Medication Outcomes Center

UCSF Department of Clinical Pharmacy
School of Pharmacy

Medication Outcomes Center Annual Report

July 2020 - June 2021

Informing Evidence-Based Decision-Making: Supporting UCSF Health's Response to the COVID-19 Pandemic

Contents

Message from the Director

Founded in 2007, the Medication Outcomes Center (MOC) is a Center of Excellence in formulary management, value and quality improvement, health economics and outcomes evaluations, and innovative learning and training.

Over the course of the last year, the MOC's work in support of UCSF Health's True North Goals became even more important as UCSF and its partners worked to address the impact the global pandemic had in our communities across campus and the city of San Francisco. The MOC's faculty and staff supported critical COVID-19-related endeavors throughout UCSF in support of vaccine roll-out and conducted a study to better understand treatment patterns among patients with COVID-19.

In addition to COVID-19-related work, the MOC continued its efforts on value improvement to enhance quality of care while avoiding inefficiencies in the allocation of pharmacy resources. Several initiatives were launched this year including biosimilar substitutions that provide the same level of effectiveness and safety at a significantly lower cost, introducing decision-support tools for providers to facilitate cost-effective prescribing practices, and introducing standardized dosing to reduce waste and the potential for medication errors.

While a challenging year for the UC community, the MOC faculty leveraged technology to continue their support to students and residents. Several student and resident projects were presented at the virtual Clinical Pharmacy Spring Research Seminar and our faculty continued to be recognized for their outstanding teaching and precepting contributions to the pharmacy curriculum, learners' experiential rotations, and mentorships.

As we look forward to the next year, we are eager to welcome back our learners and continue supporting innovative and impactful initiatives in support of UCSF Health's True North Goals. Our wonderful team and network of collaborators across the UC community have paved the path to our progress and success and I personally thank you all for your continued support to the MOC.

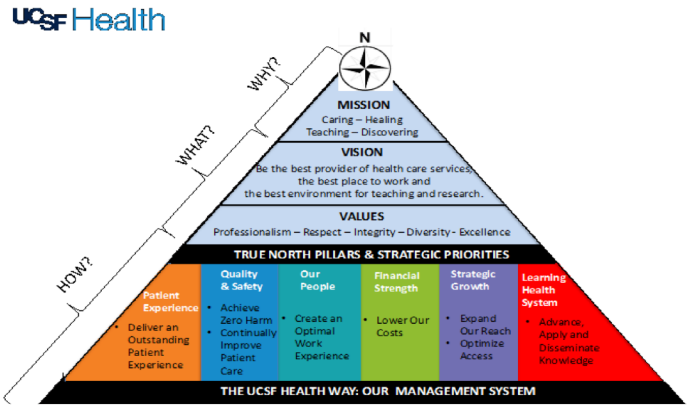
Thank you very much to the MOC family for your continued dedication to our learners and valuable contributions to the UC community.

Sincerely,

Rosa Rodríguez-Monguió, PhD, MS
Professor and Director, Medication Outcomes Center
Department of Clinical Pharmacy
UCSF School of Pharmacy

Executive Summary

The MOC's 2020-2021 annual report highlights a year in which the MOC led major initiatives to inform best practices in drug prescribing, utilization, and outcomes evaluation, and to reduce pharmaceutical expenditures while improving operational efficiencies in drug use management. This effort was even more critical as UCSF Health and the UC system grappled with the unprecedented challenges of a global pandemic.



Source:

https://meded.ucsf.edu/sites/meded.ucsf.edu/files/inline-files/UCSF%20True%20North%20pyramid.pdf

Within the context of these challenging times and circumstances, supporting UCSF Health's True North Goals remained a priority for the MOC. The MOC's formulary management efforts supported the pillar of **Q*uality and Safety*** as part of the UCSF Health Pharmacy & Therapeutics (P&T) Committee work. The MOC supported the Committee's efforts to provide high-quality care to our patients and at the systemwide level by producing drug monographs and medication utilization evaluations (MUEs) to help guide decision-making regarding drug formularies.

This year, the MOC contributions toward the pillar of ***Strategic Growth*** included work on optimizing access to pharmaceuticals through its support of UCSF's COVID-19 response. The MOC faculty led the process of reviewing and documenting the safety and efficacy of the Pfizer-BioNTech, Moderna, and Johnson & Johnson (Janssen) vaccines. This helped obtain the approvals needed by the P&T Committee and Executive Medical Board for addition to UCSF's formulary. In addition, our faculty provided training and recommendations to clinical workflows to prepare for vaccine rollout. Additional work under this pillar included conducting an MUE to identify patterns of drug use among hospitalized patients with COVID-19 to inform pharmaceuticals treatment.

The MOC also continues to support the True North Goals pillar of ***Financial Strength*** through several value improvement projects. This year, the MOC focused on drug expenditure reduction strategies while ensuring continued high level of quality care. Initiatives included expanding drug dose rounding to reduce waste and the risk for medication errors as well as developing tools and guidance for providers to support the drug prescribing processes.

