

CARDIOLOGY AND CARDIAC SERVICE LINE RESEARCH UPDATE Q1 2019

Contents

Welcome to the introductory Cardiology and Cardiac Service Line research newsletter! This newsletter is designed to communicate information about active research, recent accomplishments, and research opportunities pertaining to practicing TPMG cardiologists.

In this inaugural issue, we share results from a recent research survey, summarize active research projects among TPMG cardiologists, provide information about upcoming events, highlight internal funding opportunities, and recognize recent achievements and research published by our colleagues. Our cardiology group works diligently to develop rigorous new evidence to inform and improve clinical care. This research update is a first step toward organizing interested clinicians, connecting those involved in data-driven inquiry, and planning next steps for data collection that can inform clinical practice change. Below are described our incredible cardiology clinical trials program, and many ongoing observational studies, both funded and non-funded, but this is by no means an exhaustive list. If we have missed anyone, please do let us know, it was not intentional!

Given the large portfolio of cardiovascular research at the Division of Research (DOR), a complementary newsletter from the DOR will be forthcoming and shared, and in future updates these efforts aim to be merged.

3rd Annual KPNC Cardiovascular Research Symposium



On March 23rd, 2019, many KPNC cardiologists/internists/neurologists and DOR researchers attended the successful 3rd Annual KPNC Regional Cardiovascular Research Symposium, co-hosted by the DOR and Cardiac Service Line. Thanks and congratulations to Alan Go, MD, and his team for organizing another spectacular Symposium! It was an amazing showcase of research and collaboration by clinical cardiologists and DOR researchers, stimulating great discussion, networking, and new ideas (see list of presentations and panel discussion below). There was also an impressive showing of outstanding research by housestaff and KPNC cardiology fellows.

AGENDA

Keynote Address – “Role of Registries to Improve Care” - Ralph Brindis, MD, MPH, MACC, FSCAI, FAHA – Clinical Professor of Medicine, Department of Medicine & The Philip R. Lee Institute for Health Policy Studies, UCSF

Session 1

- Evaluating and Treating Iron Deficiency Anemia in Older Adults with Heart Failure: Preliminary Data and the RBC HEART Pilot Study - Andrew Ambrosy, MD – Department of Cardiology, KP San Francisco; Research Scientist, Division of Research
- The Heart Failure Readmission Intervention by Variable Early Follow-up (THRIVE) Study: A Pragmatic Randomized Trial - Keane Lee, MD - Assistant Chief, Department of Cardiology, KP Santa Clara
- Optimizing Diagnostic Imaging for Suspected Coronary Heart Disease: The Future is Now - Jamal Rana, MD, PhD, FACC – Chief, Department of Cardiology, KP Oakland; Adjunct Investigator, Division of Research
- Structured and Unstructured Data in Cardiology: Challenges and Opportunities -Matthew Solomon, MD, PhD, FACC – Department of Cardiology, KP Oakland; Adjunct Investigator, Division of Research
- Does HIV Infection Increase the Risk of Heart Failure? The HIV HEART Study - Harshith Avula, MD – Chief Cardiology Fellow, KP San Francisco

Session 2

- Effect of a Regional Telestroke Program on Door-To-Needle Time and Clinical Outcomes - Mai Nguyen-Huynh, MD, MAS – Director, Kaiser Primary Stroke Centers, Diablo Service Area; Research Scientist, Division of Research
- Impact of Bariatric Surgery on Microvascular and Macrovascular Clinical Outcomes in Diabetics - Stephen Sidney, MD, MPH – Director of Research Clinics, Division of Research
- Predictive Modeling at KPNC – Work in Progress, Thoughts on Progress - Gabriel Escobar, MD – Regional Director for Hospital Operations Research, KP Northern California
- Association of Genetic Risk Score with Future Coronary Heart Disease Events Across Different Cardiovascular Risk Factors - Carlos Iribarren, MD – Research Scientist III, Division of Research

Lunch and Networking and Trainee Research Poster Session

Group Discussion on Blood Pressure and Hypertension Controversy (Alan Go, MD – Associate Director, Cardiovascular and Metabolic Conditions Research, Division of Research; Joseph Young, MD – Regional Hypertension Lead, Department of Internal Medicine, KP Oakland; Nailah Thompson, DO – Department of Internal Medicine, KP Oakland)

Session 3

- Optimization of a Risk Calculator to Predict Outcomes and Utilization After Percutaneous Coronary Intervention - Samuel Savitz, PhD – TPMG Delivery Science Research Postdoctoral Fellow, Division of Research
- KPARE: Improving Atherosclerotic Cardiovascular Disease Risk Prediction - Alan Go, MD – Associate Director, Cardiovascular and Metabolic Conditions Research, Division of Research

Cardiology Research Survey Update

A total of 29 TPMG cardiologists are interested or active in research, and 11 cardiologists responded to our survey providing information about specific areas of interest and research recommendations. Most survey respondents requested 1-2 cardiovascular research updates every year, in newsletter or Webex format, and an annual standing meeting such as the Regional Cardiovascular Research Symposium. Many are interested in leading their own projects.

