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DNA

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Focus on Research

Getting to the heart of what matters for patients

In the operating room, whether it involves repairing an aneurysm or fixing an aortic valve by surgery or catheter based approaches, cardiac surgeon Dr. Elaine Tseng focuses on small areas of the heart with the utmost precision.

In the laboratory, however, the NCIRE-supported researcher utilizes computational models to look at the "big picture." Even though the surgeries of her expertise are successful using today's standards, Tseng constantly ponders questions such as: How can we better predict which aneurysm patients are at risk of dying and offer surgery earlier? Are there less invasive ways—even non-surgical—to mend damaged hearts? How can physicians predict and manage a patient's heart disease as they age?

"Research is never stagnant," said Tseng, Chief of Cardiothoracic Surgery at the San Francisco VA Health Care System (SFVAHCS) and University of California, San Francisco (UCSF) Professor of Surgery. "Answer one question, and then there's something else to explore. That's the nature of research."

Elaine Tseng, MD

Co-Director
Cardiac Biomechanics Laboratory
University of California, San Francisco

Professor of Surgery
University of California, San Francisco

Chief of Cardiothoracic Surgery
San Francisco VA Health Care System

Career path

From a young age, Tseng seemed destined to be an academic, a scientist, and a physician. Both of her parents were college professors. She attended high school at the North Carolina School of Science and Mathematics, a prestigious residential public school, where talented students find their niche and potential in STEM. At the age of 16, Tseng began her college eduction at the Massachusetts Institute of Technology (MIT), where she graduated Phi Beta Kappa with a 5.0 GPA.

Yet, between high school and college, an undiagnosed myocarditis had inflamed her heart, causing it to fail. She was transported by helicopter from her hometown in North Carolina to Duke University Medical Center, where she eventually recovered. After that near-death experience and medical care, Tseng decided that she would become a cardiologist.

After MIT, Tseng attended Harvard Medical School in its Health Sciences and Technology Division with the intent of going into cardiology. Becoming a surgeon was not her original plan. Her first clinical rotation was in surgery, and she took an elective course in thoracic surgery. During that time, mentors suggested she had the talent and aptitude for the arduous specialty.

"I did become fascinated with surgery and how the surgeons worked so calmly," said Tseng. "I asked to scrub into as many heart surgeries as possible. It didn't matter that pre-rounds started at 4:30am and that sometimes we didn't get out of the operating room until 10pm. It was exciting to be there; and I decided I wanted to really do this."

Eventually, she completed an integrated residency in general surgery and a fellowship in cardiothoracic surgery at Johns Hopkins University, where she received multiple honors. Wanderlust sparked her journey in 2002 to San Francisco. "I had grown up in the south, and I had been in the Northeast and Mid-Atlantic," said Tseng. I just wanted to explore the West Coast. I sent out letters and my CV to every academic institution in California."

At the time, there were few jobs for cardiothoracic surgeons and researchers. Luckily, a UCSF/SFVA Medical Center position opened, and Tseng would carve out her own successful research and clinical career.

Aortic heart valves

When she arrived in San Francisco, a groundbreaking technology—transcatheter aortic valve replacement (TAVR)—was published as a first-in-man study. A new era had emerged, and TAVR would be undergoing clinical trials for the next two decades. TAVR is a minimally invasive procedure for aortic valve stenosis, whereby a metal stent with a new valve inside is expanded to open the diseased aortic valve and allow the new valve to function. It does not require open heart surgery and is the most common heart valve disease in older people. It occurs when the aortic valve thickens due to excessive calcium buildup, and as a result, the valve cannot fully open causing the heart to struggle to pump through the small opening, which eventually leads to failure.

Before TAVR, the gold standard to treat severe aortic stenosis was surgical aortic valve replacement, which requires opening the chest cavity and placing the patient on cardiopulmonary bypass.

Tseng, whose expertise and interest were in aortic disease, recognized the demand for TAVR early on. "This was going to revolutionize the field of cardiac surgery," she said. "But I needed to fully understand this from the science perspective."

