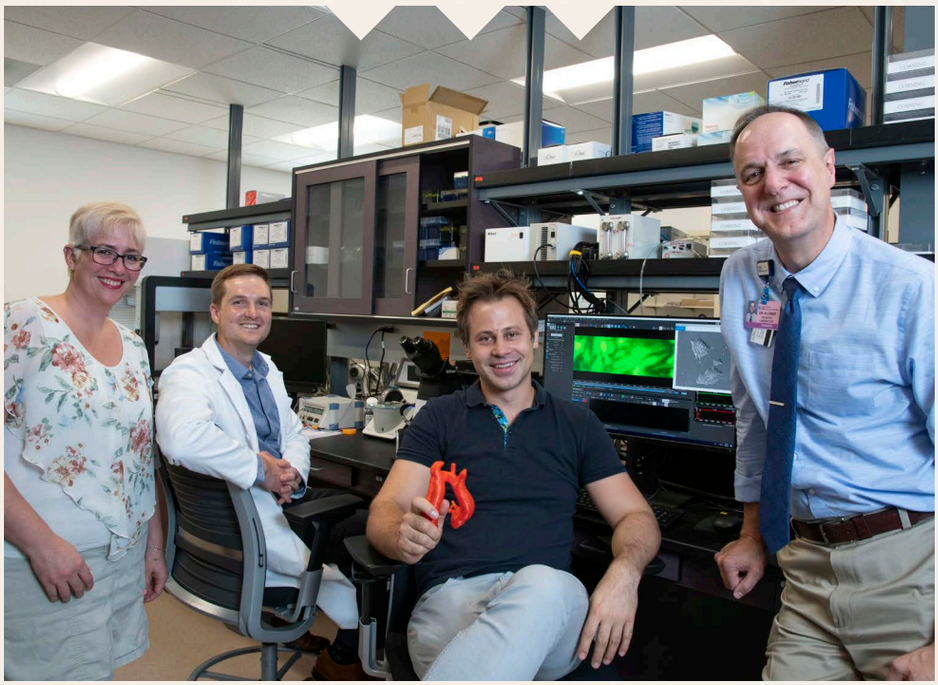
THE UNIVERSITY OF ARIZONA

SARVER HEART CENTER

NEWSLETTER ISSUE 79 • FALL 2019

PATIENT STEM CELLS POINT TO CAUSES, TREATMENTS OF CONGENITAL HEART DISEASE



Personalized medicine in a dish. *A collaborative research team is searching for genetic themes among family members who share a high prevalence of bicuspid aortic valve disease. They are testing medical therapies on cellular models grown in the lab from stem cells derived from each family member. Their goal is to more precisely predict which therapies would manage the conditions effectively. From left: Jennifer Andrews, PhD, assistant professor of pediatrics; Matthew Kern, second-year medical student; Jared Churko, PhD (holding a 3-D model), assistant professor of cellular and molecular medicine; and Scott Klewer, MD, professor of pediatrics, medicine, and cellular and molecular medicine.*

A family with a desire to help others is giving University of Arizona Sarver Heart Center physicians and scientists an opportunity to learn more about the genetics of bicuspid aortic valve (BAV) disease.

BAV affects about 2 percent of the entire population, according to the *Journal of American College of Cardiology*. "If a pediatrician sees 50 patients a day, most likely one would have BAV," said **Scott Klewer, MD**, professor of pediatrics, medicine and cellular and molecular medicine at the UA College of Medicine – Tucson and the UA Sarver Heart Center Peggy M. Barrett Endowed Chair for Congenital Heart Disease in Adults.

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Innovating. Life-Saving. Patient Care.

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NOTE FROM THE DIRECTOR

We have one of the best jobs in the world. That's the heartfelt message I typically deliver when welcoming new fellows or congratulating our graduating fellows as they move on from our cardiology training programs. But to embrace the joy of a career in cardiology, young doctors in training first must choose this field.

All academic medical centers are challenged to recruit and train the best young doctors. About half of our patients are women, yet cardiology remains a male-dominated specialty. As editor in chief of *Circulation: Heart Failure*, I recently had the opportunity to publish an important survey of advanced heart failure cardiologists, "**Perceived Generational, Geographic, and Sex-Based Differences in Choosing a Career in Advanced Heart Failure**," an article accompanied by editorials written by three female cardiologists from different regions of the world. I was privileged to write the U.S. perspective.

While the journal discussion focused on heart failure cardiologists, the issues raised apply to many medical professionals choosing their next career training steps, such as internal medicine trainees making the decision to pursue general cardiology. If we want to recruit and train a more diverse group of cardiologists, particularly women and under-represented minorities, we need to acknowledge the current state of the profession, change some perceptions and think creatively about the cardiology career of the future.

The survey published in the journal identified four themes, and in my editorial I challenged the profession's current leaders to think strategically to increase the talent pool and diversity of heart failure professionals. The themes are modified here for cardiology in general:

Cardiology is a Rewarding Career – I really believe that we have the best job in the world. The partnerships formed with patients in pursuit of better cardiovascular health are incredibly rewarding. To increase the talent pool choosing cardiology, we need to increase recognition of this joy among medical students and internal medicine residents considering specialization.

Dr. Nancy Sweitzer (fourth from left) welcomed the first-year cardiovascular disease fellows to Sarver Heart Center in July. They are from left: Mahesh Balakrishnan, MBBS, Emily Cendrowski, MD, Ignacio Zepeda, MD, Adriana Martin, MD, PhD, Nanda Pullela, MBBS, Juliya Cress, MD, PharmD, and Michael Kendall, MD, MSc. Besides rigorous training, the program's goals include developing work-life balance and recruiting future cardiologists who will more closely reflect the diversity of patients.

