

# UC DAVIS HEALTH

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A publication for alumni, donors, faculty and friends of UC Davis Health

*Influencing  
precision medicine*

*First-in-the-nation role  
in gun violence prevention*

*Q&A: Expanded complex  
vascular services*

*In Photos:  
School of Medicine  
Alumni Weekend*

In many nations, health providers often struggle to recognize or treat many neurodevelopmental disabilities. UC Davis MIND Institute experts are working to change that.

“There is  
*no help  
for our  
child*”

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# The latest treatments and expertise for your patients

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of UC Davis Health*



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# Advancing health outside of the clinic walls

The mission of UC Davis Health is to make our community and our world better and healthier. This issue of the *UC Davis Health Magazine* provides a look at three very different ways we take this mission outside the hospital and clinic walls in groundbreaking ways.



One is a story showing how the MIND Institute, the nation's most-funded autism program, is sharing its expertise across the globe; another is a reminder of the value of bringing the globe's most popular sport to our community; and the third is a look at how we're helping shape the policies and therapies connected to precision medicine, which integrates data ranging from patient zip codes to their genetic codes to provide better and more focused treatments. These efforts

are examples of how we weave together our clinical care, education and research missions to help our community and provide world-class patient care.

The MIND Institute has been a global beacon of research, therapy and hope for people with neurodevelopmental disabilities for two decades. Randi Hagerman is one of the reasons. She's an internationally recognized clinician and researcher working on fragile X syndrome, and she's shared her expertise in 20 countries, helping them develop infrastructure and best practices for diagnosis, treatment and family support. She was part of a group from the MIND that traveled recently to a historic hotel in the center of Belgrade to address an international conference on fragile X. It was organized by a Serbian physician and researcher who had trained under Hagerman here at UC Davis, and who is now educating doctors in Eastern Europe.

MIND experts also helped Serbian families and their children dealing with fragile X. As the story shows, for some of the families, those meetings had once seemed as unlikely as meeting Julia Roberts. This exemplifies the continuing evolution of health at UC Davis. Leveraging our great physicians, we're reaching out to patients and training providers where they live, whether it's in the Central Valley, rural Northern California or Eastern Europe.

Another story details a different kind of pioneering effort to help patients. UC Davis Health has been an early adopter and pioneer in precision medicine for cancer care, and is now home to growing portfolios in precision medicine research and policy leadership. Our Center for Precision Medicine, led by Fred Meyers, is both helping California develop full policies on

precision medicine and creating new capabilities and treatments in areas that range from combat medicine to everyday nutrition.

Precision medicine uses large amounts of data to account for small differences in individuals or groups, including the variability in genes, environment and lifestyle of each person. This helps doctors and researchers more accurately predict the treatments and prevention strategies that are best for each patient. This, too, is an evolution of medicine that UC Davis is uniquely positioned to lead. We have an extraordinary depth of national and global leading disciplines, including medicine, agriculture, veterinary medicine, engineering, biomedical engineering, genome editing and stem cell research, all of which help facilitate our work in precision medicine.

Then there is one of this year's feel good stories: The announcement that Sacramento Republic FC will soon be joining Major League Soccer. We have a long-running partnership with Sac Republic that's benefitted our community, our neighborhoods and our youth. Together, we're promoting the benefits of physical activity, fostering health education for children and highlighting the joy of playing sports, which includes bringing street soccer to the urban core areas in our backyard.

Physical activity, sports, and simple play have substantial health and wellness benefits for children and adults. Conveying the value of these and enabling more physical activities throughout our region, especially in our urban core where it can be difficult to find a place to play, are important components of our care for our community. That's one reason the UC Davis Health name is on the UC Davis football stadium. We want everyone to understand our goal to help keep people active through their lifetimes – from inner-city youth, to college athletes, students and faculty, and residents of Davis, Sacramento and Northern California.

Providing great care is at once global, local and as intricate as our genomes. These examples illustrate a few of the ways UC Davis Health is moving health care and wellness into the future and continually expanding the world-class care we offer our patients.

Yours in health,

**David Lubarsky, M.D., M.B.A.**  
Vice Chancellor of Human Health Sciences  
Chief Executive Officer, UC Davis Health



## Autism expert elected to National Academy of Medicine



Autism expert **David Amaral, Ph.D.**, distinguished professor and Beneto Foundation Chair in the Department of Psychiatry and Behavioral Sciences and the UC Davis MIND Institute, has been elected to the prestigious National Academy of Medicine. Amaral joins an

elite group of physicians and scientists in the academy, one of only 100 in the U.S. and abroad, and the only UC Davis faculty member elected this year. He is one of 13 UC Davis faculty members elected to the Academy since its founding in 1970. Election is considered one of the highest honors in the fields of health and medicine, and recognizes individuals who have demonstrated outstanding professional achievement and commitment to service. Amaral was the founding research director of the MIND Institute, and has focused for two decades on understanding the biological bases of autism spectrum disorder.

## RE-VERIFIED AS A LEVEL I CHILDREN'S SURGERY CENTER



UC Davis Children's Hospital has been re-verified as a Level I Children's Surgery Center by the American College of Surgeons (ACS), the world's largest organization of surgeons.

The highest-level designation from the ACS Children's Surgery Verification Quality Improvement Program focuses on the nation's first and only multi-specialty standards of surgical care for pediatric patients. In 2016 UC Davis Children's Hospital was the first hospital on the West Coast, and one of only a handful in the nation, to earn the distinction.

Last fall UC Davis Health also opened a new, improved 20,000-square-foot children's surgery center facility, with seven operating rooms, advanced equipment, and 24 pre- and post-op bays.

## National Magnet Nurse of the Year



NICU nurse **Christa Bedford-Mu, M.S.N., R.N., CNS-BC**, was named National Magnet Nurse of the Year for New Knowledge, Innovation and Improvement at October's American Nurses Credentialing Center National Magnet Conference. The recognition is given to five nurses annually for outstanding contributions in innovation, consultation, leadership, and professional risk-taking. Bedford-Mu joined Christi DeLemos as the second UC Davis Health nurse in three years to receive the honor.

Bedford-Mu is a board-certified neonatal clinical nurse specialist and a key participant in innovative telehealth programs at UC Davis Children's Hospital. She is a lead contributor to a tele-visit and telehealth project aimed at improving the transition from NICU to home, which has allowed for earlier discharge, increased parental and provider satisfaction, and reduced readmission rates.





## UC Davis invests \$4 million to launch new research centers

From a sea of competitive proposals, UC Davis Provost and Executive Vice Chancellor Ralph Hexter and Vice Chancellor for Research Prasant Mohapatra chose to invest \$4 million over three years to launch four new research centers addressing some of society's greatest challenges and needs, including two affiliated with UC Davis Health:

- A UC Davis **Gene Therapy Center** will establish a center of excellence to target genetic diseases through multidisciplinary research, education and manufacturing, bringing together a growing network of expertise and equipment at UC Davis Health. Led by **Jan Nolta, Ph.D.**, a professor of cell biology and human anatomy who directs UC Davis' Stem Cell



Jan Nolta, Ph.D.



Janine LaSalle, Ph.D., and Leigh Ann Simmons, Ph.D.

Program, the new gene center will offer highly experienced consultations, in vitro and in vivo study models, state-of-the-art equipment, manufacturing, regulatory expertise, patent and licensing resources, and specialized on-site cellular and gene therapy operations.

- A **Perinatal Origins of Disparities (POD) Center** will investigate why and how some groups are more likely to be sicker than others, and develop ways to prevent disparities when they often

begin, from pre-conception to infancy. Leaders include **Janine LaSalle, Ph.D.**, professor of medical microbiology and immunology and associate director of the Genome Center, and **Leigh Ann Simmons, Ph.D.**, professor and chair of human ecology.

The UC Davis Office of Research initiative, known as the IMPACT Program, will also launch a **Data Science Center** and a **Global Migration Center** including collaborations with UC Davis Health.

## A “Most Wired” health care organization once again

For the eighth time, UC Davis Health – led by interim Chief Information Officer John Cook – has earned “Most Wired” status by the College of Healthcare Information Management Executives (CHIME). The designation includes a performance excellence award and classifies UC Davis Health as a leader in the health care information technology industry. UC Davis was one of just three California hospitals to be recognized as a “Level 9 hospital,” the penultimate classification and defined as an organization that has actively pushed

the industry forward. CHIME also added an “ambulatory” recognition for outpatient clinics, in which UC Davis Health also earned Level 9 recognition.



## ONE OF NATION'S LEADING SCHOOLS FOR PRESTIGIOUS SOCIAL-JUSTICE SCHOLARSHIP



Pauline Nguyen

When medical student **Pauline Nguyen** was awarded one of the most prestigious medical education scholarships in America this summer – the Herbert W. Nickens Medical Student Scholarship – it confirmed that both Nguyen and UC Davis are national leaders in addressing health inequities.

Nguyen, selected for her leadership role as a social justice activist, is the seventh Nickens winner at the UC Davis School of Medicine. Among the 154 accredited U.S. medical schools, UC Davis now sits at the top of the Nickens recipient list, tied with Stanford and UCLA.

The Association of American Medical Colleges awards the scholarship to recognize students for their efforts to eliminate inequities in medical education and health care, as well as their strong desire to address the educational, societal and health care needs of racial and ethnic minorities.



**MAVERAKIS NAMED FELLOW OF THE CALIFORNIA ACADEMY OF SCIENCES**

Emanuel Maverakis, M.D., an expert in immune-mediated diseases involving the skin, has become one



of the few physicians to be named as an Academy Fellow of the California Academy of

Sciences, a governing group of more than 450 scientists and leaders who have made notable contributions to science education and communication. Maverakis, an associate professor in the Department of Dermatology, is widely known for his work in melanoma, skin ulcers and autoimmune diseases such as scleroderma and rheumatoid arthritis. He was also on a team that educated the general public during the initial stages of the Zika virus outbreak.

**Experts to lead national patient safety website, serve on NSF panel**

Patrick Romano, M.D., M.P.H., F.A.C.P., F.A.A.P., and Debra Bakerjian, Ph.D., A.P.R.N., F.A.A.N., F.A.A.N.P., F.C.S.A., have become co-editors-in-chief of PSNet — the Patient Safety Network — a globally recognized web-based resource for scholarship and perspectives in the field of patient safety.

The site, a project of the Agency for Healthcare Research and Quality of the U.S. Department of Health and Human Services, is regarded as an authoritative resource for evidence-based practices that can reduce adverse events. Romano was also recently selected to serve on the Scientific Methods Panel of the National Quality Forum (NQF), a nonprofit organization that sets national standards for improving health care. As a member of the panel, he will help evaluate measures for scientific acceptability before they are adopted for NQF initiatives.

Romano is a professor of internal medicine and pediatrics and member of the Center for Healthcare Policy and Research, widely known as an expert on measures to assess care quality and safety. Bakerjian is a clinical professor at the Betty Irene Moore School of Nursing at UC Davis with a focus on safety and quality improvement in long-term care.



*Patrick Romano*

**AWARDS FOR ADVOCACY, EDUCATION ON GUN VIOLENCE PREVENTION**



*Amy Barnhorst*

Amy Barnhorst, M.D., associate professor of psychiatry and behavioral sciences and vice chair of Community Mental Health, is the first recipient of the Horwitz Public Health Award from the Coalition to Stop Gun Violence, the nation's oldest gun violence prevention organization. Barnhorst was awarded for leadership in developing and educating about California's gun violence restraining orders.



*Rocco Pallin*

Rocco Pallin, M.P.H., received the 2019 Urgent Matters Commendation Award for Excellence as director of UC Davis' "What You Can Do" initiative, an intervention for health care providers to help prevent firearm injury. Pallin was to be honored by the American College of Emergency Physicians this fall.

**PATHOLOGISTS AMONG TOP 100 INDUSTRY TRAILBLAZERS**



*Richard Levenson*

Richard Levenson, M.D., and Bennet Omalu, M.D., M.B.A., M.P.H., pathologists in the Department of Pathology and Laboratory Medicine, are among the 100 trailblazers named to *The Pathologist's* 2019 Power List for their breakthroughs at the laboratory bench and in the clinic. Levenson, the department's vice chair for Strategic Technologies, is recognized for developing Microscopy with Ultraviolet Surface Excitation (MUSE), which creates high-resolution images of tissue specimens without glass slides.