In support of the ***Learning Health System*** pillar, several MOC-led studies were disseminated through peer-reviewed journals and the virtual Department of Clinical Pharmacy Spring Research Seminar. Journal articles looked at the incidence and predictors of shortages of opioid analgesics in the US, the impact of new guidelines on intravenous antibiotic use, and a pilot study to integrate pharmacy practice experience and research, and revised recommendations for critical care pharmacy practice. Our students and residents presented work they conducted in collaboration with their MOC preceptors at the Department's Spring Research Seminar. Studies related to injectable calcitonin, optimized deliriogenic medication use, and the role of hospital admission medication reconciliation in high-risk patients to reduce prolonged use of opioids, a predictors analysis of opioid-use related postoperative complication in older adults were presented.

MOC faculty embraced new technologies and approaches to ensure enriched engagement with our learners. Our faculty's dedication to our UCSF learners was highlighted by the awarding of the prestigious School of Pharmacy Dean Apple Awards for excellence in teaching to several faculty members. Dr. Rosa Rodríguez-Monguió was also awarded the School of Pharmacy's Apple Award for Excellence in Precepting.

For information about the MOC, visit *https://medicationoutcomescenter.ucsf.edu/home*

Our Vision & Mission

Established in 2007, the Medication Outcomes Center (MOC) is a Center of Excellence in formulary management, value and quality improvement, health economics and outcomes evaluations, and innovative learning and training.

The MOC's **mission** is to conduct state-of-the-art, evidence-based, medication-related research to inform decision-making, improve health and reduce health disparities.

Our **vision** is to be a premier Center for medication safety, economic evaluation and outcomes research, and dissemination.

The MOC is an independent research unit within the Department of Clinical Pharmacy at UCSF's School of Pharmacy (SOP). Its current focus is on supporting UCSF Health and more broadly, applying its clinical expertise and scientific knowledge, across the UC System. This year's pandemic highlighted the importance of the MOC's contributions, as MOC faculty and staff continued their ongoing activities while successfully contributing to emerging training and information needs in support of UCSF Health's response to COVID-19.

Major Initiatives

In support of UCSF Health's True North Goals, our work in formulary management focuses on providing high-quality care while our value improvement and economic and outcome evaluation research generate a body of knowledge to inform clinical practice and enhance patient care. Our work in supporting formulary decision-making and leading value improvement initiatives to reduce waste and maintain high levels of quality care is important now more than ever.

Formulary Management

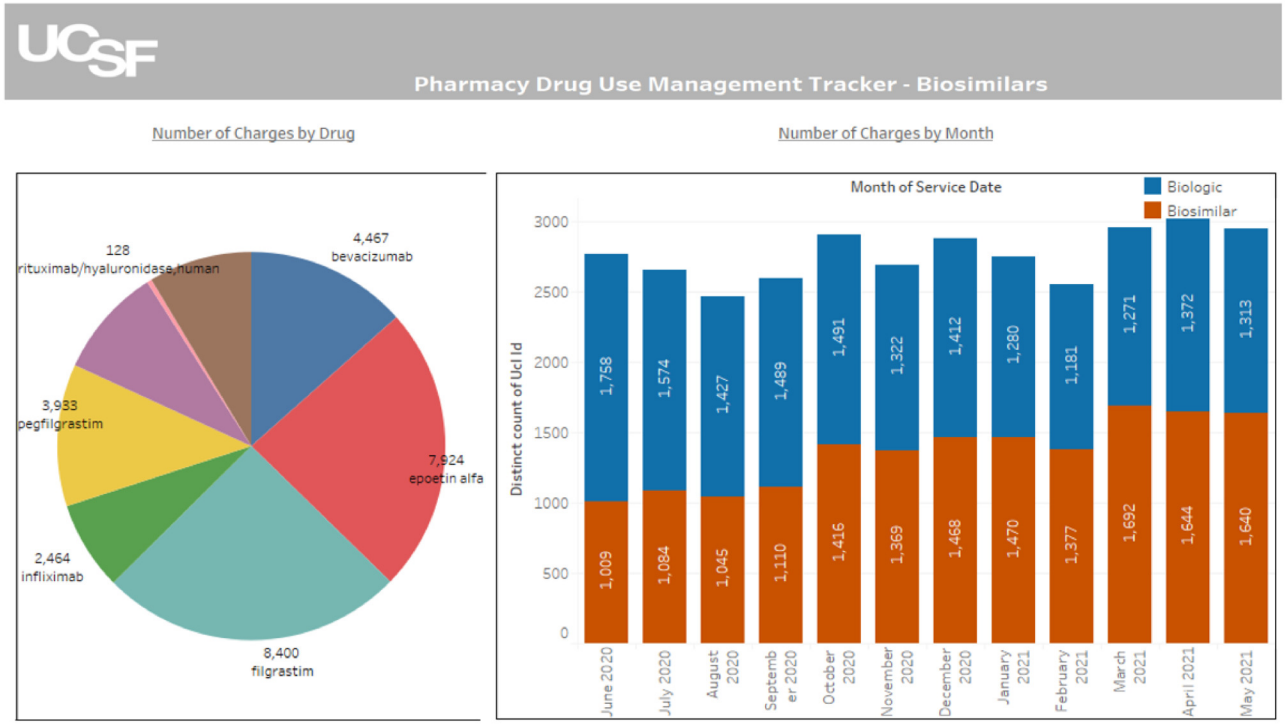
UCSF Health saw some exciting changes with the new leadership team in the Department of Pharmaceutical Services this year. Dr. Desi Kotis joined UCSF Health as its new Chief Pharmacy Executive and joined the UCSF School of Pharmacy as an Associate Dean and faculty member. Dr. Kenny Scott joined UCSF Health as its new Chief Pharmacy Officer, bringing more than 35 years of experience in pharmacy leadership and innovation. The recruitment of these two seasoned professionals is vital in promoting value-based care and highlights the important contribution of pharmacy professionals to patient care. The collaborative work of the MOC and the Department of Pharmaceutical reflect our true partnership.