The Demanding Nature of Cardiology – While caring for patients who have complex conditions is rewarding, it also carries a toll of responsibility and significant time dedicated to the patient and family members. Perceived poor work-life balance is a reason talented physicians state for not choosing cardiology. Our trainees must see that many cardiologists achieve highly satisfactory life balance. We should advocate for multidisciplinary health-care teams that provide great care for cardiac patients while helping to prevent provider burnout. This is particularly true in academic practices where we care for the very sickest patients. Leaders need to ensure that our organizations sufficiently support cardiovascular professionals who will care for increasing numbers of patients in the coming decades.

Sex-based Discrimination – Cardiology remains markedly male dominated. More women are choosing advanced heart failure, where training programs are one-third women, and both men and women answering the survey perceived heart failure as an inclusive specialty. But women who responded to the survey perceived more discrimination in terms of pay and promotion for taking family leave, despite the fact that men took advantage of leave policies in equal percentages. Workplace discrimination and micro-aggressions remain common in cardiology. There is significant movement on the part of women in cardiology to combat this, and female leaders have a growing voice. Check out #WomenAs1 and #TheFaceOfCardiology.

Sponsorship of Future Leaders – Sponsorship is distinct from mentorship. Although mentorship provides an entree to the profession, sponsorship provides a path to the top. Current leaders in cardiology must intentionally and effectively help early-career colleagues build professional networks. It is natural for all of us to sponsor those who remind us of ourselves. However, to grow a more diverse world of cardiologists, we must consider individuals who may not immediately come to mind, who may be the leaders of the future, and not necessarily ones who look like us.

As the director of the UA Sarver Heart Center, I am working to be an enlightened leader, to sponsor talented early-career cardiologists and grow the diversity in our cardiology division. When I started in 2014, we had 22 cardiologists, including four women (18 percent). Now we have 30 cardiologists; nine (30 percent) are women. We are very proud of the future cardiologists we are training.

This year we welcomed eight new cardiovascular fellows to our training program; three are women and two are under-represented minorities (African American and Latino). These efforts provide Tucsonans with more access to cardiovascular care than ever before and a diversity of providers to better reflect our patients. This is possible because of your support. Thank you for supporting me as I continue our cardiovascular leadership in Arizona.

Nancy K. Sweitzer, MD, PhD
Director, University of Arizona Sarver Heart Center
Professor and Chief, Division of Cardiology,
UA College of Medicine – Tucson

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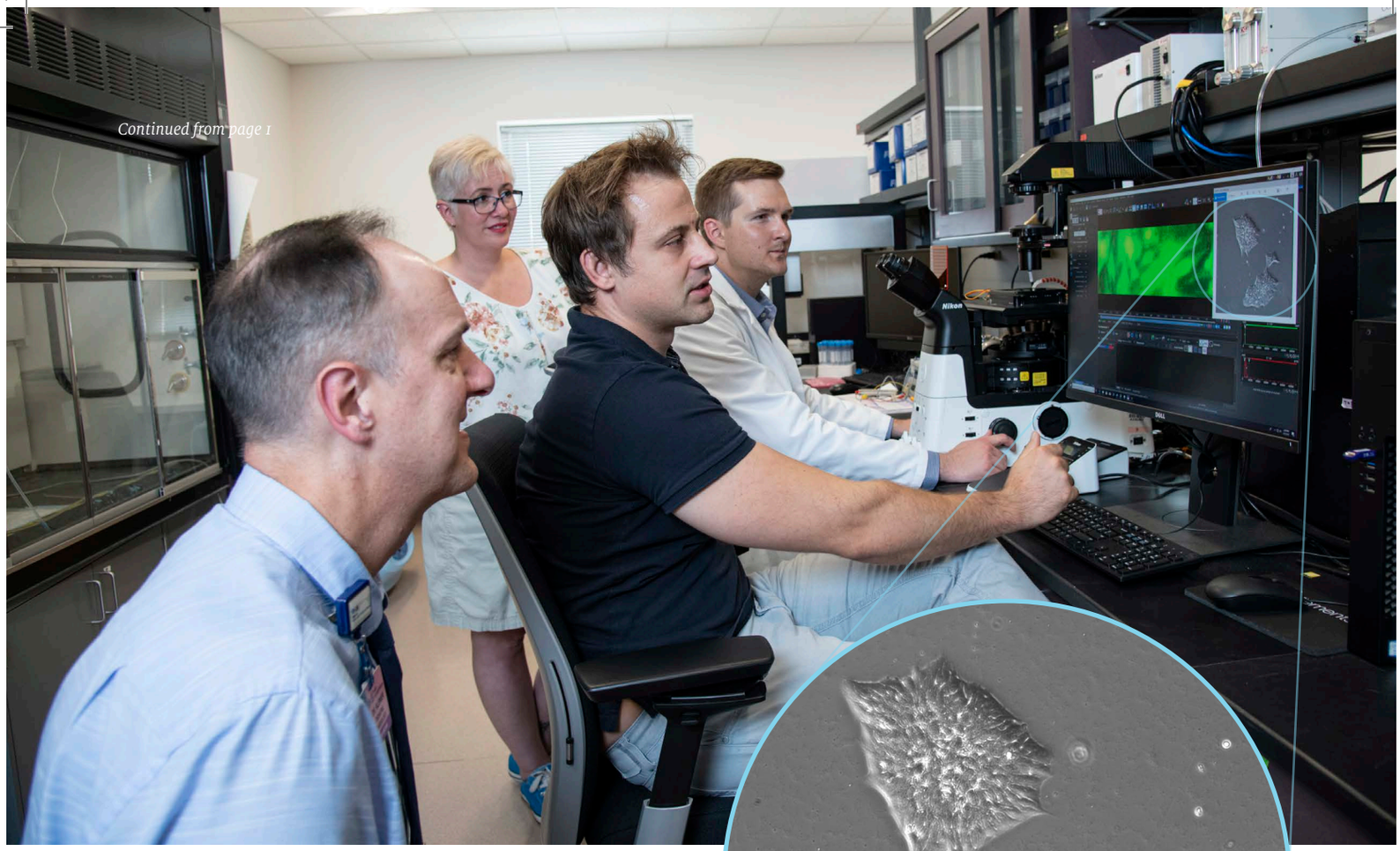
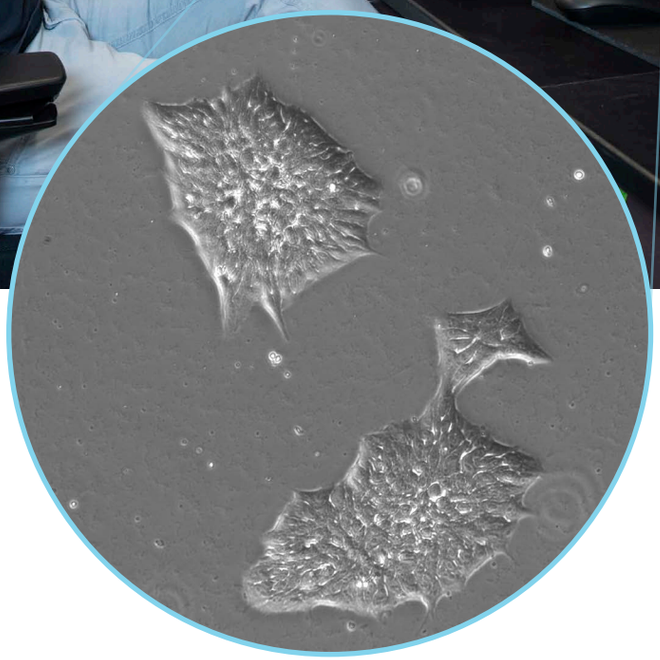


