We are pleased to offer a combined clinical and translational research and molecular medicine symposium dedicated to the research accomplishments of our residents. The mission of CTST, the training component of CTSI, is to create a pipeline and training system that enhances the number, quality, and cross-disciplinary skills of clinical and translational researchers at UCSF. The Molecular Medicine Pathway aims to enrich the residency experience with opportunities to engage with clinician-scientists and peers, to engage with current scientific literature, and to develop mentoring relationships in order to support career development.

The primary goal of the CTSI Resident Research Training Program (RRTP) is to create opportunities for all residents to gain fundamental knowledge in clinical and translational research methods and evidence-based medicine skills. Additionally, we aim to inspire residents to pursue future opportunities in investigation. CTST sponsors a one-month course (Designing Clinical Research) which provides residents with the opportunity to gain fundamental skills and to develop their own research proposal in small group sessions with close guidance from the faculty. CTST also offers two funding opportunities: the Resident Research Funding (RRF) award, which provides up to $2000 per academic year to UCSF residents for qualified clinical and translational research expenses not covered by their mentor or other sources; and the Resident Research Travel (RRT) award, which provides $600 matching funds to support travel to present research findings at a scientific meeting.

The main goal of the graduate medical education component of the Molecular Medicine Pathway (MMP) is to create a community of and for basic science oriented residents across all specialties in the UCSF School of Medicine and other professional schools. We are here to help these physician-scientists achieve their career goals in academia. Activities throughout the year include social gatherings, a mentoring/career-development workshop, and the annual resident research symposium co-sponsored with the CTSI.

We thank you for joining us today to celebrate the accomplishments of this year’s participants.

Miriam Kuppermann, PhD, MPH  
Co-Director, RRTP

Anna Bakardjiev, MD  
Co-Director, MMP

Alison Huang, MD, MPhil, MAS  
Co-Director, RRTP

Ben Cheyette, MD, PhD  
Co-Director, MMP
Schedule of Events

4:00 pm  Welcome & Resident Research Program Overview
  Miriam Kuppermann and Alison Huang, Co-Directors,
  CTSI Resident Research Training Program
  Ben Cheyette and Anna Bakardjiev, Co-Directors, Molecular Medicine Pathway

4:15 pm  Resident Oral Papers
  Moderated by Alison Huang and Miriam Kuppermann

  Speaker Name: Jessica B. Rubin, MD, MPH
  Title: Sex Differences in Acetaminophen-Induced Acute Liver Injury and Failure
  Residency Program: Internal Medicine, Categorical
  Research Mentor: Monika Sarkar, MD

  Speaker Name: Ashish Premkumar, MD
  Title: The Effect of Hypertensive Disorders in Pregnancy On Preterm Birth Rates Among African-American Women
  Residency Program: Obstetrics, Gynecology and RS
  Research Mentor: Mary Norton, MD

  Speaker Name: David M. Hughes, PharmD
  Title: Morbid Assessment of Bayesian PK Software for Optimizing Vancomycin in Children
  Residency Program: Pharmacy
  Research Mentor: Jonathan Faldasz, PharmD

  Speaker Name: Cortlyn W. Brown, MD
  Title: Identifying Scapular Fractures in the Pan-Scan Era
  Residency Program: Emergency Medicine
  Research Mentor: Robert Rodriguez, MD

  Speaker Name: Deeptee Jain, MD
  Title: Do Patient Expectations Influence Patient Reported Outcomes and Satisfaction in Total Hip Arthroplasty? A Prospective, Multicenter Study
  Residency Program: Orthopaedic Surgery
  Research Mentor: Kevin Bozic, MD, MBA

5:30 pm  Mentor of the Year Award
  Clinical and Translational Recipient: Rita Redberg, MD, MS, Cardiology

5:45 pm  Poster Viewing and Reception
  MH-1400
Mentors of the Year Award

It is well recognized that mentoring is a critical factor in academic success. The success of residents embarking on a research project is highly influenced by the quality of their mentorship. Thus, we would like to recognize the contributions of the many faculty who have assisted with the research endeavors presented today.

Today we are recognizing a faculty mentor for outstanding excellence in mentoring. This year’s awardee was selected from many outstanding nominations.

Clinical and Translational Mentor
Rita Redberg, MD, MS

“Dr. Redberg always promptly provides feedback. She has connected me to experts in the field. She has a way of helping move the work forward. She is thoughtful in her discussions with me about the research. She is also supportive and has provided helpful career advice.”
Abstracts:

Oral Presentations

UCSF Multidisciplinary Resident Research Symposium

Monday, May 1st, 2017

Mission Bay, Mission Hall, MH-1401/1402
Abstract title: Sex Differences in Acetaminophen-Induced Acute Liver Injury and Failure

Resident's name: Jessica B. Rubin, MD, MPH

Name of program: Internal Medicine, Categorical

Purpose: Sex differences in clinical course of many chronic liver diseases are evident, but few studies have investigated sex differences in natural history of acute liver injury (ALI) or acute liver failure (ALF). Acetaminophen (APAP) is one of the most commonly consumed medications worldwide, and APAP toxicity is the leading cause of ALI and ALF in the United States. Sex differences in the course of APAP-induced ALI (APAP-ALI) and ALF are unknown. We aimed, therefore, to evaluate sex differences in the presentation and clinical course of APAP-ALI and ALF.

Methods: Using the United States-based Acute Liver Failure Study Group (ALFSG), we conducted a retrospective cohort study of patients with APAP-ALI and ALF enrolled between January 2000 and September 2016. Descriptive statistics were used to describe differences demographics, clinical characteristics, and outcomes between men and women with APAP-ALF. Multivariate models for severe hepatic encephalopathy were performed using logistic regression with backward covariate selection.

Results: The majority of patients with APAP-ALI (68%) and ALF (76%) were women. Women with APAP-ALF were more likely to have psychiatric disease (60% vs 48%, p

Conclusions: Women are more likely to present with APAP-ALI and ALF and to have more critical care needs than men. Female sex is independently associated with risk of severe HE, which is not entirely explained by their greater co-ingestion history. Future studies should explore physiologic differences in APAP metabolism and hepatotoxicity, particularly in the context of concurrent use of sedating medications, to improve APAP-associated morbidity in women.

Resident’s name: Ashish Premkumar, MD

Name of Program: Obstetrics, Gynecology and RS

Purpose: To investigate the role chronic hypertension (HTN) plays in rates of preterm birth (PTB) among African-American women.

