Department of Physical Therapy and Rehabilitation Science

Year in Review 2022



Pathways to the future



University of California San Francisco

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Message from Our Chair Pathways to the Future



As Chair, one of the focal points of my role is listening to the interests of our learners, staff and faculty to help them find meaningful pathways for continued learning, development and growth.

Whether we are offering advanced training for neurologic physical therapy, creating a community of pelvic floor therapists equipped to address rising demand, or working with a historically Black college to create a pipeline of future

rehabilitation scientists, we are paving pathways for the future.

We hope you are inspired by the various pathways we have developed, launched or enhanced over the past year. These outlets will serve as the substrate to build the physical therapist clinicians, educators, scientists and advocates whose work improves the human experience by optimizing movement and fostering health for all.

Our students, faculty, staff and alumni inspire me every day with their tenacity, courage and passion for serving others. I hope you enjoy learning about the many initiatives that occurred over the last year in the UCSF Department of Physical Therapy and Rehabilitation Science.

Amber Fitzsimmons, PT, MS, DPTSc *Chair,* UCSF Department of Physical Therapy and Rehabilitation Science

ON THE COVER: Third-year DPT student Zerrick Santos, winner of the 2022 Justice, Equity, Diversity, and Inclusion (JEDI) Scholarship, funded by the Alumni Association of UCSF. See story on page 7.

DPTRS at a Glance

Clinical Care

- 50,323 patient visits to Faculty Practice Sites in 2022
- 3 Faculty Practice Sites: Lakeshore, Mount Zion, Mission Bay
- 10 Interprofessional Clinical Sites (such as TBI, ALS, Brachial Neuritis clinics)
- Introduction of a new hand therapy service at the Orthopedic Institute

Education

- 147 DPT students, 4 PhD students, 4 residents
- \$65,500 distributed to DPT students in scholarships
- Reaffirmation of Accreditation for DPT program through April 2032
- Start of our new Neurological Physical Therapy Residency in fall 2022

Research

- \$20 million in total active NIH awards
- 18 active research grants



Clinical Care

A Path to Partnership: Increased Access to Pelvic Floor Therapy

As the demand for pelvic floor therapy has risen across the country in recent years, the health care system has not been able to keep up with demand. This includes UCSF Health. "We haven't been able to expand fast enough and hire enough clinicians to cover those needs at UCSF and the community," said Cathy Hoang, PT, DPT.



To meet this demand, Dr. Hoang is overseeing DPTRS' burgeoning clinical affiliate partnership with Origin, a provider of pelvic

floor and whole-body physical therapy.

While still in its early stages, the partnership's goal is to open access to patients so that therapy services can be initiated more expeditiously and patients can get the help they need. DPTRS has developed a dashboard with Origin to facilitate improved patient access, patient outcomes and provider development. This dashboard also highlights and monitors health equity, inclusive care and clinical quality metrics.

Physical therapy can help women prepare for childbirth, reduce labor trauma, recover more quickly postpartum, and avoid issues like incontinence and pelvic organ prolapse. Origin expects to be an in-network provider for patients with Medicare and Medi-Cal within the next two years.

Dr. Hoang is hopeful that UCSF Health providers will be able to refer patients to Origin for pelvic floor therapy that will be of the same quality they would receive at UCSF. This relationship promises to be bidirectional and offer opportunities to learn from one another and elevate the Bay Area's community of pelvic health providers. Origin's innovative work around digital exercise programs and community-based services in the pelvic health community will be an excellent resource.

Reducing Workplace Injuries for UCSF Health Employees

In March 2022, DPTRS and the UCSF Health Ergonomics Program piloted the Wellness at Work Program to prevent workplace injuries among employees at UCSF Health.

Employees working for UCSF Health have high rates of workplace injuries. Such injuries, in addition to their physical and emotional toll, resulted in the loss of over 3,000 workdays, 6,000 modified workdays, and a cost of \$2.4 million for UCSF Health in fiscal year 2022.

"Many of these injuries are preventable," said Assistant Clinical Professor and Vice Chair of Clinical Operations Heather Bhide, PT, DPT. "That means the pain, suffering and enormous expenses associated with them could be greatly diminished."

The pilot, launched in UCSF Medical Center at Mount Zion's operating room and the UCSF Bakar Precision Cancer Medicine Building (PCMB) pharmacy, will extend to both Material Services and Hospitality Services in February 2023.

The program plays out in several phases. First, physical therapists shadow employees on the job to identify risk, observing staff as they work to learn about any potential ergonomics problems. Based on their observations, the physical therapists provide four custom one-hour education and stretching classes. Unit leaders follow up to address observed risk factors.

To assess the success of the program, the team will evaluate injury rates in these departments and see if they have decreased after the pilot. Once injury rates and staff feedback are assessed, a sustainable program can be implemented that includes staff wellness champions, peer-to-peer feedback and resources offered via the UCSF PhysFit Physical Therapy Health & Wellness Center.

Preventing occupational injuries is vitally important to improving quality of life for the workforce, according to Dustin Tom, PT, DPT, one of the physical therapists in the program. "Working with an injury and not having any awareness of how to fix it can feel unrelenting," Dr. Tom said. "The Wellness at Work Program can step in and provide the knowledge to individuals to promote healthier work habits and independent exercising at work or at home."

