

# PROGRAM MANUAL

## University of Washington Training Program in Cardiovascular Disease

Department of Medicine  
Division of Cardiology

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### #1 Hospital in Washington

UW Medical Center is Washington's #1 Hospital 10 years in a row and is nationally ranked in six specialties: cancer\*; diabetes and endocrinology; ear, nose and throat; geriatrics; gynecology; and rehabilitation.

\*with Seattle Cancer Care Alliance

# UNIVERSITY OF WASHINGTON SCHOOL OF MEDICINE TRAINING PROGRAM IN CARDIOVASCULAR DISEASE

## Overview

The UW Fellowship Training Program in Cardiovascular Disease is an ACGME-accredited program designed to prepare trainees for a career of excellence in Cardiology research and scholarly work, teaching, and patient care. There are eight (8) trainees accepted into the program each year. Application to the training program is made via the ERAS online application system. All positions are filled via the National Residency Match Program. Cardiology trainees are recruited to a standard ACGME fellowship training track. Cardiology trainees begin their fellowship with a core curriculum comprising 2 years of clinical training with rotations in inpatient cardiology, cardiac catheterization, echocardiography, nuclear cardiology, electrophysiology, adult congenital heart disease, heart failure and transplantation, cardiac consultation, critical care cardiology, mechanical circulatory support, and ambulatory cardiovascular care. Year 3 of training allows trainee differentiation into pathways, the *Clinician Scholar pathway* and the *Research Scholar pathway*. Research is an integral part of our fellowship training program, with dedicated research time provided in the third ACGME year of training for all pathways. Trainees in the *Clinician Scholar pathway* complete an integrated 3<sup>rd</sup> year of advanced clinical and scholarly work, including clinical quality improvement initiatives. Interested trainees may additionally focus on mentored teaching activities with development of curricular materials. Trainees accepted to the *Research Scholar pathway* complete a 3<sup>rd</sup> and 4<sup>th</sup> year of training in research in basic sciences, health services, population science or clinical investigation under the guidance of a research mentor.

## Prerequisites

Prerequisites include completion of an ACGME accredited three-year residency in internal medicine from a U.S. based training program, outstanding clinical skills, and demonstration of prior research interest and experience. Because of the critical role that research training plays in the formation of future academic cardiologists, close attention is paid by the fellowship selection committee to applicants' aptitude for and experience in research. All fellows are expected to conduct research during their fellowship training, with presentation and publication of the results of their work.

## Fellowship Clinical Training Sites

Fellows rotate through four affiliated University of Washington Hospitals. UW Medicine hospitals and programs consistently rank highly in U.S. News and World Report's annual "Best Hospitals" issues.

The [University of Washington Medical Center - Montlake](#) (UWMC) is a 450-bed hospital with a 46-bed medical/surgical critical care center. Cardiovascular services at the University of Washington Medical Center include specialized clinical teams in cardiac catheterization, echocardiography, clinical electrophysiology, advanced heart failure and cardiac transplantation, nuclear cardiology, advanced cardiovascular imaging, adult congenital heart disease, and cardiothoracic surgery.



[Harborview Medical Center](#) (HMC). HMC is a 413-bed hospital with a 63-bed critical care center owned by King County and managed by the University of Washington. Harborview is a world-renowned Level 1 adult and pediatric trauma center. Cardiovascular services include an active coronary care unit service, cardiology clinics and consultation service, echocardiography, and cardiac catheterization laboratories.



[Seattle VA Medical Center](#) (VAMC) has 268 beds with 82 beds assigned to the medical service, including 18 medical intensive care/coronary care unit beds. The cardiology

service at the VA Medical Center maintains an active cardiac catheterization laboratory, inpatient and outpatient clinical cardiology, electrocardiography, and echocardiography services.



[UW Medical Center - Northwest](#) is a full-service community hospital, with 281 beds, located north of Seattle. A full-service community hospital, the cardiology service at NWH offers elective rotation experience in cardiac catheterization, cardiac rehabilitation, and peripheral artery disease management.



## Clinical Training

Year 1 and year 2 clinical rotations are scheduled over a consecutive time period (4-week blocks, 13 blocks each year):

### **YEAR 1**

UWMC Cardiology A (general inpatient cardiology wards)  
UWMC Echocardiography  
Harborview Consult (inpatient cardiology consultation)  
Harborview Cath/Inpatient  
Harborview Echocardiography  
VAMC Inpatient Cardiology Consultation/CCU  
VAMC Cardiac Catheterization  
Intermittent overnight call for specialty consult services, cardiac procedures, inpatient services  
Ambulatory Continuity Clinic

### **YEAR 2**

UWMC Cardiology B (heart failure/transplantation inpatient cardiology wards)  
UWMC Cardiac Intensive Care Unit  
UWMC Advanced Echocardiography  
UWMC Electrophysiology  
UWMC Inpatient Cardiology Consultation  
UWMC Nuclear Cardiology  
UWMC Adult Congenital Heart Disease  
UWMC Cardiac Catheterization  
Intermittent overnight call for specialty consult services, cardiac procedures, inpatient services  
Ambulatory Continuity Clinic

### **YEAR 3**

UWMC Cardiac Intensive Care Unit  
UWMC Mechanical Circulatory Support Consultation (VAD)  
UWMC co-attending general inpatient Cardiology wards  
Advanced subspecialty electives  
Intermittent overnight call for specialty consult services, cardiac procedures, inpatient services  
Ambulatory Continuity Clinic

### **ELECTIVES (OFFERED DURING YEAR 3 UNLESS OTHERWISE SPECIFIED)**

Research elective (year 2)  
Advanced Imaging (intraoperative echo, CT/MRI, advanced echocardiography)  
Adult Congenital Heart Disease  
Heart Failure/MCS

Nuclear Cardiology (advanced training for Nuclear boarding)  
Advanced Electrophysiology  
Advanced Cardiac Catheterization  
Critical Care Cardiology Night Float  
Clinical Quality Improvement

## Teaching Conferences

- Division of **Cardiology Grand Rounds** on Fridays from 7:30 to 8:30 AM (September – June). Grand Rounds include at least 1 research conference per month, regular clinical-pathologic correlation conferences, and topics of clinical interest. Each fellow presents at least once with other presentations by Cardiology faculty, faculty from related disciplines, and visiting speakers.
- **Fellows Tutorial, Inpatient Didactic** on Fridays from 8:30 to 10:30 AM. (All year, with conferences from 7:30 to 10:30 AM during the summer when Grand Rounds are not held.) Cardiology tutorials provide a comprehensive introduction to cardiovascular disease with emphasis on pathophysiology, pathology, pharmacology, diagnostic imaging techniques, and research methods.
- **Multidisciplinary Case Conference (MDC)**, Wednesday's, 7:30 to 8:30 AM, weekly, with collaboration of Cardiology, CT-Surgery and Cardiac Anesthesia in these discussions. The cases and background information are presented by the Cardiology Fellows on a rotating schedule.
- **Journal Club** is a monthly dinner meeting arranged by the Cardiology Fellows. Fellows present recent journal articles of general interest, describing the content of the article and directing a brief discussion of its strengths and weaknesses. All fellows are strongly encouraged to pre-read the selected articles and provide an interactive dialogue on current cardiology topics. Faculty with an interest in the area of the articles are invited to share their perspective and experience.
- **Fellows Research Scholarly Conference** is held monthly. Fellows present ongoing work in a venue that is relatively informal and interactive. Constructive dialogue and questions are encouraged and suggestions regarding research directions and approaches are solicited. Presentations are forward-looking, including presentation of new hypotheses as well as plans for acquiring grant funding that would allow the hypotheses to be tested. A **Faculty Research Conference** is also presented monthly.
- Fellows may attend other conferences, such as Cardiovascular Biology Breakfast Club and Medicine Grand Rounds, as their rotations and schedules allow.

- Subspecialty weekly conferences are also available, in a variety of areas of expertise such as multimodality cardiac imaging, interventional Cardiology, electrophysiology, heart failure and cardiac transplantation, and adult congenital heart disease. Fellows are encouraged to attend as schedules permit.
- Other lectures/conferences scheduled throughout the year by the Department of Medicine and School of Medicine may be found here: <https://medicine.uw.edu/news/trumba-calendar>. In addition, fellows are encouraged to attend one national scientific meeting annually. Partial support for travel is provided. Conferences are regularly scheduled including topics such as: OSHA and radiation safety regulations, continuous quality improvement and risk management.
- Fellows on VAMC rotations participate in the weekly Friday VAMC Cardiology Conference and fellows on HMC rotations participate in ECG and case conferences at HMC.
- Fellows are encouraged to attend the Ethics in Medicine lecture series.

## Research Training

The University of Washington is one of the largest and most productive research universities in the world. Cardiology fellows have access to a broad spectrum of outstanding research training programs at the University of Washington Medical Center and at affiliated institutions such as Harborview Medical Center, the VA Puget Sound Medical Center, the Fred Hutchinson Cancer Research Center, the Puget Sound Blood Center, the Institute for Systems Biology, and the Northwest Lipid Research Laboratory. Research opportunities are available in laboratory-based, clinical, and population-based research. Many fellows pursue research training under the guidance of a member of the Cardiology Division. However, collaborations with investigators outside of the division are also common. Research is an integral part of the UW Fellowship Training Program in Cardiovascular Disease, with dedicated research time provided in the third ACGME year of training. All fellows are expected to conduct research during their fellowship years and publish the results of their work, preparing trainees for a science-based career and is consistent with the recommendations of the Core Cardiology Training Statement (COCATS 4).

- A meaningful, supervised fellowship research experience with appropriate protected time is provided.
- Fellows are given guidance with regards to the design and interpretation of research studies, responsible use of informed consent, research methodology, and interpretation of data.
- Fellows are advised and supervised by faculty members who are proficient in the design and conduct of research.

### YEAR 1 TRAINING

Fellows meet with the Associate Program Director for Research, to define research interests and explore opportunities. Fellows identify a faculty research mentor and begin discussion of potential research projects. Fellows with an interest in the *Research Scholar pathway* should apply to this program by the end of the first year.

*Resources:* University of Washington faculty and departmental web sites  
Fellowship program manual and website:

<http://www.uwcardiologyfellows.org/>

Faculty Mentors include Drs. Rosario Freeman, Kelley Branch, Jacob Doll, April Stempien-Otero, Francis Kim, and David Dichek.

<http://www.uwcardiologyfellows.org/mentors-projects>

*Timeline:* July-December: Fellow researches potential projects/mentors, shared areas of interest either clinical or research. In consultation with fellowship directors, fellows select a research planning adviser. Fellows should have a list of possible topics/projects (stand-alone project or part of a larger

project carried on by the research mentor). January: Associate Director for Research meets with fellow to help identify research and career goals. A list of potential research mentors is formulated. Meetings with potential mentors scheduled over next few months.

## **YEAR 2 TRAINING**

Fellows are able to schedule a research block elective to initiate work on their research project. By May 1 (preceding start of second year), fellows update their Individualized Development Plan (IDP) and submit a research proposal with their mentor's commitment to work with them. This proposal should include a summary of the research project, the specific research activities that are planned during the research month, and anticipated scholarly work (paper, chapter, grant application), signed and agreed on by the research mentor.

## **YEAR 3 TRAINING**

*Clinician Scholar pathway*: Trainees complete an integrated ACGME 3<sup>rd</sup> year of advanced clinical and scholarly work, including clinical quality improvement. Fellows are provided clinical quality improvement/research blocks during the third year of fellowship training. Scholarly work and clinical research are focused within the area of subspecialty interests. Clinical rotations in this pathway include core rotations in specialized inpatient consultation and critical care. Additionally, advanced clinical subspecialty elective time is provided. Clinician scholar trainees participate as small group educators for the UW Medical School MedSci530 Circulatory Systems course.

Requirements Year 3 *Clinician Scholar pathway*:

- Clinical training time during the year 3 fellowship training includes: specialized inpatient consultation and critical care rotations, advanced subspecialty clinical electives, maintenance of a weekly continuity clinic and intermittent overnight call for specialty consult services, cardiac procedures, inpatient services.
- Individual Development Plan (IDP) initiated in year 1. The IDP is updated and discussed with the program director/faculty at semi-annual and annual evaluation meetings to clarify short and long-term academic and career goals.
- Fellows have the opportunity to complete a clinical quality improvement project under the mentorship of a faculty member. Fellows will submit a project proposal with the mentor's commitment to work with them which includes a summary of the project, the specific investigative activities that are planned, and anticipated scholarly work (protocol, publication, intervention, meeting submission). Other opportunities include work with Division of Cardiology clinical quality and safety initiatives and programs.
- During year 2 training, fellows will be provided an option for a clinical research elective to begin their project. Fellows committed to a clinical

- research project will also assess the need for Human Subjects approval for their projects, design data collection forms, and develop a timeline for data collection and publication prior to completion of fellowship training.
- Fellows present interim results of clinical research or patient quality safety projects at cardiology conferences, submit clinical case presentations, and, where appropriate, submit abstracts/prepare manuscripts for presentation and publication. Faculty mentor should attend these presentations.
  - Fellows present an in-depth clinical topical review at a UW Cardiology Grand Rounds in the area of their specialty or subspecialty interest.
  - Interested fellows may prepare grant applications to fund clinical research during Year 3 of training. The program director and associate program director must be notified 6 months in advance of this submission. For extramural grant funding applications, such as the ACC or AHA, application to earlier funding cycles (award notification by winter preceding funding period) is mandatory. In the rare case where application to a later funding cycle is needed, (award notification by the spring preceding funding period), fellows are subject to the clinical training schedule adjustment needed to meet the funding requirements of the grant, which may delay the grant start date.

For trainees interested in a *Clinician Educator* focus, additional activities include:

- Development of a teaching portfolio
- Completion of a substantive educational initiative or scholarly project under the mentorship of a faculty member. Submit an education proposal with the mentor's commitment to work with them which includes a summary, specific activities planned, and anticipated work (protocol, materials).

*Research Scholar pathway:* After completion of 2 years of core clinical curricular training, trainees who plan a significant research component in their careers spend a minimum of two years obtaining research experience designed to provide necessary tools in techniques of investigator-initiated clinical, translational and/or bench based basic research. A commitment to research training is required, with development of a detailed research plan coordinated by the trainee, research mentor, program director, and Division Head. A clinical research scholar pathway provides trainees with the appropriate statistical background and expertise in clinical research methodology to succeed as a clinical investigator, utilizing formal coursework through the UW School of Public Health.

Grant writing is an essential component of research career development for fellows aspiring to become independent investigators, and trainees in this pathway are required to apply for grant funding. With the assistance of a faculty led mentoring team, competitive candidates apply for grant funding early during year 2 of training. Extramural funding sources include AHA fellowships and individual NIH F32. Internal funding sources include NIH-sponsored research training grants (T-32) for eligible candidates (US citizens or permanent residents) including the Cardiovascular Research

Training Program, the Palliative Care Research Fellowship, and the Genetic Approaches to Aging.

After year 4, fellows who intend to become independent principal investigators in laboratory-based, clinical, or population-based research may need to extend their research training. Research mentors guide fellows whose aptitude and interest for research remain high towards submission of faculty transition grants such as the NIH K08 or K23, and the American Heart Association Scientist Development Grant or Fellow to Faculty Award. NIH KL2 awards, which provides 2 years of faculty-level salary support and a mentored training environment for fellows who wish to develop a career in clinical research are awarded through a competitive process by the Institute of Translational Health Sciences (ITHS).

#### Requirements *Research Scholar pathway*:

- Years 3 and 4 are devoted primarily to research under the guidance of a faculty mentor and mentoring committee. Clinical training time during year 3 of fellowship training meets ACGME training requirements, and includes maintenance of a weekly continuity clinic and intermittent overnight call for specialty consult services, cardiac procedures, inpatient services. During year 3 of training, fellows are responsible for specialized inpatient consultation and critical care rotations, the specifics of which are dependent on stipulations of individual grant awards.
- Individual Development Plan (IDP) initiated in year 1. The IDP is updated and discussed with the program director/faculty at semi-annual and annual evaluation meetings to clarify short and long-term academic and career goals.
- Fellows develop a mentoring committee by the end of year 1 and apply for research fellowship grants during a second-year research elective block elective. Current institutional training grants support fellows working in basic and applied cardiovascular biology, imaging, health care outcomes, bioengineering, and epidemiology. External fellowship grant applications are typically submitted to the American Heart Association, the American College of Cardiology, the National Institutes of Health, and other professional societies, private agencies, or corporate foundations. Fellows must meet the training and research time requirements of research awards.
- Fellows prepare grant applications to fund research beginning in July of Year 3 of training. For extramural grant funding applications, application to earlier funding cycles (award notification by winter preceding funding period) is preferred. In the cases where application to a later funding cycle is needed, (award notification by spring preceding funding period) fellows are subject to the training schedule adjustment needed to meet the salary funding requirements of the grant.
- Fellows are expected to complete a substantive cardiovascular disease research project.
- Fellows present interim results of research projects at cardiology research conferences, submit abstracts, and prepare manuscripts for presentation and publication. Faculty mentors are required attend these presentations.

- Fellows present an in-depth review of their research work at UW Cardiology Grand Rounds
- Fellows receive training in the scientific and practical “survival skills” that are required for success as an independent investigator. These skills include writing manuscripts and grants, speaking, biomedical ethics, financial management, job finding, and mentorship. Training in these areas is provided by formal courses and by the research mentors on an informal basis. Research Scholars in epidemiologic and population sciences will complete Masters level training in these skills.

## Appointments/Stipends/Benefits

Details of the Fellowship Position Agreement for the University of Washington are available at: [2022- 2023 Residency and Fellowship Position Appointment \(RFPA\)](#)

After beginning training, most fellows will be reappointed to successive years of training, but this is not binding upon either the fellow or the Program Director. A fourth year of research training requires application or arrangement with the Research Scholars Program.

In October of 2014, the Resident Fellow Physician Union (RFPU) was certified as the labor union and exclusive bargaining representative for the majority of residents and fellows in the UW School of Medicine (UW SOM) and in the UW School of Dentistry (UW SOD). The UW/RFPU Collective Bargaining Agreement was first ratified on November 1, 2016. On June 9, 2020, UW reached agreement with RFPU on a successor CBA that will go into effect upon ratification, through June 30, 2022.

The UW/RFPU Contract: <https://hr.uw.edu/labor/academic-and-student-unions/uw-housestaff-association/uwha-contract>

Stipends are reviewed annually and determined at the Institutional level. The current UW resident stipend schedule: [Stipend Schedule for RFPU Members](#)

These salaries are adjusted annually. Medical insurance and basic life insurance are provided to all fellows and their dependents. Supplemental life insurance, disability insurance, and retirement benefits also are available. As of July 1, 2021, all Cardiology fellows will receive 28 days of vacation per year (20 weekdays and 8 weekend days). Unused vacation is not carried over to the following academic year.

Fellows organize evening and weekend call schedules throughout the three years of training. On average, first year fellows are on-call an every 4<sup>th</sup> night/weekend and second/third year fellows every 5<sup>th</sup> night/weekend. Cardiology fellows are entitled to staff privileges at the University, including use of the library, and membership to the Intramural Sports Activities Building.