The research team discusses aortic valve cells created from a family member's stem cells.

BAV typically causes obstruction to blood flow leaving the left side of the heart to the body. While most often an isolated finding, some families are impacted by a hereditary form of BAV, where 25 to 50 percent of all family members can be affected. Some families may have variations in the severity of BAV disease. A two-generation family under the care of **Dr. Klewer** has experienced this directly — two of their three children have a form of BAV.

"I follow the son and daughter at the Children's Clinics for Rehabilitative Services and the father at Banner Adult Congenital Heart Clinic," Dr. Klewer said. The father and son have isolated bicuspid aortic valve disease. The daughter, however, has hypoplastic left heart syndrome (HLHS), a birth defect in which the entire left side of the heart does not form. Babies with HLHS cannot live without a series of heart surgeries during infancy.

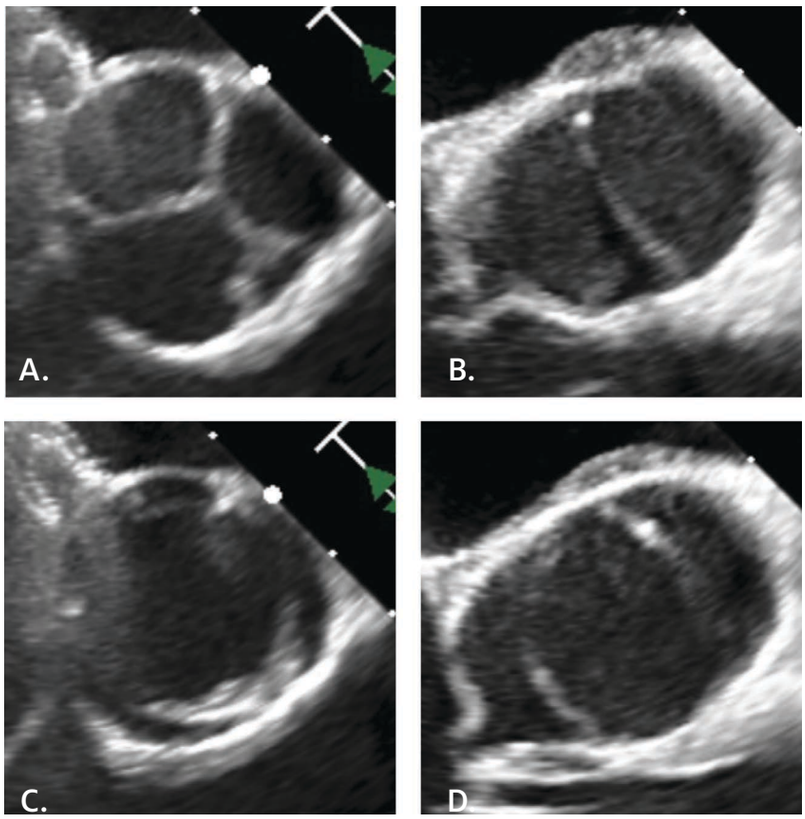
For many living with BAV disease, dilation of the aorta is an issue that develops and progresses over time and can lead to catastrophic consequences due to tearing or rupture. "**The big challenge for congenital cardiologists is to determine the right time and the right therapy to intervene," Dr. Klewer said**. "So, now we evaluate available medical therapies without having predictive models; unfortunately, laboratory studies have not translated well to clinical trials. With these limitations in mind, personalized medicine may help us predict who will respond to a specific therapy."



These bicuspid aortic valve cells serve as the lab model for testing medical therapies for an individual family member.

That's when Dr. Klewer turned to the UA iPSC Core in Sarver Heart Center. **Jared Churko, PhD**, assistant professor of cellular and molecular medicine at the UA College of Medicine – Tucson, is director of the UA iPSC (induced pluripotent stem cells) Core.

In this family's case, Dr. Churko's research team drew blood from each family member and is converted each individual's cells into iPSCs. From this stage, Dr. Churko's research team will convert iPSCs into various cardiac cell types to discover the disease mechanisms leading to this family's heart defect. "We'll use the iPS cells to create valve



Echocardiographic images of normal aortic valve (closed =A, open = C) and bicuspid aortic valve (closed =B, open = D)

cells, model the disease in a dish and then try drug therapies to see if disease processes can be altered," Dr. Churko said.

"We don't know the underlying mutation that causes the defect, but we're looking for a common variant in blood samples from the parents and the two affected children," Dr. Churko said. The Churko lab also conducted whole genome sequencing for the family, something that was unaffordable until a few years ago. "This technology gives us a genetic roadmap to know more than we possibly could before," Dr. Klewer said.