For Alejandra Hernandez, PT, DPT, another physical therapist in the program, the initiative is personally meaningful. "My dad frequently suffered from work-related injuries, so it has always been my mission to help individuals improve how they move at work," Dr. Hernandez said. She has enjoyed immersing herself in the work environment and providing feedback in real time, which can be more practical than when given in clinic. "My hope is to expand this initiative to other departments at UCSF and help keep our workforce healthy and free of discomfort."

A Path Forward for Value-Based Care

The shift to value-based payment will happen soon, according to DPTRS Assistant Professor Sam Pak, PT, DPT. "It's less a question of 'if' and more a question of 'when'," Dr. Pak said.

"To prepare, we need to be proactive and answer some important questions to better understand the types of patients we're seeing, their health conditions, why certain patients are slow to change in response to PT, and why others are especially poised to respond well to it."

Dr. Pak became interested in this topic while working for a quality payment program at another system. His approach is informed by his training in both physical therapy and informatics, incorporating an under-



"This shift will result in higher accountability, clarity in the value we provide, and a better understanding of costs." – Dr. Sam Pak, pictured above (right)

standing of day-to-day clinical care alongside a view towards the big picture, infrastructure and the ways that data can be leveraged to ensure better outcomes for patients.

There is a clear need for better national benchmarking data and greater transparency regarding patient outcomes. Although cost of care is persistently high, significant variations in practice exist. "Beyond the individual patient-level data, we need to be able to understand the population health perspective," Dr. Pak said.

One of Dr. Pak's key quality improvement initiatives is a personalized orthopedic dashboard containing patient health data, self-reported quality of life outcomes and practice metrics. This ongoing project aims to center quality improvement in the residency curriculum, offering residents and faculty mentors better perspective on how people are self-reporting and trending over the course of their care at both a patient and population level.

Dr. Pak is also collaborating with other clinical faculty to reduce the wait time for patients to be seen at the clinic and identify prime candidates for telehealth to fast-track them for proper treatment. "We did a deep dive of the patients we commonly see to improve access to care," Dr. Pak said. At the end of the day, he thinks physical therapists are well suited to make the shift to value-based care. "We do extensive history gathering and serve as the primary gateway for neuromusculoskeletal patients." While challenges will persist, Dr. Pak thinks that the changes will ultimately be good for patients and providers alike. "This shift will result in higher accountability, clarity in the value we provide, and a better understanding of costs."

Speech, Hand and Occupational Therapy Services Added at Outpatient Faculty Practice Sites

In an effort to improve the patient experience, speech, hand and occupational therapy services are being added at outpatient faculty practice sites. Speech therapy will be conducted via telehealth by Patricia Liu, MA, CCC-SLP, as will occupation therapy with Jessica Mok, MOT, OTR/L. In addition, two certified hand therapists are seeing patients onsite at the Orthopedic Institute at Mission Bay.



Jessica Mok, MOT, OTR/L



Patricia Liu, MA, CCC-SLP

Education

Pro Bono Community Clinic Evolves in Second Year

The Community Clinic at UCSF's PhysFit Health and Wellness Center, now in its second year, continues to provide free physical therapy services to patients who are uninsured and underinsured with the goal of improving the health and quality of life of underserved populations in the Bay Area.

The number of patients seen doubled in 2022, from 6-8 patients per day to approximately 15. The clinic also has increased access for patients reporting neurological issues, up to 40% of patients from only 10% at the clinic's opening.

According to Assistant Clinical Professor and Vice Chair of Clinical Operations Heather Bhide, PT, DPT, "Our goal is to provide equitable access to patients with a host of challenges, and we want to give students increased exposure to people with more complex movement issues which helps them incorporate more effective treatments and interventions for patients with neurological diagnoses."

Student volunteers typically get exposure to 2 to 3 patients each per shift at the clinic, which is open two Saturdays per month. Evaluations and follow-up visits are an hour long.

Students, Dr. Bhide said, appreciate the increased time with patients. "I think that helps with the stress and anxiety of working with patients. The students can relax a little more and have a little more time to think through the care they provide to patients, preparing them well for the more fast-paced interactions they'll experience during their clinical rotations."



"Our goal is to provide equitable access to patients with a host of challenges, and we want to give students increased exposure to people with more complex movement issues which helps them incorporate more effective treatments and interventions for patients with neurological diagnoses." – Dr. Heather Bhide

A New Pathway for Neurology Education

The UCSF Neurologic Physical Therapy Residency, launched in Fall 2022, is designed for clinicians and graduating DPT students interested in expanding their depth of knowledge in

neurologic physical therapy.

The program enhances residents' clinical expertise treating



patients with neurological challenges across multiple clinical settings with mentors who are board-certified neurologic clinical specialists.

The current neurologic resident, Daniel Hernandez, PT, DPT, was born and raised in Chicago, where he received his bachelor of science in health sciences at DePaul University. He received his doctorate from UCSF/ SFSU in 2020. Dr. Hernandez worked as a physical therapist in outpatient orthopedics for approximately two years before starting the neurologic rehabilitation residency with UCSF. Neurologic rehabilitation has always been Dr. Hernandez' passion in physical therapy, and he is very excited to be part of this residency.

