THE UNIVERSITY OF ARIZONA

SARVER HEART CENTER

NEWSLETTER ISSUE 77 • SUMMER 2018

SLEEP

TO YOUR HEART'S CONTENT

By Michael Grandner, PhD

If you have heart disease or heart disease risk, you probably work on improving health and quality of life by managing diet and exercise. You may even take advantage of the benefits of meditation, yoga, tai-chi and social engagement. But are you also focusing on sleep and circadian health? Your circadian rhythm is the pattern of your physical, mental and behavioral daily cycle. Sleep plays many important roles in health maintenance and disease prevention. Adding a focus on sleep may improve your daytime function and quality of life.

Sleep is a fundamental part of human biology. Just as the whole body benefits from the oxygen we breathe and the food we eat, it benefits from sleep. Circadian rhythms are important as well, since many body systems, including metabolism, brain

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NOTE FROM THE DIRECTOR

America is an aging nation, and given that age is a significant risk factor for heart disease, this demographic looms large as we plan future cardiovascular medicine services at the UA Sarver Heart Center and Banner – University Medical Center in Tucson.

Nationally, 20 percent of the total population of 316 million are people 60 and older, according to the Pima Council on Aging's ***Community Report****, which analyzed the U.S. Census Bureau American Community Survey 2015. Statewide, 21 percent of Arizona's 6.6 million people are 60 or older, a number projected to be 25 percent by 2020. In Pima County, from 2010 to 2015, the growth rate of people 60 and older was 17.5 percent, compared to the overall population growth rate of just 3 percent. It is currently estimated the cardiovascular workforce in Tucson is substantially less than demand requires, and this workforce deficit only will grow in the next decade! One of our missions is to work tirelessly to ensure we are able to provide timely and expert heart care to everyone in our community quickly and efficiently, while providing access to the latest in new therapies and research to all our patients.*

The implications are enormous for cardiovascular disease patient care, prevention education and workforce development – all missions of the UA Sarver Heart Center. As readers of this newsletter well know, heart disease remains the leading cause of death in the United States., ***responsible for 1 in 3 deaths****. Coronary heart disease, due to plaque buildup in arteries, claims 43.8 percent of these lives, followed by stroke (16.8 percent), high blood pressure (9.4 percent) and heart failure (9 percent), according to an American Heart Association statistical update, published in* ***Circulation*** *in 2018.*

UA Sarver Heart Center faculty members and staff are collaborating to address the approaching heart disease epidemic as the last-born of the baby boomers approach age 65. On the patient-care front, we are welcoming four more cardiologists to our faculty by the end of October for a total of eight new faculty members in the past academic year. Bolstering the physician workforce are six nurse practitioners with specialty cardiovascular knowledge – two of them new recruits to our division. Our research programs show promise as clinical and basic science faculty collaborate and mentor young physicians and scientists to bring the latest and most promising basic science discoveries into the realm of clinical care. Our clinical trials program currently provides our patients access to more than 40 experimental disease treatments across multiple cardiovascular conditions, more than any cardiovascular program in the state.

In education, we continue to expand cardiovascular fellowship training at UA Sarver Heart Center and Banner – University Medicine to include accredited subspecialty programs in electrophysiology and heart failure, in addition to growing the program in general cardiovascular medicine and our continuing excellence in training the next generation of specialists in interventional cardiology. Our faculty members work side by side with UA medical students, resident physicians, cardiovascular medicine fellows and scientists in diverse disciplines, from cellular and molecular medicine to biomedical engineering.

Our ongoing commitment to community education is heavily focused on saving lives through chest-compression-only CPR training and preventing heart disease, particularly helping people to recognize heart disease risk and symptoms and to seek early medical care. Early attention to cardiovascular risk and symptoms improves outcomes. Whether studying heart-disease risk reduction or advocating to eliminate health disparities, our faculty members continue to lead nationally on these issues while working tirelessly to educate the people of Arizona.

While the shift towards an older population appears monumental, together we can continue on the path of innovation while providing life-saving patient care in our state.

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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function and others, rely on maintenance of normal 24-hour rhythms to function well. Many studies have shown that lack of sleep or disturbance of the 24-hour cycle can lead to health problems.

In addition to heart health, sleep is closely linked with mood, ability to handle stress, risk for depression, ability to be clear-headed during the day, memory, concentration and many other brain functions. It is tied to energy level, focus, and even productivity. Although our society often sees sleep as unproductive time, that is a misguided perspective. Sleep is important to maintaining health, productivity and quality of life.

The American Heart Association recommends adults should strive for at least seven hours of sleep per night. But it's not only time sleeping, but sleep quality that matters. To improve sleep quality, first make sure you're sleeping at the right time. The human body was built to sleep at night; getting restful, restorative sleep during the day is difficult. Also, make sure you are sleeping enough. While many adults get seven hours a night, many others cannot. It's true that not everybody needs a full seven hours, but it can be difficult to tell if you are getting enough high-quality sleep. One way to assess your sleep habits is to think about how you feel during the day. If you have trouble staying awake, especially while you are doing something, that's a clear sign something is problematic with your sleep. Another sign is if you fall asleep right away at bedtime – it should take a few minutes. If you fall asleep as soon as your head hits the pillow, it's a sign that you stayed up too long.

Even if you are getting enough hours of sleep, you may still be sleepy. This could be a sign of poor sleep quality, possibly caused by insomnia, either mild or more severe. The more severe type is called insomnia disorder and likely requires treatment. If you regularly need at least 30 minutes to fall asleep at the beginning of the night or if you spend more than 30 minutes awake during the night trying to sleep, you may have an insomnia disorder. The good news is the recommended treatment is not medication (which can carry troubling side effects), but rather a re-training protocol called Cognitive Behavioral Therapy for Insomnia (CBTI). Insomnia is recognized increasingly as a risk factor for obesity, heart disease and diabetes. If you have insomnia, you should consider treatment.

Sleep apnea is another common sleep disorder among both men and women and becomes more common as we get older. Untreated sleep apnea is serious, since it can lead to high blood pressure, weight gain, diabetes, heart attack and stroke. Sleep apnea involves difficulty breathing during the night and is best treated without medication. The main signs of sleep apnea are loud snoring, periods when you stop breathing while sleeping and extreme tiredness during the day.

