels is common among older adults with CKD compared with those without CKD; attention to the burden of high TG & low HDL-C levels may improve clinical outcomes in older adults with CKD.

Abushouk AI…**Michos ED**…Nissen SE. Fixed-dose combination (polypill) for CVD prevention:meta-analysis. *Am J Prev Med.* 2022 Sep;63(3):440-449.
Conclusion: Despite reductions in CVD risk factors, the observed mortality benefit for the polypill did not reach statistical significance.

Ishigami J, **Mathews L**….Matsushita K. Echocardiographic measures & subsequent decline in kidney function in older adults: ARIC. *Eur Heart J Cardiovasc Imaging*. 2022;23(2):283-293.
Conclusion: Among older individuals, LV mass index, ejection fraction, & peak RV-RA gradient were independently associated with the risk of incident CKD.

Kou M…**Mathews L**…Ishigami J. Echocardiography-based cardiac structure parameters for the long-term risk of end-stage kidney disease (ESKD) in Black individuals: ARIC. *Mayo Clin Proc.* 2022;97(10):1794-1807.
Conclusion: Echocardiographic parameters of LV structure, including LV wall thickness, were robustly associated with the risk of subsequently incident ESKD.

Yu Z…**Ndumele CE**…Coresh J. Association between midlife obesity & kidney function trajectories: ARIC. *Am J Kidney Dis.* 2021;77(3):376-385.
Conclusion: Obesity status is a risk factor for future decline in kidney function & development of kidney failure replacement therapy in women, with less consistent associations among men.

Cardiac Imaging/Coronary Angiography/Intervention

Minhas AMK…**Sharma G,** Blankstein R, **Blaha MJ**… **Nasir K,** Khan SU. Clinical & economic burden of PCI in hospitalized young adults in the US. *Curr Probl Cardiol*. 2022 Nov;47(11):101070.
Conclusion: In-hospital mortality significantly increased between 2004 & 2018; women, MI, drug abuse, heart failure, PAD, & renal failure were associated with higher mortality.

F**eldman DI, Latina J, Lovell J, Blumenthal RS, Arbab-Zadeh A.** Coronary computed tomography angiography in patients with stable coronary artery disease. T*rends Cardiovasc Med.* 2022 Oct;32(7):421-428.
Conclusion: CCTA may be preferable to stress imaging in certain patients with stable angina.

Dr. Bill McEvoy, who served on the full-time Ciccarone faculty from 2015-2018, continues to collaborate closely with the Center from his home in Galway, Ireland. Appointed as Established Chair in Preventive Cardiology at the National University of Ireland Galway in Jan 2022, the highest rank of Full Professor in Irish academics. Dr. McEvoy also completed his PhD in medicine in the summer of 2022.

He has greatly increased his activities in the European Society of Cardiology over the last year, serving on the Cardiovascular Risk Collaboration (ESC-CRC) steering committee and also in his role as co-chair of the forthcoming 2024 ESC Guideline on Arterial Hypertension. His work with ESC-CRC has led to a number of high-profile publications, including the EHJ SCORE-2 and EHJ SMART-2 risk equation papers. Dr. McEvoy is also co-principal investigator of the multi-million-euro INTERASPIRE international cohort study, which is due to complete recruitment in early 2023.

Drs. Charles Lowenstein and Simeon Margolis

Rozanski A…**Blaha MJ**…**Nasir K**…**Blumenthal RS**…Berman DS. Association between hypercholesterolemia & mortality risk among patients referred for cardiac imaging test: evidence of a "cholesterol paradox?. *Prog Cardiovasc Dis*. 2022 Oct 19:S0033-0620(22)00106-2.
Conclusion: Hypercholesterolemia may be sensitive to confounding by other clinical factors & post-test treatment changes in patients.

Gudenkauf B, Hays AG…Trost J, Ambinder DI, Wu KC, Arbab-Zadeh A, Blumenthal RS, Sharma G. Role of multimodality imaging in the assessment of myocardial infarction with nonobstructive coronary arteries: beyond conventional coronary angiography. *J Am Heart Assoc*. 2022 Jan 4;11(1):e022787.
Conclusion: We review the strengths & limitations of various imaging approaches in patients with MINOCA.

Marques MD…**Post WS**…Ambale-Venkatesh B. Myocardial fibrosis by T1 mapping MRI predicts incident CVD events & all-cause mortality: MESA. *Eur Heart J Cardiovasc Imaging.* 2022 Sep 10;23(10):1407-1416.
Conclusion: Extracellular volume fraction (ECV), with its ability to characterize both diffuse & focal fibrosis processes, better predicted incident events than regional myocardial abnormalities visualized by LGE imaging.

Pezel T… **Post WS**…Lima JAC. Determinants of left atrioventricular coupling index (LACI): MESA. *Arch Cardiovasc Dis*. 2022 Aug-Sep;115(8-9):414-425.
Conclusion: Age, sex, ethnicity, diabetes & BMI were independent determinants of LACI, which was independently associated with myocardial fibrosis markers & NT-proBNP concentration.

Farrell C,…**Hays AG**…Mukherjee M. Clinical approach to multimodality imaging in pulmonary hypertension (PH). *Front Cardiovasc Med*. 2022;8:794706.
Conclusion: The authors describe the clinical application of multimodality imaging techniques across PH subtypes as it pertains to screening & monitoring of PH.

RESEARCH PUBLICATIONS


Allison Hays

Malik N…**Wu KC**……**Hays AG.** Multimodality imaging in arrhythmogenic right ventricular cardiomyopathy (ARVC). *Circ Cardiovasc Imaging*. 2022;15(2):e013725.
Conclusion: Multimodality imaging is a key component in the diagnosis & evaluation of ARVC; diagnostic criteria include noninvasive parameters from echo & cardiac MRI (CMR).

Scheel PJ 3rd, Mukherjee M, **Hays AG,** Vaishnav J. Multimodality imaging in the evaluation & prognostication of cardiac amyloidosis (CA). *Front Cardiovasc Med*. 2022;9:787618.
Conclusion: Multimodality imaging approach is integral to the diagnosis of CA including echo, CMR, & nuclear techniques.

Minhas AS, Goerlich E…**Arbab-Zadeh A… Leucker T**…**Hays AG**. Imaging assessment of endothelial function: index of cardiovascular health. *Front Cardiovasc Med*. 2022;9:778762.
Conclusion: Endothelial dysfunction is a strong prognosticator for CVD events & mortality; assessment of endothelial function can aid in selecting therapies & testing their response.

Jani V, **Kapoor K**…**Michos E, Wu K**,…**Hays AG,** Mukherjee M. Unsupervised machine learning demonstrates the prognostic value of TAPSE/PASP ratio among hospitalized patients with COVID-19. *Echocardiography*. 2022;39(9):1198-1208.
Conclusion: Impaired RV-PA coupling, assessed noninvasively via the TAPSE/PASP ratio, was predictive of need for ICU level care & mortality in hospitalized patients with COVID-19.

Figtree GA…**Blumenthal RS, Blaha M**… Nicholls SJ. Noninvasive plaque imaging to accelerate coronary artery disease drug development. *Circulation*. 2022;146(22):1712-27
Conclusion: Improvements in invasive and noninvasive imaging techniques have enabled an increasing recognition of distinct quantitative phenotypes of coronary atherosclerosis that are prognostically relevant. Noninvasive coronary imaging techniques, such as CT, PET, and coronary MRI, have major potential to accelerate cardiovascular drug development, which has been affected by the high costs and protracted timelines of cardiovascular outcome trials.

Kolossváry M,..**Whelton SP….Arbab-Zadeh A,**..,Villines TC. The Journal of Cardiovascular Computed Tomography: year in review 2021. *J Cardiovasc Comput Tomogr.* 2022;16(3):266-276.

Hong GH, Hays AG, Gilotra NA. Evolving role of echocardiography during the coronavirus disease 2019 Pandemic. *Heart Int*. 2022;16(1):28-36.
Conclusion: A wide spectrum of echo findings, including LV & RV systolic or diastolic dysfunction, reduced basal LV strain & abnormal myocardial work efficiency occur in patients with acute COVID-19 infection, & many correlate with biomarkers & mortality.

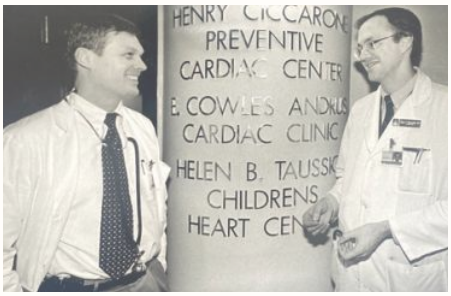
Cardio-Obstetrics


Salman Zahid

Zahid S…**Minhas AS**…**Hays AG, Michos ED.** Racial & socioeconomic disparities in cardiovascular outcomes of preeclampsia hospitalizations in the US 2004-2019. *JACC: Advances.* 2022;1:1-14.
Conclusion: Across all income groups, Black, Hispanic, and Asian/Pacific Islander women experience higher odds of in-hospital mortality compared with White women.

Shah LM, Kwapong YA, Boakye E, Ogunwole SM…Blumenthal RS, Hays AG, Blaha MJ, Nasir K…**Sharma G**. Racial disparities in prevalence of gestational diabetes by maternal nativity & length of US residence in an urban low-income population in the US., *CJC Open.* 2022 Feb 19;4(6):540-550.
Conclusion: The "healthy immigrant effect" & its waning with longer duration of US residence apply to the prevalence of gestational diabetes among Hispanic women but not non-Hispanic Black women; further research on the relationship between race & nativity-based disparities is needed.

Kwapong YA, Boakye E, Obisesan OH, Shah LM…Hays AG, Blumenthal RS…Blaha MJ, Cainzos-Achirica M, Nasir K…Sharma G. Nativity-related disparities in preterm birth & cardiovascular risk in a multiracial U.S. cohort. *Am J Prev Med*. 2022 Jun;62(6):885-894.
Conclusion: A shorter duration of US residence was associated with lower odds of preterm birth; further studies are needed to understand the biological & social determinants underlying these nativity-related disparities & the impact of acculturation.



Drs. Ed Kasper and Roger Blumenthal

Boakye E, Kwapong YA, Obisesan O, Ogunwole SM, Hays AG, Nasir K, Blumenthal RS…Blaha MJ…Sharma G. Nativity-related disparities in preeclampsia & CVD risk among a racially diverse cohort of US women. *JAMA Netw Open.* 2021 Dec 1;4(12):e2139564.
Conclusion: Nativity-related disparities in preeclampsia persisted among non-Hispanic Black women but not among white women after adjusting for sociodemographic & CVD risk factors.

Minhas AS, Boakye E, Obisesan OH, Kwapong YA…Cainzos-Achirica M, Nasir K, Blaha MJ, Blumenthal RS…Sharma G. Association of preterm birth with maternal nativity & length of residence among non-hispanic black women. *CJC Open.* 2021 Nov 5;4(3):289-298.
Conclusion: The prevalence of CVD risk factors & proportion of women delivering preterm were lower in foreign-born than US-born NHB women; the "foreign-born advantage" was not observed with ≥ 10 years of US residence; we need to intensify public health efforts in exploring & addressing nativity-related disparities in preterm birth.

Zahid S, Hashem A, **Minhas AS,** Bennett WL, Honigberg MC, Lewey J, Davis MB and **Michos ED.** Trends, Predictors, and Outcomes of Cardiovascular Complications at Delivery Associated With Gestational Diabetes: A National Inpatient Sample Analysis (2004-2019). *J Am Heart Assoc.* 2022;11:e026786.


Yaa Kwapong

Kwapong YA, Boakye E…. Blaha MJ, Nasir K, Hays AG, Blumenthal RS…Sharma G. Maternal glycemic spectrum & adverse pregnancy and perinatal outcomes in a multiracial US Cohort. *J Cardiovasc Dev Dis.* 2022 Jun 4;9(6):179.
Conclusion: Moderate maternal glycemia without pre-gestational or gestational diabetes was associated with higher odds of high birth weight & hypertensive disorders of pregnancy, even more strongly among Black women.

Gami A, **Sharma G, Blumenthal RS, Patel J.** National Trends in Gestational Diabetes: the Importance of Data Disaggregation. *ACC.org.* November 9, 2022.
Conclusion: Asian Indians and Puerto Rican women had the highest rates of gestational diabetes mellitus.

RESEARCH PUBLICATIONS

Much of **Dr. Erin Michos ’s** research has focused on Cardio-Obstetrics, which is the intersection of how cardiovascular disease impacts pregnancy and how pregnancy impacts future cardiovascular risk. Her research group had multiple high-impact research studies evaluating novel risk factors for pregnancy-associated complications. In a series of papers led by her mentee **Dr. Salman Zahid** using nationally representative U.S. data, Dr. Michos ’s research group identified polycystic ovary syndrome, use of assisted reproductive technology, gestational diabetes, and SLE to be independent risk factors for the development of preeclampsia during pregnancy, as well as acute cardiovascular complications at pregnancy delivery. Identification of such high-risk groups offers opportunities to implement preventative measures.

Additionally, her group has identified significant disparities in maternal morbidity by race/ethnicity and income, with Black women of high income with preeclampsia having worse cardiovascular outcomes at delivery compared to White women of lower income, indicating that higher socioeconomic status did not protect Black women from being at greater risk of worse health outcomes. This is alarming in the background of rising maternal mortality rates in the U.S., which disproportionately affect Black women. Dr. Michos was also a co-author on a high-profile study led by **Dr. Anum Minhas** that found a lower risk of preeclampsia in women who followed a Mediterranean style diet.

Dr. Michos ’s studies have shown that the cardiovascular health profile of pregnant women has been worsening over a 15 year period in the U.S., with greater prevalence of obesity, hypertension, and diabetes. Additionally, Dr. Michos showed that peripartum cardiomyopathy, or heart failure that develops due to pregnancy, has been rising in the U.S. over a 14 year period. Her research group has further identified that women with a history of grand multi-parity (5 or more live births) on average have a worse cardiovascular health profile later in life, including greater inflammatory state, a more androgenic (“male-like”) sex hormone profile9, and a worse adipokine hormone profile.

One way to help mitigate the cardiovascular risks associated with pregnancy is to train the next generation of clinicians how to be better equipped to manage pregnancy-associated cardiovascular complications. Several years ago, Dr. Michos and Dr. Minhas started a Cardio-Obstetric fellowship training program in Hopkins Cardiology, of which Dr. Minhas was the inaugural fellow who trained in this pathway. Drs. Michos and Minhas recently published a “blueprint” of what this training program looks like, so that other cardiology programs could develop similar training programs. Current Cardio-Obstetric fellow, **Dr. Esther Choi**, led a state-of-the-art review article on the “Fourth Trimester” of hand-off of care after an adverse pregnancy outcome to provide guidance on ensuring women are followed post-pregnancy and treated with preventive measures to avoid long-term cardiovascular complications.

Dr. Michos has been a sought-out invited speaker on the topic of Cardio-Obstetrics, locally (at the recent Johns Hopkins A Women’s Journey program in October 2022), as well as nationally and internationally.

Minhas AS…Michos ED…Mueller NT. Mediterranean-style diet & risk of preeclampsia by race in the Boston Birth Cohort. *J Am Heart Assoc.* 2022 May 3;11(9):e022589.
Conclusion: Higher adherence to a Mediterranean-style diet is associated with lower preeclampsia risk, & benefits of this diet is present among Blacks as well as Whites.

Gambahaya ET, **Minhas AS, Sharma G… Michos ED, Hays AG**. Racial differences in delivery outcomes among women with peripartum cardiomyopathy (PPCM). *CJC Open*. 2021 Dec 16;4(4):373-377.
Conclusion: In the US, Black & Native American women are the most likely to develop PPCM, despite adjustment for CV & socioeconomic risk factors, but Asian women have higher odds of having CV complications.

Mehta LS, **Blumenthal RS, Sharma G.** Implications of restrictive maternity leave in Cardiology: time to hold the levers. *J Am Coll Cardiol*. 2022 Mar 22;79(11):1088-1091.
Conclusion: Maternity and paternity leave should be longer than it currently is.

Jowell AR…**Michos ED**…Honigberg MC. Interventions to mitigate risk of CVD after adverse pregnancy outcomes (APOs): Review. *JAMA Cardiol*. 2022 Mar 1;7(3):346-355.
Conclusion: Transitional clinics, lifestyle intervention, targeted pharmacotherapy, as well as clinician & patient education are promising strategies for improving postpartum maternal cardiometabolic health in women with APOs.

Ijaz SH…**Minhas AS, Hays AG…Michos ED.** Trends in characteristics & outcomes of peripartum cardiomyopathy (PC) hospitalizations in the US between 2004 & 2018. *Am J Cardiol.* 2022 Apr 1;168:142-150.
Conclusion: There has been a nonsignificant increase in hospitalizations for PC, driven by an increasing rate of hospitalizations in younger women; older maternal age & Black patients had a higher proportional hospitalization as compared with the younger age group & Whites.

Ezeigwe A, **Ogunmoroti O, Minhas AS… Michos ED**. Association between parity & markers of inflammation: MESA. *Front Cardiovasc Med.* 2022 Sep 14;9:922367.
Conclusion: Higher parity was associated with some inflammatory markers, but these associations were largely attenuated after adjustment for CVD risk factors.


Anum Minhas

Minhas AS…Michos ED. Instituting a curriculum for cardio-obstetrics subspecialty fellowship training. *Methodist Debakey Cardiovasc J*. 2022 Jun 3;18(3):14-23.
Conclusion: We describe a proposed specialized Cardio-Ob training pathway that prepares trainees to care for women with CVD before, during, & after pregnancy.

RESEARCH PUBLICATIONS

Tony Salem, Simeon Margolis & Bob Scott

Rodriguez CP, **Ogunmoroti O, Quispe R, Osibogun O, Ndumele CE, Echouffo Tcheugui J, Minhas AS…Michos ED.** Association between multiparity & adipokine levels: MESA. *J Womens Health (Larchmt).* 2022 May;31(5):741-749.
Conclusion: Greater parity was associated with resistin & leptin, but this association was attenuated after accounting for CVD risk factors' dysregulation of adipokines could contribute to the excess CVD risk associated with multiparity.