We are now accepting applications for the 2023 residency program. To apply online or for more information about the program, please visit our website at tiny.ucsf.edu/NPTR. The application deadline is February 15, 2023. ■

Physical Therapy Students Build Community Partnerships

Students in the UCSF/SFSU Graduate Program in Physical Therapy are engaged with three community partnerships serving marginalized populations in San Francisco.

At the Mabuhay Health Center, serving the Filipino American community in

the SOMA district, students provide interdisciplinary care through a teleclinic and participate in a monthly health education/screening event. At Clínica Martín-Baró, serving the Latinx community in the Mission district, students provide interdisciplinary care through a bimonthly clinic in addition to health and wellness education during bimonthly food distributions. At the San Francisco Medical Respite Center, serving recently discharged people who are medically frail and impacted by homelessness, students provide monthly exercise instruction and mobility training.

DPT students serve patients through one of our community partners between four and five times a month. Since the establishment of these partnerships, student physical therapists have participated in 21 telehealth clinics and 13 health education/screening activities while interacting with over 200 colleagues from different disciplines and providing care for 119 patients who would not otherwise have access to physical therapy. Student governance in 2022 included members of all three DPT cohorts: Sophie Baghodoyan, Fernando Cazares, Elizabeth Holt, JC Lynne Lu Sing, Jocelyn Morales, Jillian Rodriguez, MariaJose Solis Lopez, Cynthia Tze, Matt Villaneuva, Pam Ygrubay and Stacey Zupan.

DPTRS Wins JEDI Scholarship

The Alumni Association of UCSF (AAUCSF) has launched a scholarship for UCSF students across the health sciences: the Justice, Equity, Diversity, and Inclusion (JEDI) Scholarship.

The award is given to a UCSF student in their final year who has demonstrated promise addressing health care disparities. In a close competition,



and rallied by alumna and chair emeritus Kimberly Topp, PT, PhD, our UCSF/SFSU DPT alumni stepped up t heir donations to win the inaugural JEDI Scholarship for one of our current students.

Congratulations to Zerrick Santos, the third-year DPT student who received the scholarship! Santos was

born and raised in Long Beach by his father, who emigrated from Cape Verde, Africa. While working as a physical therapy aide in college, Santos noticed that patients often arrived upset



or in pain. After treatment, these same patients would be in an elevated mood and moving better; during follow-up visits they would report how they were able to enjoy their weekend with their family, run errands or more easily go for a walk. These positive changes inspired him to become a physical therapist.

Since joining the DPT program, Santos has spent considerable time at UCSF's pro bono Community Clinic and working with the TeenFit program. He looks forward to a career in physical therapy and becoming a movement system expert who can help improve his community.

DPT students serve patients through one of our community partners – including Mabuhay Health Center, Clínica Martín-Baró, and the San Francisco Medical Respite Center – between four and five times a month.



Congratulations DPT Class of 2022



Emily Applewhite



Analissa (Kitana) Bautista



Emily Blaker



Lam Bui



Amie Chien



Eric Choy



Priscilla Chung



Victoria Cimo



Lacy Coquillard



Kristen Corsaro



Madeline Cowan



Savannah Estes



Oscar Estrada



Juliana (Jules) Evans-Anfom



Fahmida Faiza



Mikayla Fender-Badgley



Tomas Guerra



Alex Hansen



Ahmadullah (Ahmad) Hasani





Marielena Hercher



Jirael Hipol



Justin Hong



Dana Jacobs



Horace Kwan



lan Leung



Aristeo Lucero



Veronica (Nicki) Lunghi



Jamison Ly



Innah Claire Malig



Lillie Mansfield



Logan Marshall



Nina Mokhtarzada



Monica Nolte



Marissa Ogata



Ashley Omwanghe



Kirstyn Ormsby



Ayako Ota



Tony Peng



Andrew Phong



Tania Rojas-Gonzalez



Alejandra Roque



James Salazar



Rachel Spivak



Jane Clare Vosteen



Andy Wang



Eliza Winter



Megan Wong



Samantha Yee



Chowyu Zhang



Dr. Sarah Pawlowsky



Dr. Erica Pitsch



Dr. Heather Bhide



Amy Lou

Excellence in Teaching Awards

In recognition of the exemplary quality and impact of her achievements in pedagogy, associate clinical professor in SFSU's Department of Physical Therapy Sarah Pawlowsky, PT, DPT, received the Excellence in Teaching Award for lecturers.

Dr. Pawlowsky has been a full-time lecturer in Physical Therapy at SF State for the past six years and is highly valued for her clinical expertise, knowledge of musculoskeletal content, and teaching skill.

Students praised her thorough and well-organized lectures, integration of materials, feedback on assignments, clinical relevance of her teaching, accessibility and approachability, solid foundation of knowledge, open-mindedness and commitment to making sure all students' voices are heard. They also noted her ability to adjust to the learning pace of each student and willingness to go above and beyond as a teacher and faculty member.

Associate Professor Erica Pitsch, PT, DPT, and Heather Bhide, PT, DPT, were awarded the 2021-2022 UCSF Excellence in Interprofessional Teaching Award for their outstanding teaching, collaboration and facilitation in interprofessional education and collaborative practice.

Staff Highlight: Developing Leader Amy Lou

DPTRS Program Manager Amy Lou supports faculty and students in the DPT, PhD, and residency programs with curriculum management, program evaluations and accreditations.