"We are using this technology to develop a proof of concept to determine if we can predict a personalized medical therapy. From here we plan to apply for funding from the National Institutes of Health)" Dr. Klewer said.

The research team includes **Tom Doetschman, PhD,** and **Raymond Runyan, PhD**, both professors of cellular and molecular medicine in the UA College of Medicine – Tucson, **David Bull, MD**, professor of cardiothoracic surgery, **Sydney Pettygrove, PhD,** assistant professor of epidemiology and biostatistics in the Mel and Enid Zuckerman College of Public Health, **Michael Seckeler, MD**, associate professor of pediatrics, **Jennifer Andrews, PhD**, assistant professor of pediatrics, and **Matthew Kern**, second-year UA medical student.

The research team is looking for a genetic theme based on the family members' conditions and seeking new insights to contribute to this field of knowledge.

The Promise of Human iPS Cells

Repairing heart muscle damaged by a heart attack or other cardiovascular diseases is one of the "holy grails" for cardiovascular scientists. The ability to repair heart muscle — especially by using a person's own cells— would be a significant advance that could enhance quality of life for the millions of people who suffer from a heart attack or have a chronic heart condition. Heart cells do not typically regenerate, limiting its ability for self repair.

Researchers believe human-induced pluripotent stem cells (hiPSC) may be the key to unlocking the cardiomyocytes' (heart muscle cells) regenerative ability. This research, however, is in its infancy and the technique is not ready to be deployed for human heart disease regenerative purposes.

Other Health Conditions Under Study

For another research project, the Churko lab is using funds from the **Steven M. Gootter Foundation Investigator Award** to create a model to study arrhythmogenic cardiomyopathy (ACM), a condition that is found in 22% of sudden cardiac deaths. Although ACM is considered a genetic disease, exercise and other contributing non-genetic environmental factors are suspected to increase risks. However, researchers still do not understand completely the mechanisms leading to ACM.

"We have collected blood samples from ACM patients and are working on a model to assess arrhythmias in cells while under stress. We hope to prove our model works and use data from this pilot research to apply for national funding to study ACM on a larger scale," Dr. Churko said.

In addition to support from the UA Sarver Heart Center, the UA iPSC Core is supported by the BIO5 Institute and the UA Center for Innovation in Brain Science.

MEMBER UPDATES

In June, Dr. Breathett published an editorial, "Dare to Achieve Health Equity," in the Journal of the American College of Cardiology Heart Failure, and presented at the Gordon Research Seminar – Assisted Circulation in Spain.

Khadijah Breathett, MD, MS, FACC, FAHA, assistant professor of medicine, was awarded a **Young Investigator Database Seed Grant** from the American Heart Association "**Get With The Guidelines®** program" focused on improving patient care. Dr. Breathett also was awarded a **Carl Storm Underrepresented Minority Fellowship** to support her presentations at the 2019 Assisted Circulation Gordon Research Seminar and Conference. She was awarded a coveted position in the **National Heart, Lung, and Blood Institute, Research in Implementation Science for Equity (RISE) Program.**

In April, Dr. Breathett was selected by the National Minority Quality Forum as one of "***40 Under 40 Leaders in Minority Health.***" (She is pictured above with her mother, Barbara Breathett).

Zoe Cohen, PhD, assistant professor of physiology, UA College of Medicine – Tucson, was honored for excellence in teaching and mentoring with the **Margaret M. Briehl and Dennis T. Ray Five Star Faculty Award**, the only award for UA faculty members who are nominated and selected by undergraduate students.

Sharon Gregoire, ACNP, FNP, CCTC, now adds (Doctor of Nursing Practice) to her credentials after graduating from Grand Canyon University's Doctor of Nursing Program. She also is a certified clinical transplant coordinator.

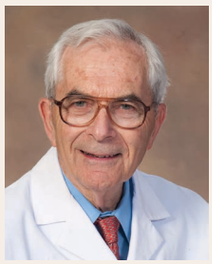
Meredith Hay, PhD, professor of physiology at the UA College of Medicine – Tucson, and a faculty member of the Evelyn F. McKnight Brain Institute, has been elected president of the **American Physiological Society** for 2019-2020.

Olivia Hung, MD, PhD, assistant professor of medicine, is serving as a faculty facilitator for the UA College of Medicine – Tucson Clinical Reasoning Course.

Raj Janardhanan, MD, professor of medicine and medical imaging and medical director on non-invasive cardiac imaging, was selected to serve as a volunteer with the **American Society of Echocardiography Global Outreach** in China during September 2019.

Kwan Lee, MD, associate professor of medicine and associate chief of cardiology, and **Alvaro Altamirano, MD**, clinical assistant professor of medicine, organized the first **American College of Cardiology Arizona Cardiology Simulation Summer Camp** at the UA Sarver Heart Center in June. Dr. Lee is the current governor of the ACC Arizona chapter. Special thanks go to the numerous health-care professionals, including faculty, fellows and staff who participated as teachers and mentors during this two-day program for an enthusiastic group of high school students.

During the summer, Dr. Lee delivered the keynote lecture, "Physician Burnout," for the **MYLIVE 2019 Scientific Program** of the **National Heart Association of Malaysia**. He also was faculty for the **Asia Pacific Society of Interventional Cardiology** (AICT-Asia PCR 2019).



Frank Marcus, MD, professor emeritus of medicine and an active research scientist, was honored by the **Heart Rhythm Society** in May for his seminal research on right ventricular dysplasia. He presented a lecture, "Arrhythmogenic Right Ventricular Cardiomyopathy: State-of-the-Field."

John Ruiz, PhD, associate professor of psychology, co-authored "Associations Between Objective Sleep and Ambulatory Blood Pressure in a Community Sample," in ***Psychosomatic Medicine***, 2019, along with lead author, Caroline Doyle, a graduate student in the UA Department of Psychology. Dr. Ruiz was a recipient of a 2018-2019 UA Sarver Heart Center Investigator Award.