Dr. Desi Kotis, Chief Pharmacy Executive

"It is truly a privilege to have a collaborative team lead by Rosa. The MOC is an engine that not only turns out pharmacoeconomic research but keeps our Pharmacy and Therapeutics Committee running at UCSF Health. We have saved over 6 million dollars this fiscal year with efficient and effective drug use mainly through biosimilar adoption. We will continue to drive efficiency without compromising quality of care and, of course, patient safety. It goes without saying that our pharmacy students and post-graduate trainees are also engaged in work at the MOC. This is priceless experience for next steps into the real world of health system pharmacy."

In their efforts to provide high-quality care at lower costs, both within UCSF and at the systemwide level, UC Health has been increasingly supporting the use of ***biosimilars*** while continuously monitoring and documenting their safety and efficacy. In this fiscal year alone the increased use of biosimilars has saved UCSF 6 million dollars and UC Health 12 million dollars. The UCSF Health P&T Committee focused efforts this year on healthcare value and prioritizing the use of biosimilars to ensure safety and effectiveness while reducing unnecessary expenses on costly biologics. Dr. Candy Tsourounis and Dr. Shalini Lynch supported these efforts by overseeing the production of monographs and MUEs to help guide decision making. As a result, the P&T Committee supported the adoption of rituximab, infliximab, pegfilgrastim, and filgrastim biosimilars among several others. They will closely monitor for additional opportunities for adoption of other biosimilars in the future.

Figure 1: UCSF's biosimilar tracker used to monitor biosimilar use and costs



Dr. Candy Tsourounis continued her leadership role and served as chair of an American Society of Health-System Pharmacists (ASHP) steering committee that was established to develop an online ***Formulary Management Resource Center*** to help pharmacists, pharmacy learners, and others with medication formulary management. The Formulary Management Resource Center serves as a repository for tools to help guide users through the entire formulary lifecycle. The Resource Center was updated to include guidance on the use of electronic health records and how to conduct MUEs. The information contained within this online tool applies to all health systems, regardless of size, making this a valuable resource. For more information on the Formulary Management Resource Center, visit https://www.formularytoolkit.org/.

Supporting the COVID-19 response through our formulary management activities

Dr. Candy Tsourounis led the process of reviewing and documenting the safety and efficacy of the Pfizer-BioNTech, Moderna, and Johnson & Johnson (Janssen) vaccines to obtain the UCSF's P&T Committee and Executive Medical Board approvals required for these vaccines to be added to UCSF's formulary. Dr. Tsourounis also provided an overview of the three approved COVID-19 vaccines during a UCSF Town Hall where over 2,500 people attended.

Dr. Trang Trinh helped develop and provided a live, just-in-time training for pharmacy students and pharmacists who volunteered to help administer COVID-19 vaccines. Dr. Trinh also collaborated with UCSF Health Pharmacy Enterprise leadership to better understand clinic workflows, including key steps for preparing, labelling, and administering vaccines to assure their integrity throughput the distribution process. More than 200 people attended the just-in-time training while more than 400 views of the recording took place after the event.

UCSF staff receives the COVID-19 vaccine

Source: UCSF

Value Improvement

Dose rounding is a strategy that helps reduce waste and the potential for medication errors. This year, UCSF Health introduced dose rounding for selected medications, changing rounding thresholds from 5% to 10% and introducing standardized doses for key medications. For high-cost and high-volume drugs, the reduction in expenditures resulting from the introduction of dose rounding can be significant. Between July 2020 and June 2021, Dr. Candy Tsourounis and Dr. Kendall Gross supported efforts to monitor drug use and develop decision-support tools that facilitated dose rounding. This resulted in a decreased waste and reduced expenditure of over $321,000 across both pediatric and adult patients. These reductions in waste and expenditures will be even greater as dose rounding is introduced for 20 additional medications.