Methods: The study population was drawn from singleton live births in California from 2007-2011 in the birth cohort file maintained by the California Office of Statewide Health Planning and Development. The sample was restricted to African-American women with non-anomalous fetuses, delivering between 20 and 44 weeks’. Poisson logistic regression was used to calculate the risk of PTB by gestational age and type of PTB (PPROM; spontaneous and medically-indicated preterm delivery) among women with a diagnosis of either chronic or gestational HTN. Relative risks (RR) and 95% confidence intervals (CI) were calculated for PTB, adjusting for maternal age, payment for delivery, level of education, body mass index, pre-gestational diabetes mellitus, smoking, location of mother’s birth, urban/rural residence, previous PTB, and inter-pregnancy interval &lt; 6 months.

Results: 61,561 African-American women were included; 2,276 had chronic HTN and 5,861 had gestational HTN. Women with any HTN disorder were at increased risk of spontaneous and medically-indicated PTB (aRRs 2.6-12.7). Women with chronic HTN progressing to pre-eclampsia were at 43-fold higher risk of a medically-indicated PTB &lt; 32 weeks compared with women without chronic HTN. When comparing women with the diagnosis of chronic HTN progressing to pre-eclampsia versus those with gestational HTN progressing to pre-eclampsia, those with chronic HTN had higher risks of spontaneous and medically-indicated PTB, especially &lt; 32 weeks (aRR 2.5 and 3.4, respectively).

Conclusions: Among African-American women, chronic HTN progressing to pre-eclampsia significantly increased the risk for spontaneous and medically-indicated PTB, especially &lt; 32 weeks. Further inquiry into the pathophysiology of hypertensive disorders of pregnancy and evaluation of socio-structural inequality should accompany research on racial/ethnic disparities in PTB.
Abstract title: Assessment of Bayesian PK Software for Optimizing Vancomycin in Children

Resident's name: David M. Hughes, PharmD

Name of program: Pharmacy

Purpose: Clinical data supporting the use of vancomycin is offset by its narrow therapeutic window and need for therapeutic drug monitoring (TDM). Clinical decision support (CDS) tools that have been developed to aid clinicians in optimizing vancomycin dosing are limited, particularly in pediatrics. This retrospective observational cohort study compared the pharmacokinetic predictive capabilities in achieving targeted vancomycin troughs and AUC between a UCSF pediatric dosing nomogram and model-based recommendations using Insight-Rx, a software tool utilizing a published pediatric-specific pharmacokinetic model and Bayesian CDS.

Methods: Eligible patients included children between 1 and 18 years old admitted to UCSF Benioff Children’s Hospital from July 1, 2015 to July 1, 2016 and receiving intravenous vancomycin, with at least two vancomycin levels measured. Bayesian pharmacokinetic parameters were calculated using both vancomycin levels and these new parameters were used to calculate the predicted steady-state troughs and AUC-24 of the regimen implemented by the pharmacist in response to the first level, as well as the regimen suggested through Bayesian analysis conducted by the Insight-Rx CDS tool.

Results: One hundred and fifty one subjects were included in this study. Mean age of the patients was 8.5 years (± 5.57 years) and mean serum creatinine was 0.43 mg/dL (± 0.19 mg/dL). When adjusting regimens in response to the first level, recommendations based on predictions utilizing Bayesian analysis performed by the Insight-Rx CDS tool achieved steady-state troughs in the targeted range more frequently than pharmacist judgment alone (70% vs. 37%).

Conclusions: The use of a CDS tool improves pharmacists’ ability to reach vancomycin target troughs and AUC for dose adjustment in response to vancomycin levels in the pediatric population. It may also serve as a more accurate tool accounting for variability in trough collection time.
Abstract title: Scapular Fractures in the Pan-Scan Era

Resident’s name: Cortlyn W. Brown, MD

Name of program: Emergency Medicine

Purpose: Scapular fractures have been traditionally taught to be associated with significant injuries and major morbidity. As we have demonstrated with sternal fracture, increased chest CT utilization and head-to-pelvis CT (pan-scan) protocols in blunt trauma evaluation, however, may diagnose minor, clinically irrelevant scapular fractures, possibly rendering previous teachings obsolete. We sought to determine the 1) percentage of scapular fractures seen on chest CT only (SOCTO) versus on both chest x-ray (CXR) and CT, 2) admission rates, mortality, length of stay, and injury severity score associated with scapular fracture, and 3) injuries commonly associated with scapular fractures.

Methods: We conducted a pre-planned analysis of patients prospectively enrolled in the NEXUS Chest CT study at eight level 1 trauma centers with the following inclusion criteria: age ≥ 14 years, blunt trauma within 12 hours of ED presentation, and receiving both CXR and chest CT during ED trauma evaluation. Scapular fractures and other injuries were defined according to CT reports. We followed subjects through their hospital course to determine clinical outcomes.

Results: Of 11,477 enrolled subjects, 4501 (39.2%) had both CXR and chest CT and 134 (3.0%) of these had scapular fractures. Eighty-six (64.2%) scapular fractures were SOCTO. Four (3.0%) patients received surgery for their scapular fracture during the index hospital stay. Although scapular fracture patients had higher admission rates (92.5% versus 60.4%; mean difference 32.1%, 95% CI 26.2% to 36.0%), injury severity scores (17 versus 5; mean difference 12, 95% CI 10.3 to 13.7), and length of stay 9.6 days versus 6.4 days (mean difference 3.2 days, 95% CI 1.6 to 4.8) than patients without scapular fracture, hospital mortality was similar in both groups (4.8% versus 3.7%; mean difference 1.2%, 95% CI -1.6% to 6.5%). The most common thoracic injuries associated with scapular fracture were pulmonary contusion (40%), pneumothorax (38%), thoracic spine fracture (27%), hemothorax (18%) and clavicle fracture (18%), all of which were significantly more common (p < 0.01) than in non-scapular fracture patients.

Conclusions: Under current blunt trauma imaging protocols that commonly include chest CT, most scapular fractures are SOCTO. Considering the higher admission rates, injury severity scores, hospital length of stay and rates of associated thoracic injuries in scapular fracture patients, traditional teachings about morbidity and thoracic injury with scapular fracture are substantiated.
**Abstract title:** Do Patient Expectations Influence Patient Reported Outcomes and Satisfaction in Total Hip Arthroplasty? A Prospective, Multicenter Study

**Resident’s name:** Deeptee Jain, MD

**Name of program:** Orthopaedic Surgery

**Purpose:** The relationship between patient expectations and patient reported outcomes (PROs) in total hip arthroplasty (THA) patients is controversial. The purpose of this study was to examine the impact of preoperative patient expectations on postoperative PROs and patient satisfaction.