Rao SJ, Douglas PS…Mehta LS, **Blumenthal RS, Sharma G**. Global differences in parental leave policies & satisfaction among Cardiologists. *Curr Probl Cardiol.* 2022 Oct;47(10):101299.
Conclusion: Options for longer parental leave would improve work-life balance throughout the world.

Rooney MR…**Minhas AS**…Selvin E. Performance of glycated albumin (GA) as a biomarker of hyperglycemia in pregnancy. *Clin Biochem*. 2022 Nov 19.
Conclusion: GA is not a sensitive test to screen for hyperglycemia in pregnancy; GA was inversely associated with adiposity in pregnant women without diabetes.

Zahid S, Mohamed MS, Wassif H, Nazir NT, Khan SS, **Michos ED**. Analysis of Cardiovascular Complications During Delivery Admissions Among Patients With Systemic Lupus Erythematosus, 2004-2019. *JAMA Netw Open.* 2022;5(11):e2243388.

Choi E…Minhas AS…Michos ED. The fourth trimester: time for enhancing transitions in cardiovascular care. *Curr Cardiovasc Risk Rep.* 2022 Sep 21:1-11.
Conclusion: Development of a comprehensive postpartum care plan with careful consideration of each patient's risk profile & access to resources is critical to improve maternal morbidity.

A national leader in Women's Health and Preventive Cardiology, **Dr. Garima Sharma i**s the Director of Cardio-Obstetrics at Johns Hopkins and an Associate Vice Chair for Women's Careers in Academic Medicine. She is also the Chair of the Task Force on Women's Academic Careers in the Department of Medicine. Her interest in diversity, health equity, and gender are the result of her experiences as a first-generation immigrant to the US and a woman navigating a career in Cardiology, a subspecialty where women are under-represented.

In 2021, Dr. Sharma became the Governor of the Maryland Chapter of the ACC. She was Vice-Chair of an AHA Policy Statement "Call to Actions: Maternal Health and Saving Mothers." She is co-author on the American Heart Association Scientific Statement on Cardiovascular Consideration in Caring for Pregnant Patients released in 2020. Dr. Sharma was also the co-author on the recent 2021 ACC/AHA/SCAI Coronary Artery Disease Revascularization, where she wrote the sections on secondary prevention and SCAD.

She was a co-author on the 2022 AHA Presidential Advisory that updated the cardiovascular health metrics from Life's Simple 7 to Life's Essential 8. This statement from the AHA redefined CVH and its 2024 Impact Goal. She is the recipient of AHA Health and Social Needs Grant to understand the social determinants of risk of hypertension in reproductive age women in Baltimore. Her research has been awarded funding from NIH and AHA and she has published extensively in *JACC, Circulation,* and *JAMA* on disparities in Adverse Pregnancy Outcomes.

Her clinical and research interests are in cardiovascular disease in women especially pregnancy, preeclampsia, maternal obesity, health disparities, post-partum prevention of complications from hypertensive disorders of pregnancy. Dr. Sharma is also a leading expert in diversity and gender equity issues in medicine.

Zahid S…Minhas AS, Michos ED. Trends, predictors, & outcomes of cardiovascular complications associated with PCOS during delivery hospitalizations. *J Am Heart Assoc.* 2022 Aug 16;11(16):e025839.
Conclusion: Efforts to improve preconception cardiometabolic health & prevent gestational diabetes may improve peripartum maternal outcomes & long-term CVD risk.

Sharma G, Grandhi GR… Cainzos-Achirica M, Blumenthal RS, Nasir K. Social determinants of suboptimal cardiovascular health among pregnant women in the US. *J Am Heart Assoc.* 2022 Jan 18;11(2):e022837.
Conclusion: Over half of pregnant women with the highest social determinants of health (SDOH) burden had suboptimal cardiovascular health.

Zahid S…Minhas AS…Michos ED. Cardiovascular complications during delivery ddmissions associated with assisted reproductive technology (ART) from 2008 to 2019). *Amer J Cardio.* 2022. S0002-9149(22)00953-5.
Conclusion: Women who conceived with ART had higher risks of pre-eclampsia, heart failure, arrhythmias, stroke, & other complications during their delivery hospitalization.

Thakkar A, Hailu T, **Blumenthal RS, Martin SS…Sharma G.** Cardio-Obstetrics: the next frontier in CVD Prevention. *Curr Atheroscler Rep.* 2022 Jul;24(7):493-507.
Conclusion: Pregnancy creates an opportunity to begin engaging women in CVD protective strategies before the development of the disease.

Shah LM, Varma B, Nasir K, Walsh MN, **Blumenthal RS**, Mehta LS, **Sharma G.** Reducing disparities in adverse pregnancy outcomes in the US. *Am Heart J.* 2021 Dec;242:92-102.
Conclusion: Pregnancy provides a unique opportunity to identify at-risk women from a social determinants perspective, & provide early interventions to optimize long-term CVD & mitigate cardiovascular health disparities.

Kazzi B, Ogunmoroti O…Zhao D, Minhas AS, Ouyang P, **Michos ED**. Parity history & later life sex hormone levels in MESA. *Can J Cardiol*. 2022 Sep 7:S0828-282X(22)00790-5.
Conclusion: Women with multigravidity & multiparity had higher testosterone/estradiol levels, reflecting a more androgenic sex hormone profile.

Cardio-Oncology


Roberta Florido

Florido R, Daya NR, **Ndumele CE…Blumenthal RS**…Selvin E. Cardiovascular disease risk among cancer survivors: ARIC. *J Am Coll Cardiol.* 2022 Jul 5;80(1):22-32.
Conclusion: Adult cancer survivors have significantly higher risk of CVD, especially heart failure, independent of traditional CVD risk factors; there is an unmet need to define strategies for CVD prevention in this high-risk population.

Dzaye O…Dardari ZA..Nasir K…Mortensen MB, Whelton SP, Blaha MJ. Coronary artery calcium is associated with long-term mortality from lung cancer: CAC Consortium. *Atherosclerosis*. 2021 Dec;339:48-54.
Conclusion: CAC scores were associated with increased risks for lung cancer mortality, with strongest associations for current & former smokers, especially in women; CAC scanning may identify high-risk lung cancer screening candidates.

Zhan J…**Hays AG**…Kutty S. Deterioration in myocardial work indices precedes changes in global longitudinal strain following anthracycline chemotherapy. *Int J Cardiol*. 2022;363:171-178.
Conclusion: Non-invasive myocardial work indices correlate well with conventional markers of LV function.

Dzaye O…Dardari ZA, Mortensen MB, Marshall CH, Nasir K, Budoff MJ, Blumenthal RS, Whelton SP, Blaha MJ. Coronary artery calcium (CAC) is associated with increased risk for lung & colorectal cancer in men & women: MESA. *Eur Heart J Cardiovasc Imaging*. 2022 Apr 18;23(5):708-716.
Conclusion: CAC scores were associated with cancer risk in both sexes, but this was stronger for lung & colorectal when compared with sex-specific cancers; this supports potential synergistic use of CAC scores in the identification of both CVD & lung + colorectal cancer risk.

Brown SA…**Marshall CH**…Cheng RK. Bridging the gap to advance care of individuals with cancer: collaboration & partnership in the Cardiology Oncology Innovation Network (COIN). *Cardiooncology.* 2022;8(1)2.
Conclusion: The goal of this network is to connect our patients and their health to informatics-based opportunities to advance cardiovascular disease prevention in cancer patients.

Khan SU…Gulati M, **Hays AG, Michos ED**. A comparative analysis of premature heart disease- & cancer-related mortality in women in the USA, 1999-2018. *Eur Heart J Qual Care Clin Outcomes*. 2022;8(3):315-323.
Conclusion: The mortality gap between cancer & heart disease is decreasing among women < 65 years.


Cathy Marshall

Michos ED, Marshall CH. Healthy lifestyle benefits both cancer & CVD: more bang for the buck. *JACC CardioOncol*. 2021 Dec 21;3(5):675-677.
Conclusion: Better lifestyle habits reduce the risk of cancer as well as CVD.

Cholesterol

Khan SU…**Blaha MJ, Blumenthal RS, Michos ED**. Efficacy & safety for achievement of guideline-recommended lower LDL-C levels: systematic review & meta-analysis. *Eur J Prev Cardiol*. 2022 Feb 9;28(18):2001-2009.
Conclusion: Treatment to achieve LDL-C levels below 70 mg/dL using intensive lipid-lowering therapy can safely reduce the risk of mortality & major cardiac events.

Blaha MJ, Daubert MA. Assessing the impact of coronary plaque on the relative & absolute risk reduction with statin Rx. *JACC Cardiovasc Imaging*. 2021 Dec;14(12):2411-2413.
Conclusion: Statin treated patients with moderate or severe CAC had a much greater absolute risk reduction than those with no plaque; the PREVENTABLE trial will use blinded baseline CAC score to determine the value of an imaging-based approach for informing benefit of statin Rx in the elderly.

Orringer CE, **Blaha MJ**, Stone NJ. Coronary artery calcium (CAC) scoring in patients with statin associated muscle symptoms: prescribing statins for those most likely to benefit. *J Clin Lipidol.* 2021 Nov-Dec;15(6):782-788.
Conclusion: CAC scoring, by individualizing estimated risk and identifying those most likely to benefit, plays a key role in decision-making for the primary prevention patient with muscle complaints.

Montovano M, Stone NJ, **Blumenthal RS**. Comparing Guideline Recommendations of Statin Use for the Primary Prevention of ASCVD. *ACC.org*. October 4, 2022.
Conclusion: The USPSTF guidelines on statin eligibility are overly conservative and would delay statin treatment in many individuals with diabetes and those with multiple risk enhancing factors.

Cainzos-Achirica M, Quispe R, Dudum R… Joshi PH…Toth PP…Blaha MJ, Bittencourt M, Nasir K. CAC for risk stratification among individuals with hypertriglyceridemia free of clinical ASCVD. *JACC Cardiovasc Imaging.* 2022 Apr;15(4):641-651.
Conclusion: Future trials of therapies for hypertriglyceridemia could use CAC >100 to enroll a high-risk study sample, with implications for a larger target population.

Sharma J…**Michos ED**…Lindley KJ. Evaluation and management of blood lipids through a woman's life cycle. *Am J Prev Cardiol.* 2022 Mar 13;10:100333.
Conclusion: This review focuses on how lipids are impacted during normal hormonal changes throughout a woman's life starting in adolescence.


Thorsten Leucker

Vavuranakis MA, **Jones SR…. Blaha MJ… Gerstenblith G, Leucker TM**. Trajectory of Lipoprotein(a) during the peri- & early postinfarction period & the impact of PCSK9 inhibition. *Am J Cardiol.* 2022 May 15;171:1-6.
Conclusion: Lp(a) rises during the peri-infarction & early postinfarction period after an acute MI; the increase was prevented by a single dose of evolocumab given within 24 hours of hospitalization.

Cainzos-Achirica M, Quispe R, Mszar R, Dudum R…Toth PP…Blaha MJ, Greenland P, **Nasir K.** Coronary Artery Calcium Score to Refine the Use of PCSK9i in Asymptomatic Individuals: A Multicohort Study. *J Am Heart Assoc*. 2022 Aug 16;11(16):e025737
Conclusion: CAC may be used to refine the allocation of PCSK9i, potentially leading to more conservative use if CAC=0.

Chevli PA…**Blaha MJ**…Shapiro MD. Association between remnant lipoprotein cholesterol (RLP-C), hsCRP, & risk of ASCVD events in MESA. *J Clin Lipidol.* 2022 Sep 19:S1933-2874(22)00251-3.
Conclusion: RLP-C & hsCRP showed a similar independent association with incident ASCVD; the combination of increased RLP-C & hsCRP was associated with increased CV events.

Janovsky CCPS…**Blaha MJ, Jones S, Toth PP**…Benseñor IM. Substantially elevated TSH, not traditional clinical subclinical thyroid disorder groupings, are associated with smaller LDL-P mean size: ELSA-Brasil. *J Clin Lipidol.* 2022 May-Jun;16(3):335-344.
Conclusion: LDL mean size decreases as TSH levels increase, which may represent a more atherogenic lipid profile.

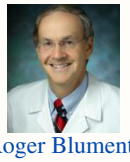
RESEARCH PUBLICATIONS

Mehta A, **Vasquez N…Patel J…Blumenthal RS…Blaha MJ, Joshi PH**. Independent Association of Lp(a) & CAC with atherosclerotic CV risk. *J Am Coll Cardiol.* 2022 Mar 1;79(8):757-768.
Conclusion: Compared with participants with nonelevated Lp(a) & CAC = 0, those with elevated Lp(a) & CAC ≥100 were at the highest risk (HR 4.71) & those with elevated Lp(a) & CAC = 0 were not at a statistically significant increased risk.

Ed Speno & Heartfest honoree Kevin Kilner

Castagna F…**Blaha MJ**…Slipczuk L. Visual coronary & aortic calcium scoring on chest CT predict mortality in patients with LDL-C ≥190 mg/dL. *Circ Cardiovasc Imaging*. 2022 Jun;15(6):e014135.
Conclusion: In patients without history of ASCVD but a LDL-C≥190 mg/dL, the presence & severity of CAC & TAC are independently associated with all-cause mortality.

Obisesan OH…Boakye E…Uddin SMI, Dzaye O, Osei AD, Orimoloye OA… Blumenthal RS…Matsushita K, Ballantyne CM, **Blaha MJ.** Lp(a) & subclinical vascular & valvular calcification on cardiac CT: ARIC. *J Am Heart Assoc.* 2022 Jun 7;11(11):e024870.
Conclusion: Elevated Lp(a) at middle age is significantly associated with vascular & valvular calcification in older age, represented by elevated CAC, aortic valve calcium, aortic valve ring, mitral valve, & thoracic aortic calcification



Roger Blumenthal

Rajendran A, Belanger M, Stone NJ, **Blumenthal RS**. Lost Opportunities for Prevention if Clinicians Adopt USPSTF Statin Recommendations. *Healio.com*. October 18, 2022.
Conclusion: Many fewer women would be treated with statin therapy if the USPSTF recommendations are followed by clinicians.

Minhas AMK…**Michos ED**… Virani SS. National trends & disparities in statin use for ischemic heart disease from 2006 to 2018. *Am Heart J*. 2022 Oct;252:60-69.
Conclusion: Persistent disparities in statin prescription remain, with the largest treatment gaps among younger patients, women, & racial/ethnic minorities (Blacks & Hispanics).

Zheng W, **Chilazi M…Sathiyakumar V…Toth PP, Jones SR, Martin SS.** Assessing the accuracy of estimated Lp(a) cholesterol & Lp(a)-free LDL- Cholesterol. *J Am Heart Assoc.* 2022 Jan 18;11(2):e023136.
Conclusion: Lp(a)-C estimations using fixed conversion factors overestimated Lp(a)-C & underestimated Lp(a)-free LDL-C at clinically relevant Lp(a) values; application of inaccurate Lp(a)-C estimations to correct LDL-C may lead to undertreatment of high-risk patients.

Gagel A, Zghyer F…Martin SS. What is the optimal low-density lipoprotein cholesterol? *Med Clin North Am.* 2022 Mar;106(2):285-298.
Conclusion: Total atherosclerotic plaque burden is related to cumulative exposure to LDL-C & other apoB-containing lipoproteins; long-term exposure to lower LDL-C levels is associated with lower CVD risk.

Gaine SP, Quispe R, Patel J, Michos ED. New Strategies for lowering LDL cholesterol for CVD prevention. *Curr Cardiovasc Risk Rep.* 2022 Sep;16(9):69-78.
Conclusion: Novel lipid therapies aim to lower risk of ASCVD by targeting reduction of LDL, Lp(a), & triglyceride-rich lipoproteins.

Gupta K…**Blumenthal RS**, Stone NJ…Virani SS. Comparing eligibility for statin therapy for primary prevention under 2022 USPSTF recommendations & the 2018 AHA/ACC/ multisociety guideline recommendations: NHANES. *Prog Cardiovasc Dis*. 2022 Aug 28:S0033-0620(22)00096-2.
Conclusion: Approximately 15% (~16 million) fewer adults were eligible for statin Rx for primary prevention under the 2022 USPSTF recommendations as compared to the 2018 AHA/ ACC/ MS Cholesterol guideline.

Sean Gaine

Gaine SP, Yoo E, Duvall C, Matasic D, Blumenthal RS, Whelton SP. Emerging Techniques for Cardiovascular Risk Assessment and Prevention. *ACC.org.* September 12, 2022.
Conclusion: The coronary artery calcium score is currently the best litmus test to determine a young adult's CVD risk since polygenic risk scores are not available to order in commercial labs.

Rikhi R…**Michos ED**…Shapiro MD. Relationship of LDL-cholesterol & lipoprotein(a) to CVD risk: MESA. *Atherosclerosis*. 2022 Oct 8:S0021-9150(22)01475-7.
Conclusion: When Lp(a) was elevated, risk of CHD events increased, regardless of baseline LDL-C.

Griffith N…**Sajja A, Gluckman TJ.** Leveraging healthcare system data to identify high-risk dyslipidemia patients. *Curr Cardiol Rep.* 2022;24(10):1387-1396.
Conclusion: Healthcare systems are uniquely positioned to define care gaps & areas of opportunity, as well as leverage tools (e.g., clinical decision support, case identification) aimed at closing them.

Shaya GE, Leucker TM, Jones SR, Martin SS, Toth PP. Coronary heart disease risk: Low-density lipoprotein & beyond. *Trends Cardiovasc Med.* 2022 May;32(4):181-194.
Conclusion: Atherosclerosis is a chronic immunoinflammatory, fibroproliferative disease fueled by lipids.