Nancy K. Sweitzer, MD, PhD, director of the UA Sarver Heart Center, professor of medicine and chief of cardiology, was invited to present three named lectures:

- Miriam Lemberg Professorship in Cardiovascular Disease at the University of Miami Miller School of Medicine in March
- Thomas W. Smith, MD, Memorial Lecture, Brigham and Women's Hospital in Boston
- The George and Frances Broaddus Crutchfield Lectureship at VCU Health (Virginia Commonwealth University), where she delivered three lectures: "The Science of Uncertainty: A Practical Approach to Management of Heart Failure with preserved Ejection Fraction;" "Save Lives and Prevent Readmissions! Outpatient Management of Heart Failure with reduced Ejection Fraction;" and "Known Unknowns and Unknown Unknowns: Moving Forward in Heart Failure with preserved Ejection Fraction"

Dr. Sweitzer authored "Choosing a Career in Heart Failure A US Perspective," in ***Circulation: Heart Failure,*** July 18, 2019.

Dr. Sweitzer also was a co-author on:

- "Vet the Message – Medical Misinformation" in ***Circulation: Heart Failure.*** Dr. Sweitzer is the editor in chief of this journal.
- "Comparison of Outcomes in Patients With Diabetes Mellitus Treated With Versus Without Insulin + Heart Failure With Preserved Left Ventricular Ejection Fraction (from the TOPCAT Study)" in ***The American Journal of Cardiology***
- "Metformin improves diastolic function in an HFpEF-like mouse model by increasing titin compliance" in ***Journal of General Physiology*** (with **Henk Granzier, PhD**, professor of cellular and molecular medicine and the Allan and Alfie Norville Endowed Chair, in Women's Heart Disease).

Perhaps the most joyous recognition, Dr. Sweitzer was nominated by her daughter, and honored by **Tu Nidito**, Tucson in May, as a **Remarkable Mom**.

Jil C. Tardiff, MD, PhD, and members of her research team published, "Chronic Calmodulin-Kinase II Activation Drives Disease Progression in Mutation-Specific Hypertrophic Cardiomyopathy" in ***Circulation***, March 19, 2019. Dr. Tardiff is professor of medicine, cellular and molecular medicine, and biomedical engineering.

Dr. Tardiff also was co-chair of the **Basic Cardiovascular Science Council 2019**, held in Boston this summer.

Rebecca Vanderpool, PhD, assistant professor of biomedical engineering, received an **AHA Early Career Award** for her project, "Role of HIF-2α and Right Ventricular Fibrosis in the Development of Right Heart Failure and Pulmonary Hypertension."

Patients with pulmonary hypertension (PH) have high blood pressure in the blood vessels in their lungs because of narrowing of the pulmonary arteries. The right side of the heart increases in size due to increased pulmonary pressure and progression of PH results in right ventricular failure and death. A critical need exists to develop biomarkers allowing a physician to identify high-risk patients in need of early or aggressive treatment. The Vanderpool research team seeks to identify what genetic factors are responsible for structural and functional changes in the right ventricle that lead to right heart failure. They also are investigating the role of cellular factors in the development of right ventricular fibrosis.

Craig Weinkauf, MD, PhD, assistant professor of surgery, was awarded an **Early Career Development Grant from University of Arizona Health Sciences** to develop improved targeted care for patients with carotid vascular disease through imaging strategies and treatment techniques. Stroke is associated with unstable carotid atherosclerosis and is a leading cause of death and disability in the United States, yet the majority of patients with carotid atherosclerosis have no symptoms. Dr. Weinkauf's primary mentor is **Irving L. Kron, MD**, professor of surgery, UA College of Medicine – Tucson, senior associate vice president, UA Health Sciences, professor, UA Department of Surgery, and Sarver Heart Center member.

ECHOCARDIOGRAPHY LABS REACCREDITED

The echocardiography labs at Banner – UMC Tucson, South, North and Green Valley were reaccredited this summer by the Echocardiography - Intersocietal Accreditation Commission. Pictured from left back row: Greg Bliss, William Roeske, MD, Elizabeth Juneman, MD, Paul Fenster, MD, Raj Janardhanan, MD, Jeff Gregoire, Phillip Barrios, Carrey Stivers, Sarah Ditri, Amy Shepherd. Front row: Manya Denman, Shane Scully, Kellie Ohanian, Todd Rutter, Magda Gutierrez, Caitlin Stumpf.

From left: Kate LaMantia (Alpha Phi), MacKenzie Meza, UA student, Dr. Nancy Sweitzer.

ALPHA PHI GIFT

Benefits UA Sarver Heart Center

Sarver Heart Center received a generous gift of more than $27,000 from the Alpha Phi Foundation. *The Beta Epsilon chapter of Alpha Phi International Women's Fraternity at the University of Arizona* held a Red Dress Gala on Oct 5, 2018, featuring Nancy Sweitzer, MD, PhD UA Sarver Heart Center director, as the speaker.

The Alpha Phi Foundation is dedicated to improving women's heart health through its philanthropy and advocacy and has supported consistently education and research since their dedication to its cause in 1946.

Sarver Heart Center has a historic relationship with the Tucson Alpha Phi Alumnae going back to 1988, when the alumnae met founding Heart Center director Eugene Morkin, MD, and raised $6,320 for the new Sarver Heart Center building through lollipop sales. "We deeply appreciate Alpha Phi's vision, advocacy and philanthropy, then and now," Dr. Sweitzer said. "Such gifts are essential to support our mission of advancing cardiovascular research and community education."

Visit heart.arizona.edu and select "Ways to Give," for more information.

Be Part of Something Big to Help Beat Heart Disease

Thanks to a great response from the community, UA Sarver Heart Center has enrolled more than the 200 participants in its Cardiac Biorepository. Please help us reach our goal of enrolling 100 people this year.