**Methods:** This was a prospective multicenter observational cohort study including patients from four institutions who underwent primary THA. Preoperatively, patients completed Hospital for Special Surgery Hip Replacement Expectations Survey (expectations), SF-12, UCLA activity score, and Hip Disability and Osteoarthritis Score (HOOS). Postoperatively at six months and one year, patients completed the Hospital for Special Surgery Hip Replacement Fulfillment of Expectations Survey (fulfillment of expectations), a satisfaction survey, and the same PROs as preoperatively. Step-wise multivariate regression models were created to determine the relationships between preoperative factors and expectations, and expectations and PROs, fulfillment of expectations, and satisfaction.

**Results:** 207 patients were enrolled. Follow-up rate was 91% at 6 months and 92% at 1 year. Being employed and lower baseline HOOS predicted higher expectations (employment status: B= -7.5 p=0.002; HOOS: B=-0.27, p=0.002). Higher preoperative expectations predicted greater improvements in UCLA activity, SF-12 PCS, and HOOS at 6 months (UCLA activity: B=0.03, p=0.001; SF-12 PCS: B=0.15, p = 0.001; HOOS B=0.20; p=0.008) and UCLA activity at 1 year (B=0.02, p=0.004). Furthermore, higher expectations predicted higher postoperative satisfaction and fulfillment of expectations at 6 months (satisfaction: B=0.21, p

**Conclusions:** In patients undergoing THA, being employed and worse preoperative hip function are predictive of higher preoperative expectations of surgery. Higher expectations predict greater improvement in PROs, greater patient satisfaction, and the fulfillment of expectations. These findings can be used to guide patient counseling and shared decision making preoperatively.
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Abstracts:
Poster Presentations

UCSF Resident Research Symposium

Monday, May 1st, 2017
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Abstract title: Appropriateness of Drug-Disease Alerts Related to Live Vaccines

Resident's name: William Alegria, PharmD

Name of program: Pharmacy

Purpose: Product-specific labeling and consensus guideline recommendations suggest that live vaccines should be used cautiously or avoided altogether in immunocompromised hosts. Clinical Decision Support (CDS) technology is intended to provide clinicians with knowledge of person-specific data that is intelligently filtered and presented at appropriate times. Immunocompromised states may be transient, however, and as a result, alerts triggered by the electronic medical record (EMR) may or may not be relevant at the time of order-entry or order-verification. The objective of this study is to identify and quantify the appropriateness of live vaccine contraindication alerts in the "pregnancy" and "history of hematologic malignancy" categories within the EMR.

Methods: Data will be collected for a period of 6 months and consist exclusively of patients at UCSF Medical Center. It will then be determined if the alert triggered by the EMR was appropriate at the time it was presented to the healthcare provider. In order for the alert to be labeled "appropriate," the patient must have met one of the following pre-identified criteria at the time the alert was triggered by the EMR: (1) be pregnant, (2) receiving immunosuppressive chemotherapy, or (3) have laboratory findings consistent with immunosuppression (e.g. neutropenia). If appropriate, it will then be determined if the live vaccine was administered or discontinued.

Results: Preliminary results reveal that in patients with a history of hematologic malignancy (n=18), the EMR triggered an appropriate alert 33% of the time. Of the 6 patients that were contraindicated to receive a live vaccine, 5 had the order discontinued or held. The alert that was unaccounted for was sent to an outpatient pharmacy. In patients who generated a pregnancy contraindication alert (n=12), 0% of the alerts were appropriate.

Conclusions: The conclusion of this study is contingent upon final results and data analysis. Based on preliminary data collected, it appears that the majority of alerts triggered by the EMR for a history of hematologic malignancy and pregnancy have the opportunity to be redesigned or optimized. Ideally, the alert would be designed in such a way to alert providers of a contraindication when one truly exists.
Abstract title: The Experiences of Black Women During Fertility Treatment

Resident’s name: Olusinmi M. Bamgbose, MD

Name of program: Psychiatry

Purpose: Although more likely than their Caucasian counterparts to experience fertility problems, Black women are less likely to be in treatment (Ceballo, Graham, and Hart, 2016). When they are, they are more likely to have poor outcomes (Spitzer and Fujimoto 2013; Seifer et al 2008). Reasons for their underrepresentation in fertility clinics are varied but include decreased knowledge of interventions, cultural stigma, financial barriers, and late presentation to care. In addition, providers themselves may not be aware that minority women are at increased risk for infertility (Ceballo, Abbey, and Schooler, 2010). This pilot study aims to describe the experiences of Black women while seeking treatment for infertility.

Methods: Black females in the United States were recruited via social media and word of mouth. Eligible participants identified themselves as Black women who had had difficulty getting pregnant, were English speaking, and had received fertility treatments in the United States. Participants participated in an hour-long semi-structured telephone interview about their experiences accessing treatment for fertility issues. Women were asked about entering into care, barriers they encountered, and how they felt medical providers and clinical staff had treated them. The interviews were recorded and analyzed for themes.

Results: Eight participants were recruited. The median age at the time of interview was 42.5 years and the age at which each participant had sought treatment ranged from 25-42 years. Two participants were British but were US residents at the time of treatment. All women had professional careers. Five main themes were identified: 1) Higher socioeconomic status seemed to compensate for potential racial biases; 2) Providers often seemed to overlook or minimize their patients’ fertility struggles; 3) Participants wanted the opportunity to connect with other Black women in similar situations; 4) Women wanted more education and knowledge about complementary/alternative therapies; 5) Their experiences would have been much better if they had gone into the process “armed with knowledge”.

Conclusions: Black women reported a variety of events they encountered while seeking fertility treatment, but did share some commonalities, the most striking being the universal wish to be part of a supportive community during the process. Also notable was the women’s distress when they felt that their providers minimized their struggle to conceive, thus delaying appropriate diagnosis and treatment. Given these findings, providers working with Black women should take care to seriously consider their patients’ concerns about infertility while taking time to discuss evaluation and treatment options with them. In addition, many patients would likely be interested in support programs specifically tailored to minorities. A potential limitation of this study is that all participants were professional women, which previous research suggests could confer privilege that diffuse the effect of race alone.
**Abstract title:** Oxytocin impacts auction bidding behavior in individuals with schizophrenia and in healthy controls

**Resident’s name:** Ellen R. Bradley, MD

**Name of program:** Psychiatry

**Purpose:** Social decision-making deficits are common and strongly impact functional outcomes in schizophrenia. Economic games have been used to investigate social decision-making in individuals with schizophrenia, but results have been mixed and these deficits remain inadequately characterized. Oxytocin administration has been shown to improve some aspects of social cognition in schizophrenia, but its effects are complex and poorly understood. To better understand social decision-making and the impact of exogenous oxytocin, we used a multiplayer auction game known to induce the “winner’s curse,” i.e., overbidding in order to win, despite financial losses. This game allows for analysis of behavior in a dynamic social context and quantification of the value of winning and losing money versus social status.