Although fellows in the general Cardiology training program are not concurrently trained for board eligibility in subspecialty ACGME fellowships, the University of Washington Cardiology program does offer subsequent subspecialty fellowship training in interventional Cardiology, electrophysiology, adult congenital heart disease, and advanced heart failure/cardiac transplantation. These fellowship programs require a separate application process, and are between one to two years in length, depending on the specialty.

# University of Washington Training Program in Cardiovascular Disease Administrative Guidelines 2023-2024

Specific Guidelines for detailed University of Washington procedures and policies for fellows are contained in the Fellowship Position Appointment Agreement, which each fellow receives. This contract provides for a variety of procedures, should they be needed, including emergency or exceptional leave requirements, termination of contract, grievances, etc. The following Administrative Guidelines apply specifically to the Cardiology Fellowship Programs. Additional information is also available at the UW Graduate Medical Education website: [Incoming Residents and Fellows](#)

## 1. Fellowship Administration Office and Communication

All questions regarding fellowship issues should be handled by the Fellowship Office.

Fellowship Office Hours: Monday-Friday, 8:30AM – 5:00PM

Phone/Voice mail: 206-685-1397\*

Fax: 206-685-9394\*

Email : [uwcardapps@cardiology.washington.edu](mailto:uwcardapps@cardiology.washington.edu)\*

*\* Not to be used or provided for clinical communications, or call-backs ; please provide your pager or cell phone.*

## 2. Evaluation of Clinical Performance and Documentation of Procedures

A description of each clinical rotation, including principal responsibilities for both inpatient and outpatient components, is provided at the beginning of the fellowship year and on the Cardiology fellowship website. In addition, rotational goals and objective documents are delivered via MedHub prior to each rotation and available for review all year long. Faculty are required to provide oral, as well as written, feedback to each fellow at the end of the rotation regarding clinical performance and areas for improvement. Online evaluations of fellow performance are obtained after each rotation. Evaluations are reviewed by trainees with the Fellowship Director or Associate Fellowship Directors every 6 months.

The ACGME requires that fellows maintain records of procedures performed during their Fellowship Training. Records should include date, supervising physician, exact procedure performed, any complications and the fellow's role. Procedure logs are maintained using the same online system used to complete and review evaluations. It can be accessed by going to [MedHub](#). Every 6 months, the procedure log and total numbers of procedures are reviewed with the fellowship Program Director or associate fellowship Program Directors.

Fellows are responsible for providing the fellowship staff with an updated CV and IDP by November 1; updated CV only and scholarly activity by May 1 each academic year by email to: [uwcadapps@cardiology.washington.edu](mailto:uwcadapps@cardiology.washington.edu).

### 3. Participation in Program Development

Fellows actively participate in program development of the Cardiology fellowship program:

- Informal lunches with the program directors and selected faculty to discuss areas for improvement
- Online evaluations of faculty and rotations by the fellows
- Participation by Chief Fellows on the Fellowship Committee
- Annual confidential online evaluation of the Fellowship Program through MedHub

### 4. On-Call Responsibilities

On-call responsibilities are approximately every 4th night and every 4th weekend for the 1<sup>st</sup> year fellows, every 5th night/weekend for 2nd year fellows and approximately every 5th night/weekend for 3<sup>rd</sup> year fellows. On-call responsibilities are divided as follows (with Attending coverage for each):

#### **CARDIOLOGY A CALL (FIRST YEAR FELLOWS)**

**Weekday:** The Card A fellow supervises the inpatient Cardiology A team from 8AM-8PM. From 8PM-8AM, there is a floor hospitalist that provides supervisory support to the in-house Cardiology A resident overnight. Urgent weekday cardiology consults between 5PM-8PM are shared between the Cardiology A fellow (MWF) and Echo I fellow (T/Th)

**Weekend: 8AM-8PM Saturday/Sunday:** The Card A weekend fellow supervises admissions to the service and concurrently provides general Cardiology consults from 8AM-8PM. They are responsible for Card A service ordered echoes starting November 1. Echo requests are directed through the procedure fellow and must be read that night with a preliminary note in ORCA.

#### **CCU/CICU SENIOR FELLOW (SECOND/THIRD YEAR/ADVANCED HEART FAILURE FELLOWS):**

**Weekday:** The CCU/CICU senior fellow is the supervising fellow from 8AM-5PM and covers urgent consults 5PM-8PM Tuesdays and Thursdays.

**Weekend: 8AM-8PM Saturday/Sunday:** The CCU/CICU weekend senior fellow is on service 8AM-8PM. They are responsible for CCU/CICU service ordered echoes. Echo requests are directed through the procedure fellow and must be read that night with a preliminary note in ORCA. From 8PM-8AM, there are in-house CCU/CICU hospitalists. The weekend CCU/CICU fellow covers MCS weekend consults.

### **CCU NIGHT FLOAT CALL (THIRD YEAR/RESEARCH FELLOWS)**

#### **Weekday and weekend: 8PM-8AM, intermittent**

In-house, intermittent overnight primary care and coverage of the CCU service integrating medical management, cardiac diagnostics, and appropriate consultation of other clinical services (1-2 evenings per month). This float call is a clinical elective for general cardiology fellows on the clinician educator track. It is a mandatory rotation for fellows on the research scholar pathway.

### **CARDIOLOGY B/MCS CALL (SECOND/THIRD YEAR/ADVANCED HEART FAILURE)**

**Weekday evening:** 5PM-8AM for heart failure consults, cardiology B service calls/urgent inpatient issues. This is shared with weekday EP call (see below). From 8PM-8AM, there is a floor hospitalist overnight. EP at Harborview is not covered by the general fellows on-call.

**Weekend: 5PM Friday to 8AM Monday:** Fellows identify patients on MCS/CTICU/Cardiology C and D requiring cardiology B consultation over the weekend. They are responsible for Card B service ordered echoes. Echo requests are directed through the procedure fellow and must be read that night with a preliminary note in ORCA.

### **EP CALL (SECOND/THIRD YEAR/EP SPECIALTY FELLOWS)**

**Weekday evening:** 5PM-8AM (EP fellows when assigned) for HeartCare alerts, CIED interrogation requests, new EP consultations, device interrogations, and consults for malignant arrhythmias. EP at Harborview is not covered by the general fellows on-call.

**Weekend 5PM Friday to 8AM Monday:** covered by EP specialty fellows. The fourth weekend of the month, general fellows cover the on-call evening/night home call from 5PM-8AM.

### **"TRIPLE"(PROCEDURE/CONSULT/ECHO) (ALL GENERAL FELLOWS)**

**Weekday evening:** 5PM-8AM Cover Cath lab-based procedures, echoes, urgent consults 8pm - 8am. STEMI call is elective.

**Weekend:** 5PM Friday to 8AM Monday Cover Cath lab-based procedures, echoes and urgent consults. Cardiology A/B/CCU fellows read their weekend service echoes. STEMI call is elective.

### **JEOPARDY CALL (THIRD YEAR FELLOWS)**

Pre-designated fellow to back up sick or otherwise unexpectedly unavailable fellows for essential clinical responsibilities. Intermittent assignment throughout the year. Jeopardy coverage is evenly divided among third year general cardiology fellows. Jeopardy shifts run from 8:00am to 8:00am the next morning.

### **RESEARCH SCHOLAR PATHWAY TRAINEES (THIRD/FOURTH YEAR FELLOWS)**

Call responsibilities for research scholar pathway trainees is the same as outlined above for the ACGME clinical training (years 1/2). Years 3/4 are devoted primarily to research under the guidance of a faculty mentor and mentoring committee. Clinical training time during year 3 meets ACGME training requirements, and includes maintenance of a weekly continuity clinic and intermittent weekend call for specialty consult services, cardiac procedures, inpatient services. Fellows are also assigned 1-2 blocks of specialized inpatient consultation and critical care rotations (CCU night float) with protected time as stipulated by individual grant awards.

## **5. Work Hours**

Fellows are required to adhere to the ACGME requirements for work hours (mandatory):

- No more than 80 hours per week in house (averaged over 1 month).
- No more than 30 consecutive work hours (in house)
- At least 1 day in 7 free of work, when averaged over four weeks.
- Fellows should have 10 hours free of work, and 8 hours between scheduled duty periods
- Fellows must have at least 14 hours free of work after 24 hours of in-house work
- At-home call counts towards the 80-hour maximum weekly hour limit.

To effectively follow these rules requires efficiency, open lines of communication among members of all health care teams, the ability and willingness to effectively sign out pending tasks. Fellows also help ensure that the medicine residents meet the work hour rules and help them learn to work as a team so they can leave on time while still providing excellent patient care. All fellows record their work hours online in MedHub weekly.

## **6. Lines of Supervisory Responsibility**

On each clinical rotation, the fellow is supervised by the cardiology attending on that service both in direct patient care activities and in performing and interpreting

diagnostic and therapeutic procedures. During the research month(s), each fellow has a designated supervisor. A weekly cardiology continuity clinic is supervised by the clinic faculty mentor. Evening and weekend on-call attendings are designated for each cardiology sub-specialty.

## 7. Training for Conduct of Human Subjects Research

Training in the conduct of human subjects research is required for all fellows who plan to do patient-based research and also is required for “key personnel” receiving funding from the National Institutes of Health (NIH). Education in the basics of human subjects research that meets the NIH requirement is available on a regular basis via In-Person Sessions, CITI Web-Based Training, and the Investigator 101 CD ROM. The Human Subjects Division also provides and coordinates other training opportunities related to human subjects research. A listing of in person and online training courses are available at: [Human Subjects Division Training and Education](#)

## 8. Vacations

As of July 1, 2021, fellows have four weeks of vacation per year as stated in the Fellowship Position Appointment (20 weekdays and 8 weekend days). Vacations are scheduled with the fellowship office. The schedule for the academic year is completed by May of the preceding academic year. Any changes to the vacation schedule are approved by the Cardiology fellowship office and Program Director. Vacations are typically scheduled in one-week increments from Sunday through Saturday. Fellows should limit instances of missing more than one week of any given rotation or scheduling vacation concurrently with other fellows on the same service. **Fellows are responsible for** notifying their continuity clinic attending at the beginning of the year and direct rotation supervisor at least four weeks in advance of vacation plans. It is the responsibility of the fellow to review and confirm they do not have any on-call responsibilities when on vacation.

Vacation is not scheduled when fellows are assigned to the inpatient cardiology rotations. For all other clinical rotations, when fellows are on vacation, or coverage has not been arranged in advance, the attending is responsible for clinical responsibilities.

Fellows provide cross coverage between assigned rotations for urgent clinical issues as follows:

- UWMC Echo, Consult, and Adult Congenital Heart Disease fellows
- UWMC 2<sup>nd</sup> Year EP fellow and EP fellows
- UWMC 2<sup>nd</sup> Year Cath lab fellow and Interventional fellows
- HMC Echo and Consult/Cath fellows
- VAMC Cath and ECG fellow

For cross-covering arrangements, only urgent issues are covered and should not interfere with the educational component of training.

## **9. Travel to scientific meetings/Professional Development**

Our fellowship programs allow time and partial funding (\$600.00) for trainees to attend 1 national scientific meeting annually at which original research is presented. Most fellows choose to attend the AHA or ACC meetings, or other scientific sessions (such as The Heart Rhythm Society, the Heart Failure Society, or the American Society of Echocardiography meetings). We encourage fellows to submit original research abstracts for presentation. All travel must be pre-approved prior to making any arrangements. Scientific meeting assignments are made annually by the fellowship office as part of rotation/vacation scheduling. Any requests for change should be directed to the fellowship office as soon as possible. Receipts are required for reimbursement for registration, lodging, airfare and any ground transportation.

To guarantee reimbursement, receipts must be submitted as a single PDF to the fellowship office within 30 days of completion of your trip. The fellow should ensure appropriate on-call and clinic coverage during absences.

## **10. Outside Professional Activities**

Outside professional activities ("moonlighting") is not prohibited, but must not interfere with fellowship trainee responsibilities and duties or result in deterioration of the fellow's clinical or research performance. Involvement in Outside Professional activities must be consistent with ACGME policies and are included in work hours reporting. Advance written approval for outside professional activities is required. The fellow should submit the request form to the Program Director indicating the activity and the amount of time involved. If the Program Director approves of this activity, the paperwork will be forwarded to the Graduate Medical Education Office for approval. This approval must be renewed annually.

Please see the detailed policy and copy of the Moonlighting form on the following links:

[Policy on Working Outside the Training Program](#)

[Outside Work Forms](#)

## **11. Housestaff Coverage**

Every year there is 1 housestaff IM residency event where overnight in-house patient care responsibilities are covered by fellows. Cardiology fellows are expected to provide coverage for the Cardiology services of UWMC, HMC and the VAMC for this event, and will be compensated.

## **12. Parking**

Fellows are responsible for their own transportation and parking arrangements. In order to attend conferences and continuity clinics, paying double parking fees may be needed on some days. Fellows are only responsible for paying one parking permit per day. If reimbursement for the second payment is needed, printed documentation of two parking fees in one day must be provided to the fellowship office at the end of each rotation for reimbursement. We encourage use of the Health Sciences Shuttle when traveling between UWMC and HMC.

There are 2 options for parking at the UWMC. 1) Purchase an entire year (set up as a payroll deduction) or a month at a time or 2) PPUP Program at Portage Bay Garage: *RECOMMENDED*. Located west of UWMC. If residents/fellows are not eligible for payroll deduction, a [Husky Card Account](#) may be used as a payment option. The Husky Card Account must be set up prior to signing up for PPUP. Once signed up with [UW Transportation Services](#), you enter the garage by swiping your Husky Card. This parking program does allow in and out privileges (for single entry, not available for carpools) and must be renewed at the end of each year

**For more information:** <https://sites.uw.edu/uwgme/parking-transportation-resources/>

There are no fees for parking at the VAMC. At Harborview you are required to either acquire a monthly parking permit or the HMC PPUP plan. You must obtain green & white liability waiver forms at the HMC Parking and Commuter Services Office. Pay the fee and a parking permit will be issued for the dates that you will rotate at HMC. Escort services are available at the UWMC and at HMC for walking to your car late at night.

- UW Security: 206-598-5555
- Husky Night Walk: 206-685-9255
- HMC Security: 206-744-3193

#### **14. Appointment and Reappointment**

Fellow reappointment to successive years of training is done each year, contingent on adequate trainee performance and achievement of competency goals. Following successful completion of 3 years of training in the general cardiology fellowship program, fellows are eligible for the ABIM examination in Cardiovascular Disease. Competency in cardiology subspecialties requires additional training. Subspecialty fellowship programs in adult congenital heart disease, advanced heart failure and cardiac transplantation, interventional cardiology and electrophysiology require participation in a separate ACGME-accredited training program following completion of the general Cardiology fellowship program. Additionally, there are non-ACGME subspecialty fellowships in advanced multimodality imaging, structural interventional cardiology, and complex coronary and advance hemodynamic support (CHiP). Participation in our general fellowship training program does not guarantee acceptance

into our subspecialty fellowship training programs, but internal applicants are generally competitive for these positions.

## **15. ID Badges**

All fellows are required to wear a current photo ID badge for each medical center at all times when in or entering the building. ID badges must be displayed above the waist and be visible.

## **16. Radiation Safety**

All fellows are provided with one Radiation Exposure Badge and a ring by the Radiation Safety Office each month, which are required whenever radiation exposure is likely. Fellows are required to wear lead aprons as instructed by the Cath Lab faculty. Badges and rings are to be turned in monthly to the Fellowship Office. Instruction in basic radiation safety is provided annually. Additional information is available from the UW Radiation Safety Office.

## **17. Health**

All fellows are required to have annual influenza vaccination, respiratory mask fitting and TB testing by the Employee Health Office in room BB-306.

### *Vaccination Requirement*

Per Governor Inslee's [Proclamation 21-14.2](#), employees of higher education and healthcare institutions must be fully vaccinated against COVID-19 unless a medical or religious exemption is approved. Being fully vaccinated means that an individual is at least two weeks past their final dose of an authorized COVID-19 vaccine regimen. As a condition of employment, newly hired employees will be required to provide proof of their COVID-19 vaccination.

## **18. Lactation Stations**

Lactation stations are available in numerous locations in the UW Medical Center Northlake and Health Sciences Center. Please click the link below for additional information and locations.

[UW Medical Center - Montlake/Health Sciences Center lactation stations](#)

## **19. Licensing**

Each fellow must have a current Washington State Medical License. The fee for the license is reimbursable by the division. A current copy of both the Washington State

Medical License and the DEA License must be on file in the Fellowship Office. If fellows do not moonlight they may obtain their DEA license through the fee exempt protocol.

## **20. Learning Gateway**

The e-Learning is developed by UW Medicine Learning Gateway as in previous years. Learning Gateway training focuses on safe patient care which has been standardized across UW Medicine based on state and national policies for safer patient care. The modules have been designed to help residency and fellowship programs meet certain of the ACGME competency education requirements.

Please refer to the GME website for additional information: [Current Resident & Fellow Information](#). All fellows are required to complete several online modules using the Learning Gateway prior to beginning training.

**21. UW HIPAA Compliance Training** (online module due within 30 days of start date)

**22. VA Puget Sound Health Care System** (VA Online Training due prior to start of rotation at the VA)

## **23. Clinical Documentation**

The Cardiology Fellowship requires that all clinical care be documented concurrently with provision of care. Specifically, the medical record for all clinic visits, consults and procedures must be completed on the same day as the service was provided. In addition, any significant telephone or email contact with a patient should be documented in the medical record. All electronic notes must be signed within 72 hours of the clinical visit.

## **24. Adult Cardiac Life Support (ACLS)**

Each fellow must have a current ACLS certification. Online training or retraining is available at no-cost via the UW Learning Hub. A current copy of the ACLS training must be kept on file at the fellowship office.

## **25. Conscious Sedation**

Advanced training and documentation of competency in conscious sedation is required during the first 6 months of fellowship, per UW Medicine requirements.

# University of Washington Cardiovascular Disease Fellowship Training Program: Essential Abilities Requirements for Appointment, Reappointment, Retention, and Certification

Essential abilities are academic performance requirements that refer to those physical, cognitive and behavioral abilities required for satisfactory completion of all aspects of a graduate medical curriculum, and the development of personal attributes required by the faculty of all fellows at certification. The essential abilities required by the curriculum are in the following areas: motor, sensory, communication, intellectual (conceptual, integrative, and quantitative abilities for problem solving and diagnosis) and the behavioral and social aspects of the performance of a physician. These are attributes, each Cardiology Fellow must possess and the use of a third party for the fulfillment of these attributes is not adequate. Additionally, fellows must be legally authorized to practice in all healthcare clinical training sites.

## **Motor Skills**

- Physical dexterity to master technical and procedural aspects of patient care.
- Adequate physical stamina and energy to carry out taxing duties over long hours.
- Bilateral upper extremity manual dexterity to perform complex diagnostic and therapeutic cardiovascular procedures.

## **Sensory Abilities**

- Fellows must be able to gather information with all senses, especially sight, hearing, and touch, in order to gather a medical and psychosocial history, perform a physical examination, and diagnose and treat patients.

## **Communication Skills**

- Fellows must be able to communicate effectively with patients, including gathering information appropriately, explaining medical information in a patient-centered manner, listening effectively, recognizing, acknowledging and responding to emotions, and exhibiting sensitivity to social and cultural differences.
- Fellows must be able to communicate effectively and work cooperatively with supervisors, other fellows, residents, health care team members and staff.