Sugammadex is an increasingly used medication among surgical patients given it can quickly reverse the effects of anesthetics, but its cost has been increasing over the last few years. At the same time, therapeutic alternatives like ***neostigmine*** are equally effective in select surgical procedures, and its cost has been

decreasing. Dr. Candy Tsourounis and Dr. Kendall Gross worked closely with providers to develop a more detailed clinical guideline outlining when each drug should be used. This work led to an estimated reduction in annual drug spend of more than $500,000.

Dr. Kendall Gross, Shanthi Noriega Minichiello, and several departments at UCSF Health's adult and pediatric hospitals collaborated to continue efforts to reduce unnecessary use of ***IV acetaminophen***. Identified as a UC-wide collaboration, efforts at UCSF focused on maintaining gains observed at Benioff Children's Hospital, West Bay. The Learning Health System Team is working with the MOC to review data to determine the impact related to each of the different interventions implemented to drive down use and waste among pediatric patients. Lessons learned will help identify the most effective strategies and could be used by other UC Health systems in their efforts to reduce unnecessary use of IV acetaminophen. On the adult side, interventions this year focused on introducing one-time ordering restrictions to avoid prolonged drug use. After two years of effort, this area of work will be concluded, providing a legacy of tools to help providers make informed decisions and evidence demonstrating the most effective strategies to reduce unnecessary use of IV acetaminophen. It is estimated that this work has resulted in a reduction in expenditures of greater than $475,000 to the Medical Center this fiscal year.

Several MUEs were overseen by Dr. Shalini Lynch and Dr. Candy Tsourounis, who worked with students and residents to evaluate drug use and outcomes. An MUE that included a clinical record review of postmenopausal women receiving ***injectable calcitonin*** to treat osteoporosis showed significant variance in the way the drug was ordered, used, and monitored. To standardize procedures and reduce waste, Drs. Lynch and Tsourounis worked with PharmD students, Esther Moon and Madeena Siddiqui, to develop tools based on existing guidelines to streamline the ordering process. An MUE on ***thrombin*** was undertaken by residents Dr. Pablo Lapetina and Dr. Heather Wittkorn and evaluated the administration of key products in the perioperative area providing new insights into the use, administration, and documentation of thrombin products. Findings were shared widely among stakeholders, including the operating room, nursing, and APeX teams. A third MUE on ***sodium zirconium cyclosilicate*** was led by residents, Dr. Eugene Burbige and Dr. Jonathan Nguyen, and showed cost savings related to the use of sodium polystyrene sulfonate and patiromer. Unlike sodium polystyrene sulfonate, sodium zirconium cyclosilicate has no use contraindications and fewer warnings and precautions than patiromer. Study findings informed P&T decision making on adding the conversion to sodium zirconium cyclosilicate.

Generating evidence to inform COVID-19 responses

Led by Dr. Trang Trinh, an MUE was conducted to identify patterns of drug use among UCSF Medical Center patients hospitalized with COVID-19. These patterns reflected real-world practices and the evolving knowledge around the management and treatment of COVID-19, where the MUE showed how certain drug classes were used more or less frequently based on the available evidence. The information generated was useful for identifying areas for treatment improvement and a similar analysis may be beneficial to other medical centers.

Dr. Trinh was requested by UCSF Health leadership to support an analysis on the efforts at the San Francisco City College vaccination site. Dr. Trinh's analysis helped better understand uptake of COVID-19 vaccines by different demographic groups.

The Society of Infectious Diseases Pharmacists identified Dr. Trinh to create an educational video on interferon therapy for COVID-19 treatment. This video has been viewed more than 1,500 times on YouTube and can be accessed at: https://www.youtube.com/watch?v=xVXzLdSRn5k.

Health Economics & Outcomes Evaluation

Section 4118.5 of the California Law Business and Professions Code enacted in 2019 deemed pharmacists the responsibility for performing ***medication reconciliation*** for high-risk patients admitted to hospitals with more than 100 beds during the hospital pharmacy's hours of operation. Dr. Rodríguez-Monguió, in collaboration with senior pharmacists at the Medical Center and PharmD students, assessed the feasibility and clinical significance of conducting medication reconciliation in surgical patients who had ***extended-release/long-acting (ER/LA) opioids*** on their medication list prior to admission. Using a retrospective observational quasi-experimental study design among adult (≥18 years) non-cancer surgical patients with LA/ER opioids at hospital admission, the team assessed differences in the perioperative use of opioid analgesics in patients who underwent medication reconciliation upon hospital admission compared to patients who did not and identified predictors of opioid administration. They found that medication reconciliation upon hospital admission significantly reduced unnecessary exposure to opioids in hospitalized surgical patients without adversely impacting postoperative pain control.