THANK YOU for your thoughtful input regarding knowledge gaps in cardiology, improving practice efficiency, and generating high-impact research questions. Your ongoing suggestions and contributions are important and appreciated.

Here is a summary of the outstanding research interests, ideas, and comments put forward by your colleagues (most comments are verbatim), where focused research questions could inform our practice at TPMG:

- There is wide variation in how cardiologists manage patients with demand ischemia (i.e., elevated troponins without clear ACS). How can we investigate this and perhaps standardize the workup?
- Strategies for prevention of chemotherapy-induced cardiac side effects? Examination of cardiac outcomes for various chemotherapeutic agents.
- Safety and efficacy of standard therapies (medical, interventional) in high risk and understudied groups such as the elderly.
- Better anticoagulation risk stratification for atrial fibrillation. CHADS2-vasc score is not that good - the area under the curve is something like 0.6. Barely better than flipping a coin. We are probably anticoagulating way more Pts than we really need to, which is not only a wasteful, but potentially harmful for those with adverse outcomes to anticoagulation.
- Congenital heart disease.
- Infiltrative myocardial disease.
- Data on cardiac diagnostic testing utility, surveillance echoes, anti-thrombotic regimens.
- Most things related to structural heart disease! Which patients should have TAVR versus palliative care at end of life? When should we close ASDs in adults middle age and older? Which patients with MR should be treated with catheter-based therapies and if so, which one?
- Appropriate use of antiarrhythmic therapies in atrial fibrillation.
- Outcomes (quality of life, morbidity/mortality, costs, use of the system, and adverse events) of rate vs rhythm control in atrial fibrillation/flutter in KP NCAL population.
- New cardiac pharmacotherapies, such as use of new medications for heart failure (Entresto) and lipid management (PCSK9 inhibitors). TPMG tends to be insular and I feel we don't get updated on new therapies as we should.
- Outcomes in patients with mild cTnI elevations seen in the ED for non-ACS presentations.
- Medical therapy vs PCI outcomes in those with CAD and LV dysfunction.
- Diet and cardiovascular outcomes.
- Number of LV pacing lead insertions in patients with pacemakers/defibrillators with high percentage (>40%) of RV lead pacing, bundle branch block and LV dysfunction.
- Best practices to treat HFpEF (i.e., telemonitoring, population care, patient and PCP education).
- Long term outcomes of left main PCI.
- Examining best practices for perioperative AFib after cardiac surgery. How long should amiodarone be given for? Should we be continuing anticoagulation in these pts, doing event monitors, what's the best plan? What about peri-MI VF? After amiodarone IV for 24-48 hours, should we be discharging them on amiodarone, and for how long?
- Should anticoagulation with DOAC be used for HCM patients – never studied. Or DOAC use for LV thrombus, again never studied. Or outcomes using DOAC for LAA thrombus?

- Population based outcomes of patients receiving vs denied for specific therapies (example: those denied TAVR vs proceeding with TAVR).

Here is a summary of opportunities for increasing practice efficiency where the barriers are lack of knowledge or systems-related:

- Decision support tools (such as best practice alerts or automated reminders) to help with appropriate test ordering and appropriate follow up intervals for various conditions (e.g., aortic stenosis, aortic disease, etc.), and more clarity on optimal surveillance intervals.
- Utility of cardiac troponin-I levels sent for patients with non-ACS primary presentations, (e.g. hypertensive urgency, GI bleed, PNA, etc.) and associated outcomes.
- Appropriate use of emergency department orders for stress testing. The HEART score and Ristra should be more widely used.
- Determining the association of left atrial appendage size or other characteristics and risk of stroke in atrial fibrillation. A small study from Mass General (Beinart, Heist, Newell, et al, J Cardiovasc Electrophysiol 2011, vol 22, p 10) showed that left atrial size by MRI was a much better predictor of stroke risk than other clinical risks. The MRI data had ROC area under the curve of 96%. This was a retrospective study, however, so it would need to be validated in a prospective study. We could do such a prospective study at KP.
- Chest pain work up and preoperative clearance... our current preop guidelines are outdated. Our econsult specialty changes with complicated flowcharts are useless and not helpful to busy PCPs. We need clinical decision guidance that is up-to-date, accurate but SIMPLE and quick to use.
- Radiation dose of CAD evaluation strategies (Cath vs MPI vs CCTA) and any patient or site-specific factors that could contribute to variability.
- Utility and appropriateness of remote monitoring (i.e., ziopatch monitor for 2 weeks or 1 month event monitor) ordered by primary care physicians without prior consultation with cardiology.
- Utility and appropriateness of stress echocardiogram ordered by primary care physicians without prior consultation with cardiology.
- Appropriate and optimal diagnostic testing for chest pain. What is the best test to evaluate someone with chest pain for CAD. Functional vs Anatomic. Treadmill stress test vs stress echo vs nuclear vs cardiac CT. Should we use cardiac CT in the ER as a first line test as is done in Europe?
- Utility and appropriateness of echocardiography referrals (many repeat echoes for non-significant findings).
- More support for more clinical trials, or even our own registries.
- Better knowledge and optimal workup for procedures not done at my home site (e.g., TAVR or MitraClip, Ablation, Cardiac Surgery). For example, TAVR program will not take inpatients or transfers. I'm not 100% sure why? Why does a patient being referred for ablation needs to have an echo in the last 6mo-1yr? If the patient still has paroxysmal AF, why do we need to repeat the echo and waste resources?

Active Research Studies Among TPMG Cardiologists

Currently, there are numerous research activities going on in cardiovascular medicine. Below are the active and recent projects reported from our research survey, but we recognize this is not an exhaustive list – please let us know if there are any additions or updates! We can include them in the next newsletter. The first section focuses on our remarkable participation and leadership in cardiology-related clinical trials, and the following section lists the numerous high-impact observational studies currently in progress.

TPMG Cardiologist Participation and Leadership in Cardiology Clinical Trials (Site PI listed first)

Studies	Investigators	Description
BSC S2073 EVOLVE	Andrew Rassi, Kenneth Mahrer	A prospective, multicenter, single-arm study designed to assess the safety of 3-month dual antiplatelet therapy (DAPT) in subjects at high risk for bleeding undergoing percutaneous coronary intervention (PCI) with the SYNERGY™ Everolimus-Eluting Platinum Chromium Coronary Stent System (SYNERGY Stent System)
CORVIA 1601 REDUCE LAP HF	Ann Sheridan, Alicia Romero, Dana McGlothlin, Ivy Ku, Jacob Mishell, Andrew Rassi	A study to evaluate the Corvia Medical, Inc. IASD® System II to REDUCE Elevated Left Atrial Pressure in Patients with Heart Failure
EDWAR DS 2015-08 P3	Edward McNulty, Brian Cain, Ken Fox, Gordon Leung, Vicken Melikian, Jacob Mishell, Andrew Rassi, Richard Richter, Michael Ren, Mario Pompili, Ahmad Sheikh, Samir Thadani, Gennie Yee	Prospective, Randomized, Controlled, Multi-Center study to establish the safety and Effectiveness of the Sapien 3 Transcatheter Heart Valve in low risk patients who have severe, calcific, aortic stenosis requiring Aortic Valve Replacement
EDWAR DS 2015-08 AVIV	Edward McNulty, Ken Fox, David Lange, Gordon Leung, Jacob Mishell, Andrew Rassi, Richard Richter, Michael Ren, Mario Pompili, Samir Thadani, Gennie Yee	A Prospective, Single-Arm, Multicenter Study to Investigate the Safety and Effectiveness of SAPIEN 3 Transcatheter Heart Valve Implantation in Patients With a Failing Aortic Bioprosthetic Valve
EDWAR DS	Richard Richter, Ken Fox, David Lange, Gordon Leung, Edward	Evaluation of Transcatheter Aortic Valve Replacement Compared to Surveillance for Patients with Asymptomatic Severe Aortic Stenosis: EARLY

