



UCSF Department of Medicine ZUCKERBERG SAN FRANCISCO GENERAL

SPECIALTY CENTERS PROVIDE INNOVATION AND ACCESS TO CARE

The ZSFG Renal Center at 50 Years : Compassionate Kidney Treatment

For half a century, the ZSFG Renal Center has provided life-sustaining treatment for some of San Francisco's most vulnerable residents, while discovering new ways to improve the care of patients with kidney disease.

"We walk with patients through all the stages of disease," said the center's director, Anitha Toke, MD, Professor in the ZSFG Division of Nephrology. "Some patients have kidney problems we can treat, and they get better. For those with end-stage kidney disease, we provide dialysis."

The kidney is an amazing organ, filtering waste and extra fluid out of the blood, rebalancing salts and minerals, and performing other essential duties. "Kidneys are much more intelligent than what a dialysis machine can do," said Dr. Toke. Still, unless patients are able to receive a kidney transplant, dialysis is the only option for those with kidney failure.

"I tell patients that dialysis is like a washing machine," said Dr. Toke. "Their blood is washed, cleaned, and returned to them." First developed in the 1940s, by the 1960s it became clear that dialysis was no longer experimental and should be available as a life-saving treatment. However, it is also expensive, costing \$50,000 or more annually per patient. In the late 1960s, the State of California opened two dialysis clinics for patients who could not otherwise afford it – one in Los Angeles, and the other on January 30, 1968 based at ZSFG providing both hemodialysis and home peritoneal dialysis training. Originally called the Northern California Artificial Kidney Center at its opening attended by state legislators, the Northern California Kidney Foundation, public health officials and



ZSFG Renal Center Staff: (front row) Roscoe Layug, Jose Puzon, (second row) Clarina Kennedy, Jeannette Vasquez-Villagran, Amanda Gong, Greg Parulski, Colleen Carney, Joel Abutal, Rubin Rodriguez, Allen Garlitos, Eanaanake Di Stefano, Analuz Ignacio, Danilo Dantes, Inset: Center Director Anitha Toke MD

UCSF physicians, it is now known as the ZSFG Renal Center.

The center has been a trailblazer. Former faculty members helped advance the hollow fiber artificial kidney technology still used by dialysis machines today, and developed complex mathematical formulas to determine when a patient has received enough dialysis during a session. Under the leadership of Michael H. Humphreys, MD, Professor of Medicine Emeritus, and now David Pearce, MD, Professor of Medicine, as chiefs of the ZSFG Division of Nephrology the center has also trained many nephrology fellows who have become leaders in the field.

In 1973, Medicare began covering dialysis for

kidney failure patients regardless of age, the only medical treatment to receive that distinction. However, some patients are ineligible for Medicare, such as undocumented immigrants. "Our goal is to provide dialysis irrespective of patients' ability to pay, whether they are insured or uninsured, documented or undocumented," said Dr. Toke. "We take care of everyone, including inmates from County Jail, patients with behavioral or substance use disorders, and homeless patients."

A collaborative research study conducted by Dr. Toke's colleagues and published in *JAMA Internal Medicine* in February 2018 compared standard thrice-weekly hemodialysis for undocumented immigrants with kidney failure managed at the ZSFG Renal Center with intermittent emer-

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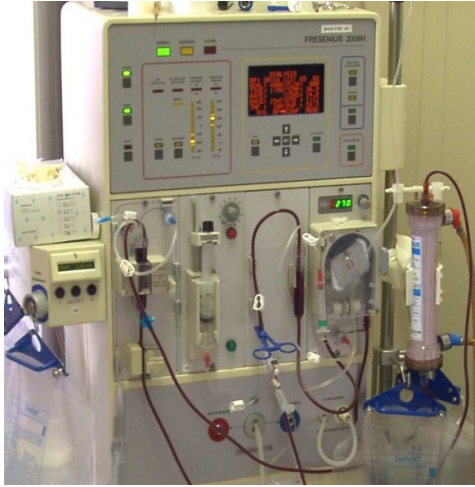


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agency-only hemodialysis for their counterparts managed at Denver Health in Denver, Colorado and Harris Health in Houston, Texas, where state Medicaid reimbursement policies do not cover chronic outpatient care. There was 14-fold higher mortality and 10-fold higher acute hospital days with emergency-only vs ZSFG standard dialysis. Many patients face multiple challenges, including



Hemodialysis machine in ZSFG Renal Center

diabetes, food insecurity, limited health literacy, and transportation difficulties. To address these complex needs, the center has a team of about 40 people, including nephrologists, a nurse practitioner, nurse, dialysis technicians, physician's assistant, dietitians, social workers and administrative staff. The whole team sees each patient once a week. "Our staff can handle it all – that's their motto," said Dr. Toke. "They bring their experience and can-do attitude."