Lou is working on many exciting projects, including the reimagining of the DPT curriculum and the reaccreditation of the Orthopedic Residency program. "I am learning a lot and enjoying being part of initiatives that will have a positive impact on current and future students," Lou said.

She completed the School of Medicine Leadership Development Program in June 2022. This eight-month program includes structured sessions focused on essential knowledge areas and leadership discussions. "It was inspiring to hear campus leaders share their different career journeys," Lou said. "I also appreciated the opportunity to learn from and connect with colleagues in the program."

Prior to joining UCSF, Lou worked at UC Merced and UC Berkeley. Her favorite part about working with DPTRS is the people. "Our faculty, staff and students are caring and hardworking. Their passion for education, research, and patient care uplifts and motivates me."



In 2022, our researchers brought in \$3.97 million in new funding, and have a total of \$20 million for all active funding. (Pictured above: Myriam Chaumeil, PhD, in the MRI lab)

Research

In 2022, our researchers brought in \$3.97 million in new funding, and have a total of \$20 million for all active funding. In addition to NIH, the Department of Defense, the Department of Veterans Affairs, UCSF and various private foundations funded the work of DPTRS researchers.

Areas of Study

Neurorehabilitation Research

FACULTY: Valerie Block, PT, DPTSc Myriam Chaumeil, PhD Robert Matthew, PhD

LABS AND CENTERS:

- The Chaumeil Lab focuses on magnetic resonance imaging of neurological disorders, including Multiple Sclerosis, Traumatic Brain Injury and Alzheimer's disease.
- UCSF Biorobotics focuses on the development and use of clinically deployable systems to assess function and augment the recovery process.

Musculoskeletal Biomechanics Research

FACULTY: Victor Cheuy, PhD, Richard Souza, PT, PhD

LABS AND CENTERS:

- The Biomechanics and Musculoskeletal Imaging Lab (Souza Lab) uses 3D motion analysis, quantitative MRI, multi-modal dynamometry and EMG to understand predictors of disease progression.
- The UCSF Human Performance Center partners with research labs, scientists and companies around UCSF and the Bay Area to carry out studies in biomechanics, exercise physiology, and sleep and athletic performance. Its state-of-the-art equipment and staff expertise enable this center to handle a diverse range of research opportunities, from knee osteoarthritis to prostate cancer.

Health Services Research

FACULTY:

Matt Miller, PT, PhD Sam Pak, PT, DPT

Education Research

FACULTY:

Amber Fitzsimmons, PT, MS, DPTSc Kai Kennedy, PT, DPT

Two Faculty Members Receive Career Development KL2 Awards

In 2022, Victor Cheuy, PhD, and Matt Miller, PT, PhD, won career development awards to support their work as clinical scientists at UCSF.

Supported by the Clinical and Translational Science Institute, the Department of Epidemiology and Biostatistics, and the Schools of Medicine, Nursing, Dentistry and Pharmacy, the KL2 Award provides salary support for faculty members to establish protected time to focus on research and training.

Dr. Cheuy will use the award to study the relationships between diabetic kidney disease (DKD) and skeletal muscle deterioration. "I'm working to understand how DKD negatively influences physical activity, physical function and knee joint health," Cheuy said. In addition to funding the science itself, the award will cover coursework, workshops for professional development, conference travel, biostatistical support and serves as a launching pad for Dr. Cheuy's laboratory.

"I'm honored to have had my study proposal viewed as innovative and



"As the first physical therapist to receive the KL2, this award means a lot."—Dr. Miller

clinically relevant," Dr. Cheuy said. "Being funded through this mechanism means that I get to embark on collaborative, highly interdisciplinary work that is valued for bringing together physical therapy, radiology, endocrinology and nephrology. I'm happy that I get to expand my translational research program and develop leadership skills to transition into a successful independent investigator."

Dr. Miller will use the award to support his research toward a deeper understanding of rehabilitation practice among older adults with cognitive



Dr. Cheuy researches the impact of diabetic kidney disease (DKD) on physical ability. The image below shows two glomeruli in DKD: the acellular light purple areas within the capillary tufts are the destructive mesangial matrix deposits. (Image source: Wikipedia)



impairment. He is working to develop effective approaches to improve health outcomes for this vulnerable population.

The award will help improve agingrelated research training, analyze quantitative and qualitative data, write manuscripts and grants, and build collaborations for future research. He will also use the funds to help with costs related to biostatistical analyst support and travel for national research conferences.

"As the first physical therapist to receive the KL2, this award means a lot," Dr. Miller said. "To me, it means that the UCSF research community wants to invest in my research agenda as a doctor of physical therapy and rehabilitation scientist." The investment shows that UCSF values the rehabilitation and person-centered perspectives of the Department of Physical Therapy and Rehabilitation Science, Dr. Miller said. ■

Creating a Pathway for the Next Generation of Rehabilitation Scientists

Thanks to generous funding from the UCSF School of Medicine Dean's Office and a collaboration with UCSF's Summer Research Training Program (SRTP), the UCSF Department of Physical Therapy and Rehabilitation Science will launch the inaugural UCSF-Morehouse College Summer Training for Scientific Careers in Rehabilitation Science.

The goal of this 8-week program is to provide students from Morehouse College, an all-male and historically Black college, with hands-on research experience in rehabilitation science, illuminating a pathway for enrollment into our DPT and PhD programs or into other programs across the country. We are thrilled to welcome two exceptional individuals in the summer of 2023!