*Bennet Omalu*

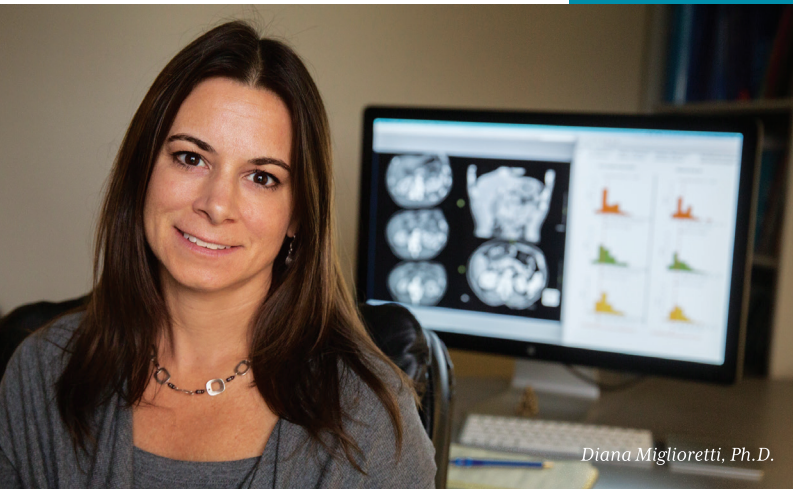
Omalu is a volunteer clinical faculty member who was the first to identify and describe chronic traumatic encephalopathy (CTE) in athletes in 2002.



## Miglioretti new chief for biostatistics

**Diana Miglioretti, Ph.D.**, has been selected chief of the Division of Biostatistics in the UC Davis Department of Public Health Sciences, replacing Laurel Beckett who recently retired. Division faculty collaborate with investigators on research

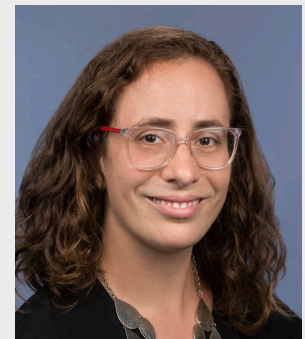
to improve care in cancer, neurosciences, vascular disease, infectious diseases and genomics. Miglioretti's own investigations focus on cancer screening and surveillance, reducing radiation exposure from imaging, and developing new statistical methods for assessing health outcomes and diagnostic efficacy. She is a co-principal investigator for the national Breast Cancer Surveillance Consortium, a network of registries that collaborate to improve screening, and a fellow of the American Statistical Association for contributions to the field.



*Diana Miglioretti, Ph.D.*

## National award for helping human trafficking victims

For her national work to improve the care of patients with emotional trauma and educate providers about their needs, **Rachel Robitz, M.D.**, was one of six U.S. physicians to receive an early career development award this year from the Association for Academic Psychiatry. Robitz, the associate director of the Family Medicine/Psychiatry Residency Program, co-chairs the Direct Service Committee for HEAL Trafficking, a network of over 2,700 providers in 35 countries working with professionals across multiple disciplines to end trafficking and support survivors.



## 2019 Excellence in Healthcare award

UC Davis Health has received a 2019 Excellence in Healthcare award from the nonprofit Integrated Healthcare Association (IHA) for providing high-quality, affordable and patient-centered care. The health system also received special designation for the Sacramento region's highest relative quality improvement from 2018 to 2019.

Of 200 participating physician organizations in California, only 30 met performance standards to receive an award for excellence, and only eight received a most-improved distinction.

Oakland-based IHA promotes continuous improvements and integrated care. Members include health plans, physician groups, hospitals, health systems and representatives from purchaser, consumer, academic, pharmaceutical and technology organizations.

## Honors for quality outpatient care

Vizient, Inc. has recognized UC Davis Health as ninth for the outstanding quality of its ambulatory care in outpatient clinics and emergency department, among a group of 50 participating health institutions from across the nation. The Vizient Ambulatory Care Quality and Accountability Awards measure the quality of outpatient care in five areas: access to care, capacity and throughput, quality and efficiency, continuum of care, and equity. Texas-based Vizient, Inc. is a health care services company that provides analytics and advisory services.



## New patient-centered Pediatric Aerodigestive Center first of its kind in inland Northern California



D. Gregory Farwell, M.D.

UC Davis Health has opened a regionally unique new Pediatric Aerodigestive Center to provide a specialized team approach for chil-

children with complex airway, pulmonary, upper digestive tract, sleep and feeding disorders. Instead of visiting multiple offices to see various specialists, patients visit one location to improve coordination of care and reduce number of procedures, imaging and anesthesia exposures, according to the UC Davis Department of Otolaryngology-Head and Neck Surgery. The center's care teams treat a wide variety of larynx and trachea disorders, esophageal and swallowing disorders, and pulmonary disorders in renovated space at the UC Davis Glassrock Building in Sacramento.

## ADVANCED VALLEY EYE ASSOCIATES JOINS UC DAVIS HEALTH

The medical practice of **Robert Miller, M.D.**, an eye specialist who has cared for thousands of patients in Davis and surrounding communities as director of Advanced Valley Eye Associates, became part of UC Davis Health in September.

Miller will continue to see patients at his location on Lyndell Terrace in Davis, and five eye experts from UC Davis Eye Center will join his practice. Miller also will see patients at the UC Davis Eye Center in Sacramento, where he has accepted a faculty appointment (and long served as volunteer faculty). UC Davis Eye Center also operates clinics in Sacramento, Folsom and Roseville.

# Calendar

## February 12

### MIND Institute Distinguished Lecture Series: Early Detection of Autism Spectrum Disorder in Primary Pediatric Care.

Presenter: Diana Robins, Ph.D. of the Drexel Autism Center. Lectures intended for both specialists and community members. Free and open to public, no reservations necessary (seating limited). 4:30–6 p.m. at MIND Institute in Sacramento. Info at **916-703-0253** or MIND Institute website.

## March 11

### MIND Institute Distinguished Lecture Series: Women on the Autism Spectrum: Unique and Common Vulnerabilities.

Presenter: Julie Lounds Taylor, Ph.D. of Vanderbilt University. Lectures intended for both specialists and community members. Free and open to public, no reservations necessary (seating limited). 4:30–6 p.m. at MIND Institute in Sacramento. Info at **916-703-0253** or MIND Institute website.

## Ongoing

### Online CME: On-demand and live-stream courses:

- Adult Occupational Lead Poisoning in California (with CDPH)
- E-cigarettes and Your Patients (with CDPH)
- PACES – Pediatric Bronchiolitis Clinical Guidelines
- PACES – Pediatric Diabetic Ketoacidosis Clinical Guidelines
- Preventing Firearm-Related Injury and Death: A Targeted Intervention
- Valley Fever/Coccidioidomycosis Health Issues (with CDPH)

Info at [health.ucdavis.edu/cme](http://health.ucdavis.edu/cme).

Date-certain events are in Sacramento unless otherwise noted. For more information about upcoming educational courses, please visit [health.ucdavis.edu/cme](http://health.ucdavis.edu/cme). Or contact the Office of Continuing Medical Education at **916-734-5352** or [cmereg@ucdavis.edu](mailto:cmereg@ucdavis.edu).

Note: Before making travel arrangements, please call the Office of Continuing Medical Education at **916-734-5352** to confirm there are no changes to dates or locations printed in this calendar.

## A celebration of the new edition of 'the book' on orthopaedic surgery

In 1988, **Michael Chapman, M.D.**, published the first definitive text on the treatment of orthopaedic conditions. The massive undertaking has been completed three times since and, during a fall ceremony, the former UC Davis orthopaedic surgery chair and collaborators signed copies of the fourth edition of *Chapman's Comprehensive Orthopaedic Surgery*. The 30-pound, nearly 6,000-page book is widely recognized as the field's most complete how-to guide – and for trainees, a symbol of the orthopaedics

leadership tradition at UC Davis Health, which consistently ranks among the nation's top 20 programs. Chapman donated several copies to the UC Davis School of Medicine, as well as to all residents and fellows of orthopaedic surgery and physical medicine & rehabilitation.





# Notable quotes

“What they’re doing is trying to taper down super-high levels of nicotine. Unfortunately, manufacturers don’t have a manual on how to quit their devices.”

**Elisa Tong, M.D., M.A.**, a UC Davis Health internal medicine physician and leader of statewide tobacco-cessation programs, in a *CNN Health/California Healthline* story on how some vapers turn to cigarettes as a cure for nicotine addiction.

“There is a lot of interplay between these two diseases... Ten percent of stroke patients already have cancer and 4% of stroke patients will be diagnosed with cancer in the few years after stroke. We’re just scratching the surface of what we might uncover in cancer-stroke.”

UC Davis Health geneticist **Boryana Stamova, Ph.D.**, in a *U.S. News & World Report/American Heart Association News* story on a study that uncovered unique gene activity in people with both stroke and cancer. Stamova performed the molecular analyses for the study.

“A number of us have pushed for this kind of (stem cell) policy over the years, so this news is a welcome surprise.”

Stem cell biologist **Paul Knoepfler, Ph.D.**, in a *Washington Post* story on a new Google policy that bars advertising for unproven stem cell therapies. Many patients who have been seriously harmed were initially recruited as customers via Google ads, he said.

“Racism is an issue that is difficult to take on, it’s an issue that makes a lot of people feel uncomfortable. (However), if we want to achieve our mission of health for all children, we need to tackle racism head on.”

**Tiffani Johnson, M.D., MSc**, a UC Davis Health pediatric emergency physician and member of an American Academy of Pediatrics committee on health equity, in a *California Health Report* piece on how racism affects health.

“It’s only a crime for the (gun) seller to sell to me, a prohibited person, if — to use the exact words — ‘they know or have reasonable cause to believe’ that’s what they’re doing. What extending background checks to private party sales does is make the operations of the criminal market much less efficient.”

**Garen Wintemute, M.D., M.P.H.**, director of the UC Davis Violence Prevention Research Program, in a *Time* story discussing background checks for private firearm sales. After repeatedly failing federal checks, a man who murdered seven people in Odessa, Texas obtained his weapon from a private seller.



A summary of recent findings  
in clinical, translational  
and basic-science research  
at UC Davis Health

# Body of Knowledge



Despite reduction campaigns, use rates of CT, MRI and other scans have continued to increase in the U.S. and Ontario, Canada, according to a study of more than 135 million imaging exams conducted by researchers at UC Davis, UCSF and Kaiser Permanente. The *JAMA* study was the first of its size to determine rates across different populations. A notable exception was a recent decline in pediatric CT.



Use of medical imaging during pregnancy has also increased significantly in the U.S., with nearly a four-fold rise over the last two decades in the number of women undergoing CT scans. Authors from UC Davis, UCSF and Kaiser Permanente said the *JAMA Network Open* study of 3.5 million cases was the first large, multi-center study to assess the amount of advanced imaging occurring during pregnancy.



U.S. and Saudi experts led by UC Davis Health have developed a web-based calculator that helps middle-aged women predict risks of conditions that become more likely with age. Developers said the risk-prediction calculator, reported in the journal *Menopause*, is unique in that it accounts for multiple health conditions at once, and identifies changing probability over time.



Referral centers with experienced family planning specialists are the best places for removal of nonpalpable, or deep, birth control implants, according to a UC Davis Health study in *Obstetrics and Gynecology*. Complications were minimal and removals in the office almost always successful when conducted by experienced family planning specialists at a referral center, rather than by a primary care provider or at a community clinic.

A novel UC Davis Health study identified five distinct types of firearm owners — early work that may help to assess risk and tailor injury prevention strategies. The *Injury Prevention* study identified two groups of single-firearm owners and three groups of multiple-gun owners — including a small but unique group who own high-capacity magazines and assault-type weapons, and carry a loaded handgun for protection. For more gun violence studies, see p. 11.



# California legislation creates **first-in-the-nation** gun violence prevention training program for health professionals at UC Davis Health

UC Davis Health and the state of California are taking on a formally expanded leadership role in educating health professionals about best practices to reduce firearm-related injury and death.

Assembly Bill 521, signed by Governor Gavin Newsom in October, designates the University of California Firearm Violence Research Center — hosted by UC Davis' Violence Prevention Research Program (VPRP) — to expand its research and give health care professionals clinical tools to assess patients for risk, provide counseling, and intervene when necessary.

The program will be the only one of its kind in the country, according to Garen Wintemute, M.D., M.P.H., an emergency physician and director of both the UC Center and the VPRP. The sponsoring bill was authored by Assemblymember Marc Berman (D-Palo Alto), and the Budget Act of 2019

*Medical and mental health providers are uniquely positioned to respond to and prevent firearm-related harm.*

UC DAVIS PSYCHIATRIST AND GUN VIOLENCE RESEARCHER  
**AMY BARNHORST, M.D.**

includes \$3.85 million for the training. Assemblymember Cecilia Aguiar-Curry (D-Winters) was one of several co-authors.