Dr. Grandner is director of the UA Sleep and Health Research Program and assistant professor in the UA Department of Psychiatry in the University of Arizona College of Medicine - Tucson. He is board certified in behavioral sleep medicine.

In addition to getting evaluated for sleep disorders, follow these tips to improve your sleep:

- The bed should be for sleep (and sex) only. That means that you should not be spending time in bed awake. This includes laying in bed watching TV or doing other things. If you cannot sleep, get out of bed and try again later. The main risk factor for developing chronic insomnia is staying in bed tossing and turning. Get out of bed for a while and then try again to sleep.
- Keep a regular sleep schedule. Regularity can help promote healthful sleep. It's just like what happens if you eat lunch at the same time every day – your body knows when to be hungry. Sleeping at a regular time helps promote a regular sleep pattern.
- Get good bright light in the morning and avoid bright light in the evening. This helps promote a healthful circadian rhythm by promoting a strong "daytime" signal in the morning and a strong "nighttime" signal at night.
- Surprisingly, you may want to make some time for a nap. A brief nap (about 20 minutes) during the day can reduce fatigue and improve mental and physical performance. A longer nap can even replace some nighttime sleep, though you need to be careful; you want to make sure you don't wake up during "deep" sleep. If you've ever wakened from a nap and felt terrible, you possibly woke up during this deep-sleep stage. The solution is to either take a shorter nap (and avoid dropping into deep sleep) or allow yourself a couple of hours to go through a full cycle. ♥

Photo: UA HS BioCommunications

Members of the Goldman-Juneman Lab. (Back row): Danya Pradeep, graduate student; Meghna Jayaraman, undergraduate; Craig Morris, medical student; Pierce Bradley, medical student; Giuliana Repetti, medical student; and Ryan Avery, MD, associate professor, medical imaging. (Front row): Roxanne Garcia, technician; Jordan Lancaster, PhD, assistant research scientist, UA Sarver Heart Center; Steve Goldman, MD, professor of medicine, Division of Cardiology; Jennifer Koevary, PhD, research assistant professor, Department of Biomedical Engineering; and Sherry Daugherty, technician. Not pictured: Elizabeth Juneman, MD, associate professor of medicine, Division of Cardiology; Mary Kaye Pierce, NP; Grace Gorman, research technician; Ike Chinyere, medical student; and Danielle Spencer, undergraduate in biomedical engineering.

DR. STEVE GOLDMAN

Appointed to C. Leonard Pfeiffer Chair of Cardiovascular Medicine

Steve Goldman, MD, a highly productive heart research scientist and cardiology professor, was named to fill the ***C. Leonard Pfeiffer Chair in Cardiovascular Medicine*** at the University of Arizona Sarver Heart Center. Dr. Goldman most recently co-founded Avery Therapeutics, a company that is transferring technology developed in his lab at the UA Sarver Heart Center for commercial use in patients.

"Dr. Goldman's commitment to advancing translational research that bridges basic science to clinical care, mentoring young scientists and educating medical students, residents and fellows makes him an outstanding fit for the Pfeiffer chair," said **Nancy K. Sweitzer, MD, PhD**, director of the UA Sarver Heart Center and chief of cardiology.

A native of Ohio, Dr. Goldman received his undergraduate education at Cornell University and his medical doctorate from The University of Cincinnati Medical School. His residency training was at the University of Illinois, the University of Chicago and Stanford University. He completed his cardiology training at Pacific Medical Center in San Francisco. In 1975, he came to the UA and the Tucson VA, where he was chief of cardiology for 35 years.

"I thank Dr. Frank Marcus, who recruited Dr. Eugene (Gene) Morkin to the UA in 1974 to fill the C. Leonard Pfeiffer Endowed Chair of Cardiovascular Medicine, the first endowed chair in the University of Arizona College of Medicine – Tucson. Dr. Morkin was a friend, mentor, collaborator and a great tennis partner. In our work together, Gene did the biochemistry while I did the physiology, a system that worked well for us. Gene not only tried to teach me how to succeed, but also how to stay out of trouble in the world of academic medicine. There are parallels between C. Leonard Pfeiffer and my life; we were both military veterans, he attended the University of Arizona on

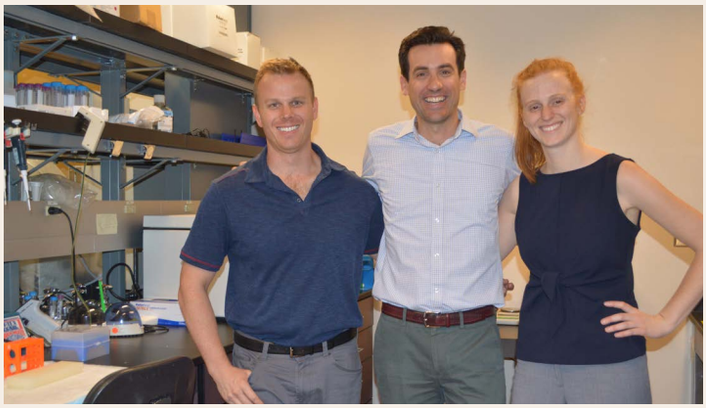
Advancing Innovation for 44 Years

The Pfeiffer Endowed Chair was the first such established at the UA College of Medicine – Tucson, in memory of C. Leonard Pfeiffer, who earned his bachelor's degree in 1940 and his master's degree in 1948 at the UA. Mr. Pfeiffer started his philanthropic support of the UA in 1946, when he established the C. Leonard Pfeiffer Collection of Contemporary American Art at the UA Museum of Art.

The Pfeiffer Research Foundation was established by his uncle and aunt, Gustavus and Louise Pfeiffer, in 1942, "to improve public health through the advancement of medicine and pharmacy." In 1972, the foundation presented Dr. Frank Marcus, then chief of cardiology, a check to establish the chair in cardiology.

Great progress has resulted from this permanent endowment in memory of C. Leonard Pfeiffer. The interest income from the endowment first supported the research program of Dr. Eugene Morkin, who was recruited to the UA in 1974 from Beth Israel Hospital in Boston and Harvard University as the first holder of the C. Leonard Pfeiffer Chair of Cardiovascular Medicine.

Now, with the appointment of Dr. Steve Goldman as the Pfeiffer chair, the legacies of Mr. Pfeiffer and Dr. Morkin live on.



