

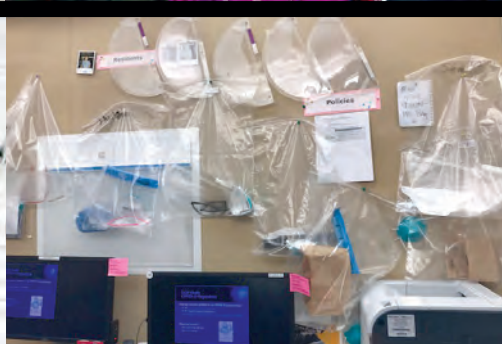
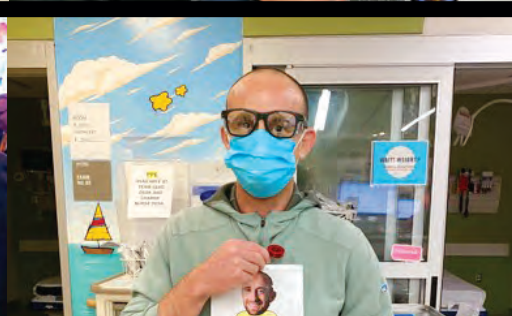
The UC San Francisco Department of Emergency Medicine

2020 ANNUAL REPORT

Honored to Serve

Emergency Medicine Shines in a Crisis-Filled Year





Letter from the Chair

1

In 2020 – a year in which emergency medicine clinicians were, perhaps, the most essential of essential workers – the UCSF Department of Emergency Medicine responded with more skill, tenacity, compassion and courage than anyone could have hoped for. When I read through the stories that comprise this annual report, I am impelled, as John Steinbeck said in accepting his Nobel Prize in Literature, “to roar like a lion out of pride in my profession,” and I am overwhelmed with gratitude for the sacrifices that everyone in this department has made and the remarkable things we have accomplished.

My colleagues, including our outstanding trainees, stepped up in unprecedented ways in a time of unprecedented uncertainty. They delivered exemplary care and sacrificed and supported each other through a relentless pandemic and its subsequent economic impact, a national reckoning with systemic racism and a series of devastating wildfires. They solved seemingly unsolvable problems and made split-second decisions with less-than-perfect information in every hour of every day. And while this is what we train to do in emergency medicine, never have our actions been more fraught.

Yet the people of this department refused to shy away from adapting and responding. They exhibited the very best of humanity as they marched into uncertainty, fully aware that their own health was at risk. They cared, without fail, for all of our patients, never losing sight of the underserved, the underprivileged and the discriminated against.



Of course, I would be remiss if I did not acknowledge that their work was and is made possible by the support, collaboration and partnership of a tremendous team: nurses and lab techs, respiratory therapists and administrative staff, security personnel and clerks, social workers and environmental service workers, as well as colleagues in other departments and UCSF as an institution. And no one deserves more gratitude than our family members and friends who lived with and supported us through the long hours, stress and fears, while they also experienced the unprecedented challenges of this pandemic themselves.

This year, more than any other, demonstrates the value of emergency medicine and the staggering front-of-the-frontline contributions of everyone who practices this profession. In the years ahead, I hope we all remember how, in a year of unrelenting crises, this department stood tall. From a deep sense of gratitude for this department’s extraordinary team, here’s hoping and believing there are much better days ahead.

A handwritten signature in dark ink, appearing to read 'Peter E. Sokolove'. The signature is fluid and stylized, with a long horizontal flourish extending to the right.

PETER E. SOKOLOVE, MD ■ CHAIR AND PROFESSOR OF EMERGENCY MEDICINE



A Year Like No Other

In California, a confluence of 2020's devastating events – the pandemic, the gripping confrontations with racial injustice and the lethal wildfires – demanded an immediate response from the UCSF Department of Emergency Medicine.

6
The Hospitals
Respond

16
Beyond the
Hospitals' Walls

26
Education
Overcomes
Challenges,
Discovers Silver
Linings

32
The Research Pivot

At the Forefront of the Pandemic Response

In late January, the world knew next to nothing about COVID-19, but emergency medicine physicians at the hospitals this department staffs knew this: The emergency department is the one place that cannot close its doors or set conditions about the patients it will accept. That fact did not keep any member of any UCSF emergency team from embracing their frontline duties and delivering lifesaving care.

They did so while taking care of each other, becoming the first hospital unit to require expanded use of personal protective equipment (PPE), far ahead of state or hospital

mandates. They worked with colleagues across all departments to flexibly adapt workflows as new information emerged for how to protect staff and patients alike.

And when this faculty's expertise was needed outside of the hospital – in communities frightened and devastated by wildfires, in departments of public health in San Francisco and Fresno, in school districts searching for ways to reopen safely, in COVID-19 hot spots across the country and, ultimately, on the Advisory Board of a president-elect determined to subdue the pandemic – our people again responded. They regularly conveyed critical information to an anxious populace. They conducted research to help frontline workers stay safe. And they managed to continue with their mission of training the next generation of physicians.



Advancing Diversity, Equity and Inclusion

Then, in late spring, George Floyd's brutal murder stirred a long overdue racial reckoning, even as it illuminated how the pandemic has disproportionately impacted Black and brown communities. In response, **Starr Knight, MD**, the department's director of diversity and inclusion, and eight other facilitators initiated a virtual conversation about race, inequality, privilege and anti-Blackness across the department. "It was very well attended, with over 120 participants, representing all clinical sites," says Knight.

Drawing on her experience presenting diversity, equity and inclusion (DEI) trainings across UCSF and the country, Knight framed the discussion around present-day and historical events to help people understand the emotional impact of current events, consider how these concerns arise in patient care, and openly discuss what actions people can take in response. The presentation was so well received that the team wound up presenting it to over 500 people across the country, from UCSF and Highland Hospital in Oakland through Henry Ford Medical Center in Detroit and Columbia University in New York. "I feel we have now equipped a team to continue doing this work," says Knight.

It didn't stop at talk. Knight and **Tomás Díaz, MD**, a department fellow in medical education, created a critical race theory in medicine curriculum, which they piloted with the department's interns. They then presented the curriculum to diversity leaders across UCSF to discuss creating such a course outside of the ED. Leaders within the department offered incentives to encourage DEI training. The department's education and research leaders implemented innovative curriculum and research to raise awareness and change practice. In collaboration with the UCSF Center for Community Engagement, the department is creating a community advisory board focused on equitable care at all hospital sites.

The racial equity efforts have progressed hand in hand with the department's continued efforts to achieve gender equity. This year the department formalized its Women's Council by lending financial support to a group that since 2017 has been promoting, supporting and mentoring female faculty. "We are giving voice to gender equity issues in the workplace," says **Kavita Gandhi, MD**, co-director of the Women's Council.

Formal recognition enabled the group to host a session at the fall faculty retreat that focused on gender equity concerns. **Marianne Juarez, MD**, one of the group's founders, notes that while there have been some advances, such as more women moving into leadership positions within the department, women continue to score lower on job satisfaction surveys. This is likely multifactorial, but may be related to ongoing microaggressions experienced in the workplace, and a need for things like improved scheduling and lactation support for new mothers.

"There is still a lot of work to be done," says Juarez.

"What's nice is that the department has really stepped up and put their money where their mouth is and is making steps toward change."



Coping with the Emotional Toll

While it's unlikely anyone in California has been unaffected by the year's major crises, the year has certainly left a deep mark on the department's members. **Robert Rodriguez, MD**, associate chair for clinical research, was lead author on a study in *Academic Emergency Medicine* that was the first to report that emergency room doctors across the country had moderate to severe levels of stress and anxiety during the first surge of the pandemic. In a survey study of over 400 physicians, the authors also noted that this stress markedly impacted their home lives, with decreased close interactions with their loved ones.

"As emergency room physicians, it's a privilege and an honor to do what we do. Resilience is part of our jobs, and I think most of us are uncomfortable being called heroes without capes, but I'm sure we all took it home with us," says **Malini K. Singh, MD, MPH, MBA**, vice chief of Emergency Medicine at Priscilla Chan and Mark Zuckerberg San Francisco General Hospital and Trauma Center (ZSFG). "This year more than ever we have come to appreciate our support by way of partners, families and friends who have allowed us to lean on them just a little bit harder than usual."

"It's taken a toll on all of us in different ways," says **James Comes, MD**, chief of emergency medicine at UCSF Fresno. "When you see that much misery and morbidity and mortality, it wears on your soul, even as an emergency physician. And I do worry about lingering stress disorders that could come from all this.... But we are also finding out how we build our resiliency like generations before us."

"The pandemic has tested our connections but also clarified for me the importance of those connections to our patients, who too often have had to be sick or die alone, our connection to our communities and to our families," says faculty member **Clement Yeh, MD**, medical director of the San Francisco Fire Department. "I really believe our resilience comes from that latticework of connections."





The Hospitals Respond

In January 2020, reports from Wuhan, China, about a novel coronavirus raised understandable concerns for the UCSF Department of Emergency Medicine. “We knew immediately we would be the front lines,” says **Jeanne Noble, MD**, who would be named director of COVID-19 disaster and preparedness for the emergency department at UCSF Helen Diller Medical Center at Parnassus Heights. She says the entire department understood this was precisely the type of situation where emergency training and experience are most needed.

Working with scant information about the nature of the virus, teams across all hospitals’ emergency departments (EDs) that the department manages scrambled to figure out how to protect patients, staff and clinicians. “At first, we really didn’t know enough about how COVID-19 spreads, how to protect our patients and ourselves or how vulnerable we were to the disease,” says **Christopher Colwell, MD**, chief of Emergency Medicine at Zuckerberg San Francisco General Hospital and Trauma Center (ZSFG).

“Our whole world changed and continued to change, it seemed like by the hour. It was a constant challenge to chase the facts.”

MALINI SINGH, MD, MPH, MBA

Over the ensuing weeks, each hospital devised new protocols and workflows, which they had to adjust as information about the virus changed. Far ahead of other hospital units or clear federal guidance, UCSF emergency room clinicians began wearing N95 masks, goggles, face shields or, when appropriate, PAPRs (powered air-purifying respirators) throughout every shift. Department faculty members worked closely with hospital administrators to coordinate care decisions and develop protocols. Department leadership held frequent meetings to answer questions and concerns of fearful staff and to convey the ever-changing protocols. Patient screening – first for travel and symptoms – became standard practice before testing became available. Each hospital created makeshift treatment areas outside of the ED. The boarding of admitted patients in the ED – a perennial concern – grew because other hospital units had to restrict access, and outpatient units began limiting hours or closing their doors.