"These blood samples will help scientists better understand heart disease and improve care and treatment, now and in the future," said Nancy Sweitzer, MD, PhD, director of the UA Sarver Heart Center and principal investigator of the biorepository research program.

Participants must complete a questionnaire, sign an informed consent form that allows researchers to view their electronic health record, and donate about 3 tablespoons of blood. **To complete a Cardiology Research Registry Form, please visit heart.arizona.edu/clinical-research or call 520-626-5431.**

HEALTH EDUCATION ASSISTANT ALWAYS REACHES FOR

GREATER GOOD

So many conversations with **Erika Yee** begin with, "I have some great news!" Yee brings an unmatched spirit of dedication and professionalism to her role as health education assistant at UA Sarver Heart Center – whether she's teaching chest-compression-only CPR in underserved communities, developing accessible educational materials for Spanish speakers or the deaf community, or conducting clinical research on health-care disparities with a faculty member.

Yee first encountered Sarver Heart Center as a Girl Scout while attending Camp Fury in Tucson. Then, **Melissa Ludgate, MD,** a former SHC health education assistant, now a resident physician at University of Iowa Hospitals in, Iowa City, taught CCO-CPR at the camp organized by Tucson Fire Department and other local fire departments for high school girls.

A couple of months later, while sharing a meal with friends before high school band practice, Yee became aware that a band mate collapsed in sudden cardiac arrest. She responded with the training she learned at Camp Fury, saving her friend's life. "This was a life-changing experience for me," Yee said. The experience opened her mind to consider health care as a profession.

Yee focused her Girl Scout Gold Award project on teaching CCO-CPR to more young people, collaborating with UA Sarver Heart Center and the **Steven M. Gootter Foundation** to produce a video directed at teens. While attending the University of Arizona as a physiology major, Yee became a certified emergency medical tech (EMT) and continued to volunteer at Sarver Heart Center, teaching CCO-CPR.

She started working part time as a health education assistant while a student and continues as she begins her studies in the master's of public health degreeprogram at the UA. A natural leader, Yee has recruited and trained about 15 volunteers, mostly UA undergraduate students, who are committed to teaching CCO-CPR throughout Southern Arizona. This group often coordinates with the UA College of Medicine – Tucson REACT Group (Resuscitation Education and CPR Training), UA Sarver Heart Center Women's Committee Minority Outreach Program and the Steven M. Gootter Foundation.

Erika Yee teaches a community group chest-compression-only CPR.

Spanish-language materials are available for chest-compression-only CPR training. Pictured from left: Alejandra Zapien Hidalgo, MD, assistant professor, Family and Community Medicine, Erika Yee, Sarver Heart Center health education assistant, Issa Dominguez, volunteer, Marty Cisneroz, MD, resident physician and former REACT Group president.

'Great News' and a Growing Need

One of Yee's "great news" announcements recently: her efforts resulted in about 4,500 people learning CCO-CPR this year, well ahead of her targeted goal of 3,000 people. "We've been able to train people in Tucson and in underserved areas of Arizona, including Bisbee, Douglas, Nogales, Tohono O'odham and more. I am incredibly proud of the work that our team has been able to complete and hope that we will have even more people trained next year with the new state statute (SB1137) going into effect that requires high schools to provide CPR training before students graduate," Yee said.

How does Sarver Heart Center provide free trainings? By relying on collaborations with other agencies who provide resources and through donations from people who support the outreach education mission.

To reach the often underserved deaf community, Yee collaborated with the UA Office of Disability Resources and Arizona School for the Deaf and Blind to produce a CCO-CPR training video in American Sign Language. Working with REACT Group leaders who received funding from Arizona Area Health Education Centers, she helped develop Spanish-language resources and recruited volunteers who provide trainings in Spanish.

Expanding Horizons

Yee also assists **Khadijah Breathett, MD, MS**, an advanced heart failure cardiologist who conducts clinical research focused on health disparities in minority populations. "Erika has been an integral part of my investigational study of health-care decision-making. She is an expert in performing cognitive interviews, managing electronic surveys and problem-solving. She demonstrates excellence in all of her pursuits," Dr. Breathett said.

Also on Yee's plate: applying to medical school to pursue her dreams of becoming a doctor. We hope she chooses to specialize in cardiology.

Brian Bateman Superb Service Award

Congratulations to Katie Maass, Sarver Heart Center director of communications and public education! Katie is the recipient of the 2018 Brian Bateman Superb Service Award. She was nominated by Drs. Nancy Sweitzer and Karl Kern for her dedication and commitment to her role as the public voice of the UA Sarver Heart Center. "Katie's consistent effort and enthusiasm for growing and evolving in the communications sphere have been critically important to keeping the center in the public eye consistently during times of change," Dr. Sweitzer said. Brian Bateman, former director of development at the Sarver Heart Center, helped present the award.

DR. MARVIN SLEPIAN

RECEIVES REGENTS' PROFESSOR RECOGNITION PLUS OTHER HONORS

The Arizona Board of Regents appointed **Marvin Slepian, MD**, a Regents' Professor in April, a title awarded to full professors who have the most distinguished accomplishments in teaching, scholarship, research or creative work. These prestigious appointments are limited to no more than 3% of the university's tenured and tenure-track faculty members.

A professor of medicine, cardiology and medical imaging, Dr. Slepian is a noted cardiologist, inventor, entrepreneur, innovator and educator. He also is associate head of the UA Department of Biomedical Engineering, professor of materials science and engineering and a member of the UA Sarver Heart Center and the UA BIO5 Institute. He founded and directs the Arizona Center for Accelerated Biomedical Innovation (ACABI), a university-wide "creativity engine," or "inventor's workshop," that helps faculty members and students identify unmet needs and address them, said **Michael Dake, MD**, senior vice president, UA Health Sciences.

His translational work has resulted in novel therapeutic solutions, including stent coatings, polymer paving, synthetic tissue and cardiovascular prosthetic devices, including the total artificial heart, to name a few.