Amy Barnhorst, M.D., a UC Davis psychiatrist who has dedicated much of her career to the issue of gun violence, suicide and public mental health, will direct the training. Barnhorst is vice chair for community mental health in the UC Davis Department of Psychiatry

and Behavioral Sciences, and a frequent collaborator with Wintemute.

“Medical and mental health providers are uniquely positioned to respond to and prevent firearm-related harm,” Barnhorst said. “Many have asked for more information on when and how to discuss firearms with patients, and what to do when patients have access to guns and are at high risk for harming themselves or others.”

The new initiative builds on VPRP’s existing “What You Can Do” program, which offers strategies providers can use in clinic to reduce firearm injury and death. AB 521 supports comprehensive training for a wide range of providers, including practicing physicians, mental health professionals, physician assistants, nurse practitioners, nurses, health professions students and other specialists.

The UC Davis center will guide providers in working with at-risk patients, such as offering safer storage practices, initiating gun violence restraining orders, and pursuing interventions for individuals with mental health issues. It also will continue research to further identify barriers that prevent counseling and other interventions.

The VPRP-run UC Firearm Violence Research Center launched in 2017 with a historic \$5 million state appropriation to fund leading-edge research on firearm violence and its prevention.

*The state budget includes nearly \$4 million for widespread training*



Boldly Learning: Dr. Amy Barnhorst

UC Davis gun violence researchers Amy Barnhorst, M.D., and Garen Wintemute, M.D., M.P.H. A video profile of Barnhorst is available on the web at [health.ucdavis.edu/boldly-learning](http://health.ucdavis.edu/boldly-learning).



# More new insights on gun violence

UC Davis Violence Prevention Research Program members released several new studies this fall, including three published in October's special "Violence and Health" issue of the journal *Health Affairs*.

## Background checks

In a comprehensive *Health Affairs* review of current U.S. background check policies, Wintemute identified nine problem areas and suggested specific ways to address them. In September he was one of several expert panelists who testified before the House Gun Violence Prevention Task Force in Washington, D.C., where he discussed background checks and the effect of gun violence on children.

## Talking with patients about firearms

Most Californians find gun-safety conversations between health professionals and their patients appropriate when a patient has a gun and has a risk factor for firearm-related harm, to a *Health Affairs* study led by Rocco Pallin, M.P.H. The study was the first to ask about these conversations in specific risk scenarios. It also found most Californians, including gun owners, find interventions by health professionals appropriate when a patient with a gun is at acute injury risk.

## Alcohol and gun violence

Rose Kagawa, Ph.D., M.P.H., and other researchers reported in *JAMA Internal Medicine* online that legal purchasers of handguns with a prior DUI conviction have a greater risk of a future arrest for a violent offense and for firearm-related violent crimes.

Gun purchasers with DUI convictions are also more likely to be arrested for intimate partner violence, UC Davis' Hannah Laqueur, Ph.D., M.A., M.P.A., and coauthors reported in *Health Affairs*. Authors suggested that policies intended to regulate firearm ownership among people with a history of risky alcohol use may help reduce violence and harms.

## Gun violence protection orders

A review of 21 case studies of individuals threatening mass violence suggested that extreme risk protection orders (ERPOs or "red flag orders") may play a role in preventing mass shootings, VPRP researchers reported in the *Annals of Internal Medicine*. California enacted the nation's first ERPO statute in 2016, and the UC Davis study sought to begin evaluating effectiveness.

## Purchasing spikes linked to injuries

Spikes in handgun purchases after high-profile events can be linked to more firearm injuries, VPRP researchers reported in *Injury Epidemiology*, with spikes in 2012 after Sandy Hook and the presidential re-election linked to a 4% increase in California firearm injury. The study was the first to use a direct measure of handgun purchasing to link purchases with subsequent harm and to assess impact on firearm injury, authors said.

## Patterns of gun ownership by motivation

A study of 429 firearm owners in *Injury Prevention* was the first to identify nuanced patterns of gun ownership. "We hope to inform the development of public health and safety efforts that are relevant to firearm owners' varying motivations, choices and risk," said lead author Julia Schleimer, M.P.H.







Inspiring  
the future  
generation  
to advance  
health across  
**Latinx  
communities**

The award-winning Prep Médico partnership shows college students a pathway to medical careers — and insights into addressing health disparities.

When 45 energized college freshmen and sophomores graduated from Prep Médico in July, they joined a choice group of more than 150 students who have learned what it takes to get into medical school and reinforce their desire to address health inequities among their future Latinx patients.

The pathway program, which was started four years ago by UC Davis and Kaiser Permanente, addresses a critical need across California: to boost the number of doctors who care for the state’s increasingly diverse and underserved communities, particularly in rural areas such as the Central Valley.

“Despite their incredible contributions to California’s culture and economy, Latinx communities continue to experi-

ence significant health disparities due to access barriers and poorer quality of care,” said Hendry Ton, UC Davis Health’s interim associate vice chancellor for diversity and inclusion. “UC Davis is committed to serving the health of California’s diverse community, and Prep Médico is an important part of that promise.”

The collaboration between The Permanente Medical Group and UC Davis aims to prepare college students to provide culturally and linguistically relevant care to Latinx patients. It was recently honored with a Quetzal Award from the Latino Leadership Council, a regional nonprofit that connects Spanish-speaking communities with services in Sacramento and Placer counties.

Over the course of the program’s six weeks, bright-eyed students — most from underrepresented populations in/from Central or Northern California — spend nights at Sacramento State dorms and



days in classrooms at the UC Davis School of Medicine. They also explore other parts of the medical center campus, Kaiser Permanente hospitals and clinics, and provide screenings at a migrant labor camp.

“This program has been excellent, really, really excellent,” said Lucas Cunha, who attends Skyline College south of San Francisco. “I came here thinking maybe they’ll show you ways to transfer to a university or get into medical school, but it’s so beyond that, so deep. You make connections, you make friends, you meet leaders that work at Kaiser.”

“All that helps you to pursue your dream and show you that you really can do this.”

### Unforgettable moments

An unforgettable moment for Andrea Gil, who attends Sacramento City College, was when she gowned up and watched the surgery of a child with third-degree burns at Shriners Hospitals for Children – Northern California. Now she, too, wants to be a surgeon.

“I felt like I was awakened just because I could see what these people, who have worked so hard in school, can do to save somebody else’s life,” Gil said. “I almost wanted to cry tears of joy because they were able to do that for someone else.”

Prep Médico, which also goes by the tagline “Navigating Your Path into Medicine,” started in 2016 out of concerns about how best to provide health care to the Latinx community – a group that makes up about 40% of the California population but only 5% of the state’s physicians. The name is short for Preparando Estudiantes Para Ser Médicos, or Preparing Students to Be Physicians.

About 100 students from community colleges and four-year schools apply for the program, whose eligibility requirements include factors such as demonstrated interest in medicine and serving Latinx populations. Thus far 175 students have completed it, including July’s fourth graduating co-hort.



In addition to teaching science, statistics, communication and public health, Prep Médico “empowers our students with the knowledge of how to navigate their pathway to medicine, the confidence to access needed resources, the conviction that they have a vital role to play in medicine,” Ton said.

*The Prep Médico program was recently honored with a Quetzal Award from the Latino Leadership Council, a regional nonprofit that connects Spanish-speaking communities with services.*

Prep Médico also solidified UCLA student Hector Acosta’s dream of becoming a doctor in the Central Valley community where he grew up. As a child farmworker laboring in Kerman, west of Fresno, he saw first-hand how family members suffered from health conditions related to their occupation.

*(Prep Médico) helps you to pursue your dream and show you that you really can do this.*

LUCAS CUNHA, PREP MÉDICO PARTICIPANT

### Firsthand disparities

American River College student Marykay Maduiké landed two valuable mentors – including one in obstetrics/gynecology, a field the Nigerian-born and Belize-raised sophomore hopes to pursue. Maduiké, who describes herself as shy, said the program gave her the confidence to “come out of my shell and ask someone, ‘Hey, can you please be my mentor?’”

His father, who is still a farmworker, “ended up tearing his meniscus from years of wear and tear of bending over picking tomatoes, lettuce.” His uncle has pulmonary emphysema due to excess dust and smoke from burning wood.

“Seeing those chronic conditions develop over time in the farmworkers who are predominantly Hispanic, it really hurt me, especially seeing it within my own family,” he said.

### Some Prep Médico activities

- Shadowing UC Davis and Kaiser physicians
- Connecting with mentors who share personal stories about their educations
- Tips on personal statements for medical school applications
- Twice-a-week science classes
- Learning about race relations, advocacy and social determinants of health affecting the Latinx community
- Meetings with medical students and residents
- Hands-on emergency medicine and labor/delivery simulations
- CPR certification

## Q&A: Complex vascular care

**M**atthew Mell, M.D., M.S., a national leader in defining health policy for managing and treating aortic disease, joined UC Davis Health from Stanford University in 2018 as director of the UC Davis Vascular Center and chief of the Division of Vascular and Endovascular Surgery in UC Davis Health's Department of Surgery.

At Stanford, Mell was medical director of the Vascular Clinic and Stanford Healthcare Ambulatory Specialty Care, and vice chair of clinical affairs for the surgery department. He is an expert in promoting early recognition of vascular disease to reduce the risks of heart attack, stroke and amputation, and is well-known nationally for improving knowledge and standards for screening, surveillance and treatment of abdominal aortic aneurysm.

At UC Davis, Mell leads a multidisciplinary team of experts who offer advanced diagnostics and both endovascular and surgical interventions for vascular diseases — from venous conditions to peripheral artery disease and critical limb ischemia. In his own clinical practice, he specializes in complex vascular and endovascular surgery, including open and endovascular reconstruction of the abdominal and thoracic aorta, renal and mesenteric arteries, carotid and subclavian arteries, and arteries of the lower extremities.

Mell has been recognized as the Pearl Stamps Stewart Endowed Professor in Surgery, complementing Diana Farmer's Pearl Stamps Stewart Endowed Chair.

### ***Can you describe your role in the spectrum of complex vascular care here?***

I oversee all operational aspects of the Vascular Center, which links experts in radiology, surgery and internal medicine. My administrative role is to be the catalyst for bringing in new technology to support my faculty. Clinically, my practice is broad and has focused on new technologies for aortic, carotid, and peripheral vascular disease. I also provide complex open surgical repair for such conditions.

### ***What are your thoughts on current trends in the overall complex vascular field? What's new and on the horizon, and how is this coming into play at UC Davis Health?***

New technologies continue to be on the horizon. In the past year and a half since I've been at UC Davis Health, we have expanded our abilities to provide complex endovascular aortic repair; transcarotid endovascular stents (TCAR);

and alternative access for endovascular treatment of peripheral artery disease (radial access, pedal access). We're constantly monitoring the field and working to introduce new and improved diagnostic and treatment modalities in our region.

### ***Are there specialized services in particular that you'd like to highlight for referring physicians in our 33-county area?***

Aortic aneurysm repair for one, including endovascular repair (EVAR) with all FDA-approved endografts. We also offer aortic fenestration and other newer aortic dissection repair techniques. Some other key areas are carotid artery stenting and endarterectomy, and endovascular and surgical treatment for PAD.

Our overall goal is to offer the latest proven technologies, and an approach that includes personalized decision-

making based on the patient's specific situation and both medical and surgical treatment options. For example we can provide complete aorta care in different modalities, from open replacement to endovascular surgery, and tailor plans for venous disorders to address aesthetic and medical concerns.

Our noninvasive vascular lab is central California's busiest and the best in our region — accredited and with outstanding technologists focused solely on vascular imaging.

### ***The UC Davis Vascular Center was one of the region's first providers to make transcarotid artery revascularization (TCAR) available to patients. Why did we pursue early adoption, and what are the advantages for our patients?***

This is the first endovascular or hybrid carotid procedure with outcomes that appear to be equivalent or better than traditional surgical carotid endarterec-





## Matthew Mell, M.D., M.S., F.A.C.S.

Pearl Stamps Stewart Professor  
in Surgery

Chief, Division of Vascular  
and Endovascular Surgery

Medical Director,  
UC Davis Vascular Center

### Fellowships

Vascular surgery  
Multi-organ transplantation

### Board Certifications

Vascular surgery  
Surgery

### Special interest areas

- Complex vascular and endovascular surgery, including open and endovascular repair and reconstruction
- Abdominal aortic aneurysm screening, surveillance, and care improvement
- Health policy and population-based management of vascular conditions

tomy. Roughly two-thirds of patients with surgical carotid disease may be candidates for TCAR. I wanted to bring the exciting new technology to UC Davis.

TCAR generally offers three major benefits over traditional carotid procedures: stents travel less distance; loosened material travels away from the brain to larger, lower extremity vessels; and the treatment takes up to half the time of traditional procedures.