## **Intellectual Abilities**

- Fellows must be able to comprehend and learn factual knowledge from readings and didactic presentations, gather information independently, analyze and synthesize

learned material and apply information to clinical situations. Fellows must be able to develop habits of life-long learning.

- Fellows must be able to develop sound clinical judgment and exhibit well-integrated knowledge about the diagnosis, treatment, and prevention of illness within their scope of practice. They must be comfortable with uncertainty and ambiguity in clinical situations, and seek the advice of others when appropriate.

### **Behavioral, Social and Professional Abilities**

- Fellows must possess the emotional maturity and stability to function effectively under stress that is inherent in medicine and to adapt to circumstances which are unpredictable or that change rapidly. They must be able to interact productively, cooperatively and in a collegial manner with individuals of differing personalities and backgrounds, and be an active contributor to the process of providing health care by demonstrating the ability to engage in teamwork and team building. They must demonstrate the ability to identify and set priorities in patient management and in all aspects of their professional work. They must be punctual and perform work in a timely manner.
- Fellows must be capable of empathetic response to individuals in many circumstances and be sensitive to social and cultural differences.
- Fellows must exhibit an ethic of professionalism, including the ability to place others' needs ahead of their own. They must exhibit compassion, empathy, altruism, integrity, responsibility and tolerance, as well as demonstrate the ability to exercise the requisite judgment required in the practice of medicine.

The Training Program in Cardiovascular Disease is designed to prepare trainees for an academic career of excellence in Cardiology research, teaching, and patient care. Our program's educational goals and objectives reflect ACGME requirements for accreditation ([www.acgme.org](http://www.acgme.org)) that address each of the 6 competencies. In addition, our program is aligned with the COCATS Guidelines for Training in Adult Cardiovascular Medicine ([www.acc.org](http://www.acc.org)). OR [https://www.jacc.org/doi/10.1016/j.jacc.2015.03.017 ?](https://www.jacc.org/doi/10.1016/j.jacc.2015.03.017)

### **The 6 ACGME Competencies are:**

- Patient Care and Procedural Skills (PC)
- Medical Knowledge (MK)
- Practice-Based Learning and Improvement (PBLI)
- Interpersonal and Communication Skills (ICS)
- Professionalism (PROF)
- Systems-Based Practice (SBP)

The core curriculum of our program is an intense 24-month block of clinical rotations. The first two years of fellowship training are clinically rigorous and designed to expose trainees to the broad spectrum of clinical cardiology. Fellows manage a high acuity patient population at state-of-the-art facilities, serving as cardiology consultants for acutely ill medical and surgical patients, participating in critical cardiovascular care, providing ongoing, ambulatory care and performing and interpreting both invasive and noninvasive diagnostic procedures.

### **Training in the competencies is provided through:**

- One-on-one attending-fellow provision of patient care in inpatient and outpatient settings, with increasing levels of independence during the training period.
- Direct faculty teaching of cardiovascular procedures including indications, performance and study interpretation.
- A series of didactic conferences on core cardiovascular knowledge.
- Clinical and research conference presentations.
- Research training under the supervision of a faculty mentor, including dedicated research time, journal clubs, and training in research methods and ethics.
- A teaching curriculum that includes training in presentation of clinical cases, writing review articles, written and oral presentation of research data, and teaching medicine residents and medical students.
- Involvement in the quality improvement activities of the Cardiology Division for optimizing our patient care systems and participation in academic and clinical administrative functions of the Division.
- Responsibility for providing continuous care to patients by implementation of appropriate call schedules and mechanisms for handling unexpected coverage issues.

**Evaluation of trainee's competency in each area is documented by:**

- Direct one-on-one observation of patient care and procedures
- Written (online) evaluations by supervising faculty for each month-long rotation
- Review of procedure logs
- Procedural proficiency evaluations in echocardiography, nuclear cardiology and cardiac catheterization
- Fellow self-evaluation narratives submitted every 6 months
- 360-degree evaluations by academic, technical and nursing staff members
- An updated CV including teaching conferences, presentations and publications
- One on one meetings with each trainee and the Fellowship Program Director or Associate Program Directors or designate every 6 months, summarized in a letter
- Summary letter at completion of training documenting areas of clinical proficiency, final procedure numbers, narrative comments on clinical performance and a synopsis of research experience. A passing score on the ABIM examination in Cardiovascular Disease.

# Educational Goals

## **INPATIENT CARDIAC CARE**

- Efficient and accurate diagnostic approach to hospitalized patients with a wide range of cardiac diseases.
- Manage a wide range of acute cardiac diseases
  - Evaluation of and management for various types of valvular heart disease
  - Recognize and treat complications of endocarditis that may lead to hemodynamic instability. Understand timing for surgery in patients with endocarditis
  - Manage vasoactive drips for hypertensive emergency
  - Manage STEMI/NSTEMI, including indications for and timing of coronary intervention
  - Recognize complications that may occur after ACS and manage them appropriately
  - Assess volume status by both clinical exams, with invasive monitoring, and with imaging modalities
  - Develop an intricate understanding of hemodynamics from right heart catheterization measurements including target values for each parameter
  - Determine optimal medical therapy and appropriate timing of these therapies for heart failure including diuretics, RAAS inhibition, beta-blockade, digoxin, and inotropes
  - Manage inotropes and vasopressors, and understand the nuances and differences between the different types
- Inpatient cardiology consultation and the appropriate role of the consultant.
- Participatory and leadership skills as part of a team of professionals.
- Become more sensitive and skilled in interacting with patients and families.
- Develop communication skills with other health care providers, including referring physicians, cardiac surgeons, pharmacists, nurses, and cardiovascular allied health professionals.
- Integrate multiple clinical disciplines (cardiothoracic surgery, cardiothoracic anesthesia, critical care, etc.) in the collaborative inpatient care of patients with cardiac disease, including in the intensive care unit.

## **ADULT CONGENITAL HEART DISEASE**

- Learn the anatomy and physiology of common congenital heart lesions and the types of repairs used to treat them.
- Learn the long-term complications of repaired congenital heart disease and the need for lifelong care.

- Coordinate care for complex patients across a multidisciplinary team including cardiologists, surgeons, interventionalists, anesthesiologists, obstetricians and geneticists in order to provide optimal patient care.
- Understand how to plan and interpret a complex congenital catheterization including the definition of cardiac anatomy, physiology and shunt physiology. To learn how to plan the catheterization with the interventional cardiologist.
- Learn the role of cardiac MRI in the evaluation of patients with congenital heart disease.
- Present patients in the monthly ACHD conference, including preparation of MRI images, and be able to communicate the reasons for surgical or procedural consideration.

### **AMBULATORY CARDIAC CARE**

- Learn the differential diagnosis for common presenting symptoms and signs and appropriate diagnostic testing strategies.
- Learn appropriate management of cardiac disease in the outpatient setting including use of diet, pharmacological therapy, exercise, cardiac rehabilitation, and the appropriate timing of surgical or percutaneous interventions.
- Learn cardiac risk factor evaluation and modification in patients with or at risk for cardiac disease, including dietary and other life style modifications, smoking cessation therapy, lipid-lowering therapy, and other effective strategies.
- Learn the appropriate intervals for periodic evaluation and testing of patients with chronic cardiac disease.
- Knowledge and experience in the diagnosis, evaluation, and management of patients with peripheral vascular disease, including physical examination, review of diagnostic testing, appropriate medical therapy, and indications for intervention.
- Knowledge and experience about the role of cardiac rehabilitation in the management of adults with cardiovascular disease.
- Gain a longitudinal perspective regarding the clinical course of patients with chronic disease.
- Communication skills with referring physicians and other health care providers.
- Integrate inpatient and outpatient management of patients with heart disease, including incorporation of cardiac diagnostics in clinical decision making with appropriate involvement of subspecialists across multiple disciplines.

### **ELECTROCARDIOGRAPHY AND CARDIAC ARRHYTHMIAS**

- Learn the diagnostic approach to and appropriate management of cardiac arrhythmias.
- Learn the indications for, management, risks and follow-up of cardiac pacemakers, implantable defibrillators and cardiac resynchronization devices.
- Learn the indications for, management, risks and follow-up of invasive diagnostic electrophysiologic testing and catheter ablation procedures.
- Gain a basic understanding of device interrogation, re-programming, threshold and sensing tests and to have the opportunity to evaluate device rhythm events and participate in decision making regarding those events.
- Manage post-cardiac arrest patients including the institution of cooling protocols when appropriate
- Management of VT storm including with antiarrhythmics, post-ablation, gangliectomy
- Management of refractory afib/flutter including medical therapy and cardioversion
- Place and manage temporary pacing wires for high grade heart block
- To interpret at least 3,500 12-lead ECGs and at least 150 24-hour ECGs.
- Perform and interpret stress ECG studies.
- Correlate ECG and stress test findings with clinical diagnosis, prognosis, and management.
- Gain competency in performing DC cardioversion (at least 10 cases) and in insertion and management of temporary pacemakers (at least 20 cases).

## **ECHOCARDIOGRAPHY**

- Learn normal and abnormal tomographic cardiac anatomy, physiology, and pathophysiology.
- Learn principles of echocardiographic instrumentation, fluid dynamics, cardiac hemodynamics, and imaging and Doppler artifacts.
- Learn indications for and limitations of echocardiography including appropriateness criteria.
- Performance and interpretation of transthoracic echocardiography with scanning at least 150 patients and interpreting at least 300 studies.
- Learn indications and risks of stress echocardiography and transesophageal echocardiography and participate in performing at least 100 stress echo studies, 20 contrast studies, and 50 transesophageal echo studies.
- Correlate data from echocardiographic, physical examination and other diagnostic procedures.

- Communicate with referring physicians the clinical significance of the echocardiographic findings in the context of the patient's specific disease process.

## **NUCLEAR CARDIOLOGY & ADVANCED CARDIAC IMAGING**

- Learn the basic concepts of radiotracer delivery, uptake and release kinetics and their relationship to coronary anatomy
- Learn the basic operation of gamma cameras.
- Learn the principles of patient selection, performance, monitoring, interpretation, and reporting of exercise and pharmacological stress testing including appropriateness criteria.
- Learn how to acquire, reconstruct and analyze radionuclide ventriculograms and myocardial perfusion images including both SPECT and PET.
- Understand the indications and clinical utility of CT imaging for coronary, aortic and other cardiac disease.
- Perform and interpret nuclear cardiology studies, to integrate the results with other clinical parameters, and to assess the impact of the study on subsequent clinical management.
- Understand the indications and clinical utility of cardiac magnetic resonance images for assessment of anatomy and function in patients with both congenital and acquired heart disease.
- Correlate data from different cardiac imaging modalities, physical examination and other diagnostic procedures.
- Communicate with referring physicians the clinical significance the clinical significance of cardiac imaging findings in the context of the patient's specific disease process

## **CARDIAC CATHETERIZATION**

- Evaluate patients undergoing invasive procedures in the cardiac catheterization laboratory, understanding the indications/risks/benefits for the procedure, and reviewing potential alternate diagnostic approaches.
- Knowledge of normal and abnormal coronary artery and intracardiac anatomy, physiology, and pathology.
- Knowledge and understanding of intracardiac hemodynamics and its relationship to various pathophysiologic states.
- Participate in a team based clinical practice in evaluating, explaining and obtaining consent, and reviewing study results with the patient.

- Gain experience in arterial/venous cannulation from various anatomic sites, catheter manipulation, and image acquisition during diagnostic angiography procedures, including understanding image plane orientation, radiographic instrumentation, and factors that impact image quality.
- Demonstrate knowledge of radiation safety issues and techniques to minimize radiation exposure.
- Perform and interpret left heart catheterizations with coronary angiography, right heart catheterizations, pericardiocentesis and intra-aortic balloon pumps.
- Correlate angiographic and clinical findings and formulate an appropriate therapeutic approach for each patient based on these findings.
- Knowledge in the role of interventional cardiology, interventional radiology, and vascular surgery in various therapeutic approaches in caring for patients with peripheral vascular disease.
- Knowledge and experience in the role of interventional cardiology and cardiac surgery in various therapeutic approaches. To learn about the factors important in the patient selection for such procedures and work collaboratively in determining clinical treatment plans.

## **HEART FAILURE AND CARDIAC TRANSPLANTATION, AND MECHANICAL CIRCULATORY SUPPORT**

- Learn the appropriate diagnosis and treatment of heart failure in the acute care setting including use of invasive hemodynamic monitoring, use of continuous infusion intravenous medications and other acute care treatment options.
- Learn the diagnosis and treatment of chronic heart failure in the outpatient setting.
- Learn the pharmacology of agents used in the treatment of heart failure.
- Learn the indications for heart transplantation, the pre-transplant evaluation protocol, and post-transplant follow-up.
- Identify cellular and humoral rejection based on clinical findings, echo features, and pathology from endomyocardial biopsy, and donor specific antibody profiles
- Recognize the acuity of heart transplant patients that are actively rejecting. Manage acute cellular with augmented immunosuppression with IV steroids and ATG. Manage humoral rejection with plasmapheresis, IVIG, and medical therapies.
- Learn the indications for ventricular assist device implantation, both pulsatile and continuous flow devices, and to work with the cardiac surgical team to provide longitudinal follow-up for these patients.

- Understand longitudinal perspective regarding the clinical course of patients with advanced heart failure and understand indications for patient counseling regarding end-of-life decision making.
- Understand the indications for mechanical circulatory support as a bridge to cardiac transplantation and as destination therapy. Understand indications and device selection for short-term MCS including IABP, Impella devices
- Understand how patients should be evaluated for mechanical circulatory support, including the contraindications and comorbidities relevant to the decision to place a device.
- Understand the immediate post-operative issues in managing patients with MCS and participate in the long-term management of patients with MCS with a focus on: management of right heart failure, anticoagulation, evaluation of VAD dysfunction/thrombosis, evaluation and management of infection and GI bleeding, management of ventricular and atrial arrhythmias
- Interpret VAD data from each device and understand the implications of data provided from each device.
- Understand indications and device selection for short-term MCS and for durable MCS as bridge to transplant (BTT) and destination therapy (DT).
- Understand patient evaluation and selection for MCS.
- Understand the differences in device types, mechanics and physiology of device therapy, and how indications, anatomy and/or surgical technique can impact device choice.

## **RESEARCH**

- Identify a research problem, critically analyze the relevant literature and formulate a competitive research proposal.
- Learn the benefits of peer review and constructive criticism during all phases of research.
- Learn to formulate a testable hypothesis and describe how to test it.
- Learn research methodologies specific to the individual research project.
- Learn the basics of experimental design, including the appropriate use of control groups.
- To understand and apply the concepts of sample size and statistical power to the design of experiments and interpretation of data.
- Learn to collect, organize, and preserve experimental data.
- Learn to analyze experimental and observational data objectively and evaluate the quality, impact, and limitations of the data.

- Develop skills important in clear organization and presentation of research results.
- Learn the strengths and weaknesses of basic, clinical, and health services research techniques.
- Learn responsible conduct of research including general issues of scientific integrity as well as issues specific to the individual research product including animal care requirements, protection of privacy, informed consent, and institutional approval of human investigation.
- Learn to evaluate the risks and benefits of a research project from the points of view of the research subjects and society.

### **TEACHING AND PRACTICE BASED LEARNING**

- Use recommended textbooks and online resources to develop effective self-study methods for continuing medical education.
- Learn effective teaching and presentation skills.
- Remain current regarding the research literature.
- Learn to synthesize information from multiple sources, including print and electronic media.
- Develop an approach to life-long learning.

**Areas beyond general Cardiology that require additional training:**

- Electrophysiology, including permanent pacemaker and ICD implantation\*
- Interventional Cardiology\*
- Advanced heart failure and cardiac transplantation\*
- Adult congenital heart disease\*
- Nuclear Cardiology (board-eligibility) \*\*
- Echocardiography (board-eligibility) \*\*

\* Formal training in a subspecialty ACGME fellowship program is available for these training pathways. Internal candidates are generally competitive applicants, but fellowship positions in the subspecialty programs are not guaranteed. Application is made early in the 2<sup>nd</sup> year of general cardiology training.

\*\* Training may be achieved within the context of the general cardiology fellowship if additional clinical time, and, if needed, coursework and laboratory sessions, are completed, along with the requisite number of clinical studies and demonstration of competency.

# Rotation Guidelines

## **GENERAL INPATIENT CARDIOLOGY (CARD A, UWMC)**

- Supervise the Medicine R2s for patient admissions including the initial evaluation, plans and orders
- Work closely with the attending cardiologist in decision-making and patient management.
- Evaluate patients with acute cardiac disease in the Emergency Department and on other inpatient services.
- Facilitate communication with primary providers and outpatient physicians regarding inpatient patient status and hospital course.
- Present case-oriented lecture discussions to medical housestaff for morning didactic sessions
- Read and study the ACC/AHA guidelines for patient management of common cardiac diagnoses including acute myocardial infarction, acute coronary syndromes, atrial fibrillation, congestive heart failure, valvular heart disease, etc.

## **CARDIOLOGY CONSULTATION AND CARDIAC CATHETERIZATION (HMC CONSULT)**

- Supervise the inpatient Cardiology Consult Service. Perform cardiology consults and appropriate follow-up with the Consult Attending. Teach medical students/residents on the rotation.
- Review ECGs daily with the medical students and the Consult Attending.
- Present case-oriented didactic presentation to medical housestaff and students during services conferences.
- Read and study recommended textbooks and articles on ECG interpretation and clinical cardiology.
- Read and study the ACC/AHA guidelines for patient management of common cardiac diagnoses.

## **CARDIAC CRITICAL INTENSIVE CARE (HMC CCU/CATHETERIZATION)**

- Participate in management of patients on the inpatient service in collaboration with the R3s on the service. Patient management including leading daily work rounds, under the supervision of the inpatient attending.
- Evaluate patients for cardiac catheterization and participate in performance and interpretation of catheterization procedures such as (right heart catheterization, left heart catheterization, temporary pacemaker placement, or pericardiocentesis).
- Patient management integrating medical management, cardiac diagnostics, and appropriate consultation of other clinical services.

- Read and study recommended textbooks and articles on heart failure, pharmacology, critical care, and heart transplantation.

### **CARDIOLOGY CONSULTS (UWMC CONSULT)**

- Perform cardiology consults and appropriate follow-up with the Consult Attending. Teach medical students on the consult rotation.
- Perform DC cardioversions on inpatients and outpatients including pre-procedure evaluation, the cardioversion procedure, TEE if needed and coordinating post-procedure medical therapy and follow-up.
- Review ECGs daily with the medical students and the Consult Attending.
- Read and study the ACC/AHA guidelines for patient management of common cardiac diagnoses.

### **NUCLEAR CARDIOLOGY IMAGING (UWMC)**

- Develop skills in serving as a consultant to multiple non-cardiology clinical services that are requesting advice on appropriate study.
- Participate in performance and interpretation of nuclear cardiac studies including exercise stress perfusion imaging, pharmacologic perfusion imaging, and radionuclide ventriculography. Studies will include both SPECT and PET/CT.
- Correlate results of noninvasive imaging with coronary angiography and clinical outcomes.
- Participate in reading sessions of other thoracic and cardiac imaging modalities including chest tomography (CT), magnetic resonance imaging (MRI) and positron emission tomography (PET).