TAVR indeed is a better, safer option than open-heart surgery for many elderly patients. There were, however, some questions that needed answers: Would the TAVR migrate because it was not sewn in? Would it work inside other diseased valves such as prior surgical aortic tissue valves that failed? Was it durable and for how long?

In order to understand if the TAVR would migrate, Tseng developed computational models to simulate what happens in patients after a TAVR with leaking instead of blocked aortic valves. Her team found that the risks for migrating into the ventricle were much greater than the aorta, and those results helped to explain how TAVR oversizing and the friction from the calcified stenotic valves were required for TAVR. New designs would be required for TAVR to effectively function in leaking noncalcified valves as those designs are working towards FDA approval.

Since TAVR at the time was for higher risk surgical patients, Tseng wondered about the effectiveness of TAVR in failed surgical valves. The team tested home-built TAVRs within failed surgical tissue valves and proved TAVR effectiveness but only if the surgical valve was large enough (23 milimeters or greater). This pioneering work opened TAVR to the field of valve-in-valve implantation for failed surgical valves. The procedure has indeed revolutionized the treatment of aortic stenosis, but still many questions remain—especially about durability—as TAVR over the years has become increasingly utilized.

Engineering simulations show that surgical aortic valve replacement (SAVR) valves should have greater longevity than TAVRs—up to 20 years compared to up to 8 years for TAVRs, depending on the device. An older patient whose remainig lifespan is 8-10 years may find a TAVR to be suitable, however, a younger patient in their mid-60s to 70s may not want another valve replacement in less than 10 years. In this case, they may opt for the longer-lasting surgically placed valve. TAVR may not be ideal for them if they are not candidates for TAVR-in-TAVR when the first TAVR fails.

Today, the Cardiac Biomechanics Lab—located at the SFVAHCS and co-directed by Tseng—is developing new devices to cut and remove TAVR leaflets without

open heart surgery, which would allow TAVR-in-TAVR for such patients above when TAVR fails over time. TAVR patients would have the opportunity to have nonsurgical options in lifetime management of aortic valve disease.

Aortic aneurysms

While studying aortic valve replacement, Tseng started to look at aortic aneurysms. The ascending aorta, which extends upward from the aortic valve, carries oxygenated blood from the heart to the rest of the body. When it becomes enlarged, it can tear (dissect) or rupture, causing internal bleeding, severe pain, a rapid drop in blood pressure, a rapid heart rate, and shock. If not treated quickly, it can be fatal. Some 30,000 people in the U.S. are diagnosed with an ascending thoracic aortic aneurysm (aTAA) every year; and it is the 16th leading cause of death in patients over age 35.

Patients with these aneurysms are closely monitored, and current guidelines suggest elective surgical repair if the aneurysm grows to 5.5 centimeters or more in diameter. Tseng wrote additional thresholds for elective surgery in the new 2022 American Heart Association guidelines. Nonetheless, she realized these criteria were based upon single center limited data that had not been validated across diverse populations. And yet, the thresholds had altered natural history and now the vast proportion of dissection patients— approximately 60 percent and greater—dissected or ruptured when their aneurysms were smaller than 5.5 and even 5 centimeters.

"From a biomechanics perspective, a rupture or dissection is a biomechanical failure that can occur when aneurysm wall stress exceeds wall strength," said Tseng, who has successfully received NIH R01 funding as a surgeon-scientist. "Our published studies showed that diameter is a poor predictor of wall stress."

Now, the Cardiac Biomechanics Laboratory is developing state-of-the-art computational models using data from Veteran patients with aTAA to analyze aortic wall stress using finite element analysis. They have shown that peak longitudinal wall stress correlates with all-cause mortality. Their findings could help improve criteria for elective aTAA surgical repair by tailoring risk assessment to individual patients, said Tseng, whose current aTAA research is funded through a VA Merit Award.