***You're well-known for improving screening, surveillance and treatment of abdominal aortic aneurysm (AAA), and you've been a driving force behind national standards for identification, monitoring and treatment following rupture. Why this particular area of interest?***

These areas, along with treatment advances, are an effective way to improve the outcomes for patients with AAA at both an individual and population level. Optimizing screening, surveillance, and timely treatment of ruptured AAA assumes special importance for central California because the region is challenged with large rural areas.

***You've published extensively on AAA, including on practice guidelines, long-term outcomes, and opportunities for population-based management. Care to share any key takeaways?***

Increased screening for men with any smoking history. And for those with documented aneurysms, routine surveillance is mandatory!

***You and colleagues here recently published a study that indicated less-invasive procedures for opening severely-clogged leg arteries are as good as more-invasive open surgeries at helping people avoid and survive amputation. Can you tell more about the findings and their potential impact?***

This retrospective study suggested that the invasiveness of the procedure is not as critical as reestablishing blood flow for these patients with chronic limb-threatening ischemia. At a patient level, the intervention needs to be chosen at an individual level. This is an example of precision medicine that we can provide.



# 'A big, bi



*Radoslav and Svetlana Cujetic and their 6-year-old son Demetrije, diagnosed with fragile X syndrome.*





# g step'

*In many countries, health providers are often in the dark about effective strategies for autism, fragile X and other neurodevelopmental disabilities. So UC Davis MIND Institute experts are sharing best practices across the globe — and providing new hope for struggling families like the Cvijetics of Serbia and the Sukreskis of Croatia.*

*Reported from Serbia and Croatia*

**M**others, fathers and their young children crowded into an old, government-run children's hospital in Belgrade, colorful, cartoonish drawings covering its hallway walls. Parents struggled to soothe their anxious, wriggly boys and girls. But they were patient, polite. It was, after all, a day unlike any other. A day for hope.

Doctors and scientists — experts in the rare and severely disabling fragile X syndrome — had arrived from the United States, including six from the UC Davis MIND Institute. They came to offer the families useful information and maybe open doors to desperately needed help in a region of the world that, until fairly recently, hardly recognized fragile X syndrome, let alone knew how to diagnose or treat it.

The visit was part of a two-day educational conference in Belgrade organized by Dragana Protic, M.D., Ph.D., a Serbian medical doctor and scientist. Protic's training in neurodevelopmental disabilities at the MIND Institute under the guidance of Randi Hagerman, M.D., inspired her to improve the course of diagnosis, treatment and support for families affected by fragile X in Eastern Europe.

"The MIND Institute changed my professional life," said Protic. "It was important for me and for all of my country and the region because I came back and translated all my knowledge from the U.S. to Serbia."

Held in a historic hotel in Belgrade's city center, the meeting drew neurologists, pediatricians, genetic counselors, speech pathologists, psychologists and families from Eastern Europe and beyond. Protic said her goal was "to increase knowledge of fragile X and to introduce this important field to our medical professionals and increase testing of fragile X."

#### **'There is no help for our child'**

To parents like Radoslav and Svetlana Cvijetic, the meeting and clinic visit meant much more.





Randi Hagerman meets with the Cvijetics

It was a chance to meet Hagerman, whose name kept popping up in Google searches when looking for help for their son. At the time, Radoslav said, a face-to-face with Hagerman seemed as unlikely as meeting actress Julia Roberts. A pediatrician, professor and endowed chair in fragile X research at UC Davis, Hagerman is an icon in fragile X research and treatment worldwide. She and her UC Davis scientist husband Paul Hagerman, M.D., Ph.D., discovered the related genetic disorder FXTAS, and the couple has conducted hundreds of studies on fragile X syndrome and its related conditions over 40 years. Paul Hagerman attended the Serbia conference to update participants about the current scientific thinking about FXTAS.

The Cvijetics are the parents of 6-year-old Demetrije, an affectionate, joyful boy diagnosed with fragile X syndrome. Demetrije cannot talk, use a spoon to feed himself or manage his own toileting needs. He has never attended school.

When Demetrije was 4 and not yet talking, the couple took their toddler to

## A face-to-face meeting with Hagerman seemed as unlikely as meeting actress Julia Roberts.

several doctors in Belgrade who told them there was nothing unusual about his development because he was a boy — and boys, they said, are late bloomers. The couple refused to accept this explanation, and finally found a lab at the University of Belgrade where they paid to get him tested for genetic abnormalities. That's when they learned he had fragile X syndrome, a condition that often causes many disabilities and for which there is no cure.

"From the doctor there was nothing," said Radoslav Cvijetic. "No care. No therapy. There is no help for our child. We must do for ourselves."

The news was catastrophic for the family, especially for Svetlana, whose 18-year-old son from a prior marriage,

Vuc, has yet to be diagnosed with neurodevelopmental disabilities, and has severe disabilities and is non-verbal. Vuc now lives with grandparents in another city; Svetlana fears he will be one day be institutionalized.

### A city and country in transition

To a casual tourist, Belgrade seems like any other old European city. It bustles with outdoor cafes that dot the cobblestone sidewalks, grand bronze sculptures of national heroes, and a pervasive odor of cigarette smoke. But the city that was once the capital of the former Socialist Federal Republic of Yugoslavia has struggled for years to achieve economic growth and prosperity. The Balkan nation continues to be plagued by political unrest, particularly with the Kosovo and Bosnian conflicts, resulting economic sanctions and trade embargoes, the global financial crisis and recurrent recessions. Its application to join the European Union is still pending after 10 years.

Serbia's universal health care system faces related challenges. Historically it has struggled with corruption, mostly due to low physician salaries, as well as too few medical providers or hospital beds to care for the population. With the help of the World Bank and others, Serbia is working on reforms, including system restructuring and better medical training, to improve outcomes and help lift people out of poverty.

When it comes to care and services for people with neurodevelopmental disabilities like fragile X, there is a long way to go. Protic's published study found that medical professionals in Serbia know very little about fragile X, a problem she hopes to remedy through medical conferences and the country's newly launched Fragile X Society — the only one for the entire Balkan region. With funding support from Sacramento's Serbian immigrant community, Protic already has set up the country's first fragile X testing site.



## About fragile X

The “X” in fragile X syndrome refers to the X chromosome, where the mutated gene that causes the disorder is located. That gene, FMR1, is involved in making a protein important for the development of critical connections between nerve cells. When the cells can’t make the protein, the nervous system can malfunction, leading to the signs and symptoms of fragile X syndrome. Fragile X affects one in 2,500-4,000 males and one in 7,000-8,000 females.

What the disorder looks like in children varies, but males are more severely affected. They are more likely to have intellectual disabilities and distinguishing physical characteristics like long, narrow faces, big ears, prominent jaw and forehead, unusually flexible fingers and flat feet. Affected individuals also frequently have speech and language delays, behavior challenges, ADHD and anxiety.

An estimated 50% of children with fragile X also have autism, and it’s the most common single-gene cause of autism, accounting for about up to 6% of cases. And while children with

When it comes to care and services for people with neurodevelopmental disabilities, **there is a long way to go.** Protic’s study found that medical professionals in Serbia know very little about fragile X, a problem she hopes to remedy.

fragile X and autism may share many characteristics, children with fragile X can be more interested in other people, make friends more easily and do better in social settings, Hagerman said.

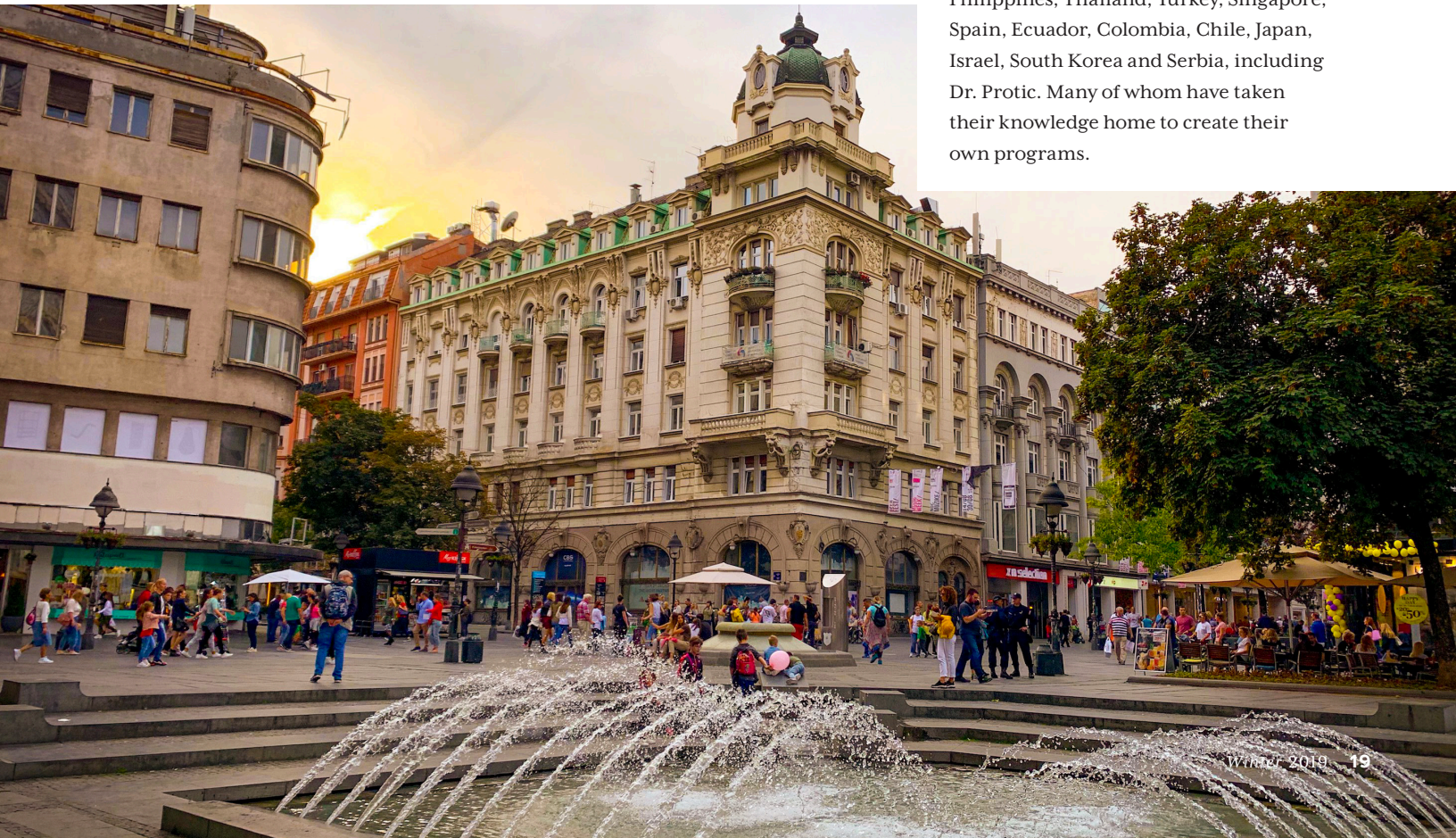
“I’ve known many boys with fragile X who have been voted Homecoming King,” she told the conference audience — one of many hopeful anecdotes she shared during her talk.

## Introducing Eastern Europe to advances in fragile X treatments

As they’ve been doing increasingly over the past several years in Serbia and countries across the globe, MIND Institute experts brought a treasure trove of information to the people gathered in

Belgrade to advance the region’s understanding of fragile X and help clinicians and others begin to address the needs of the affected population.

MIND Institute Director Leonard Abbeduto, Ph.D., whose work includes using digital communication technologies to help parents support their children’s language development, said the trip to Belgrade exemplifies the evolution of the MIND Institute, founded in 1998 to find and develop treatments for neurodevelopmental disabilities. The Institute’s International Training Program in Neurodevelopmental Disorders, which invites health care professionals and scientists from around the world to train at the MIND Institute, has had 24 participants from China, Philippines, Thailand, Turkey, Singapore, Spain, Ecuador, Colombia, Chile, Japan, Israel, South Korea and Serbia, including Dr. Protic. Many of whom have taken their knowledge home to create their own programs.





“The MIND is a research, treatment and training center created out of the efforts of families who wanted to make life better for their children and other families,” Abbeduto said. “We are really trying to build on what we’ve done to enhance our impact locally, nationally and internationally, which is why I was motivated to make the trip to Belgrade.”

Joining colleagues from Johns Hopkins, Rush, Emory and other universities, MIND Institute speakers elaborated on the latest in clinical diagnosis and assessments for children with fragile X: family-focused language interventions; the latest in scientific discovery and DNA testing; new targeted treatments currently in use, and others on the horizon; as well as the importance of involving patients and families in advocacy efforts.