**Methods:** We administered a single dose of intranasal oxytocin (40IU) or placebo to 39 men with schizophrenia (SZ) and 54 matched healthy controls (HC) in a randomized, double-blind study. Participants believed they were competing against real opponents as they bid on items with common but unknown values. Participants also completed a card game to assess non-social risk-taking behavior that served as a control task. We analyzed bidding behavior over 35 auction trials using multilevel linear mixed models, and performance on the control task using mixed-factorial ANOVA.

**Results:** We found an effect of Trial, (p

**Conclusions:** SZ demonstrated abnormal bidding behavior in the placebo condition, which may reflect a decreased drive for social reward. Oxytocin affected bidding behavior in both groups, enhancing the “winner’s curse” by increasing bids at the end of the game. This effect may reflect oxytocin’s ability to increase social salience. The fact that oxytocin did not impact non-social risk-taking suggests that its effects may be specific to social contexts. Overall, we found that schizophrenia and oxytocin affected bidding behavior but in distinct ways. Further study using economic games may help to clarify the mechanisms underlying altered social decision-making in schizophrenia as well as the effects of oxytocin.
Abstract title: Extended cytomegalovirus prophylaxis with valganciclovir in lung transplant recipients

Resident's name: Matias D. Campos, PharmD

Name of program: Pharmacy

Purpose: Chronic lung allograft rejection, characterized as bronchiolitis obliterans syndrome (BOS), is the primary cause of mortality after lung transplantation. According to the registry from The International Society of Heart & Lung Transplantation, 50% of lung transplant recipients will develop BOS at five years post-transplant. Cytomegalovirus (CMV) remains a common complication affecting solid organ transplant contributing to significant morbidity and has been associated with acute rejection and BOS. Current guidelines recommend routine use of valganciclovir (Valcyte®) in lung transplant recipients for CMV prophylaxis with or without the use of CMV immunoglobulin. However, studies show conflicting evidence regarding the optimal duration of prophylaxis to prevent CMV reactivation while minimizing the risk of myelosuppression. Consequently, several guidelines recommend prophylaxis for a minimum of 6 to 12 months. The practice at our institution is to maintain indefinite CMV prophylaxis after lung transplant.

The primary objective of this study is to determine if there is an association with extended valganciclovir exposure in reducing the incidence of BOS in lung transplant recipients. The secondary objective is to characterize patient tolerability of valganciclovir based on reasons for cessation of therapy.

Methods: This is a retrospective single-center cohort study evaluating adult lung transplant recipients who were transplanted from 2008-2011 at the University of California, San Francisco. Patients were followed through 2014 for the primary outcome of time-to-BOS diagnosis given duration of valganciclovir prophylaxis.

Results: 200 lung transplant recipients were included in the preliminary analysis (70% white, 53% male, average age of 55 at time of transplant). The top 3 transplant indications were idiopathic pulmonary fibrosis, chronic obstructive pulmonary disease, and cystic fibrosis. Using a chi-square test, we found that greater than 90% exposure to valganciclovir during the study period was associated with a decreased incidence of BOS at three years after transplant (10% in >90% exposure group vs 90% in

Conclusions: Our preliminary data may suggest that extended valganciclovir exposure is associated with a decreased incidence of BOS. The final analysis will evaluate time-to-BOS, incidence of CMV infection, incidence of acute rejection, incidence of BOS during 3-year follow-up, leukopenia, and death in association with duration of valganciclovir use. Further controlled studies are needed to justify extended valganciclovir use in this patient population.
Abstract title: HIV & Peripheral Arterial Disease in the Women’s Interagency HIV Study

Resident’s name: Emily R. Cedarbaum, MD, MPH

Name of program: Internal Medicine, Categorical

Purpose: Peripheral arterial disease (PAD) is associated with major vascular events, decline in physical function, and mortality. Cardiovascular disease is now one of the most common non-HIV-related causes of death among HIV-infected individuals. The purpose of this study is to determine the association of HIV and metabolic factors with PAD in HIV-infected and HIV-uninfected women, as well as to determine the association of HIV-related factors with PAD in HIV-infected women.

Methods: This study was performed with the Women’s Interagency HIV Study (WIHS) cohort, which is a large, national, multi-center cohort of women. Ankle-brachial index (ABI) was measured in about 1,820 WIHS participants >40-years-old. Predictors included HIV status, demographics, behaviors, and metabolic factors. The outcome was PAD (both symptomatic and asymptomatic). We are currently performing subgroup analysis and multivariate regression, including evaluating the duration of HIV infection among HIV-positive women.

Results: There was a higher prevalence of borderline (0.91 -

Conclusions: The WIHS cohort has a higher prevalence of PAD than previous reports in the general population. Longitudinal measurements of PAD will be useful in determining whether the rate of development & time of onset of PAD varies between HIV-infected and HIV-uninfected women. With readily available antiretroviral therapy, viral suppression is achieved for many individuals and it is especially important to characterize the ways in which chronic diseases such as PAD may impact the health of HIV-infected individuals.
Abstract title: The Effect of Computerized Clinical Decision Support on the Use of Intravenous Immunoglobulin

Resident’s name: Fred Chang, PharmD

Name of program: Pharmacy

Purpose: Intravenous Immune Globulin (IVIG) is a high cost medication that is the treatment of choice for primary immunodeficiency diseases, autoimmune neurological diseases and many other indications. The pharmacokinetics of IVIG suggests that doses based on Ideal Body Weight (IBW) may be reasonable. Past studies have demonstrated that the implementation of computerized Clinical Decision Support (CDS) interventions can lead to reduction of IVIG dose and significant savings.

The primary objective of this study was to evaluate the effectiveness of a computerized CDS tool in the reduction of the IVIG dose prescribed per patient. Primary endpoint is the mean change in the dose of IVIG per kilogram. Secondary outcomes include the frequency in which the computerized CDS tool was used and cost savings. Incidence of infusion related reactions was measured to evaluate safety.

Methods: This study is a pre-post intervention study conducted at the University of California, San Francisco Medical Center (UCSFMC) Parnassus facility. The intervention was an implementation of modifications to the computerized physician order entry for IVIG that provided guidance to the provider on how to dose IVIG. All patients who received IVIG at the UCSFMC Parnassus facility were included in the study. Patients were excluded if they were less than 60 inches in height, IBW greater than actual body weight, or IVIG ordered as discrete dose. A sample size of 40 patients was required in each cohort to achieve 80% power and an alpha of 0.05 to detect a 20% reduction in dose. (n=80).

Results: Preliminary results show a reduction of the average dose of IVIG per kilogram from 0.48 to 0.62 g/kg (22.7%). Frequency in which IVIG was ordered with IBW weight type increased from 4% to 60%. In the first 1.5 months post intervention, a savings of $54,750 was realized (23%). No difference in the number of infusion related reactions between the pre and post intervention cohorts was detected.