When some faculty members were called to assume roles in their departments of public health and others volunteered in hot spots around the country, department colleagues and trainees stepped up to cover shifts without complaint. Clinical researchers quickly pivoted to a variety of COVID-19-related projects.

But department leadership also understood all too well that given the unique demands of emergency medicine, the stressors were particularly challenging for emergency department personnel. Creating trust among multidisciplinary teams was essential, says Singh. “Because information was coming from so many sources, we needed to make sure we were providing reliable information consistent with what hospital leadership, our infectious disease experts and the city’s COVID Command Center were saying.”

Early decisions to protect their people with enhanced use of personal protective equipment (PPE) helped. “Those decisions built a lot of trust, especially among our nursing staff, who are so essential on the front lines; they knew we would act quickly if we needed to,” says Noble.



ABOVE: Accelerated care units at UCSF Helen Diller Medical Center at Parnassus Heights

BELOW: Christopher Colwell, MD, and Maria Raven, MD, MPH, MSc

The spring and summer’s racial reckoning might have exacerbated the trust issues, but the department faced the crisis head on.

As noted above, while working their way through the pandemic’s demands, faculty, residents and fellows doubled down on ongoing diversity, equity and inclusion (DEI) efforts, which continue to this day.

“The year has not been easy,” confesses **Maria Raven, MD, MPH, MSc**, chief of Emergency Medicine at UCSF Helen Diller Medical Center. “But our people did a remarkable job. Nothing has ever exemplified the true practice of emergency medicine the way this pandemic has.”

What follows details some of the work at each site that characterized the department’s exemplary response.



THIS PAGE, TOP: Andrea Tenner, MD, MPH, and Malini Singh, MD, MPH, MBA

THIS PAGE, MIDDLE: Joseph Graterol, MD, Brian Cheung, MD, and Ania Bilski, MD

THIS PAGE: Tents at ZSFG

FACING PAGE: Hemal Kanzaria, MD, MSc, and Dina Wallin, MD



ZSFG Responds

In San Francisco, ZSFG was the pandemic's early epicenter. "During those first months, I believe we were the hardest-hit hospital in the city, largely because we serve the city's most vulnerable populations," says Colwell. "Our Latinx population was particularly impacted."

After meeting with hospital leadership daily to understand and align messaging, department leadership then conveyed that updated information in whole-staff huddles that included allaying understandable safety concerns. "Nurses were doing the lion's share of the work, by far, and they have had the highest infection rates, so it was particularly important to get them the information they needed," says Singh.

Andrea Tenner, MD, MPH, who had played an important role in the world's response to the Ebola epidemic in the mid-2010s, created a department task force aimed at reducing staff risk and easing fears. "We needed to keep working, but we needed to feel comfortable doing it, in a supportive environment," she says.

Tenner was also in constant communication with global health colleagues, including some who were in New York as that city's COVID-19 caseload exploded. "I still remember us struggling with our first really sick COVID patient...when I got a message on WhatsApp from New York colleagues suggesting we try proning to increase oxygen levels," she says. When they did, the patient's oxygen levels returned to near normal.

The ED faculty also worked closely with colleagues in other departments – most notably psychiatry and urgent care – to successfully screen and offload lower-acuity patients. "The pandemic taught us that we're in this together and have to align to address patient flow," says Singh.

Finally, because ZSFG is part of the San Francisco Department of Public Health (SFPDH) – and because many of the faculty at ZSFG are respected experts in disaster medicine – some were recruited to lead COVID-19-related efforts throughout San Francisco (see page 17). The workforce was further stretched as clinicians became infected or exposed. Thankfully, colleagues stepped up to fill shifts, some arriving from other hospitals.

"At times, people were overwhelmed, even scared, but everyone did a remarkable job in spite of the very difficult circumstances," says Colwell.



Movement to Address Health Inequities

Even as the pandemic progressed, ZSFG's social medicine team, led by **Hemal Kanzaria, MD, MSc**, maintained its effort to help the hospital's most underserved patients. With a grant from the San Francisco General Hospital Foundation's ZSFG COVID-19 Fund, the social medicine team helped patients meet basic material needs related to food and financial insecurity, as well as barriers to transportation and medication access. In partnership with community-based organizations, the social medicine team provided hundreds of in-need patients' food vouchers, hygiene kits, cell phones and clothing. The team also began formally assessing unhoused clients and supporting their entry into permanent supportive housing.

In addition, as part of the city and county's safety net hospital, ZSFG staff members are actively involved in addressing racial equity concerns. For example, the presence of sheriffs in the ED emerged as a thorny issue that can divide staff. In response, the hospital's ED-ACT (Assembly for Communication and Teamwork) committee, a multidisciplinary group formed in 2018, organized three community conversations in collaboration with the UCSF Office of Diversity and Outreach after surveying staff to understand the full scope and nature of their concerns.



"We held three two-hour discussions, with breakout rooms and a facilitator in each," says **Dina Wallin, MD**, one of ED-ACT's original organizers. ED attending physician **Lily Muldoon, MD, MPH**, and fourth-year resident **Tim Hong, MD**, joined Wallin to summarize what emerged from the sessions and survey. "We found the intense feelings reflected the fact people sometimes felt unsafe in the emergency department, though for different reasons," says Wallin. The three presented their summaries to ED-ACT, so the entire group could decide on next steps, all of which focused on beefing up both the psychological and physical safety in the ZSFG ED.

"As a group, we've prioritized making our ED safer, more inclusive and anti-racist," says Wallin. Meetings with physician and nursing leadership continue with plans to add training on conflict resolution.

Finally, to guard against unequal treatment, a work group composed of Wallin, **Anneka Hooft, MD**, and resident **Sojung Yi, MD**, is developing a dashboard that ties clinical outcomes or processes, such as analgesic rates, to racial, ethnic and sexual identity data.

Other Essential Work Continues

Faculty at ZSFG also kept a close eye on other elements of the department's mission. Among the efforts:

- **Eric Isaacs, MD**, explored the ethical responsibilities of addressing palliative and end-of-life care in a pandemic and began an effort to get ZSFG certified as a geriatric trauma center.
- **Christopher Peabody, MD, MPH**, stepped up to continue ongoing work on performance improvement.
- **Lauren Chalwell, MD**, assumed the position of trauma liaison, with a focus on managing coagulopathy in trauma in the ED.
- **Aaron Harries, MD**, led the way in helping medical students return to clinical rotations.

Thanking the Community

The patients and surrounding community have been deeply appreciative of all the hard work, says Singh. "We were getting 10 meals a day, people donating like crazy, making masks and hats – an unbelievable outpouring of donations."

In response, when the community played an essential role in flattening the curve of the pandemic's first surge, the ZSFG team created a video – replete with a song written and performed by faculty member **Scott Fruhan, MD** – to thank them. A finalist in the short film category for the American Public Health Association Awards, the video has inspired ongoing communications work to address potential vaccine hesitancy in San Francisco's communities of color.



UCSF Helen Diller Medical Center at Parnassus Heights Responds

“Early on, when we had a few potential COVID-19 patients, we didn’t know how to effectively test them or what kind of PPE we needed,...but we quickly began making decisions, especially as we saw the surge beginning in New York City,” says **Jahan Fahimi, MD, MPH**, medical director of the emergency department at UCSF Helen Diller Medical Center.

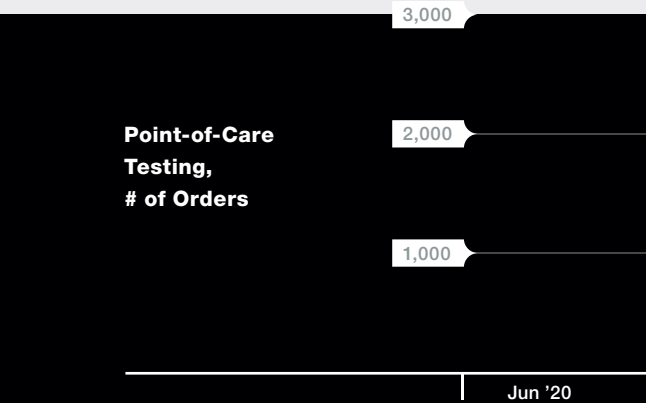
As information improved, the leadership team recognized that limited physical space at Parnassus could potentially put staff in danger because of the inability to distance. Noble identified what she believes were the country’s last two military-grade negative-pressure medical tents and acted quickly with administrative staff at UCSF Health to purchase them.

“By the end of business that day we got approval, purchased them and had them up and running in seven days, so we

could conduct rapid triage outside the emergency department,” she says. “This involved the team transforming the tents into accelerated care units (ACUs), where COVID-19 patients could be safely cohorted but still provided with the same level of care as inside the main ED, including X-rays, EKGs, labs and IV medications.” Noble, Fahimi and Raven, along with **Nida Degesys, MD, Elizabeth Kwan, MD, Edward Grom, MD, and Cortlyn Brown, MD**, detailed the effort in a July 2020 *Emergency Medical Journal* article.

Thankfully, the first surge never arrived at UCSF Helen Diller Medical Center. In fact, says Fahimi, “It was an almost eerie period. The ED was quiet and we were sending extra physicians home. But the patients who came, proportionally, were sicker.”

IMPLEMENTING UNIVERSAL POINT-OF-CARE TESTING

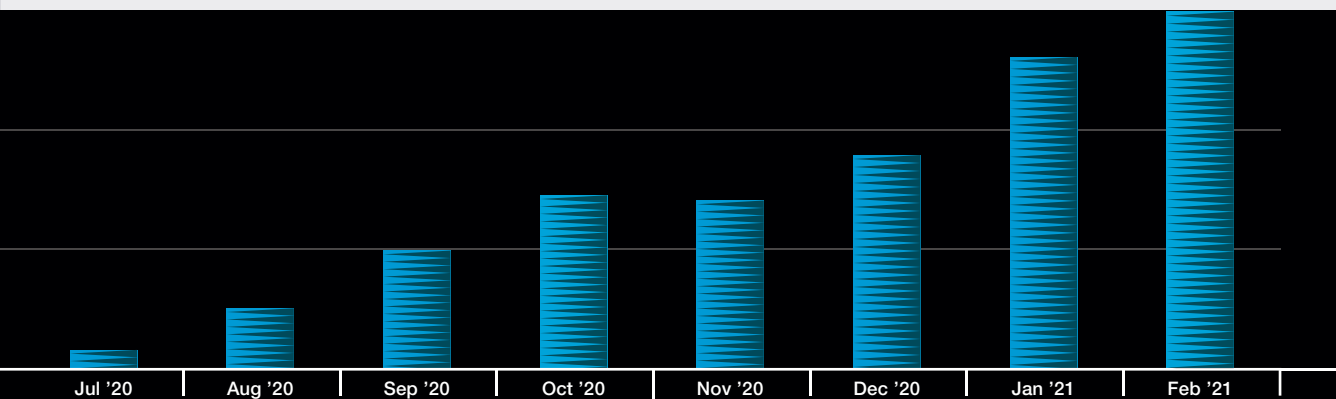




At the time of the second surge, approximately 60 outpatients with mild to moderate disease at the UCSF Helen Diller Medical Center ED received experimental monoclonal antibody infusions to reduce the risk of hospitalization.