### **CARDIAC CATHETERIZATION I (VAMC)**

- Evaluate and develop the initial management plan on patients admitted for cardiac catheterization.
- Perform and interpret diagnostic catheterization with the attending cardiologist.
- Perform post-procedure patient evaluation and discuss results with the housestaff. Maintain communication with the physicians on the Cardiology service and the Catheterization Lab.
- Correlate angiographic and clinical findings. Discuss impact of angiographic findings on patient management.
- Plan and participate in the Friday VAMC Cardiology Conference.
- Read and study recommended textbooks and articles on cardiac catheterization and clinical cardiology.

### **CARDIAC CATHETERIZATION II, ADVANCED CATH (UWMC CATH)**

- Evaluate, write a brief H & P, and develop the initial management plan on patients scheduled for cardiac catheterization.

- Perform and interpret diagnostic catheterization with the attending cardiologist. Participate in or observe percutaneous coronary and other interventions when time allows.
- Perform post-procedure patient evaluation and discuss results with the housestaff. Maintain communication with the physicians on the Cardiology service and the catheterization lab.
- Correlate angiographic and clinical findings. Discuss impact of angiographic findings on patient management.
- Read and study recommended textbooks and articles on cardiac catheterization and clinical cardiology.

### **ECHOCARDIOGRAPHY I AND EXERCISE TESTING (UW ECHO I)**

- Know the indications and potential risks of echocardiographic procedures and exercise stress testing. Provide patient counseling regarding testing, including consent, where needed for medical procedures.
- Perform echocardiograms under the supervision of a qualified sonographer.
- Interpret echocardiograms under the supervision of the echocardiography attending.
- Perform scheduled treadmill exercise and stress echo tests and review the results with an attending.
- Read and study recommended books and articles on echocardiography.
- Correlate echocardiographic findings with physical examination findings and other clinical data. Interact with referring physicians when echocardiograms are requested and when further interpretation of echocardiographic results is needed.

### **ECHOCARDIOGRAPHY (HMC ECHO)**

- Perform echocardiograms under the supervision of a qualified sonographer.
- Interpret echocardiograms under the supervision of the echocardiography attending.
- Evaluate patients for whom a transesophageal echocardiogram has been requested.
- Interpret and review electrocardiograms with rotating medical students, residents and consult service attending.
- Read and study recommended books and articles on echocardiography.

### **ECHOCARDIOGRAPHY (UW ECHO II)**

- Participate in the performance and interpretation of complex transthoracic echocardiography studies.
- Perform and interpret pharmacologic stress echocardiographic studies

- Evaluate patients for transesophageal echocardiography, participate in patient management, performance of the procedure and interpretation
- Read advanced textbooks and article on echocardiographic diagnosis.

### **ELECTROPHYSIOLOGY AND CARDIAC ARRHYTHMIAS (UWMC EP)**

- Attend outpatient EP and pacer ½-day follow-up clinics ~2 per week.
- Perform DC cardioversions on inpatients and outpatients who have an implanted pacer or defibrillator.
- Perform temporary pacer insertions under the supervision of an attending cardiologist (may occur on other rotations, depending on clinical indications.)
- Interpret 24-hour ECGs and event monitors with attending supervision.
- Participate in EP and/or operating room procedures for diagnosis and treatment of arrhythmias.
- Perform consults on patients needing device implantation or with refractory arrhythmias.
- Assist in management of inpatients on the nonresident arrhythmia service.
- Read and study recommended textbooks and articles on electrophysiology and arrhythmias.

### **HEART FAILURE AND CARDIAC TRANSPLANTATION (CARD B, UWMC)**

- Participate in admission and day-to-day management of patients on the inpatient service in collaboration with the ARNPs on the service. Work closely with the attending on patient management including leading daily work rounds.
- Consult upon and follow CT surgical patients following VAD insertion or cardiac transplantation.
- Attend the weekly multidisciplinary cardiac transplant recipient selection committee meeting; presenting patients for initial transplant consideration and providing follow-up on hospitalized patients.
- Provide weekend daytime coverage for the inpatient service under the supervision of the inpatient attending.
- Read and study recommended textbooks and articles on heart failure, pharmacology, and heart transplantation.

### **ADULT CONGENITAL HEART DISEASE (UWMC ACHD)**

- Perform inpatient cardiology consults in conjunction with the Congenital Heart Disease attending.
- Provide appropriate comprehensive outpatient management in patients with congenital heart disease utilizing multiple clinical disciplines (EP, genetics, pulmonary hypertension, and high-risk obstetrics clinic).

- Reviewing and integrate results from various cardiac imaging modalities and diagnostics in the care of patients with congenital heart disease.
- Understand the systems-based multidisciplinary approach to comprehensive care of patients with Congenital Heart Disease. Attend and participate in the multidisciplinary Congenital Heart Disease conference (once monthly).
- Read and study the ACC/AHA guidelines for management of Congenital Heart Disease.

### **CARDIAC CRITICAL INTENSIVE CARE (UWMC CCU)**

- Participate in admission and day-to-day management of patients on the inpatient service in collaboration with the ARNPs on the service. Work closely with the attending on patient management including leading daily work rounds.
- Perform bedside right heart catheterization and interpret hemodynamics in critically ill patients with heart failure.
- Patient management integrating medical management, cardiac diagnostics, and appropriate consultation of other clinical services.
- Provide weekday daytime coverage for the CCU ICU inpatient service under the supervision of the inpatient attending.
- Read and study recommended textbooks and articles on heart failure, pharmacology, critical care, and heart transplantation.

### **MECHANICAL CIRCULATORY SUPPORT (UWMC)**

- Participate in management of perioperative phase in MCS patients.
- Participate in long-term management of patients with MCS including: anticoagulation strategies and goals, management of hypertension, diagnosis and treatment of VAD dysfunction or thrombosis, managing driveline and other MCS-related infections, manage arrhythmias, participate in echocardiographic imaging related to optimization of VAD speed
- Interpret data and complete a documented interrogation for each MCS device and understand the implications of the data being provided from each device, including when and how to adjust parameters to optimize device function.

### **CARDIOLOGY CONSULTS (UWMC CONSULT)**

- Perform cardiology consults and appropriate follow-up with the Consult Attending. Teach medical students on the consult rotation.
- Perform DC cardioversions on inpatients and outpatients including pre-procedure evaluation, the cardioversion procedure, TEE if needed and coordinating post-procedure medical therapy and follow-up.

- Review at least ECGs daily with the medical students and the Consult Attending.
- Read and study the ACC/AHA guidelines for management of conditions commonly encountered on the consult service.

### **CARDIAC CRITICAL INTENSIVE CARE NIGHT FLOAT ELECTIVE (UWMC CCU FLOAT)**

- Participate in intermittently scheduled, primary care of patients in the CCU (continuous in-house, 8pm-8am). Clinical responsibilities include overnight admission and clinical management of patients on the CCU inpatient service, under the supervision of on-call inpatient attending.
- Perform bedside right heart catheterization and interpret hemodynamics in critically ill patients with heart failure.
- Patient management integrating medical management, cardiac diagnostics, and appropriate consultation of other clinical services.
- Read and study recommended textbooks and articles on heart failure, pharmacology, critical care, and heart transplantation.

### **CARDIAC IMAGING AND ECHOCARDIOGRAPHY ELECTIVE (UW ECHO III)**

- Participate in the performance and interpretation of complex transthoracic echocardiography studies, stress echocardiographic studies
- Evaluate patients for transesophageal echocardiography, participate in patient management, performance of the procedure and interpretation
- Participate in intraoperative transesophageal studies and observe cardiac surgical procedures in patients with a range of cardiac diseases.
- Participate/observe radiology based cardiac imaging procedures, including cardiac computed tomography and cardiac magnetic resonance imaging. Participate in post-processing of cardiac imaging procedures.
- Read advanced textbooks and article on echocardiographic diagnosis.

### **NORTHWEST HOSPITAL CARDIAC DIAGNOSTICS AND REHABILITATION (NWH) ELECTIVE**

- Evaluate, write a brief H & P, and develop the initial management plan on patients scheduled for cardiac catheterization.
- Perform and interpret diagnostic catheterization with the attending cardiologist. Participate in or observe percutaneous coronary and other interventions when time allows.
- Perform post-procedure patient evaluation. Maintain communication with referring providers and the catheterization lab.

- Perform and interpret diagnostic evaluation in patients with suspected peripheral vascular disease. Participate in or observe peripheral vascular percutaneous interventions when time allows.
- Correlate angiographic and clinical findings. Discuss impact of angiographic findings on patient management.
- Supervise cardiac rehabilitation and review referrals for adults with cardiovascular disease.
- Read and study recommended textbooks, articles, and ACC/AHA guidelines on cardiac catheterization and clinical cardiology.

### **CONTINUITY CLINIC**

- All fellows are assigned a 1/2 day per week continuity clinic during ACGME fellowship training.
- In each clinic session, the fellow will typically see 1-3 new and 3-6 return patients.

## Useful Websites

### University of Washington

[University of Washington Department of Medicine \(DOM\)](#)  
[University of Washington Graduate Medical Education \(GME\)](#)  
[Residency and Fellowship Position Appointment \(RFPA\) 2022-2023](#)  
[The UW / RFPU-Resident and Fellow Physician Union Contract](#)  
[University of Washington Heart Institute](#)  
[MedHub](#)  
[ACLS Simulator](#)

### Training Guidelines

[American Board of Internal Medicine \(ABIM\)](#)  
[Accreditation Council for Graduate Medical Education \(ACGME\)](#)  
[ACGME Common Program Requirements](#)  
[ACC 2015 Core Cardiovascular Training Statement \(COCATS 4\)](#)

### National Professional Organizations

[American College of Cardiology \(ACC\)](#)  
[American Heart Association \(AHA\)](#)  
[American Society of Echocardiography \(ASE\)](#)  
[American Society of Nuclear Cardiology \(ASNC\)](#)  
[Heart Failure Society of America \(HFSA\)](#)  
[Heart Rhythm Society \(HRS\)](#)  
[Society for Cardiovascular Angiography and Interventions \(SCAI\)](#)  
[Society of Cardiovascular Magnetic Resonance \(SCMR\)](#)  
[Society of Cardiovascular Computer Tomography \(SCCT\)](#)

### Other Useful Sites

[National Center for Health Statistics \(NCHS\)](#)  
[National Institutes of Health](#)  
[NIH Loan Repayment](#)

## Teaching Curriculum

**Goal:** Teaching skills are essential for a successful academic career. During fellowship training there will be opportunities to improve teaching skills in various formats with supervision and feedback from faculty, peers and students.

### **Specific Teaching Requirements (all trainees):**

#### **CARDIOLOGY/CT SURGERY CLINICAL CONFERENCES**

All fellows present clinical cases with presentation of diagnostic studies and a concise review of the relevant literature. Each fellow presents between 10 and 15 times (30 minutes each).

#### **CARDIOLOGY GRAND ROUNDS**

These 1-hour formal presentations provide an opportunity for fellows to present a rigorous review of the literature on a focused topic or present their own research results. Each fellow works with a faculty mentor on selection of a topic, preparation of slides and presentation style. Each fellow presents at Grand Rounds between 1 and 3 times.

#### **RESIDENT TEACHING**

Cardiology Fellows provide both bedside teaching and didactic sessions to the Medicine Residents during rotations on inpatient Cardiology at both UWMC and HMC. Fellows also teach medical students on the VA ECG and UWMC Cardiology Consult service.

#### **MEDICAL STUDENT TEACHING**

Cardiology Fellows also provide bedside teaching and didactic sessions for 3<sup>rd</sup> and 4<sup>th</sup> year medical students on the Cardiology Consult rotation at UWMC (2 months).

#### **CARDIOLOGY FELLOWS**

Cardiology Fellows may, under the supervision of a faculty member, develop or update teaching material for each clinical rotation (for example, a cardiac cath workbook or echo workshops). This may include QA or developing approaches to measuring competency. Trainees may elect to expand the 3<sup>rd</sup> year of training to include the clinician educator pathway: additional focus on mentored teaching activities and development of curricular materials to strengthen educational skill sets and prepare the trainee for a career in academic cardiology, including development of a formal teaching portfolio. Trainees choose a faculty mentor and are provided protected scholarly work development blocks during the third year of fellowship training. Teaching activities and curricular materials are focused within the area of subspecialty interests. Trainees are

expected to teach in multiple clinical settings, and will receive feedback on teaching skills.

## Research Training Resources:

Departmental and Divisional web sites usually provide lists of faculty and research interests. Access Departmental web sites (e.g., Physiology, Epidemiology, Biochemistry, Bioengineering, Immunology):

[https://www.washington.edu/about/academics/departments/?utm\\_source=whitebar&utm\\_medium=click&utm\\_campaign=academics&utm\\_term=academicdepartments](https://www.washington.edu/about/academics/departments/?utm_source=whitebar&utm_medium=click&utm_campaign=academics&utm_term=academicdepartments)

Department of Medicine, Division web sites are accessed through:

<https://mednews.uw.edu/divisions>

The Institute of Translational Health Sciences

<https://www.iths.org/ED>

Training Grant Websites:

Cardiovascular Research Training Program:

<https://cardiology.uw.edu/education/training-pathways>

Cardiovascular Pathology Training Program: <https://dlmp.uw.edu/education/training-cvp>

Epidemiology and population science - Cardiovascular Health Research Unit:

<http://depts.washington.edu/chru/index.html>

Outcomes research - Northwest Center for Outcomes Research at the VA Puget Sound

<https://www.pugetsound.va.gov/services/research.asp>

Clinical research - KL2 program, pursued after fellowship is completed:

<http://www.iths.org/education/kl2>

Department of Genome Sciences web site for a list of biomedical research-related seminars: <http://www.gs.washington.edu/news/related.htm>

“Survival Skills for the Research Years” course. This annual UW Department of Medicine workshop is held each summer and covers skills necessary for academic success, such as grant writing, scientific writing, oral presentation, and job negotiations.

<https://medicine.uw.edu/education/fellows/research-fellows-orientation-course>

All Departments and most organized research units present seminar series during the academic year. The list is not meant to be exhaustive:

- Cardiovascular Breakfast Club (Tuesday 9:00 am UW SLU):  
<http://slubio.blogspot.com/?view=classic>

- Institute for Stem Cell and Regenerative Medicine Research Update (Tuesday 4pm UW SLU): <https://iscrm.uw.edu/news/>
- Medical Genetics journal club (Wednesday 8:30 am, K250)
- Medical Genetics Seminar Series (Friday 12:30, Autumn, Winter and Spring quarters in HSB K-069): <https://medgen.uw.edu/calendar>
- Genome Science Seminar Program:  
<http://www.gs.washington.edu/news/seminars.htm>
- Biochemistry Seminar Series (generally Tuesdays at 10:30AM):  
<https://sites.uw.edu/biochemistry/seminars/>
- Immunology seminar series (generally Tuesdays at 9:30AM): see  
<http://immunology.washington.edu/seminars-and-events>
- LabMed Research Conference and LabMed Grand Rounds (generally Wednesdays at 2:30 and 3:30) <https://dlmp.uw.edu/events>
- Fred Hutchinson Cancer Research Center Current Biology Seminar Series (Tuesdays at 12:00) <https://www.fredhutch.org/en/events.html>
- Bioengineering weekly seminars (Thursdays, Winter and Spring quarters at 1:00PM): <https://bioe.uw.edu/bioe-life/events/department-seminars/>

A mentoring guide is found in the HHMI publication "Making the Right Moves: A Practical Guide to Scientific Management for Postdocs and New Faculty" available at: <https://www.hhmi.org/science-education/programs/making-right-moves>

## Meet Our Fellows

### THIRD YEAR FELLOWS

#### **Graham Bevan**

Graham grew up in Seattle and completed his medical training at University of Rochester in New York where he met his wife Becca. During residency in Cleveland, he pursued his passion for research through the Cardiovascular Research Institute at Case Western Reserve University. Graham and Becca are excited to return to Seattle and be outdoors in the Pacific Northwest with their dog Angus.

#### **Lee Bockus (Y2 Research)**

Lee grew up in Oklahoma City, where the rest of his family still lives today. He met his wonderful wife Mia, who is from North Carolina, during college at the University of Richmond. After graduating, they decided to begin their careers in Oklahoma, where Lee completed physician scientist training at the University of Oklahoma. During his residency at Stanford, they fell in love with the West Coast – they are avid hikers, kayakers, and scuba divers, all of which they are very excited to explore in the PNW!

#### **Barbara Danek-Karatasakis**

Barbara Danek-Karatasakis is originally from the Czech Republic, where she witnessed the Velvet Revolution from her stroller. Shortly thereafter, her family moved to Boston, later California, and ultimately back to Prague, where she completed high school and then medical school. After graduating, she and her future husband, Aris, worked as cardiology research fellows at UT Southwestern, before couples-matching for residency at Rutgers in New Jersey. In 2020, they relocated to Seattle for Aris' fellowship, while Barbara joined UW as a hospitalist at Harborview. She is elated to now pursue her dream of becoming a cardiologist. In her free time, she enjoys running, hiking, biking, and has re-discovered her love of skiing.

#### **Lee Eschenroeder**

Lee Eschenroeder studied Biomedical Ethics and medicine at the University of Virginia. He completed his residency in internal medicine at the University of Washington and subsequently worked at Valley Medical Center as hospitalist. Through his experiences as a middle school teacher (Go Lobos!) and a physician in underserved areas, he has developed research interests in community health indicators and their association with cardiovascular health outcomes. He lives in Seattle with his wife, Polina, where they enjoy the region's stunning natural beauty, delicious and diverse local food scene, and myriad road trip opportunities.

#### **Danelle (Danee) Hidano**

Danee was born and raised in Seattle and received her bachelor's degree from the University of Washington in Biomedical Engineering. She attended medical school at UW School of Medicine, followed by Internal Medicine residency training at the

University of California San Francisco. Danee's professional interests include echocardiography and hypertrophic cardiomyopathy. Outside of work, Danee enjoys playing soccer, hiking, and cooking.

### **Matthew Huber (Y2 Clinical)**

Originally from Gainesville, Florida, Matt attended the University of Florida College of Medicine for his undergraduate medical education. He then moved to Seattle to complete his internal medicine residency at the University of Washington. He is elated to stay at this institution for his general cardiology fellowship. His clinical interests are still undefined, but is most intrigued by advanced heart failure/ transplantation and interventional cardiology. Outside of medicine, Matt enjoys alpine skiing, mountain biking, and cycling.

### **Bryce Johnson**

I grew up in Montana and Kansas City before moving to Seattle to go to UW for my undergraduate degree in Bioengineering. I then went to medical school at UW, taking a 1-year break halfway through to do cardiology research at Mount Sinai in NYC. I completed internal medicine residency at Penn in Philadelphia, and then moved back to Seattle to work at UW prior to starting fellowship. I'm a huge hockey, husky, and KC Chiefs fan. My wife and I love cooking, trying new food, and taking our baby daughter and two dogs on adventures throughout the PNW.

### **Chinonso (Chino) Opara**

Chinonso was born in Nigeria and his family moved to the US when he was a child. He grew up in Eastern Washington and attended the University of Washington for undergraduate school. He then moved to Nashville, TN, where he attended medical school at Vanderbilt University, and subsequently came back to the Pacific Northwest for internal medicine residency at the University of Washington. In his spare time, he enjoys spending time with family, writing music, and staying physically active.