Conclusions: Initial results indicate that an implementation of computerized CDS for IVIG can lead to reduction of IVIG dosage.
Abstract title: Outcomes of Medialization Laryngoplasty with and without Arytenoid Adduction

Resident's name: Joseph Chang, MD

Name of program: Otolaryngology

Purpose: To evaluate the effect of medialization laryngoplasty (ML) performed alone compared to ML with arytenoid adduction (AA) on glottic gap and voice quality in unilateral vocal fold paralysis (UVFP) patients.

Methods: UVFP patients treated with ML alone and ML with AA at the University of California San Francisco Voice and Swallowing Center were identified. Demographic information and history of laryngeal procedures was collected. Preoperative and postoperative examinations were digitally analyzed using ImageJ for normalized anterior and posterior glottic gap, and CAPE-V scores.

Results: 47 patients underwent ML and 27 patients underwent ML with AA. Normalized anterior gap (AG) improved in both ML (preop: 4.4u, postop: 0.8u, p

Conclusions: UVFP patients undergoing ML may benefit from addition of AA when a large posterior glottic gap is present. In this study, ML with AA, but not ML alone, resulted in statistically significant improvement in PG.
Abstract title: Once-daily PM Enoxaparin to Reduce Interruptions to VTE Prophylaxis

Resident’s name: Kerjun Chang, PharmD

Name of program: Pharmacy

Purpose: UCSFMC policy states that enoxaparin must be held for a minimum of 12 hours prior to lumbar punctures (LPs). Therefore, once-daily enoxaparin for venous thromboembolism (VTE) prophylaxis must be discontinued prior to the procedure, then later resumed. This practice increases the risk of human error causing interruptions to VTE prophylaxis. To address this problem, a practice change was implemented on the neurology service, changing the default administration time of enoxaparin from 09:00 to 21:00. This is expected to allow enoxaparin to be administered daily without interruption and minimize delays to LPs being performed. The objective of this study is to evaluate the efficacy of regularly dosing enoxaparin in the evening in reducing the number of missed doses and improving outcomes (including length of stay, incidence of VTE, delays in performing LPs).

Methods: This is a retrospective observational study using a historical control group with a study population of adult neurology patients at UCSFMC. Patients were excluded if they were not candidates for VTE prophylaxis with enoxaparin. Data collection was performed by manual chart review and APeX/EPIC EHR system reports.

Results: Based on preliminary results, 74% of patients in the post-intervention group had enoxaparin orders appropriately dosed in the evening. The median numbers of missed doses were 0 and 1 in the pre- and post-intervention groups respectively. Post-intervention patients were more likely to be female, have longer lengths-of-stay, receive LPs, and of those who received LPs, LPs were performed later and more frequently. Additionally, prescribers were more likely to assess patients to be at higher VTE risk and prescribe enoxaparin in the post-intervention group.

Conclusions: An evening dosing strategy did not appear to reduce the number of missed doses of enoxaparin relative to length of stay. This may be in part due to differences in patient characteristics and prescribing patterns between the study groups. Providers were more likely to assess patients to be at higher VTE risk in the post-intervention group, potentially indicating that evening dosing of enoxaparin promoted more use of VTE prophylaxis. Further investigation into how dosing time affects prescribing practices and quality of VTE prophylaxis is needed.
**Abstract title:** Effect of Current Focusing on Pitch Perception in Cochlear Implant Users

**Resident's name:** Divya A. Chari, MD

**Name of program:** Otolaryngology

**Purpose:** For many cochlear implant users, speech perception matches that of normal-hearing individuals, but complex pitch perception (i.e. musical pitch and voice pitch) remains poor for all cochlear implant users. In conventional cochlear implant technology, current stimulation is accomplished through a monopolar mode of stimulation, in which current flows from an intracochlear electrode to an extracochlear, or ground, electrode. Monopolar current stimulation generates a widespread neural excitation pattern resulting in undesirable interactions among neighboring electrodes. Channel interactions are thought to interfere with the perception of temporal frequency information and thus contribute to the poor performance in implant-mediated music perception. Using a tripolar stimulation strategy has been proposed as a way to reduce channel interactions, thereby mitigating the broad spread of neural excitation.

**Methods:** We aimed to evaluate the performance of post-lingually deafened adult cochlear implant users in pitch perception tasks in both tripolar and monopolar configurations using a two-part study: 1) pitch perception task in which cochlear implant users are presented with two notes and asked to identify which note is higher in pitch; and 2) polyphonic pitch task in which cochlear implant users are presented with 1-pitch, 2-pitch, and 3-pitch stimuli and asked to distinguish between the stimuli. Both tasks were presented as 2-alternative forced choice tests with a 1-up, 1-down adaptive tracking model.

**Results:** Four adult cochlear implant users were tested. We found significant improvement in tasks of pitch perception under the tripolar configuration (p < 0.05).

**Conclusions:** Tripolar current stimulation may improve performance of cochlear implant users, specifically in tasks of complex sound perception, such as in pitch perception.
Abstract title: Practice Patterns for Management of Pediatric Femur Fractures in Low- and Middle-income Countries

Resident’s name: Patrick Curran, MD, MS

Name of program: Orthopaedic Surgery

Purpose: Femoral shaft fractures in children are common injuries in the developing world [1]. The management of these fractures is largely dictated by patient age, fracture pattern, associated injuries, the social and economic situation of the child and their family, and surgeon preference [2, 3]. Despite anecdotal reports of widely varying treatment patterns for these injuries in resource-limited settings, the published literature remains sparse for surgeons from low- and middle-income countries. The purpose of this study is to survey surgeons from low- (LIC), lower-middle- (LMIC), and upper-middle-income (UMIC) countries regarding treatment patterns for pediatric femur fractures.

Methods: An electronic survey designed to capture treatment preference for pediatric femur fractures was distributed to surgeons from low- and middle-income countries on REDCap. The survey inquired about surgeon demographics, level of training, and specialty training. It then queried treatment preferences and indications for treatment preferences for pediatric femoral shaft fractures in four age groups: infant (0-6 months); toddler (7 months-4 years); child (5 years-12 years); adolescent (12-17 years). The survey was available in English, Spanish, and French. The data were analyzed with t-test for continuous variables, Chi-square test for categorical variables, and weighted Pearson’s correlation test with significance set at p < 0.05.

Results: There were 418 surgeons from 83 countries (20 LIC, 33 LMIC, 30 UMIC) who participated in the study (Fig 1). Respondents were mostly fellowship trained in Pediatric Orthopaedics (26%) and Trauma Orthopaedics (43%), practiced in urban settings (84%), and treated more than 10 pediatric femur fractures per year (68%).