Comprehensive data empowers smarter strategies, and Tseng is the UCSF/SFVAHCS site-principal investigator for a multi-institutional international randomized trial of surgery versus surveillance of 5.0-5.4 centimeters aTAA.

The role of an academic

Even though there is never enough time in any day, Tseng relishes being an academic, and her roles as a clinician, researcher, and teacher/mentor. She also believes it is her job as a scientist to challenge the status quo and discover evidence-driven development of modern guidelines to supersede outdated recommendations.

"Most of us clinicians have fulfilling careers by fixing something," said Tseng. "We bypass blocked arteries, replace diseased heart valves, remove aneurysms for example."

"On the research side, you can look at the bigger picture of an issue or problem, and look outside of the box for answers," she said. "If you answer important, broad questions, you can impact so many more people. And you have a much larger influence on being able to affect morbidity and mortality on a scale that you can't reach as a single individual in a clinical environment."

As an educator, "there's an intrinsic satisfaction to both training people to be physicians and to taking care of our patients," said Tseng. "You help each individual patient, and at some point during training, you can expand your level of influence because your trainees will take what they are learning forward to benefit scores of patients."

Tseng's laboratory is also a training ground for future scientists with a full-time PhD scientist, Dr. Liang Ge. The lab is often full of residents, medical students, college students, and even high school students from diverse communities who are encouraged to imagine, question, and problem solve with the established scientists.

It was not too long ago when specialists worked in silos, even competitively. As a lab Director and Clinical Chief, Tseng espouses a principle of collaboration. Her lab team collaborates with experts in tissue biomechanics, engineers, radiologists, cardiothoracic surgeons and interventional cardiologists.

The Cardiac Surgery Program at the SFVAHCS emphasizes innovative research and exceptional care. The goal for clinicians and scientists is to understand the needs of the patients and offer the best care options for heart patients.

Q and A: An Interview with Dr. Katherine Hoggatt

Q: How did you become interested in math, numbers, statistics? And how did you translate that interest into a career in health sciences research?

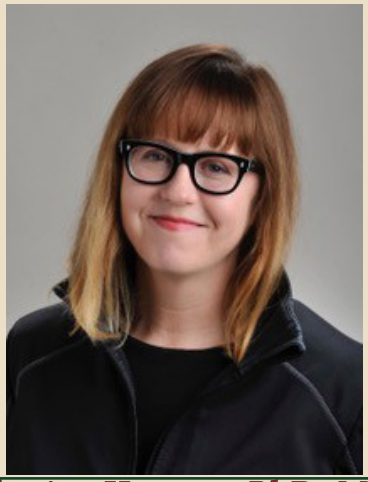
A: I studied math in college mainly because I wasn't sure what I wanted to do for a career. I figured with math I would have tools which I could apply broadly. After graduating from UC Berkeley, I joined the Peace Corps to teach math in Guinea, West Africa; and while there, I started working with a Non-Governmental Organization that produced the first report on the socioeconomic impact of HIV/AIDS in Guinea.

Through this work, I became more interested in epidemiology; and when I returned from the Peace Corps, I decided I wanted to get a Master of Public Health (MPH) degree, so I could work on outbreak investigation with the Centers for Disease Control and Prevention (CDC). When I entered the program at UC Berkeley, I became more interested in quantitative epidemiologic methods, and this was the focus for my PhD at UCLA.

Q: What brought you to SFVAHCS and UCSF to conduct research?

A: I started working at the VA Greater Los Angeles (VAGLA) in 2010 when I relocated to California after a stint at the University of Michigan. I had been collaborating with researchers at VA Ann Arbor and wanted to continue to build a VA-based research career.

While at VAGLA, I received a



Katherine Hoggatt, PhD, MPH

Professor, Department of Medicine
University of California, San Francisco

Research Health Scientist
San Francisco VA Health Care System

Director of the Quantitative Core, Center for Data to Discovery and Delivery Innovation
San Francisco VA Health Care System

Co-Lead, UCSF Center for Healthcare Improvement and Medical Effectiveness (CHIME) Data Core
San Francisco VA Health Care System

Career Development Award (CDA) to study care for women Veterans with substance use disorder (SUD); and substance use/SUD remained a focus of my research in my first post-CDA projects. When I decided to move "back home" to Northern California, I wanted to continue collaborating with other VA or non-VA investigators who were working on SUD and measurement issues around SUD and related care.