Mentoring Future Physician Scientists

The Goldman-Juneman lab has a long history of mentoring award-winning translational scientists – teams who work collaboratively to bridge the flow of knowledge between patient-care settings and basic science laboratories.

The Arizona Chapter of American College of Cardiology awarded Giuliana Repetti, medical student, second place for her project, "3D Imaging." **Pierce Bradley**, also a medical student was awarded third place in the same competition for "Post-Hoc Evaluation of Immune Response." Both medical students are mentored by **Jordan Lancaster, PhD**.

Repetti is a Sarnoff Cardiovascular Research Foundation Fellow

Giuliana Repetti also was awarded a 2018-2019 Sarnoff Fellowship from the Sarnoff Cardiovascular Research Foundation. The Sarnoff Fellowship Program offers medical students the opportunity to spend a year conducting intensive work in a biomedical research facility other than the medical school in which they are enrolled. Through a highly competitive process, Sarnoff nationally seeks individuals with demonstrated intellectual and academic achievement, as well as leadership ability. The goal is to cultivate a lifelong appreciation and enthusiasm for cardiovascular research. Awardees of the Sarnoff Fellowships commonly go on to high-profile academic careers in cardiovascular medicine.

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the GI bill. I was a Navy doc with the Marine Corps in Vietnam and I did my cardiology fellowship on the GI bill," said Dr. Goldman.

For the past 40 years, the Goldman laboratory has focused research on heart failure (HF), its causes and development of new treatments. "As a result, we now have a new way to treat HF using induced pluripotent stem cells (iPSC) derived from cardiomyocytes," Dr. Goldman said.

This research builds on the work of John Gurdon and Shinya Yamanaka who were awarded the Nobel Prize in 2012 for creating iPSCs, showing that adult cells can be reprogrammed to become stem cells capable of being then differentiated into any specific cell-type of interest, no matter what cell type they were when the process started.

"The Nobel Prize work provided us with the technology to create new heart cells and use these cells to treat heart failure. We have shown that we can effectively treat heart failure in laboratory models of disease by creating a tissue-engineered cardiac graft composed of specialized cells grown on a matrix," Dr. Goldman said.

In 2014, Dr. Goldman collaborated with Jordan Lancaster, PhD, to co-found a UA biotech spin-off company called Avery Therapeutics to commercialize this work.

His research laboratory has received funding from the UA Sarver Heart Center, Tech Launch Arizona, the Veterans Administration, National Institutes of Health, American Heart Association, the Arizona Biomedical Research Commission, the biotechnology industry and private foundations. His laboratory has supported the development of several young investigators.

"The support from the C. Leonard Pfeiffer Chair will allow us to continue our research in regenerative medicine and to support young investigators at the University of Arizona. We are very proud of the collaborative atmosphere in our laboratory, where senior scientists and young students work side-by-side, sharing ideas and doing experiments. We have high school students, university undergraduates, medical students, MD/PhD students, post-doctoral students and professors in the lab. We will use the C. Leonard Pfeiffer funds for their support and the support of new research projects," said Dr. Goldman.

"I am appreciative and humbled to be awarded the C. Leonard Pfeiffer Chair. I thank Drs. Nancy Sweitzer, Monica Kraft, and Chuck Cairns for supporting my nomination for this award. Most importantly, I appreciate the ongoing support from Dr. Kathy Reed." ♥

Dr, Jennifer Cook showing the location of the implanted CardioMEMS device on Deborah Martinez.

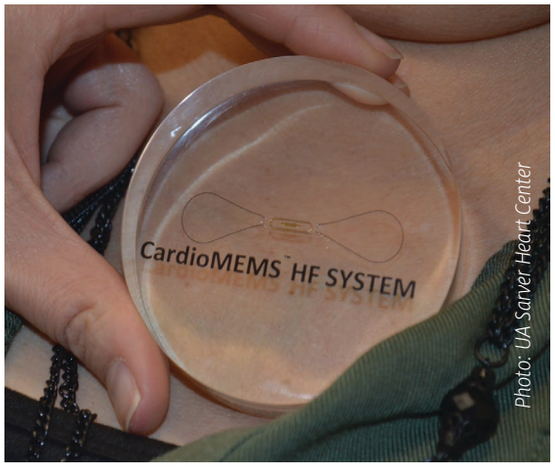
SMALL, IMPLANTABLE DEVICE GIVES PATIENT WITH ADVANCED HEART DISEASE

LIFE-SAVING DATA

About 12 years ago, **Deborah Martinez** was admitted to Mt. Graham Hospital in Safford, Ariz., with pneumonia. "An echocardiogram showed I had heart disease, but it didn't really affect me until about two years ago when I became really sick," said Deborah, age 58. She has a genetic condition called hypertrophic cardiomyopathy, which leads to thickening of the heart muscle, often making the heart stiff and less able to relax and fill with blood.

She was hospitalized five times due to worsening advanced heart disease, often called heart failure. "I spent two months in the hospital during May and June 2017. I was given six months to live, but Dr. Cook saved my life," said Deborah.

Jennifer Cook, MD, associate professor of medicine at University of Arizona Sarver Heart Center and a board-certified advanced heart failure and transplant cardiologist, recommended the CardioMEMS device to monitor Deborah's



From left: Frank Martinez, son Francisco Martinez, Deborah Martinez and Angelica Lentner, NP

condition while at home. This device—an implantable hemodynamic monitoring system—measures blood pressure in the lungs, information health professionals use to adjust medications to meet her specific needs.

"The entire device is about 2 inches long - two wires that form a loop around a chip – and is implanted through the veins. From their homes, patients can record heart pressure measurements by simply lying down on a specially designed pillow. Information from the device is sent electronically and can be viewed by the patient care team online," explained Dr. Cook. In a recent clinical trial, CardioMEMS reduced hospital admissions by 37 percent.

Dr. Cook, in collaboration with the UA Sarver Heart Center Clinical Research Program, has developed a network of cardiologists at five Banner hospitals that implant CardioMEMs. This group has established favorable outcomes among patients who seek heart failure care at Banner hospitals. "We are working together to make the future brighter for heart failure patients across Banner," said Dr. Cook. Currently more than 20 patients at Banner hospitals have CardioMEMS implanted.