The ZSFG Renal Center is open Monday through Saturday from 4:30 a.m. to 8 p.m., including holidays. The center serves about 100 patients who come three times a week for four-hour sessions. ZSFG also partners with four community dialysis centers to provide treatments for another 150 patients. The team cares for an additional 20 to 30 ZSFG patients who do home dialysis, training them how to avoid infection and providing home visits. Dr. Toke also oversees an inpatient dialysis unit for hospitalized patients.

The ZSFG Renal Center has never closed since its founding half a century ago, and the facility is

showing its age. "The flooring is falling apart, the windows don't open, and there are lots of structural issues that can't be fixed," said Dr. Toke. Fortunately, construction of a new, improved home for the center is scheduled to begin in 2020.

The new, expanded location in ZSFG's Building 5 will increase the number of dialysis stations from 13 to 24. It will include isolation rooms where patients with infectious diseases can receive treatment, as well as additional private rooms for training home dialysis patients. The increased capacity will allow many patients currently receiving dialysis at community centers to get their treatments at ZSFG, enhancing continuity of care. Each station will have a television to help the time pass more enjoyably. The new center will also have state-of-the-art equipment to purify the 150 liters of water required for each session, as well as automated systems to prepare electrolyte solutions.

"It's a privilege to care for these patients, and I care deeply about them," said Dr. Toke. "We see them 12 hours a week, hear their life stories, and meet their family members. The spirit and resilience that these patients bring is inspiring"

The ZSFG Echocardiography Lab: Improving Heart Imaging

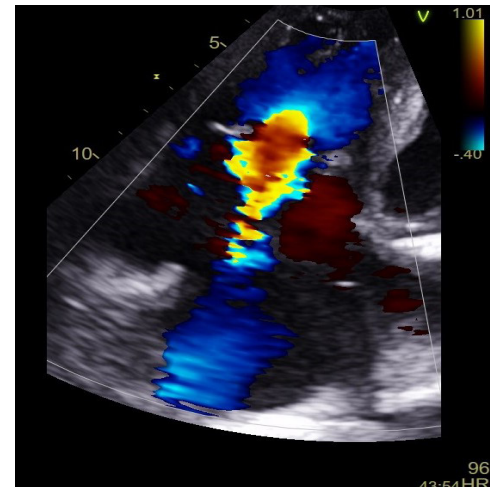
Cardiac imaging has many tools, each with strengths and limitations. Since Sithu Win, MD, MPH, Assistant Professor of Medicine, was recruited to direct the ZSFG Division of Cardiology's Echocardiography and Non-Invasive Cardiac Laboratory, his team has increased this toolkit and improved access.

In addition to offering exercise stress tests – which measure electrical activity of the heart while patients run on a treadmill – the lab now provides stress echocardiography, which captures ultrasound images of the heart right after a patient stops exercising. "Stress echoes are usually more sensitive and can be used for many purposes, such as determining whether a heart valve problem is causing shortness of breath," said Dr. Win.

Another new service is using contrast, which can help enhance image quality for some patients. Rather than injecting dye, contrast echocardiogra-

phy uses tiny gas bubbles which reflect ultrasound beams, similar to how reflective tape on a jogger's shirt increases visibility at night. Dr. Win engaged outside trainers to teach sonographers this new procedure, developed a hospital-wide protocol empowering nurses to administer intravenous contrast when needed – without a doctor's order – and partnered with the Epic implementation group to build electronic medical record templates making this test accessible.