In looking around at what other VA investigators were studying, I read about the work being done by Dr. Salomeh Keyhani, who had ongoing research examining cannabis use, and Dr. Mary Whooley, who leads the Measurement Science QUERI (Quality Enhancement Research Initiative Program); both of whom are NCIRE-supported PIs. Ultimately, it was the opportunity to work with investigators who are focused on SUD and measurement science that made the San Francisco VA Health Care System (and the University of California San Francisco) an attractive prospect!

Q: Explain your role at the SFVAHCS. Why are health care data analytics so important in your mission "to drive health system improvement, ensure health equity, and improve physical and mental health at the individual and population levels?"

A: The genesis of my research on women Veterans with SUD was the observation, circa 2010, that despite the widespread conventional wisdom that women are reluctant to receive specialty SUD care in the VA, their rates of treatment involvement were comparable to men's.

As I worked to understand why clinical intuition did not match what we were seeing in the VA data, I started to wonder whether the lack of a gap in treatment involvement was a downstream effect of under-identification of SUD among women.

I hypothesized the use of care quality measures that focus on diagnosed patients was obscuring a gap in care for women with less severe SUD that was going undiagnosed and undocumented. Our inability to see this care gap was the result of

the choice of measures we used to quantify care. This was a concrete example of how the systems we use to improve care can be strengthened or undermined depending on how health care data is used.

As a non-clinician with a quantitative background, I saw the potential for health data analytics to improve how we measure care and how we identify patients who need care. To my mind, health data analytics are an essential tool for fostering health equity by identifying when there are care gaps and contributing to better population health by ensuring patients who need care are "seen" by the system.

Q: You work with multidisciplinary teams of scientists and clinicians at the "ground floor" of research design and planning. Please give an example of your role.

A: In my quantitative roles with the Center for Data to Discovery and Delivery Innovation (3DI) and the Data Core, I consult on grant proposal development, study design, and statistical analysis plans. That can include everything from framing research questions, so they can be answered through data analysis, to identifying the best available sources of VA and non-VA data, helping investigators decide on their analytic strategy, and advising on how a project should be staffed to address the study aims.

For a recent study, I worked with a team to identify an appropriate analytic framework given their specific aims, contributed text to explain the details of the proposed methods, provided background on the VA data and health measures that would be needed, and drafted the statistical analysis plan. And as a trained epidemiologist, I was of course also responsible for the power calculations!

Q: You are a collaborator, co-author of studies on a wide array of health topics, including physical and mental health and well-being, substance use, quantifying the burden of disease and health care needs of Veterans and civilians, health disparities, women's health, and more. Do you have a "favorite" topic?

A: Recently, I have been focused on improving how we measure substance use, particularly cannabis use. In the VA, we don't routinely screen for non-alcohol, non-tobacco substance use; so, we rely on documented diagnoses to measure the population who may need care related to substance use.

For cannabis, for example, we know that many patients actively use the substance, but most patients who use cannabis do not meet criteria for a use disorder. I have been working with colleagues on other ways to obtain measures of cannabis use from health record data, using Natural Language Processing for example, and on strategies to encourage open conversations between patients and providers around cannabis use.

Q: As a PI, you have a lot on your plate, such as grant writing, administrative responsibilities, and the volume of research that you consume and analyze. What keeps you going and motivated?

A: At the VA, we have a real opportunity to see our research translated into improvements to care. For example, colleagues and I examined how we were screening women Veterans for unhealthy alcohol use, and this research ultimately led to VA tailoring the screening instrument to reflect the (lower) recommended drinking limits for women.