### **Vidhushei (Vid) Yogeswaran**

Vid Yogeswaran is a first-year cardiology resident at the University of Washington. She completed medical school at the Mayo Clinic College of Medicine and residency at the University of California San Francisco. She has slowly been making her way out West, and enjoys hiking, spin class, and finding cheap flights abroad (pre-COVID). Long term career interests include research interests in public health/prevention and clinical interests in structural/congenital cardiology.

## **SECOND YEAR FELLOWS**

### **Rasheed Durowoju**

Rasheed grew up in Toronto, Canada, and has previously lived in Nigeria and Tunisia. He obtained his undergraduate degree from the University of Toronto before obtaining a master's degree in Global Medicine at the Keck School of Medicine at USC. He went on to medical school at Michigan State University, where his research with Dr. Opesanmi

Esan focused on outcomes following atrial fibrillation ablation. He came to the University of Washington in 2019 for his Internal Medicine residency, where he worked with Dr. April Stempien-Otero and Dr. Neal Chatterjee on assessing correlation of ventricular arrhythmia burden in pre-transplant hearts to levels of inflammation and fibrosis on biopsies. He has also worked with Dr. Gary Huang and Dr. Song Li on evaluating outcomes in Takotsubo syndrome patients and the correlations with echocardiographic parameters. His current clinical and academic interests include non-invasive cardiac imaging and lowering disparities in heart failure care. He plans to pursue a career in noninvasive cardiology. Outside of work, Rasheed enjoys spending time with his partner, exploring the wonderful surroundings, and playing sports with his friends.

### **Cooper Kersey**

Cooper grew up in Santa Cruz, CA and attended Middlebury College for undergrad where he studied Spanish. After graduating he lived in Madrid for a year teaching English before starting medical school at Columbia University. He then came to the University of Washington in 2019 for Internal Medicine residency where he confirmed his interest in cardiovascular medicine through his research in sedation practices for transesophageal echocardiography and the genetic factors associated with stroke risk in patients with atrial fibrillation. Moving forward he is interested in focusing his clinical and scholarly work on pathologies that occur at the intersection of substance use disorders and cardiovascular disease, such as methamphetamine-associated cardiomyopathy and endocarditis from injection drug use. Long-term his career interests include heart failure and medical education. Outside of work, Cooper enjoys running, travel, hiking the beautiful trails of the Pacific Northwest, and paddle boarding on Lake Washington with his fiancée Plicy and their dog Woody.

### **Jason Li**

Jason was born in the land of the pandas and moved to Waco, TX before Waco became popular. After many years in the lone star state he moved to the northeast and majored in chemistry at Cornell University. After graduating, he moved back to Boston and worked under Dr. Donald Bloch in immunology research. During that time, he got married and embarked on the medical student life at Boston University. Dr. Rajeev Maholtra graciously took Jason into his laboratory to study early HFpEF and vascular biology. That helped cement his interests in cardiology and clinical research. Because he heard about the west coast being the best coast from his wife, he attended USC for residency where he continued to study HFpEF through the lens of exercise physiology. He also dabbled on advanced heart failure projects. Jason is honored and excited to train at UW for cardiology fellowship and plan on utilizing the research scholar pathway. Through that pathway and the opportunities available at UW, he plans to pursue an academic cardiology career. While living in Seattle he hopes to pick up salmon fishing as fresh salmon roe is quite a delicacy.

### **Shauna Newton**

Shauna grew up in Billings, MT, and initially pursued a degree in radiologic technology before completing her medical training. Working as an x-ray and computed tomography technologist provided her with a foundation in imaging and diagnostic techniques. She subsequently attended medical school at the University of North Dakota before traveling out east for residency at Massachusetts General Hospital in Boston, MA. Her clinical and research interests include interventional and structural cardiology, cardiac imaging, radiation safety, and quality improvement (with a focus on healthcare access in rural areas). Outside of work, you'll find Shauna exploring nature or attempting to advance her amateur baking skills.

### **Andrew Pattock**

Andrew was born and raised outside of Minneapolis, MN. He stayed home and attended medical school at the University of Minnesota before moving to Seattle for his internal medicine residency training at the University of Washington. During residency, his research has focused on cardiac point-of-care ultrasound practices and the use of echocardiography for non-invasive stroke volume estimation. He also has an interest in health systems and quality improvement and has been involved in related work analyzing current sedation practices for transesophageal echocardiography at Harborview Medical Center. His future plans in cardiology are undecided, he will likely pursue a career in non-invasive cardiology. Outside of work Andrew enjoys being disappointed by his beloved Minnesota sports teams, golfing, and spending time outdoors and hiking with his wife.

### **Elliot Stein**

Elliot is originally from Tampa, Florida. His undergraduate education was at Harvard College where he studied molecular and cellular biology. After college, he completed a bicycle ride from Baltimore to San Francisco before settling in at medical school at the University of Pennsylvania. There, he spent an additional year to obtain a Master of Science in Translational Research for his work on a novel hepatocellular carcinoma ablation device. He moved south for internal medicine residency at Vanderbilt University. In residency, he worked with Brian Lindman on projects describing the association of cardiac plasma biomarkers and frailty with post-TAVR mortality risk in patients with severe, symptomatic aortic stenosis. He is interested in translational research and device development within structural cardiology, but he also has intellectual interests in preventive cardiology. In the future, he plans to continue to interventional and structural sub-specialty fellowship. Pastimes include (but are not limited to) cycling, cooking, and stand-up comedy. He is excited to explore his new home in the Pacific Northwest.

### **Connor Tice**

Connor grew up in Kalispell, Montana before studying biological sciences at the University of Notre Dame. He moved to Seattle after college to teach high school science through the AmeriCorps program. Connor completed medical school at the University of Washington (E'15 Montana WWAMI), and his medical residency at the

Hospital of the University of Pennsylvania with a special interest in medical education. Connor and his wife, Riann, enjoy being parents to their two-year-old daughter. When not in the hospital, Connor can be found in the mountains skiing, hiking, or camping, or at home enjoying being a dad.

### **Andrew Wescott**

Andy grew up in Buffalo, NY, and studied biomedical engineering at the University of Rochester. Following college, he joined the medical-scientist training program at the University of Maryland, where he completed his Ph.D. in the laboratory of Dr. W. Jonathan Lederer. Andy researched the regulation of heart muscle energy production by cellular calcium signals. He came to the University of Washington for internal medicine residency and is excited to continue his clinical cardiology and research training here as a fellow. Andy enjoys spending free time with his family at local parks, hiking, snowboarding, and traveling.

## **FIRST YEAR FELLOWS**

### **Seifu Abera**

Born and raised in Tigray. I did medical school in Ethiopia. I am interested in structural heart disease and serving underserved communities. I am passionate about Tigray, Football (aka soccer), Tennis and family including my 10 siblings and their countless children. I enjoy small hikes, easy camping, card games, friends get together. Wanting to learn more water related hobbies.

### **Briana Balansay**

I originally grew up in Lynnwood, WA then moved to the Bay Area for undergrad and a brief stint in health tech. I spent some time in New York for medical school at NYMC before moving back to the West Coast for residency at UW. I enjoy traveling, playing board/card games, and eating delicious food (especially tacos). You can usually find me taking too many photos of my British Shorthair named Pancake.

### **Alexander Hoffmann**

I was born and raised in Spokane where I went to college at Whitworth University. From there, I graduated from the UW School of Medicine and left for medicine residency at Massachusetts General Hospital/Harvard Medical School. I am interested in imaging and preventive cardiology, particularly echocardiography and cardiac CT. Outside of medicine I enjoy aviation, traveling, and happy hour.

### **Kathleen Khan**

I was born and raised in Fairbanks, Alaska. I first moved to the Pacific Northwest for college and attended medical school at Oregon Health & Science University, followed by internal medicine residency at Massachusetts General Hospital in Boston. My clinical interests include valvular heart disease, cardiac imaging, healthcare equity, and

structural interventional cardiology. Outside of the hospital, I enjoy trail running, biking, skiing, and exploring the beautiful PNW in every season.

### **Omar Khan**

I am a native of Portland, Oregon. I attended college in Boston and returned to the Northwest for medical school at Oregon Health & Science University. I continued training in Internal Medicine at Massachusetts General Hospital in Boston. I am passionate about valvular heart disease, advanced cardiac imaging and interventional cardiology. Beyond medicine I love to hike, bike, run and ski my way through the PNW. I also enjoy cooking, tending a vegetable garden and trying new foods.

### **Daniel Lim**

I grew up in Bellevue, Washington and attended Emory University where I obtained a bachelor of science in anthropology and human biology. I returned back to the Pacific Northwest where I have been at the UW for my medical training. My clinical interests include preventive cardiology, echocardiography, and medical education. In my free time, I enjoy exploring new breweries, tending to my indoor plants and playing Monopoly Deal.

### **Craig Morris**

I grew up in Colorado and love the outdoors. I studied chemical and biochemical engineering for my undergraduate degree and worked for four years in engineering consulting before going to medical school. I greatly enjoy cardiovascular research involving medical devices and patient outcomes. Outside of work, I enjoy playing music, making coffee, and spending time outdoors hiking, biking, and camping.

### **Katie Truong**

I grew up in Spokane, Washington and obtained my degree in Bioengineering at the University of Washington. Then I went on to get my medical degree at Oregon Health & Science University and completed my internal medicine residency at University of California, Los Angeles. After completing my west coast tour, I am thrilled to be home in the PNW. My current clinical and research interests include heart failure and medical education. Outside of work, I enjoy spending time outdoors hiking, camping, and fishing with my wife and dog.

<b>Year Graduated</b>	<b>Name</b>	<b>Additional Training/Activities</b>	<b>Current Activity</b>
<b>2023</b>	Ashinne, Betty		
	Bell, Sean		
	Karatasakis, Aris	Co-Chief Fellow	2023-2024 Heart Failure Fellow, UWashington
	Leedy, Doug		
	Mayfield, Jacob	Co-Chief Fellow	
	Salahuddin, Taufiq		
	Tran, Tomio		
<b>Year Graduated</b>	<b>Name</b>	<b>Additional Training/Activities</b>	<b>Current Activity</b>
<b>2022</b>	Colbert, Robert		Non-invasive Cardiologist, Health Partners, Minneapolis, MN
	Feller, Kyle		Non-Invasive Cardiologist, Polyclinic, Seattle
	Macheret, Fima	2022-2024 Clinical Cardiac Electrophysiology Fellow, University of Washington	2022-2024 EP Fellow, UWashington
	Medhane, Fitz	Co-Chief Fellow	Evergreen Health, Kirkland, WA (2022)
	Perry, Andrew		Post-doctoral Research Fellowship, Vanderbilt University, 2022-2024
	Taylor, Alex	Co-Chief Fellow	Non-invasive Cardiologist, Bozeman Health, Bozeman, MT.
	Voit, Jay		Seattle VA: VA Puget Sound Healthcare System
<b>2021</b>	Elison, David	Co-Chief Fellow 2021-2022 Interventional Cardiology Fellow, University of Washington	2022-2023 Acting Instructor, University of Washington Structural Heart Fellowship
	Larson, Sophia		Non-Invasive Cardiologist, St. Charles Medical Center, Bend, OR
	McConnaughey, Shannon	Co-Chief Fellow	Non-Invasive Cardiologist, St. Luke's Idaho Cardiology Associates, Boise, ID
	Morcos, Michael		Assistant Professor, Department of Medicine, Division of Cardiology, University of Colorado, Denver, CO
	Nnanabu, Jerry		Non-Invasive Cardiologist, Kaiser, Tacoma, WA
	Shakil, Saate	Acting Instructor (Research), University of Washington, Division of Cardiology (2021-2022)	
	Yang, Sushan		Non-Invasive Cardiologist, PeaceHealth, Eugene, OR
<b>2020</b>	Andrew Harris	Co-Chief Fellow	University of Michigan, Faculty
	Akash Kataruka		University of Washington NW, Faculty
	Christian Ngo	Co-Chief Fellow University of Washington, WA Electrophysiology Fellowship (2020-2022)	University of Washington NW EP, Faculty
	Hailu Tilahun		Virginia Mason, Seattle, WA

	Jasleen Tiwana	2021-2022 Interventional Cardiology Fellow University of Washington, 2020 University of Washington, Faculty	University of Washington CHiP Fellow, Acting Instructor, University of Washington 2022-2023
	Logan Vincent	2020-2021 Interventional Cardiology Fellow, University of Washington 2021-2022 Acting Instructor, University of Washington Structural Heart Fellowship	2022 St. Vincent's, Portland, OR
<b>2019</b>	Billy Chen	Advanced Imaging Fellowship (20-21)	Hospitalist, University of Washington, WA
	Amy Cheney	Co-Chief Fellow ICARD fellowship 2020-2021 ChiP Acting Instructor	2021- University of Washington/HMC Faculty, Director HMC Cath lab
	David Lam	Co-Chief Fellow	Swedish Heart Institute, Seattle, WA
	Vidang Nguyen	AHFTC fellowship 2019, Cedars Sinai	Providence Health, Portland OR
	Hans Huang		Kaiser Permanente, Sacramento, CA
	Katie Dawson	2020-2021 ICARD Fellowship UW, Seattle, WA 2021-2022 CHIP Fellowship (Acting Instructor), UW, Seattle, WA	
	Karman Tandon		Peace Health, Bellingham, CA
	Dennis Wang	AHA Post-doctoral Fellowship	University of Washington Faculty
<b>2018</b>	Robin Brusen	Co-Chief Fellow	Kaiser Permanente, Seattle, WA
	Selma Carlson		UMinnesota, Minneapolis, MN, Faculty
	Tara Jones	ICARD fellowship UUtah	Interventional Cardiologist, UUtah, SLC,UT
	Julio Lamprea		UC San Francisco, CA, Faculty
	Song Li, MD	Co-Chief Fellow	University of Washington, Faculty
	Enrique Zolezzi		Pulse Heart Institute, WA
<b>2017</b>	Catherine Benziger	UW SPH MS Clinical research	Essentia Health, Minneapolis, MN
	Tiffany Chen	Advanced Cardiac Imaging, UPennsylvania	University of Pennsylvania, Philadelphia, PA Faculty
	Patrick Goleski	Co-Chief Fellow ICARD fellowship MidAmerica Heart, Kansas City, MO	CHI Franciscan Health, Bremerton, WA
	James Lee	Advanced Cardiac Imaging, Piedmont	Henry Ford Hospital, Detroit, MI
	Mariko Harper		Virginia Mason, Seattle, WA
	Rick Rossow	ICARD fellowship UUtah	Providence Health, WA
	Jill Steiner	Co-Chief Fellow UW SPH MS Clinical research NIH T-32 CV Training Grant, Palliative Care	University of Washington, Faculty
<b>2016</b>	Sophia Airhart	AHA research fellowship AHFTC fellowship, Allegheny	U Arizona Tucson, AZ Faculty

	Jason Huang	EP fellowship, UPenn	
	Kate Kearney	Co-Chief Fellow ICARD fellowship 2017, UW UW SPH MS Clinical research	University of Washington, Faculty
	Juan Ortega-Legaspi	NIH T-32 CV Training Grant Senior research fellow, UW AHFTC fellowship 2017, UPenn	University of Pennsylvania, Philadelphia, PA Faculty
	Shalin Patel	Co-Chief Fellow	Hudson Valley Heart, NY, Practice physician
	Nina Rashedi	Cardiac imaging fellow, Columbia University	Attending Physician, UWNW, UWMC Montlake
	Daniel Yang		UW/Seattle VAMC, Faculty
<b>2015</b>	Paco Bravo	Cardiac Imaging fellowship, Brigham Women's, Boston, MA	University of Pennsylvania, Philadelphia, PA Faculty
	Christopher Greenman	ICARD fellowship, Harbor UCLA	Pulse Heart Institute, Tacoma, WA
	Ivan Medvedev	NIH T-32 CV Training Grant ICARD fellowship, UMiami	Swedish Medical, Seattle, WA
	Aneet Patel	Chief Fellow	The Polyclinic, Seattle, WA
	Andrea Vitello		Overlake Hospital, Bellevue, WA
	Mark Willcox	EP fellowship, UW (2015-16)	Alaska Heart and Vascular Inst, Anchorage, AK
<b>2014</b>	Steve Farris	Chief Fellow ACCF/Merck research fellowship AHFTC Fellowship, UW	UW/Seattle VAMC, Faculty
	Joanna Ghobrial	ICARD fellowship, BI Deaconess	Cleveland Clinic, Cleveland, OH
	Oscar Gonzalez	NIH T-32 CV Training Grant	Evergreen Hospital, Practice physician
	Matthew Hartman	NIH T-32 CV Training Grant	Swedish Medical, Seattle, WA
	Jehu Mathew	EP fellowship, UColorado UColorado Clinical Outcomes research fellowship	South Denver Associates, Denver, CO
	Zachary Steinberg	ICARD fellowship, UW (2014-15) ACHD fellowship, UW	University of Washington, Faculty
	Gregory Wood	AHFTC fellowship, UW	University of Washington, Faculty
<b>2013</b>	Andrew Cheng	UW research fellowship	UW/Seattle VAMC, Faculty
	Todd Dardas	Chief Fellow AHFTC fellowship, UW	University of Washington, Faculty
	Sunil Dhar	ICARD fellowship, UMinn	Mercy Health, Philadelphia, PA
	Todd Goldman		University of Wisconsin, Faculty
	Manoj Kesarwani	ICARD fellowship, UCSF	UW Davis, Faculty
	John Mignone	NIH T-32 CV Training Grant AHFTC fellowship, UW	Swedish Medical, Seattle, WA
	Farid Moussavi-Harami	NIH T-32 CV Training Grant UW research fellowship	University of Washington, Faculty
	Elisa Zaragoza-Macias	ACHD fellowship, UW	Kaiser Permanente, HI
<b>2012</b>	Jaekyoung Hong	ICARD fellowship, UW	Southern Oregon Cardiology, Medford OR
	Steven Le		Fountain Valley Regional, CA
	Jason Linefsky	Chief Fellow	Emory University, Atlanta VAMC, GA, Faculty