"For me this has been life-changing," said Deborah. "Since I have COPD (chronic obstructive pulmonary disorder) and heart disease, the doctors are not always sure whether they need to treat my heart or my lungs. CardioMEMS removes the guesswork."

Since the device was implanted, Deborah has received calls from **Angelica Lentner, NP**, an acute care nurse practitioner with Banner – UMC Tucson who monitors the patient data transmitted via the CardioMEMS system.

"Angelica tells me whether to increase or decrease my diuretics, depending on the pressure in my lungs. It gives me tremendous peace of mind." With better management of fluid levels, Martinez has been able to maintain a weight loss of 70 pounds.

Martinez enjoys an active life with her family, including Frank, her husband of 39 years, who recently re-proposed to her. They have two sons and several grandchildren. She enjoys hip-hop concerts, arts and crafts, and fishing and camping trips. "We're planning a trip to Hawley Lake this summer and I need to figure out where I get cell service so I can take the CardioMEMS readings. I never miss a reading." ♥

TAVR TEAM SURPASSES 300TH TRANSCATHETER

AORTIC VALVE REPLACEMENTS

Kathleen Rothwell, a 73-year-old woman from Silver City, N.M., became the 300th transcatheter aortic valve replacement patient when she was referred to the University of Arizona Sarver Heart Center cardiology team at Banner – University Medical Center Tucson to treat aortic stenosis and coronary artery disease. Her Silver City cardiologist diagnosed her with stage 4 heart failure.

As is typical of too many women with heart disease, Kathleen cared for others in her family and didn't make time to go to the doctor, blaming her breathlessness on other things.

"When I lived in Miami and couldn't breathe, I blamed it on the heat, humidity and general congestion of that big city. When I moved to Silver City, I blamed it on the elevation. I was experiencing breathlessness for two years before I went to a doctor." "I no longer feel out of breath. It's a miracle." ♥

The TAVR team at UA Sarver Heart Center and Banner University Medical Center – Tucson who cared for Kathleen Rothwell (center) included (from left) Kristie Fry, NP, Samata Paidy, MD, Toshinobu Kazui, MD, PhD, Ranjith Shetty, MD, Kapil Lotun, MD, and Devan Lodge, RN, MSc, CCRN.

STRUCTURAL HEART CARDIOLOGISTS SEEING PATIENTS IN GREEN VALLEY

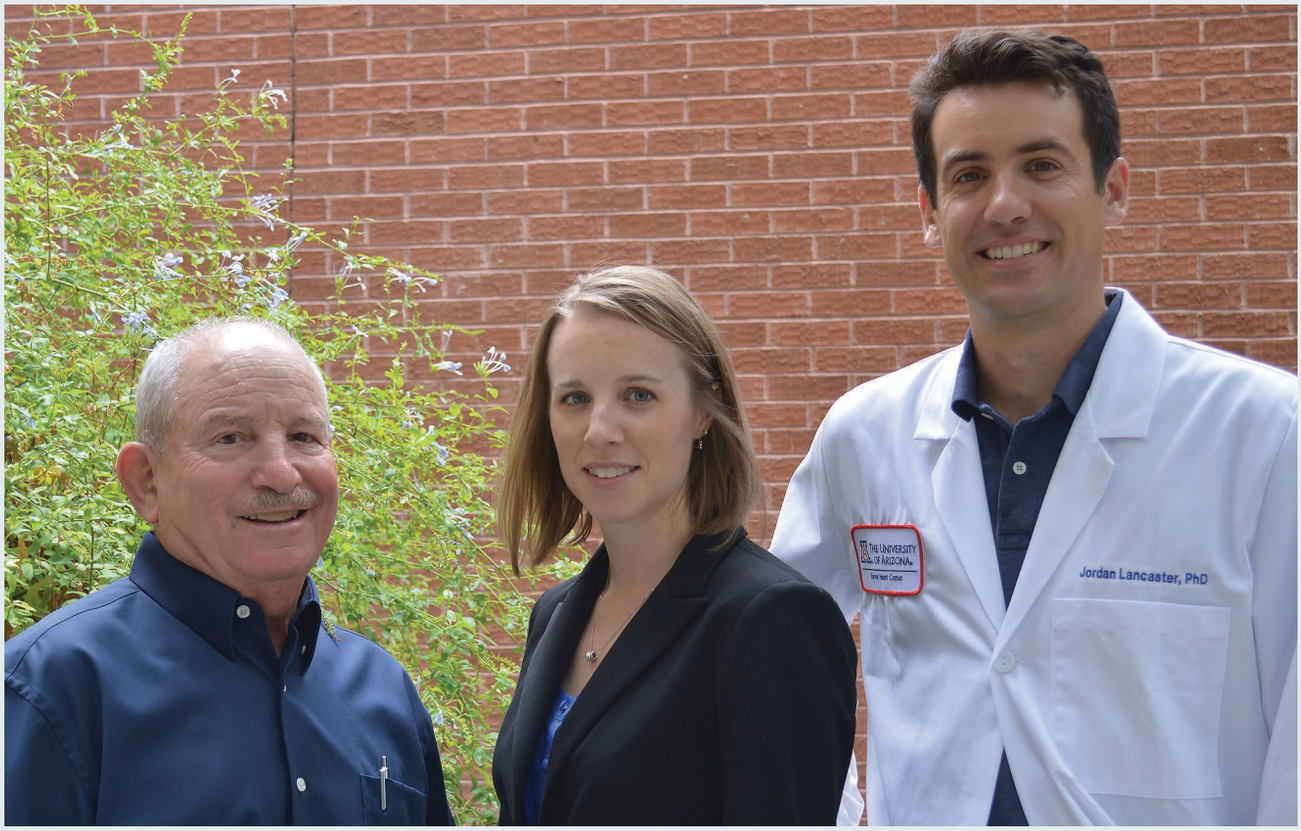
Patients now can see cardiologists from the UA Sarver Heart Center Structural Heart Program at the **Banner - University Medicine MultiSpecialty Clinic** in Green Valley.

Drs. Lotun and Shetty provide general cardiology care plus evaluations and follow-up specialty care for transcatheter aortic valve replacement (TAVR), transcatheter mitral valve repair, left atrial appendage closure for selected patients with atrial fibrillation and catheter-based closures for other structural heart conditions. Please call **Kimberly Emmons** at 520-694-4686 to schedule an appointment. The Green Valley clinic is at 1141 S. La Canada Drive.