As the pandemic surged during the fall and winter months of 2020–2021, the emergency department at UCSF Helen Diller Medical Center was among the first in the state to offer universal, rapid point-of-care testing to all of its patients. The ability to receive results in 15 minutes created much-needed flexibility in the triage and placement of patients, while also setting a public health standard by offering timely COVID-19 testing at a time when timely tests had become difficult to obtain in the Bay Area.



FACING PAGE, TOP, FROM

LEFT: Child Life Specialist
Christine Sowar and
Margaret Lin-Martore, MD

FACING PAGE, BOTTOM

LEFT: Jacqueline
Grupp-Phelan, MD, MPH

FACING PAGE, BOTTOM

RIGHT: UCSF Benioff
Children's Hospital Oakland

However, the time provided the team the opportunity to hone protocols based on emerging information, so they were prepared for what would be the summer and winter surges. "We not only had well-developed surge plans...but also the experience and familiarity allowing us to service the airplane mid-flight," says Fahimi.

Those months also enabled the ED to be among the first in the state to implement universal, rapid, point-of-care testing, with results returned in 15 minutes. "The testing allows us to be more flexible about where we can place patients safely," says Raven. "And it is an important public health measure, because it is still so hard for people to get timely COVID-19 testing in the community."

The UCSF Helen Diller Medical Center ED has also been among the first to administer experimental monoclonal antibody infusions for outpatients with mild to moderate disease. During the second surge in the Bay Area, approximately 60 patients had received these treatments, with the emergency department working closely with their critical care and infectious disease colleagues to administer the treatment safely and appropriately.

"If someone is well enough to go home but at risk for severe disease, we administer a one-time infusion, which may substantially decrease the risk of later hospitalization," says Fahimi. Raven notes that access to both universal testing and monoclonal antibody infusions is also a way to address health equity concerns.

Communication and Inclusion

The pandemic has had at least one silver lining: improved communication across multiple groups at UCSF, a development that has helped advance ongoing equity concerns. For example, Kwan has constructed shift huddles to engage and call out the value of people across professions, including those who make up the security, hospitality, patient service attendant and clerical workforces, which have higher percentages of individuals of color.

In addition, the unit-based leadership teams, composed of advanced practice clinicians, nurses, social workers, pharmacists and physicians, have put together a strike team to build COVID-19-specific working relationships with other hospital

units, because, says Fahimi, "We can't build anything if it isn't solving for everyone's workflow. We are collectively developing protocols and building goodwill between units. It has been a very collaborative process."

Keeping an Eye on Ongoing Work

Extraordinarily, the crisis has not significantly deterred other important work.

For example, Degesys has helped spearhead the emergency department's successful effort to secure a geriatric emergency grant that puts the department on track to apply to the American College of Emergency Physicians (ACEP) for Level 1 certification as a geriatric emergency department in May 2021.

In addition, says Raven, "Through various funding mechanisms, we've put together a very solid support team for our patients with substance use disorders that includes social workers and substance use navigators – and we have an ongoing trial of injectable naltrexone to help our patients with alcohol use disorder." She and Kanzaria have also been longtime collaborators on social emergency medicine efforts that aim to address the psychosocial needs of patients who frequently show up in the ED – and the department has an initiative aimed at streamlining and improving the care of psychiatric patients at UCSF Helen Diller Medical Center.

"The key for us is that everyone has been very flexible, very willing to try new things," says Raven. "We have made our emergency department a place of yes."

Pediatric Emergency Medicine Responds

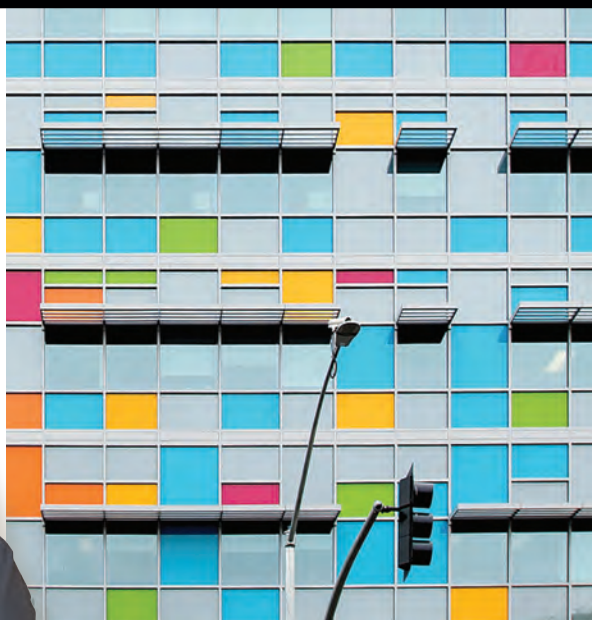
While it is now widely understood that a smaller percentage of children and adolescents are subject to severe illness due to COVID-19, that was unclear early in the pandemic; nor do the smaller numbers mean there are no dangers to pediatric patients, as recent studies attest. In addition, the disease has impacted pediatric emergency medicine (PEM) at UCSF in a number of indirect ways.

"By the end of February, we knew this was an all-hands-on-deck situation," says **Jacqueline Grupp-Phelan, MD, MPH**, chief of PEM.

At UCSF Benioff Children's Hospital San Francisco, for example, **Nicolaus Glomb, MD, MPH**, worked with nursing leadership to create an overflow space, eventually sharing lessons learned in three town halls with regional medical centers. **Carol Chen, MD, MPH**, notes that the PEM team created a plan to adapt to treat adults, should their colleagues at UCSF Helen Diller Medical Center become too inundated. Glomb is also working with **Christopher Newton, MD**, director of trauma care at UCSF Benioff Children's Hospital Oakland, who is principal investigator for a large disaster planning grant aimed at connecting large groups of people across the country in case of a natural disaster or pandemic.



In addition, when it became apparent that volumes were down and COVID-19 posed less of a direct threat to their patients, PEM faculty members volunteered to cover for their stretched colleagues in adult emergency units. **Shruti Kant, MBBS**, and pediatric emergency department RN **Melissa Love** came together to create workshops that help other pediatric clinicians practice care of patients with COVID-19. **Israel Green-Hopkins, MD**, worked to acquire PPE, as well as swabs and reagents for testing. Pediatric emergency department RN **Sydney Gressel** created Frontline Foods, which has grown into a multimillion-dollar nonprofit that raises funds for restaurants so they can stay afloat, in part by feeding health care professionals on the COVID-19 front lines.



THIS PAGE: Rajesh Daftary, MD, MPH

FACING PAGE: James Comes, MD



And despite the decrease in volumes, the EDs have been seeing increases in higher-acuity cases. “Our biggest concern is whether there are children experiencing delays in care because of worries about being exposed to COVID-19 or not wanting to overburden us,” says **Rajesh Daftary, MD, MPH**, who leads the pediatric emergency medicine team at ZSFG.

Partly with those types of concerns in mind, **Steven Bin, MD**, medical director of the Children’s Emergency Department at UCSF Benioff Children’s Hospital San Francisco, and **Sonny Tat, MD**, are leading an effort at that hospital to improve outreach to the hospitals’ primary care partners. The effort includes a comprehensive review of workflows to support referral hospitals and improve communication at both admission and discharge.

In addition, Daftary believes that pediatric emergency departments are experiencing more – and more severe – mental health emergencies. “Anecdotally, we’ve seen a significant component of depression affecting our patients as a result of the direct and indirect consequences of COVID-19, and I worry this will have a long-term impact on the mental health of many patients,” he says.

Grupp-Phelan – who spoke with the *New York Times* in November 2020 about the uptick in such conditions as suicidality, anxiety and eating disorders – agrees. She noted that eating disorders are up 400 percent at UCSF Benioff Children’s Hospital San Francisco. In addition, out of all children aged 10 to 18 treated there, 21 percent screened positive for suicidal thoughts in January 2021, a more than threefold increase from 6 percent in March 2020. “It’s one of the reasons we’re interested in schools getting back to in-person learning,” says Grupp-Phelan. “Kids on the margin are falling off.”

Responding to Racial Inequities

Grupp-Phelan also notes that the PEM faculty and staff, led by Wallin, **Margaret Lin-Martore, MD**, and **Mimi Lu, MD**, redoubled their DEI efforts in 2020. “At the end of 2019 we did a strategic plan with DEI as one of the major pillars, thinking of each of our missions through this lens,” says Grupp-Phelan.

For example, Tat has worked with nursing leadership to incorporate DEI concerns into UCSF Benioff Children’s Hospital

San Francisco’s multidisciplinary morbidity and mortality sessions about children who come in with rare and acute illnesses. They rigorously examine how families are treated, so staff can work through potential concerns and examine their biases.

“The sessions allow the group to have a safe space to address and bring up topics that can be hard to discuss outside of this setting,” says Grupp-Phelan. The PEM team is also working down a list of awareness-raising efforts that include posting eye-catching facts about health care disparities around the department and wearing Black Lives Matter stickers on their badges.

All of this work has had its rewards, but as with colleagues throughout health care, the nonstop crises have taken a toll. That’s why, says Grupp-Phelan, “We held caring-for-the-caregiver sessions with our chaplains, aimed at keeping our group talking,...including taking pride in how we covered and cared for each other.”

Fresno Responds

While all of the UCSF-affiliated emergency departments faced significant challenges in 2020, the COVID-19 numbers at Community Regional Medical Center in Fresno roughly matched those at all hospitals in San Francisco county combined.

But the Fresno staff handled the crisis, in part because in February 2020, Chief of Emergency Medicine **James Comes, MD**, Medical Director **Jeff Uller, MD**, and nursing leadership began surge and disaster planning to protect both patients and health care workers. “We strategically identified faculty resources in the service of a whole-department approach for addressing the pandemic,” says Comes.

One important step was the creation of multiple tents outside of the ED that had X-ray, electrocardiogram (ECG) and lab capabilities. Clinicians could also tap telehealth capabilities to see and treat low-risk patients without those patients having to enter the hospital emergency department. As surges occurred, the tents have remained part of a warm zone within the ED that can flex so that during a severe surge, stable admitted patients could be cohorted to them.