More Recognitions

The **UA College of Engineering** named Dr. Slepian a DaVinci Fellow in April. The award recognizes talented and resourceful faculty members and provides a one-time grant of $10,000. Dr. Slepian plans to use the funds to support student research in his lab.

Dr. Slepian also received the Daniel Drake Award from his medical school, the **University of Cincinnati College of Medicine**. The award honors distinguished alumni.

He has been elected president of the *American Society for Artificial Internal Organs* (ASAIO).

Dr. Slepian's recent research has been published in *Nature*, highlighted by **National Institutes of Health** and featured in a video produced by UA Health Sciences. He also co-chaired the **International Forum on Virtual Reality and Health Care,** held at the UA in March.

In July, Dr. Slepian and members of his lab hosted high school students who were enrolled in the **UA College of Engineering's Summer Engineering Academy**, exposing students to biomedical engineering and research related to heart disease.

Legacy Awards Honor Outstanding Trainees

The **Zenas B. Noon Award of Excellence in Cardiology** is given to medical students with outstanding performance in their cardiology rotations. **Christine E. Chiu, MD**, who graduated with her medical degree in May, is the 2019 recipient. Dr. Chiu grew up in Glendale, Ariz., before moving to UCLA to earn her bachelor's degree in biochemistry. At UCLA, she volunteered at a student-run free clinic for the homeless. "This volunteer experience opened my eyes to the field of medicine and its ability to change lives." She continued volunteering at free clinics in Tucson and graduated with Distinction in Community Service from UA College of Medicine – Tucson in May. She is returning to the Los Angeles area for her internal medicine residency at Los Angeles County + USC Medical Center. Although she has not chosen her subspecialty focus, Dr. Chiu became aware of the ubiquitous presence of heart disease in hospital patients and how management of these conditions could dramatically improve patient lives.

The **Charles W. Hall, Jr., and Virginia C. Hall Memorial Award** recognizes amazing residents on the coronary care unit rotation at Banner – University Medical Center Tucson. **Louis Eubank, MD**, a second-year internal medicine resident physician, received the Hall award for 2018-2019. Louis grew up in Portland, Maine, but fell in love with the desert while working as a guide in Utah. After meeting his wife, he decided to pursue a career in medicine and obtained his medical degree from Tufts University School of Medicine in Boston. Following internal medicine residency, Dr. Eubank plans to pursue a career in pulmonary/critical care medicine and one day hopes to run an intensive care unit.

From left: William Roeske, MD, Tom Lassar, MD, Charles Katzenberg, MD, Nancy Sweitzer, MD, PhD, Irving Kron, MD.

Enjoy Retirement, Dr. Katzenberg!

Charles Katzenberg, MD, a leader in Tucson's cardiovascular medicine community, retired from the University of Arizona Sarver Heart Center in May. "We are so proud that he chose to spend the final years of his professional service at the UA College of Medicine – Tucson, sharing his wisdom and experience with colleagues and the learners in our community," said Nancy Sweitzer, MD, PhD, director of the UA Sarver Heart Center and chief of cardiology.

Dr. Katzenberg's expertize in preventive cardiology and his leadership in cardiovascular medicine have made him a role model for many, including the hundreds of inspired participants of the Heart Series course that he co-founded with Edna Silva, RN. "Although retiring from clinical practice, we look forward to his continued engagement with our Cardiovascular Medicine Fellowship, community education programs and his continued leadership in the Heart Series," Dr. Sweitzer said.

Dr. Katzenberg's legacy continues, in part, on the UA Sarver Heart Center prevention webpage: https://heart.arizona.edu/heart-health/prevention. Here you'll find his "10 Things You Can Do Today to Prevent/Reverse Heart Disease" and "One-Page Guide to a Heart-Healthy Diet."

CONGRATULATIONS TO THE 2019 CARDIOLOGY FELLOW

GRADUATES

The University of Arizona Sarver Heart Center celebrated this year's graduates from two fellowship programs through the Division of Cardiology at the UA College of Medicine – Tucson.

The six graduates from the **Cardiovascular Disease Fellowship** and their post-training plans are:

Rishi Bhargava, MD,
private practice, Toronto, Canada

Melissa Dakkak, DO,
private practice, Northwest Hospital Tucson

Dmitry Familtsev, MD,
private practice, Phelps Health, Rolla, Mo.

Ahmed Harhash, MBBS,
heart failure fellowship, University of Missouri Kansas City

Jennifer Huang-Tsang, DO,
private practice, Marshall Cardiology, Tucson

Sridhar Reddy, MD,
interventional cardiology fellowship, UA Sarver Heart Center

The fellows honored the following cardiology faculty members with teaching awards:

Eric Brody, MD,
cardiologist, best lecturer

Karl B. Kern, MD,
professor of medicine, best research mentor

Mark Friedman, MD, professor of medicine, best procedure teacher and best fellowship mentor

Krishan Patel, MD, clinical assistant professor, best clinical teacher at Southern Arizona VA Medical Center

Kapil Lotun, MD, professor of medicine, best clinical teacher at Banner – University Medical Center Tucson

The Division of Cardiology in the University of Arizona College of Medicine – Tucson offers four fellowship programs in cardiovascular disease, interventional cardiology, advanced heart failure and electrophysiology.

The two **interventional cardiology fellows** and their next steps are:

Deepak Acharya, MD, will remain with the UA College of Medicine – Tucson, Division of Cardiology as associate professor of medicine

Chun-Yu Lee, MD, will "return home" to California Pacific Medical Center in San Francisco, where he completed his cardiovascular disease fellowship. Now, he will practice interventional cardiology

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Cardiovascular disease fellowship graduates: Melissa Dakkak, DO, Sridhar Reddy, MD, Ahmed Harhash, MBBCh, Rishi Bhargava, MD, Jennifer Huang-Tsang, DO, Dmitry Familtsev, MD.