EARLY TAVR	McNulty, Jacob Mishell, Andrew Rassi, Michael Ren, Samir Thadani, Gennie Yee	TAVR trial 2016-07 EARLY TAVR SAPIEN 3 Transcatheter Heart Valve G160259
EDWARDS 2017-05 ACTIVE	Andrew Rassi , Ivy Ku, Gordon Leung, Vicken Melikian, Jacob Mishell	Annular ReduCTion for Transcatheter Treatment of Insufficient Mitral Valve (ACTIVE): A prospective, multicenter, randomized, controlled pivotal trial to assess transcatheter mitral valve repair with Edwards Cardioband System and guideline directed medical therapy (GDMT) compared to GDMT alone in patients with functional mitral regurgitation (FMR) and heart failure.
EDWARDS 2018-07 CLASP III	Andrew Rassi , Ivy Ku, David Lange, Gordon Leung, Vicken Melikian, Jacob Mishell, Jon Zaroff	Edwards PASCAL TrAnScatheter Mitral Valve RePair System Pivotal Clinical Trial (CLASP IID): A prospective, multicenter, randomized, controlled pivotal trial to evaluate the safety and effectiveness of transcatheter mitral valve repair with the Edwards PASCAL Transcatheter Mitral Valve Repair System compared to Abbott MitraClip in patients with degenerative mitral regurgitation (DMR).
EVALVE 11-512-COAPT	Jacob Mishell , Ivy Ku, Gordon Leung, Dana McGlothlin, Vicken Melikian, Andrew Rassi, Ahmad Sheikh, Ann Sheridan, Dana Weissnar, Gennie Yee, Jon Zaroff	A Clinical Evaluation of the Safety and Effectiveness of the MitraClip® System for the Treatment of Functional Mitral Regurgitation in Symptomatic Heart Failure Subjects
MEDTRONIC APOLLO	Jacob Mishell , Ivy Ku, Gordon Leung, Vicken Melikian, Mario Pompili, Andrew Rassi, Richard Richter, Ahmad Sheikh	Transcatheter Mitral Valve Replacement with the Medtronic Intrepid™ TMVR System in patients with severe symptomatic mitral regurgitation - APOLLO Trial Medtronic Intrepid TMVR System G160020/S007
MITRALIGN CLPR-010 SCOUT	Andrew Rassi , Ivy Ku, Gordon Leung, Vicken Melikian, Jacob Mishell	Early Feasibility Of The Mitralign Percutaneous Tricuspid Valve Annuloplasty System (Pivas) For Symptomatic Chronic Functional Tricuspid Regurgitation CLPR-010

TPMG Cardiologist Participation and Leadership in Observational Research

There are numerous, high-impact observational studies being conducted within the cardiovascular service line. Here is an update of active and recent studies involving TPMG clinicians. Again, we recognize this is not an exhaustive list and please let us know if there are any additions or updates! There are many additional studies being conducted within the DOR not listed, which will be detailed in a forthcoming DOR Cardiovascular and Metabolic Conditions Research newsletter.

Drew Ambrosy

- Co-Investigator – PIONEER-HF – A large, multi-center randomized clinical trial of sacubitril-valsartan versus enalapril in heart failure. Working on several related analyses.
- Applying for an NIH Career Development Award on outpatient worsening heart failure with Dr. Alan Go as well as several other potential NIH grants.

Sirtaz Adatya

- Co-Investigator – Research grant funded by Abbott Vascular – Hypercoagulability in mechanical circulatory support.

Richard Birnbaum

- Principal Investigator – Rapid Analytics Unit Analysis – Identification and management of familial hypercholesterolemia in an integrated health care delivery system.

Anne Goh

- Principal Investigator - KP Community Benefits Grant - Development of chronic thromboembolic pulmonary hypertension after acute pulmonary embolism.

Ashok Krishnaswami

- Principal Investigator - Changes in weight, lipids, blood pressure, health care utilization and CV outcomes in participants of the Medical Weight Management Program
- Principal Investigator -Deprescribing CV and non-CV medications
- Principal Investigator - Pulse Pressure, Treatment Intensity in Participants of the SPRINT trial
- Principal Investigator - Addressing Age and Blood Pressure – utilizing a national database
- Principal Investigator - Use of Elixhauser Comorbidity Index in risk stratifying participants referred for Permanent Pacemaker placement
- Principal Investigator - Systematic Review of the role of age in cardiac imaging
- Co-Investigator – KP Community Benefits Grant (PI: Ahmed Shah) – CABG vs PCI in Older Acute Coronary Syndrome (ACS) patients: Impact of revascularization strategy on outcomes.

Keane Lee

- Principal Investigator – TPMG Delivery Science Grant – THRIVE: a pragmatic trial randomizing 2300+ KPNC patients after HF hospitalization to early initial follow-up by HF care management telephone visit vs. primary care physician clinic visits. Study completed and preliminary results showing non-inferiority of telephone arm for 30-day all cause readmission and 30-day mortality with trend toward benefit.

Edward McNulty

- Co-Investigator – KP Community Benefits Grant – Duration of thienopyridine therapy and outcomes after PCI for chronic total occlusions.

Sahar Naderi

- Principal Investigator and National Steering committee member for iSCAD, a national SCAD registry housed at PERFUSE (Beth Israel Deaconess) enrolling patients across 13 different US sites with the goal to increase our understanding of this relatively rare condition.