Comes says that because Fresno was not overwhelmed early, its planning efforts were able to incorporate lessons learned



from other locales about best practices. “The spring surge became our dress rehearsal for the real surge that occurred this winter when we were overwhelmed, with zero capacity,” says Comes. “We were at a point I don’t ever want to go again, although we are a better team because of it. The work our faculty did, including residents who volunteered for extra hours in the ICU, speaks to the caliber of our emergency physicians.”

Comes adds that members of his department also worked outside of the ED to help the entire county cope with the crisis. In addition to its leadership role in the Fresno County Department of Public Health (see page 21), **Kenny Banh, MD**, secured grant money to get testing to the county’s most vulnerable populations. **Danielle Campagne, MD**, was the emergency medical services (EMS) lead in the protocolization of isolation and care of prehospital patients with COVID-19.

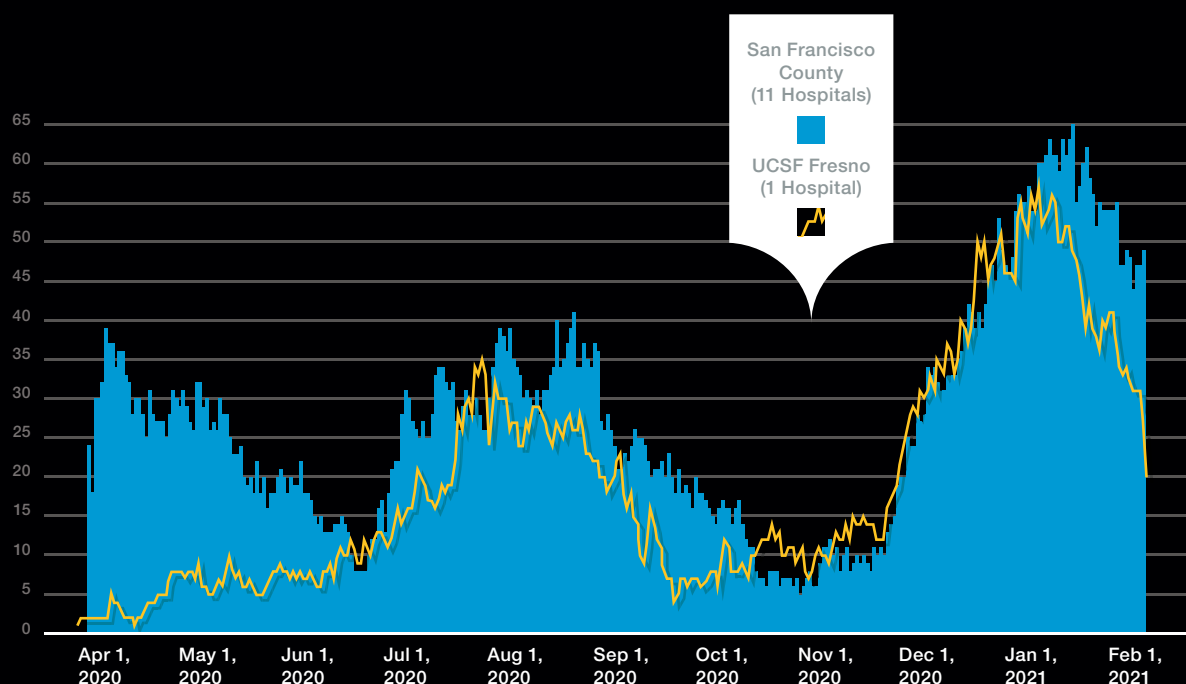
Geoff Stroh, MD, led the way for EMS procurement and implementation of alternate care sites for the Fresno ED.

Crystal Ives Tallman, MD, who is trained in both emergency and critical care medicine, directed strategic implementation of advanced critical care initiatives involving COVID-19 and was part of a team of intensivists that cared for COVID-19 patients requiring extracorporeal membrane oxygenation (ECMO).

In addition, due to departmental connections with the University of Toronto, which had experience with the SARS epidemic, the Fresno team participated in multiple town halls with Toronto faculty that helped shape early and aggressive education of all providers and health care professionals around the unique requirements of caring for COVID-19 patients.

“We now believe we are positioned well to proactively educate, treat and assist our community in the years to come,” says Comes.

COVID-19-Confirmed ICU Patients





Beyond the Hospitals' Walls

While emergency physicians do the majority of their lifesaving work inside of hospitals, their training, vast experience responding to crises and frontline sensibilities made them indispensable in a variety of settings in 2020.

“The key...is transparency of data and collaboration, so we can distribute vaccinations equitably. I’m confident we will get it done; we’re already doing a lot in highly impacted communities and feel buoyed by the response from the community.”

MARY MERCER, MD

Collaboration with Departments of Public Health

Prior to the pandemic, UCSF emergency department physicians were already significant actors within departments of public health in both San Francisco and Fresno, but over the past year the collaborations between UCSF emergency department faculty and those two DPHs expanded dramatically.

The SFDPH Alliance

In San Francisco, the department's **John Brown, MD**, medical director of the San Francisco Emergency Medical Services Agency, was instrumental in the development of a unified COVID Command Center. Once the city began to dramatically expand testing, care and investigation, department physicians – including **Christopher Colwell, MD; Andrea Tenner, MD, MPH; Elizabeth Kwan, MD; Carol Chen, MD, MPH; Rajesh Daftary, MD, MPH; Mary Mercer, MD**; professor emerita **Ellen Weber, MD**; and **Alan Gelb, MD** – all joined the DPH effort in varying capacities. Among their duties: Develop a field clinic system and alternate care sites for community testing, longer-term acute care and surge capacity, while also advising the city on how to reach and protect its more vulnerable populations and how to reopen schools and keep them safe.

"We are really fortunate here," says Tenner, who first became medical operations lead then operations section chief for SFDPH's COVID Command Center, and is now on department leave to serve as SFDPH's director of Public Health Emergency Preparedness and Response, overseeing all public health preparations. "Since the HIV/AIDS crisis...we've developed one of the most robust DPHs in the country, with a lot of emphasis on data, messaging and community engagement." Consequently, she says, the city's COVID-19 data system, which draws on cooperative approaches with nearly all the city's hospitals and clinics, gives the city extraordinary visibility into the course of the pandemic.



ABOVE: San Francisco COVID-19 testing site

BELOW: Mary Mercer, MD, and John Brown, MD

Mercer, who was originally brought on to advise on surge planning and coordination between hospitals and the health system and has since

moved on to oversee the SFDPH's vaccination efforts, says the data-centric approach has been essential. "We set a strategy that is very objective-driven and time-based because we need to think about what we are prepared to do when we go from one level to the next," she says. "For example, what if we can't build multiple field care clinics and can only pick one? Where will it be? If we stop doing some activities, which ones are appropriate to stop?"





Tenner adds that this approach, along with having city leaders who listen to the science, as well as a public willing to heed the rules, has saved San Francisco from having a New York-type surge to date. But that hardly means San Francisco has been spared, which is why these efforts are so critical.

During the first real surge, in April, Brown, Mercer, Tenner and Colwell led the creation of an emergency care clinic site at Southeast Health Center in the Bayview-Hunters Point neighborhood, which provides services that include point-of-care ultrasound and X-rays. The center helps offload emergency departments and, if needed, could serve as the basis for a full field hospital. Tenner has also worked with her colleagues to oversee the creation of a Lower Acuity Continuing Care Site (LACC) in the Presidio, designed to keep hospital beds available for the sickest patients requiring acute care during a potential COVID-19 surge. Department faculty have also been instrumental in providing the necessary training for nurses,

physical therapists and occupational therapists who will need to work in this environment.

Senior emergency medicine residents and some fellows have also contributed by staffing the CADDIE (Centralized Ambulance Destination Determination) system out of the newly developed EMS [emergency medical services] Transportation Hub at the Civic Center, a partnership with paramedic supervisors that aims to move COVID-19 patients safely among locations and balance the load of 911 patients across hospital facilities. "This is a new role for the residents...and they are doing a great job," says Brown.

Now that the country has moved into the vaccination stage, Mercer has led the effort to help hospital systems and community partners come together to build high-volume vaccination sites and a community-based vaccination strategy that will include mobile units for those who cannot travel. As vaccine logistics deputy, Kwan has been ensuring San Francisco vaccine sites make the most efficient use of the available vaccine supply and staffing. The vaccine effort has also embraced the use of emergency medical technicians (EMTs) working as part of an interdisciplinary team that also includes RNs, pharmacy technicians, IT personnel and community leaders. Developed with the assistance of the two EMS and Disaster Medicine fellows (see facing page), the EMT training has been adopted by the state as the standard for the new vaccination scope of practice for all EMS providers.

Weber, who has served on the Case Investigation and Contact Tracing team for SFPD and has mentored more than 200 city and state disaster service workers and UCSF School of Medicine contact tracers, is now helping that team pivot toward vaccine outreach to communities most disproportionately affected by the pandemic. She is helping to create workflows and trainings for the same team to reach out to prior contacts to let them know they are eligible for the vaccine and to assist them in booking an appointment.

"The key, again, is transparency of data and collaboration, so we can distribute vaccinations equitably," says Mercer. "I'm confident we will get it done; we're already doing a lot in highly impacted communities and feel buoyed by the response from the community."



THE FELLOWS STEP UP

To help with both the COVID-19 pandemic and the devastating California wildfires, the department's EMS and Disaster Medicine and Global Health fellows have volunteered their time and expertise in multiple settings, while adapting their fellowships to the current circumstances. "They have done truly extraordinary work," says John Brown, MD.

EMS and Disaster Medicine fellows **Gurvijay Bains, MD**, and **Amelia Breyre, MD**, have, for example, joined Brown to provide medical direction and telehealth consultation for SFDPH personnel giving COVID-19 vaccinations. Both have also worked with the CAL-MAT (California Medical Assistance Team) program under the Emergency Medical Services Authority in response to both the pandemic and the wildfires. Bains even found himself working with his sister, also a physician, who has played a variety of roles in the state's wildfire and COVID-19 responses.

"There has been so much to figure out, but it was a tremendous experience," says Breyre. "It's been

sad at moments, but also inspiring to see paramedics working alongside nurses and EMTs and physical therapists, all with different skill sets and scopes of practice.... This opened my eyes to what's possible."

Global Health fellows **Amye Farag, MD**, and **Cecily Sotomayor, MD**, have also been called into service at the COVID Command Center and on vaccination campaigns. Farag created a survey used to develop a map that helps target underserved areas for COVID-19 vaccinations; she has also moonlighted with

the CADDIE (Centralized Ambulance Destination Determination) program. Sotomayor has been involved in developing the city's alternative care site and completed a few shifts as area operations coordinator.