Source: UCSF

Older adult patients are at increased risk of developing postoperative complications including ***opioid-related postoperative ileus*** (POI). As in prior studies, with the overarching goal of identifying opportunities to reduce unnecessary exposure to opioids and opioid-related adverse events in mind, Dr. Rodríguez-Monguió led a study, in collaboration with pharmacists at the Medical Center and PharmD students, on the incidence and predictors of POI in opioid naïve, non-cancer patients, aged 65 and older who underwent elective surgery. In the study period, 3.0% of patients had documented POI. Patients who developed POI received a significantly greater number of opioids per day of hospitalization compared to patients who did not develop POI. Yet, there were no significant differences in the patient's self-reported postoperative pain scores. The daily opioid administration was a statistically significant predictor for the risk of developing POI.

Education & Mentorship

Supporting learners has been a cornerstone of the MOC's work in contributing to the next generation of pharmacy leaders. In addition to supporting student and resident research and projects, the MOC's ***Medication Use and Outcomes learning experience*** provides hands-on experience to pharmacy residents in formulary management and medication use evaluations (MUEs). Students and residents are provided the opportunity to research therapies under consideration by UCSF Health's P&T Committee and to present their findings to help inform clinical decision-making. MUEs provide more depth and understanding to the P&T Committee regarding the therapeutic outcomes and economic implications of provision of inpatient pharmaceuticals. This year the MOC was honored to work with more than a dozen PGY-1 pharmacy residents who contributed remotely to monographs and MUEs.

Mandy Morris, Residency Program Director, UCSF School of Pharmacy

"The Medication Use & Outcomes rotation, led by the MOC team, is a core learning experience for all PGY1 Pharmacy residents. The exposure residents receive to the medication use process serves as a critical foundation for their professional development. Residents get hands on experience in evaluating medication use practices, interacting with key stakeholders, and providing decision support for formulary consideration. A highlight of the experience is getting to see in real-time the impact of their work within the pharmacy enterprise. The Medication Use & Outcomes rotation has helped to facilitate our mission of developing residents into the leaders of tomorrow."

The uniqueness of the past year allowed for novel ways to involve and interact with learners. One example included opportunities to involve students in the COVID-19 response and vaccine rollout. As vaccines became available, the MOC's Executive Director, Dr. Lisa Kroon, worked with the directors of the School of Pharmacy's experiential education programs to enable ***pharmacy students and residents to volunteer as staff for the COVID-19 vaccination campaign***. MOC faculty member Drs. Candy Tsourounis and Trang

Trinh also supported this effort and collaborated with departments across UCSF to develop the just-in-time training for over 200 pharmacy students and staff who served as volunteers at the COVID-19 vaccine clinic.

The challenges imposed by the global public health pandemic meant that new approaches were required to interact with learners. This provided an unparalleled opportunity to utilize online approaches including Zoom, Google Docs, Microsoft Teams, and other online platforms to maintain regularly scheduled communication and collaboration. Below, one of our PGY-1 residents shared how the MOC contributed to her learning, and how leveraging online technologies helped achieve learning objectives:

"The MUE experience provided us with a unique opportunity where we now have a stronger understanding of the pharmacist's roles in assessing medication safety, conducting pharmacoeconomic evaluations, and improving health outcomes. Dr. Lynch's dedication and excitement toward teaching contributed to the success of the learning experience. Dr. Lynch shared the peer review opportunity with me and dedicated the time to guide me through the process! This year's unique situation promoted the pivot from in-person communication to the use of distance platforms including Zoom and Teams. The weekly Zoom check-ins were not only effective for answering questions related to the projects, but they were also helpful in developing relationships between learners and preceptors."

– Tiffany Guan, PGY-1 Pharmacy Resident

Spotlight on Dr. Zhixin Lun, MOC Postdoctoral Scholar

"I joined the MOC as a postdoctoral scholar in the Fall of 2020 after receiving my PhD in applied mathematics. The MOC has given me a very supportive environment in which I have started to get involved in a variety of multidisciplinary research projects using large, complex electronic health records data. I have had many opportunities to learn and apply machine learning and advanced statistical methods in pharmaceutical economics and outcomes evaluation studies. Interactions with MOC faculty has broaden my horizons and led me to look at research questions in a new light. Overall, the experience at the MOC is sharpening my data analytics skills, boosts my confidence in solving big-data problems, and preparing me to pursue a career in biostatistics."

Disseminating our Work

Dr. Rosa Rodríguez-Monguió's opioid-related work on the incidence and predictors of shortages of opioid analgesics in the US during the period 2015–2019 was published in *PLoS ONE.*[1] In this publication, the research team assessed the incidence of shortages of opioid analgesics in the US in the period 2015–2019 and evaluated predictors of shortages of opioids using 8207 national drug codes (NDCs) for opioid analgesics approved by the FDA.