MEMBER UPDATES

Avery Therapeutics Selected for Bioscience Entrepreneurship Program

The Tucson startup company conducted its foundational research in a University of Arizona Sarver Heart Center Lab.



Avery Therapeutics principals have UA roots. From left: Steve Goldman, MD, Jen Watson Koevary, PhD, and Jordan Lancaster, PhD.

Avery Therapeutics is one of six Arizona startup firms selected by the Flinn Foundation to participate in its **2018 Bioscience Entrepreneurship Program**. Each firm receives $30,000 in funding support for expenses related to grant proposals, patent work, equipment or developing business plans.

Avery, the only Tucson-based startup selected in the 2018 program, has its roots in a University of Arizona Sarver Heart Center lab. **Steve Goldman, MD**, professor of medicine and the C. Leonard Pfeiffer Endowed Chair of Cardiovascular Medicine, collaborated with **Jordan Lancaster, PhD**, an assistant research scientist at UA Sarver Heart Center who obtained his doctoral degree from the UA College of Medicine – Tucson Department of Physiology. They co-founded **Avery**.

Dedicated to advancing tissue-engineered therapeutics to treat diseases of, and injuries to, human heart muscle, Avery's lead product, MyCardia, is a tissue-engineered heart graft developed to treat heart failure. It is in the pre-clinical development phase, meaning that critical laboratory studies are being conducted with an eye toward moving the therapy into human disease in the near future.

MyCardia is positioned to be among the world's first off-the-shelf product for treating heart failure, said Dr. Goldman, Avery's chief medical officer. Jen Watson Koevary, PhD, Avery's chief operating officer, earned her doctorate from UA Biomedical Engineering, where she now is a research assistant professor.

Nancy Sweitzer, MD, PhD, was an invited distinguished international speaker at the Egyptian Cardiology Association's CardioEgypt 2018 meeting in Cairo, speaking on Biomarkers in Heart Failure: The Old and the New, Cardiogenic Shock: The Evolution of Patient and Device Selection for Acute Circulatory Support and HFpEF : Novel therapies: hope or dream?

Dr. Sweitzer also has been an invited speaker at:

- University of California San Francisco 34th Annual Advances in Heart Disease, speaking on HFpEF – Classification into Phenotypes, and Management of Right Ventricular Failure
- Fifth Annual Utah Cardiac Recovery Symposium
- Cardiovascular Medicine Grand Rounds, University of Colorado, Denver
- Cardiovascular Medicine Grand Rounds, Wake Forest University

She continues her work as a member of the National Heart, Lung and Blood Institute's Clinical Trials study section, a branch of the National Institutes of Health, involved in evaluating the scientific merit of proposed large clinical research trials in heart disease. She has had multiple scientific publications in the past six months related to her work in large clinical trials in heart failure. She is editor in chief of the prominent heart failure scientific journal *Circulation: Heart Failure*, and in that role is increasing engagement of the community of young heart failure scientists in the journal using digital strategies and social media. Follow her on Twitter @DrNancySweitzer.

Dr. Sweitzer also co-authored with **Dr. Sophia Airhart** an editorial in *Circulation* on the importance of managing potassium levels to improve outcomes for heart failure patients.

Nancy Sweitzer, MD, PhD

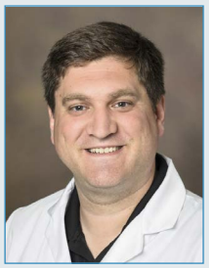
Sophia Airhart, MD

Sophia Airhart, MD, assistant professor of medicine, launched the University of Arizona's participation in the Global Congestive Heart Failure Registry, which is a multicenter study that will explore demographics, socioeconomic and clinical factors, etiologies, pathophysiology, management, barriers to care and outcomes in heart failure patients. The goal is to gain more knowledge about the current state of heart failure to direct future gains in prevention and treatment of this global disease.

Khadijah Breathett, MD, MS

Khadijah Breathett, MD, MS, assistant professor of medicine, is the lead author on four recent publications, including "Factors Related to Physician Clinical Decision-Making for African American and Hispanic Patients: A Qualitative Meta-synthesis," *Journal of Racial and Ethnic Health Disparities*; "Same Story, Different Disease: It's Time to Change the Storyline for Racial Minorities and Patients of Lower Socioeconomic Status," *Circulation: Heart Failure*; "Pilot Randomized Controlled Trial to Reduce Readmission For Heart Failure Using Novel Tablet and Nurse Practitioner Education," *American Journal of Medicine*; also presented as a poster presentation at International Society of Heart and Lung Transplantation; "African Americans Are Less Likely To Receive Care By A Cardiologist During An Intensive Care Unit Admission For Heart Failure," *JACC Heart Failure*.

Dr. Breathett also was appointed to the Oversight Advisory Committee for the American Heart Association Strategically Focused Vascular Disease Research Network and collaborated with Imo Ebong, MD, a graduated cardiology fellow on "Treating Heart Failure in the African American Patient," a guideline for providers published by the American College of Cardiology.



Michael Grandner, PhD

Michael Grandner, PhD, assistant professor of psychiatry and director of the UA Sleep and Health Research Program, was awarded a $3.6 million grant from National Institute on Minority Health and Health Disparities of the National Institutes of Health to study sleep health on the U.S.-Mexico Border. "The Nogales Cardiometabolic Health and Sleep Study" seeks to learn more about sleep health and sleep disorders in the border region, how sleep issues are related to social, behavioral and environmental factors and their potential role as risk factors for cardiovascular disease and diabetes.

Julia Indik, MD, PhD

Julia Indik, MD, PhD, professor of medicine, was named Performance Question Editor-in-Chief for the American College of Cardiology's Collaborative Maintenance Pathway, which is a new endeavor that will encompass all of the ACC's Self-Assessment Program products. She also co-authored a chapter with Dr. Frank Marcus: Arrhythmogenic Right Ventricular Cardiomyopathy, in a book titled Heart Failure in the Child and Young Adult: From Bench to Bedside, Academic Press, ELSEVIER, 2018, pp. 291–296.