Seema Pursnani

- Principal Investigator – KP Community Benefits Grant – Coronary heart disease risk prediction in South Asians.

Jamal S. Rana

- Principal Investigator – TPMG Delivery Science Grant – Variation and Barriers in Cardiac Imaging Tests for Suspected Coronary Heart Disease in KPNC.
- Principal Investigator – KP Community Benefits Grant – Cardiovascular Health Categories and Health Care Utilization in an Large Integrated Health Care System
- Co- Investigator – Coronary Artery Risk Development in Young Adults (CARDIA) Study, NHLBI sponsored study.
- Co-Investigator – KP Community Benefits Grant (PI: Ahmed Shah) – CABG vs PCI in Older Acute Coronary Syndrome (ACS) patients: Impact of revascularization strategy on outcomes.

Amit Sachdeva

- Principal Investigator – KP Community Benefits Grant – Duration of thienopyridine therapy and outcomes after PCI for chronic total occlusions.

Ahmed Shah

- Principal Investigator – KP Community Benefits Grant – CABG vs PCI in Older Acute Coronary Syndrome (ACS) patients: Impact of revascularization strategy on outcomes.

Matt Solomon

- Principal Investigator – TPMG Delivery Science Grant, Physician Researcher Program – Optimizing Management and Outcomes for Patients with Valvular Heart Disease.
- Principal Investigator – Research grant funded by Abbott Vascular – KP Post-PCI Outcomes and Resource Utilization Study, and Development and Validation of a KP Post-PCI Risk Calculator
- Principal Investigator – KP Community Benefits Grant – Epidemiology and Outcomes for Thoracic Aortic Aneurysms and Acute Aortic Dissections in a Large, Integrated Delivery System.
- Co-Investigator – Research Grant funded by Genentech, Inc. (PI: Alan Go) – Adherence to Guideline Recommendations for Secondary Prevention and Mortality after Acute MI
- Co-Investigator – Research Grant funded by iRhythm, Inc. (PI: Alan Go) – KP Real-world Heart Monitoring Strategy Evaluation, Treatment Patterns and Health Metrics (RHYTHM) Study
- Co-Investigator – KP Community Benefits Grant (PI: Aaron Baker) – A Natural History of Descending Thoracic Aortic Dissections in Northern California Kaiser Permanente.
- Co-Investigator – KP Community Benefits Grant (PI: Ahmed Shah) – CABG vs PCI in Older Acute Coronary Syndrome (ACS) patients: Impact of revascularization strategy on outcomes.

Jon Zaroff

- Principal Investigator – Examination of the acute effects of azithromycin use on cardiovascular mortality, as compared with amoxicillin and levofloxacin. This is an FDA-mandated, industry sponsored cohort study quantifying associations between antibiotic exposure and CV death.
- Co-Investigator and Director, Core Echocardiography Laboratory – Evidence Based Evaluation and Acceptance of Donor Hearts for Transplantation. (PI: Kiran Khush of Stanford). This is a NIH/NHLBI funded study which aims to provide the process of evaluating potential donor hearts for transplant.

- Co-Investigator – Multicenter Arteriovenous malformation Research Study (MARS) extension. (PI Helen Kim of UCSF). This is a NIH/NINDS funded multicenter cohort study quantifying predictors of hemorrhage for unruptured brain arteriovenous malformations.

Suggested Next Steps

We aim to organize a semi-annual Webex among clinicians interested in research, to discuss active projects, increase awareness, and organize and connect physicians interested in research. Broad goals for the organized network of cardiology research physicians are:

1. Increasing awareness: Facilitate idea development and answer questions
 - a. Research training—what is it? IRBnet, Online KP/TPMG resources
 - b. Funding opportunities and deadlines
2. Identify stakeholders: Facilitate discussion around high-priority topics and assist in assembling the appropriate team members
3. Assist in idea generation, refinement and research question development, and promoting collaboration
4. Develop and implement a shared-resource tool to facilitate and engage stakeholders

Internal Research Funding Opportunities

1. Rapid Analysis Projects

DOR PI and TPMG clinical leader, 6 month project, up to \$30,000 mainly for Programmer Analyst time, 2 cycles per year

2. Community Benefits Grant

TPMG physicians, 12 month project, up to \$70,000, 1 cycle per year, letter of intent to local research chair by second Monday of March

3. Delivery Science grants

TPMG Physician and DOR co-PI, up to 24-month projects, up to \$250,000, 2 cycles per year, must be high priority by Chair of Chiefs and/or TPMG Executives

Upcoming Cardiology Conferences and Events

1. American Heart Association (AHA) Scientific Sessions 2019, Philadelphia, PA, November 16-18, 2019.

https://professional.heart.org/professional/EducationMeetings/MeetingsLiveCME/ScientificSessions/UCM_316900_Scientific-Sessions.jsp

2. Transcatheter Cardiovascular Therapeutics (TCT) 2019, San Francisco, CA, September 25-29, 2019. <https://www.crf.org/tct>
3. COAST Conference, likely Sept 6-7, 2019 in Las Vegas (date and location TBD).
4. 4th Annual KP Cardiovascular Research Symposium, Oakland, CA, Spring 2020.