Seeing my research result in better assessment and care for women Veterans is incredibly rewarding! I am also learning more about VA data (daily) and finding better methods for working with that data. These learning opportunities keep quantitative work interesting.

Q: What are the advantages of doing research at SFVAHCS and VA in general?

A: The biggest advantages for me are the collaborations with other researchers and the freedom to pursue a wide range of research questions. In VA research, collaboration and partnership are essential. In addition to the CDA program, VA has funding opportunities, training programs, professional meetings, and other activities that all support and encourage collaboration with other researchers locally and nationwide.

The connections with other investigators and the ability to access multiple sources of support in VA have enabled me to work on SUD, but also on topics that were new to me, including genetic testing, vaccination, and smoking cessation.

Research News

Dr. Carl Grunfeld receives NAVREF Barbara West Award for Distinguished Service

NCIRE congratulates VA research leader, Dr. Carl Grunfeld, for receiving the Barbara West Award for Distinguished Service from the National Association of Veterans' Research and Education Foundations (NAVREF)!

NAVREF presented Dr. Grunfeld with the award at its Annual Awards Dinner, as part of the organization's 33rd Annual Conference in Denver, Colorado, September 14-17, 2025.

The Barbara West Award recognizes Dr. Grunfeld's 45-plus years of federal service and leadership. He most recently served as Professor of Medicine, Emeritus at UCSF and served as the Veterans Health Administration Central Office's Deputy Chief of Research and Development Officer for IT & Data Governance and Special Advisor for Field Operations, Office of Research and Development. Dr. Grunfeld serves as an advisor to the NCIRE Board of Directors, after serving as a Board member for 12 years.

This is one of four awards presented to individuals who exemplify innovation, service, partnerships, and leadership that drive "tangible meaningful impact for Veterans and advancing American public health," said NAVREF CEO Rashi Romanoff.

Dr. Carl Grunfeld (left) accepts the NAVREF Barbara West Award for Distinguished Service at the NAVREF Annual Awards Dinner on September 15th. Dr. Grunfeld is joined by NCIRE Leadership: CEO Rebecca Rosales, CFO Joanna Zhao, and Associate Director, Contracts and Compliance Newton Ong (right).

Federal Funding Awards

Congratulations to the following Principal Investigators for your funded awards!

Phyllis Tien, MD
Project Title: Stimulant and Polysubstance use, Inflammation and Sex Effects on Myocardial Disease in HIV (SPISE)
Sponsor: National Institute on Drug Abuse
Award Received Date: 7/9/2025

John Daniel Kelly, MD, MPH
Project Title: Long-term ocular sequelae and biological determinants of post-acute Ebola virus disease
Sponsor: National Eye Institute
Award Received Date: 7/14/2025

Beth Cohen, MAS, MD
Project Title: Evidence-based Treatment for PTSD and Cardiovascular Disease Risk
Sponsor: NIH via Subaward from UCLA
Award Received Date: 7/29/2025

Sabra Inslicht, PhD
Project Title: Suvorexant: Targeting Orexin to Augment Exposure Therapy in Veterans with PTSD and Insomnia
Sponsor: USAMRAA
Award Received Date: 8/12/2025

Duygu Tosun-Turgut, PhD
Project Title: Clarifying the association of depressive symptoms with cortico-limbic tau, cerebral blood flow, neurodegeneration, and longitudinal cognitive decline in individuals with mild cognitive impairment
Sponsor: NIH via subaward from UCSF
Award Received Date: 9/16/2025

Barbara Bensing, PhD
Project Title: PRG4/Lubricin glycoform variants associated with endocardial infections and sepsis
Sponsor: National Institute of Allergy and Infectious Disease
Award Received Date: 9/17/2025

In the Helix

Leslie Yack
NCIRE Staff Research Associate IV, Supervisor

Q: If your life had a theme song, what would it be, and why does it resonate with you?

A: "Beautiful Rose" by Sean McConnell. My life has taken some unexpected turns, and this song reassures me that I'm exactly where I am meant to be as I am growing through what I am going through. It reminds me that there are always positives intertwined with the difficult times and that sometimes I need to pause to be more present and mindful in the moment to appreciate both.