Raj Janardhanan, MD

Raj Janardhanan, MD, was promoted to professor of medicine, and has been invited to present at the American Society of Echocardiography 2018 Scientific Sessions. He also presented at the Indian Academy of Echocardiography, American College of Cardiology Scientific Sessions (poster presentation with Kris Kumar, MD, resident, and Arun Kannan, MD, fellow), California Nuclear Cardiology Society and World Echo Conference in Varne, Bulgaria.

Karl B. Kern, MD

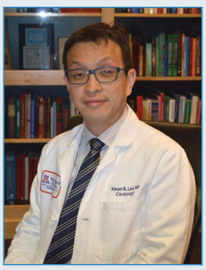
Karl B. Kern, MD, professor of medicine, was the keynote speaker at the second International CPR Conference of the Saudi Heart Association in November, and an invited international speaker at the 29th Annual Conference of the Saudi Heart Association Conference in March. He also was the plenary speaker at the Emergency Cardiovascular Care Update (ECCU) Conference in New Orleans in December; invited speaker for medicine ground rounds at Mercy San Juan Medical Center in Sacramento, Calif., in February; and delivered the Cleman's Lecture at Yale University/Yale New Haven Hospital on March 27, a prestigious lecture series in honor of Dr. Michael Cleman, director of the Yale New Haven Hospital cardiac catheterization lab for more than 30 years.

Jordan Lancaster, PhD

Jordan Lancaster, PhD, was promoted to assistant research professor in the UA College of Medicine - Tucson, Division of Cardiology.

Kwan Lee, MD, associate professor of medicine and associate chief of cardiology, was inducted as president of the Arizona Chapter of the American College of Cardiology.

Kapil Lotun, MD, was promoted to professor of medicine in the UA College of Medicine – Tucson, Division of Cardiology.



Kwan Lee, MD

Frank Marcus, MD, professor emeritus, was an invited speaker at the Family Support Meeting "Advances in the Diagnosis and Treatment of ARVC" in San Francisco in January. He also wrote a chapter in ECG Masters Collection: Favorite ECGs from Master Teachers Around the World. He is an author on a published manuscript in the journal *Circulation:* Risk stratification in Arrhythmogenic Right Ventricular Cardiomyopathy (ARVC).

Sharon Morgan, DNP, FNP-BC, AGACNP-BC, and her mentor, **Kwan Lee, MD**, associate professor of medicine, received first place among nurse practitioners for their research poster, "Improving patient safety by decreasing hospital readmissions of cardiology patients using Re-Engineered Discharge (RED) Toolkit (discharge phone calls)." The winning entry was presented at the American College of Cardiology national conference in Orlando, Fla., in March. Dr. Morgan also was inducted as an associate of the American College of Cardiology.

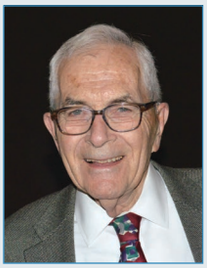
Kapil Lotun, MD

Marvin J. Slepian, MD, professor of medicine and biomedical engineering, is president-elect of American Society for Artificial Internal Organs (ASAIO). He co-chaired a bioengineering session, "Bleeding and von Willebrand Factor," at ASAIO 2018.

Dr. Slepian, who also is director of Arizona Center for Accelerated Biomedical Innovation, associate department head of biomedical engineering and the McGuire Scholar in the UA Eller College of Management, was part of the University of Arizona's delegation at the 2018 KU-UA Joint International Symposium at Korea University in Seoul. The goal is to foster research collaborations between the two universities.

Marvin J. Slepian, MD, with Frederic Zenhausern, PhD, UA College of Medicine – Phoenix, at the 2018 Korea University-University of Arizona Joint International Symposium.

Other invited presentations for Dr. Slepian included the 38th International Society for Heart Lung Transplantation in Nice, France; Swedish Heart and Vascular Center in Seattle; University of Southern California Surgery; 2018 Society for Thoracic Surgery – INTERMACS Meeting in Chicago; and C3 Complex Cardiovascular Catheter Therapeutics Conference in Orlando, Fla.



Frank Marcus, MD

Huu Tam Truong, MD, assistant professor of medicine, received American Heart Association's Young Investigator Award at the 2017 Scientific Session for his presentation, "Combining Mechanical Chest Compressions with a Percutaneous Left Ventricular Assist Device Improves Favorable Neurological Function after Cardiac Arrest in a Large Animal Catheterization Laboratory." His mentors were Karl Kern, MD, and Kapildeo Lotun, MD.

Sharon Morgan, DNP, FNP-BC, AGACNP-BC
Kwan Lee, MD

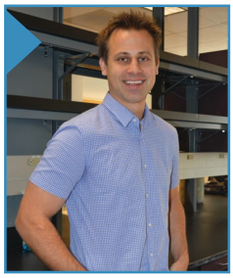
Huu Tam Truong, MD, receives AHA young Investigator Award.

WELCOME NEW SARVER HEART CENTER

MEMBERS

The Sarver Heart Center membership continues to expand as talented new faculty join the University of Arizona.

Rupa Bala, MD, associate professor in the UA College of Medicine – Tucson, Division of Cardiology, joined the UA Sarver Heart Center from Oregon Health and Science University, where she was the director of complex ablation in the Department of Electrophysiology at the Knight Cardiovascular Institute. Following medical school at Georgetown University School of Medicine, where she graduated cum laude in 1998, Dr. Bala completed her internal medicine residency at the University of Chicago Medical Center. She then completed a cardiology fellowship and electrophysiology fellowship at the Hospital of the University of Pennsylvania in Philadelphia, Penn. Dr. Bala is board certified in internal medicine, cardiovascular disease and electrophysiology.



Jared Churko, PhD, assistant professor of cellular and molecular medicine and director of the University of Arizona Induced Pluripotent Stem Cells (iPSC) Core, joined the University of Arizona and the Sarver Heart Center in April 2018. Previously he was with Stanford University's Cardiovascular Institute, where he was an instructor. Dr. Churko's laboratory is involved in the study of heart muscle disease, combining systems biology, stem cell biology, cardiac biology, genetic engineering and bioinformatics to understand mechanisms leading to heart disease. His appointment as director of the UA iPSC Core is a collaborative effort, funded in part by the BIO5 Institute and the UA Center for Innovation in Brain Science. Human induced pluripotent stem cells can be differentiated into many cell types, including beating heart muscle cells, with potential for developing targeted and individualized, or "precision," treatments.