WHAT YOU NEED TO KNOW ABOUT

TYPE 2 DIABETES

TOO MANY PEOPLE DON'T KNOW

TOTAL U.S. ADULTS WITH DIABETES: 30.3 MILLION

Diagnosed: 90%-95% of cases are Type-2 diabetes
About 5% of cases are Type-1 diabetes
1 in 4 adults don't know they have diabetes

Prediabetes: 84 million cases among U.S. Adults

90% **of individualswith prediabetes don't know they have it**

People with diabetes are twice as likely to have heart disease or stroke – and at an earlier age of onset

In the last 20 years, the number of adults diagnosed with diabetes has tripled among the U.S. population

ARE YOU AT RISK?

OVERWEIGHT (BMI > 25) & physically inactive

FAMILY HISTORY of diabetes

Older than **45 YEARS** of age

HISTORY of gestational diabetes or a baby weighing more than 9 pounds

Risk of developing prediabetes or type-2 diabetes is higher among African American, American Indian/Alaskan Native, Hispanic/ Latino, Pacific Islander & some Asian populations

MANAGE YOUR RISK

Maintain a healthy weight – A healthy BMI is less than 24.9

Maintain a healthy and nutritious diet

Be physically active – At least 150 minutes of exercise per week

Monitor your blood sugar and A1C

Follow these tips and talk with your doctor for more information on how to reduce your risk of diabetes. Visit our prevention pages.
heart.arizona.edu/heart-health

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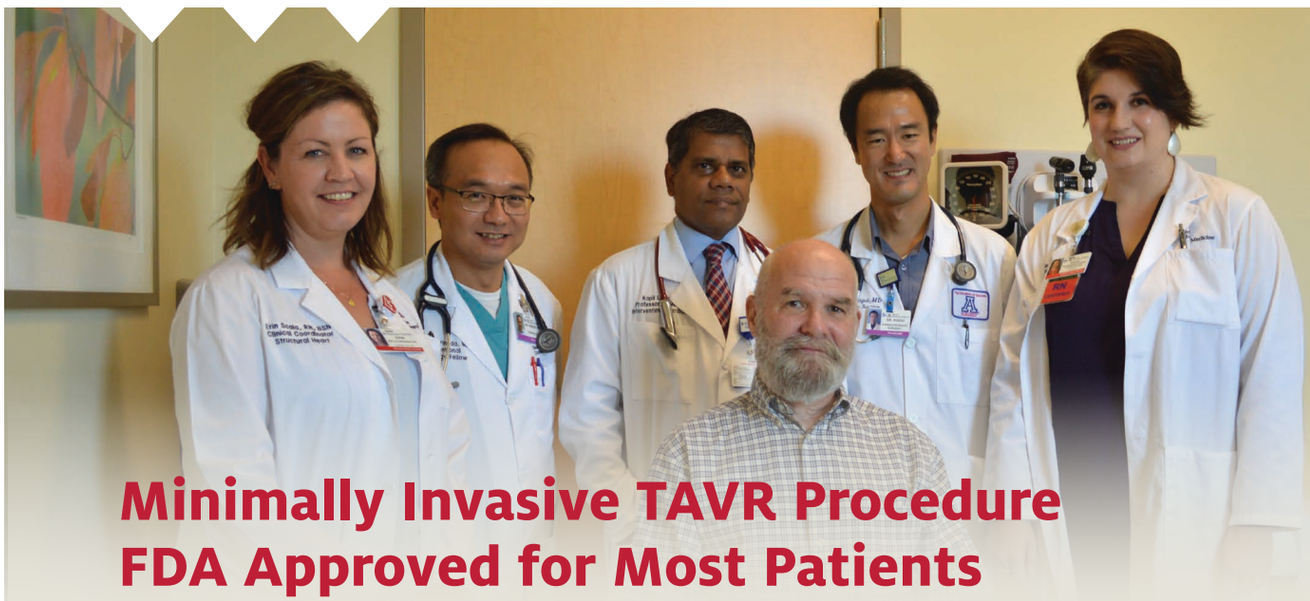

Chip Rock (seated) is the first "low-risk" TAVR patient at Banner – University Medical Center Tucson. Chip golfed on day 12, following the minimally invasive heart-valve replacement procedure. TAVR team members from left: Erin Scala, RN, BSN, Keng Pineda, MD, PhD, Kapil Lotun, MD, Toshinobu Kazui, MD, PhD and Devan Lodge, RN, MSc, CCRN).

Minimally Invasive TAVR Procedure FDA Approved for Most Patients

Most patients with heart valve disease now may be candidates for the transcatheter aortic valve replacement (TAVR) procedure as an alternative to open-heart surgery. In August 2019, the Food and Drug Administration expanded the eligibility criteria to patients who are at low risk for major complications associated with open-heart surgery. Previously the FDA approved TAVR devices only for patients evaluated as medium or high risk for surgery.

"The technology for transcatheter valve replacement continues to advance, allowing more and more valves to be replaced less invasively," said **Kapil Lotun, MD**, professor of medicine and director of the **Structural Heart Disease Program** at UA Sarver Heart Center.

A Family History

Chip Rock was the first low-risk patient in line for a TAVR procedure at Banner – University Medical Center Tucson. Earlier in the summer he was scheduled for knee-replacement surgery and his doctor sent him for a standard anesthesiology clearance. That triggered a referral to a cardiologist who diagnosed aortic stenosis and recommended a heart-valve replacement.

Chip considered his mother's experience. At age 92, was one of the first TAVR patients in February 2014, when the UA Sarver Heart Center Structural Heart Team offered the procedure only for high-risk patients. "My mother did well for several years after her procedure, so when I learned I needed a valve replacement, I contacted Dr. Lotun," Chip said.

At age 66, Chip was considered low-risk for surgery, but Dr. Lotun advised him that the FDA was likely to expand the eligibility criteria soon. Chip decided it would be worthwhile to wait for TAVR, even though that meant postponing his knee-replacement surgery to avoid open-heart surgery.

All went well with the TAVR procedure and Chip scheduled a golf game 12 days later.

For more information, or to refer a patient, contact: (520) 694-8578 | BUMCTStructuralHeart@bannerhealth.com