“I find that we have so much knowledge at the MIND Institute, I really want to share it,” said Hagerman. “Sometimes, in many other countries the doctors have never even heard of fragile X syndrome.”

### A chance to talk to experts

Maija and Cristian Sukreski traveled from Croatia to the meeting in Belgrade in search of advice to help their 3-year-old son, Petar, diagnosed a year ago with fragile X. The tiny blonde Petar is rambunctious, non-verbal and increasingly aggressive, hitting his parents when they attempt to calm him. It’s a trait his mother worries could become dangerous as she tearfully ponders the future.

Their trip, Maija Sukreski said, was to find help.

“He is going to therapy now, and I hope he can receive other therapy that will be more effective to slow down the behavior problems and help him talk,” she said.

In a small and drab clinic exam room, the couple awaited a chat with David Hessel, Ph.D., a MIND Institute psychologist and researcher known internationally for his work to refine psychological assessments for children with fragile X syndrome and other neurodevelopmental disabilities. Petar stood, biting his hands then flapping them, a common autism characteristic referred to as stimming—short for self-stimulating. They told Hessel about the boy’s worrisome behaviors.

“The aggression is a form of communication,” Hessel told the parents. He’s not angry with you. He’s just overwhelmed.”

“The MIND is a center created out of the efforts of families who **wanted to make life better** for their children and other families. We are really trying to build on what we’ve done to enhance our impact locally, nationally and internationally.”

MIND INSTITUTE DIRECTOR LEONARD ABBEDUTO



Maija Sukreski and David Hessel



Hessl suggested that instead of punishing Petar for hitting, they should reinforce good behavior with rewards of things he wants, like bananas, or special toys.

“When he hits, don’t be emotional or reactive. Stay really neutral. Turn away,” he said, adding: “Put a lot of time in this now and you will save yourself a lot of problems later. When his speech comes, he will probably be less aggressive.”

In another exam room Drs. Hagerman and Protic were talking to the Cvijetics, while Demetrije chewed his knuckles, played with his father’s iPhone and made frequent whimpering sounds.

Protic had already arranged for genetic testing of the family using the most sophisticated techniques available. Flora Tassone, Ph.D., another MIND Institute researcher in Belgrade, is helping ensure that Serbia can provide state-of-the-art genetic testing and that scientists understand how to use it.

Hagerman took a quick history and turned her attention to the couple’s shy 8-year-old daughter, Anja, who inherited the mutated X chromosome from her mother, Svetlana. Anja is a premutation carrier, meaning she does not have enough of the mutation to have fragile X—but has a 50-50 chance of having a child with the disorder, and will herself probably have an IQ in the average range.

Hagerman then turned to Svetlana, whom her husband tenderly calls “an emotional woman.” Tearfully, Svetlana told Hagerman that she has chronic muscle pains, difficulty with sleep, migraines and anxiety—all conditions that researchers, including Hagerman, have demonstrated in controlled studies occur more frequently in premutation carriers than in those who don’t carry the mutation.

Hagerman gave her practical suggestions, including quitting smoking, exercising regularly, and treating the anxiety with available medications. She told her that the dietary supplement melatonin can help her sleep.

Radoslav Civijetic then introduced Hagerman to his son, a boy with “no

“I hope Demetrije can do some job in his life and he can learn to speak. He knows a lot of things. Why not hope to marriage and have a wife and other things?”

DEMETRIJE’S MOTHER, SVETLANA CIVIJETIC



Dragana Protic with Randi and Paul Hagerman

behavior problems, no arguing, no jealousy, nothing,” he said. But also, without speech.

While Protic took notes, Hagerman went through a list of possible medications that could help him, including Metformin—the diabetes drug now undergoing tests in people with fragile X—and a multi-vitamin. She also urged the couple to encourage any kind of verbalization with Demetrije at home.

“I think you will find these recommendations helpful, and there will be other new treatments, so you have to think positive,” she said. Svetlana stood up and kissed Hagerman on each cheek, elated at the potential for help.

And while the family understands that making such treatments available to families in need will take time in a country that’s slow to change, they are confident that Dr. Protic will see that it happens. The conference and chance to meet the doctors from the MIND represented a “big, big step” and they are optimistic, he said.

“I hope Demetrije can do some job in his life and he can learn to speak,” said Svetlana, through her husband. “He knows a lot of things. Why not hope to marriage and have a wife and other things? I don’t know what the future will give us, but we are lucky with him in this moment.”



# UC Davis Precision Medicine Hub



UC Davis Health hematologist-oncologist Fred Meyers, M.D., M.A.C.P., leads the UC Davis Center for Precision Medicine and Data Sciences, a convener and incubator for a variety of innovative precision medicine research projects across the university. Meyers wrote the education chapter for the California governor's precision medicine action plan, and serves as president of the Association for Clinical and Translational Science. The former UC Davis Health vice dean and internal medicine chair previously founded one of the nation's first palliative care centers, and helped UC Davis' cancer center gain coveted "comprehensive" status from the National Cancer Institute.



*‘We need precision medicine to make*

# the next great leap in care’

*UC Davis Health is a pioneer and early adopter in precision cancer care, and is now home to growing portfolios in both precision medicine research and education. The university’s Center for Precision Medicine will promote advances across the field, in subjects ranging from combat medicine to everyday nutrition.*

The regional burn center at UC Davis Medical Center routinely treats victims of car accidents, industrial accidents and other mishaps occurring in the external world around us. But the center’s experts have also cared for patients who have received burn-like injuries to their skin from a purely internal phenomenon — the side effects of prescriptions.

Drug-induced Stevens-Johnson syndrome, or toxic epidermal necrolysis, is a rare but life-threatening intolerance reaction most often caused by reactions to medicines. And Christopher Wang, C.R.A., manager

of UC Davis’ Center for Precision Medicine and Data Sciences, could have been one of the victims.

After Wang developed kidney stones, he became a candidate to take allopurinol, a prescription xanthine oxidase inhibitor medication commonly prescribed to help. But thanks to elements of the burgeoning field of precision medicine — in this case, pharmacogenomics, predictive analytics, and enhancements in data-sharing — we now know that specific ethnic genetic backgrounds are associated with the risk of the syndrome, especially in Asians.

Wang researched the drug and discovered up to a quarter of people of Asian descent who take it can develop the toxic syndrome. They have a specific genetic mutation — their combination of genetic makeup that alters response to the environment (in this case, a common medication) — that makes them react differently than other patients.

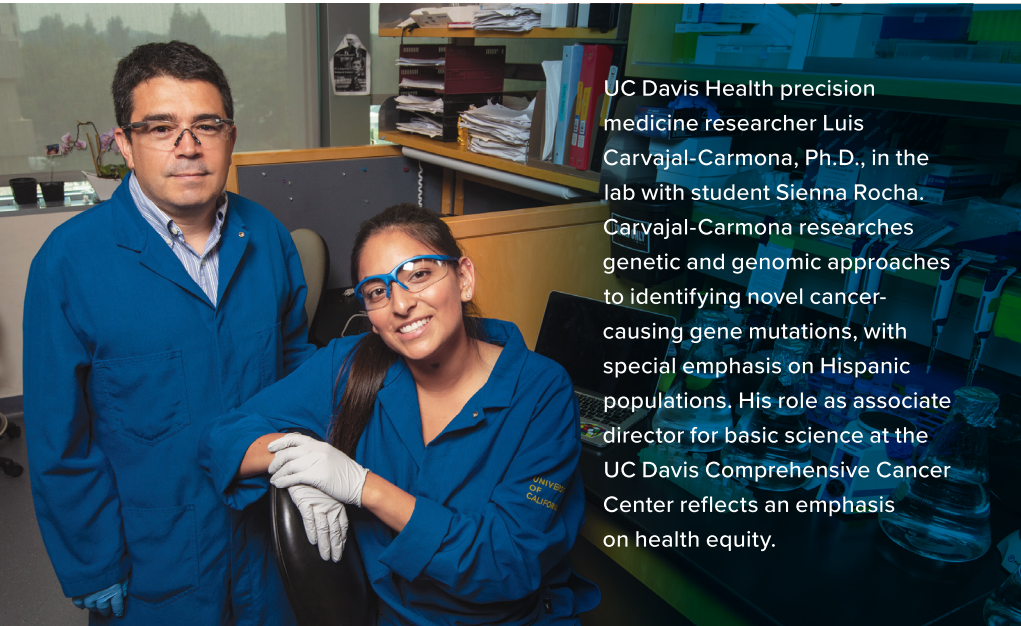
“I had to be very careful about taking those medicines — because of my racial background, I can get this problem,” Wang said. “If it wasn’t for big data, they wouldn’t have found this predictable side effect. That’s how the knowledge network can be used for big health.”

It’s the kind of insight that UC Davis is now working to create and pollinate — for the benefit of patients in our region and beyond — through a formal university initiative. The Center for Precision Medicine is a long-term research project that’s one of several formal Big Ideas at UC Davis — a series of forward-thinking, interdisciplinary projects or programs designed to positively impact the world for generations to come.

The initiative centers on the university’s growing influence and research portfolio in the field of precision medicine, also known widely as “personalized medicine.” This relatively new approach to care utilizes the most powerful technologies and disciplines — diverse data sources ranging from geographic variation of health and environment to genomics, enhanced by “Big Data” capabilities such as artificial intelligence and machine learning — to research increasingly precise treatments for individuals and communities based on a more robust understanding of gene-environment interaction.

The goal is to allow clinicians and researchers to predict more accurately the selection of treatment and prevention strategies for a particular disease or





UC Davis Health precision medicine researcher Luis Carvajal-Carmona, Ph.D., in the lab with student Sienna Rocha. Carvajal-Carmona researches genetic and genomic approaches to identifying novel cancer-causing gene mutations, with special emphasis on Hispanic populations. His role as associate director for basic science at the UC Davis Comprehensive Cancer Center reflects an emphasis on health equity.

injury that will provide the best outcomes for specific groups of people or individuals. Besides the direct benefit to the patient, delivering the optimal treatment the first time could also positively impact health care efficiency and costs in a larger social sense.

“We’ve always been doing this kind of work in medicine, but we have better tools now, and it gives us a new lens we can use to see health and clinical care differently — and more clearly,” said Fred Meyers, M.D., M.A.C.P., a hematology-oncology professor and former UC Davis internal medicine chair who directs the UC Davis Center for Precision Medicine and Data Sciences, and its supporting Big Idea. “It isn’t going to be perfect, but ultimately no one wants to be the average patient either.

“It’s OK to be the average patient until you have a bad side effect, and then you ask ‘Why didn’t we know that was going to happen?’” he said. “You don’t want to be the average person — you want them to treat you, and your unique makeup and situation.”

### Involvement from square one

The National Cancer Institute (NCI)-designated UC Davis Comprehensive Cancer Center has already employed and researched precision medicine strategies for the better part of a decade. For example, UC Davis oncologists can use a leading-edge battery of molecular tests to determine whether a cancer will respond to drugs designed to target particular genetic mutations, and identify which chemotherapies will be more effective.

The center is currently one of California’s only to be awarded NCI’s LAPS grant, making it a lead academic participating site for clinical trials across four major networks. Patients at LAPS sites have access to an array of clinical studies — including MATCH, a precision medicine trial in which patients receive treatment based on the genetic changes found in their tumors. It also includes Lung MAP, another precision medicine trial for advanced non-small cell lung cancer that’s grown after treatment.

Outside of the cancer realm, clinical and biochemical geneticists in UC Davis

Health’s Division of Genomic Medicine also offer precision and general genomic medicine services. For hard-to-diagnose patients and others with certain symptom sets, identifying disease-causing genes can help to create new treatment and management options.

“You will get the most sophisticated approach here,” Meyers said. “You’ll get the right test, at the right time, for the right patient. Our colleagues are leading us into precision diagnostics.”

These activities represent the “ground zero” of precision medicine, Meyers said. Taking the overall field to the next level requires not only advances in its various individual disciplines, but also — crucially — seamless cooperation to help envision, design, conduct and disseminate research.

“No one can do precision medicine by themselves — it’s all about teams,” Meyers said. “No one has the sufficient knowledge alone, so you have collaborations between genomics, informatics and biostatistics... It’s everyone in the pool, trying to look at the same thing in a different way. And when you look at things differently, you get new ideas.”

### State and federal leadership

UC Davis’ longtime, formal emphasis on interdisciplinary collaboration makes the university well-positioned to play the convener role, Meyers said. The university’s nationally prominent animal and human research centers, diverse patient population, and proximity to the state Capitol also provide unique benefits.