Joel B. Holland, MD, associate professor of medicine, joined the Division of Cardiology in March 2018. A clinical cardiologist who primarily sees patients at Banner-University Medicine North, Dr. Holland joined the UA from the Cleveland Clinic Foundation. His clinical interests include echocardiography, valvular heart disease and adult congenital heart disease. He has extensive expertise and experience in the use of different forms of echocardiography to evaluate patients for mitral valve repair and to optimize surgical outcomes.

Craig Weinkauf, MD, PhD, assistant professor of surgery in the Division of Vascular Surgery, treats patients with vascular disease, including carotid, aortic and lower extremity atherosclerotic disease, in addition to venous and lymphatic disease. Dr. Weinkauf's research program is focused on understanding and improving treatment of carotid (neck blood vessel) atherosclerotic disease using advanced non-invasive imaging and molecular biology, with strong implications for stroke care. Dr. Weinkauf completed his MD/PhD at Tufts University School of Medicine, where he received his PhD in immunology. He then completed his training in vascular surgery at the UA in 2017.

Nancy Sweitzer, MD, PhD (center), director of the UA Sarver Heart Center and chief of cardiology, congratulates award recipients, from left: Elise Vo, MD, Jack Rusing, MD, Mathew Bull, MD, and Nathan Coffman, MD.

ADVANCING THE NEXT GENERATION OF
PHYSICIAN SCIENTISTS

The Zenas B. Noon Award of Excellence in Cardiology is given to medical students with outstanding performance in their cardiology rotations. The 2018 recipients are two recent UA College of Medicine – Tucson graduates:

Mathew Bull, MD, PhD, an internal medicine resident at the UA College of Medicine – Tucson, completed the MD/PhD program in the laboratory of Henk Granzier, PhD. Dr. Bull continues to study how stress and strain on the giant sarcomeric protein titin regulate hypertrophy signaling - the cell connections that cause the heart muscle to enlarge. He plans to pursue a cardiology fellowship after he completes the residency program: "I aspire to become a leading scientist in cardiovascular research with the purpose of investigating questions directly impacting the patients under my care."

Jack Rusing, MD, now an internal medicine resident at St. Joseph's Hospital and Medical Center in Phoenix, is a Prescott native who obtained a biology degree from Point Loma Nazarene University in San Diego, before returning to Arizona to complete his medical degree at the UA College of Medicine – Tucson. "During rotations in cardiothoracic surgery, heart failure, cardiology consult and the coronary care unit, I saw the cutting edge of medicine being used to save many individuals, including the use of a total artificial heart. I also saw the impact cardiovascular disease is having on the American population and became more interested in the preventative aspect of medicine. My goal is to work as a primary care physician in a rural town."

The Charles W. Hall, Jr., and Virginia C. Hall Memorial Awards recognize amazing residents on the coronary care unit rotation at Banner – University Medical Center Tucson.

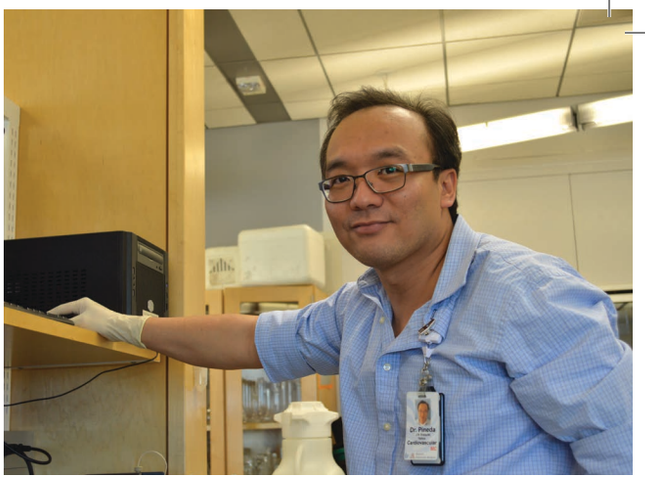
Elise Vo, MD, born and raised in Vietnam, came to the United States in 2005. "I am a Wildcat through and through - undergrad, med school and now residency. A third-year internal medicine resident, she plans to apply for a cardiology fellowship this year. "My current research is about CPR and chest diameter with Dr. Nancy Sweitzer," said Dr. Vo. Within the field of cardiology, she is interested in heart failure, adults with congenital heart disease and cardiac resuscitation.

Nathan Coffman, MD, is an internal medicine resident who came to the UA following medical school at the University of Colorado School of Medicine and his undergraduate degree at the University of Colorado at Boulder.

"I'll be staying with the University of Arizona internal medicine program through 2020 as a chief resident. My plans after that are not yet fully decided but I will likely be applying for fellowship in cardiology."

Arizona Chapter, American College of Cardiology Research Winner

J.R. Exequiel "Keng" Pineda, MD, PhD, was awarded first place at the Arizona Chapter of the American College of Cardiology annual meeting for his research poster, "Persistent Fetal Cardiac Troponin." Dr. Pineda, whose research mentor is Jil C. Tardiff, MD, PhD, will continue his research as a clinical and research fellow at University of Arizona/Banner UMC-Tucson. (See page 6 for more on the second and third place awards to Giuliana Repetti and Pierce Bradley.)



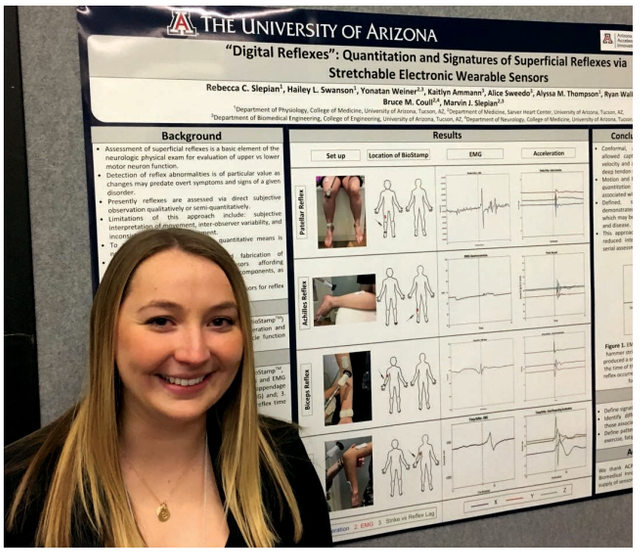
Students from Slepian Lab Presented at ASAIO 2018

Students and staff from Dr. Marvin Slepians's lab were well represented at the American Society for Artificial Internal Organs (ASAIO); (*from left*) Sanga Shir, Yana Rokka-Moiia, PhD, John Jackson, MBA, Kaitlyn Ammann, Daniel Palomares and Alice Sweedo.