		UW research fellowship, VA Health Services Research Grant	
	Pankaj Madan	ACCF/Merck research fellowship ACHD Fellowship, Mayo Clinic	Methodist Physicians, San Antonio TX
	Greg Roth	AHA research fellowship	University of Washington, Faculty
	Christopher Thomas		Regions Hospital - The Heart Center, Saint Paul, MN
<b>2011</b>	Steven Bradley	UW research fellowship, VA Health Services Research Grant	Minneapolis Heart Institute, Faculty
	Joshua Busch		Valley Medical, Renton
	Rose Do		Kaiser Permanente, CA
	Ramy Hanna	EP fellowship, UW	Skagit Valley Medical, Mount Vernon, WA
	Alec Moorman		University of Washington, Faculty
	Eric Pacini		Northwest CV Institute, Portland, OR
	Ramin Shadman	Chief Fellow	UCLA/Kaiser, Los Angeles, CA, Faculty
<b>2010</b>	Christopher Kurtz	Chief Fellow	VP Global Dev. And Therapeutic Head, Amgen
	Luis Muñoz		Kaiser Permanente, CA
	Bipin Ravindran	EP fellowship, UW	Michigan Heart, Ypsilanti, MI
	Abhishek Sinha	ICARD fellowship, UW	Pacific CV Medical Group, CA
	Joan Susie Woo	UW research fellowship, VA Health Services Research Grant	Virginia Mason, Seattle, WA
	Bin An Phan	NIH T-32 CV Training Grant	University of California, San Francisco, Faculty
<b>2009</b>	Pierre S. Aoukar	Chief Fellow EP fellowship, UW	Kaiser Permanente, CA
	Joshua M. Buckler	NIH T-32 CV Training Grant	Minneapolis Heart Institute, Waconia, MN
	Elizabeth Chan	ACCF/Merck research fellowship	The Polyclinic, Seattle, WA
	Jay Chen	EP fellowship, UW	University of New Mexico VAMC, Faculty
	Hui-San Chung		University of Washington, Faculty
	Eric V. Krieger	ACHD fellowship, Boston Children's Hospital	University of Washington, Faculty
	David S. Owens	AHA research fellowship	University of Washington, Faculty
	Jordan Prutkin	EP fellowship, UW	University of Washington, Faculty
<b>2008</b>	Jefferson Baer		Emory University, Atlanta, GA, Faculty
	Creighton Don	ICARD fellowship, Mass. General	University of Washington, Faculty
	Kier Huehnergath	Chief Fellow	The Polyclinic, Seattle, WA
	Ranjini Krishnan	NIH T-32 CV Training Grant	Olympic Medical Physicians Specialty Clinics, Sequim, Washington
	Ryland Melford		Pacific Cardiovascular Assoc, CA
<b>2007</b>	Joseph Blatt	EP fellowship, UW	Scripps Memorial/Kaiser, CA
	Peter Cawley		Geisinger Medical Center, Faculty
	Kent Chen	NIH T-32 CV Training Grant	Heart Care, Scottsdale, AZ
	Joshua Scholnick		Tahoe Forest Specialty Clinics, CA

	Justin Strote	ICARD fellowship, UW	Heart Center of the Rockies, CO
	Wai Shun Wong	EP fellowship, UMichigan	Mercy Health, Cincinnati, OH
<b>2006</b>	Grace Chen		Kaiser Permanente, CA
	Kiyon Chung	NIH T-32 epidemiology	Scripps Memorial/Kaiser, CA
	Justin Lee		Stanford, CA Faculty
	Benjamin Schaefer	Chief Fellow ACCF/Merck research fellowship	Hudson Valley Heart, NY
	Peter Sutcliffe		Everett Clinic, WA
<b>2005</b>	Michael Chen	Geriatric Med. fellowship, UW	University of Washington, Faculty
	Gretchen Crittenden	ICARD fellowship, UW	Overlake Medical Center, Bellevue, WA
	Elizabeth Gauer	Interventional, Lahey Clinic, MA	Peace Health, Bellingham, WA
	Pathmaja Paramsothy	ACCF/Merck research fellowship	Pacific Medical Center, Seattle, WA
	Ramin Tabibiazar		UCLA Santa Monica, CA Faculty
	Kara Urnes		Olympic Medical, Sequim, WA
<b>2004</b>	Andrew Frutkin	NIH T-32 CV Training Grant ICARD fellowship, UMissouri	Eisenhower Desert Cardiology, Rancho Mirage, CA
	Philip Massey	NIH T-32 CV Training Grant	Pacific Medical Center, Seattle, WA
	Kelley Branch	ACCF/Merck research fellowship Cardiac Imaging fellowship, UW	University of Washington, Faculty
	Brian Keefe	UW research fellowship, VA Health Services Research Grant	CV Assoc. San Francisco, CA
	Jeanne Vesey-Phillips		Montage Medical, Monterey, CA
<b>2003</b>	Dariush Mozaffarian	UW research fellowship, VA Health Services Research Grant	Tufts University, Dean (Nutrition Science)
	Audrey Wu	AHA Fellow Research Grant	University of Michigan, Faculty
	Elina Minami	NIH T-32 Bioengineering	University of Washington, Faculty
	Karen Stout	ACCF/Merck research fellowship ACHD fellowship, UW	University of Washington, Faculty
	James Willems Nona Sotoodehnia	Robert Wood Johnson Program NIH T-32 epidemiology	The Polyclinic, Seattle, WA University of Washington, Faculty
<b>2002</b>	Keiko Aikawa	Cardiac Imaging fellowship, UW	Pacific Medical Center, Seattle, WA
	Michael Caulfield	ICARD fellowship, Mass. General	Permanente Med Group, Santa Clara, CA
	Elizabeth Gold	AHA Fellow Research Grant	Virginia Mason Medical Center, WA
<b>2001</b>	David Shavelle	ICARD fellowship, UCLA	University of Southern California, CA, Faculty
	Hennessey Tseng		Diablo Cardiology, Walnut Creek, CA

## Fellow Research Projects 2001-2023

2023				
FELLOW	DURATION	RESEARCH PROJECT	MENTOR	FUNDING
<b>Ashinne, Betty</b>		HearTW	Jake Doll, MD	
<b>Bell, Sean</b>				
<b>Bockus, Lee</b>		<p>Changes that occur with myocardial metabolism and physiology in HFpEF</p> <p>Effect of atrial fibrillation on physiology and metabolism, association of sphingolipid species with cardiology related outcomes</p> <p>SCD risk in patients with ejection fraction of 35-50%</p>	<p>Rong Tian, MD</p> <p>Nazem Akoum, MD</p> <p>Kevin O'Brien, MD</p> <p>Nona Sotodehnia, MD</p> <p>Wayne Levy, MD</p>	
<b>Karatasakis, Aris</b>		<p>Sudden Death CT after Cardiac Arrest – Resuscitation Complications substudy; Kelley R. Branch – presented at ReSS</p> <p>Diagnostic and prognostic utility of Rb-82 PET compared with DSE, TME, and coronary angiography in OHT recipients</p>	<p>Richard Cheng, MD</p> <p>Song Li, MD</p> <p>Claudio Bravo, MD</p>	
<b>Leedy, Doug</b>		<p>Transcatheter Aortic Valve Intervention in Patients with Cancer</p> <p>Blood Pressure and Cardiovascular Risk in Women With and Without Breast Cancer: Insights from the Kaiser Pathways Heart Study</p>	<p>Richard Cheng, MD</p> <p>Marta Alhama-Belotto, MD</p> <p>Jainy Savla, MD</p>	
<b>Mayfield, Jacob</b>		<p>Sex differences in inherited aortopathies</p> <p>Development of novel echocardiographic case-based learning platform</p> <p>Use of digital health technologies to execute a fully remote multicenter clinical trial: Lessons from the study of hydroxychloroquine with or without azithromycin for</p>	<p>Catherine Otto, MD</p> <p>Sherene Shalhub, MD</p> <p>Arun Sridhar, MD</p> <p>Patrick Boyle, MD</p>	

		<p>treatment of early SARS-CoV-2 infection among high-risk outpatient adults</p> <p>Deep learning augmented ECG analysis to identify myocardial infarction</p>		
<b>Salahuddin, Taufiq</b>		<p>Novel medication utilization for Heart Failure and Coronary Artery Disease in the Veterans Affairs system Cardiovascular outcomes after coronary angiography in psoriasis patients from the VA CART Program.</p> <p>Cardiovascular outcomes comparison with metformin and sulfonylureas: a retrospective analysis of the ODYSSEY trial.</p> <p>Cardiovascular outcomes by degree of renal impairment in a breast cancer population: Insights from the Kaiser Pathways Study</p> <p>Implementation of new chest pain guidelines through development of Chest Pain Phone/Internet Browser Application.</p>	<p>Jake Doll, MD James Floyd, MD MS Kelly Branch, MD MS</p>	<p>T32 UW Cardiovascular Training Grant</p>
<b>Tran, Tomio</b>		<p>Estimated VO2 by Smart Watches compared to CPET</p> <p>Appropriateness of overnight echocardiogram requests</p> <p>Echocardiographic imaging of temporary percutaneous mechanical circulatory support devices.</p>	<p>Yoni Buber, MD Jim Kirkpatrick, MD</p>	
<b>2022</b>				
<b>FELLOW</b>	<b>DURATION</b>	<b>RESEARCH PROJECT</b>	<b>MENTOR</b>	<b>FUNDING</b>
<b>Colbert, Robert</b>		Simulation mapping of left atrial flutter	<p>Arun Sridhar, MD, MBBS, MPH Patrick Boyle, PhD, PENG, FHRS</p>	
<b>Feller, Kyle</b>				

<b>Macheret, Fima</b>				
<b>Medhane, Fitz</b>				
<b>Perry, Andrew</b>		Association of changes in myocardial extracellular matrix and inflammation in patients with severe aortic stenosis undergoing transcatheter aortic valve replacement (TAVR)  Long-term outcomes and risk stratification of patients with heart failure with recovered ejection fraction	April Stempien-Otero, MD Catherine Otto, MD Brian Lindman, MD, MSCI  Song Li, MD	
<b>Taylor, Alex</b>		Effect of statin therapy on incident non-dyslipidemia risk factors in patients with and without a history of breast cancer, Kaiser Pathways Heart Study group	Richard Cheng, MD, MSc	
<b>Voit, Jay</b>		Hypertension in breast cancer: Insights from the Kaiser Pathways Study on Blood Pressure Thresholds and Variability on Cardiovascular Risk. Statistics ongoing in retrospective cohort study  Review article: Acute, severe aortic regurgitation. Invited review paper from BMH Heart.	Richard Cheng, MD, MSc  Catherine Otto, MD Chris Burke, MD	
<b>2021</b>				
<b>FELLOW</b>	<b>DURATION</b>	<b>RESEARCH PROJECT</b>	<b>MENTOR</b>	<b>FUNDING</b>
<b>Elison, David</b>		Clinical outcomes after AbioMed Impella Device Placement (2015-20)  Clinical Characteristics and Outcomes After Transcatheter Tricuspid Clip Placement, a Single Center Study.	Zach Steinberg, MD  James McCabe, MD	
<b>Larson, Sophia</b>		Histamine H2 receptor antagonists and heart failure risk in women: findings from the Women's Health Initiative.  Validation of an iPhone based stethoscope with echocardiography.	Richard Cheng, MD  Larry Dean, MD	
<b>McConnaughey, Shannon</b>		Focused Cardiac Ultrasound, Image Quality	Rosario Freeman, MD and Florence Sheehan, MD	

<b>Morcos, Michael</b>		Echocardiographic outcomes following left atrial appendage occluder device placement (Watchman). Single center experience (115 patients)  Flecainide Overdose, ECMO and Tamponade  Predictors for left atrial appendage occluder device (Watchman) thrombosis. Multicenter cohort review (with UC Irvine)  Multicenter review of secondary mitral regurgitation outcomes following MitraClip placement (collaboration with UMichigan, UColorado, UVa, Cedars Sinai)	James Kirkpatrick, MD, Todd Dardas, MD, Mark Reisman, MD, and Creighton Don, MD  Michael Chen, MD and Jenelle Badulak, MD  Creighton Don, MD  James Kirkpatrick, MD and Burkhard Mackenson, MD	
<b>Nnanabu, Jerry</b>			James Kirkpatrick, MD and Todd Dardas, MD	
<b>Shakil, Saate</b>		Population health, global cardiovascular outcomes research	Gregory Roth, MD, Nona Sotoodehnia, MD, and Catherine Johnson, MD	NIH Training grant 2020-2021
<b>Yang, Sushan</b>		Validation of the Seattle Heart Failure Model in the Swedish Heart Failure Registry	Wayne Levy, MD	
<b>2020</b>				
<b>FELLOW</b>	<b>DURATION</b>	<b>RESEARCH PROJECT</b>	<b>MENTOR</b>	<b>FUNDING</b>
<b>Harris, Andrew</b>		Predictors of atrial fibrillation after lung transplantation  Prediction of systolic dysfunction after liver transplantation  Covid-19 and cardiovascular disease	Kelley Branch, MD  James Kirkpatrick, MD  Todd Dardas, MD	
<b>Kataruka, Akash</b>	<b>7/19-4/20</b>	T-32 - Cardiovascular Research Training Grant	Jacob Doll, MD and Chuck Maynard, MD	NIH
<b>Ngo, Christian</b>		Amyloidosis in Atrial Fibrillation	Carolina Masri, MD and Nazem Akoum, MD	

		Impact of Obesity on Outcomes in Subcutaneous ICD	Jordan Prutkin	
<b>Tilahun, Hailu</b>		Evaluation of acute coronary syndrome management in Ethiopia (sub-Saharan Africa).  Association of nutrition and exercise with metabolic syndrome among HIV positive and negative patients at a district hospital in Kenya.	Greg Roth, MD, and Desalew Mekonnen, MD  Carey Farquar, MD and Stephanie Page.MD	
<b>Tiwana, Jasleen</b>		Biomass Fuel Use and Cardiac Function in Nepali Women  Transcatheter mitral valve registry: clinical outcomes	Joel Kaufman, MD  Jamie McCabe, MD	
<b>Vincent, Logan</b>		Evaluation of TAVR outcomes in patients with cardiogenic shock, heart failure, and patient's requiring transfer between hospitals for management from 2011-2014.  Safety in the Cardiac Catheterization Lab: Fetal Dosimetry Study	Vidang Nguyen, MD, and James McCabe, MD  Kathleen Kearney, MD, MS	
<b>2019</b>				
<b>FELLOW</b>	<b>DURATION</b>	<b>RESEARCH PROJECT</b>	<b>MENTOR</b>	<b>FUNDING</b>
<b>Chen, Billy</b>		Human embryonic stem cell-derived cardiomyocytes restore function in infarcted hearts of non-human primates	Chuck Murry, MD	
<b>Cheney, Amy</b>		Emerging from the Shadows – a series on the use of pressurized cadaver models to guide structural interventions (the mitral valve, aortic valve, trans-septal puncture, LAA).  Transesophageal Pericardiocentesis: A Novel Approach to Treat Loculated Hemopericardium  Tricuspid Valve in Valve TAVR	Mark Reisman, MD  Creighton Don, MD  Burkhard Mackensen, MD	
<b>Dawson, Katie</b>		1st in Cadaver: Diagnostic and Interventional Cardiology Skills Simulation	Creighton Don, MD, Mark Reisman, MD	

		<p>iatrogenic mitral valve chordal rupture after percutaneous Impella placement managed with percutaneous edge to edge repair (Planned submission: JACC Interventional Imaging)</p> <p>Axillary access for percutaneous intervention procedures</p> <p>Outcomes in transcatheter aortic valve replacement in patients with a small aortic annulus and an assessment of transcatheter aortic valve patients with low coronary ostia.</p> <p>An echocardiographic assessment of left ventricle location in parturients – an insight into cardiopulmonary resuscitation: a pilot study</p> <p>Clinical outcomes relative to percutaneous intervention stent sizing and IVUS</p>	<p>Creighton Don MD, Mark Reisman MD</p> <p>Jamie McCabe, MD</p> <p>Danny Dvir, MD and Creighton Don, MD</p> <p>Carlos Delgado Upegui, MD</p> <p>Bill Lombardi, MD</p>	
<b>Huang, Hans</b>		Improvement in global longitudinal strain following treatment of light chain (AL) cardiac amyloidosis	Richard Cheng, MD	
<b>Lam, David</b>		Appropriate use of Stress Testing in New Cardiology Referrals for Chest Pain or Angina by Cardiologists	Richard Cheng, MD and James Kirkpatrick, MD	
<b>Tandon, Karman</b>		<p>Multi-Ethnic Study of Atherosclerosis – Assessing bone mineral density loss as a predictor of vascular calcification using CT.</p> <p>Mavacamten in HOCM sub-PI on phase 2/3 trials of Mavacamten (negative inotrope) in HOCM</p>	<p>Kelley Branch, MD, and Kevin O’Brien, MD</p> <p>David Owens, MD</p>	
<b>Nguyen, Vidang</b>		<p>Prognostic Markers in Cardiogenic Shock</p> <p>The Impact of Right Ventricular Uncoupling in Cardiogenic Shock</p>	<p>James McCabe, MD</p> <p>Carolina Masri, MD</p>	

<b>Wang, Dennis</b>	<b>10/18-6/19</b>	Sterile Inflammation and mitochondrial dysfunction in heart failure	Kevin O'Brien, MD, Rong Tian, MD, April Stempien-Otero, MD and David Dichek, MD	Institute of Health Sciences Catalyst Award
	<b>10/18-6/19</b>	Preoperative Nicotinamide Riboside Supplementation in Elective LVAD Patients		Institute of Health Sciences Voucher Award
<b>2018</b>				
<b>FELLOW</b>	<b>DURATION</b>	<b>RESEARCH PROJECT</b>	<b>MENTOR</b>	<b>FUNDING</b>
<b>Jones, Tara</b>		Patterns, Predictors and outcomes of antiplatelet use in patients undergoing CTO PCI: Insights from the OPEN CTO registry	Ravi Hira, MD	
<b>Lamprea, Julio</b>	<b>7/1/2016-18</b>	The dyslipidemia of ESRD: role of triglyceride rich-lipoproteins and association with cardiovascular events	Ian DeBoer, MD	American Heart Association
<b>Li, Song</b>		1) Identification of novel risk factors for heart failure readmissions and predictive model development. 2) Application of the Seattle Heart Failure Model in predicting mortality in patients discharged following acute heart failure hospitalization	1) Todd Dardas, MD 2) Wayne Levy, MD	
<b>Steiner, Jill</b>	<b>2/29/2016 – 2/28/17</b>	Palliative care of ACHD patients	James Kirkpatrick, MD	T32 – Palliative Care
<b>Wang, Dennis</b>	<b>7/1/2016-18</b>	Mitochondrial Dysfunction in Heart Failure, a Target for Therapeutics?	Rong Tian, PhD	American Heart Association
<b>Zolezzi, Enrique</b>		Temporal Changes in the complexity of PCI in the NCDR CATH PCI Registry from 2007-2014	Creighton Don, MD, PhD	
<b>2017</b>				
<b>FELLOW</b>	<b>DURATION</b>	<b>RESEARCH PROJECT</b>	<b>MENTOR</b>	<b>FUNDING</b>
<b>Benziger, Katie</b>		PRISMA-style systemic review on the global burden of bradyarrhythmias in collaboration with the Global Burden of Disease study at the Institute for Health Metrics and Evaluation	Greg Roth, MD	
<b>Brusen, Robin</b>		1) Get Going Trial	1) Michael Chen, MD	