With the advent of the U.S. Precision Medicine Initiative in 2016, Meyers — who has served as vice dean of the UC Davis School of Medicine, founded one of the nation’s first palliative care centers, and helped UC Davis achieve NCI designation — was asked to lead and integrate precision



medicine across the university. The Center for Precision Medicine he directs acts as an internal consultancy, directly convening research teams while also helping to connect and support other efforts.

UC Davis is now helping to inform precision medicine leadership at both the state and national levels. Meyers was appointed to Jerry Brown's Governor's Advisory Committee on Precision Medicine in 2017, and UC Davis Health is a partner in the California Initiative to Advance Precision Medicine (CIAPM) board, where Meyers wrote the education chapter for the governor's precision medicine action plan.

As a charter member of the California Precision Medicine Consortium, last year UC Davis Health also became one of five California health systems to collaborate to implement the All of Us Research Program, a 10-year, \$1.4 billion landmark study that's a major component of the federal Precision Medicine Initiative. Led by the National Institutes of Health (NIH), the study is an unprecedented effort to gather genetic, biological, environmental, health and lifestyle data from 1 million U.S. volunteers. Alexander Borowsky, M.D., an associate professor of pathology and laboratory medicine, heads UC Davis participation with Katherine Kim, Ph.D., M.P.H., M.B.A., an assistant professor at the Betty Irene Moore School of Nursing at UC Davis.

"You can't get precision medicine without data from a diverse population, and All Of Us develops that diversity information that's needed to help reduce health disparities," said Jennifer Sanchez, the precision medicine center's program coordinator.

This spring, Meyers was named president of the Association for Clinical and Translational Science, a 5,000-member

career-development association for translational scientists. UC Davis hosts one of the nation's inaugural national Clinical and Translational Science Centers, with Meyers serving as director of research education and training.

#### Clinical and structural efforts

A variety of UC Davis Health research teams are currently working on precision medicine-embedded translational or clinical studies, aimed at creating new insights that directly inform or improve care. Subject and specialty areas range from common military combat injuries such as traumatic brain injury and burns (see page 26), to Jordan's syndrome,

## What is *precision medicine*?

Traditional medical treatments are designed as a "one-size-fits-all" approach that can be effective for some or many patients, but may not be for others.

The objective of precision medicine is to make diagnosis of disease or illness, treatment therapies, and prevention more *personalized, proactive, predictive and precise*.

To do so, the field considers individual differences in genes, environments, and lifestyles. Clinicians can select treatments that are most likely to help patients, based on a more complete picture and understanding of their disease or ailment.

This targeted, personalized care relies on Big Data and technological advances — bringing together innovations in fields such as genomics, metabolomics, biomedical data sciences and environmental sciences, and utilizing technologies such as mobile health, imaging, artificial intelligence, and social networking.

In the process, multiple variables that affect health can be studied to draw better treatment conclusions for individuals. Data such as toxic exposure, emotional states, sleep, diet, heart rate, labs and more can be used to inform better care.

Along the way, scientists and society consider and debate the ethical, legal and social implications of the use of these new tools.

Here's a scenario from Christopher Wang, manager of UC Davis' Center for Precision Medicine and Data Sciences:

A man and a woman develop the same type of cancer, in the same place. The woman gets better, the man doesn't. Why? Different phenotypes:

- Different ages
- Different underlying genetics related to gender
- Different microbiomes and gut microbiomes (the bacteria, viruses and other life in the gut)
- Different environments — perhaps one has been more exposed to stressors such as adverse childhood experiences (ACEs)
- Different behaviors — one uses tobacco, or lives near a freeway

Precision medicine looks at as many of these factors as possible together at once — striving to consider the patient's whole story from the very beginning, rather than a 10-minute exam-room snapshot.

a rare pediatric condition that causes neurodevelopmental disorders.

Meanwhile, other UC Davis teams are enhancing the foundations of precision medicine through studies and projects meant to strengthen both local and national capabilities in genomics, data gathering, data analytics and workforce preparation (see page 28).

"When I started my own career in hematology-oncology, it was difficult to provide high-quality cancer care — the cure rate was less than 50%," Meyers said. "Now the rate is up to 75% — but the truth is that we want to prevent cancer in the first place. We need precision medicine to make the next great leap in care."



# Bringing precision medicine

*Research teams across UC Davis Health are using precision medicine to create treatment approaches and insights for use in direct patient care. Examples:*

## ‘PEOPLE ARE LOOKING FOR ANSWERS’

Daniel Robles is very interested in how precision medicine can shed light on questions about liver disease and liver cancer among military veterans.

Robles, a senior research coordinator at the UC Davis Comprehensive Cancer Center, served in the U.S. Marine Corps from 1988 to 1993 — including months in the active combat theater during 1991’s Persian Gulf War.

During a workup for headaches a couple of years after his discharge, doctors noticed chronic liver inflammation. A few years later, Robles — who doesn’t drink alcohol — was diagnosed with non-alcoholic fatty liver disease or NAFLD, a common precursor to liver damage and cancer.

He wasn’t the only one. Robles is heavily involved in a large veterans’ organization, and has noticed many NAFLD questions on web forums. But so far, he’s found no formal advice published by the Veterans Administration.

“People are looking for answers, and right now there are just none,” he said.

NAFLD is often seen in patients with diabetes, obesity, alcohol use, or occasionally inherited predisposition. But many military personnel also develop NAFLD and consequent liver problems without known predisposition.

Many veterans suffer from anxiety or post-traumatic stress disorder (PTSD), Robles said, which can lead to self-medication with food or alcohol. “You tend to hunker down with what’s comfortable, and that can include poor food choices,” he said.

But while mental health support for veterans is crucial, Robles said there’s also speculation and suspicion that environmental exposures play a role in the liver issues as well. Specialists told Robles that while no studies currently show formal correlation between liver problems and the Gulf War, there’s other empirical evidence linking the two — possibly involving depleted uranium in ammunition.

“I do worry,” Robles said. “When I look at my life today and see loose patterns of empirical evidence pointing to the Gulf War, that concerns me. However, the best approach for now is to make better choices about fitness, diet and lifestyle.”

Predict susceptibility to a disease or a treatment side effect

**Example:** *What’s causing a rise in liver cancers in the military population?*

**Problem/Issue:** Without known predisposition, many civilians and military personnel develop a condition known as non-alcoholic fatty liver disease (NAFLD), which can be a precursor to liver disease and cancer.

Researchers are concerned that active duty and veterans appear more susceptible, due to co-occurrence of additional risks such as unappreciated environmental factors in regions of deployment, behavioral health stresses, and access to or acceptance of good nutrition.

**Goal:** An initial UC Davis-led pilot study will identify military personnel at greatest risk for liver disease and liver cancer, setting the stage for prevention or earlier detection and improved care.

**Approach:** Researchers will use military databases to create and analyze new data sets for cohorts of Vietnam-era, Gulf War-era, and current-duty service members, with biostatisticians and informaticists then working with liver experts and machine learning algorithms to produce a risk index. A more extensive index after the pilot grant is expected to integrate phenotype, biomarkers, environmental exposures and behavioral patterns.

**Principal investigators:** UC Davis, UCSF, Utah, Boston and USUHS. Uniquely, retired and active-duty personnel will help guide research and results-sharing.





# home to the patient

## Personalize treatment

*Example: Improving co-treatment of burns and traumatic brain injuries in soldiers*

**Problem/Issue:** Traumatic brain injury or TBI is a leading cause of death in the U.S. military and civilian populations. When combined with burn injury, TBI mortality doubles. When the two injuries occur together, medical teams face a decision about strategy; TBI treatments usually focus on minimizing intravenous fluid administration to avoid brain swelling, whereas burn treatments use large amounts of IV fluid to replace those lost.

**Goal:** Improve outcomes by developing a precision medicine approach — a precise, personalized and proactive classification of injury using biomarkers and data — that gives medical teams a roadmap to determine the best way to provide care for improved survival and recovery.

**Approach:** Led by Drs. Tina Palmieri, M.D., F.A.C.S., and Meyers, researchers are characterizing the entire continuum of polytrauma care, incorporating the use of biomarkers.

**Principal investigators:** Meyers and Palmieri, assistant chief of burn surgery at UC Davis and Shriners Hospitals for Children – Northern California; UC Davis colleagues; Major Ian Stewart, David Grant Medical Center; Mary Jo Pugh, University of Utah/Department of Veterans Affairs.

## Advance participatory wellness and prevention

*Example: Precision Nutrition Program*

**Problem/Issue:** Poor diet is the leading cause of U.S. mortality, contributing to heart disease, stroke, diabetes and cancer.

**Goal:** A new Precision Nutrition Program will develop and test interventions which provide, prescribe and educate patients regarding healthy and medically appropriate diets. It aims to leverage UC Davis Medical Center's executive chef Santana Diaz, a national "farm-to-fork" leader working to substitute processed hospital food with local, whole and plant-based foods.

**Approach:** Develop programs that improve health by providing healthy patient meals, then quantify impacts on patient health and overall health care costs. An initial one-year retrospective study will look at quality improvement in food and patient satisfaction outcomes at UC Davis Medical Center, comparing data and patient satisfaction at different times to assess impact of farm-to-fork initiatives. A two-year trial will then enroll 50 patients and families on the hospital's cardiac floor to receive medically tailored meals. Ultimately, the data will inform a pilot project of food-based interventions, such as medically tailored patient or family meals and prescriptions for healthy food.

**Principal investigators:** Meyers. The UC Davis Health Food and Nutrition Services and UC Sustainable Agriculture Research and Education Program are collaborators.





UC Davis teams are also working to advance the underlying disciplines, systems and technologies that contribute to precision medicine, such as data analytics, genomics, and workforce training. Some examples:

# Supporting precision medicine's foundations

## Data gathering

### Snapshot: Study seeks to improve cancer survival for Latinos, Asians and Blacks

The UC Davis Comprehensive Cancer Center is leading a five-year effort using patient-derived cancer models to tease out why some ethnic and racial minority groups fare worse when they get cancer —

and to find more precise treatments to improve their chances of survival.

Supported by a \$6.3 million grant from the NCI's Center to Reduce Cancer Health Disparities, the collaborative study engages four NCI-designated comprehensive cancer centers that are part of the recently created UC Cancer Center Consortium, with a combined patient population among the most diverse in the U.S.



The study will focus on four cancers that disproportionately affect minorities: lung, liver, gastric (stomach) and bladder, with a minimum of 60% of tumor samples used for UC Davis research drawn from minority patients to grow tumors (or xenografts) in mice. The rest will be from

non-Hispanic whites and used as controls.

Once a patient-derived xenograft or "PDX" is established, it can be replicated so that a single patient tumor can be used to test numerous drugs at the same time. The goal is to generate at least 200 PDXs for use in two research projects, and to share findings with the NCI and other scientists to aid development of more precise treatments.

## Data analytics

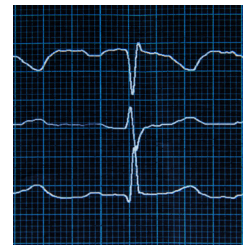
### Snapshot: Preclinical methodology to differentiate useful or potentially harmful cardiac arrhythmia drugs at the molecular level

In an effort to help enable better development of new drugs for cardiac arrhythmias, a group of UC Davis researchers and clinicians developed a series of novel simulations that provide

insights on vital interactions of drugs and cardiac cells at the atomic scale.

Before the study, authors said there was no effective preclinical methodology to differentiate useful or potentially harmful drugs at the molecular level. Led by Eleonora Grandi, Ph.D., of the Department of Pharmacology and collaborations with clinical cardiologists such as Uma Srivatsa, M.B.B.S., M.A.S., this study will change the treatment of common arrhythmias such as atrial fibrillation.

Combining molecular modeling software with simulations to study drug-channel interactions is a novel approach that allows future automated virtual drug screening, and a technology that can be applied to any ion channel and benefit multiple treatments. Ultimately, the approach advances precision medicine by predicting individual patient responses to drug therapy based on a patient's specific ion channel mutation.





» **Help advance precision medicine**

UC Davis is spearheading an innovative paradigm at the intersection of people and populations, environmental influences of health and health care, biological markers, and behavioral and mental health. The Center for Precision Medicine is assembling unique, cross-disciplinary teams to solve intractable challenges, ask bold new questions and propel research from bench to bedside and back.

UC Davis is partnering with donors, corporations and foundations to accomplish the following:

- Create powerful, diverse teams that revolutionize genomics, patient experience and public health via start-up funding for pilot studies and multidisciplinary projects
- Fuel leading-edge training with Big Data analytics architecture and critical technology upgrades
- Recruit faculty and trainees who embrace team science and work at the interface of disciplines. The center will endow a directorship and six faculty positions designed to accomplish high-impact research that translates to improved care.