Presentations included:

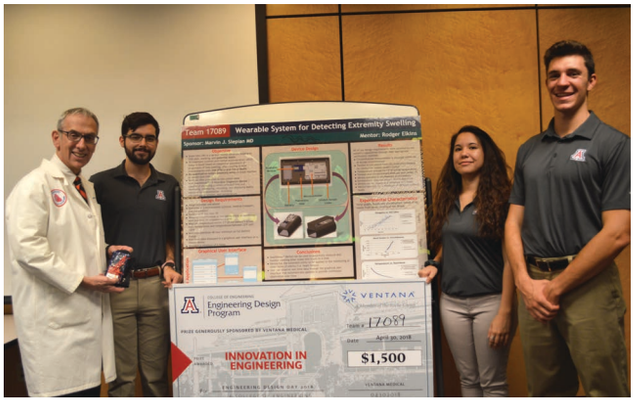
- Galvanotaxis: An Electroceutical Strategy for Modulating Cell-Selective Migration
- The Six-Minute Walk Test Revisited: A Human Motion Study of Heart Failure Patients
- Inventive Knowledge Flow: Tracking the Progress of Biomedical Innovation
- PVAD: A Linear, Pulsatile, Peristaltic Ventricular Assist Device Mechanism
- The Molecular Signature of Dynamic Shear-Mediated Platelet Activation in Mechanical Circulatory Support
- Platelet Membrane Fluidity: A Mechanistic Component of Shear-Mediated Platelet Activation

Rebecca Slepian, a recent graduate from the UA Department of Physiology, presented a poster at ASAIO, "Digital Reflexes: Quantitation and Signatures of Superficial Reflexes via Stretchable Electronic Wearable Sensors - a novel strategy and method to digitize the neurologic reflex exam," with Sarver Heart Center members Marvin Slepian, MD, (her father) and Bruce Coull, MD.



Biomedical Engineering Team Wins Ventana Medical System Award

Will SwellSense™ take the bite out of snakebite as well as the guess work out of limb swelling in heart failure patients? That was the question posed by the UA College of Engineering design team that conducted much of their research in Dr. Marvin Slepian's laboratory in the UA Sarver Heart Center. They won $1,500 from "Innovation in Engineering" sponsor, Ventana Medical, during the UA College of Engineering's Senior Engineering Design Day for their project, "Wearable System for Detecting Extremity Swelling." Besides providing accurate measurements to guide anti-venom treatment for snakebites, the technology also has potential applications for monitoring edema in heart failure patients.



Dr. Marvin J. Slepian with members of the UA College of Engineering "Innovation in Engineering" design team members: Jacob Toman-Ibarra, electrical and computer engineering, Venus Slag, systems engineering, Jacob Wait, engineering management. Team members not pictured: Greg Wheeler, biomedical engineering, David Johnson, biomedical engineering, and Laine Vasquez, seamstress.

THE UNIVERSITY OF ARIZONA HEALTH SCIENCES
Sarver Heart Center

The University of Arizona
Health Sciences
Sarver Heart Center
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Cardiology Fellowship Graduates 2018

Congratulations to these graduates of the University of Arizona Sarver Heart Center.

Graduates of the 2018 Cardiovsacular Medicine Fellowship (from left) Arun Kannan, MBBS, Imo Ebong, MBBS, MS, Candice Kim, MD, Hyon-he Garza, MD, J.R. "Keng" Pineda, MD, Preethi William, MBBS.

The 2018 Cardiovascular Medicine Fellowship Program graduated six new cardiologists, who have the following plans:

- Imo Ebong, MBBS, MS, will continue her training in the advanced heart failure and transplant fellowship at University of Chicago.
- Candice Kim, MD, will join a private practice in Temecula, Calif.
- Arun Kannan, MBBS, will pursue a clinical cardiac electrophysiology fellowship at University of Chicago.
- Preethi William, MBBS, will attend the University of Utah for an advanced heart failure and transplant fellowship.
- J.R. Exequiel Pineda, MD, PhD, will continue as a clinical and research fellow at the University of Arizona/Banner – UMC-Tucson.
- Hyon-he Garza, MD, will remain at the University of Arizona to pursue a clinical cardiac electrophysiology fellowship.

Interventional cardiology graduating fellows joined family and faculty members to celebrate this important milestone in their cardiology careers. From left: Ayesha H. Chaudry, Taimoor Hashim, MBBS, graduate, Kapil Lotun, MD, director of the Interventional Cardiology Fellowship Program, Madhan Sundaram, MD, clinical assistant professor at Southern Arizona Veterans Affairs Health Care System, Kapil Yadav, MBBS, graduate, Megha Sharma, Huu Tam Truong,MD, assistant professor of medicine, SAVAHCS, Esther Truong.

The 2018 Interventional Cardiology Fellowship Program graduated two fellows:

- Taimoor Hashim, MBBS, will pursue a structural heart fellowship at the University of Alabama in Birmingham.
- Kapil Yadav, MBBS, will be an interventional cardiologist at Baptist Health in Little Rock, Ark.

Faculty awards from the graduates included:

- Fellowship mentor of the year: Mark Friedman, MD
- Procedural teaching faculty of the year: Tam Truong, MD
- Lecturer of the year: Peter Ott, MD
- Clinical teaching faculty of the year: Mark Friedman, MD
- Favorite attending to be on call with this year: Kapil Lotun, MD

The graduating fellows also named two first-year cardiovascular medicine fellows to receive a Professionalism Award: Bishnu Dhakal, MBBS, and Kristina Skinner, DO.

Faculty from the Southern Arizona Veterans Affairs Health Care System awarded the VA cardiology fellow of the year to Preethi William, MBBS.