[1] Rodriguez-Monguio R, Naveed M, Seoane-Vazquez E (2021) Predictors of shortages of opioid analgesics in the US: Are the characteristics of the drug company the missing puzzle piece? PLoS ONE 16(3): e0249274.

Study findings provided evidence of a significantly greater risk of shortage of opioid analgesics in companies that experienced prior instances of shortages. In addition, the greater was the number of NDCs marketed by a company, the lower was the risk of shortages for that company. Authors suggested that the characteristics of the manufacturing company, rather than the number of companies, may be the missing piece to the complex puzzle of drug shortages in the US. These findings shed light on the debate regarding the role of market competition in the incidence of shortages of opioid analgesics.

Dr. Trang Trinh and colleagues published the results of their study looking at the impact of management guidelines on intravenous antibiotic use. This study, published in *Infection Control and Hospital Epidemiology*[2], demonstrated significant reductions in the use of two antibiotics, vancomycin and meropenem, after the introduction of new management guidelines for the treatment of fever accompanied by low neutrophil granulocytes (febrile neutropenia). The appropriate management and use of antibiotics are critical to prevent antimicrobial resistance, and study results demonstrated how revised guidelines around stewardship can reduce antibiotic use without adverse health outcomes.

In her work supporting learners, Dr. Gross and colleagues published a case study describing a new approach to integrating introductory pharmacy practice experience (IPPE) students and research. In this work, published in *JACCP*'s *Advances in Clinical Pharmacy Education and Training* theme issue*,* authors showcased the success of including pharmacy students in resident-led research studies. Student pharmacists were an integral part of the research, supporting patient screening, enrollment, and data collection. The case study demonstrated how these approaches enhance resident research skills while being mutually beneficial to students and residents[3].

Drs. Rodriguez Monguio and Tsourounis along with their UCSF Health colleagues published a study evaluating the effects of liposomal bupivacaine on the length of stay and opioid use in patients undergoing radical cystectomy. The study was a single-center, retrospective cohort study among patients undergoing open radical cystectomy with urinary diversion between 2015 -2019 as part of the early recovery after surgery pathway. The study found that liposomal bupivacaine in open radical cystectomy was associated with reduced length of stay, less opioid exposure, and earlier diet advancement than in patients that did not receive liposomal bupivacaine[4].

Dr. Tsourounis and colleagues published their work related to the online marketing of ephedra weight loss supplements. The study focused on the labeling and marketing compliance of these products sold online to US consumers. This cross-sectional study assessed websites selling ephedra-like supplements using the

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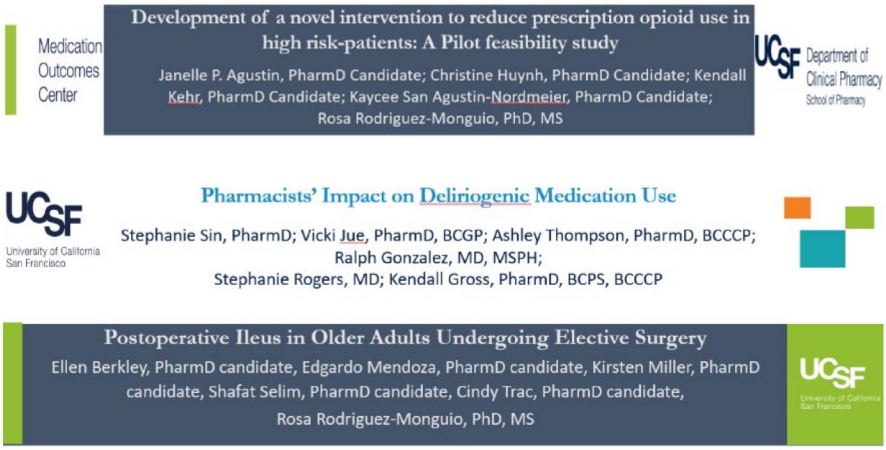
[2] Trinh TD, Strnad L, Damon L, Dzundza JH, Graff LR, Griffith LM, Hilts-Horeczko A, Olin R, Shenoy S, DeVoe C, Wang L, Rodriguez-Monguio R, Gu TM, Hampton SR, Macapinlac BAC, Yang K, Doernberg SB. Reductions in vancomycin and meropenem following the implementation of a febrile neutropenia management algorithm in hospitalized adults: An interrupted time series analysis. Infect Control Hosp Epidemiol. 2021 Jan 25; 1-8.

[3] Rashidi S, Shieh J, Agustin J, Gross K, Thompson A, Li F, Staub E. Expanding pharmacy resident research capacity through integration of introductory pharmacy practice experience students into a prospective research study: A novel application of the layered learning practice model. J Am Coll Clin Pharm. 2020 Nov; 4(3): 318-324.