During his two-year term as President of the American Society for Preventive Cardiology (ASPC), **Dr. Peter Toth** initiated a comprehensive program for clinicians to gain added certification in cardiovascular disease prevention. He and his colleagues are developing a self-assessment comprised of 350 questions. In addition, he developed a two-day "Experts Course in Preventive Cardiology" comprised of 24 lectures spanning the entire spectrum of Preventive Cardiology.

He also co-developed two other courses put forth by ASPC: one on Cardiovascular Imaging and another on Exercise and Lifestyle. And he initiated the preparation of ASPC Clinical Practice Statements, mentoring program for young preventive cardiologists, and ASPC-certified Centers of Excellence, among other initiatives.

Dr. Toth serves as Chair of the American Heart Association's ATVB Council on Clinical Lipidology, Lipoproteins, Thrombosis, and Atherosclerosis, and is a member of the AHA Council on Arteriosclerosis, Thrombosis, and Vascular Biology, ATVB Leadership Committee. He is a member of the International Atherosclerosis Society, Regional Federation Executive Committee for the Americas, serves as Associate Editor, J*ournal of Clinical Lipidology* and *American Journal of Preventive Cardiology* and Editor-in-Chief, Contemporary Cardiology Library of Books, Springer-Humana Publishing, which offers over 100 volumes spanning the entire spectrum of modern cardiovascular medicine.

Rao SJ, Martin SS…Davis DM, **Nasir K, Cainzos-Achirica M, Blumenthal RS, Sharma G.** Evaluating the role of statins in prevention of preeclampsia: deeper insights into maternal cardiometabolic changes. *J Clin Lipidol*. 2022 Jul-Aug;16(4):403-416.
Conclusion: The lipid-lowering, immunomodulatory, anti-inflammatory, & pleiotropic effects of statins make them promising candidates for the prevention & Rx of preeclampsia; however, the clinical use of statin therapy to prevent preeclampsia currently is not justified.

Patel J, Blumenthal RS, Al Rifai M. Hypertriglyceridemia in MESA-Reply. *JAMA Cardiol.* 2022 Apr 1;7(4):462-463.
Conclusion: Optimizing lifestyle habits is the most important step in lowering triglycerides.

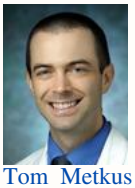
Chilazi M…Marvel FA, Khoury S, Jones SR, Martin SS. Quantifying the contribution of lipoprotein(a) to all apoB containing particles. *J Clin Lipidol.* 2022 Mar-Apr;16(2):220-226.
Conclusion: A particle-based approach was used to quantify the contribution of Lp(a) to all apoB-containing particles using validated, widely available clinical assays.


Rick Ferraro

Ferraro RA, Leucker T, Martin SS, Banach M, Jones SR, Toth PP. Contemporary management of dyslipidemia. *Drugs*. 2022 Apr;82(5):559-576.
Conclusion: Special attention is paid to long-term adherence to lipid-lowering therapies, & the benefits derived from instituting appropriate medications in a structured manner.

Zhou Z…**Whelton SP…Blaha MJ**… Nelson MR. Impact of blood lipids on 10-year CVD risk in individuals without dyslipidemia & with low risk factor burden. *Mayo Clin Proc.* 2022 Oct;97(10):1883-1893.
Conclusion: Except for triglycerides, all lipid variables were associated with atherosclerosis & future risk of CV disease among persons without dyslipidemia & with low risk factor burden.

Mortensen MB, Caínzos-Achirica M…Blaha MJ…Nasir K, Nørgaard BL. Association of coronary plaque with low-density lipoprotein cholesterol & rates of CVD events among symptomatic adults. *JAMA Netw Open.* 2022 Feb 1;5(2):e2148139.
Conclusion: In symptomatic patients with severely elevated LDL-C >190 mg/dL, absence of calcified & noncalcified plaque on coronary CTA was associated with low risk for events; this suggests that atherosclerosis burden, including CAC, can individualize Rx intensity in patients with elevated LDL-C.


Tom Metkus

Metkus TS… Jones SR, Martin SS, Schulman SP, Leucker TM. Plasma proprotein convertase subtilisin/kexin type 9 (PCSK9) in the ARDS Syndrome. *Front Med).* 2022 Jun 13;9:876046.
Conclusion: Plasma PCSK9 is not associated with mortality in ARDS; however, higher PCSK9 levels are associated with fewer ICU free & ventilator free days.

Quispe R, Sweeney T, Varma B, Agarwala A, Michos ED. Recent Updates in hypertriglyceridemia management for CVD prevention. *Curr Atheroscler Rep*. 2022 Oct;24(10):767-778.
Conclusion: Ongoing clinical trials are evaluating novel selective therapies such as apoC3 & ANGPTL3 inhibitors.

Penson PE…**Toth PP…Banach M**; International lipid expert panel (ILEP). Step-by-step diagnosis & management of the nocebo/drucebo effect in statin-associated muscle symptoms patients. *J Cachexia Sarcopenia Muscle.* 2022 Jun;13(3):1596-1622.
Conclusion: Many perceived adverse events are due to physical musculoskeletal injury & inflammatory myopathies, & subjective symptoms occur because patients expect them to do so when taking medicines (the nocebo/drucebo effect); this might be applicable 50% of all patients with muscle weakness/pain.

O'Donoghue ML…for the OEAN(a)-DOSE Trial Investigators (including **Leucker, T**). Small interfering RNA to reduce Lipoprotein(a) in CVD. *N Engl J Med.* 2022;387(20):1855-1864.

Leatherman S…**Toth PP**…Boden W. Increased residual cardiovascular risk in US veterans with moderately elevated baseline triglycerides (TG) and well-controlled LDL-C levels on statins. *Front Cardiovasc Med*. 2022 Nov 4.
Conclusion: Elevated TG levels were associated with increased CV events in patients with established CV disease & with diabetes only, suggesting that elevated TG levels are associated with a similar degree of residual risk in high-risk primary prevention and secondary prevention settings.


Renato Quispe

Elshazly MB, Quispe R. The lower the apoB, the better: now, how does apoB fit in the upcoming era of targeted therapeutics. *Circulation.* 2022;146(9):673-5.
Conclusion: Before apoB takes center stage in risk assessment & Rx in clinical practice guidelines, more work needs to be done to standardize apoB measurement & define thresholds to begin or intensify therapy in primary & secondary prevention.

Simony SB, **Mortensen MB**…Nordestgaard. Sex differences of Lp(a) levels & associated risk of risk of morbidity & mortality by age. *Atherosclerosis.* 2022;355:76-82.
Conclusion: Elevated lipoprotein(a) above age 50 is a relatively more common CVD risk factor in women, but risk of morbidity and mortality was similar in both genders.

Mortensen MB…Nordestgaard BG. Statin eligibility for primary prevention of CVD according to 2021 European prevention guidelines compared with other international guidelines. *JAMA Cardiol.* 2022;7(8):836-43.
Conclusion: The new treatment thresholds in the 2021 European-ESC guidelines dramatically reduce eligibility for primary prevention with statins in low-risk European countries; using lower treatment thresholds can improve overall guideline performance.

Maniar Y, Blumenthal RS, Alfaddagh A. The role of coronary artery calcium (CAC) in allocating pharmacotherapy for primary prevention of cardiovascular disease: The ABCs of CAC. *Clin Cardiol.* 2022 Sep 10.
Conclusion: Higher CAC warrant more aggressive secondary prevention treatment goals.


Aparna Sajja

Sajja A…Blumenthal RS… Martin SS, Gluckman TJ. Discordance between standard equations for determination of LDL cholesterol in patients with atherosclerosis. *J Am Coll Cardiol*. 2022 Feb 15;79(6):530-541.
Conclusion: Because the Martin/Hopkins equation is easy to implement & has no additional cost to patients, it is the most practical means to estimate LDL-C.

Cigarettes

Boakye E, Obisesan OH, Uddin SMI… Dzaye O, Osei AD… Blaha MJ. Cannabis vaping among adults in US: prevalence, trends, & association with high-risk behaviors & adverse respiratory conditions. *Prev Med*. 2021 Dec;153:106800.
Conclusion: The increasing trends of cannabis vaping, particularly among young adults, raise concern & underscore the need for continued surveillance.

El-Shahawy O…**Mirbolouk M, Osei AD… Blaha MJ.** Association of E-cigarettes with erectile dysfunction. *Am J Prev Med*. 2022 Jan;62(1):26-38.
Conclusion: The use of e-cigarettes is associated with erectile dysfunction independent of other risk factors.

RESEARCH PUBLICATIONS

An Assistant Professor of Medicine, who focuses on prevention of atherosclerotic vascular disease and cardiac CT, **Dr. Seamus Whelton** completed his undergraduate studies at Princeton University, followed by a Masters of Public Health in Epidemiology, Doctor of Medicine degree, and Internal Medicine residency training at Tulane. He completed a post-doctoral fellowship at the Welch Center for Prevention, Epidemiology and Clinical Research at the Bloomberg School of Public Health. He then completed his Cardiology training as a fellow within the Johns Hopkins Division of Cardiology.

Dr. Whelton's primary research interest is the use of non-contrast cardiac CT imaging as well as coronary CT angiography for risk prediction, examining the competing risks of cardiovascular and non-cardiovascular disease, and how aging impacts cardiovascular risk prediction. He also is exploring aortic valve calcium to identify persons at increased long-term risk for severe aortic stenosis, which may guide future strategies to slow the progression of aortic valve calcification and aortic stenosis.

He recently published a paper with **Dr. Erin Michos** that looked at the prevalence of coronary artery calcium (CAC) and cardiovascular disease risk in women with early menopause. Surprisingly they found that more than 50% of women with early menopause had no CAC with a similar 10-year ASCVD risk to women without early menopause, but there was a signal that 15-year risks were higher.

Along with **Drs. Michael Blaha** and **Omar Dzaye**, Dr. Whelton co-authored an Expert Consensus Statement from the SCCT on cardiac computed tomographic imaging in Cardio-Oncology, which highlighted the importance of reporting coronary artery calcium from non-cardiac CT scans to improved CVD risk stratification among cancer patients.

Together with **Drs. Blaha** and **Ellen Boakye**, Dr. Whelton led a study on aortic valve calcification (AVC) showing that, though AVC was common, it was not universally present in a cohort of older adults in the ARIC study. Dr. Whelton also was the lead author on another publication that found that traditional cardiovascular risk prediction using the AHA/ACC Pooled Cohort Equations provides important information for both CVD and cancer risk stratification, potentially guiding a synergistic approach to screening and preventive therapies for the two leading causes of death in the U.S.

Xie W…**Blaha MJ…DeFilippis AP**…Stokes AC. Association of electronic cigarette use with respiratory symptom development among U.S. young adults. *Am J Respir Crit Care Med*. 2022 Jun 1;205(11):1320-1329.
Conclusion: Former & current e-cigarette use was associated with higher odds of developing wheezing-related respiratory symptoms, after accounting for cigarette smoking & e-cigarettes.

Berlowitz JB…**Blaha MJ**…Stokes AC. E-cigarette use & risk of CVD: Longitudinal analysis of PATH study (2013-2019). *Circulation*. 2022 May 17;145(20):1557-1559.
Conclusion: Combining smoking with e-cigarette use does not reduce CVD events & quitting both products is required to ensure a mitigation of risk.

Mirbolouk M, Boakye E, Obisesan O, Osei AD, Dzaye O…Blaha MJ. E-cigarette use among high school students in the US prior to the COVID-19 pandemic: Trends, correlates, & sources of acquisition. *Prev Med Rep*. 2022 Jul 22;29:101925.
Conclusion: Most youth are evading age-related restrictions by obtaining e-cigarettes from older people & nearly half of youth tobacco users are making quit attempts.

Boakye E… Obisesan O, Dzaye O, Osei AD, Erhabor J, Uddin SMI, Blaha MJ. The inverse association of state cannabis vaping prevalence with the e-cigarette or vaping product-use associated lung injury. *PLoS One.* 2022 Oct 17;17(10):e0276187.
Conclusion: State-level cannabis vaping prevalence was not positively associated with e-cigarette or vaping product-use-associated lung injury (EVALI) prevalence; the relationship is nuanced & reflective of access to informal sources of THC-containing e-cigarettes.

Ellen Boakye

Boakye E… Osei AD, Mirbolouk M…Dzaye O… Blaha MJ. Assessment of patterns in e-cigarette use among adults in the US, 2017-2020. *JAMA Netw Open*. 2022 Jul 1;5(7):e2223266.
Conclusion: Daily e-cigarette use consistently increased, particularly among young adults aged 21 to 24 years; this suggests greater nicotine dependence among those who use e-cigarette users.

Boakye E, Dzaye O…Obisesan O, Osei AD… Blaha MJ. Impact of the FDA enforcement policy on flavored e-cigarettes on the online popularity of disposable e-cigarettes: analyses of Google search query data. *BMC Public Health.* 2022 Oct 19;22(1):1937.
Conclusion: The tracking of online search data demonstrates rapid public recognition of the FDA's announcements of tobacco regulatory actions.

Zghyer, F, Shin J, Blumenthal R, Ratchford EV. Just What the Doctor Ordered in 2022: Nicotine Replacement Therapy. *http://www.acc.org* April 22, 2022.
Conclusion: We provide a concise guide to how to help smokers kick the habit.

Dr. Charles Lowenstein and Sue Hall, CRNP

Zhang Z…**Blaha MJ, Osei A**… Biswal S. Association between e-cigarette use & prediabetes: 2016-2018. *Am J Prev Med.* 2022 Jun;62(6):872-877.
Conclusion: E-cigarette use was associated with greater odds of prediabetes.

Ding N…**Blaha MJ…Matsushita K.** Cigarette smoking, cessation, & risk of heart failure (HF) with preserved & reduced ejection fraction. *J Am Coll Cardiol*. 2022 Jun 14;79(23):2298-2305.
Conclusion: Smoking is an important modifiable risk factor for HF & this highlights the importance of smoking prevention & cessation for the prevention of all types of HF..

COVID/Infectious Disease

Usman MS…**Michos ED.** Is there a smoker's paradox in COVID-19? *BMJ Evid Based Med.* 2021 Dec;26(6):279-284.
Conclusion: Smoking may worsen susceptibility & prognosis in COVID-19; the claims of a protective effect are likely false**.**

Maniar YM, Al-Abdouh A, **Michos ED.** Influenza vaccination for CVD prevention: further insights from IAMI trial and an updated meta-analysis. *Curr Cardiol Rep*. 2022 Oct;24(10):1327-1335.
Conclusion: The influenza vaccine should be strongly encouraged in all patients with CVD & incorporated as an essential facet of post-MI care & secondary CVD prevention.

Satoskar MA…**Michos ED…Post WS, Hays AG.** Improving risk prediction for pulmonary embolism (PE) in COVID-19 patients using echocardiography. *Pulm Circ.* 2022 Mar 8;12(1):e12036.
Conclusion: Positive D-dimer >5, RV dysfunction on echo, & troponin were important predictors for calculating likelihood of PE.

Kianoush S, Rifai MA, **Patel J, Michos ED…** Virani SS. Racial disparity in flu vaccine uptake among Asian American individuals. *Curr Probl Cardiol.* 2022 Sep 12;47(12):101391.
Conclusion: Influenza vaccine coverage remains suboptimal across all studied races/ethnicities.

Won T,…**Goerlich E,…Hays AG**…Čiháková D. Endothelial thrombomodulin downregulation caused by hypoxia contributes to severe infiltration & coagulopathy in COVID-19 patient lungs. *EBioMedicine.* 2022;75:103812.
Conclusion: Pulmonary endothelial cells become dysfunctional during COVID-19 with a loss of thrombomodulin expression related to severe thrombosis & infiltration; endothelial cell dysfunction might be caused by a pathologic condition in COVID-19 patient lungs rather than a direct infection with SARS-CoV-2.

Bozkurt B…**Michos ED**…Yancy CW. 2022 AHA/ACC key data elements & definitions for cardiovascular & noncardiovascular complications of COVID-19: report of the ACC/AHA task force on clinical data standards. *Circ Cardiovasc Qual Outcomes*. 2022 Jul;15(7):e000111.
Conclusion: The authors provide a clinical lexicon comprising data elements related to complications of COVID-19.

Ogungbe O…Dennison Himmelfarb CR, **Post WS,** Commodore-Mensah Y. Subclinical myocardial injury, coagulopathy, & inflammation in COVID-19: meta-analysis of hospitalized patients. *Int J Cardiol Heart Vasc*. 2022 Jun;40:100950.
Conclusion: Patients who have recovered from COVID-19 may benefit from minimally invasive assessment for markers of myocardial injury, stretch, & coagulopathy for early risk stratification purposes.

Collaborative Cohort of Cohorts for COVID-19 Research (C4R) Study: Study Design. Oelsner EC..**Post WS**…Zhang Y; for the C4R Investigators. *Am J Epidemiol*. 2022 Jun 27;191(7):1153-1173.
Conclusion: C4R will allow evaluation of risk & resilience factors for COVID-19 severity & outcomes, including postacute sequelae, & assessment of the social & behavioral impact of the pandemic on long-term health trajectories.

Shade JK,…**Hays AG**, Trayanova NA. Real-time prediction of mortality, cardiac arrest, & thromboembolic complications in hospitalized patients with COVID-19. *JACC Adv.* 2022;1(2):100043.
Conclusion: COVID-HEART predictor accurately estimates all-cause mortality/cardiac arrest (AM/CA) & thromboembolic events (TEs) within multiple time windows in hospitalized COVID-19 patients.


Charles Lowenstein

Osburn WO……**Leucker TM, Lowenstein CJ.** Markers of endothelial cell activation are associated with the severity of pulmonary disease in COVID-19. *PLoS One.*2022;17(5):e0268296.
Conclusion: Increased levels of VWF & P-selectin were linked to lung disease severity in COVID-19 & correlated with biomarkers of inflammation & vascular inflammation state.