Recent Publications Co-authored by TPMG Cardiologists

TPMG Cardiologists' Publications from 2018:

1. Ambrosy, A.P., A.S. Bhatt, A.L. Stebbins, L.M. Wruck, M. Fudim, S.J. Greene, W.E. Kraus, C.M. O'Connor, I.L. Pina, D.J. Whellan, and R.J. Mentz, *Prevalent digoxin use and subsequent risk of death or hospitalization in ambulatory heart failure patients with a reduced ejection fraction-Findings from the Heart Failure: A Controlled Trial Investigating Outcomes of Exercise Training (HF-ACTION) randomized controlled trial*. *Am Heart J*, 2018. 199: p. 97-104.
2. Ambrosy, A.P., L.P. Cerbin, M. Fudim, R.M. Clare, Y. Lokhnygina, E. Braunwald, R.M. Califf, C.P. Cannon, A.M. Tershakovec, M.T. Roe, and M.A. Blazing, *Natural History of Patients Postacute Coronary Syndrome Based on Heart Failure Status*. *Am J Cardiol*, 2018. 122(9): p. 1451-1458.
3. Ambrosy, A.P., G.D. Lewis, R. Malhotra, A.D. Jones, S.J. Greene, M. Fudim, A. Coles, J. Butler, A. Sharma, A.F. Hernandez, and R.J. Mentz, *Identifying responders to oral iron supplementation in heart failure with a reduced ejection fraction: a post-hoc analysis of the IRONOUT-HF trial*. *J Cardiovasc Med (Hagerstown)*, 2018.
4. Ambrosy, A.P., R.J. Mentz, M. Fiuzat, J.G.F. Cleland, S.J. Greene, C.M. O'Connor, J.R. Teerlink, F. Zannad, and S.D. Solomon, *The role of angiotensin receptor-neprilysin inhibitors in cardiovascular disease-existing evidence, knowledge gaps, and future directions*. *Eur J Heart Fail*, 2018. 20(6): p. 963-972.
5. Ambrosy, A.P., H. Mulder, A. Coles, W.E. Krauss, C.S.P. Lam, P.A. McCullough, I. Pina, J. Tromp, D.J. Whellan, C.M. O'Connor, and R.J. Mentz, *Renal Function and Exercise Training in Ambulatory Heart Failure Patients With a Reduced Ejection Fraction*. *Am J Cardiol*, 2018. 122(6): p. 999-1007.
6. Ambrosy, A.P., C.S. Parzynski, D.J. Friedman, M. Fudim, A.F. Hernandez, G.C. Fonarow, F.A. Masoudi, and S.M. Al-Khatib, *Is Time From Last Hospitalization for Heart Failure to Placement of a Primary Prevention Implantable Cardioverter-Defibrillator Associated With Patient Outcomes?* *Circulation*, 2018. 138(24): p. 2787-2797.
7. Ambrosy, A.P. and E.J. Velazquez, *Angiotensin receptor-neprilysin inhibitor therapy in heart failure: An end that justifies the means*. *Am Heart J*, 2018. 199: p. 176-177.
8. Anyanwu, E.C., V. Kagan, A. Bhatia, D.M. Tehrani, S. Adatya, G. Kim, N. Sarswat, V. Jeevanandam, G. Sayer, and N. Uriel, *Home Inotropes in Patients Supported with Left Ventricular Assist Devices*. *ASAIO J*, 2019. 65(1): p. e7-e11.