In the infant age group, 99.5% treat nonoperatively with majority Pavlik (19%), spica cast (60%), or traction with delayed spica cast (14%). In the toddler, child, and adolescent age groups, there were significant trends towards more surgeons treating nonoperatively with decreasing country socioeconomic level (Fig. 1). There was a moderate negative correlation between rate of majority nonoperative treatment and country socioeconomic level by GNI per capita (r = 0.40). In the child age group, respondents treat significantly more with bed rest and traction than spica casting in LIC (63%) and LMIC (65%) than UMIC (35%) countries. Those treating with surgery in the child group were significantly more likely to use open reduction with internal fixation (UMIC 19%, LMIC 33%, LIC 40%) than intramedullary fixation (UMIC 80%, LMIC 64%, LIC 53%; p < 0.05) with decreasing country socioeconomic level. The most common reason respondents chose ORIF treatment choice was implant availability (52%). Whereas for respondents who chose majority intramedullary nail fixation, the most common reasons for this choice were decreased trauma to the patient (38%) and biomechanical superiority (38%).

Conclusions: This study presents a survey of treatment patterns for pediatric femur fractures by surgeons from countries of differing socioeconomic means. The results present possible disparities in treatment selection based on variations in resources. Future studies should investigate the value of alternative treatment options in resource-limited settings.
Abstract title: The Impact of the Patient-Centered Medical Home on Health Care Disparities: A qualitative study exploring stakeholder perspectives on current standards and future directions

Resident’s name: Emilia H. De Marchis, MD

Name of program: Family and Community Medicine

Purpose: Over the past decade, the Patient-Centered Medical Home (PCMH) has become a preeminent model for primary care delivery. Simultaneously, health equity has gained increasing attention as an important goal for our healthcare system. There has been limited research on whether and how the PCMH can or should impact health and health care disparities. In this study, we assessed perspectives on the PCMH model’s impact on health care disparities, and evaluated if and how PCMH transformation can, or even should, be augmented to target health care disparities. Our goal was to understand the appropriateness and feasibility of formally integrating attention to disparities into the various PCMH accrediting/recognition processes and framework.

Methods: We recruited key stakeholders and experts on the PCMH model and health care disparities, including: grant and policy makers, researchers, accreditors, patient advocates, primary care practices, practice transformation organizations and funders. Using a combination of quota and snowball sampling, we conducted 32 semi-structured interviews. Qualitative thematic analysis was used to identify core themes.

Results: We identified four major themes: 1) the existing PCMH model has some impact on health care disparities, though many feel that it is small or indirect; 2) the PCMH model and standards could more directly address health care disparities; 3) reducing health care disparities requires higher level policy initiatives; and 4) health care disparities can be addressed by prioritizing and incentivizing addressing disparities, improving awareness of existing disparities, and engaging our communities. Grant makers and accreditors more commonly viewed the PCMH as already having some impact on health care disparities, whereas patient advocates and practice transformation organizations were least apt to, speaking to a subtheme of PCMH philosophy and goals not always aligning with on-the-ground implementation.

Conclusions: The PCMH model continues to be refined, as we learn from our patients’ and clinics’ experiences. A core component of the Quadruple Aim, improving population health, requires that we reflect on our policies to ensure they are not contributing to disparities, and that we work to identify and ameliorate those that already exist. Stakeholders consistently recognized the need for increased efforts toward health equity, and most saw the PCMH as having a role, but additional support, both at the clinic and policy level, is needed to ensure meaningful progress.
**Abstract title:** Tachyarrhythmia Not Associated with Mortality During Single Ventricle Reconstruction

**Resident’s name:** Dana Gal, MD

**Name of program:** Pediatrics

**Purpose:** Early interstage mortality following single ventricle reconstruction (SVR) remains significant and recent studies suggest an association between digoxin and decreased interstage mortality in arrhythmia-free patients, suggesting potential treatment of occult arrhythmia. Arrhythmias have been shown to be common in this population with single center experiences suggesting no impact on survival. The objective of this study is to determine the impact of tachyarrhythmias and antiarrhythmic therapy on the survival of patients undergoing SVR.

**Methods:** Publically available data from the Pediatric Heart Network Single Ventricle Reconstruction trial was used. Patients with known tachyarrhythmia during their Stage I hospitalization were compared to those without arrhythmias. Patients treated for tachyarrhythmia were compared to those without treatment. Primary outcomes were mortality by the end of Stage I hospitalization, interstage mortality, and post-Glenn mortality.

**Results:** 129 patients with tachyarrhythmia were identified, 17 had arrhythmia prior to Stage I and 118 had arrhythmia post-operatively. The arrhythmia and arrhythmia-free groups did not differ in gender, prematurity, anatomic diagnosis, use of anticoagulation or heart failure medications, ECMO during Stage I hospitalization, or degree of TR on Stage I echo. Mortality did not differ between the tachyarrhythmia group and arrhythmia-free group at any stage during SVR (Stage I hospitalization (19.53% vs 15.48%, p=0.503), interstage mortality (7.81% vs 9.52% p=0.800), post-Glenn (31.25% vs 24.29% p=0.243). 74 patients treated with antiarrhythmics at time of Stage I discharge were identified. There was no difference in mortality between the treated and untreated subjects during the interstage period or post-Glenn.

**Conclusions:** Tachyarrhythmia is not associated with mortality during the Stage I hospitalization or follow-up through the Glenn operation. This finding challenges the use of digoxin to reduce interstage arrhythmic mortality. Since identified tachyarrhythmia does not appear to play a role in mortality, it is unlikely for occult arrhythmia to be responsible for significant interstage mortality.
Abstract title: Variations in HCV+ Deceased Donor Liver Utilization across UNOS Regions

Resident's name: Jin Ge, MD, MBA

Name of program: Internal Medicine, Categorical

Purpose: In late 2013, the Food and Drug Administration approved the first interferon-free direct acting antivirals (DAAs) for the treatment of hepatitis C virus (HCV) infection. At the same time, the opioid epidemic has increased the pool of high risk donors, many of whom are HCV+. Given these changes, we aimed to explore variations in utilization of HCV+ livers.

Methods: Included were all deceased donor livers (DDLs) from 1/1/2007-3/31/2016. DDLs were categorized as HCV- and HCV+ cohorts based on donor antibody testing. We categorized UNOS regions into “Low” (3, 8, 10, and 11), “Medium” (2 and 6), and “High” (1, 4, 5, 7, and 9) based on median allocation MELD score for successful transplant candidates in 2016. The following comparisons were made in each set of regions: 1. Allocation MELD scores for successful transplants, 2. Discard rates, and 3. Modified deceased risk indices (mDRI), which can be used to predict graft survival following transplantation.