Sender S, Kohli P, **Sharma G, Blumenthal RS.** COVID-19's impact on heart disease and stroke mortality. *http://www.acc.org.* May 25, 2022.
Conclusion: There was an increase in CVD events during the first two years of the pandemic.


Thorsten Leucker

Leucker TM,…Gerstenblith G,… Solomon SD, **Lowenstein CJ.** Effect of Crizanlizumab, a P-selectin inhibitor, in COVID-19: placebo-controlled, randomized trial. *JACC Basic Transl Sci*. Dec 2021;6(12):935-945.
Conclusion: Crizanlizumab reduced P-selectin levels by 89%, increased D-dimer levels by 77%, & decreased prothrombin fragment, suggesting that crizanlizumab may induce thrombolysis in the setting of COVID-19.

Petersen SE,…**Hays AG**…Bluemke DA. Cardiovascular magnetic resonance for Patients With COVID-19. *JACC Cardiovasc Imaging.* 2022;15(4):685-699.
Conclusion: CMR is a valuable diagnostic tool in patients with COVID-19 presenting with myocardial injury & evidence of cardiac dysfunction.

Rajpal S,…**Gluckman TJ**, Fuster V. Fulminant Myocarditis Following SARS-CoV-2 Infection: JACC Patient Care Pathways. *J Am Coll Cardiol.* 2022;79(21):2144-2152.
Conclusion: This case of fulminant myocarditis following SARSCoV-2 infection highlights many of the severe clinical manifestations that may occur including pericarditis, ischemia, microvascular disease, nonischemic cardiomyopathy, stress cardiomyopathy, thromboembolism, & arrhythmia.

Writing Committee, **Gluckman TJ**, Bhave NM, et al. 2022 ACC Expert Consensus Decision Pathway (ECDP) on Cardiovascular Sequelae of COVID-19 in Adults: Myocarditis & Other Myocardial Involvement, Post-Acute Sequelae of SARS-CoV-2 Infection, & Return to Play. *J Am Coll Cardiol.* 2022;79(17):1717-1756.
Conclusion: This ECDP provides a framework for evaluation & management of adults with cardiovascular sequelae following SARS-CoV-2 infection.

Kwapong YA, Sharma G…Wu KC, Hays AG. Effect of HIV Serostatus on ICU Admission & mortality among hospitalized patients with COVID-19. *J Acquir Immune Defic Syndr*. 2022;90(5):e13-e16.
Conclusion: Immunocompromised patients with COVID-19 are at higher risk for ICU admission relative to immunocompetent individuals.

Solomon AL, **Ratchford EV**…Kovacic JC. Vascular Disease Patient Information Page: vascular considerations with COVID-19 vaccines. *Vasc Med*. 2022;27(1):102-106.
Conclusion: Rare cardiovascular complications of COVID-19 vaccine include myocarditis/pericarditis, vaccine-induced thrombotic thrombocytopenia (VITT), & thrombosis, but most of these adverse effects are seen more frequently due to COVID-19, rather than after the vaccine.

Diabetes/Metabolic Syndrome

Chevli PA…**Nasir K, Blaha MJ**…Mongraw-Chaffin M. Relationship of AHA's Life Simple 7, ectopic fat, & insulin resistance in 5 racial/ethnic Groups. *J Clin Endocrinol Metab.* 2022 May 17;107(6):e2394-e2404.
Conclusion: Poor & intermediate CVH, defined by LS7 metrics, were associated with significantly higher measures of ectopic fat & insulin resistance among 5 racial/ethnic group.

Adhikari R, Jha K, Dardari Z…**Blumenthal RS… Blaha MJ**. National trends in use of SGLT2 inhibitors & GLP-1 receptor agonists by cardiologists & other specialties, 2015 to 2020. *J Am Heart Assoc.* 2022 May 3;11(9):e023811.
Conclusion: While use of SGLT2is & GLP-1RAs by cardiologists in the US increased substantially over a 6-year period, cardiologists still account for a small proportion of all use, contributing to marked undertreatment of individuals with type 2 diabetes at high risk.

Hamo CE, Echouffo-Tcheugui JB… **Florido R… Michos ED…Gerstenblith G, Post WS, Blumenthal RS**…Selvin E, Coresh J, **Ndumele CE**. Diabetes duration & subclinical myocardial Injury: ARIC. *Clin Chem*. 2022 Oct 6;68(10):1272-1280.
Conclusion: Longer diabetes duration is strongly associated with subclinical myocardial injury; interventional studies are needed to assess whether the delay of diabetes onset can mitigate early myocardial damage.

Dzaye O…**Jha K, Nasir K**…**Mortensen MB, Blaha MJ**. Online searches for SGLT-2 inhibitors & GLP-1 receptor agonists correlate with prescription rates in the US: An infodemiological study. *Front Cardiovasc Med*. 2022 Jul 29;9:936651.
Conclusion: Trends in online searches complement conventionally acquired data to reflect & forecast prescription trends of cardiometabolic drugs.

Al Rifai M…**Patel J, Blaha MJ**…**McEvoy JW**…Virani SS. Statin use & risk of diabetes by subclinical atherosclerosis burden: MESA. *Am J Cardiol*. 2022 Sep 30:S0002-9149(22)00958-4.
Conclusion: Statin Rx was not significantly associated with incident diabetes mellitus in this observational study; the risk of incident diabetes did not significantly differ by baseline CAC.

Joining the Ciccarone Center for the Prevention of Cardiovascular Disease in March 2022, **Samantha Sender, MSN, CRNP, FNP-BC** is a Nurse Practitioner with a passion for Preventive Cardiology. She earned her degree at Emory University, where she was invited to become a member of Sigma Theta Tau International Honor Society of Nursing. However, her path to become a Nurse Practitioner is non-traditional.

Prior to attending Emory, she obtained her bachelor's degree in Public Health and Entrepreneurship & Management at the Johns Hopkins University, She graduated Phi Beta Kappa. During her undergraduate studies, Samantha Sender had the opportunity to study in Denmark to complete a course that focused on health delivery and prioritization in Northern Europe.

She worked in healthcare consulting before making the decision to pursue a career in nursing. She loves being able to partner with her patients to work towards achieving their health goals. Samantha Sender, CRNP is also a member of The American College of Cardiology, American Society for Preventive Cardiology, AHA, and The American Association of Nurse Practitioners. Her favorite way to get her steps in is walking her goldendoodle, Tucker.

Handelsman Y, Anderson JE…**Michos ED**… Weir MR. DCRM Multispecialty practice recommendations for the management of diabetes, cardiorenal, & metabolic diseases. *J Diabetes Complications*. 2022 Feb;36(2):108101.
Conclusion: Type 2 diabetes, chronic kidney disease, ASCVD, & heart failure (HF)-along with their associated risk factors have overlapping etiologies & frequently occur in the same patient.

Inciardi RM,,..Echouffo Tcheugui JB, **Ndumele C**…Skali H.. Cardiac structure & function & diabetes-related risk of death or heart failure in older adults. *J Am Heart Assoc.* 2022;11(6):e022308.
Conclusion: The increased risk of events associated with diabetes was partially explained by cardiac structure & function abnormalities.

Varma B, Ogunmoroti O, Ndumele CE, Zhao D…Michos ED. Higher leptin levels are associated with coronary artery calcium (CAC) progression: MESA. *Diabet Epidemiol Manag*. 2022 Apr-Jun;6:100047.
Conclusion: Higher levels of the adipokine leptin were independently, but modestly, associated with CAC progression; atherosclerosis progression may be one mechanism through which leptin confers increased CVD risk.

Salazar IMC, Tibuakuu M, Blumenthal RS, Sarkar S. Cardiovascular disease in patients with diabetes: comparison of professional society guidelines. *Curr Diabetes Rev.* 2022;18(4):e200821195733.
Conclusion: Comprehensive risk factor modification is just as important as glycemic control in persons with diabetes.

Echouffo-Tcheugui JB…**Ndumele CE**… Selvin E. Diabetes, GDF-15 & incident heart failure: ARIC study. *Diabetologia.* 2022;65(6):955-963.
Conclusion: GDF-15 provided complementary prognostic information on HF risk, especially among individuals with diabetes.

Chobufo MD… **Michos ED**, Whelton PK, Balla S. Temporal trends in ASCVD risk among US adults. NHANES 1999-2018. *Eur J Prev Cardiol*. 2022 Aug 3:zwac161.
Conclusion: Mean BMI & prevalence of diabetes increased, while mean serum cholesterol levels & prevalence of smoking declined during the study period.

Shabani M…**Post WS**…Demehri S. Association of quantified costal cartilage calcification (CCC) & long-term cumulative blood glucose exposure: MESA. *Front Endocrinol*. 2021 Dec 13;12:785957.
Conclusion: CCC, a reliably quantified marker in non-contrast cardiac CT, is associated with 10-year cumulative fasting blood glucose exposure only in female participants, even those with zero CAC.

Eric Broni

Broni EK, Ndumele CE, Echouffo-Tcheugui JB…**Michos ED**. The diabetes-cardiovascular connection in women: understanding the known risks, outcomes, and implications for Care. *Curr Diab Rep*. 2022 Jan;22(1):11-25.
Conclusion: Women with diabetes are at greater relative risk for CVD complications than men, with poorer outcomes, superimposed on preexisting gender disparities in social determinants of health & lower likelihood of being offered cardioprotective interventions.

RESEARCH PUBLICATIONS

An Assistant Professor of Medicine and a diabetologist, **Sudi Sarkar, MD,** was newly named Director, Clinical Diabetes Services in the Division of Endocrinology, Diabetes, and Metabolism. She leads the Inpatient Diabetes Management Service at the Johns Hopkins Hospital and Johns Hopkins Bayview Medical Center, and chairs the JHH Glucose Steering Committee. Dr. Sarkar, a part of the Ciccarone Center since 2018, has a special clinical and research interest in the effects of HIV on lipids and glycemic control.

In 2022, she co-authored a review led by **Drs. Allison Hays** and **Ellise Gambahaya** on the strengths and limitations of various cardiovascular imaging modalities to improve the management of cardiomyopathy in persons living with HIV. She also co-authored a research manuscript led by Drs. Hays and **Erin Goerlich** which found that waist and hip circumference and subcutaneous fat area are associated with impaired coronary endothelial function. The latter is an established metric of abnormal vascular health and likely contributes to the increased rate of heart disease in adults with HIV.

Williams A…**Michos ED**…**Golden SH**, Joseph JJ. Vitamin D, parathyroid hormone, glucose metabolism & incident diabetes in MESA. *BMJ Open Diabetes Res Care*. 2022 Sep;10(5):e002931.
Conclusion: Serum 25(OH)D is inversely associated with insulin resistance & incident diabetes in White, Black, Hispanic & Chinese Americans.

Matasic DS, Echouffo-Tcheugui J, **Blumenthal RS.** Influence of diabetes on the progression of heart failure: minimizing the risk. *ACC.org* Jul 28,2022.
Conclusion: Longer duration of diabetes is associated with a higher risk of developing heart failure.

Rajan T, Gaine SP, Echouffo-Tcheugui J, **Blumenthal RS, Sender SJ**. Effect of metformin & lifestyle interventions on CV Events from the Diabetes Prevention Program & its outcome Study. *ACC.org* July 12, 2022 & subsequently on Medscape.com September 21, 2022.
Conclusion: While metformin reduces the development of diabetes, it is unclear if it provides additional cardiovascular benefit.

Filippatos G…**Michos ED**…Agarwal R. Finerenone efficacy in patients with chronic kidney disease, type 2 diabetes (T2D) & ASCVD. *Eur Heart J Cardiovasc Pharmacother*. 2022 Oct 17:pvac054.
Conclusion: Finerenone, a selective, non-steroidal mineralocorticoid receptor antagonist, reduced the risk of CV & kidney outcomes consistently across the spectrum of CKD in patients with T2D.

Johri AM… **Michos ED**…Spence JD. Progression of atherosclerosis with carnitine supplementation: a randomized controlled trial in the metabolic syndrome (MetS). *Nutr Metab*. 2022 Apr 2;19(1):26.
Conclusion: Though total carotid plaque volume did not change in MetS participants taking L-carnitine over 6-months, there was a concerning progression of carotid plaque stenosis.

Rossing P…**Michos ED**….de Boer IH. Executive summary of the KDIGO 2022 clinical practice guideline for diabetes management in CKD: update based on rapidly emerging new evidence. *Kidney Int.* 2022 Nov;102(5):990-999.
Conclusion: This summary represents a focused update of the KDIGO 2020 guideline on the topic.

Skendelas JP…**Arbab-Zadeh A**…Slipczuk L. Perioperative cardiometabolic targets and CABG mortality in patients with diabetes. *J AM Heart Assoc*. 2022 May 3.
Conclusion: Among patients with diabetes, blood pressure control and statin therapy were the most important perioperative cardiometabolic survival determinants 5 years after CABG.

Taha MB…**Cainzos-Achirica M…Nasir K.** Glucagon-like peptide 1 receptor agonists: a medication for obesity management. *Curr Atheroscler Rep*. 2022; 24(8):643-54.
Conclusion: Upcoming studies will evaluate the durability of weight loss achieved with GLP-1RAs and the impact on cardiovascular outcomes.

Alnabelsi T…**Cainzos-Achirica M**, Al-Mallah MH. Added prognostic value of plaque burden to CTA & MPI in patients with diabetes. *Am J Med.* 2022;135(6):761-8.
Conclusion: In high-risk patients with diabetes & suspected coronary disease, the segment involvement score (SIS) has incremental prognostic value over ischemia by SPECT or stenosis by CCTA in predicting incident CVD outcomes.

Taha MB…**Sharma G…Cainzos-Achirica M, Nasir K.** Cost-related medication nonadherence (CRN) in adults with diabetes in the US.
Conclusion: One in six nonelderly & one in 14 elderly adults with diabetes reported CRN; removing financial barriers to accessing medications will improve medication adherence among these patients & likely improve their outcomes.

Jha KK…Rajan T, Blaha MJ. Transitioning to GLP-1 RA & SGLT2 inhibitors as the first choice for managing cardiometabolic risk in Type 2 diabetes. *Curr Atheroscler Rep*. 2022 Nov 24
Conclusion: SGLT-2 inhibitors reduce heart failure hospitalization & chronic kidney disease progression, while GLP-1 RA demonstrated the largest effects on HbA1c reduction, weight loss, & ASCVD outcomes prevention, including stroke.

John Astin - former Heartfest honoree

Diet/weight/environment

Kim J, **Duvall CR, Blumenthal RS**, Sutton NR. The necessity of improving cardiovascular health in commercial motor vehicle drivers. *American Heart Journal Plus: Cardiology Research and Practice.* 22 (2022) 100206.
Conclusion: Commercial vehicle drivers often have multiple CVD risk factors & clinicians need to emphasize the need for comprehensive risk factor modification strategies.

Zghyer F, Duvall C, Gianos E, Blumenthal RS. Putting the 2021 AHA Dietary Guidelines Into Practice. *ACC.org*. January 14, 2022.
Conclusion: This is an excellent review of contemporary dietary advice from the AHA.

RESEARCH PUBLICATIONS

Goldsborough E III, Gopal M, **McEvoy JW, Blumenthal RS, Jacobsen AP**. Pollution & cardiovascular health: a contemporary review of morbidity and implications for planetary health. A*merican Heart Journal Plus: Cardiology Research and Practice.* November 2022.
Conclusion: Pollution has emerged as leading cause of premature morbidity and mortality & is a very important risk factor for many types of CVD.

Belardo D, **Michos ED…Blumenthal RS**… Gulati M. Practical, evidence-based approaches to nutritional modifications to reduce ASCVD: An ASPC Clinical Practice Statement. *Am J Prev Cardiol*. 2022 Mar 2;10:100323.
Conclusion: A diet consisting predominantly of fruits, vegetables, legumes, nuts, seeds, plant protein & fatty fish is optimal for the prevention of ASCVD.


Jelani Grant

Grant J, Ndumele CE. A hunger for action: the need to address the food environment in the evaluation and management of heart failure Patients. *Circ Heart Fail.* 2022;10.1161
Conclusion: We highlight the links of food security & environments with CVD outcomes, specifically heart failure mortality.

Esposito S, Abovich A, Jacobsen AP, Blumenthal RS, Gulati M. Air pollution and the erosion of heart health. *ACC.org.* January 12, 2022.
Conclusion: Increasing air pollution is a causal risk factor for CVD.

Raffield LM,..**Ndumele C**… Avery CL. Obesity duration, severity, & distribution trajectories & CVD risk in ARIC study. *J Am Heart Assoc*. 2021;10(24):e019946.
Conclusion: Risk of incident CVD & mortality is different across subclasses of obesity over time; individuals with rapid declines in adiposity metrics had elevated mortality, coronary disease, stroke, & heart failure risk versus the stable/slow decline reference group.

Jacobsen AP, Blumenthal RS. Cardiovascular disease is the condition, air pollution the risk factor, fossil fuel combustion the cause. *J Am Coll Cardiol*. 2022 Jan 18;79(2):e131.
Conclusion: We need to limit use of fossil fuels to improve cardiovascular health.


E Goldsborough

Goldsborough E III, Esposito S, Blumenthal RS, Jacobsen AP. Pollution has 'deleterious effects' on CV Health. *Healio.com.* February 23, 2022.
Conclusion: The many types of pollution need to be promptly addressed by all countries.

Jacobsen AP, Khiew YC, **Duffy E**…Auwaerter PG, **Blumenthal RS…McEvoy JW.** Climate change and the prevention of cardiovascular disease. *Am J Prev Cardiol*. 2022 Sep 11;12:100391.
Conclusion: Climate change is an existential crisis that must be addressed on an urgent basis.

Laffin LJ…**Michos ED**…Nissen SE. Comparative effects of low-dose rosuvastatin, placebo, & dietary supplements on lipids & inflammatory biomarkers. *J Am Coll Cardiol.* 2022 Oct 19.
Conclusion: Rosuvastatin 5 mg daily lowered LDL-C significantly more than placebo, fish oil, cinnamon, garlic, turmeric, plant sterols, and red yeast rice.