9. Auer, R., S. Sidney, D. Goff, E. Vittinghoff, M.J. Pletcher, N.B. Allen, J.P. Reis, C.E. Lewis, J. Carr, and J.S. Rana, *Lifetime marijuana use and subclinical atherosclerosis: the Coronary Artery Risk Development in Young Adults (CARDIA) study*. *Addiction*, 2018. 113(5): p. 845-856.
10. Avula, H.R., T.K. Leong, K.K. Lee, S.H. Sung, and A.S. Go, *Long-Term Outcomes of Adults With Heart Failure by Left Ventricular Systolic Function Status*. *Am J Cardiol*, 2018. 122(6): p. 1008-1016.
11. Avula, H.R. and A.N. Rassi, *The Current State of Left Main Percutaneous Coronary Intervention*. *Curr Atheroscler Rep*, 2018. 20(1): p. 3.
12. Aymami, M., M. Amsallem, J. Adams, K. Sallam, K. Moneghetti, M. Wheeler, W. Hiesinger, J. Teuteberg, D. Weisshaar, J.P. Verhoye, Y.J. Woo, R. Ha, F. Haddad, and D. Banerjee, *The Incremental Value of Right Ventricular Size and Strain in the Risk Assessment of Right Heart Failure Post - Left Ventricular Assist Device Implantation*. *J Card Fail*, 2018. 24(12): p. 823-832.
13. Balasubramanian, S., F.D. Ramirez, Y. Bui, E.S. Selamet Tierney, and S.K. Behera, *Comparison of Initial Pediatric Outpatient Echocardiogram Indications between Community and Academic Practice*. *J Pediatr*, 2019.
14. Banks, M.P., R. Auer, J.J. Carr, D.C. Goff, Jr., C. Kiefe, J.S. Rana, J. Reis, S. Sidney, J.G. Terry, and P.J. Schreiner, *Self-reported marijuana use over 25 years and abdominal adiposity: the Coronary Artery Risk Development in Young Adults (CARDIA) Study*. *Addiction*, 2018. 113(4): p. 689-698.
15. Casey A. Gifford, S.S.R., Ryan Samarakoon, Hazel T. Salunga, T. Yvanka de Soysa, Yu Huang, Ping Zhou, Aryé Elfenbein, Stacia K. Wyman, Yen K. Bui, Kimberly R. Cordes Metzler, Philip Ursell, Kathryn N. Ivey, Deepak Srivastava, *Oligogenic inheritance of congenital heart disease involving a NKX2-5 modifier*. Cold Spring Harbor Lab BioRxiv, 2018.
16. Cerbin, L.P., A.P. Ambrosy, S.J. Greene, P.W. Armstrong, J. Butler, A. Coles, A.D. DeVore, J.A. Ezekowitz, A.F. Hernandez, M. Metra, R.C. Starling, W. Tang, J.R. Teerlink, A.A. Voors, A. Wu, C.M. O'Connor, and R.J. Mentz, *Is Time of the Essence? The Impact of Time of Hospital Presentation in Acute Heart Failure: Insights From ASCEND-HF Trial*. *JACC Heart Fail*, 2018. 6(4): p. 298-307.
17. Cowger, J.A., Y. Naka, K.D. Aaronson, D. Horstmannshof, S. Gulati, D. Rinde-Hoffman, S. Pinney, S. Adatya, D.J. Farrar, U.P. Jorde, and M. Investigators, *Quality of life and functional capacity outcomes in the MOMENTUM 3 trial at 6 months: A call for new metrics for left ventricular assist device patients*. *J Heart Lung Transplant*, 2018. 37(1): p. 15-24.
18. Cuttica, M.J., L.A. Colangelo, M.T. Dransfield, S.P. Bhatt, J.S. Rana, D.R. Jacobs, Jr., B. Thyagarajan, S. Sidney, C.E. Lewis, K. Liu, D. Lloyd-Jones, G. Washko, and R. Kalhan, *Lung Function in Young Adults and Risk of Cardiovascular Events Over 29 Years: The CARDIA Study*. *J Am Heart Assoc*, 2018. 7(24): p. e010672.
19. Drudi, L.M., M. Ades, A. Asgar, L. Perrault, S. Lauck, J.G. Webb, A. Rassi, A. Lamy, N. Noiseux, M.D. Peterson, M. Labinaz, T. Lefevre, J.J. Popma, D.H. Kim, G. Martucci, N. Piazza, and J. Afilalo, *Interaction Between Frailty and Access Site in Older Adults Undergoing Transcatheter Aortic Valve Replacement*. *JACC Cardiovasc Interv*, 2018. 11(21): p. 2185-2192.
20. Go, A.S., K. Reynolds, J. Yang, N. Gupta, J. Lenane, S.H. Sung, T.N. Harrison, T.I. Liu, and M.D. Solomon, *Association of Burden of Atrial Fibrillation With Risk of Ischemic Stroke in Adults With Paroxysmal Atrial Fibrillation: The KP-RHYTHM Study*. *JAMA Cardiol*, 2018. 3(7): p. 601-608.