Studying Interventions for Parkinson's Disease

Q&A with PhD candidate Jessica Bath, DPT

Q: You received your DPT degree in 2020. What made you want to go back to school to get your PhD?

A: I really like to sit and analyze and synthesize information, learn new



skills and work autonomously. I did a year in clinical practice, and I would often get to the clinic an hour or more ahead of my first patient to chart review but would mostly be

finding and reading through many journal articles relevant to my patients for the day. Combined with the documentation, this schedule was pretty unsustainable as a new graduate and led me to reevaluate what I wanted out of my physical therapy career. I also believe there are an infinite number of ways to use the knowledge that a physical therapy doctorate provides and felt my skillset may be best utilized in a different way than primarily as a 9-5 clinician.

Q: Tell me about your research. What questions are you trying to answer?

A: People with Parkinson's disease often have significant gait and balance issues, which have been well studied, but unfortunately those issues are not yet effectively treated, especially long term. While current interventions are better for tremors and short-term management, they frequently do not address axial or medication-related motor symptoms that happen day to day and impact whether someone can still do all the things that bring their life meaning. A novel deep brain stimulation (DBS) device, however, which we work with and is made by Medtronic, can be programmed to sense the neural activity in someone's brain as they walk, for instance, then deliver the exact amount of stimulation they need at the regions of the brain affected by PD in real time to improve their motor function and safety. We use the neural





(Image source: lab of Doris Wang, MD, PhD)

"A novel deep brain stimulation device can be programmed to sense the neural activity in someone's brain as they walk, then deliver the exact amount of stimulation they need at the regions of the brain affected by PD in real time to improve their motor function and safety."

sensing capabilities of the device combined with biomechanical data to program their device to know when to turn on/off (i.e., at toe off during left stance phase), then also use that data to understand how their motor functions change as an effect of DBS parameters/therapy. The Wang Lab, which I am part of, is currently 1 year into a clinical trial analyzing the effects of adaptive DBS therapy on various gait and balance outcomes in people with severe PD. I work on a verv interdisciplinary team with UCSF bioengineers and electrical engineers, neuroscientists, neurologists and neurosurgeons, and have developed my own programming and neurophysiology skillsets too.

My dissertation uses data from the clinical trial to look at postural control in people with PD, particularly during turning and gait initiation. The novel DBS device allows me to both conceptualize the circuits underlying these activities and find patient-specific neural biomarkers that can be used to further program their device to improve these functions. I hope to begin also investigating the effects of exercise on one's neural data and someday various physical therapy interventions as well.

Q: What do you think treatment for Parkinson's disease will look like 10-20 years down the line?

A: Hopefully in the future, managing Parkinson's disease will be like managing any other chronic condition versus being such a debilitative and rather grim diagnosis. Ideally, once people are diagnosed with the disease they would get genetic testing and based on that data understand what interventions are most likely to be effective for them. Like a lot of other neurodegenerative conditions, Parkinson's presents in different ways for different people. For those who have a high likelihood of benefiting from deep brain stimulation, for example, they could then go through with device implantation and hopefully have tremendous benefit based on the adaptive work our lab and some others are doing. Then, while they might still take some medication, do focused cycles of PT, etcetera, treatment would result in a much more stable management of day-to-day symptoms, allowing individuals to still work, exercise, go out in the world and lead meaningful lives.

Q: What is your connection with Parkinson's disease?

A: My grandfather was officially diagnosed with Parkinson's disease while I was in PT school in 2017. I would accompany him to treatments and felt there was a lot of guesswork in his care. He experienced a very rapid decline and passed away in 2020. His treatment was also compounded by living in a rural area and his preference to not seek much treatment in general, believing it would not help. All of these factors led to a rather poor prognosis and experience as a family member, and are what also led me down this path to studying the disease. ■

Metabolic Imaging of Neurological Disorders

Q&A with Marina Radoul, PhD, a specialist in the Chaumeil Lab

Q: What research questions are you trying to answer and what are the potential implications for disease?

A: I am a biophysicist and an MRI expert. My research is focused on



development of new imaging methods to help better understand brain diseases. More precisely, we develop new advanced magnetic resonance imaging (MRI) and spectroscopy (MRS) techniques, combined with metabolomics, to look at brain metabolism

non-invasively, which gives us new information about disease processes. These new methods can then be used by clinicians as a diagnostic tool, which helps in monitoring treatment and predicting treatment outcomes for patients with neurological diseases.

Q: How did you get interested in this area of research?

A: I find it fascinating to be able to noninvasively get an insight into brain metabolism using MRI. Furthermore, I find it extremely interesting that our research helps better understand the alterations responsible for neurodegenerative diseases and brain tumors, which could lead to new avenues for therapies.

Q: What motivates you to do this research?

A: The main motivation for these studies is that they are clinically translatable. New MRI methods can help clinicians to tailor optimal treatment for each patient, thus increasing efficiency in the decisionmaking process and leading to advancement of precision medicine.

Q: How do you expect biomedical imaging to advance rehabilitative science in the next 10-20 years?

A: Biomedical imaging provides noninvasive insight into biological processes during disease progression and response to treatment, and as a result it helps to predict an early outcome. Thus, I believe that for the next 10 to 20 years, biomedical imaging is going to be a key element, not only in tailoring treatment to each patient, but also in advancing individualized rehabilitation intervention as a part of personalized medicine in general.