Aneni EC…**Cainzos-Achirica M…Nasir K.** Cardiometabolic disorders, inflammation, & the incidence of non-alcoholic fatty liver disease (NAFLD); longitudinal study comparing lean & non-lean individuals. *PLoS One*. 2022;17(4):e0266505.
Conclusion: Cardiometabolic risk factors are independently associated with NAFLD, but there are significant differences in the risk predictors of NAFLD between lean & non-lean individuals.

Taha MB…**Cainzos-Achirica M, Nasir K**, Patel KV. Implementation of cardiometabolic centers & training programs. *Curr Diab Rep*. 2022;22(5):203-212.
Conclusion: Training programs focused on cardiometabolic health & better dietary haits are needed to address the growing burden of disease & specific training needs in this ever-expanding area.

Chang R…**Cainzos-Achirica M…Nasir K**. Food insecurity (FI) & CVD: current trends & future directions. *Am J Prev Cardiol*. 2021 Dec 10;9:100303
Conclusion: Healthcare systems & community organizations can play a vital role in screening individuals for FI and connecting them with food & educational resources.

Digital Health

Marvin-Peek J… **Martin SS, Blaha MJ**, Brittain EL. Daily step counts are associated with hospitalization risk in pulmonary arterial hypertension. *Am J Respir Crit Care Med.* 2021 Dec 1;204(11):1338-1340.
Conclusion: Low daily baseline daily step counts were associated with an increased risk of hospitalization & worse functional class over 2 years of follow-up.

Berning P…**Boakye E…Martin SS**, Ayers JW, **Blaha MJ, Dzaye O**. Association of online search trends with vaccination in US: June 2020 through May 2021. *Front Immunol*. 2022 Apr 20;13:884211.
Conclusion: US online search data can potentially guide public health efforts, including policy changes & identifying geographical areas to expand vaccination campaigns.

Ahmed AI…**Michos ED**…Al-Mallah MH. Association of twitter metrics & cardiology & heart surgery national hospital rankings. *Mayo Clin Proc Innov Qual Outcomes*. 2021 Dec 20;6(1):16-18.
Conclusion: Hospital leaders can leverage social media platforms as an important medium to disseminate accomplishments & increase their visibility & reputation.

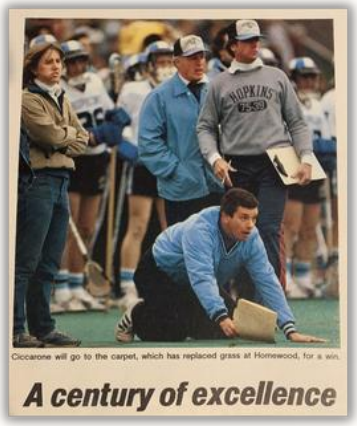
Patel RJS, Ding J, Marvel FA, Shan R, Plante TB, **Blaha MJ, Post WS, Martin SS**. Associations of demographic, socioeconomic, & cognitive characteristics with mobile health access: MESA. *J Am Heart Assoc*. 2022 Sep 6;11(17):e024885.
Conclusion: Among older adults, mHealth access varied by major demographic, socioeconomic, & cognitive characteristics, indicating a digital divide; novel mHealth interventions should consider individual access barriers.

Hassoon A…**Martin SS**…Appel LJ. Randomized trial of two artificial intelligence (AI) coaching interventions to increase physical activity in cancer survivors. *NPJ Digit Med.* 2021 Dec 9;4(1):168.
Conclusion: AI-based voice-assisted coaching shows promise as a practical method of delivering scalable, individualized coaching to increase physical activity in sedentary cancer survivors.

Johnson T, Martin SS, Blumenthal RS, Marvel F. A Remote Technology-Enabled, Algorithm-Guided Program to Improve Health Equity in Hypertension and LDL-C Management. *http://www.acc.org*. Feb 22, 2022.
Conclusion: Digital health strategies can improve blood pressure & cholesterol management.

Dr. Francoise Marvel is a Johns Hopkins Cardiologist with frontline experience with healthcare systems integration of digital health tools. She is also a former Johns Hopkins Cardiology Fellow as well as a former Johns Hopkins Patient Safety and Quality Improvement Fellow. Dr. Marvel serves as Co-Director of the Johns Hopkins Ciccarone Digital Health Lab.

Dr. Marvel is interested in understanding the role of digital biosensors, biomarkers, and software that can generate, gather, and share data in cardiovascular disease. Dr. Marvel's research explores how cardiovascular disease could be identified earlier, proactively intervened upon, and personalized to the patient to drive their empowerment to execute self-management actions with digital health. Dr. Marvel is part of the Johns Hopkins Ciccarone Advanced Lipid Disorders Program.



Coaches **Henry Ciccarone, Fred Smith**, and **Joe Cowan** were featured in *Sports Illustrated*

Seneviratne MG…**Martin SS**, Parakh K. Grains of san to clinical pearls: realizing the potential of wearable data. *Am J Med*. 20222 Nov 6.
Conclusion: In order to bridge the adoption gap, wearable data must become visible, interpretable, & actionable for the clinician.

Isakadze N…Spaulding EM…Marvel, Khoury S, Marine JE, **Michos ED…Martin SS**. The virtual inclusive digital health intervention design to promote health equity (iDesign) framework for atrial fibrillation: co-design 7 development study. *JMIR Hum Factors*. 2022;9(4):e38048.
Conclusion: We co-designed an atrial fibrillation digital health intervention in partnership with patients, caregivers, & clinicians; we summarize our experience & describe a flexible approach to human-centered design for digital health intervention development that can guide innovative clinical investigators.

Javaid A, Zghyer F, Kim C, Spaulding EM, Isakadze N, Ding J…**Martin SS… Blumenthal RS, Marvel FA.** Medicine 2032: The future of cardiovascular disease prevention with machine learning (ML) & digital health technology. *Am J Prev Cardiol.* 2022 Aug 29;12:100379.
Conclusion: This review provides a primer on key advances in ML for CVD prevention & how they may impact clinical practice.

Kim CH, Marvel FA, Martin SS. Influenza vaccination: a call for cardiologists. *Eur J Prev Cardiol*. 2022 Oct 20;29(14):1878-1880.
Conclusion: Mobile health apps can provide personalized education, enable personal health tracking, foster the development of digital social communities, & monitor public health metrics at the population level.
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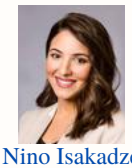
Johnson T, Isakazde N, Mathews L, Gao Y, MacFarlane Z, Spaulding EM, Martin SS, Marvel FA. Building a hybrid virtual cardiac rehabilitation program (CR) to promote health equity: Lessons learned. *Cardiovasc Digit Health J.* 2022 Jul 2;3(4):158-160.
Conclusion: We are addressing CR underutilization by combining guideline-directed cardiovascular care & innovative technology to enable equitable access to CR


Nino Isakadze

Isakadze N, Marvel FA.. Martin SS, Michos ED. Starting a research career in Cardiology: advice for fellows & early-career cardiologists. *Methodist Debakey Cardiovasc J.* 2022 Jun 3;18(3):49-58.
Conclusion: Core principles include encouraging mentees to develop a unique professional identity cultivated by a diverse, collaborative, & effective mentorship & sponsorship team.

Exercise

Chu DJ… **Nasir K, Blumenthal RS, Blaha MJ, Cainzos-Achirica M**… Al-Mallah MH. Prognostic value of cardiorespiratory fitness in patients with chronic kidney disease: The FIT (Henry Ford Exercise Testing) Project. *Am J Med.* 2022 Jan;135(1):67-75.e1.
Conclusion: Cardiorespiratory fitness provides incremental prognostic information when added to traditional risk factors & may help guide treatment options among patients with renal dysfunction.

Whelton SP, Blaha MJ, Berry JD, Lavie CJ. Coronary artery calcium (CAC) & cardiorespiratory fitness (CRF): simple keys to truly personalized ASCVD risk prediction? *Mayo Clin Proc*. 2022 Jul;97(7):1226-1229.
Conclusion: Whereas CAC improved risk stratification of patients with both low & moderate to high CRF, it is especially useful among persons with low levels of CRF.

Wanigatunga AA… **Michos ED**…Schrack JA. Objectively measured patterns of daily physical activity & phenotypic frailty. J *Gerontol A Biol Sci Med Sci*. 2022 Sep 1;77(9):1882-1889.
Conclusion: Less favorable patterns of objectively measured daily physical activity are associated with frailty & the components of slowness, low self-reported activity, & weakness.

Mathews L…**Blumenthal RS, Matsushita K, Ndumele CE.** Disparities in the use of cardiac rehabilitation in African Americans. *Curr Cardiovasc Risk Rep*. 2022;16(5):31-41.
Conclusion: Cardiac rehabilitation participation needs to be increased in all ethnic groups.

Wanigatunga AA…**Michos ED**… Schrack JA. Patterns of daily physical movement, chronic inflammation, & frailty incidence. *Med Sci Sports Exerc.* 2022 Sep 28.
Conclusion: Among older adults who are either robust or prefrail, lower total activity minutes & higher activity fragmentation were prospectively associated with higher risk of frailty, but not modified by frailty-related chronic inflammation.

Kianoush S…**Patel J**…Virani SS. Association of participation in cardiac rehabilitation (CR) with social vulnerability index. *Prog Cardiovasc Dise.* 20222;71:86-91.
Conclusion: CR use following AMI is low & is associated with social vulnerability; identifying social risk factors should improve access to care among vulnerable populations.

Barouch LA. Swimming-induced pulmonary edema: an underrecognized cause of triathalon-associated medical emergencies. *JACC Case Rep.* 2022;4(17):1094-97.
Conclusion: The pathophysiology is due to increased central blood pooling, leading to increased pulmonary capillary wedge pressure.

Dr. Lili Barouch, an Associate Professor at Johns Hopkins, is the inaugural Director of the new Ciccarone Center Sports Cardiology Program. Dr. Barouch graduated from Harvard College and The Johns Hopkins University Medical School. She completed residency training in Internal Medicine, and a fellowship in Cardiovascular Disease and Advanced Heart Failure/Transplant at Hopkins.

An expert in advanced heart failure and sports medicine, Dr. Barouch, leads a group of multidisciplinary specialists who provide comprehensive care for athletes and highly active individuals. The program will meet the growing need for Sports Cardiologists from an educational and research perspective and serve as a resource for local colleges, athletic clubs, and community members regarding the cardiovascular care of athletes.

Dr. Barouch and her team will build a clinical base across the Mid-Atlantic region, focusing on several groups of athletes: college, professional/elite, recreational endurance athletes, and masters athletes (age > 40). Comprehensive cardiovascular care for athletes will include the areas of Preventive Cardiology, Electrophysiology, Cardiomyopathy, multimodality imaging, and athletic performance testing. Dr. Barouch and her team will construct a research database and develop an educational curriculum including regular conference topics for faculty and fellows.

Gender & Ethnicity

Garg K…**Nasir K, Blumenthal RS, Blaha MJ…Sharma G.** Evolving role of coronary computed tomography in understanding sex differences in coronary atherosclerosis. *J Cardiovasc Comput Tomogr.* 2022 Mar-Apr;16(2):138-149.
Conclusion: Based on its ability to identify complex plaque morphology such as low attenuation plaque, high risk noncalcified plaque, positive remodeling, fibrous cap, CCTA can assess plaque characteristics; it will likely prove useful in further understanding CVD in women & those without traditional obstructive coronary disease.

Chu JH, **Michos ED…Blumenthal RS…Blaha MJ, Whelton SP.** Coronary artery calcium & ASCVD risk in women with early menopause: MESA. *Am J Prev Cardiol*. 2022 Jun 13;11:100362.
Conclusion: More than half of women with an early menopause had CAC = 0 & an associated low-to-borderline 10-year cumulative incidence of ASCVD; however, the risk for ASCVD was significantly higher for women with early menopause after 15-years follow-up.

Kemaloglu O…**Michos ED**…Thamman R. International consensus statement on challenges for women in cardiovascular practice & research in the COVID-19 era. *Minerva Cardiol Angiol.* 2022 Feb 25.
Conclusion: The authors discuss the pandemic challenges women in Cardiology face, raise awareness of the gender equity gap, & propose mitigating actionable solutions.

Michos ED, Sabouret P. Racial differences in Takotsubo cardiomyopathy: more alike than different? *Minerva Cardiol Angiol*. 2021 Dec;69(6):746-749.
Conclusion: There may be persistent subclinical cardiac dysfunction, risks of mortality & recurrence as well as poor long-term outcomes in Takotsubo cardiomyopathy in some adults; there are potential racial differences in takotsubo cardiomyopathy with a similar risk of adverse events by race & triggers for adverse events are different by race.

Daher M…**Michos ED**…Virani SS. Gender disparities in difficulty accessing healthcare & cost-related medication non-adherence. *Prev Med*. 2021 Dec;153:106779.
Conclusion: Women were less likely to report lack of healthcare coverage & not having a primary care physician; disparities were pronounced in younger (<45 years) & Black women.


Bill McEvoy

Raber I…**Michos ED…McEvoy JW**. Gender Differences in Medicare Payments Among Cardiologists. *JAMA Cardiol.* 2021 Dec 1;6(12):1432-1439.
Conclusion: There may be potential differences in CMS payments between men & women Cardiologists, which appear to stem from gender differences in the number & types of charges submitted.

Ariss RW… **Michos ED**…Nazir S. Demographic & regional trends of mortality in patients with acute MI in the US, 1999 to 2019. *Am J Cardiol*. 2022 Feb 1;164:7-13.
Conclusion: Despite decreasing mortality rates in all groups, persistent disparities continued throughout the study period.


Erin Michos

Shahid I…**Michos ED**. Evaluation of representation of women as authors in pivotal trials supporting US FDA approval of novel cardiovascular drugs. *JAMA Netw Open*. 2022 Feb 1;5(2):e220035.
Conclusion: An increased focus on women as clinical trial leaders could improve the representativeness of women trial participants, attract more junior female investigators, & strengthen the quality of the research.

Islek D…**Matsushita K…Blaha MJ**… Vaccarino V. Differences in incident & recurrent MI among white & black individuals aged 35 to 84: ARIC surveillance study. *Am Heart J*. 2022 Nov;253:67-75.
Conclusion: Large disparities exist by race for recurrent AMI risk; the magnitude of disparities is stronger for recurrent events than for first events, particularly among women.

Mansour M…**Michos ED**…Al'Aref SJ. Major adverse cardiac events in symptomatic women with non-obstructive CAD on coronary CTA: pooled analysis from PROMISE & SCOT-HEART. *Int J Cardiovasc Imaging*. 2022 Mar;38(3):683-693.
Conclusion: Symptomatic women with non-obstructive CAD on coronary CTA are at higher risk for MACE, with the ASCVD risk score being independently associated with the occurrence of adverse events.

Sharma A, **Ogunmoroti O, Fashanu OE, Zhao D**, Ouyang P…**Michos ED**. Associations of endogenous sex hormone levels with the prevalence and progression of valvular and thoracic aortic calcification in MESA. *Atherosclerosis.* 2022 Jan;341:71-79.
Conclusion: Sex hormones may influence vascular calcification, but further work is needed to understand clinical implications of these findings.

Mannoh I…**Michos ED**, Commodore-Mensah Y. Disparities in awareness of myocardial infarction & stroke symptoms & response among US- & foreign-born adults. *J Am Heart Assoc*. 2021 Dec 7;10(23):e020396.
Conclusion: There is a disparity in MI & stroke symptom awareness & response among immigrants in the US; culturally tailored public health education & health literacy initiatives are needed to reduce these disparities.

RESEARCH PUBLICATIONS

Abusnina W, Latif A…**Michos ED**, Dahal K. Sex differences in the clinical outcomes after left atrial appendage closure: systematic review & meta-analysis. *Cardiovasc Revasc Med.* 2022 Aug;41:29-34.
Conclusion: Women are more likely to experience worse periprocedural outcomes with longer hospital stay after LAA closure.

Zahid S, Khan MZ..**Michos ED**. Gender differences in age-stratified in-hospital outcomes after transcatheter aortic valve implantation (2012 to 2018). *Am J Cardiol*. 2022 Mar 15;167:83-92.
Conclusion: Female gender was associated with higher vascular complications & bleeding requiring transfusions; male gender was associated with higher rates of pacemaker implantation & acute kidney injury.

O'Kelly AC, **Michos ED**…Honigberg MC. Pregnancy & reproductive risk factors for CVD in women. *Circ Res*. 2022 Feb 18;130(4):652-672.
Conclusion: A history of reproductive risk factors represents an opportunity for comprehensive risk factor screening, refinement of CVD risk assessment, & implementation ofprimary prevention to optimize long-term cardiometabolic health.

Rai D…**Michos ED**, Gulati M. Gender differences in international cardiology guideline authorship: comparison of the US, Canadian, & European Cardiology guidelines from 2006 to 2020. *J Am Heart Assoc*. 2022 Mar;11(5):e024249.
Conclusion: There is a significant disparity in the inclusion of women on all national guideline committees, in addition to serving as a chair of cardiology guidelines.

Khan SU…**Isakadze N…Michos ED**. Association of women authors with women enrollment in clinical trials of atrial fibrillation. *J Am Heart Assoc.* 2022 Mar;11(5):e024233.
Conclusion: Promoting women in trial leadership can decrease gender bias, improve diversity and inclusivity, & reduce sex- and gender-related inequalities in science.

Vignac M…**Michos ED**…Gaye B. Sex differences in aortopathy & valve diseases among patients undergoing cardiac surgical procedure. *Ann Thorac Surg*. 2022 Mar 7:S0003-4975(22)00304-6.
Conclusion: There is a greater degree of aortic dilation in women compared with men, suggesting a need for earlier monitoring of women; women with a bicuspid aortic valve had a significantly higher prevalence of aortic stenosis compared with men.