While it's not been the educational experience any of the fellows expected, "It's been very relevant, the kinds of things I might be doing in developing countries, and it's offered some valuable tools you might only learn about theoretically," says Sotomayor. "During a global pandemic, we all have to make sacrifices and change expectations."





Many faculty members and trainees from the UCSF Department of Emergency Medicine volunteered and/or assumed essential public health leadership roles in San Francisco and beyond to help contain the pandemic.



The Outbreak Management Group

Another aspect of the SFPD response has been its Outbreak Management Group, a team aimed at protecting those vulnerable populations that may be especially susceptible to high rates of both transmission and mortality. These include attendees or residents of schools, summer camps, day care facilities, skilled nursing facilities, homeless shelters and single-room occupancy (SRO) hotels. Weber has made herself available as an expert consultant for this management group, including overseeing the development of dozens of sites where people who normally reside in shelters can receive testing and services. Chen is physician co-lead for SROs, and she and Daftary are physician co-leads for schools.

"There are between five and six hundred SROs in San Francisco, with tens of thousands of residents sharing kitchens and bathrooms," says Chen. Generally speaking, residents are low-income, many are elderly, and many are essential workers at service-type jobs. When Chen's team of investigators,

trackers and clinical leads identifies an outbreak, it moves to mitigate it through a variety of methods, including mass testing and offering infected residents access to isolation and quarantine hotels, food delivery and education about how to stop the spread.



"San Francisco has been very thoughtful about addressing these vulnerable populations with the least access to resources," says Chen. "It says a lot about the SFPD, and it's why I love this work."

As for schools, while school openings in San Francisco have been limited to date, that team has focused on developing a team that can provide effective case investigation and contact tracing, as well as consistently updated recommendations about who should come to school, symptom surveillance and other concerns. Such work demands a skill set that is not necessarily part of an emergency physician's daily practice. If, for example, a child has a sick parent, but the school only finds out five days into the parent's symptoms and the student has no symptoms at all, what is the proper response? Does that child's classroom need to undergo testing or pause activities? What are the appropriate questions to ask about exposure, testing and the likely impact on the school?

Regarding the reopening of schools, says Daftary, "There are rarely absolute answers, but there is an increasing amount of data that suggests schools are safe, essential and should be open, not least because schools can be an important way to mitigate health disparities."



With the Fresno County DPH

In Fresno, UCSF faculty member **Rais Vohra, MD**, who became interim health officer for the county four weeks before the pandemic hit, has been aided in this work by a number of UCSF Fresno colleagues, including **Suki Dhillon, MD**, and **Kenny Banh, MD**.

"We went from worrying about a few cruise ship passengers to the [full-blown] pandemic," says Vohra. "But I'm blessed with a really good team at both public health and UCSF Fresno. If I've done anything well, it is to connect two agencies and institutions that were not well connected before."

Noting that the first casualty of disasters is often communication, Vohra – a toxicologist by training, with no formal public health or communication training – has worked with his public health and UCSF Fresno colleagues to tackle the challenge of conveying preventive health messages to their community, parts of which have been skeptical of the science. Vohra himself has written editorials, been active on social media and conducted traditional media interviews twice a week. The team has also consistently translated public health messages into everything from Spanish to Hmong and Punjabi. He believes his commitment to full transparency and to reminding the community that we're all in this together has helped people get on board with public health measures.

"People here understand we have their best interests in mind," he says. "As stressful and exhausting as it's been, it's been anything but demoralizing. I'm more optimistic than I've ever been about connecting public health with academic medicine. Now is when our value is shining through."

Working to Reopen Schools

The UCSF Collaborative to Advise on Re-opening Education Safely (UCSF CARES) was formed to support young learners by synthesizing the scientific data and making objective recommendations about how to reopen schools safely. Three members of the department have joined this effort: **Jeanne Noble, MD**, **Judith Klein, MD**, and the department's only general pediatrician, **Emily Frank, MD**.

Klein, the mother of a middle schooler, says, "Along with the pandemic, we have an infodemic, with so much information coming at people that is often difficult to interpret. So the first thing we need to do is listen and understand all the groups involved. What concerns do students have? Parents? Teachers? Administrators? Our goal is to come to those questions with the best information and best science we have."

From the pandemic's outset, Frank has been called on to consult with Oakland Unified School District, and so was grateful for UCSF CARES and the ability of experts like Noble and Klein to bring the latest literature to bear.



Moving to Advocacy

Though all three appreciate the objectivity that UCSF CARES brings to the discussion, Noble says there is a role for advocacy as well, a role both she and Klein have embraced. Noble has written numerous editorials and made the case for reopening to various stakeholders, but has met resistance from both teachers and parents in communities that have historic reasons to distrust medicine.

"We have good data that reflects the safest place for children is in schools, but there is a level of distrust and fear – and a tidal



wave of misinformation – that has made communities and families reject the science,” says Klein. This despite increasing evidence of the severe harm that distance learning is having, especially on the most vulnerable children.

Frank says that few teachers enjoy distance learning and most want to get back to the classroom, but they are fearful and wary of trusting that COVID-19-related safety measures are

enforceable. “My school has soap on average one day a week,” says Frank. “It’s things like that that explain why so many teachers wonder why they should trust their school to keep them safe.”

Noble hopes that as teachers receive vaccinations and community prevalence drops, efforts like hers and UCSF CARES can create the confidence needed to get schools back in session.

A DOCTOR AND A TEACHER

Emily Frank, MD, teaches health and public health to high school freshmen, and medical terminology, anatomy and physiology to high school juniors and seniors. Perhaps uniquely, she combines her teaching with working alongside the pediatric emergency medicine (PEM) faculty as a general pediatrician caring for lower-acuity patients in the UCSF Emergency Department. Here’s what she has to say about her goals and the impacts of the pandemic:

“My dream is to go to full-time in the emergency department, while also working in the Office of Diversity and Outreach, putting together pipeline

opportunities for youth from Oakland public schools, because everyone benefits from a diverse health care workforce. Some of the young people I work with can attest to the enormous impact these opportunities have had on their lives.

“I’ve always wanted to ignite a flame that creates an opportunity for a young person to see his or her potential – and I really believe that raising health literacy leads to health advocacy and community

change. When COVID-19 broke out, some of my students distributed posters in East Oakland, in multiple languages, and saw their community members get educated. They take seriously being ambassadors and leaders in their community, their roles in giving voice to the voiceless.”



THIS PAGE, MIDDLE:
Clement Yeh, MD, says
goodbye to his family before
flying to aid in New York
City's COVID-19 response.

THIS PAGE, BOTTOM:
Tomás Díaz, MD, at New York-
Presbyterian/Weill
Cornell Medical Center

The Hot Spots

New York City

When it became clear UCSF would escape the early surge, **Tomás Díaz, MD**, and **Clement Yeh, MD**, were moved to help out in New York City.

Born and raised in New York, Díaz had heard from friends and colleagues about how overwhelmed the city's hospitals were. "But my biggest initial concern was my family," he says. "My mom works in a hospital in New Jersey, and my two grandmothers are 89 and 88.... I wanted to be closer."

He replied to the call for UCSF volunteers on a Wednesday, and by Saturday he was credentialed and on a flight, assigned to NewYork-Presbyterian/Weill Cornell Medical Center on the Upper East Side of Manhattan, where he worked with and supervised residents. Though the worst of the surge was over by then, he was shocked at all the patients in spaces that were not previously patient care spaces, and at the ability of the hospital system to adapt.

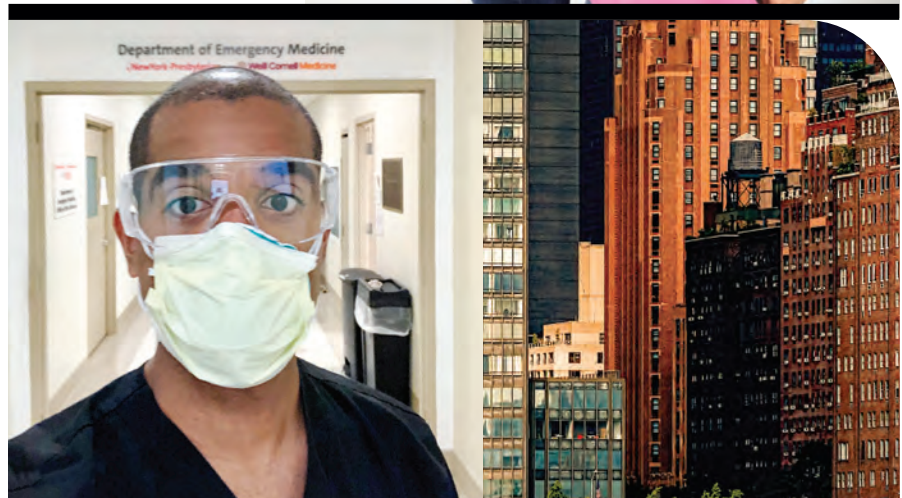
He also was acutely aware that, "Even in the peak of the pandemic, there was still an inequitable and unjust effect on communities of color." While many Upper East Side residents were able to leave the city or self-isolate, "The ones we saw were the bus drivers, supermarket workers, convenience store cashiers – mostly people of color."

Meanwhile, at NewYork-Presbyterian in Queens, Yeh says, "My mission was to help in any way I could at a time when the clinical pathways and treatment protocols were really just being discovered."

His role was largely one of providing fresh legs, he says, for people who were doing a tremendous job taking care of their own community. "I was incredibly impressed by their

resilience and grit, and we were mostly just brothers and sisters in arms working shoulder to shoulder on the toughest cases I've ever had," says Yeh.

It wasn't just individual cases. Yeh says that while he often has to respond on a shift to a patient in acute respiratory distress, it was quite different to have to respond to a roomful of people



THIS PAGE, TOP:
Helping out in Gallup,
New Mexico

THIS PAGE, BOTTOM:
Nate Teismann, MD,
and Jeanne Noble, MD

with the same extremely severe condition. "But in the end, this is something I'm trained to do, and we found our tempo quickly."

Outside of his shifts, Díaz, the New York native, was struck with how quiet and empty the streets were, but was also grateful that he could use his downtime to see his family. They would park on the street while Díaz stood on the sidewalk, talking and eating the home-cooked food they'd brought to him. "I know, as physicians, we sometimes wonder why people don't just distance and follow the rules, but I can empathize and sympathize with folks who need that human connection," he says. "Living [without human contact] is a different type of danger."