Results: 76,614 DDLs were recovered during the study period, 3,500 were HCV+. The percentage of HCV+ livers recovered increased from 4.4% (352/8,077) in 2007 to 5.9% (535/9,077) in 2015. 908 HCV+ livers were offered to HCV- candidates resulting in 7,803 offers. 2,067 HCV+ livers were offered to HCV- candidates resulting in 26,363 offers. HCV+ livers were more likely to originate from White donors (72.3% vs 66.2%) and less likely to originate from “High” regions (32.8% vs 40.3%). The median age of HCV+ donors was 45 versus 42 for HCV- donors during the study period – though in 2016, this was 36 versus 42 for HCV- donors. Across all regions, allocation MELDs for HCV+ liver recipients were four points lower than those for HCV- liver recipients in 2016 – this gap has increased in all regions from 2007 (Figure 1). Discard rates of HCV+ livers, however, is at or near parity with HCV- livers in all regions (Figure 2). The median mDRI had the greatest decreases amongst HCV+ livers in “Low” and “Medium” regions between 2011 and 2016, but has remained relatively constant in “High” regions (Figure 3). The average number of declined offers per acceptance for HCV+ livers declined from 16.6 to 10.4 (Figure 4).

Conclusions: With the advent of the DAA era, HCV+ liver utilization has increased with discard rates at or near parity in most regions. Despite this, HCV+ livers still suffer from a four point MELD score penalty at transplantation. The increase supply of HCV+ organs in “Low” and “Medium” regions may be due to the opioid epidemic, and this is reflected in increasing in donor quality for organs originating in these regions. Based on lower mDRI scores, however, discard rates should be even lower in “Low” and “Medium” regions. In contrast, “High” regions already have high utilizations of HCV+ organs with similar median mDRI between HCV+ and HCV- organs. These trends indicate that there is room for increased utilization of HCV+ organs, especially in “Low” and “Medium” regions.
Abstract title: Defining Grit in Pharmacy Learners and Predictive Value for Academic Performance

Resident’s name: Katherine Gruenberg, PharmD

Name of program: Pharmacy

Purpose: Grit, defined as sustained interest and effort, is a construct associated with academic achievement that is independent of talent or cognition. Compared to other personality traits, Grit displays greater emphasis on endurance. In healthcare education, Grit is associated with higher grades in medical and pharmacy students, as well as less burnout in surgical residents. Defining Grit in our students may offer insight into student success and provide an approach to academic improvement. Therefore, our objectives are to measure Grit in UCSF pharmacy students and determine the relationship between Grit and cumulative pharmacy grade point average (GPA).

Methods: In 2016, UCSF pharmacy students voluntarily participating by taking the validated Short Grit Scale (Grit-S) via Qualtrics. The Grit-S is an 8 item survey that produces a score ranging from 1 (low Grit) to 5 (high Grit). Responses were linked to each UCSF student ID to allow association between Grit score and pharmacy GPA. We then calculated the multivariable correlation between GPA, Grit scores, and the following covariates: standardized exam scores, pre-pharmacy GPA, age, gender, ethnicity, unrepresented minority status, and first generation to college status.

Results: Of the 500 eligible students, 86% (n=431) completed the survey. Mean (± SD) Grit scores were 3.685 (±0.45). There was not a significant correlation between Grit score and pharmacy GPA (r2

Conclusions: Grit scores were similar to those reported of medical students. We did not detect a significant association between Grit and pharmacy GPA within our curriculum. Possible explanations for these findings include: skewed GPA distribution, attrition bias, and unique UCSF student characteristics.
Abstract title: Occult Malignancy in Risk Reduction Bilateral Mastectomies from Women with BRCA 1 or BRCA 2 Germline Mutation: Correlation with Imaging Abnormalities and Implications for Specimen Sampling Strategies

Resident's name: Lucy M. Han, MD

Name of program: Anatomic Pathology

Purpose: The lifetime occurrence of breast cancer in women with a BRCA1 or BRCA2 germline mutation is significantly lowered by risk reducing bilateral mastectomy (RRBM), however early stage occult cancer may already be present in a minority of women at the time of RRBM. The incidence of occult cancer in RRBM varies widely in the limited available studies. We hypothesize that the reported incidence may depend on patient age at surgery, radiologic imaging abnormalities, and specimen sampling strategy. Whereas an evidence-based protocol for specimen management of risk reducing bilateral salpingo-oophorectomy (RRSO) (so-called SEE-FIM protocol) has been established, a similar standardized protocol for managing RRBM remains to be defined.

Methods: Clinical, radiologic, and pathologic findings were retrospectively evaluated in RRBM specimens from 72 women with a BRCA 1 or BRCA 2 germline mutation who did not have any pre-operative pathologic diagnosis of atypia or malignancy. For patients who underwent pre-operative imaging and biopsy, the correlation between BI-RADS score, biopsy findings, and RRBM diagnoses was evaluated. The specimen sampling of RRBM was 2 cassettes per quadrant plus sampling of any gross abnormality.

Results: Invasive ductal carcinoma (IDC) with DCIS was present in 1/72 RRBM (0.5 cm, grade 2, ER+PR+HER2-, pT1N0); the patient was 40 yrs (BRCA2), BI-RADS score 1 and a benign biopsy. Pure Paget disease was found in 1/72; the patient was 37 yrs (BRCA2) with an ill-defined nodule on MRI. In the remaining 70 patients (average age 41 yrs), 54 had imaging: 38/54 were BI-RADS score 3 or less and 8/38 underwent biopsy; 16/54 (30%) were BI-RADS score 4 and 11/16 underwent biopsy. None were BI-RADS score 5. None of the biopsies contained atypia or malignancy, however, 7/70 RRBM contained ADH/FEA and 4/70 RRBM contained LCIS/ALH. Gross abnormalities were visible in 5/70 RRBM. Average number of cassettes per breast was 12. RRSO was performed in 48/72 patients, 4 of which contained tubal/ovarian carcinoma. Pure high grade DCIS (0.4 cm, ER+PR+) was present in RRBM of 1 patient (BRCA1); the other 3 RRBM were benign.

Conclusions: Occult cancer is rare in RRBM specimens from women as young as the late 3rd decade, as is occult atypia, but neither radiologic imaging nor gross pathology correlated with its detection. Benign biopsy does not exclude occult cancer and specimen sampling strategies should still focus on grossly normal tissue. An evidence-based standardized protocol for pathologic management of RRBM specimens is needed; the optimal number of cassettes remains to be established.
Abstract title: Adolescent Medicine Providers’ Attitudes towards Prescribing Pre-Exposure Prophylaxis (PrEP) to Youth at Risk of HIV Infection in the US

Resident's name: Geoff Hart-Cooper, MD

Name of program: Pediatrics

Purpose: Young men who have sex with men (MSM) aged 13-24 years are disproportionately affected by HIV. PrEP is an effective intervention to prevent HIV acquisition; however, patients' access to PrEP is limited by provider knowledge of and willingness to prescribe PrEP. We sought to examine PrEP-prescribing barriers among adolescent and young adult providers.