Q: Is there a current or recent research project that you are particularly proud of? What did you learn from it?

A: For the past two years, I'm particularly proud to have been working on the identification of biomarkers for a new kind of treatment for epilepsy, which is called neural cell therapy, in partnership with a UCSF-founded company, Neurona Therapeutics. Recently, Neurona has conducted a multi-center clinical trial for treating drug-resistant chronic focal epilepsy using a groundbreaking approach: injecting interneurons into the diseased hippocampus to correct dysregulated neural circuits. Results in mice demonstrated that injection of interneurons reduced seizures and hippocampal pathology and results in patients are very promising.

Our role in this project was to identify MRI biomarkers that are

characteristic of epileptic brain and were corrected back to healthy level in response to therapy. Moreover, we further investigated what metabolic pathways were altered and corrected back to healthy levels using advanced metabolomics. An understanding of mechanisms causing seizure's occurrence and response to interneuron transplantation is essential in prediction of outcome for a patient. I was able to noninvasively measure the levels of the altered neurotransmitters, GABA and glutamate, and a neuronal marker, N-acetyl aspartate, and other brain metabolites. I was able to identify what alterations that were reversed back towards healthy levels, which makes them biomarkers of response to neural cell therapy. When working with neurodegenerative diseases it is crucial to understand that the noninvasive nature of MRS makes it possible to perform repeated measurements and monitor dynamics of changes of identified biomarkers and as a result to predict outcome. These findings are not only a base for the ongoing clinical trial, but also for future studies in precision medicine for other neurodegenerative diseases. This project gives me hope that in the upcoming years there will be less people who must live with recurrent uncontrollable drug-resistant seizures.

"For the past two years, I'm particularly proud to have been working on the identification of biomarkers for a new kind of treatment for epilepsy, which is called neural cell therapy."



Cytoskeleton in neurons differentiating from induced pluripotent stem cells. (Image source: Torsten Wittmann, PhD)



Richard Souza, PhD (above left)

Partial List of Active Grants

Valerie Block, PT, DPTSc

Moving MS bladder dysfunction into the 21st Century: developing novel and accessible ways to treat, predict and prevent dysfunction in the home, funded by the Marilyn Hilton MS Research Fund

Myriam Chaumeil, PhD

- MR Metabolic Imaging of Multiple Sclerosis, funded by National Institute of Neurological Disorders and Stroke
- Application of Hyperpolarized 13C Magnetic Resonance Imaging to Detect Target Inhibition of NF-kB Activation and Response in Primary CNS Lymphoma, *funded by National* Cancer Institute
- Imaging innate and adaptive immune response in MS using [18F]F-AraG PET and hyperpolarized 13C MRSI, funded by National Institute of Allergy and Infectious Diseases
- Development and validation of novel models for cerebral small vessel disease and vascular cognitive impairment, funded by National Institute of Neurological Disorders and Stroke

- Mechanisms of Functional Vascular Impairment In Genetic Models of Cerebral Small Vessel Disease, funded by National Institute of Neurological Disorders and Stroke
- MR metabolic Imaging of Multiple Sclerosis, funded by National Institute of Neurological Disorders and Stroke
- Understanding and probing disrupted glucose metabolism in Alzheimer's disease, funded by National Institute on Aging

Caroline M. Guglielmetti, PhD

Real time imaging of immune cells and glutamate dynamics by PET and metabolic MRI, *funded by National Institute of Allergy and Infectious Diseases*

Lydia M. Le Page, PhD

 Cerebral imaging of ketone metabolism in Alzheimer's disease, funded by the Alzheimer's Association

Sam Pak, MS, DPT

 Digital care program for chronic shoulder tendinopathy, funded by Sword Health, Inc.

Monika Patel, PT, DPT

 UCSF Neurologic Physical Therapy Residency Program, funded by the BrightFocus Foundation

Richard Souza, PhD

- Mentoring Biomechanics Research in Osteoarthritis, funded by National Institute of Arthritis and Musculoskeletal and Skin Diseases
- Simultaneous Imaging of Tissue Biochemistry and Metabolism associated with Biomechanics in Patella Femoral Joint Osteoarthritis, funded by National Institute of Arthritis and Musculoskeletal and Skin Diseases
- Structural, Biochemical and Functional Connectivity in Osteoarthritis using Quantitative Magnetic Resonance Imaging and Skeletal Biomechanics, funded by National Institute of Arthritis and Musculoskeletal and Skin Diseases

Introducing New Faculty Member Valerie Block

Valerie Block, PT, DPTSc, is harnessing cutting-edge technology to better understand and respond



to neurologic disease progression. Drawing on nearly a decade as a clinical physical therapist (PT) for patients who have MS, her foundational research established the viability of longitudinal, continuous remote activity monitoring

using wearable monitors. Building on this work with a fellowship from the NMSS (National Multiple Sclerosis Society) and in partnership with industry, Dr. Block's research has continued to use technology, including wearable devices, advanced MRI metrics and telemedicine to both further demonstrate the feasibility of gathering and interpreting these patient outcomes and to monitor the response of patients to emerging treatments. Going forward, her research efforts will focus on a functional domain in MS that is frequently affected but understudied - the impacts of MS on bladder function.