		2) Wearable multimodality patient monitor	2) David Linker, MD	
<b>Carlson, Selma</b>		1) Diagnostic and Treatment Capacity for Heart Failure in Sub-Saharan Africa: an Analysis of Uganda and Kenya 2) Limited supplies of antihypertensive medications in primary care settings in three African countries	1) Greg Roth, MD 2) David Watkins, MD, Herbie Duber, MD, and Greg Roth, MD	
<b>Chen, Billy</b>		Human Embryonic Stem Cell-Derived Cardiomyocytes Restore Function in Infarcted Hearts of Non-Human Primates	Chuck Murry, PhD	T32 UW Cardiovascular Training Grant
<b>Chen, Tiffany</b>		Pulmonary Hypertension in TAVR	Creighton Don, MD, Carolina Masri, MD	
<b>Goleski, Patrick</b>		Predicting Successful Strategies for Hybrid Percutaneous Revascularization of Coronary Chronic Total Occlusions	Jamie McCabe, MD	
<b>2016</b>				
<b>FELLOW</b>	<b>DURATION</b>	<b>RESEARCH PROJECT TITLE</b>	<b>MENTOR</b>	<b>FUNDING</b>
<b>Airhart, Sophia</b>	<b>7/1/15 – 6/30/16</b>	Novel Nutritional Therapy for Mitochondrial Dysfunction in Systolic Heart Failure	Kevin O'Brien, MD	American Heart Association
<b>Huang, Jason</b>	<b>7/1/15 – 6/30/16</b>	AF Burden Before and After LVAD Implantation	Kristen Patton, MD	
<b>Kearney, Kate</b>		1. PCI Operator Attributable Harm in the NCDR CathPCI database  2. Coronary angiogram findings in post-cardiac arrest patients	1. James McCabe, MD  2. Francis Kim, MD	
<b>Ortega, Juan</b>	<b>9/2015-6/2016</b>	Development of a Universal Donor Embryonic Stem Cell for Cardiac Regeneration	W. Robb MacLellan, MD	T32 UW Cardiovascular Training Grant
<b>Patel, Shalin</b>		1. Implementation of same day EP procedural discharges 2. Implementation of appropriate discharge planning for post ACS Low LVEF patients	1. Kristine Patton, MD  2. Jeanne Poole, MD	
<b>Rashedi, Nina</b>		Aortic Valve Stenosis and Outcomes in the Cardiovascular Health Study	David Owens, MD	
<b>2015</b>				

<b>FELLOW</b>	<b>DURATION</b>	<b>RESEARCH PROJECT TITLE</b>	<b>MENTOR</b>	<b>FUNDING</b>
<b>Bravo, Paco</b>	<b>7/1/14-6/30/15</b>	Etiology of Sudden Circulatory Arrest and the Impact of Early Comprehensive Computed Tomography on Post- Arrest Management and Outcome: A Pilot Study	Kelley Branch, MD	
<b>Greenman, Chris</b>	<b>7/1/14-6/30/15</b>	Determinants and Significance of Left Ventricular Systolic Dysfunction in Acute Myelogenous Leukemia Patients.	Pamela Becker, MD, PhD	
<b>Patel, Aneet</b>	<b>7/1/14-6/30/15</b>	Knowledge based 3D right ventricular ejection fraction versus standard echocardiographic function assessment to predict right ventricular failure after left ventricular assist device implantation	Florence Sheehan, MD	
<b>Vitello, Andrea</b>	<b>7/1/14-6/30/15</b>	Clinical and Pathologic Predictors of Ventricular Arrhythmias in Advanced Heart Failure Patients Requiring Left Ventricular Assist Device Support	April Stempien-Otero, MD Melissa Robinson, MD	
<b>Willcox, Mark</b>	<b>7/1/14-6/30/15</b>	Additive Utility of Makers of Cardiac Calcification in Cardiovascular Risk Assessment and Prediction: Beyond Framingham Risk Factors	David Owens, MD	
<b>2014</b>				
<b>FELLOW</b>	<b>DURATION</b>	<b>RESEARCH PROJECT TITLE</b>	<b>MENTOR</b>	<b>FUNDING</b>
<b>Dardas, Todd</b>	<b>7/1/13-6/30/15</b>	Priorities for Resource Allocation among Patients with Advanced Heart Failure	Wayne Levy, MD	ACCF/Daiichi Sankyo Fellow to Faculty transition
<b>Farris, Steve</b>	<b>7/1/13-6/30/14</b>	Specific Pathways and the Role of Plasmin in Cardiac Macrophage-Induced Fibroblast Activation in Human Cardiac Fibrosis	April Stempien-Otero, MD	ACCF/Merck
<b>Ghobrial, Joanna</b>	<b>7/1/13-6/30/14</b>	Sudden Cardiac Death in African Americans	Nona Sotoodehnia, MD	
<b>Gonzalez, Oscar</b>	<b>7/1/10-6/30/12</b>	Endothelial Acyl-CoA Synthetase 1 is not Required for Inflammatory and Apoptotic Effects of a Saturated Fatty Acid-Rich Environment		T32 UW Cardiovascular Training Grant

<b>Mathew, Jehu</b>	<b>7/1/13-6/30/14</b>	Altered Mineral Metabolism and Incident Atrial Fibrillation	Ian deBoer, MD	
<b>2013</b>				
<b>FELLOW</b>	<b>DURATION</b>	<b>RESEARCH PROJECT TITLE</b>	<b>MENTOR</b>	<b>FUNDING</b>
<b>Goldman, Todd</b>	<b>7/1/12-6/30/13</b>	Can an aerobic exercise training program in patients with ICDs for secondary prevention of sudden cardiac arrest improve cardiac autonomic activity and reduce the frequency of ventricular arrhythmias?	Cynthia Dougherty ARNP Wayne C. Levy, MD Jordan Prutkin, MD	
<b>Kesarwani, Manoj</b>	<b>7/1/10-6/30/13</b>	Evaluation of Plaque Morphology by Optical Coherence Tomography and Serum Markers in Non-Occlusive Segments of Coronary Arteries	Kelley Branch, MD Creighton Don, MD Xue-Qiao Zhao, MD	
<b>Moussavi-Harami, Farid</b>	<b>7/1/09-6/30/13</b>	2-Deoxy adenosine triphosphate improves contraction in human end-stage heart failure.	Michael Chin, MD	Cardiovascular Research Training Program NIH T32
<b>Mignone, John</b>	<b>7/1/08-6/30/13</b>	Transcriptional profiling of human embryonic stem cells undergoing cardiac directed differentiation	Charles Murry, MD	Cardiovascular Research Training Program NIH T32 L07828
<b>Zaragoza-Macias, Elisa</b>	<b>7/1/10-6/30/13</b>	Risk stratification of Adults with Congenital Heart Disease and Heart Failure using the Seattle Heart Failure Model	Wayne C. Levy, MD	
<b>2012</b>				
<b>FELLOW</b>	<b>DURATION</b>	<b>RESEARCH PROJECT TITLE</b>	<b>MENTOR</b>	<b>FUNDING</b>
<b>Dardas, Todd</b>	<b>7/1/10-6/30/12</b>	Improvement in skeletal muscle mitochondrial function following left ventricular assist devices	Wayne C. Levy, MD	
<b>Hong, Jaekyoung A.</b>	<b>7/1/09-6/30/12</b>	Evaluation of gender difference in atherosclerotic plaque composition by MRI. A sub-study of the Carotic Plaque Composition (CPC) Study.	Xue-Qiao Zhao, MD	

<b>Le, Steven K.T.</b>	<b>7/1/09-6/30/12</b>	Will Carotid Intima-media Thickness (CIMT) Continue to Improve after Long-term Lipid Therapy? – A Carotid Ultrasound Study in FATS 20-year	Xue-Qiao Zhao, MD	
<b>Linefsky, Jason</b>	<b>7/1/08-6/30/12</b>	Association of mineral metabolism biomarkers with aortic valve sclerosis and mitral valve calcification	Stephan D. Fihn, MD	Department of Veterans Affairs, Health Services Research and Development
<b>Madan, Pankaj</b>	<b>7/1/09-6/30/12</b>	Effect of Intensive Lipid Modification Therapy on Carotid Atherosclerotic Plaque	Xue-Qiao Zhao, MD	ACCF/Merck
<b>Roth, Gregory</b>	<b>7/1/09-6/30/12</b>	A Pharmacokinetic Approach to Measuring Treatment Disparities in Heart Failure	Chris Murray, MD	AHA
<b>Thomas, Christopher D.</b>	<b>7/1/09-6/30/12</b>	The Seattle Heart Failure Model: Predictive Value and Application in the Acute Heart Failure Setting	Wayne C. Levy, MD	

**2011**

<b>FELLOW</b>	<b>DURATION</b>	<b>RESEARCH PROJECT TITLE</b>	<b>MENTOR</b>	<b>FUNDING</b>
<b>Bradley, Steven L.</b>	<b>7/1/07-6/30/11</b>	"Appropriateness of Percutaneous Coronary Interventions"; "Missed Opportunities for Pharmacologic Risk Reduction in Ischemic Heart Disease"	Stephan D. Fihn, MD	Department of Veterans Affairs, Health Services Research and Development
<b>Busch, Joshua L.</b>	<b>7/1/08-6/30/11</b>	Cardiac Computed Tomography, Integrated Perfusion and Angiography	James H. Caldwell, MD	
<b>Do, Rose Q.</b>	<b>7/1/08- 6/30/11</b>	Defining the Role of Nitrite in Resuscitation from Cardiac Arrest	Francis Kim, MD	
<b>Hanna, Ramy L.</b>	<b>7/1/08-6/30/11</b>	Repolarization Parameters and Arrhythmia Vulnerability in the Sudden Cardiac Death in Heart Failure Trial	Jeanne E. Poole, MD	
<b>Moorman, Alec J.</b>	<b>7/1/08-6/30/11</b>	The Seattle Heart Failure Model and Geographic Variation in Heart Failure Hospitalizations	Wayne C. Levy, MD	

<b>Pacini, Eric L.</b>	<b>7/1/08-6/30/11</b>	Non-invasive guidance of catheter ablation of atrial flutter utilizing the surface electrocardiogram	David T. Linker, MD	
<b>Shadman, Ramin</b>	<b>7/1/08-6/30/11</b>	The Prognostic Value of Electrocardiographic Parameters in Congestive Heart Failure: Analysis of the SCD-HeFT Trial	Jeanne E. Poole, MD	
<b>2010</b>				
<b>FELLOW</b>	<b>DURATION</b>	<b>RESEARCH PROJECT TITLE</b>	<b>MENTOR</b>	<b>FUNDING</b>
<b>Kurtz, Christopher</b>	<b>7/1/07-6/30/10</b>	Characterizations of right ventricular shape and function in pulmonary hypertension with 3D – Echocardiography.	Florence H. Sheehan, MD	Training grant (Otto/Sheehan)
<b>Muñoz, Luis</b>	<b>7/1/07-6/30/10</b>	Lp-PLA2 as a marker for high risk coronary plaques and increase risk for cardiovascular events post PCI	Xue-Qiao Zhao, MD	
<b>Sinha, Abhishek (Abhi)</b>	<b>7/1/07-6/30/10</b>	Comparing carotid MRI to carotid ultrasound in assessment of atherosclerosis change in response to lipid therapy	Xue-Qiao Zhao, MD	
<b>2009</b>				
<b>FELLOW</b>	<b>DURATION</b>	<b>RESEARCH PROJECT TITLE</b>	<b>MENTOR</b>	<b>FUNDING</b>
<b>Aoukar, Pierre</b>	<b>7/1/06-6/30/09</b>	Effects of Long-term Therapy with LDL-lowering plus HDL-raising on Carotid Intima-Media Thickness (CIMT) – Familial Atherosclerosis Treatment Study 20-year Observational Study (FATS-OS )	Xue-Qiao Zhao, MD	
<b>Buckler, Joshua M.</b>	<b>7/1/05-6/30/09</b>	Apo A-1 Gene Therapy	David A. Dichek, MD	NIH: Cardiovascular Research Training Program
<b>Chan, Elizabeth</b>	<b>7/1/06-6/30/09</b>	Insulin Sensitivity and Vascular Reactivity in Oral vs. Patch Hormone Therapy	Robert H. Knopp, MD	American College of Cardiology – Merck Research Fellowships in Cardiovascular Disease and the

				Metabolic Syndrome
<b>Krieger, Eric</b>	<b>7/1/06-6/30/09</b>	The effects of omega-3 fatty acids on exercise efficiency in the metabolic syndrome: A randomized double blind placebo controlled pilot study	Robert H. Knopp, MD	
<b>Melford, Ryland(Trey) E.</b>	<b>7/1/06-6/30/09</b>	Antiplatelet Therapy for High-Risk Percutaneous Coronary Intervention: Is P2Y12 Receptor Blockade Adequate?	Kenneth G. Lehmann, MD	
<b>Owens, David S.</b>	<b>7/1/05-6/30/09</b>	Determinants of Aortic Valve	Kevin D. O'Brien, MD	American Heart Association
<b>Phan, Binh An P.</b>	<b>7/1/05-6/30/09</b>	Direct Assessment of Carotid Plaques Using Contrast-Enhanced Carotid MRI	Xue-Qiao Zhao, MD	NIH: Cardiovascular Research Training Program
<b>Woo, Joan Susie</b>	<b>7/1/06-6/30/09</b>	Subclinical Left Ventricular Diastolic Dysfunction and Incident Cardiovascular Disease in the Cardiovascular Health Study	Stephan D. Fihn, MD	Department of Veterans Affairs, Health Services Research and Development
<b>2008</b>				
<b>FELLOW</b>	<b>DURATION</b>	<b>RESEARCH PROJECT TITLE</b>	<b>MENTOR</b>	<b>FUNDING</b>
<b>Baer, Jefferson T.</b>	<b>7/1/05-6/30/08</b>	Mechanistic Evaluation of the Anti-Inflammatory Properties of HDL as Assessed by Shotgun Proteomics	Xue-Qiao Zhao, MD	
<b>Blatt, Joseph A.</b>	<b>EP Fellow 7/1/07-6/30/08</b>	Utility of Defibrillation Threshold Testing in the Sudden Cardiac Death in Heart Failure Trial	Jeanne E. Poole, MD	
<b>Don, Creighton W.</b>	<b>7/1/04-6/30/08</b>	Clopidogrel Dosing for NSTEMI Patients and Radial Versus Femoral Access for PCI in ACS Patients	Jeffrey L. Probstfield, MD	Sanofi-Aventis and Vascular Biology Working Group
<b>Huehnergath, Kier V.</b>	<b>7/1/05-6/30/08</b>	Comparison of Coronary Calcium Scoring Between Non-Contrast and Contrast-Enhanced Coronary Computed Tomographic Images	Kelley R. Branch, MD James H. Caldwell, MD	
<b>Krishnan, Ranjini</b>	<b>7/1/04-6/30/08</b>	Role of uPA in Accelerated Atherosclerosis	David A. Dichek, MD	NIH: Cardiovascular Research Training Program

<b>Prutkin, Jordan P.</b>	<b>7/1/05-6/30/08</b>	Electrocardiographic Predictors of Mortality in the Sudden Cardiac Death in Heart Failure Trial	Jeanne E. Poole, MD	
<b>Ravindran, Bipin K.</b>	<b>7/1/05-6/30/08</b>	Positron Emission Tomography Imaging of Atrial Muscarinic Receptors	James H. Caldwell, MD	
<b>Strote, Justin A.</b>	<b>Interventional 7/1/07-6/30/08</b>	Role of Urgent Angiography in Patients with Sudden Death	Leonard Cobb, MD Francis Kim, MD	Medic One Foundation
<b>2007</b>				
<b>FELLOW</b>	<b>DURATION</b>	<b>RESEARCH PROJECT TITLE</b>	<b>MENTOR</b>	<b>FUNDING</b>
<b>Blatt, Joseph A.</b>	<b>7/1/04-6/30/07</b>	Utility of Defibrillation Threshold Testing in the Sudden Cardiac Death in Heart Failure Trial	Jeanne E. Poole, MD	
<b>Cawley, Peter J.</b>	<b>7/1/04-6/30/07</b>	Utilization of Magnetic Resonance Imaging for Coronary Artery Plaque Characterization	Chun Yuan, PhD Tom S. Hatsukami, MD	
<b>Chen, Kent Y.</b>	<b>7/1/03-6/30/07</b>	Cellular Therapies for Myocardial Infarct Repair	Charles E. Murry, MD, PhD	NIH: Cardiovascular Research Training Program
<b>Scholnick, Joshua D.</b>	<b>7/1/04-6/30/07</b>	MRI Surveillance of Coronary Bypass Graft Stenosis	Chun Yuan, PhD	
<b>Strote, Justin A.</b>	<b>7/1/04-6/30/07</b>	Role of Urgent Angiography in Patients with Sudden Death	Leonard Cobb, MD Francis Kim, MD	Medic One Foundation
<b>Wong, Wai Shun</b>	<b>7/1/04-6/30/07</b>	Effect of Multiple ICD Shocks on Mortality in the Sudden Cardiac Death in Heart Failure Trial	Jeanne E. Poole, MD	
<b>2006</b>				
<b>FELLOW</b>	<b>DURATION</b>	<b>RESEARCH PROJECT TITLE</b>	<b>MENTOR</b>	<b>FUNDING</b>
<b>Chen, Grace P.</b>	<b>7/1/03-6/30/06</b>	Global and Regional Sympathetic Nervous System Function Before and During Left Ventricular Assist Device Placement	James H. Caldwell, MD	
<b>Crittenden, Gretchen L.</b>	<b>Interventional Fellow 7/01/05-6/30/06</b>	Use of the COAP Data Base for Quality Improvement	Douglas K. Stewart, MD	

<b>Lee, Justin C.</b>	<b>7/1/03-6/30/06</b>	Development of Magnetic Resonance Imaging for Ex Vivo Tissue Characterization of Aortic Valve in Aortic Stenosis	Xue-Qiao Zhao, MD	
<b>Schaefer, Benjamin M.</b>	<b>7/1/03-6/30/06</b>	Inheritance of Bicuspid Aortic Valves: Phenotypic and Genotypic Classification	Peter H. Byers, MD Catherine M. Otto MD	American College of Cardiology/Merck Research Fellowship
<b>Sutcliffe, Peter D.</b>	<b>7/1/03-6/30/06</b>	Changes in LDL Heterogeneity and Carotid Atherosclerotic Plaque Characteristics in Response to Aggressive LDL Reduction	Xue-Qiao Zhao, MD	
<b>2005</b>				
<b>FELLOW</b>	<b>DURATION</b>	<b>RESEARCH PROJECT TITLE</b>	<b>MENTOR</b>	<b>FUNDING</b>
<b>Chen, Michael A.</b>	<b>7/1/02-6/30/05</b>	Perioperative Beta Blockade in Patients Undergoing Surgery for Acute Hip Fracture	Itamar Abrass, MD	
<b>Chung, Kiyon</b>	<b>7/1/02-6/30/05</b>	Prevention of Sudden Cardiac Death	David S. Siscovick, MD	NIH: Cardiovascular Epidemiology Training Program
<b>Crittenden, Gretchen L.</b>	<b>7/1/02-6/30/05</b>	Use of the COAP Data Base for Quality Improvement	Douglas K. Stewart, MD	
<b>Paramsothy, Pathmaja (Bobbie)</b>	<b>7/1/02-6/30/05</b>	The Effects of Omega-3 Fatty Acids on Endothelial Function in the Metabolic Syndrome	Robert H. Knopp, MD	American College of Cardiology/Merck Research Fellowship Award
<b>Tabibiazar, Ramin</b>	<b>7/1/02-6/30/05</b>	The Effects of Beta Blockers on Regional Pre- and Post-Synaptic Sympathetic Nervous System in Patients with Congestive Heart Failure	James H. Caldwell, MD	American Society of Nuclear Cardiology
<b>Urnes, Kara K.</b>	<b>7/1/02-6/30/05</b>	Use of a Three-Dimensional Cardiac Imaging Simulator for Training and Competency Assessment in Echocardiography	Florence Sheehan, MD	
<b>2004</b>				