[4] Chu CE, Law L, Zuniga K, Lin TK, Tsourounis C, Rodriguez-Monguio R, Lazar A, Washington SL 3rd, Cooperberg MR, Greene KL, Carroll PR, Pruthi RS, Meng MV, Chen LL, Porten SP. Liposomal Bupivacaine Decreases Postoperative Length of Stay and Opioid Use in Patients Undergoing Radical Cystectomy. Urology. 2021 Mar;149:168-173. doi: 10.1016/j.urology.2020.11.036. Epub 2020 Dec 3.

search term "buy ephedra." The study found that nearly 20% of websites sold weight loss products that potentially violated the 2004 ban on ephedra alkaloids. Ephedrine, unidentified *Ephedra* sp. not formulated as an extract, and *Ma Huang* were labeled as present in 11% of products evaluated. Incomplete reporting of adverse effects and drug interactions was common[5].

The Society of Critical Care Medicine, American College of Clinical Pharmacy Critical Care Practice and Research Network, and the American Society of Health-Systems Pharmacists convened a joint task force of 15 pharmacists representing a broad cross-section of critical care pharmacy practice and pharmacy administration. Dr. Kendall Gross was among the 15 pharmacists selected to participate in developing a multiorganizational statement updating recommendations for critical care pharmacy practice. The task force published their revised statement in *Critical Care Medicine* and outlined 82 recommendations, 21 of which addressed the role of the critical care pharmacists in patient and medication safety, clinical quality programs, and analytics[6].



Source: Selection of MOC students and resident presentations at the Department of Clinical Pharmacy's Spring Research Seminar.

The 2021 Department of Clinical Pharmacy's Spring Research Seminar was a blast! MOC students and residents participated in several projects under our faculty and staff mentorship.

PGY1 resident Stephanie Sin worked with Dr. Kendall Gross and presented her work on how pharmacy-led interventions can optimize ***deliriogenic medication use*** in patients suffering from delirium.

PharmD students and preceptor Dr. Rosa Rodríguez-Monguió presented their ***opioid-related research studies*** on the clinical significance of medication reconciliation to reduce the risk of prolonged use of prescription opioids after surgery in high-risk patients and opioid use related postoperative complications.

Drew Dickinson, Alexandra (Ally) Diiorio, and Yalda Sanaiha, under the mentorship of Dr. Trang Trinh, presented their pharmacy student research at the American College of Clinical Pharmacy's Annual Meeting in October 2020. Drew conducted a systematic review of ***antibiotic prescribing patterns at hospital discharge***. Ally and Yalda conducted an evaluation of students' perceptions of ***vancomycin pharmacokinetics*** in two pharmacy curricula.

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[5] Lai S, Yu C, Dennehy CE, Tsourounis C, Lee KP. Online Marketing of Ephedra Weight Loss Supplements: Labeling and Marketing Compliance with the U.S. Food and Drug Administration Ban on Ephedra. J Altern Complement Med. 2021 May 12. doi: 10.1089/acm.2021.0016. Online ahead of print.

[6] Lat I, Paciullo C, Daley MJ, MacLaren R, Bolesta S, McCann J, Stollings JL, Gross K, Foos SA, Roberts RJ, Acquisto NM, Taylor S, Bentley M, Jacobi J, Meyer TA. Position Paper on Critical Care Pharmacy Services: 2020 Update. Crit Care Med. 2020 Sep;48(9): e813-e834.

Achievements & Recognition

Extramural funding

Our work to generate evidence in support of policy reform at the national level continued to gain momentum throughout the year.

Dr. Rosa Rodríguez-Monguió was awarded a grant by the ***Laura and John Arnold Foundation*** to look at market failures in the US pharmaceutical sector. This exciting new study aims to assess the pharmaceutical market, including the policy and regulatory processes leading to drug development and approval of antibiotics.

At the state level, two major initiatives led by Drs. Rodríguez-Monguió and Lynch supported Medi-Cal evaluations and cost-effectiveness of diabetes prevention. Type 2 diabetes (T2DM) is a leading cause of cardiovascular disease, blindness, lower extremity amputations, and kidney failure in the US, and disproportionately affects minority and low-income Americans. Rates of T2DM are particularly high among Medicaid beneficiaries. California has mandated in Senate Bill 97 that as of January 1, 2019, all eligible Medicaid beneficiaries (*Medi-Cal*) with prediabetes who wish to enroll in the DPP must be provided the opportunity to do so. Dr. Rodríguez-Monguió serves as a subcontract PI on a 2020-2025 multi-site evaluation of the cost-effectiveness of California's Medicaid Coverage for the Diabetes Prevention Program funded by the ***National Institute of Diabetes and Digestive and Kidney Diseases*** (NIDDK) for patients with prediabetes initiate and sustain lifestyle changes to delay or prevent T2DM compared to a usual source of care for all Medi-Cal beneficiaries with prediabetes.