Khan SU…**Cainzos-Achirica M, Michos ED.** CVD Mortality among hispanic versus non-hispanic white (NHW) adults in the US, 1999 to 2018. *J Am Heart Assoc.* 2022 Apr 5;11(7):e022857.
Conclusion: NHW adults had greater CVD mortality rates & slower decline than Hispanic adults, but there are concerning trends among the Hispanic population.

Guan C…**Minhas AS**, Ouyang P…**Michos ED**. Polycystic ovary syndrome: a "risk-enhancing" factor for cardiovascular disease. *Fertil Steril*. 2022 May;117(5):924-935.
Conclusion: CVD risk screening is important in patients with PCOS, as improvements in metabolic profile & reduction in CVD risk are achievable with a combination of lifestyle management & pharmacotherapy.

Osibogun O, Ogunmoroti O…Hays AG… Minhas AS, Gulati M, **Michos ED**. Systematic review & meta-analysis of the association between PCOS & coronary artery calcification (CAC). *J Womens Health (Larchmt)*. 2022 Jun;31(6):762-771.
Conclusion: Women with PCOS had ~ 2-fold greater odds of having CAC compared with women without PCOS.

Shahid I, Khan MS…**Michos ED.** Trends in NIH R01 funding of principal investigators in Cardiology by gender. *J Am Coll Cardiol*. 2022 Apr 19;79(15):1544-1546.
Conclusion: There was a higher percentage increase in funding amounts & number of grants awarded to women, which is analogous to the increase in percentage of female cardiologists between 2010 and 2019.

Michos ED, Budoff MJ. Testosterone: therapeutic or toxic for the cardiovascular health of men? *Lancet Healthy Longev*. 2022 Jun;3(6):e368-e369.
Conclusion: Caution is advised regarding the use of testosterone replacement Rx in people with established atherosclerosis due to the findings of plaque progression in the testosterone trials.

Elmaleh-Sachs A…**Post WS**…Barr RG. Race/ethnicity, spirometry reference equations, & prediction of incident clinical events: MESA Lung Study. *Am J Respir Crit Care Med*. 2022 Mar 15;205(6):700-710.
Conclusion: Race/ethnicity-based spirometry reference equations did not improve prediction of clinical events compared with race/ethnicity-neutral equations; the inclusion of race/ethnicity in spirometry reference equations should be reconsidered.

Heravi AS, Michos ED, Zhao D…Ndumele CE… Post WS. Oxidative stress & menopausal status: coronary artery risk development in young adults cohort study. *J Womens Health.* 2022 Jul;31(7):1057-1065.
Conclusion: Postmenopausal women had higher oxidative stress, which may contribute to greater CVD risk.

Gaye B…**Michos ED**, Jouven X. Gender gap in annual preventive care services in France. *E Clinical Medicine.* 2022 May 27;49:101469.
Conclusion: Women's participation in annual preventive care services was lower, & screened women had a lower mortality gain.

Ogunmoroti O…Zhao D… Ouyang P… **Michos ED**. Associations between endogenous sex hormones & fibroblast growth factor-23 (FGF-23) among women & men in MESA. *PLoS One.* 2022 May 25;17(5):e0268759.
Conclusion: A more androgenic sex hormone profile was directly associated with FGF-23 in women & inversely associated with FGF-23 in men; longitudinal studies are required to determine whether FGF-23 mediates the relationship between sex hormones & CVD risk.

Shah KS…**Gluckman TJ,**…Shah RU. Clinical trial participation & COVID-19: descriptive analysis from the AHA's Get With The Guidelines Registry. *J Racial Ethn Health Disparities*. 2022;1-7.
Conclusion: Female & Black patients were less likely to be enrolled in a clinical trial related to COVID-19 compared to men & other racial groups, respectively.


Jaideep Patel

Al Rifai M…**Patel J…Cainzos-Achirica M…**Virani SS. Association of coronary artery calcium (CAC) density & volume with predicted ASCVD risk & cardiometabolic risk factors in South Asians: MASALA. *Curr Probl Cardiol.* 2022;101105.
Conclusion: Estimated ASCVD risk was associated with both CAC volume & density; different cardiometabolic risk factors are associated with CAC density and volume.

Gupta K…**Patel J**…Virani SS. South Asian ethnicity: what can we do to make this risk enhancer a risk equivalent? *Prog Cardiovasc Dis*. 2022 Oct 22.
Conclusion: We discuss why the South Asian population is at a higher risk of ASCVD & strategies to mitigate this increased risk.

An Assistant Professor at Johns Hopkins and Director of Basic and Translational Vascular Biology Research within the Ciccarone Center, **Dr. Thorsten Leucker** was recently selected as the Director of the Cardiovascular Diseases Fellowship Program. Prior to coming to Hopkins, Dr. Leucker received both his MD and PhD from the University of Bonn. He worked as a post-doctoral fellow at Baylor College of Medicine and then at the Medical College of Wisconsin and did his Medicine residency training at the University of Louisville. He was a Cardiology fellow at Hopkins before joining the faculty in December 2017.

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Dr. Leucker attends in the Cardiac Care Unit and sees patients in the Advanced Lipid Disorders Clinic. His research interest focuses on vascular inflammation and endothelial function, and he is principal investigator at the Hopkins site for several national trials studying the effects of PCSK9 inhibitors on vascular function, and he recently received an R43 award from the NHLBI.

As the Director of Cardiovascular Diseases Fellowship Program, Dr. Leucker oversees all aspects of the Training Program, including the fellowship selection process, the educational content of the various clinical rotations, supervision of fellows' activities on clinical and research rotations, and mentoring of fellows to ensure their career goals are met. He will ensure that the fellowship program provides a diverse academic environment and culture of inclusiveness

Genetics

Al Rifai M…**Post WS…Blumenthal RS**… Virani SS. Association of polygenic risk scores (PRS) with incident ASCVD events among individuals with CAC score of zero: MESA. *Prog Cardiovasc Dis.* 2022 Aug 8:S0033-0620(22)00085-8.
Conclusion: Among individuals with CAC = 0, the ASCVD PRS was associated with incident ASCVD events & this appears to be driven by genetic variants related to stroke but not CHD, particularly among women and non-Whites; ASCVD event rates remained below the threshold recommended for consideration for initiation of statin Rx even in the high PRS groups.

Sutton NR…**Blumenthal RS**…Chen Y. Molecular mechanisms of vascular health: insights from vascular aging & calcification. *Arterioscler Thromb Vasc Biol*. 20222 Nov 22.
Conclusion: This state of the art review summarizes the concepts & mechanisms of age-associated vascular disease with an emphasis on vascular calcification.

Appiah D…**Michos ED**…Folsom AR. Long-term changes in plasma proteomic profiles in premenopausal & postmenopausal women: ARIC. *Menopause*. 2022 Oct 1;29(10):1150-1160.
Conclusion: There are significantly different changes between premenopausal & postmenopausal women in several plasma proteins that reflect many biological processes; this may help to understand disease development during the postmenopausal period.

Li C…**Post WS**…Zhou B. AtheroSpectrum reveals novel macrophage foam cell gene signatures associated with ASCVD Risk. *Circulation*. 2022 Jan 18;145(3):206-218.
Conclusion: A subset of 30 genes expressed in circulating monocytes contributed to prediction of symptomatic ASCVD; a pathogenic foaming gene set with known risk factors increases the power to predict ASCVD risk.

Hindy G…**Post WS**... Peloso GM. Rare coding variants in 35 genes associate with circulating lipid levels-A multi-ancestry analysis of 170,000 exomes. *Am J Hum Genet*. 2022 Jan 6;109(1):81-96.
Conclusion: Gene-based associations can be beneficial for drug target development & provide evidence that the gene closest to the array-based GWAS index SNP is often the functional gene for blood lipid levels.

Wendy Post

Nauffal V…**Post WS**…Lubitz SA; TOPMed Investigators. Monogenic & polygenic contributions to QTc prolongation in the population. *Circulation*. 2022 May 17;145(20):1524-33.
Conclusion: Comprehensive assessment of the genetic determinants of QTc prolongation includes incorporation of both polygenic & monogenic risk.

Taub MA…**Arvanitis M**…Mathias RA. Genetic determinants of telomere length from 109,122 ancestrally diverse whole-genome sequences in TOPMed. *Cell Genom*. 2022;2(1):100084.
Conclusion: Telomere length (TL) polygenic trait scores (PTS) were associated with increased risk of cancer-related phenotypes.

Shabani M… **Post WS**…Lima JAC. Rare genetic variants associated with myocardial fibrosis: MESA. *Front Cardiovasc Med.* 2022 Feb 21;9:804788.
Conclusion: There was a higher prevalence of rare potentially pathogenic cardiomyopathy associated genetic variants in participants with significant myocardial fibrosis quantified in CMR as compared to controls without significant fibrosis.

Thériault S…**Post WS**…Conen D. Genome-wide analyses identify SCN5A as a susceptibility locus for PAC frequency. *iScience.* 2022 Sep 24;25(10):105210.
Conclusion: Among genetic variants previously associated with atrial fibrillation (AF), there was a significant enrichment in concordance of effect for PAC frequency; however, several AF risk loci were not associated with PAC frequency, suggesting the existence of both shared & distinct genetic mechanisms for PAC frequency & AF.

Arvanitis M…Battle A. Redefining tissue specificity of genetic regulation of gene expression in the presence of allelic heterogeneity. *Am J Hum Genet.* 2022;109(2):223-239.
Conclusion: Colocalization & fine-mapping in the presence of allelic heterogeneity (CAFEH) can prioritize the target tissue in genome-wide association complex trait loci, improving the ability to interpret complex trait genetics.

Dutta D…**Arvanitis M**….Chatterjee N. Aggregative trans-eQTL analysis detects trait-specific target gene sets in whole blood. *Nat Commun*. 2022;13(1):4323.
Conclusion: ARCHIE (a summary statistic correlation analysis method used to identify sets of gene-expressions regulated by sets of known trait-related genetic variants) is a powerful tool for identifying sets of genes whose trans-regulation may be related to specific complex traits.

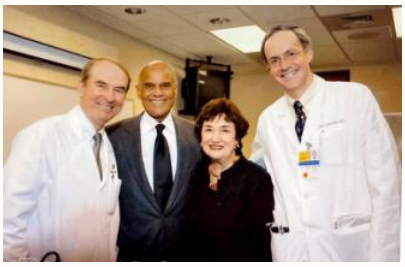
Heart Failure

Amir R, Trost J, Blumenthal RS, Boden W, **Zadeh A.** Revascularization versus guideline directed medical therapy in ischemic left ventricular systolic dysfunction: review of REVIVED & STICH. *ACC.org.* November 2022.
Conclusion: GDMT has improved greatly over the past decade and early revascularization may not be as important as once thought for those with impaired LV function.

Gorgis S…**Blaha MJ**…Brawner CA. Relation of exercise capacity to incident heart failure (HF) among men & women With Coronary Heart Disease (CHD): FIT Project. *Am J Cardiol*. 2022 Oct 15;181:66-70.
Conclusion: Among those with CHD & no history of HF, exercise capacity is inversely related to the risk of future HF.

Salah HM…**Michos ED**…Fudim M. Meta-analysis of nonalcoholic fatty liver disease (NAFLD)& incident heart failure. *Am J Cardiol.* 2022 May 15;171:180-181.
Conclusion: Patients with NAFLD have a 60% higher odds of incident heart failure.

Averbuch T…**Michos ED**…Van Spall HGC. Association between socioeconomic status, sex, race / ethnicity & in-hospital mortality among patients hospitalized for heart failure. *J Card Fail*. 2022 May;28(5):697-709.
Conclusion: Racial/ethnic differences in outcome were more pronounced in low SES groups & in male patients.



Harry Belafonte & Drs. Baumgartner, Fralic, & Blumenthal

A physician-scientist with a passion for the genetics of vascular disease and aging, **Marios Arvantis, MD,** is an Assistant Professor of Medicine and Biomedical Engineering in the Division of Cardiology at Johns Hopkins. Dr. Arvantis received his medical degree from the University of Athens, School of Health Sciences, in Greece in 2012. He later moved to Brown University for a post-doctoral fellowship in basic sciences, studying immune mechanisms of human disease, and then completed an Internal Medicine residency at Boston University and a Cardiology fellowship at Johns Hopkins.

In his current role, he devotes much of his time to research, with the vision to understand the mechanisms of human vascular disease and biological aging. Dr. Arvanitis hopes to develop approaches to intervene and improve human longevity and well-being. He also sees patients with complex cardiovascular disease and genetic lipid disorders at Johns Hopkins.

His research program in vascular genomics uses novel high-throughput sequencing approaches to analyze and integrate multi-omic data and genome editing experimental techniques to study heritable mechanisms for atherosclerosis and vascular aging. In 2022, he was rewarded for his research work, earning both a Michel Mirowski, MD Cardiovascular Research Award and an American Heart Association Career Development Award.

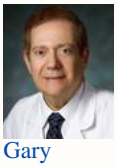
Echouffo-Tcheugui JB, **Ogunmoroti O, Golden SH… Ndumele CE, Michos ED.** Glycemic markers & heart failure subtypes: MESA. *J Card Fail.* 2022 Jan 31:S1071-9164(22)00036-7.
Conclusion: HbA1C & fasting plasma glucose in the diabetes range were each associated with higher risks of HFpEF & HFrEF, with similar magnitudes of their association.

Zghyer F…Kiss JE, **Michos ED…Hays AG**. Cardiovascular imaging in stress cardiomyopathy (Takotsubo Syndrome). *Front Cardiovasc Med.* 2022 Jan 28;8:799031.
Conclusion: This review explores the cardiovascular imaging modalities used to diagnose stress cardiomyopathy while highlighting the role that imaging plays in assessing disease severity, complications, treatment, & prognosis.

Mehta R…**Michos ED**…Khan SS. Ten-year risk-prediction equations for incident heart failure (HF) hospitalizations in chronic kidney disease: CRIC & MESA. *J Card Fail*. 2022 Apr;28(4):540-550.
Conclusion: Routine clinical data that include urine albumin-to-creatinine ratio (UACR) in patients with CKD can reliably identify individuals at risk of HF hospitalizations.

Ebong IA…**Michos ED**…Bertoni AG. Relationship between age at menopause, obesity, & incident heart failure (HF): ARIC. *J Am Heart Assoc.* 2022 Apr 19;11(8):e024461.
Conclusion: As obesity worsened, the risk of developing HF significantly increased when compared with women with lower BMI & waist circumference, particularly among those with menopause at age ≥ 55 years.

Hermann EA…**Michos ED**…Barr RG. Pulmonary blood volume among older adults in the community: MESA Lung Study. *Circ Cardiovasc Imaging*. 2022 Aug;15(8):e014380.
Conclusion: Pulmonary blood volume was substantially lower with advanced age & was associated independently with greater symptoms scores in the elderly.



Gary Gerstenblith

Lewsey SC, **Hays AG…. Gerstenblith G,** Weiss RG. Nitric oxide-mediated coronary endothelial function is impaired in patients with HFpEF. *Circ Heart Fail.* 2022;15(10): e009582.
Conclusion: Coronary endothelial function is impaired in stable HFpEF outpatients without obstructive coronary disease, as compared to age-comparable, obese normotensive, & hypertensive controls.

Florido R…Michos ED…Gerstenblith G, Post WS, Blumenthal RS…Ndumele CE. Obesity, Galectin-3, & incident heart failure: ARIC. *J Am Heart Assoc*. 2022 May 3;11(9):e023238.
Conclusion: Obesity is strongly associated with elevated galectin-3; the combination of obesity & elevated galectin-3 is associated with marked HF risk, emphasizing the importance of elucidating pathways linking obesity with cardiac inflammation & fibrosis.

Motamed M…**Cingolani O**…Baranchuk A. Disseminated lyme disease & dilated cardiomyopathy (DCM): systematic review. *Trends Cardiovasc Med.* 2022;S1050-1738(22)00077-9.
Conclusion: DCM could result as the consequence of undiagnosed or poorly treated lyme carditis.

RESEARCH PUBLICATIONS

This past year has been a busy one for **Dr. Chiadi Ndumele.** He was selected to serve as Vice Chair of the Leadership Committee of the Council on Lifestyle and Cardiometabolic Health of the AHA, which oversees the Obesity, Diabetes, Physical Activity, Nutrition and Behavioral Change committees. Moreover, he is in charge of prevention and wellness programming, including the planning of the plenary sessions for the annual meeting. Additionally, he and his colleagues presented 11 abstracts related to cardiometabolic risk and HF prevention at the November meeting (four oral presentations and two moderated poster presentations).

His major new research findings relate to the impact of adipokines on cardiometabolic health, which is the subject of his cardiometabolic SFRN. He also recently demonstrated the impact of diabetes on accelerating progression from subclinical to overt heart failure, and the impact of diabetes duration on subclinical and clinical HF. Over the summer he became the Co-Chair of a large new AHA Cardiorenal Metabolic Initiative, which is focused on identifying and addressing the gaps in the science, screening, prevention and management of patients with cardiorenal metabolic disease.

Dr. Ndumele also serves as the PI of the AHA ASCVD Cholesterol Management Initiative, designed to enhance implementation of the 2018 Cholesterol guidelines across 6 health systems with a total of 40,000 patients. His work also continues to be supported by a SFRN grant and two NIH R01 grants, for which he is PI, related to the topics of cardiometabolic health, health equity and heart failure risk.

Ijaz SH…**Sharma G…Michos ED, Nasir K**… Dani SS. Association of dementia with in-hospital outcomes in primary heart failure (HF) & acute MI hospitalizations. *Prog Cardiovasc Dis*. 2022 Jul-Aug;73:24-31.
Conclusion: Patients with dementia admitted for HF or MI had higher in-hospital mortality, a longer length of stay, & were less likely to receive aggressive revascularization after MI.

Sreenivasan …**Michos ED**, Naidu SS. Impact of BMI on mortality in hospitalized patients with HCM. *Am J Cardiol.* 2022 Jul 15;175:106-109.
Conclusion: BMI has a U-shaped relation with in-hospital mortality in patients with HCM; patients who were underweight or morbidly obese had significantly higher mortality, whereas those who were overweight or obese tended to have lower mortality than normal BMI.