Her Career Transition Fellowship support from the NMSS will help develop neurotechnology-enabled tools and interventions to track and explore the natural history of progressive MS and test the efficacy of both medical and therapeutic interventions. By eliminating the traditional reliance on sporadic clinical assessments for patients and research subjects, her work has the potential to dramatically improve the pace and reliability of research into both the natural progression of neurological disability as well as effective responses.

Farewells

Harvey Brockman, PT, DPT, has been with UCSF for over five years and



has served as an amazing clinician, mentor and co-worker. He has gone above and beyond for his students by supporting the development of our pro bono community clinic and providing excellent mentorship in the orthopedic residency program. While we are sad to see Dr. Brockman move on, we know he will continue to make a meaningful impact in his new position at UCLA.

EJ Gann, PT, DPT, will be joining faculty of University of Colorado School



of Medicine as Senior Instructor in the Department of Physical Medicine and Rehabilitation. Dr. Gann is a graduate of the UCSF/SFSU DPT program, Class of 2018, and joined our faculty in 2019 after completing the Kaiser Permanente Neurologic Physical Therapy Residency program. While at UCSF, Dr. Gann provided exemplary care to persons with neurologic diagnosis at

our Mount Zion clinic, and his research endeavors included investigating the preliminary efficacy of a novel functional electrical stimulation device to improve walking function for people with multiple sclerosis and assessing the clinical efficacy of virtual reality vestibular physical therapy. Given the tremendous start to his career, we can't wait to see what he does next and look forward to seeing him at the next APTA conference.

Susanna Rosi, PhD, has been an integral part of the physical therapy



faculty for over 16 years and has made amazing breakthroughs in neuroscience during her tenure. While we are sad to see Dr. Rosi move to her new position at Altos Labs, a biotechnology company focused on cellular rejuvenation programming to restore cell health and resilience, we are thrilled she is staying with us to help train our future PhD scientists. We wish Dr. Rosi the best

of luck in this new chapter in her career!

Linda Wanek, PT, PhD, and former chair of the Physical Therapy



department at San Francisco State University, is retiring. Dr. Wanek joined the program in 1993 and was chair at SFSU from 2002 until 2020. She co-led SFSU's Physical Therapy program through a period of remarkable growth as it evolved from a Master's degree to a Doctor in Physical Therapy degree program. She has had a hand in shaping and mentoring countless students, clinicians

and faculty, many of whom have taken leadership roles in the community and the PT profession. Dr. Wanek was a cornerstone of the orthopedic content within the PT program, and her knowledge of the subject and patient-centered values have consistently been held in high regard; she received the Sarlo Excellence in Teaching Award at SFSU in 2009, one of a handful of distinguished faculty to receive this recognition.

Alumni and Donor Support

Irene Gilbert Scholar: DPT Student Cesar Toral

Q: Why did you decide to become a physical therapist?

A: My passion for physical therapy began in my first year of high school. I was introduced to the profession as a patient of physical therapy after having an operation to correct pectus excavatum. This time of my life was difficult, both physically and mentally. However, with the help of physical therapy, I got back on my feet and gained resilience. Since that experience, I knew I wanted to pursue a career in physical therapy. My passion in physical therapy comes from seeing individuals bounce back from setbacks and take charge of their health.

Q: What challenges have you had to overcome to get to this point?

A: There have been many challenges I had to overcome along the way, such as taking challenging courses and applying to DPT programs during the COVID-19 pandemic. However, the main challenge that is unique to my story must be the surgery I underwent in my high school years. Deciding to have the surgery was a difficult decision because it meant starting my freshman year of high school from home and sacrificing my opportunity to play soccer. The experience came with many physical, mental and social challenges, which after overcoming made me the person I am today.

Q: What have been your impressions of the DPT program so far?

A: The UCSF/SFSU DPT program has been a great graduate program to be a part of. I have enjoyed the blend of courses in orthopedics, acute care, neuro, as well as in research. In each course, the program has focused on

teaching us concepts that are supported in the literature and having experts in each subject present the material. The program has focused our practice of patient care using the International Classification of Functioning, Disability and Health framework, which has improved my ability to practice providing patientcentered care. Most of all, I am grateful for my wonderful classmates and the staff who have helped me tremendously. I look forward to continue gaining knowledge and taking advantage of experiences included in the program's curriculum.

Q: Why did you choose UCSF? What does UCSF represent to you?

A: I chose to continue my education at UCSF because this is where my journey with physical therapy began. I received the operation and rehabilitation that changed my life here at UCSF. It has felt like my journey is coming full circle. Additionally, coming from a Hispanic background, I knew I would feel comfortable at UCSF with its rich diversity of cultures. UCSF is a renowned hospital and university known for its professional leaders in health care, innovative research and academics, public service and patient care. I feel very fortunate and a sense of responsibility as a student at UCSF to uphold professional and inclusive conduct.

Q: A lot of people, including Irene Gilbert, have had to fight to build up the PT program at UCSF. Could you tell me what it means to you to be part of that legacy?

A: I feel honored to be part of the legacy started by Irene Gilbert and others throughout the history of the PT program at UCSF. Learning the history of the PT program and all those who contributed to building the program to what it is today was very humbling to learn. The program has come a long way, starting as a one-year program with limited campus space for staff and students to becoming a top three-year doctoral program in the country at multiple campuses between UCSF and SFSU. I feel a sense of responsibility to stay connected to UCSF and the DPT



"I received the operation and rehabilitation that changed my life here at UCSF." – Cesar Toral

program throughout my professional career to continue improving the program for the next generation of students.