In the end, Yeh is grateful for having had the opportunity to go, something made possible, he says, by UCSF as an institution, by colleagues who covered his shifts and by his family, who supported his decision. "That really meant a lot to me," he says. "I have a deep and powerful memory of the moment my family said goodbye at SFO."

Navajo Nation

Shortly after Yeh and Díaz went to New York, Noble and **Nate Teismann, MD**, became part of the second wave of UCSF clinicians to volunteer at Gallup Indian Medical Center in New Mexico, another area of the country particularly hard hit.

Noble was immediately impressed with the expertise of Gallup's COVID-19 response. They hung plastic sheets to subdivide patient rooms and essentially doubled the number of rooms in their emergency department. They converted an adjacent pediatric clinic into additional emergency room space and enforced infection control through supervised donning and doffing of personal protective equipment (PPE) and careful decontamination of face shields.

"And they set up tents in the parking lot, used both for resuscitation of the sickest patients as well as caring for the less sick COVID patients, in a safer outdoor environment," says Noble. "Our primary job, really, was just off-loading some of the work for regular physicians who live there all the time. We were happy to help but mostly we learned a lot from them."

Still, some of the human tragedies, such as seeing whole families get the disease in succession, were difficult to witness. "And everything is exacerbated by the fact that in this community,



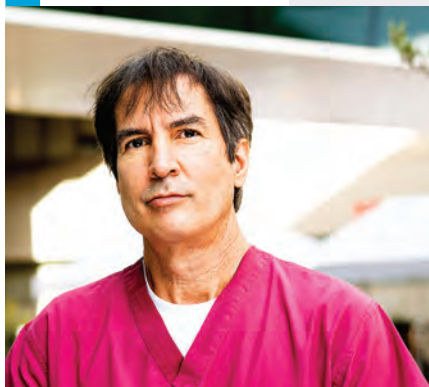
a high percentage of homes don't have electricity and running water, and there's a relatively sizable homeless population, high rates of chronic disease and behavioral health challenges," says Teismann.

Noble, who has considerable global health experience, came away determined to strengthen the connections to Gallup. "I'm hoping to increase awareness and build bridges, so we can continue to support the work they do," she says.



FROM BROWNSVILLE, TEXAS, TO ADVISING A PRESIDENT

On July 4, 2020, **Robert Rodriguez, MD**, received a call from his hometown congressman, who also happened to be an old friend. Could Rodriguez come help with the devastating COVID-19 surge the town was experiencing?



The border town of Brownsville, Texas, is about 88 percent Latino and is one of the poorest cities in the country, with a per capita income of \$9,700 per year. When Rodriguez took over a COVID-19 unit at the hospital where he was born, he was struck immediately by the disparities between Brownsville and San Francisco.

“They had over 160 COVID-19 patients – about 60 were ICU-type patients – and they were trying to cope with limited resources and a very limited number

of physicians,” says Rodriguez. “For the most part, the doctors were operating solo and caring for 10 times as many patients as I might care for up here with a larger critical care team of six or seven physicians. PPE was limited, and we ran out of the medications normally used to care for critically ill COVID-19 patients.”

These disparities led to nine times as many COVID-19-related deaths in that county as in San Francisco, which has twice the population. That, and the loss of two friends while he was in Brownsville, says Rodriguez, “really emphasized to me the disproportionate effect of the pandemic on under-resourced communities of color – and led me to try and take action.”

He began advising members of the Congressional Hispanic Caucus, as well as organizations like the League of United Latin American Citizens (LULAC) and UnidosUS. Eventually, that work led to a call from the Biden-Harris transition team to serve on its COVID-19 Advisory Board, which was tasked with preparing the president-elect and vice president-elect to hit

the ground running once they assumed office.

Rodriguez found himself engaging in wide-ranging discussions with a diverse group of experts. Each member took on a specific role rooted in his or her particular expertise. “My focus was on the effects of the pandemic on Latinos and other vulnerable groups and on-the-ground ED and ICU care for COVID-19 patients, especially as it pertains to resources and the effects of the pandemic on mental health,” says Rodriguez.

While the advisory board is no longer officially meeting – it was specifically designed for the transition – Rodriguez continues to advise and engage with stakeholders and members of Congress on various topics, including vaccine hesitancy among African Americans and Latinos and achieving equity in the vaccine distribution process. The experience, he says, has left him cautiously optimistic.

“It’s all about getting the vaccine out there and continuing to wear masks,” he says. “While I do have concerns about getting the vaccine to vulnerable populations, I’m hopeful.”



Education Overcomes Challenges, Discovers Silver Linings

“I clearly remember the moment when everything changed for us,” says **Christopher Fee, MD**, associate chair for education. “We were sitting in conference, and one of the residents got a phone call informing him he might have been exposed to a patient with COVID-19. We had more than 50 emergency medicine people in the room, and my head began swirling.”

That would be the last in-person conference day for quite some time, but also the beginning of a dynamic restructuring of trainee education, with some of the changes sparking new thinking and new formats that may become permanent.

“We’ve been very explicit as a department about diversity being a driving factor in our residency program. Because COVID-19 made it impossible to do things we’d done previously to ensure success, it forced some innovation.”

EVELYN PORTER, MD



Residency Recruitment and Selection

First and foremost, the pandemic forced the educational leadership team to rethink how they recruit potential residents.

"You can get across some of the nuts and bolts through a website or other shared documents, but it's hard to get across the culture of the institution that way," says Fee. So he gathered the education leadership team, as well as residents and the department's diversity, equity and inclusion (DEI) committee, who together decided to produce four short videos for the website: one on diversity, one on support and well-being, one on resident life and one on didactics.

Evelyn Porter, MD, assistant residency program director, took on the leadership role for diversity recruitment. "We've been very explicit as a department about diversity being a driving factor in our residency program," says Porter. "Because COVID-19 made it impossible to do things we'd done previously to ensure success, it forced some innovation."



In particular, Porter and a team of passionate residents and faculty designed a series of online chat sessions aimed at helping targeted applicant pools understand the environment for people of color within the department. The six discrete sessions included a general welcome session

and then one each on Latinx, Black, LGBTQ, allyship and women in emergency medicine. They then recruited faculty and residents who could give firsthand testimony about the things the department is doing well in those areas and things it is willing to work on, with the goal of addressing questions and fears, while also highlighting the program's strengths.

To attract prospective residents, the team also conducted intensive outreach. They worked in collaboration with nationwide groups that have supported students of color for decades, and

tapped their own social media networks and personal contacts. They updated the website and other recruiting materials to ensure potential applicants could see people who looked like them. In publicizing the chat series, the group was explicit that these would be identity-based sessions and that those interested could anonymously submit questions for discussion.

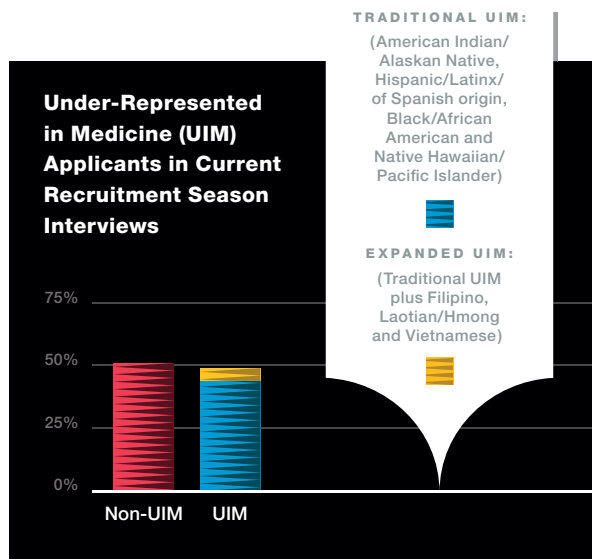
In the actual chats, the UCSF residents, faculty and fellows would speak and respond to the questions they'd received. "We encouraged our people to be very honest about what they felt and had experienced – and they were," says Porter. "It was not all rosy, but I think applicants could see that they would be able to find people who understand what they're going through and who are open to discussion and change."

The feedback from potential applicants was very positive. Many who wound up applying mentioned having attended one of the chats. "That's something special about UCSF and emergency medicine, this type of transparency," says Porter. "We feel very strongly this is a very special program, and I think that piece came through."

Fee and Porter both believe that moving ahead, the chat series will become an important component of how the program attracts its residency applicant pool, especially because it captures people who may not have the time or money to come and experience UCSF in person. "And our own residents, who put in so much time and effort to make this a really powerful experience, created a template so we could easily repeat this," says Porter.

The education team also moved to virtual interviews for residency selection, again hoping that the switch could attract a more diverse pool because it creates opportunities for those who may not be able to travel to multiple locations. On the other hand, says Fee, out of concern that the new approach could create new disparities that affect those who may not have good cameras or the most reliable Wi-Fi, he and his team have been explicit that they recognize and disregard technical complications, as no one is immune from such problems.





In addition, the educational leadership team changed the format of interview days to minimize screen time and maximize two-way information exchanges. “We now disseminate more information in advance,” says Fee. In addition, interview questions are now more standardized and incorporate more specific teamwork, leadership, communication and DEI-focused questions. Applicants also have a chance to ask residents – who have been instructed to be 100 percent transparent – what their experiences have been.



All of this seems to have made some difference. As of this writing, approximately 18 percent of applicants over the past three years were from traditional under-represented in medicine (UIM) backgrounds (American Indian/Alaskan Native, Hispanic/Latinx/of Spanish origin, Black/African American and Native Hawaiian/Pacific Islander), while approximately 20 percent were from those groups plus Filipino, Laotian/Hmong and Vietnamese. For the current recruitment season (interns starting June 2021), those numbers are approximately 22 percent and 26 percent, respectively. For those selected to be interviewed, over the past three years, those numbers range

from approximately 23 percent to 29 percent (traditional UIM) or 27 percent to 37 percent (expanded UIM). For the current recruitment season, those numbers are approximately 44 percent and 49 percent, respectively.

“A number of applicants have said that the fact you’re asking about DEI in the interview shows that the program takes this seriously,” says Fee. “So this has been a silver lining of COVID-19 – and a catalyst for us to rethink what we’re doing more frequently than we have in the past.”

Didactics Find a Silver Lining Too

As didactics shifted online, says Fee, “We began to feel more comfortable with what we were doing. While we were forced to give up things that made our program stand out, at least early on – cadaver labs, simulations and small groups – fascinating things began to happen.”

Chief Resident **Emily Neill, MD**, notes that, “The education leadership team managed to turn Zoom conference into a strength, using the flexibility to bring in more high-profile Grand Rounds speakers, piloting new education models that allow learners to choose between multiple parallel sessions, and utilizing the ever-present chat functionality to create an active and safe space for discussion and engagement. While everyone has felt the loss of in-person connections that come from physically standing in the same room, Zoom-based didactics have resulted in lower barriers to attending didactic activities and increased opportunities for new approaches to learning.”