<b>FELLOW</b>	<b>DURATION</b>	<b>RESEARCH PROJECT TITLE</b>	<b>MENTOR</b>	<b>FUNDING</b>
<b>Branch, Kelley R.</b>	<b>7/1/01-6/30/04</b>	Systemic and Myocardial Sympathetic Nervous System Function with Biventricular Pacing	James H. Caldwell, MD	American College of Cardiology/Merck Research Fellowship
<b>Frutkin, Andrew D.</b>	<b>7/1/00-6/30/04</b>	Transforming Growth Factor Beta 1 and Atherogenesis	David A. Dichek, MD	NIH: Cardiovascular Research Training Program EVEREST Foundation
<b>Keeffe, Brian G.</b>	<b>7/1/01-6/30/04</b>	Collaborative Care Model versus Standard of Care in Treating Chronic Stable Angina	Stephen D. Fihn, MD	Department of Veterans Affairs, Health Services Research and Development
<b>Massey, Philip G.</b>	<b>7/1/00-6/30/04</b>	Role of Urokinase Plasminogen Activator in Vascular Remodeling	David A. Dichek, MD	NIH: Cardiovascular Research Training Program  EVEREST Foundation
<b>Vesey, Jeanne M.</b>	<b>7/1/01-6/30/04</b>	Development of a Cardiovascular Educational Curriculum for Medical Residents	Catherine M. Otto, MD	
<b>2003</b>				
<b>FELLOW</b>	<b>DURATION</b>	<b>RESEARCH PROJECT TITLE</b>	<b>MENTOR</b>	<b>FUNDING</b>
<b>Sotoodehnia, Nona</b>	<b>7/1/99-6/30/03</b>	Genetic Predisposition to Sudden Cardiac Death	David S. Siscovick, MD	NIH: Cardiovascular Epidemiology Training Program
<b>Stout, Karen K.</b>	<b>7/1/00-6/30/03</b>	Functional Mitral Regurgitation: Does Form Follow Function?	Florence J. Sheehan, MD	American College of Cardiology/Merck Research Fellowship

<b>Willems, James P.</b>	<b>7/1/00-6/30/03</b>	Cholesterol Management Among VA Patients with Coronary Artery Disease	Nathan Every, MD	
<b>2002</b>				
<b>FELLOW</b>	<b>DURATION</b>	<b>RESEARCH PROJECT TITLE</b>	<b>MENTOR</b>	<b>FUNDING</b>
<b>Aikawa, Keiko</b>	<b>7/1/99-6/30/02</b>	The Effects of Natural Progesterone versus Medroxyprogesterone Acetate on Endothelial Function and Serum Lipoproteins	Robert H. Knopp, MD	American College of Cardiology/Merck Research Fellowship Society of Geriatric Cardiology
<b>Caulfield, Michael T.</b>	<b>7/1/99-6/30/02</b>	Lipoprotein/Proteoglycan Interactions in Restenosis	Kevin O'Brien, MD	
<b>Gold, Elizabeth S.</b>	<b>7/1/97-6/30/02</b>	Macrophage-Mediated Immunity to Salmonella Infection	Alan A. Aderem, Ph.D.	American Heart Association NIH: Cardiovascular Research Training Program
<b>Minami, Elina</b>	<b>7/1/99-6/30/02</b>	Myocardial Infarct Repair: Effects of Stem Cell Grafting and Accelerated Angiogenesis	Charles E. Murry, MD	NIH: Bioengineering Training Program
<b>Mozaffarian, Dariush</b>	<b>7/1/98-6/30/02</b>	Cardiac Effects of Fish Consumption	David S. Siscovick, MD	Department of Veterans Affairs, Health Services Research and Development
<b>Wu, Audrey H.</b>	<b>7/1/99-6/30/02</b>	Predictors of Repeat Revascularization within One Year after Initial Percutaneous Coronary Intervention	Xue-Qiao Zhao, MD	American Heart Association
<b>2001</b>				
<b>FELLOW</b>	<b>DURATION</b>	<b>RESEARCH PROJECT TITLE</b>	<b>MENTOR</b>	<b>FUNDING</b>

<b>Shavelle, David M.</b>	<b>7/1/98-6/30/01</b>	Lipid Retention and Inflammation Play a Role in the Pathogenesis of Aortic Sclerosis	Kevin D. O'Brien, MD	
<b>Tseng, Hennessey</b>	<b>7/1/98-6/30/01</b>	Beta-Receptor Imaging	James H. Caldwell, MD	

# UW Cardiology Fellow Publications

**2023**

**2022**

**2021**

Betty Ashinne

Sean Bell

Kovach CP, **Bell S**, Kataruka A, Reisman M, Don C. Outcomes of urgent/emergent transcatheter mitral valve repair (MitraClip): A single center experience. *Catheter Cardiovasc Interv*. 2021 Feb 15;97(3):E402-E410. Epub 2020 Jun 26. PMID: 32588956.

Graham Bevan

**Bevan GH**, Al-Kindi SG, Brook R, Rajagopalan S. Ambient Air Pollution and Atherosclerosis: Recent Updates. *Curr Atheroscler Rep*. 2021 Aug 21;23(10):63. doi: 10.1007/s11883-021-00958-9. PMID: 34417890; PMCID: PMC8379601.

Lee Bockus

**Bockus LB**, Biggs ML, Lai HTM, de Olivera Otto MC, Fretts AM, McKnight B, Sotoodehnia N, King IB, Song X, Siscovick DS, Mozaffarian D, Lemaitre RN. Assessment of Plasma Phospholipid Very-Long-Chain Saturated Fatty Acid Levels and Healthy Aging. *JAMA Netw Open*. 2021 Aug 2;4(8):e2120616. doi: 10.1001/jamanetworkopen.2021.20616. PMID: 34383061.

Rob Colbert

Barbara Danek-Karatasakis

Lee Eschenroeder

Kyle Feller

Danee Hidano

Matt Huber

Chen Y, Zelnick LR, **Huber MP**, Wang K, Bansal N, Hoofnagle AN, Parajji RK, Heckbert SR, Weiss NS, Go AS, Hsu CY, Feldman HI, Waikar SS, Mehta RC, Srivastava A, Seliger SL, Lash JP, Porter AC, Raj DS, Kestenbaum BR; CRIC Study Investigators. Association Between Kidney Clearance of Secretory Solutes and Cardiovascular Events: The Chronic Renal Insufficiency Cohort (CRIC) Study. *Am J Kidney Dis*. 2021 Aug;78(2):226-235.e1. doi: 10.1053/j.ajkd.2020.12.005. Epub 2021 Jan 7. PMID: 33421453; PMCID: PMC8260620.

Bryce Johnson

Aris Karatasakis

Doug Leedy

de Boer RA, Aboumsallem JP, Bracun V, **Leedy D**, Cheng R, Patel S, Rayan D, Zaharova S, Rymer J, Kwan JM, Levenson J, Ronco C, Thavendiranathan P, Brown SA. A new classification of cardio-oncology syndromes. *Cardiooncology*. 2021 Jun 21;7(1):24. doi: 10.1186/s40959-021-00110-1. PMID: 34154667; PMCID: PMC8218489

**Leedy DJ**, Reding KW, Vasbinder AL, Anderson GL, Barac A, Wactawski-Wende J, Shadyab AH, Eaton CB, Levy WC, Qi L, Cheng RK. The association between heart failure and incident cancer in women: An analysis of the Women's Health Initiative. *Eur J Heart Fail*. 2021 May 1. doi: 10.1002/ejhf.2207. Epub ahead of print. PMID: 33932263.

Fima Macheret

Jake Mayfield

**Mayfield JJ**, McKee KY, Zier LS, Kohlwes RJ. Hearts and Minds: an Exercise in Clinical Reasoning. *J Gen Intern Med*. 2021 Jun;36(6):1778-1783. doi: 10.1007/s11606-020-06575-7. Epub 2021 Mar 25. PMID: 33765236; PMCID: PMC8175678.

Fitz Medhane

Chino Opara

**Opara CC**, Du Y, Kawakatsu Y, Atala J, Beaton AZ, Kansime R, Nakitto M, Ndagire E, Nalubwama H, Okello E, Watkins DA, Su Y. Household Economic Consequences of Rheumatic Heart Disease in Uganda. *Front Cardiovasc Med*. 2021 Jul 30;8:636280. doi: 10.3389/fcvm.2021.636280. PMID: 34395548; PMCID: PMC8363312.

Andrew Perry

Schiffer WB, **Perry A**, Deych E, *et al* Association of early versus delayed normalisation of left ventricular ejection fraction with mortality in ischemic cardiomyopathy. *Open Heart* 2021;**8**:e001528.

**Perry AS**, Li S. Optimal Threshold of Left Ventricular Ejection Fraction for Aortic Valve Replacement in Asymptomatic Severe Aortic Stenosis: A Systematic Review and Meta-Analysis. *J Am Heart Assoc*. 2021 Apr 6;10(7):e020252. doi: 10.1161/JAHA.120.020252. Epub 2021 Mar 31. PMID: 33787311.

**Perry A**, Loh F, Adamo L, Zhang KW, Deych E, Foraker R, Mann DL. Unsupervised cluster analysis of patients with recovered left ventricular ejection fraction identifies unique clinical phenotypes. *PLoS One*. 2021 Mar 18;16(3):e0248317. PMID: 33735249.

Taufiq Salahuddin

**Salahuddin T**, Giannopoulos S, Adams G, Armstrong EJ. Anterior, posterior, or all-vessel infrapopliteal revascularization in patients with moderate-severe claudication: Insights from the LIBERTY 360 study.

Catheter Cardiovasc Interv. 2021 Sep;98(3):559-569. doi: 10.1002/ccd.29780. Epub 2021 May 31. PMID: 34057276.

**Salahuddin T**, Richardson V, McNeal DM, Henderson K, Hess PL, Raghavan S, Saxon DR, Valle JA, Waldo SW, Ho PM, Schwartz GG. Potential unrealized mortality benefit of glucagon-like peptide-1 receptor agonists and sodium-glucose co-transport-2 inhibitors: A report from the Veterans Health Administration Clinical Assessment, Reporting and Tracking program. *Diabetes Obes Metab.* 2021 Jan;23(1):97-105.

Alex Taylor

**Taylor AP**, Hanson D, Krieger EV. Heart murmur in a young man. *Heart.* 2021 May;107(9):733-770. doi: 10.1136/heartjnl-2020-318834.

Tomio Tran

**Tran T**, Muralidhar A, Hunter K, Buchanan C, Coe G, Hieda M, Tompkins C, Zipse M, Spotts MJ, Laing SG, Fosmark K, Hoffman J, Ambardekar AV, Wolfel EE, Lawley J, Levine B, Kohrt WM, Pal J, Cornwell WK 3rd. Right ventricular function and cardiopulmonary performance among patients with heart failure supported by durable mechanical circulatory support devices. *J Heart Lung Transplant.* 2021 Feb;40(2):128-137.

**Tran T**, Farasat M, Krantz MJ. Subendocardial stress in pre-eclampsia. *Ann Noninvasive Electrocardiol.* 2021 Jan;26(1):e12769. doi: 10.1111/anec.12769.

Jay Voit

Farina LA, Tibrewala A, **Voit JM**, Raissi SR, Chen L, Welty LJ, Khan SS, Freed BH, Akhter N. Echocardiographic parameters associated with in-hospital adverse outcomes in patients with Takotsubo syndrome. *Echocardiography.* 2021 Jun;38(6):878-884. doi: 10.1111/echo.15069. Epub 2021 May 13. PMID: 33983652.

Vid Yogeswaran

**2020**

Dave Elison

Elison DM, McConnaughey S, Freeman RV, Sheehan FH. Focused cardiac ultrasound training in medical students: Using an independent, simulator-based curriculum to objectively measure skill acquisition and learning curve. *Echocardiography.* 2020

Andrew Harris

Harris AW, Pibarot P, Otto CM. Aortic Stenosis: Guidelines and Evidence Gaps. *Cardiol Clin.* 2020;38(1):55-63.

Harris AW. Mitral regurgitation in a heart failure patient. Patient with dilated cardiomyopathy, heart failure, and secondary MR (moderate to severe). American College of Cardiology Scientific Sessions, 2020 March, Chicago (poster).

Harris AW, Dardas T, Li K, Kirkpatrick JN. Pre-operative left ventricular end-systolic volume, not diastolic dysfunction, is associated with left ventricular systolic dysfunction after liver transplant. American College of Cardiology Scientific Sessions, 2020 March, Chicago (poster)

#### Akash Kataruka

Kataruka A, Mahtta D, Akeroyd JM, Hira R, Kazi D, Spertus JA, Bhatt D, Petersen L, Ballantyne CM, Virani SS. Eligibility and cost of low-dose rivaroxiban based on COMPASS Trial: Insights from the Veterans Affairs Healthcare System. American College of Cardiology Scientific Sessions, 2020 March, Chicago (poster).

Kataruka A, Daniels D, Maynard C, Kearney KE, Mahmoud AM, Doll JA, McCabe JM, Lombardi W, Hira R. Protamine utilization and clinical outcomes for coronary artery perforation in chronic total occlusion procedures. American College of Cardiology Scientific Sessions, 2020 March, Chicago (poster)

#### Sophie Larson

Larson S, Cho MC, Tsioufis K, Yang E. 2018 Korean Society of Hypertension Guideline for the Management of Hypertension: A Comparison of American, European, and Korean Blood Pressure Guidelines. Eur Heart J. 2020 Apr 7;41(14):1384-138

Larson S, Vutien P, Steinberg Z. Platypnea orthodeoxia syndrome secondary to intracardiac shunt following orthotopic liver transplantation. American College of Cardiology Scientific Sessions, 2020 March, Chicago (poster)

#### Alex Taylor

Taylor AP, Freeman RV, Bartek MA, Shalhub S. Left ventricular hypertrophy is a possible biomarker for early mortality after type B aortic dissection. J Vasc Surg. 2019 Jun;69(6):1710-1718.

Taylor A, Yang E. Comparing American and European Guidelines for the Initial Diagnosis of Stable Ischaemic Heart Disease. Eur Heart J. 2020 Feb 14;41(7):811-815

Taylor AP, Kataruka A, Vincent L, Hirsch I, Tran A, Zern N, Wood G. Atypical takotsubo cardiomyopathy associated with pheochromocytoma. American College of Cardiology Scientific Sessions, 2020 March, Chicago (poster).

#### Hailu Tilahun

Tilahun H, Dvir D. Placement of valve-in-valve (VIV) transcatheter aortic valve replacement (TAVR) in the setting of aortic dissections and a high risk of coronary obstruction. American College of Cardiology Scientific Sessions, 2020 March, Chicago (poster).

Tilahun H, Yadeta D, Roth G. Pattern, management, and outcome of acute coronary syndrome in an urban hospital in Ethiopia. American College of Cardiology Scientific Sessions, 2020 March, Chicago (poster).

Logan Vincent

Vincent LL, Dean LS. Shading operators from the Gray: Are novel radiation barriers or changing physician behaviors the best next step? *Catheter Cardiovasc Interv.* 2020 Jan 14. doi: 10.1002/ccd.28681

Susan Yang

Yang S, Feller JK, Krieger E. Chest pressure and dyspnoea in a 47-year old man. *Heart.* 2020 Feb;106(4):260-298

**2019**

Amy Cheney

Cheney AE, Dean LS. Robotic PCI: Evolving from novel toward non-inferior. *Catheter Cardiovasc Interv.* 2019 Mar 1;93(4):618-619. doi: 10.1002/ccd.28172  
Cheney AE, McCabe JM. Alternative Percutaneous Access for Large Bore Devices. *Circ Cardiovasc Interv.* 2019 Jun;12(6):e007707

Akash Kataruka

Hira RS, Kataruka A, Akeroyd JM, Ramsey DJ, Pokharel Y, Gurm HS, Nasir K, Deswal A, Jneid H, Alam M, Ballantyne CM, Petersen LA, Virani SS. Association of Body Mass Index With Risk Factor Optimization and Guideline-Directed Medical Therapy in US Veterans With Cardiovascular Disease. *Circ Cardiovasc Qual Outcomes.* 2019 Jan;12(1):e004817.

Kataruka A, Doll JA, Hira RS. Public Reporting for Cardiac Procedures: Is the Juice Worth the Squeeze? *J Am Coll Cardiol.* 2019 Oct 29;74(17):2218.

Sophie Larson

Larson SR, Pieper JA, Hulten EA, Ficaro EP, Corbett JR, Murthy VL, Weinberg RL. Characterization of a highly effective preparation for suppression of myocardial glucose utilization. *J Nucl Cardiol.* 2019 Jun 24. doi: 10.1007/s12350-019-01786-w

Larson S, Yang E. Prevention Guidelines: Does one size fit all? *Eur Heart J.* 2019 Jul 14;40(27):2181-2183. doi: 10.1093/eurheartj/ehz501.

Christian Ngo

Lodhi HA, Peri-Okonny PA, Schesing K, Phelps K, Ngo C, Evans H, Arbique D, Price AL, Vernino S, Phillips L, Mitchell JH, Smith SA, Yano Y, Das SR, Wang T, Vongpatanasin W. Usefulness of Blood Pressure Variability Indices Derived From 24-Hour Ambulatory Blood Pressure Monitoring in Detecting Autonomic Failure. *J Am Heart Assoc.* 2019 Apr 2;8(7):e010161.

Petek BJ, Bennett DN, Ngo C, Chan PS, Nallamotheu BK, Bradley SM, Tang Y, Hayward RA, van Walraven C, Goldberger ZD; American Heart Association Get With the Guidelines-Resuscitation Investigators. Reexamination of the UN10 Rule to Discontinue Resuscitation During In-Hospital Cardiac Arrest. *JAMA Netw Open.* 2019 May 3;2(5):e194941

Ngo C, Cham M, Akoum N, Cheng R, Masri SC. Prevalence of cardiac amyloidosis in patient referred for atrial fibrillation ablation by cardiac MRI. Poster Presentation, American Heart Association Scientific Sessions 2019, Philadelphia.

Jerry Nnanabu

Imamura T, Nnanabu J, Rodgers D, Raikhekar J, Kalantar S, Smith B, Nguyen A, Chung B, Narang N, Ota T, Song T, Burkhoff D, Jeevanandam V, Kim G, Sayer G, Uriel N. Hemodynamic Effects of Concomitant Mitral Valve Surgery and Left Ventricular Assist Device Implantation. *ASAIO J.* 2019 Apr 10

Imamura T, Narang N, Nnanabu J, Rodgers D, Raikhekar J, Kalantari S, Smith B, Nguyen A, Chung B, Ota T, Song T, Jeevanandam V, Kim G, Sayer G, Uriel N. Hemodynamics of concomitant tricuspid valve procedures at LVAD implantation. *J Card Surg.* 2019 Dec;34(12):1511-1518

#### Saate Shakil

Shakil SS, Rosettie KL, Roth GA, Stafford L, Weaver MR. Predicting the cost-effectiveness of cardiovascular interventions across multiple settings: a model based approach to guide global health policy. Oral Presentation, American Heart Association Scientific Sessions 2019, Philadelphia.

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