Shah S…**Michos ED**…Pandey A. Supranormal LV ejection fraction, stroke volume, & cardiovascular risk: findings from population-based cohort studies. *JACC Heart Fail*. 2022 Aug;10(8):583-594.
Conclusion: LVEF in the supranormal range is associated with a higher risk of adverse CVD outcomes, particularly in those with lower stroke volume.

Gudenkauf B, Goetsch MR… Cingolani O, Adamo L. Case Report: steroid-responsive takotsubo cardiomyopathy associated with cytokine storm & obstructive shock. *Front Cardiovasc Med.* 2022;9:931070.
Conclusion: There is a potential close connection between systemic inflammatory response & Takotsubo stress cardiomyopathy, which contributes to the evolving understanding of inflammation in the pathogenesis of this disease.

Al-Abdouh A…**Michos ED**…Deshmukh A. Efficacy of ICD/CRT-D remote monitoring in patients with HFrEF: Bayesian meta-analysis of RCTs. *Curr Heart Fail Rep.* 2022 Oct 7.
Conclusion: ICD/CRT-D remote monitoring in patients with HF is associated with a higher probability of reduced total & cardiovascular mortality compared with standard care alone.

Coursen J, Alfaddagh A, Blumenthal RS, Trost J, Barouch LA. Optimize cardiovascular risk factors for prevention of heart failure. *http://www.acc.org*. April 21, 2022.
Conclusion: Control of traditional coronary heart disease risk factors can markedly reduce HF events.

Dr. Ndumele's research team

Wand AL…Mukherjee M, **Hays AG**, Gilotra NA. Current state & future directions of multimodality imaging in cardiac sarcoidosis. *Front Cardiovasc Med*. 2022;8:785279.
Conclusion: Cardiac sarcoidosis is well-suited to a multimodality imaging (TTE, CMR & FDG-PET) approach.

Wand AL…Duvall C… Hays AG, Gilotra NA. Effect of corticosteroids on LV function in patients with cardiac sarcoidosis. *Am J Cardiol.* 2022;177:108-115.
Conclusion: Most patients with cardiac sarcoidosis treated with corticosteroids maintain or improve LV systolic function.

Samuel TJ…**Wu KC…Gerstenblith G**… Weiss RG. Myocardial ATP depletion detected noninvasively predicts sudden cardiac death risk in patients with heart failure. *JCI Insight.* 2022;7(12):e157557.
Conclusion: These findings support investigation of metabolic strategies that limit ATP loss to treat or prevent life-threatening cardiac arrhythmias & herald noninvasive metabolic imaging as a complementary SCD risk stratification tool.

Mathews L.Ndumele CE, Matsushita K, Chang PP. Racial differences in trends & prognosis of guideline-directed medical therapy (GDMT) for HFrEF: ARIC Surveillance Study. *J Racial Ethn Health Disparities.* 2022;10.1007/s40615-021-01202-5.
Conclusion: Optimal GDMT was prescribed in only ~ 10% of HFrEF patients at discharge but was more so in Blacks than Whites; ACEI/ARB use declined in Whites while hydralazine plus nitrates use increased in both races.

Al-Abdouh A…**Michos ED**…Deshmukh A. Efficacy of ICD/CRT-D remote monitoring in patients with HFrEF: Bayesian meta-analysis of RCTs. *Curr Heart Fail Rep*. 2022 Oct 7.
Conclusion: ICD/CRT-D remote monitoring in patients with HF is associated with a higher probability of reduced total & cardiovascular mortality compared with standard care alone.

Echouffo-Tcheugui JB, **Ndumele CE… Florido R**…Selvin E. Diabetes & progression of heart failure: ARIC Study. *J Am Coll Cardiol.* 2022;79(23):2285-2293.
Conclusion: Among older adults with preclinical HF stages, uncontrolled diabetes was associated with substantial risk of HF progression.

Pavlovic NV…**Ndumele C,**…AbshireSaylor M. Fatigue in persons with heart failure: systematic literature review & meta-synthesis using the biopsychosocial model of health. *J Card Fail.* 2022;28(2):283-315.
Conclusion: Fatigue carries prognostic implications in heart failure & is a distressing symptom that interferes with multiple aspects of peoples' lives.

Ijaz N…**Gerstenblith G**, Damluji AA. Interventions for frailty among older adults with CVD: JACC state-of-art review. *J Am Coll Cardiol.* 2022;79(5):482-503.
Conclusion: Emerging data from patients admitted with heart failure indicate that interventions associated with positive outcomes on frailty & physical function are multidimensional & include tailored cardiac rehabilitation.

Keceli G...**Gerstenblith G**…Weiss RG. Mitochondrial creatinine kinase attenuates pathologic remodeling in heart failure. *Circ Res* 2022;130(5):741-759.
Conclusion: In the failing human heart, pathologic hypertrophy & adverse remodeling are closely related to deficits in ATP levels and in the CK energy reserve reaction.

Ali HR…**Cainzos-Achirica M…Nasir K.** Subjective financial hardship due to medical bills among patients with heart failure (HF) in the US. *J Card Fail.* 2022;28(9):1424-1433.
Conclusion: We need policies that reduce out-of-pocket costs for the care of HFand approaches to help minimize financial toxicity in patients with HF while ensuring optimal quality of care.

Rosen NS…**Duvall C**…Gilotra NA. Cardiac sarcoidosis (CS) outcome differences: comparison of patients with de novo cardiac vs. known extracardiac sarcoidosis at presentation. *Respir Med.* 2022;198:106864.
Conclusion: Patients presenting with CS as their first recognized organ manifestation of sarcoidosis have an increased risk of adverse cardiac outcomes as compared to those with a prior history of ECS.

HIV

Etzkorn LH… **Wu KC, Post WS**… Crainiceanu CM. Patterns of objectively measured physical activity differ between men living with & without HIV. *AIDS*. 2022 Sep 1;36(11):1553-1562.
Conclusion: Physical activity measures differed significantly by HIV serostatus & viral load.

Peterson TE…Post WS, Wu KC. Circulating biomarker correlates of left atrial size & myocardial extracellular volume fraction among persons living with & without HIV. *BMC Cardiovasc Disord*. 2022 Sep 3;22(1):393.
Conclusion: Elevated levels of sCD14, GDF-15, & NT-proBNP among persons with HIV in the current era may only minimally reflect HIV-associated elevations in left atrial volume index.

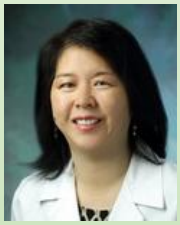
Anjali Wagle

Wagle A, Goerlich E, Post WS, Woldu B, **Wu KC, Hays AG.** HIV & global cardiovascular health. *Curr Cardiol Rep.* 2022 Sep;24(9):1149-1157.
Conclusion: Potential underlying mechanisms for CVD in persons with HIV include systemic inflammation, comorbidities, immune-mediated, or treatment-related mechanisms.

Wang Z…**Post WS**…Qi Q. Gut Microbiota, plasma metabolomic profiles, & carotid artery atherosclerosis in HIV infection. Arterioscler *Thromb Vasc Biol.* 2022 Aug;42(8):1081-1093.
Conclusion: Among individuals with or at high risk of HIV infection, we identified altered gut microbiota & related functional capacities in the lipid metabolism associated with disrupted plasma lipidomic profiles & carotid atherosclerosis.

Woldu B…**Post WS**…Bloomfield GS. Diastolic dysfunction in people with HIV without known CVD risk factors in Western Kenya. *Open Heart.* 2022 Jan;9(1):e001814.
Conclusion: Environmental & CVD risk factors such as diabetes & hypertension may be significant modifiers for development & progression of diastolic dysfunction in persons with HIV.

Anderson AM…**Post WS, Michos ED**… Becker JT. GlycA is associated with neuropsychological impairment in men with HIV. *AIDS*. 2022 Jan 1;36(1):156-159.
Conclusion: GlycA is also associated with subclinical atherosclerosis.



A non-invasive cardiologist with expertise in cardiac magnetic resonance imaging (MRI) and echocardiography, **Katherine Wu, MD,** has been a faculty member at Johns Hopkins since 2000. She is a long-standing member of the editorial board for *Circulation: Cardiovascular Imaging* and is an Associate Editor for *Frontiers in Cardiovascular Medicine*, *Cardiovascular Imaging* specialty section. Recently, she joined the newly appointed *Journal of American Heart Association* editorial board as a Senior Associate Editor.

Her NIH R01-funded research program focuses on improving personalized risk assessment for ventricular arrhythmias and sudden cardiac death, contributing to the mechanistic understanding of why some people die suddenly. Her approach aims to comprehensively integrate the multitude of data, including patient characteristics and risk factors, electrocardiographic data, and imaging features of heart structure and function at serial timepoints to better understand how the complex interplay of factors specific to an individual affects their subsequent risk of an adverse cardiovascular outcome.

Dr. Wu has built and oversees ongoing, prospective multicenter research registries of patients with ischemic and non-ischemic cardiomyopathy. She has developed numerous additional internal, national, and international collaborations to study special populations at increased risk for arrhythmias and other cardiovascular diseases, including people living with HIV, cardiac sarcoidosis, arrhythmogenic ventricular cardiomyopathy, and hypertrophic cardiomyopathy.

With generous support from the Hopkins ARVC Center, Dr. Wu recently launched a new initiative to create a databank of hospital-wide digital electrocardiograms as a resource to investigators that can be mined for numerous artificial intelligence and deep learning projects. She is partnering with the Hopkins Cardiology Hypertrophic Cardiomyopathy Center and newly established Sports Cardiology program to develop their patient registries with the aim of accelerating research innovations and multi-institutional collaborations.

RESEARCH PUBLICATIONS

Sarkar S…Post WS, Brown TT. The association of adipose tissue area with subclinical coronary atherosclerosis progression in men with & without HIV. *AIDS*. 2021 Dec 1;35(15):2549-2551.
Conclusion: Increased amounts of some types of adipose tissue correlate with atherosclerosis progression.

Anderson AM…**Post WS, Michos ED**… Becker JT. Higher soluble CD163 in blood is associated with significant depression symptoms in men with HIV. J *Acquir Immune Defic Syndr.* 2022 Nov 1;91(3):325-333.
Conclusion: Higher sCD163, a marker of macrophage activation, was significantly associated with significant depression symptoms.

Wu KC, Woldu B, **Post WS, Hays AG.** Prevention of heart failure, tachyarrhythmias & sudden cardiac death in HIV. *Curr Opin HIV AIDS.* 2022 Sep 1;17(5):261-269.
Conclusion: Aggressive control of HIV viremia & cardiac risk factors & abstinence from unhealthy behaviors remain Rx pillars to prevent heart failure & arrhythmias.

Shaikh K…**Post WS**, Budoff MJ. Coronary artery plaque (CAP) progression & CVD risk scores in men with & without HIV-infection. *AIDS.* 2022 Feb 1;36(2):215-224.
Conclusion: Pooled cohort equation categories predict CAP progression better in HIV-uninfected than in HIV-infected men; improved risk scores are needed to identify high-risk HIV-infected men for more aggressive CVD risk prevention strategies.


Sudipa Sarkar

Sarkar S, Brown TT. CROI 2022: metabolic & other complications of HIV infection or COVID-19. Top Antivir Med. 20222 Oct-Nov;30(3):522-527.
Conclusion: COVID-19 infection may have serious adverse effects in persons with HIV.

Wada NI… **Post WS**…Margolick JB. Long-term trajectories of C-Reactive protein among men living with and without HIV Infection in MACS. *J Gerontol A Biol Sci Med Sci*. 2022 Jul 5;77(7):1382-1388.
Conclusion: There were higher concentrations of CRP across 5 decades of age in men living with HIV, & steeper increases with age in men with detectable HIV RNA; this is consistent with a contribution of inflammation to the higher risk of age-related comorbidities with HIV infection.


Erin Goerlich

Goerlich E…Gerstenblith G,… Hays AG. Coronary endothelial dysfunction in people living with HIV is related to body fat distribution. *J Acquir Immune Defic Syndr.* 2022;90(2):201-207.
Conclusion: Waist & hip circumference & subcutaneous fat area are associated with impaired coronary endothelial function & may contribute to the increased rate of CVD in this population.

Minhas AS, Post WS…Wu KC. Association of HIV serostatus & inflammation with ascending aortic size. *J Am Heart Assoc*. 2022 Mar 15;11(6):e023997.
Conclusion: HIV infection is an independent risk factor for greater ascending aortic sizes; lower nadir CD4 T-cell count & higher TNF-α levels are associated with larger aortic sizes in men with HIV.

Gambahaya ET,…**Sharma G, Sarkar S, Goerlich E…Hays AG.** Role of multimodality imaging in HIV-associated cardiomyopathy. *Front Cardiovasc Med.* 2022;8:811593.
Conclusion: Multimodality imaging is crucial in establishing a diagnosis of HIV-associated cardiomyopathy in symptomatic patients.

Minhas AS, Leucker TM, Goerlich E… Gerstenblith G, Hays AG. Effect of sex on coronary endothelial dysfunction in people living with HIV.
Conclusion: Coronary endothelial dysfunction is present in women and comparable to men; PCSK9 is higher in women with HIV & a significant inverse relationship between PCSK9 & coronary endothelial dysfunction was shown.

Post WS…Budoff M. Suboptimal HIV suppression is associated with progression of coronary artery stenosis: MACS. *Atherosclerosis*. 2022 Jul;353:33-40.
Conclusion: Coronary artery stenosis progression was associated with suboptimal HIV RNA suppression & antiretroviral therapy adherence; effective ongoing HIV virologic suppression & antiretroviral Rx adherence may mitigate risk for coronary events among people living with HIV.

Anderson AM…**Post WS, Michos ED**… Becker JT. GlycA is associated with neuropsychological impairment in men with HIV. *AIDS.* 2022 Jan 1;36(1):156-159.
Conclusion: GlycA is a marker of systemic inflammation.

Post WS. Cardiovascular disease in HIV. T*rans Am Clin Climatol Assoc.* 2022;132:126-134.
Conclusion: This is an excellent review about the risk of CVD in patients with HIV.

Kuniholm MH, Vásquez E…**Michos ED**… Gustafson DR. Cardiovascular risk score associations with frailty in men & women with or at risk for HIV. *AIDS.* 2022 Feb 1;36(2):237-347.
Conclusion: Higher CVD risk was associated with increased frailty regardless of HIV serostatus among men & women.

Lai H…**Gerstenblith G**…Lai S. High-risk coronary plaque regression in cash-based contingency management intervention among cocaine users with HIV-associated subclinical coronary atherosclerosis. *J Addict Med.* 2022 Aug 4.
Conclusion: Reduction in cocaine use leads to concurrent decrease in high-risk plaque burden and endothelin-1 among cocaine users with HIV-associated coronary atherosclerosis.

Wang S…**Post WS**…Gondek LP. Clonal hematopoiesis in men living with HIV & association with subclinical atherosclerosis. *AIDS.* 2022 Sep 1;36(11):1521-1531.
Conclusion: Clonal hematopoiesis was more common in PWH & was associated with the extent of coronary artery disease.


Drs. Hill, Margolis, Baughman, Achuff, & Blumenthal

Omega-3 Fatty Acids

Pisaniello AD, **Alfaddagh A, Tibuakuu M, Whelton SP, Czarny MJ, Blaha MJ… Post WS**. Association between omega-3 fatty acid (O3FAs) levels & aortic valve calcium (AVC): MESA. *Am J Cardiol.* 2022 Sep 17:S0002-9149(22)00909-2.
Conclusion: Plasma levels of O3FAs in subjects not routinely supplemented with O3FAs are not useful for predicting the presence or development of AVC.

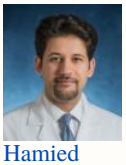
Originally born in Kenya, **Dr. Lena Mathews, MD, MHS** moved to Queens, NY, with her family when she was 13 years of age. She attended Cornell University, followed by medical school at University of Pennsylvania. She trained in Internal Medicine at Brigham and Women's Hospital and after residency she sought opportunities for working in Africa.

She joined Partners in Health and spent 2 years working in Rwanda in East Africa providing medical care and support for developing non-communicable disease programs to care for patients with hypertension, diabetes, rheumatic heart disease and cancer. She then decided to pursue additional training in cardiovascular disease management and came to Baltimore for cardiology fellowship at Johns Hopkins where she trained in Cardiology and Imaging.

Dr. Mathews then pursued additional training in epidemiology and biostatistics at Bloomberg School of Public Health where she obtained a Master's in Health Sciences. She joined the faculty at Johns Hopkins in 2018. Her clinical work is seeing patients in clinic and on the inpatient side as well as reading echocardiograms. She also directs the Cardiac Rehabilitation Program at Johns Hopkins. Her research interests include reducing cardiovascular health disparities through research on utilization of guideline therapies for cardiovascular disease particularly cardiac rehabilitation, and using implementation science methods to reduce disparities in access to care.

Quispe R, Alfaddagh A, Kazzi B, Zghyer F, Marvel FA, Blumenthal RS, Sharma G, Martin SS. Controversies in the use of omega-3 fatty acids to prevent atherosclerosis. *Curr Atheroscler Rep.* 2022 Jul;24(7):571-581.
Conclusion: The use of omega-3 FA, specifically EPA, appears to slow atherosclerosis by reducing triglyceride-rich lipoproteins &xor inflammation.

Mortensen MB, Dzaye O…Cainzos-Achirica M…Blaha MJ, Nasir K, Nørgaard BL. Association between REDUCE-IT criteria, CAD severity, & CVD events: Western Denmark Heart Registry. *Eur J Prev Cardiol*.2022 Oct 18;29(13):1802-1810.
Conclusion: Atherosclerotic plaque burden as assessed by CAC can identify REDUCE-IT-eligible patients who are expected to derive most & least, absolute benefit from icosapent ethyl regardless of obstructive versus non-obstructive CAD.