Q: What is the best concert/festival you have been to?

A: Mile 0 Fest in Key West. Live music fills every corner of the island for a week, the schedule is packed with incredible performances, yet it still has that relaxed, island-time vibe that lets you soak it all in at your own pace. I really love how approachable the musicians are and how friendly the crowd feels. It's more like a community than just an event, and it's the kind of experience that stays with you.

Q: What would your superpower be and why?

A: Solution seeker. I love the challenge of fixing things or making improvements. I thrive on reframing problems, adapting on the fly, and staying as creative and resourceful as possible throughout the process.

Diana Caal
NCIRE Administrative Analyst I

Q: If your life had a theme song, what would it be, and why does it resonate with you?

A: My theme song would be "Strut" from the Cheetah Girls 2 movie. I saw this movie when I was 10 years old, and it still gets me up and dancing in my 20s.

Q: What is the best concert/festival you have been to?

A: Outside Lands is honestly one of my favorite festivals. It has such good food and drink vendors. My favorite part is how Golden Gate Park turns into a forest of colorful lights at night.

Q: What would your superpower be and why?

A: My superpower would definitely be telekinesis. I've always yearned to pick things up with my mind. It would be such a helpful tool when cooking and cleaning.

If you are an NCIRE employee or know of one who would like to be featuered in *In the Helix*, contact us at **dna@ncire.org**.

Message from the Chief Executive Officer

As San Francisco summer burns off its spectacular "Sunset Season", there is a fresh energy in the air—crisp mornings, golden leaves, and a renewed sense of focus. It is the perfect time to reflect, reset, and re-engage as we prepare for the final stretch of the calendar year.

With our 28th volume, we have remarkable contributors for the Fall 2025 Newsletter: Elaine Tseng, MD, and Katherine Hoggatt, PhD, MPH. We appreciate their willingness to highlight their research.

NCIRE's fiscal year ended September 30, 2025. At year's end, there were 21 new Federal/Other (Non-Industry) Awards and 7 new Industry Awards (CRADAs). In comparison, at the conclusion of fiscal year 2024, NCIRE received 30 new Federal/Other (Non-Industry) Awards and 10 new Industry Awards (CRADAs). In both categories, there was a 30% decline.

As a proactive measure, we initiated the fiscal year 2026 budget planning process earlier than we have in the past. Indirect cost recovery is projected to be 6.6% less than in fiscal year 2025. This is linked to the decline in new awards.

While 2025 has brought many changes and the road ahead may have challenges, there are also opportunities. Our Administrative Team is working to streamline processes—e.g., transitioning to electronic reimbursement requests; and aligning required training due dates. In August, we initiated the NCIRE Open Forum, a one-hour forum held on the third Tuesday of the month and open to the Research Community. It is an opportunity to hear timely updates related to research administration and compliance, and to ask any questions of the NCIRE Leadership Team.

We continue to monitor several issues, including uncertainties in federal funding, new Executive Orders, changes in sponsor compliance, impending indirect cost changes, hiring, and WOCs under the VA HRMACS system. As updates on these areas become available, we will continue to send communication via NCIRE's Office of Sponsored Research email updates.

Thank you for your dedication to research and support of Veterans.

Rebecca Rosales, MBA, CRA
Chief Executive Officer

About NCIRE

NCIRE - The Northern California Institute for Research and Education, Inc. has one mission and one goal: Advancing Veterans' Health. We sustain a scientific community of clinicians and researchers and support nearly 200 researchers who have joint faculty appointments at the University of California, San Francisco (UCSF) and the San Francisco VA Health Care System (SFVAHCS) and are working to foster innovation through leadership in the field of Veterans health research. Our broad portfolio of projects receives generous support from the National Institutes of Health, the Department of Defense, and individual donors, making us the largest nonprofit research institute devoted to Veterans' health in the US.

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