21. Go, A.S., M.A. Hlatky, T.I. Liu, D. Fan, E.A. Garcia, S.H. Sung, and M.D. Solomon, *Contemporary Burden and Correlates of Symptomatic Paroxysmal Supraventricular Tachycardia*. J Am Heart Assoc, 2018. 7(14).
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TPMG Abstracts Presented at American College of Cardiology 2019

ACC 2019 Abstracts Including TPMG Clinicians and Researchers

Presenter: Andrew P. Ambrosy, MD

Authors: Andrew P. Ambrosy, MD; Adam D. DeVore, MD; David A. Morrow, MD; Eugene Braunwald, MD; Carol I. Duffy, DO; Kevin McCague, MS; Ricardo Rocha, MD; Eric J. Velazquez, MD

Title: Prior Exposure to a Conventional Renin-Angiotensin System Antagonist and Angiotensin Receptor-Nepriylsin Inhibition in Acute Decompensated Heart Failure: A Prespecified Subgroup Analysis of the PIONEER-HF Trial

Presenter: Harshith Reddy Avula, MD, MPH

Authors: Harshith R. Avula, MD, Andrew Rassi, MD, Stephanie Chen, MD, Liviu Klein, MD, MS, Jonathan Zaroff, MD

Title: Transcatheter Device Closure of a Post-Infarction Basilar Ventricular Septal Rupture in a Patient Presenting With Cardiogenic Shock

Presenter: Richard A. Birnbaum, MD

Authors: Richard A. Birnbaum, MD, Brandon H. Horton, Leslie Manace Brenman, MD, Andrew L. Avins

Title: Identification and Management of Familial Hypercholesterolemia in an Integrated Health Care Delivery System

Presenter: Stephanie Chen, MD

Authors: Stephanie Chen, MD, Harshith R Avula, MD, Andrew P Ambrosy, MD, Robert Lundstrom, MD, Sahar Naderi, MD

Title: Spontaneous Coronary Artery Dissection and incident Ventricular Arrhythmias. Frequency, clinical characteristics, and outcomes

Presenter: Adam D. DeVore, MD

Authors: Adam D. DeVore, MD; Eugene Braunwald, MD; David A. Morrow, MD; Carol I. Duffy, DO; Andrew P. Ambrosy, MD; Kevin McCague, MS; Ricardo Rocha, MD; Eric J. Velazquez, MD

Title: Initiation of Angiotensin-Nepriylsin Inhibition after Acute Decompensated Heart Failure: Results of the Open-Label Extension of the PIONEER-HF Trial (Late-Breaking Clinical Trial Session)

Presenter: Ashok Krishnaswami, MD, MAS

Authors: Ashok Krishnaswami, MD, MAS ;Taylor Liu, MD, PhD ; Wei Wang, PhD, MS ; Jessica Harris, MS, RD; Elizabeth W. Paxton, MA; Frederick W. Masoudi, MD

Title: Association of Elixhauser Comorbidity Index to 1-Year Mortality in Older Adults After Permanent Pacemaker Implantation

Presenter: Neha Mantri, MD

Authors: Neha Mantri MD, Meng Lu MS, Carlos Iribarren, MD

Title: Longitudinal Change and Fluctuation in QT and Cardiovascular Outcomes – Insights from a Large Integrated Healthcare Delivery System

Presenter: Neha Mantri, MD

Authors: Neha Mantri MD, Ahmad Sheikh MD, Andrew Ambrosy MD, Jennifer Ting MD, Robert Lundstrom MD

Title: Diagnostic Evaluation of a Right Atrial Mass with Multimodality Imaging and Endomyocardial Biopsy: A Clinical Conundrum

Presenter: Amit Sachdeva, MD

Authors: Amit Sachdeva, MD, Yun-Yi Hung PhD, MPH, Edward J. McNulty, MD

Title: Associations of Bleeding and Ischemic Outcomes with Duration of Thienopyridine Therapy after Percutaneous Coronary Intervention for Coronary Chronic Total Occlusion

Presenter: Samuel T. Savitz, PhD

Authors: Samuel T. Savitz PhD, Jamal S. Rana MD, Keane Lee MD, Thomas Leong MPH, Sue Hee Sung MPH, Grace Tabada MPH, Alan S. Go MD

Title: Re-Evaluation of Race and Ethnicity with Adverse Outcomes in Heart Failure

Presenter: Matthew D. Solomon, MD, PhD

Authors: Matthew D. Solomon, MD, PhD, Thomas Leong, MPH, Sue Hee Sung MPH, Catherine Lee, PhD, Samuel T. Savitz, PhD, Jamal S. Rana, MD, PhD, Edward J. McNulty, MD, Alan S. Go, MD

Title: Development and Validation of Models to Predict Long-Term Outcomes and Resource Utilization After Percutaneous Coronary Intervention

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