*bigideas.ucdavis.edu*

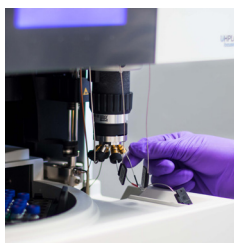
To learn more, please contact Brenda Betts, assistant vice chancellor of development, at [bkbetts@ucdavis.edu](mailto:bkbetts@ucdavis.edu) or 916-734-9583, or visit [bigideas.ucdavis.edu/precision-medicine](http://bigideas.ucdavis.edu/precision-medicine).

## Omics

### A unique application of metabolomics

In their effort to improve co-treatment of burns and traumatic brain injuries in

soldiers, UC Davis researchers are applying metabolomics to trauma research in an innovative approach that's unique to the university. Metabolomics – the study of intermediate biochemical metabolism byproducts – can help quantify



changes taking place inside cells or body fluids at specific times or conditions.

Identifying and quantifying cellular metabolites involves advanced technologies such as mass spectrometry, combined with sophisticated

statistical interpretation. Working with Oliver Fiehn, Ph.D., director of the NIH West Coast Metabolomics Center, UC Davis researchers are using metabolomics to find biomarkers, or measurable indicators of injury severity or disease presence. The approach can provide a methodical, precise way to identify and characterize clinical conditions such as a traumatic brain injury alone or in conjunction with burns and other trauma injury. By being able to assess and profile TBI pathologies this way, the team hopes to move beyond 'one-size-fits-all' assessments and care.

## Education and workforce

### Training the next generation of data-fluent professionals

Meyers promotes precision medicine research opportunities through the Academic Research Careers for Medical Doctors (ARC-MD) Program, an innovative training pathway for the next generation of UC Davis School of Medicine students and resident

physicians who aspire to become engaged in research. The school has provided substantial support for the program, which provides research and career mentorship, special experiences, a unique curriculum, and community engagement within a supportive longitudinal learning community.





# UC Davis School of Medicine Alumni Association Awards





# 2019 Distinguished Alumni Award Frank Sousa, M.D., '74, Ophth '79

*This volunteer clinical professor, mentor and assistant dean has devoted 40 years to the School of Medicine, helping students find and follow their paths to futures in medicine.*

Today was the day. Out of thousands of applicants, one student's road to medicine was about to begin.

The assistant dean for admissions picked up the phone and dialed the number. As the ringing sound rippled through the receiver, the privilege of notifying an accepted student rushed over him. He was about to witness the sheer elation and joy that comes when a young person learns they've made it into the school of their choice.

"Hello?" came a voice from the other end of the line. "Hi, this is Dr. Sousa, Assistant Dean for Admissions and Student Development at UC Davis School of Medicine. I want to congratulate you and welcome you to our community and medical family. We know you will grow here — and with our world-class medical education, have the opportunity to become the physician of your dreams."

Truer words couldn't resonate more with Frank Sousa (M.D., '74), as almost 50 years ago he was once the applicant on the other end of the line. In the decades since launching his own medical career, the highly recognized UC Davis volunteer clinical professor and alum has created an ever-lasting footprint with the School of Medicine, devoting over 40 years to teaching, mentoring, promoting student growth, innovating and leading. To date his all-encompassing dedication and volunteerism have helped hundreds of students find and follow roadmaps to their medical futures.

"I'm proud to have been able to help many students follow their paths, and eventually enter residencies and careers that are satisfying to them both person-

ally and professionally," he said.

Due to his commitment to higher learning, unparalleled passion for supporting students, and helping the UC Davis School of Medicine achieve excellence, Sousa is the recipient of the UC Davis School of Medicine Alumni Association's 2019 Distinguished Alumni Award.

## Where it all began

Recognized for his compassion and advocacy, Sousa's journey to helping others was strongly influenced by his parents' generosity, work ethics, and exemplary lives.

"My father was a natural-born innovator and organizer as a building contractor. My mother was a nurse who taught me the joy of helping others through caring for them in times of need," Sousa said. With this strong foundation plus their encouragement for higher education, he found his calling to a career in medicine — right here close to home.

Being accepted and entering the brand-new UC Davis School of Medicine was transformative. As Sousa began his first semester as a medical student in the fall of '70, the fledgling school — then based in Davis itself — offered an innovative curriculum designed to provide both a humanistic and scientific grasp of medicine. He and other classmates would actually help to shape the program, while gaining experiences and bonds that he still reflects on today.

"The UC Davis School of Medicine is truly a special place. I remember working — with a hammer and nails — on the first student-run clinic, being the first student



*A dedicated volunteer and teacher*

In addition to his extensive work as a teacher, Frank Sousa (M.D. '74, Ophth '79) has also made student development and outreach a major part of his career. The volunteer clinical professor and ophthalmologist has earned major honors during his time at UC Davis:

- Distinguished Alumnus Award, UC Davis School of Medicine Alumni Association, 2019
- UC Davis Health Office of Diversity Outstanding Performance, 2012
- Outstanding Volunteer Clinical Faculty Award (x4)
- Kaiser Hospitals Award for Excellence in Clinical Teaching (x3)
- Golden Stethoscope Award Admissions, 2004
- Inducted Alpha Omega Alpha 1992, Outstanding Teacher and Mentor

## PERSONAL FACTS

### *What is your favorite UC Davis memory?*

As a medical student and resident on the wards, learning and experiencing the human condition from patients during the most compromised moments of their lives.

### *Lessons learned from UC Davis?*

It is really easy here at UC Davis Health to surround oneself with truly high-quality people who influence what we become. Take advantage of this environment. We are special.

### *Hobbies*

Practicing magic, sketching, and poetry

### *Last book read?*

*The Four Quartets* by T.S. Eliot

### *Retirement to-dos*

More time with my wife Laurel, my children, grandchildren (I've got the Ice Cream Man on speed-dial) and, of course, keeping involved with UC Davis School of Medicine.



representative to the admissions committee, and working with so many students, faculty, and leaders who shared the same pioneer spirit," he said.

After four years and countless clinical hours, UC Davis had developed a physician who would go on to help thousands of people directly, and give back tenfold to the place where it all began.

### Focused on service

Inspired by the impact of others' gratitude and being integrally involved in the community, Sousa began his practice as an ophthalmologist with the Veteran Affairs Northern California Health System, just a few blocks from the UC Davis School of Medicine.

It was during this time his career came full circle, coupling ophthalmology with his love for education. Sousa ventured back to his roots at UC Davis, where he immediately joined the volunteer clinic faculty and began teaching UC Davis medical students and residents. After his time at the VA, he continued working in admissions and student advising, and eventually went on to

become the assistant dean for admissions and student development at UC Davis School of Medicine.

He spent decades engrossed in recruitment, mentoring, advising, and student development on several different fronts, including the UC Davis Postbaccalaureate program, the UC Davis Family Nurse Practitioner and Physician Assistant program, the UC Davis PreHealth Program, and the Betty Irene Moore School of Nursing. These contributions helped mold great students, but also phenomenal people who would eventually become health care leaders.

"We look for students with the attributes of good physicians and great people," he said. "Our medical students reflect the diversity of California and the qualities and capabilities that every physician must possess to be able to provide quality care for patients."

It was this extraordinary passion for influencing and shaping minds that would help develop the next generation of physicians — and change many students' lives forever.

## We look for students with the attributes of good physicians and great people.

FRANK SOUSA

### A strong impactful presence

Throughout Sousa's career, he has worked with hundreds of students trying to find their niches in medicine as physicians and hoping to fulfill their dreams of helping patients during vulnerable times. As an inspirational mentor and advisor, Sousa has met and empowered countless students. He has observed firsthand the heart, integrity and hard work as they have evolved from med school to residency and beyond.

These high-caliber qualities hold true to the school's original mission that Sousa recalls hearing on his first day of class in 1970 from Dean Tupper — that "one day the UC Davis School of Medicine will be a world-class medical school." Tupper went on to say, "To accomplish this mission, each and every one of us must work hand-in-hand with our academic and volunteer faculty to serve with humility the community of physicians and patients we are now an integral part of."

That mission still holds true today, with many embodying it — including Luis Godoy, who one day did receive a life-changing phone call.

The former gang member from Suisun City, now a cardiothoracic surgery resident and subject of international media attention, credits Sousa's mentorship as being a tremendous impact to his career.

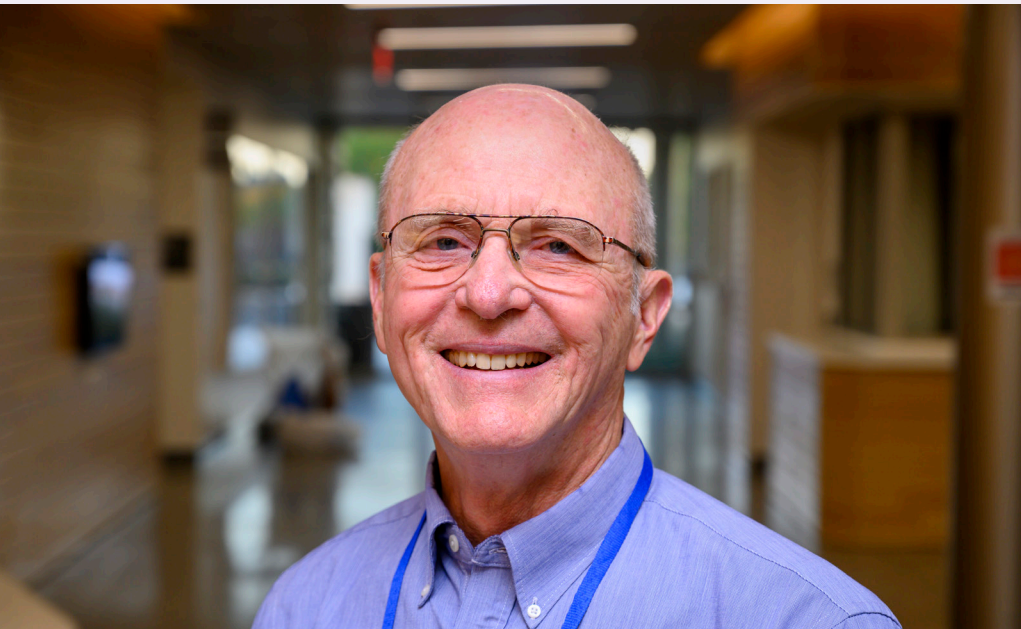
"One of the things that I have learned throughout my entire life span is to seek mentors and seek people who can help guide you along the way," said Godoy, in an ABC 10 interview. "One of those people is Dr. Frank Sousa."

Sousa says Luis, as so many others, "has helped me just as much as I have helped him."

As a true champion for students and a touchstone of humanity, Sousa's pride in UC Davis will always show.



Sousa with family and friends at his Alumni Weekend award ceremony.



## 2019 Humanitarian Award John Shepherd, M.D., '79

*This family medicine practitioner and humanitarian has spent decades helping the underserved in his community and around the world.*

Longtime family medicine practitioner and professor John Shepherd (M.D., '79) has devoted his life's work to medicine, teaching and community involvement. To date that dedication has taken him across the globe, providing care to underserved communities and aiding in disaster relief.

Due to his commitment to service and humble spirit, Shepherd is the recipient of the UC Davis School of Medicine Alumni Association's 2019 Humanitarian Award.

### **Advancing health locally and globally**

From the start of his medical career, Shepherd has demonstrated a special interest in serving the most vulnerable. Whether helping African Americans in inner-city Chicago, migrant farm workers and Hmong immigrants in California's Central Valley, or rural farmers and ranchers in the far reaches of eastern and southern Colorado, his

goal has been to break down barriers to improve health.

Shepherd has worked with Doctors Without Borders in Sierra Leone caring for war refugees; volunteered in Haiti following the 2010 earthquake; and offered his expertise to Maori indigenous people in New Zealand.

For 14 years, he also served as the Colorado state president of Physicians for Social Responsibility, and for three years as a national PSR board member. During this time, he attended international conferences of the International Physicians for the Prevention of Nuclear War in Moscow, Hiroshima, and Mexico City. Working to create a healthy and peaceful world, he participated in advocacy efforts around the elimination of nuclear weapons, gun violence, domestic violence and environmental destruction—a conscientiousness that he ties back to his UC Davis education.

In 1975, the school prioritized primary care and family medicine, Shepherd said, and recognized the value in admitting students with additional work experiences and humanities degrees. He said other medical schools seemed to depreciate his American history degree, two years of volunteer work in Japan and Korea, and work as a VA hospital orderly on a locked psychiatric ward and a spinal cord injury ward. Yet the time helped him to understand the multitude of factors that influence everyone's quality of life: equality, dignity, justice, education, housing, nutrition and environmental safety.