Fee agrees. In the past, he says, during conference, speakers would try to reach different levels of participants, ranging from interns through experienced faculty, which could make it difficult for some to feel comfortable asking questions. But on Zoom, “Chat has become a very rich educational space, an ongoing parallel dialog with contemporaries that might not have happened in an in-person setting – and conference attendance has been phenomenal,” says Fee. “When we do resume in person, we will look for ways to have some kind of online chat function.”



The department created a series of videos for prospective residents that convey its approach on diversity, support and well-being, resident life and didactics. Clockwise from top left: Emily Neill, MD, Starr Knight, MD, Joseph Nelson, MD, and David Dillon, MD.

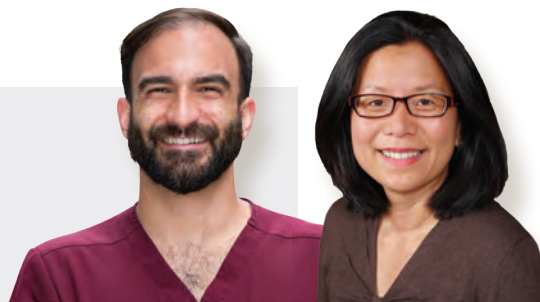
Moving DEI Concerns Forward

Another innovation that began in the 2019-2020 academic year was the incorporation of a longitudinal DEI module that cuts across all aspects of resident didactics. Director of Didactics **Dina Wallin, MD**, and **Rosny Daniel, MD**, created the module, and Daniel decides on the content. "In some cases, it is very specific to DEI, such as delineating the connection between historic redlining and subsequent pediatric asthma rates in African American communities," says Wallin. For other modules, Daniel has brought in speakers to discuss barriers they face for treatment and compliance.

"One of the other things we have been doing is periodic sessions strictly related to DEI," says Wallin, including an anti-Blackness workshop and one on bias against people with disabilities.

The sessions are targeted to residents but are open to faculty and fellows. "We've also done a session on patient and family advisory groups as a way to get minority voices heard, and we're now working on creating these groups for each clinical setting."

"Our leadership has continued to fully embrace a DEI curriculum for residents and faculty, explicitly addressing the fact that the recent protest movements are a lens, highlighting inequalities that have been present for years," says Chief Resident **David Dillon, MD**.



Addressing the Need for Social Support

As the year progressed, the education team was able to get approval for in-person education in the simulation and cadaver labs, but at reduced capacity – a difficult compromise that emphasized the limits of online learning, since the whole idea of conference was to create one block of time each week when all residents are together.

"That was often the social and support piece, when residents were hugging each other, laughing and smiling, celebrating birthdays and commiserating over stress," says Fee. "And it's made me understand that the biggest detriment of all this has been the loss of social interaction for the residents."

Moreover, "With restrictions on gatherings and activities, this has been a difficult year for organized volunteer activities," says Chief Resident **Kevin Hanley, MD**. "However, this does not mean that residents and faculty have not been active. Our department organized a Paint the Void event to contribute to beautification of the city last spring during the initial COVID shutdown. Furthermore, residents and department leadership led the campus-wide VotER initiative at UCSF and Zuckerberg San Francisco General Hospital and Trauma Center (ZSFG) that focused on using hospital visits as an opportunity to enroll people to vote in the November election."

Associate Residency Program Director **Esther Chen, MD**, who oversees all resident education at ZSFG, also noted that while the lack of socialization was a challenge, she saw ZSFG residents bonding over the care of patients who were disproportionately affected by the pandemic. They did a number of hospital-wide improvement projects through the lens of health care equity.

She also saw chief residents reaching out regularly to interns, as well as innovative communication among residents and from faculty to trainees through different platforms, especially social media, to convey important information around COVID-19 protocols.



FACING PAGE, TOP: Kevin Hanley, MD, and Esther Chen, MD

FACING PAGE, BOTTOM: Residents and department leadership led a program that used hospital visits to enroll people to vote.

THIS PAGE: Emergency department volunteers help paint a mural at ZSFG to thank the surrounding community for its support.



Innovating in Clinical Education

The year also raised some difficult challenges for hands-on clinical learning. Because patient volumes were down, residents had less exposure to the full range of cases. Junior learners, including medical students, sometimes could not observe, and senior residents had fewer opportunities to teach and supervise.

But Chen also witnessed some very real innovation in the clinical area. When opportunities arose, she says, "We would incorporate practice cases so we could do things like train how to safely don and doff PPE or intubate COVID-19 patients, doing just-in-time training."

In the end, says Wallin, "I've been floored by the residents' resiliency, their adaptability in the face of constant chaos, unpredictable schedules, hard work and caring for families. They've had a wonderful attitude while also being fierce advocates for patients. They've done an amazing job, overcoming obstacles; I am very proud of them."

PEM Fellowship Program Grows

Thanks to the leadership of **Shruti Kant, MBBS**, and **Karim Mansour, MD**, the Pediatric Emergency Medicine (PEM) fellowship program grew from four fellows to six, while also initiating an innovative weekly didactics program.

"The growth allows us more access to fellows on both sides of the bay, and the new didactics have fostered more across-the-bay collaboration that brings Oakland and San Francisco faculty together to teach our fellows and pave the way for the coming, more comprehensive integration," says **Jacqueline Grupp-Phelan, MD, MPH**. Having successfully grown the program, Kant and Mansour turned the leadership reins over to new fellowship directors **Cornelia Latronica, MD**, and **Heidi Werner, MD**.

The Research Pivot

Like the rest of the department – indeed, the rest of the country – the UCSF Department of Emergency Medicine research enterprise turned much of its focus to COVID-19. “Once COVID hit, the funding as well as publications shifted to funnel largely into COVID-related projects,” says **Ralph Wang, MD, MAS**, research fellowship director at UCSF Helen Diller Medical Center at Parnassus Heights.

“That was inevitable,” says **Renee Hsia, MD, MSc**, associate chair of Health Services Research. “But we also continued to do many other studies, including a number on racial equity in health care.”

Sending a few hundred (unhoused) patients (with mild to moderate COVID-19) from ZSFG to hotels over the initial 10-week period of the pandemic helped maintain inpatient hospital capacity and provided a safe option to care for a vulnerable population in the community.

The COVID-19 Work

Robert Rodriguez, MD, was one of those who made the shift, completing or initiating a number of studies that have received considerable attention. As noted above, he led a multicenter study that was among the first in the country to look at the effects of the pandemic on the mental health of frontline providers. The study yielded three publications in 2020 and found that the pandemic has had a substantial impact on provider stress and anxiety levels, affecting their lives at work and at home and placing many at risk for post-traumatic stress disorder (PTSD).

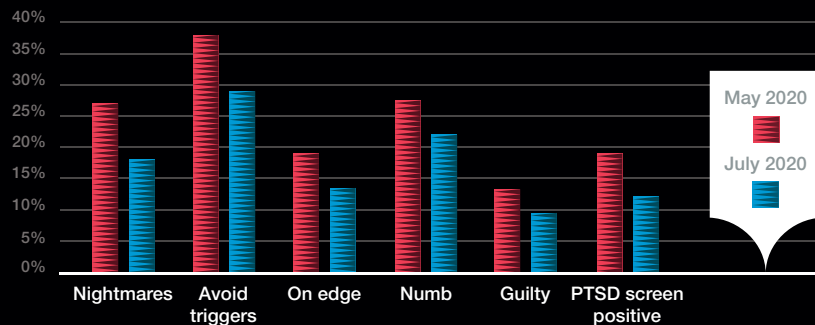
Rodriguez and his collaborators also initiated another nationwide, multisite study, this one examining vaccine hesitancy and barriers to vaccination among vulnerable populations whose primary access to health care is through the emergency department. And Rodriguez worked closely with lead author and faculty member **Aaron Harries, MD**, on a study examining the impact of the pandemic on medical students.

At UCSF Helen Diller Medical Center, Wang and his colleagues have collaborated on a number of COVID-19-related projects. FLIPCUP (Frontline Provider COVID-19 Underlying Sero-Prevalence Study), which also involved the department's **Aaron Kornblith, MD**, and **Charles Murphy, MD**, was a study that, after measuring COVID-19 antibodies in 139 ED employees, found surprisingly low prevalence, which the authors theorize was due to low community prevalence and good protective measures. The study will appear in the *Annals of Emergency Medicine*.

Wang; **Maria Raven, MD, MPH, MSc**; **Jahan Fahimi, MD, MPH**; and **Nida Degesys, MD**, also published a research letter in *JAMA*, which described their small pilot study about the safety of reusing N95 masks – something that, at the time, due to personal protective equipment (PPE) shortages, hospitals

Nearly One in Five at Risk for PTSD

Emergency Department Personnel Responses to Post-Traumatic Stress Disorder Screening Instrument, United States, May-July 2020



were asking frontline workers to do. “We found the N95s were good for one or two shifts, but at three or four there was a failure rate of 25 to 30 percent,” says Wang. Despite limitations in the study, it generated enormous interest, ultimately securing the same team a National Institute for Occupational Safety and Health grant for a large multicenter study that will look at follow-up questions.

UCSF Health and Zuckerberg San Francisco General Hospital and Trauma Center (ZSFG) also became recruiting sites for a large national study, INSPIRE (Innovative Support for Patients with SARS-CoV-2 Infections Registry), which seeks to figure out the degree to which contracting COVID-19 results in so-called



long-haul syndrome, a condition associated with symptoms like fever, cough, palpitations and fatigue even months after an initial positive test.

Raven and **Hemal Kanzaria, MD, MSc**, are working together on a few different COVID-19-related projects, leading a team that is evaluating the pandemic's effect on individuals experiencing homelessness in San Francisco.

"In collaboration with the Benioff Homelessness and Housing Initiative and San Francisco county leaders, we evaluated the safety of isolation and quarantine hotels for unhoused individuals with mild to moderate COVID-19," says Kanzaria. He notes that sending a few hundred patients from ZSFG to hotels over the initial 10-week period of the pandemic helped maintain inpatient hospital capacity and provided a safe option to care for a vulnerable population in the community.

Juan Carlos Montoy, MD, PhD, has also turned to COVID-19-related work, including INSPIRE and a 20-site, Centers for Disease Control and Prevention (CDC)-funded prospective study, with Rodriguez, to identify the risk of infection for ED personnel working with patients. The team has already published two papers on its baseline testing results and baseline anxiety/PTSD symptoms and one paper on vaccine hesitancy, and is now analyzing a time-series study.