The School of Pharmacy has served as the academic subcontractor to the Medi-Cal Drug Use Review program funded by the ***California Department of Health Care Services*** since 2012. MOC faculty members Dr. Kroon and Lynch were instrumental in the awarded opportunity to support Medi-Cal Rx. Medi-Cal Rx is one of Governor Gavin Newsom's executive orders and is the name given to the collective pharmacy benefits and services which will be transitioned from the Medi-Cal managed care delivery system to the Medi-Cal fee-for-service delivery system. Program goals include achieving cost savings for drug purchases made by the state, standardizing the pharmacy benefit statewide for all Medi-Cal beneficiaries, and increasing overall access for beneficiaries.

Teaching and precepting

Our faculty, Candy Tsourounis, Shalini Lynch, Rosa Rodríguez-Monguió, and Trang Trinh were awarded a total of 14 ***Apple Awards in Teaching*** in recognition of their excellent support to our learners. In addition, Rosa Rodríguez-Monguió received the UCSF School of Pharmacy's ***Apple Award for Excellence in Precepting***. Students nominated and selected Rosa and stated:

> *"Dr. Rodríguez-Monguió has been an excellent CP150 preceptor during this past year. She is incredibly caring and supportive of both of our work for CP150 and our well-being. ... She embodies everything a CP150 preceptor should embody and I feel very fortunate to be working with her."*
>
> *"Rosa is a fantastic preceptor! I have learned so much about data analysis through her, which is a topic outside of my comfort zone. She is very understanding of a student's schedule and is incredibly supportive."*
>
> - *Anonymous student feedback*

Other achievements

This year, the MOC was also pleased to announce the recognition of Dr. Tsourounis as the new ***Drug Use Management Supervisor***. In this role Candy will work with pharmacy leaders Dr. Desi Kotis, Chief Pharmacy Executive, and Kenny Scott, Chief Pharmacy Officer, as well as others throughout UCSF Health in providing oversight to the Drug Use Management Program for UCSF Health and analyzing trends in drug utilization to identify opportunities to improve drug use and cost-effective prescribing practices.

Dr. Candy Tsourounis was also recognized via the employee ***THANKS*** program in the category of "caring" for responding to a significant number of questions posed by UCSF community members during the COVID-19 vaccine-related Town Hall. The number of questions during this Town Hall was a record for any previous Town Hall sessions held by UCSF Health.

Source: https://www.ashpfoundation.org/Leadership-Development/Pharmacy-Leadership-Academy

Dr. Kendall Gross received her Epic ***Clarity*** certification this year, adding a valuable set of skills to the MOC's outcome-related work by providing data and insights into therapeutic outcomes and is in the process of completing the Willow Inpatient build certification. During this period Dr. Gross also completed the ***ASHP Foundation's Pharmacy Leadership Academy®*** (PLA), earning her the designation of Diplomate, Pharmacy Leadership Academy (DPLA). This rigorous one-year program covers important topics including leadership influence, transformational change, and sustained organizational and individual success.

Moving Forward

In the coming fiscal year, the MOC will continue its efforts to support UCSF Health and UC systemwide initiatives in ***value improvement***. At UCSF, P&T modernization has been identified as a value improvement project that will include: 1) updating and approving a P&T charter, 2) improved communications on P&T decisions and resources for providers and learners, 3) streamlining and standardizing data dashboards to monitor and report progress, and 6) strengthening operations and tracking. These efforts build on years of experience and aim to improve efficiencies by standardizing practices and leveraging technologies to facilitate requesting new drugs, conducting drug evaluations, and creating simple visualizations to communicate information.

Source: MOC

Efforts will also look at how decision support tools developed by MOC faculty and staff impact prescribing practices in terms of efficiency, quality of care, and impact on treatment cost provision to the medical center. In the coming year, the MOC will be looking closely at an analysis of ***injectable calcitonin*** to assess the impact of the new tools developed this year on prescribing practices. Similar efforts were undertaken to rationalize the use of intravenous ***albumin*** and intravenous immunoglobulin (***IVIG***), a drug widely used for many different immune-based disorders. Because IVIG is derived from blood donations, it is a limited resource requiring providers to be informed on appropriate ordering and dosing. In the coming year, the team will also assess the impact on IVIG use among inpatients as well as in the operating room and critical care locations. Another area of focus for optimizing medication use and reducing drug expenditure will be antimicrobial use. In addition, efforts will continue to expand to look at total costs of care, and not just drug costs. Appropriate site of care for receipt of high cost medications will be evaluated, to identify opportunities for inpatient drug savings for medications that can be administered in the outpatient setting. The MOC will continue to support UCSF Health with additional identified priorities throughout the year.

As we welcome our learners back to campus, we look forward to applying lessons learned over the last year to better leverage new technologies and provide our learners with even more opportunities to engage and succeed in their academic pursuits, both in-person and remotely.

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1 April 2020. San Francisco City Hall illuminated in blue to honor heroic health care workers who are on the frontline battling COVID-19. Source: SF Public Works

https://medicationoutcomescenter.ucsf.edu