Hamied Alfaddagh

Alfaddagh A, Kapoor K, Dardari ZA…Nasir K… Blumenthal RS, Blaha MJ. Omega-3 fatty acids, subclinical atherosclerosis, & CVD events: implications for primary prevention. *Atherosclerosis*. 2022 Jul;353:11-19.
Conclusion: Higher plasma omega-3 fatty acid levels were associated with fewer long-term CVD events; the absolute decrease in CVD events with higher omega-3 fatty acid levels was more apparent at higher CAC scores.

Social Determinants/ Emotional Stress/Mental Health

Mathews L…Ndumele CE….Matsushita K. Impact of socioeconomic status on mortality & readmission in Patients With HFrEF: ARIC. *J Am Heart Assoc.* 2022;11(18):e024057.
Conclusion: Among patients hospitalized with HFrEF, low SES was independently associated with mortality & HF readmission.

Sreenivasan J…**Michos ED**. Mental health disorders (MHD) & readmissions following acute MI in the US. *Sci Rep*. 2022 Feb 28;12(1):3327.
Conclusion: MHD are significantly associated with a higher independent risk of 30-day all-cause hospital readmissions among acute MI hospitalizations.

Khan SU…**Blaha MJ…Cainzos-Achirica M, Nasir K.** Social Determinants of Health (SDOH) among non-elderly adults with stroke in US. *Mayo Clin Proc*. 2022 Feb;97(2):238-249.
Conclusion: Nearly half of all non-elderly individuals with stroke have an unfavorable SDOH profile; assessment of SDOH risk burden informs targeted strategies to mitigate disparities in stroke burden.

Javed Z…**Cainzos-Achirica M…Nasir K**. Race, racism, & cardiovascular health:; applying a social determinants of health framework to racial/ethnic disparities in CVD. *Circ Cardiovasc Qual Outcomes*. 20222;15(1):e007017
Conclusion: We analyzed the link between race, racism, & CVD, including major pathways and structural barriers to cardiovascular health, using 5 distinct social determinants of health domains: economic stability; neighborhood and physical environment; education; community and social context; and healthcare system.

Post WS, Watson KE… McClelland RL. Racial & ethnic differences in all-cause & CVD mortality: MESA. *Circulation*. 2022 Jul 19;146(3):229-239.
Conclusion: There are persistent racial/ethnic differences in overall & CVD mortality, largely attributable to social determinants of health; this emphasizes the need to act on systemic factors that shape differences in health across racial/ethnic groups.

Javed Z…**Sharma G…Blaha MJ…Cainzos-Achirica M, Nasir K.** Social determinants of health & obesity. *Obesity*. 2022 Feb;30(2):491-502.
Conclusion: Cumulative social disadvantage, denoted by higher SDOH burden, was associated with increased odds of obesity, independent of clinical & demographic factors.

Baber U, **Blaha MJ,** Mehran R. Medication nonadherence: challenging conundrum for clinical trials, patients, & clinicians. *J Am Coll Cardiol.* 2022 Aug 23;80(8):779-782.
Conclusion: While effective tools that enhance medication adherence exist, we must do a better job of implementing these strategies if patients are to fully realize the benefits of medications.

Ogunmoroti O…Mathews L, Ndumele CE, Michos ED. Systematic review of the bidirectional relationship between depressive symptoms & cardiovascular health. *Prev Med*. 2022 Jan;154:106891.
Conclusion: Further research is needed to identify the biological mechanisms underlying the association between depressive symptoms & unfavorable CVD health so adequate screening & interventions can be implemented.

Knowles KA…**Spaulding EM…Marvel FA, Martin SS.** Clinicians for CARE: Systematic review & meta-analysis of interventions to support caregivers of patients with heart disease. *J Am Heart Assoc.* 2021 Dec 21;10(24):e019706.
Conclusion: More research is necessary to develop clinical interventions that consistently improve caregiver outcomes.

Writing Committee…**Gluckman TJ**,…Mehta LS, Virani SS. 2022 ACC Expert Consensus Decision Pathway (ECDP) for integrating ASCVD & multimorbidity treatment: framework for pragmatic, patient-centered care: report of the ACC solution set oversight committee. *J Am Coll Cardiol.* 2022;S0735-1097(22)06670-0.
Conclusion: ECDP highlights a comprehensive & integrative approach for treating patients with ASCVD & multimorbidity, with emphasis on a value-based framework that encourages prioritizing therapy tailored within a 4-domain framework (medical, mind and emotion, physical functioning, social & physical environment).

Mathews L,…Ndumele CE,,,Matsushita K. Impact of socioeconomic status on mortality & readmission in patients with HFrEF: ARIC Study. *J Am Heart Assoc.* 2022;11(18):e024057.
Conclusion: Among patients hospitalized with HFrEF, low SES was independently associated with mortality and HF readmission.

Mullachery PH…**Nasir K…Cainzos-Achirica M**…Bilal U. Inequalities by income in the prevalence of CVD & its factors in the adult population of Catalonia. *J Am Heart Asssoc.* 2022 Sep 6.
Conclusion: Our findings in a region with a high-quality public health care system and universal coverage stress that strong equity-promoting policies are necessary to reduce disparities in CVD.


Khurram Nasir

Khan SU…**Cainzos-Achirica M, Nasir K**. SES, cardiovascular risk profile & premature coronary heart disease (CHD). *Am J Prev Cardiol.* 2022 Jul 26.
Conclusion: Individuals with a poor cardiovascular risk factor (CRF) profile had higher odds of premature CHD than those with optimal profile, & the burden of CHD increased with worsening of CRF profile.

Acquah I…**Cainzos-Achirica M, Nasir K.** Delayed medical care due to transportation barriers among adults with ASCVD. *Am Heart J.* 2022;245:60-69.
Conclusion: Five % of adults with ASCVD experience delayed care due to transportation barriers. Vulnerable groups include young adults, women, low-income people, & those with public/no insurance.

Valvular heart disease/ Aortic Disease

Boakye E, Dardari Z, Obisesan OH, Osei AD…Dzaye O…Matsushita K, Blaha MJ, Whelton SP. Sex-& race-specific burden of aortic valve calcification (AVC) among older adults without overt coronary heart disease: ARIC. *Atherosclerosis.* 2022 Aug;355:68-75.
Conclusion: AVC, although highly prevalent, was not universally present in this cohort of older adults; white males had ~50% higher prevalence than other race-sex groups.

Nazir S…**Michos ED**…Jneid H. Demographic & regional trends of mortality in patients with aortic dissection (AoD) in the US 1999 to 2019. *J Am Heart Assoc.* 2022 Apr 5;11(7):e024533.
Conclusion: Despite an initial decline in AoD mortality, the mortality rate increased from 2012 to 2019, with pronounced increases among women & African Americans.

Choi E, **Mathews LM…Wu KC, Michos ED, Hays AG,** Mukherjee M. Multimodality evaluation of aortic insufficiency & aortitis in rheumatologic diseases. *Front Cardiovasc Med.* 2022 Apr 12;9:874242.
Conclusion: The authors review common rheumatologic diseases associated with aortic insufficiency & describe their imaging findings.

Dr. Ty Gluckman has been closely collaborating with the Ciccarone Center since he left Johns Hopkins after serving as Chief Cardiology Fellow. As the Medical Director of the Center for Cardiovascular Analytics, Research, and Data Science (CARDS) at the Providence Heart Institute in Portland, OR, Dr. Gluckman's principal clinical interests include identifying, coordinating, and implementing cardiovascular care improvement strategies.

Dr Gluckman also serves as an Associate Editor of *JACC a*nd Associate Editor for Guidelines and Clinical Documents for the American College of Cardiology website, *ACC.org*. He serves as Chair of the ACC's Solution Set Oversight Committee, overseeing policy and clinical documents issued by the ACC, and serves as Governor for the Oregon ACC Chapter. Dr. Gluckman was also the Co-Chair of the 2022 ACC Expert Consensus Decision Pathway on cardiovascular sequelae of COVID-19 in adults. They published their article in *JACC* in May and concluded that for both myocarditis and post-acute sequelae of SARS-CoV-2 infection (PASC), there are significant opportunities to better understand their epidemiology, underlying mechanisms, predisposing risk factors, and preferred approaches for evaluation and management.

In October 2022, Dr. Gluckman co-authored an ACC Expert Consensus Decision Pathway for Integrating Atherosclerotic Cardiovascular Disease and Multimorbidity Treatment, providing a very useful framework for pragmatic patient-centered care and emphasizing that education is of the utmost importance and that patients who have an improved understanding of their conditions tend to engage in more healthful behaviors and have improved clinical outcomes. Moreover, improved communication with clinicians is associated with favorable patient-reported outcomes, greater use of evidence-based therapies, and lower health care resource use. This reinforces the importance of improved care coordination, caregiver support, and multiple options to interact with the care team via telehealth as well as office visits.

Chehab O…**Minhas A…Arbab-Zadeh A, Post WS, Wu KC,** Lima JA. Association of HIV infection with clinical features & outcomes of patients with aortic aneurysms. *Vasc Med*. 2022 Oct 3.
Conclusion: HIV was not associated with increased risk of aortic rupture, acute aortic dissection, readmissions, or aortic repair.

Morrell CN…**Lowenstein CJ**…Cameron SJ. Platelet olfactory receptor activation limits platelet reactivity & growth of aortic aneurysm. *J Clin Invest.* 2022;132(9):e152373.
Conclusion: Olfactory receptors regulate platelet activation in AAA & aneurysmal progression through platelet-derived mediators of aortic remodeling.

Vascular/Cerebrovascular

Khan SU…**Blaha MJ, Sharma G…Nasir K.** Clinical & economic profile of homeless young adults with stroke in the US, 2002-2017. *Curr Probl Cardiol.* 2022 Mar 26:101190.
Conclusion: Homeless young stroke patients had significant comorbidities, increased hospitalization rates, & adverse clinical outcomes; public health interventions should focus on multidisciplinary care to reduce health care disparities among young homeless adults.

Minhas AS, Michos ED, Hays AG. Is vasospastic coronary disease more common than we realize? *JACC Case Rep.* 2022 Mar 2;4(5):298-300.
Conclusion: Clinical trials are evaluating the efficacy of different Rx approaches in patients with coronary vasospasm & coronary microvascular dysfunction in patients with MI but nonobstructive coronary arteries (MINOCA).

Schaich CL…**Post WS**…Hughes TM. Association of vascular risk scores & cognitive performance in a Diverse Cohort: MESA. *J Gerontol A Biol Sci Med Sci.* 2022 Jun 1;77(6):1208-1215.
Conclusion: Vascular risk scores are associated with cognitive performance & decline in the 4 most common U.S. racial/ethnic groups, but associations differ among risk scores & by race/ethnicity.

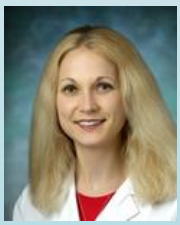
Bianco F…**Johansen MC**…Chen LY. Left atrial remodeling & stroke in patients with sinus rhythm & normal ejection fraction: ARIC-NCS. *J Am Heart Assoc*. May 3.
Conclusion: In elderly patients, among participants with sinus rhythm, normal ejection fraction, & no history of atrial fibrillation, measures of worse age-related LA reservoir function & stiffness are associated with higher odds of subclinical cerebral infarcts (SCIs) & stroke.

Hallak A… **Ratchford EV.** SVM Communications: Finding a job after fellowship - a conversation with (gainfully employed) experts. *Vasc Med.* 2022;27(3):317-319.

Sheth S…**Ratchford EV.** Vascular Disease Patient Information Page: Giant cell (temporal) arteritis. *Vasc Med.* 2022;27(5):521-524.
Conclusion: Giant cell, or temporal arteritis, is an inflammatory condition (vasculitis) of the large blood vessels that is more common in older patients.

Johansen MC…Chen LY. Associations between atrial arrhythmias and brain amyloid deposition: ARIC-PET study. *J Alzheimers Dis.* 2022;86(1): 43-48.
Conclusion: Among nondemented community-dwelling older adults, we did not find an association between atrial arrhythmias & brain amyloid-beta; other brain pathology may underlie the association described between atrial arrhythmias & cognition.

Fukaya E.…**Ratchford EV**. Vascular Disease Patient Information Page: Venous leg ulcers. *Vasc Med.* 2022;1358863X221118120.
Conclusion: Venous leg ulcers are wounds of the lower leg that are caused by venous hypertension & chronic venous disease; standard treatments include cleaning & debridement of the wound, wound dressing, & compression therapies.



Michelle Johansen, MD, PhD, is an Associate Professor at Johns Hopkins in the Department of Neurology, whose academic and scientific pursuits in cerebrovascular neurology stem from a strong desire to be an exceptional care provider and clinical researcher. Her research focuses on how changes in cardiac structure and function impact neurological outcomes, to include ischemic stroke etiology, subclinical infarcts, brain white matter disease, and vascular contributions to cognitive decline.

Dr. Johansen was the first research chief resident while training at the University of Virginia, where she realized her own passion for clinical research. Her father's stroke in 2015 solidified her resolve to push the bounds of scientific knowledge in this critical area. Relying on her background in chemistry, combined with her PhD in Clinical Investigation from the

Bloomberg School of Public Health, Dr. Johansen has established a relationship between cardiac echocardiogram markers and brain changes, such as stroke, in her own patients and has worked closely with the Ciccarone Center.

She has found similar predictors of brain health using cardiac measures in large epidemiologic cohort studies, such as the Atherosclerosis Risk in Communities study. With funding from the AHA and NIH, Dr. Johansen is using advanced cardiac imaging methods, such as Cardiac CTA, together with her expertise as a stroke neurologist, to diagnose the cause of patient's strokes.

She is also recruiting patients with high-risk cardiovascular disease and atrial fibrillation and comparing those to patients without atrial fibrillation to determine if there is any evidence of blood-based biomarkers of dementia. Dr. Johansen was recently awarded the Vascular Cognitive Impairment Award at the AHA International Stroke Conference. She credits her collaborations with the Ciccarone Center as instrumental to her success and is excited to continue to provide insight into the heart-brain connection.

Selvaraj S…**Johansen MC**…Solomon SD. ApoE polymorphism, cardiac remodeling, and heart failure (HF) in the ARIC study. **Conclusion:** A genetic predisposition to Alzheimer's disease through APOE ε4 is not associated with an increased prevalence of HF, HF hospitalization, myocardial remodeling, or biochemical evidence of HF.

Johansen MC…Ndumele C,…Chen LY. Risk of dementia associated with atrial cardiopathy: ARIC Study. *J Am Heart Assoc.* 2022;11(16):e025646.
Conclusion: Atrial cardiopathy was significantly associated with an increased risk of dementia, with only a small percent mediation of the effect by atrial fibrillation or stroke.


Martin Mortensen

Johannesen CDL, **Mortensen MB…**Nordestgaad BG. ApoB & non-HDL cholesterol vs LDL-C for ischemic stroke risk. *Ann Neurol.* 2022;92(3):379-389.
Conclusion: The proportion of ischemic stroke attributable to either elevated apoB or non-HDL cholesterol was double that attributable to elevated LDL cholesterol.

Hannawi Y…**Johansen MC**…Nyquist PA. Association of vascular properties with the brain white matter hyperintensity in middle-aged population. *J Am Heart Assoc.* 2022;11(11):e024606.
Conclusion: Changes in the systemic circulation affect the periventricular white matter and deep white matter differently.

Wang W…**Johansen MC**…Chen LY. Association of echocardiographic measures of left atrial function & size with incident dementia. *JAMA*. 2022;327(12):1138-1148.
Conclusion: Several echo measures of lower LA function were significantly associated with an increased risk of subsequent dementia; measures of LA size were not significantly associated with dementia risk.

Brilliant J…**Mathews L**. Rare case of MRSA pericarditis with expanding, purulent pericardial effusion leading to uremic kidney failure from a right, necrotic toe. *Case Rep Cardiol*. 2022;2022:7041740.
Conclusion: The authors present a rare case of MRSA pericarditis in a patient with type 2 diabetes mellitus & PAD complicated by a right necrotic toe who developed acute renal failure with an enlarging pericardial effusion.


Shireen Khoury

Khoury SR, Ratchford EV, Stewart KJ. Supervised exercise therapy for patients with peripheral artery disease: clinical update & pathways forward. *Prog Cardiovasc Dis.* 2022;70:183-189.
Conclusion: Supervised exercise therapy is a well-established, first-line therapy to improve intermittent claudication symptoms, function, & clinical outcomes in PAD.

Abola MTB…**Ratchford EV**. Vascular Disease Patient Information Page: Leg cramps. *Vasc Med.* 2022;27(4):415-417.

Vitamin D

Juraschek SP…**Michos ED…**Appel LJ. Effects of vitamin D supplementation on orthostatic Hypotension: STURDY Trial. *Am J Hypertens*. 2022 Feb 1;35(2):192-199.
Conclusion: Our findings do not support use of higher doses of vitamin D3 supplementation to prevent orthostatic hypotension.

Hsu S…**Michos ED**…de Boer IH. Clinical & biomarker modifiers of vitamin D treatment response: MESA. *Am J Clin Nutr*. 2022 Mar 4;115(3):914-924.
Conclusion: Of characteristics most commonly associated with vitamin D metabolism, only baseline 25(OH)D <20 ng/mL modified the parathyroid response to vitamin D supplementation, providing support to use this threshold to define insufficiency.

Cai Y…**Michos ED**…Schrack JA. The effects of vitamin D supplementation on frailty in older adults at risk for falls. *BMC Geriatr.* 2022 Apr 10;22(1):312.
Conclusion: High dose vitamin D supplementation did not prevent frailty.

Michos ED…Appel LJ. Relationship of falls with achieved 25-hydroxyvitamin D (25(OH)D levels from vitamin D supplementation: STURDY Trial. *J Endocr Soc*. 2022 Apr 16;6(6):bvac065.
Conclusion: Achieved 25(OH)D concentration after supplementation was not associated with reduction in falls.

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