Kornblith also pivoted from his pediatric trauma research to work on COVID-19-related projects. One is a multi-institutional chest radiography study to understand the value of diagnostic imaging for children during the pandemic. He also has two recent publications with a national pediatric emergency department working group. One is a descriptive study that found a

"We found the N95s were good for one or two shifts, but at three or four there was a failure rate of 25 to 30 percent."

—Ralph Wang, MD, MAS



decrease in low-acuity pediatric emergency department visits during the pandemic.

The second is a study, on which Kornblith is first author, that compares child abuse during the pandemic to pre-pandemic years; it appeared in *Pediatrics* in December 2020. "Child abuse was a concern early in the pandemic, but we fortunately did not find an increase across more than 50 participating pediatric hospitals," says Kornblith.

Finally, because of Kornblith's expertise in trauma and hemorrhage, he has been involved in a number of international COVID-19-related trials examining novel therapeutics for COVID-19-related coagulopathy. These trials found that compared to prophylactic dosing, therapeutic heparin may reduce mortality and organ support needs among moderately ill hospitalized adults with COVID-19, but not among severely ill patients.

Health Equity Studies

Numerous department researchers published important studies that were particularly timely, given the country's racial reckoning and the impact of COVID-19 on Black and brown communities. Hsia, for example, published an article in November in *JAMA Network Open* that found the innovation of ST-segment elevation myocardial infarction (STEMI) regionalization (a mechanism to reduce systemic disparities by protocolizing the treatment of this condition) showed significantly smaller improvement for residents of minority communities compared with patients from nonminority communities.

Rodriguez published two papers in 2020 that dealt with the issue of barriers to health care experienced by undocumented Latinx immigrants, whose fear of deportation was ratcheted up by the Trump administration's rhetoric and actions. "We found that [the rhetoric and actions] made adult patients more afraid to report crimes to the police and parents more afraid to bring their children to the ED and to clinics for care," says Rodriguez.

Kanzaria's social medicine team at ZSFG published a description of their program in the December 2020 issue of *JAMA*, along with an accompanying podcast. "The article highlights how, using performance improvement principles and multidisciplinary teamwork, we created an approach to caring for ED patients with complex medical, behavioral health and social needs," says Kanzaria.

FACING PAGE, TOP:
Ralph Wang, MD, MAS

FACING PAGE, BOTTOM:
Juan Carlos Montoy, MD, PhD,
and Aaron Kornblith, MD

THIS PAGE:
Renee Hsia, MD, MSc



In addition, Kanzaria's and Raven's work with the Benioff Homelessness and Housing Initiative (BHHI) included examining how shelter-in-place hotels have impacted the most frequent users of ED services. They are also working with the BHHI to help guide city agencies that must decide how to prioritize who to move from shelter-in-place to permanent supportive housing in an environment where the need outstrips current availability. Given that situation, they wrestle with questions such as these: Who will benefit most from permanent supportive housing? Who needs it most? Who is it going to really help? How do you house people in a way that dismantles inequity?

"What we do know is that those with serious mental health and substance use disorders can benefit from permanent support services, including housing, but we need to know how to prioritize and to continue to bolster services available in the ED if we want to really serve our clients," says Raven.

Finally, Wang noted that the department's National Clinician Scholars Program fellow, **Vidya Eswaran, MD**, is looking at the links between frequent ED use and incarceration.

"It's so important to do this type of work to demonstrate the systemic issues are there and insidious," says Hsia.

Maintaining Other Important Research

Even as COVID-19 and health equity concerns dominated the year's research, many department researchers kept other projects afloat.

Kornblith, for example, continued his work aimed at improving diagnostic strategies for sick and injured children in the ED. His current project focuses on using advanced analytics, including machine learning, to correct discrepancies in how effectively clinicians use imaging to diagnose traumatic injuries, the leading killer of children.

He has teamed with Grupp-Phelan, the UCSF Bakar Computational Health Sciences Institute, UC Berkeley and UC Davis to curate a library of imaging data that can help improve the accuracy, reliability and confidence that a provider can accomplish using point-of-care ultrasound. Some hope that improved use of ultrasound can help avert the radiation risks associated with computed tomography (CT) scans.

"The model is still in development, but it uses a novel deep learning strategy to give providers real-time feedback on completeness, quality and accuracy in identifying intra-abdominal hemorrhage," says Kornblith, whose team had its first publication in 2020.

In the same vein, PEM's Pediatric Emergency Care Applied Research Network (PECARN)-sponsored studies, highlighted in last year's report, have been building rapidly. "Even in the face of COVID, we've gone on line with three new studies, including the best way to image children with cervical spine injuries," says Grupp-Phelan.

Raven and Wang – along with Montoy and Murphy – continued their work on patients with alcohol use disorder, including the study mentioned earlier in this report to examine the impact of ED-initiated extended-release naltrexone combined with case management. Similarly, Montoy continues his work with **Mary Mercer, MD**, and **Kathy LeSaint, MD**, on a large, Substance Abuse and Mental Health Services Administration (SAMHSA)-funded study on leave-behind naloxone.

Montoy is also collaborating with Rodriguez, Wang and others in the department on a study that uses a unique data set compiled by the San Francisco medical examiner's office and UCSF cardiologist **Zian Tseng, MD, MAS**, to examine the degree to which opioid overdoses precipitate cardiac arrest, including the creation of precision instruments that can help providers make the diagnosis. "We were able to determine that about 10 percent of out-of-hospital cardiac arrests were associated with opioid overdose," says Montoy. "That finding suggests we might have been undercounting opioid overdoses by almost half."

Finally, Montoy is working with Juarez in an effort to implement electronic medical record (EMR)-based interventions that can improve management of pain for patients being discharged from the ED. "We did some recent work on default settings in the EMR and how that influences provider behavior," says Montoy. "We hope to use that and other interventions to nudge ourselves about how to manage pain, including making sure we prescribe the appropriate amount of opioids."

Selected Publications

In 2020, department faculty, fellows and residents had 97 peer-reviewed publications. What follows is a small selection of some of our most impactful studies.

Implementation of federal dependent care policies for physician-scientists at leading US medical schools.

Ormseth CH, Mangurian C, Jaggi R, Choo EK, Lowenstein DH, **Hsia RY**. *JAMA Intern Med*. 2019 Oct 14:e194611. doi: 10.1001/jamainternmed.2019.4611. Epub ahead of print.

Emergency department preparation for COVID-19: accelerated care units.

Noble J, Degesys NF, Kwan E, Grom E, Brown C, Fahimi J, Raven M. *Emerg Med J*. 2020 Jul;37(7):402-406. doi: 10.1136/emered-2020-209788. Epub 2020 May 27.

Correlation between N95 extended use and reuse and fit failure in an emergency department.

Degesys NF, Wang RC, Kwan E, Fahimi J, Noble JA, Raven MC. *JAMA*. 2020 Jul 7;324(1):94-96. doi: 10.1001/jama.2020.9843.

Early do-not-resuscitate orders and outcome after intracerebral hemorrhage.

Madhok DY, Vitt JR, MacIsaac D, **Hsia RY**, Kim AS, Hemphill JC. *Neurocrit Care*. 2020 Jul 13. doi: 10.1007/s12028-020-01014-1. Epub ahead of print.

Beliefs, perceptions, and behaviors impacting healthcare utilization of Syrian refugee children.

Alwan RM, Schumacher DJ, Cicek-Okay S, Jernigan S, Beydoun A, Salem T, Vaughn LM. *PLoS One*. 2020 Aug 7;15(8):e0237081. doi: 10.1371/journal.pone.0237081.

Academic emergency medicine physicians' anxiety levels, stressors, and potential stress mitigation measures during the acceleration phase of the COVID-19 pandemic.

Rodriguez RM, Medak AJ, Baumann BM, Lim S, **Chinnock B**, Frazier R, Cooper RJ. *Acad Emerg Med*. 2020 Aug;27(8):700-707. doi: 10.1111/acem.14065. Epub 2020 Jul 21.

Occult overdose masquerading as sudden cardiac death: from the POstmortem Systematic InvesTigation of Sudden Cardiac Death study.

Rodriguez RM, Montoy JCC, Repplinger D, Dave S, Moffatt E, **Tseng ZH**. *Ann Intern Med*. 2020 Dec 1;173(11):941-944. doi: 10.7326/M20-0977. Epub 2020 Aug 11.

The utility of focused assessment with sonography for trauma enhanced physical examination in children with blunt torso trauma.

Kornblith AE, Graf J, **Addo N**, Newton C, Callcut R, **Grupp-Phelan J, Jaffe DM**. *Acad Emerg Med*. 2020 Sep;27(9):866-875. doi: 10.1111/acem.13959. Epub 2020 Apr 15.

Evaluation of STEMI regionalization on access, treatment, and outcomes among adults living in nonminority and minority communities.

Hsia RY, Krumholz H, Shen YC. *JAMA Netw Open*. 2020 Nov 2;3(11):e2025874. doi: 10.1001/jamanetworkopen.2020.25874.

Caring for emergency department patients with complex medical, behavioral health, and social needs.

Chase J, Bilinski J, **Kanzaria HK**. *JAMA*. 2020 Dec 22;324(24):2550-2551. doi: 10.1001/jama.2020.17017.

Deactivation of SARS-CoV-2 with pulsed-xenon ultraviolet light: implications for environmental COVID-19 control.

Simmons SE, Carrion R, Alfson KJ, Staples HM, Jinadatha C, Jarvis WR, Sampathkumar P, Chemaly RF, Khawaja F, Povroznik M, Jackson S, Kaye KS, **Rodriguez RM**, Stibich MA. *Infect Control Hosp Epidemiol*. 2021 Feb;42(2):127-130. doi: 10.1017/ice.2020.399. Epub 2020 Aug 3.



COVER: Kayla Enriquez, MD, MPH

PAGE 3: Victor Contreras, MD and Winnie Chan, MD

PAGE 5: Mimi Lu, MD

emergency.ucsf.edu

© 2021 UC San Francisco, Department of Emergency Medicine

WRITING: Andrew Schwartz

DESIGN: Robin Everett

PHOTOGRAPHY: Noah Berger, Jessica Chow, Elisabeth Fall, Susan Merrell, Maurice Ramirez, Barbara Ries and Marco Sanchez. Many faculty members and trainees from the UCSF Department of Emergency Medicine generously supplied photos they took throughout 2020 to document this extraordinary year.



“The pandemic has tested our connections but also clarified for me the importance of those connections to our patients, who too often have had to be sick or die alone, our connection to our communities and to our families. I really believe our resilience comes from that latticework of connections.”

CLEMENT YEH, MD