"UC Davis provided a comprehensive education that allowed me to meet many wonderful people, who expanded my knowledge of the complexities of society and the need for political action to accomplish substantive change," he said.

During the last decade of his career, Shepherd was a full-time physician for Clinica Campesina, a federally qualified health center in Lafayette, Colorado, where he contributed to the development of a family medicine residency designed to train physicians to serve underserved populations (and along the way, benefited from the ceaseless support and appreciation shown by the community and the staff).

### **PERSONAL FACTS**

- Assistant and Associate Professor for 18 years, University of Colorado Health Sciences Center
- Served on medical staff at community health centers in Colorado, providing care for ranchers and farmers, indigent Latino families and refugees from Guatemala
- Served as medical director of the Denver Juvenile Justice System Community Assessment Center
- Teacher of the Year Award in Family Medicine, University of Colorado (x2)
- Teaching Excellence Award, University of Colorado (x2)





# classroom partners advance to clinical colleagues

Two grads of the Betty Irene Moore School of Nursing at UC Davis bring their new skills to life together serving UC Davis Health patients

The desire to see the bigger picture of health care drove Victoria Jackson to pursue a master's degree as a family

nurse practitioner. The Betty Irene

Moore School of Nursing at UC Davis brought into focus a new perspective of nursing and new confidence to hit the ground running after graduation.

"We didn't just have lectures. We worked in small groups; we interacted in teams with other professions, like physician assistants (P.A.s), medical and doctoral students," explains Jackson, a 2018 alumna. "Now I have the knowledge and the confidence to share my ideas and work well with others on the team."

One of the classmates with whom she discussed cases during her didactic year is Patrick Nguyen. Nguyen chose the School of Nursing to pursue a P.A. degree because of the reputation of UC Davis and its connection to UC Davis Medical Center.

"The program really taught me how to professionally work with people," Nguyen says. "I made connections with nurses, doctoral students, physicians in my rotations and the incredible faculty. Experiencing all that while in school now helps me to easily connect with other team members."

And connect they still do. Now, they share cases on the job at grand rounds at UC Davis Health. Nguyen works in the medical center as a radiology P.A. Across the street, Jackson partners with patients with devices in the cardiology clinic.

"Health care brings together a diverse group of people with a common purpose. Our conversations even spilled over into our personal lives. We were even both part of a classmate's wedding," Nguyen says.

"I believe the school helps students develop lifelong connections and friendships because it integrates hands-on, engaging activities that move us out of our bubbles to support each other," Jackson adds. "I chose UC Davis to interact with and learn from faculty and colleagues in the clinical field. Running into former classmates, like Patrick, reminds me how I'm part of the larger health care landscape."

I believe the school helps students develop lifelong connections and friendships because it integrates hands-on engaging activities that move us out of our bubbles to support each other.

VICTORIA JACKSON

I made connections with nurses, doctoral students, physicians in my rotations and the incredible faculty. Experiencing all that while in school now helps me to easily connect with other team members.

PATRICK NGUYEN

Nguyen echoes that sentiment of community after graduation.

"I really feel like the whole UC Davis team cared about our success," Nguyen says. "Because of the UC Davis P.A. program, I am on a career path today that I never thought was possible."

## *Supporting advanced-practice providers*

UC Davis Medical Center's advanced practice fellowship program supports new graduate nurse practitioners (NPs) and physician assistants (PAs) in the critical first year as they transition into practice. The one-year program's primary goals are to help develop relevant practical skills in critical thinking, evidence-based practice, and procedural skills.

Throughout the experience, expert advanced practice professionals and physician colleagues help develop specialty specific skills and the confidence needed to begin a career in trauma surgery, neurosurgery, interventional radiology or neurology. Fellows are paired with an experienced physician or advanced practice provider to provide supervision and support.



# Alumni association updates

## School of Medicine Alumni Association updates

We hope the Alumni Weekend 2019 photos on the following pages will inspire you to come back to campus in the fall of 2020. In the spirit of giving you ample notice, we can tell you now that the dates for Alumni Weekend 2020 are Friday and Saturday, October 23–24.

In the previous pages of this issue, you saw our bow to this year’s Alumni Award recipients. We need your help to identify fellow alumni who are doing exceptional work and deserve to be recognized next year and in the years to come. We know there are many of you.

The nomination process is simple. Go to the School of Medicine Alumni Association (SOMAA) website [health.ucdavis.edu/medalumni](http://health.ucdavis.edu/medalumni). Click the Awards tab and select “Submit a Nomination.” Nominations are reviewed in late April for awards to be presented at Alumni Weekend 2020.

Finally, please keep in touch — give us your feedback, send a class note, respond to an invitation, like us on Facebook. If you think we might not have your correct email address, please share it with us. We are always reachable through the SOMAA website or [medalumni@ucdavis.edu](mailto:medalumni@ucdavis.edu). Let’s hear from you!

## School of Nursing alumni updates

In continuing UC Davis Health’s rich history of preparing primary care providers for rural and underserved communities, the Betty Irene Moore School of Nursing is pleased to announce a new nurse practitioner residency program.

Every year for three years, up to 10 new nurse practitioners will benefit from intense, focused training while serving patients in UC Davis Health-affiliated centers and community clinics in under-resourced areas throughout Northern California.

In the coming years, alumni of the forthcoming nurse practitioner residency program will join the School of Nursing alumni community thanks to UC Davis nurse practitioner alumna and Clinical Professor Debra Bakerjian.

Led by Bakerjian, the new NP-PRACTICE initiative is funded by a \$3.5 million grant from the Health Resources & Services Administration (HRSA), in partnership with UC Davis Health and multiple Federally Qualified Health Clinics. Visit [health.ucdavis.edu/nursing/academics/NPresidency](http://health.ucdavis.edu/nursing/academics/NPresidency) to learn more.



**Doug Gross (M.D., '90)**

*President*

*UC Davis School of Medicine  
Alumni Association*



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- 1 Members of the Class of 1979 gather for their 40-year reunion.
- 2 New UC Davis School of Medicine Dean Allison Brashear greets the crowd. Brashear is an internationally known researcher on movement disorders, who has headed multicenter trials leading to federal approval of three medications.
- 3 Simran Sandhu from the Class of 2021 leads a tour of the Sacramento campus, including the new education building for the Betty Irene Moore School of Nursing. Interprofessional education and team care are central tenets of the two UC Davis Health schools.
- 4 Joe Kim (M.D., '17), Kimie Hirabayashi (M.D., '84), and Paul Beninger (M.D., '79) meet a student at the mentoring lunch.





- 1 Classmates and family members of the Class of 2009.
- 2 Fred Meyers presents about the UC Davis Center for Precision Medicine and Data Sciences (see story p. 22). Other speaker topics included gun violence prevention and healthy aging in a digital world.
- 3 Naomi Raymundo-Bikle (M.D., '89) and a classmate say hello.
- 4 Rayna Alexander (M.D., '74) and Ken Patric (Residency, '79) share a laugh.







1



2

- 1 The Class of 1974.
- 2 Headed to the Davis campus.  
Far right: John "Sandy" Friden (M.D., '79) and his wife Peggy; behind them, Richard Rudd (M.D., '79) and Judith Lamberti.
- 3 Phil Kim, Joel Gross and Mark Talavera reminisce about the Class of 1994.

**DON'T MISS**  
**UC DAVIS SCHOOL OF MEDICINE**  
**ALUMNI WEEKEND**  
**2020**



3



**OCTOBER**  
**23-24, 2020**

Mark your calendar and plan to join classmates and friends. Registration opens soon.

[health.ucdavis.edu/medalumni](http://health.ucdavis.edu/medalumni)



# Betty Irene Moore School of Nursing Alumni Updates

## Suzanne Beshore, M.S. '12, R.N.

As a Betty Irene Moore School of Nursing alumna and retired nurse, my continued commitment to the profession I love is due, in part, to the skills I learned and connections I made as a result of my graduate experience. I remain involved in professional organizations I joined while employed as a nurse. One of these organizations is the Society of Otorhinolaryngology and Head-Neck Nurses. I am currently the chairperson for their Health Policy & Advocacy Committee. I write articles quarterly for the Society's journal on topics related to nursing and health policy. My goal is to pique members' interests in the policy arena and encourage their important voice in health policy. This summer, I finally submitted my master's thesis research for publication in their journal. I feel great satisfaction that I finally took this important step in the research process to share my findings.

## Jacqueline Clavo-Hall, Ph.D., '17, J.D., C.R.N.A.

In August 2019 I was promoted to the position of Interim Director of the Touro University California School of Nursing

and Interim Assistant Dean of the College of Education and Health Sciences.

## Kimia Ighani, M.H.S. '19, P.A.-C.

I'm still riding the bliss train from my PA Oath Ceremony, August 22, 2019. This was the day I found out that I completed the program. I'm a PA! Then, on October 7, 2019, I found out that I passed my board exam and officially became a board certified physician assistant. I got my first job at Elevation Physicians practicing internal medicine in Northern California. I still can't believe this is real; can someone pinch me? I'm so grateful for my friends and family. Words can't describe the excitement that I have in calling myself a health care provider.

## Angelique I. Silva, M.S. '16, R.N.

Since graduating from Betty Irene Moore School of Nursing in 2016, I became the perinatal nurse educator and safety specialist for UC Davis Medical Center. In this role, I am fortunate to lead multidisciplinary teams including nurses, OB residents, anesthesia residents, pediatric residents and hospital leadership in

many evidenced-based practice projects. I also participated as a co-author of the California Maternal Quality Care Collaborative toolkit on OB sepsis, at the time of this writing expected to be released in late 2019.

## Kaitlynn Thurman, M.S. '14, R.N.

I am now the director of education and training at Sutter Medical Center Sacramento. I began my career as a new graduate nurse in the intensive care unit while concurrently completing the MS-Leadership program at the Betty Irene Moore School of Nursing at UC Davis. My time at the School of Nursing set the foundation for my career. As an operations and systems-focused expert, I strengthened my ability to navigate the complexities of health care and adult learning.

## Victoria Marie Conlu, M.S. '17, R.N.



In the past year, I transitioned to becoming a clinical member of a team that's configuring a new EMR for a San Antonio, Texas

health system that serves as a primary source of care for underfunded and vulnerable populations. Using a mixture of clinical and leadership knowledge I gained at Betty Irene Moore School of Nursing, I'm now working to make sure that technology is a complement and not a hindrance to high-quality patient care for a population which needs it the most.



## Help make a difference

Need a quick and easy way to feel great about yourself and know you're making a difference in the lives of UC Davis students?

Make a gift to the School of Medicine or Betty Irene Moore School of Nursing. No matter the size of your donation, what counts is your participation!

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# Matt Chan

**MATT CHAN (M.D., '04, B.S., '00)**, a longtime member of the School of Medicine Alumni Association Board of Directors and an active volunteer with medical students and in the community, passed away this fall at 40 after a nearly two-year battle with cancer.

Colleagues and friends remember Chan, a neuroradiologist with Sutter Health, as an amazing person and unique talent who always strove to improve the world around him, and who will be missed for his warmth, kindness, patience, dependability, intelligence, ingenuity and generosity. He was among the younger members of the School of Medicine Alumni Association's board, joining in 2011 only a year after beginning practice with Sutter Medical Group in Sacramento.

Outside of radiology, Chan was also a member of the SMG Communication Committee, member of the Yolo Regional Quality Management Committee, and social media committee chair of the Sacramento Electric Vehicle Association. Beyond his official roles, he is fondly remembered as the go-to technology guru, troubleshooter and adviser for everyone, whether about phones, computers, cameras, solar panels, electric cars or anything electronic.

Chan is survived by his three children, Chloe, Micah, Zoe; his wife, Dr. Eva Chan; his sister, Dr. Danielle Chan; his parents, Ken and Rebecca; and many friends.

*Colleagues and friends remember Chan as an amazing person and unique talent who always strove to improve the world around him.*

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Vice Chancellor of Human Health Sciences  
Chief Executive Officer, UC Davis Health

**Allison Brashear, M.D., M.B.A.**  
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# Cleats for a cause

Sacramento Republic FC midfielder (and childhood cancer survivor) Ray Saari brainstorms design ideas with 11-year-old Gianna Arredondo for a special pair of one-of-a-kind soccer cleats. The Sacramento-based soccer team commissioned local artist Kevin Lee to design the cleats, then auctioned them off to support UC Davis Children's Hospital — and to help tell the stories of patients like Arredondo, treated here for a genetic brain condition. In 2013, UC Davis Health was the founding kit sponsor and continues to be the kit sponsor of the Sacramento Republic FC — a second division professional team recently awarded a franchise in the top division of professional soccer in the U.S., Major League Soccer. The team and health system have partnered on multiple community initiatives, such as street soccer in underserved neighborhoods.