Q: What role do you think PTs should play in terms of advocacy and social justice work?

A: PTs play a unique and significant role in advocacy and social justice work. PTs are part of an interdisciplinary team and should make an effort to collaborate and communicate with other health care providers to approach a patient's care holistically. In some settings, PTs may be the first line of treatment for patients and have the opportunity to provide the care or resources patients need. PTs should advocate for their patients' individual needs, especially when it comes to appropriate assistive devices, appropriate discharge settings, transportation services and equitable access to care. In various settings, PTs work closely with case managers and social workers and can provide patients with appropriate resources to aid with patients' personal and environmental barriers to health. Instead of feeling the need to start from scratch, PTs can involve themselves in established organizations in their surrounding area that work towards improving diversity, equity and inclusion, improving patients' access to care and minimizing health disparities.

Q: What areas of PT are you particularly interested in? Do you have an idea of what you would like to do upon graduating?

A: Upon graduating from the DPT program, I hope to begin my professional practice at an outpatient orthopedic setting where I can gain experience working with various patient populations. I have always enjoyed sports and I have athletic training experience, so I plan to work towards becoming a Sports Clinical Specialist and a Certified Strength and Conditioning Specialist. Eventually, I hope to train and provide pre- and post-rehabilitative care to the athletic population. In my undergraduate years, I gained experience training patients with neurodegenerative disorders at an adaptive fitness clinic, and I have previously worked with the Amyotrophic Lateral Sclerosis (ALS) Association, so I hope to continue being involved with these patient populations whether it be clinically or through volunteer work.

Q: How does it feel to be selected for this scholarship?

A: I am very grateful to have received the Irene Gilbert scholarship. Receiving the scholarship provided me with a whole new sense of motivation by feeling supported and like all my hard work has been worthwhile. I owe this accomplishment to all those who have supported me along the way. I would not be where I stand today if it wasn't for the work of Irene Gilbert, contributions from Michael Go and others, the UCSF/SFSU DPT program staff, my classmates and my family. The scholarship has given me the desire to one day be able to return the favor and aid students with their education goals. ■

Student Debt Drops 12%

Thanks to the generous support of donors and an ongoing commitment from the UCSF financial aid office, students in the DPT program saw a 12% reduction in student debt in 2022.

This is an incredible decrease, and we are thankful for UCSF contributions from generous alumni donors. We will continue to focus our attention on lowering student debt as much as possible. Thank you to all who have contributed funds to our program to help with student debt!

Thank you

to the generous support of our scholarship funders

Irene Gilbert Endowed Scholarship

The Irene Gilbert Scholarship was established by alumnus Michael P. Go, Class of 1974, in honor of Dr. Irene Gilbert, former Physical Therapy Program Director. Dr. Gilbert's leadership instilled in faculty and students a strong sense of ethics and responsibility to patients, colleagues and the community – values that Michael embodied throughout his long career. The scholarship supports students with passion for a career in physical therapy, a record of success in initial coursework, and an exceptional commitment to ethics and professionalism.

Academic Year 2021-22 Awardee: Cesar Toral

Alumni Leaders in Physical Therapy Scholarship

The Alumni Leaders in Physical Therapy Scholarship was established to support students who have demonstrated academic excellence and who show promise of leadership and potential to serve the profession of physical therapy.

Academic Year 2021-22 Awardee: Salma Hassan

JoAnn Baldwin Peters Memorial Scholarship

The JoAnn Baldwin Peters Memorial Scholarship was established to support students enrolled in the UCSF/SFSU Graduate Program in Physical Therapy who demonstrate promise of leadership and potential to serve the profession of physical therapy.

Academic Year 2021-22 Awardees: Amie Chien, Mikayla Fender-Badgley, Alex Hansen

Kean Award

Recipients of the Kean Scholarship are selected by faculty based on a range of criteria, including academic performance, financial need, participation in the academic program, contributions to the physical therapy profession and the potential to be an exceptional colleague.

Academic Year 2021-22 Awardees: Lam Bui, Salma Hassan, Lillie Mansfield, Nadia Marangao de Melo, Tania Rojas-Gonzalez, Alejandra Roque

Keller Family Scholarship

The Keller Family Scholarship was established by the parents of Danny Keller, PT, DPT, OCS, a graduate of the program and a current faculty member. The scholarship aims to support students enrolled in the UCSF/SFSU Graduate Program in Physical Therapy. Recipients are selected for this award based on their passion for a career in physical therapy, a record of success in clinical rotations and exceptional "bedside manner."

Academic Year 2021-22 Awardees: Emily Applewhite, Madeline Cowan, Juliana (Jules) Evans-Anfom, Ashley Omwanghe. ■



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Thank you for all you do for the profession and in support of UCSF.





Department of Physical Therapy and Rehabilitation Science

Year in Review 2022

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Take a Two-Minute Alumni Survey



We are conducting a survey of UCSF PT alumni to assess outcomes in our field and to gather your thoughtful questions and insights to share with current and prospective students.

Complete the two-minute PT alumni survey at tiny.ucsf.edu/PTAlumni