Dr. Win also greatly increased availability of transesophageal echocardiograms (TEEs), which provide much clearer images than traditional echocardiograms because the probe is inserted into the esophagus, close to the heart. The patient is mildly sedated for the procedure. Before, TEEs were performed in the post-anesthesia care unit (PACU), requiring cardiology fellows



Echocardiography image from ZSFG lab

to round up an available nurse, anesthesiologist and bed. "Fellows spent three hours orchestrating a 20-minute procedure," said Dr. Win. "It was absolutely dismal for patients, who sometimes came at 7 a.m. and left at 5 p.m. without getting the procedure." Recently, the team moved TEEs to the ZSFG Cardiac Catheterization Lab, carved out dedicated staff time and created appointment times. "Instead of doing one or two TEEs a week, now we do three or four per day," said Dr. Win.

Similarly, it used to take about a month to get an appointment for echocardiography, stress testing and wearable Zio patches, which record the heart's



ZSFG Echocardiography Lab faculty and staff members: (front row) Alice Lee, Jennifer Luna, (second row) Director Sithu Win MD, Jaime Artola, Kiyoko Painter, Jenillee Bustos

electrical activity. “When I started, 41 percent of patients did not show up for their appointments,” said Dr. Win. Front desk staff already juggled many duties, so Dr. Win recruited two volunteers to help with patient reminder calls, reducing the no-show rate by half. He reconfigured the schedule, staggering appointment times so patients arrived in a steady flow rather than all at once. He also converted fast-track “emergency” slots to regular appointments. “My goal was to increase efficiency so regular echoes would be done with-

in a week,” he said. “It wouldn’t have to be a special request.” All these strategies reduced wait times to just two or three days.

Dr. Win also dedicated several morning slots for hospitalized patients. “I wanted to help overall hospital efficiency,” he said. “If echoes are done in the morning for inpatients, some of them could probably leave that afternoon.” One hurdle was that telemetry patients – those on cardiac monitoring – needed nurses to transport and observe

them for the entire procedure. “Certainly some of those patients are well enough to temporarily stop cardiac monitoring for a one-hour test,” said Dr. Win. “How could we find those patients, and empower nurses to make that decision?” He and Tanvi Bhakta, RN, combed through patient data and developed a formula identifying low-risk patients who did not require a nurse transporter. They also built a button in Epic so doctors ordering cardiac telemetry could easily flag these low-risk patients, and retrained hundreds of nurses on the new protocol. “It was a big culture change,” said Dr. Win. “All these adjustments allowed us to increase our overall volume by 33 percent, without working longer hours.”

In the coming year, Dr. Win plans to purchase new equipment and achieve national accreditation. He also hopes to further increase efficiency and enable the lab to perform pharmacological stress echoes; these use intravenous medication to make a patient’s heart temporarily beat faster, and are useful for people unable to exercise.

Dr. Win would like to enhance the lab’s research capacity, and is working with Priscilla Hsue, MD, Professor in the ZSFG Division of Cardiology, on a study of methamphetamine-induced heart failure. “If we can free up the Echo Lab staff’s time a bit, we can make clinical studies usable for research,” he said. “It’s part of our mission to make an intellectual contribution.”

Elizabeth Chur
 Editors: Neil Powe, Laurae Pearson

SPOTLIGHT

ZSFG Programs and Faculty Receive Recognition

The Stupski Foundation awarded \$2.5 million to the **Palliative Care Program** at ZSFG for patients with serious illness to enhance outpatient services, advance care planning, caregiver support, psychosocial needs assessment and community links.

Diane Havlir, MD, Professor and Associate Chair of Clinical Research, and Chief of Division of HIV, Infectious Diseases, and Global Medicine, was elected to the National Academy of Medicine, one of the highest honors in health and medicine.

POP-UP, the new medical program at ZSFG’s **Ward 86** for HIV-positive homeless and unstably housed persons in San Francisco, received a Certificate of Honor from the San Francisco Board of Supervisors at City Hall on October 22. The program, established in March, was recognized by Supervisor Rafael Mandelman of District 8. Congratulations to **Monica Gandhi**, **Liz Imbert**, **Jon Oskarrson**, **Matt Hickey**, **John Friend**, **Jack Kelley**, **Brigitta Ruggiero**, **Diane Havlir** and the Ward 86 and POP-UP teams.



Monica Gandhi MD, with members of the POP-UP program team at the Board of Supervisors commendation on October 22, 2019