Methods: We conducted an online survey of adolescent providers in the United States through the Society of Adolescent Health and Medicine listserv from October to December 2016. The analysis was restricted to active members capable of prescribing PrEP. Survey items assessed sexual history-taking practices, knowledge of PrEP, perceived barriers to PrEP and preferred PrEP training opportunities. We performed descriptive statistics stratified by provider practices with adolescent (aged 13-17 years) and young adult (aged 18 to 26 years) patients.

Results: Of 960 eligible providers, 144 completed the survey (response rate 15%). Nearly all (139) providers had heard of PrEP, and 56 (40%) had prescribed PrEP. While a high proportion of providers (92%) agreed that PrEP prevents HIV, fewer providers were willing to prescribe to young adults (81%) or adolescents (67%). Providers also reported safety concerns more frequently with adolescents - 75% believed PrEP could be safely used by adolescents, 94% believed it could be used safely by young adults. A minority of providers would refer adolescents (19%) or young adults (15%) for PrEP services; the most common reasons for referral included being at high-risk, or experiencing, a substantial side effect. Among providers who had not prescribed PrEP, interventions that would increase provider willingness to prescribe included: a navigation guide to pay for PrEP (92% of providers), PrEP provider training or certification program (85%), tools to promote medication adherence (85%) and a PrEP hotline to ask questions (83%).

Conclusions: Almost all adolescent providers in this sample have heard of PrEP and most providers are willing to prescribe PrEP to their patients. Prioritizing the development of navigation support systems and provider training programs might improve provider willingness to prescribe PrEP to youth, particularly among those who have not previously prescribed PrEP. Referral services might be useful for a small portion of providers.
Abstract title: Predictive Factors Associated with a Successful Clinical Outcome from Radiofrequency Ablation of the Genicular Nerves for the Treatment of Chronic Knee Pain due to Osteoarthritis

Resident's name: L. McLean House, MD

Name of program: Anesthesia and Perioperative Care

Purpose: Radiofrequency ablation of the genicular nerves has been introduced as a treatment for chronic knee pain, yet predictive factors of successful outcomes are poorly described. We sought to identify factors that predict clinical success following cooled radiofrequency ablation (cRFA) of the genicular nerves for the treatment of chronic knee pain due to osteoarthritis (OA).

Methods: Cross-sectional cohort study of patients with knee OA, anterior-posterior and lateral weight-bearing radiographs, pain numerical rating scale (NRS) score ≥4, diagnostic response (≥50% pain relief) to genicular nerve blocks, who underwent subsequent cRFA of the genicluar nerves with minimum 6-month follow-up. Outcome data were collected by standardized phone survey. The primary outcome was a composite “treatment success” variable defined as: ≥30% reduction NRS score, patient global impression of change (PGIC) of “improved” or better, and lack of total knee arthroplasty (TKA). Multivariate logistic regression was used to identify covariates associated with treatment success including age, gender, body mass index, duration of symptoms, baseline NRS score, marital status, comorbid mood disorder, history of arthroscopy, knee compartment-specific Kelgren-Lawrence OA scores, and unilateral vs. bilateral procedures.

Results: Fifty-four patients (79 discrete knees), median age of 66 years [IQR: 62-75], 22% male, were included. Median time to follow-up was 6 [IQR 6-7] months. Forty-three treatments (54%; 95% CI: 43-65%) met success criteria. In the multivariate model, younger age (p=0.01), shorter symptom duration (p=0.04), higher baseline NRS score (p=0.02), and lack of prior arthroscopy (p=0.04) were associated with successful treatment (AU-ROC curve: 0.84).

Conclusions: Genicular nerve cRFA resulted in a 54% success rate at minimum 6-month follow-up using a composite definition. Younger age, shorter symptom duration, higher baseline NRS score, and lack of prior arthroscopy predicted success. These factors should be considered when selecting patients for genicular cRFA to treat painful knee OA.
Abstract title: Direct-Acting Antivirals Do Not Increase the Risk of HCC Recurrence

Resident's name: Annsa C. Huang, MD

Name of program: Internal Medicine, Categorical

Purpose: Recent studies have suggested an increased risk of hepatocellular carcinoma (HCC) recurrence after tumor-directed therapy in patients with chronic hepatitis C (HCV) treated with direct-acting antivirals (DAA). The aim of this study was to compare the rates of HCC recurrence after locoregional therapy (LRT) and waitlist dropout in patients with HCV and HCC on the liver transplant (LT) waiting list who received DAA before HCC diagnosis, after HCC diagnosis, or no DAA therapy.

Methods: This is a retrospective cohort study of 178 LT candidates with HCV and HCC with Model for End-Stage Liver Disease (MELD) exception at a single academic medical center from 2014 to 2016.

Results: Compared to patients treated with DAA before HCC diagnosis (n=29) and after HCC diagnosis (n=62), those who did not receive DAA (n=87) had higher Child-Pugh class and were less likely to achieve complete radiologic tumor response after LRT. Compared to patients with no DAA (49%, reference group), those treated with DAA before HCC diagnosis had lower 1-year cumulative incidence of HCC recurrence after complete response with LRT (13%, p=0.04), and those treated with DAA after HCC diagnosis had similar 1-year cumulative incidence of recurrence (45%, p=0.92). In univariate competing risk analysis, compared to patients without DAA, those treated with DAA after HCC diagnosis had similar rates of HCC recurrence (HR: 0.98, p=0.92), but those treated with DAA before HCC diagnosis had significantly lower rates of HCC recurrence (HR 0.46, p=0.04).

In multivariate competing risk analysis, adjusted for DAA group, Child-Pugh class at listing, and AFP at listing, there was no difference detected in risk of waitlist dropout for patients treated with DAA before HCC diagnosis compared to those with no DAA therapy (HR: 0.47, p=0.11). However, patients who received DAA after HCC diagnosis had significantly reduced risk of dropout (HR: 0.22, p=0.002) compared to those without DAA.

For LT recipients, alpha-fetoprotein at LT (p=0.56), presence of viable tumor on explant (p=0.48), grade of differentiation (p=0.43), presence of vascular invasion (p=0.40), and explant HCC within Milan criteria (p=0.83) were similar among the three groups.

Conclusions: In LT candidates with HCV and HCC treated with LRT with initial complete response, DAA use is not associated with increased risk of HCC recurrence or waitlist dropout. Our results support the use of DAA therapy in patients on the transplant waiting list with HCC who have achieved initial response to LRT.
**Abstract title:** Cell of Origin and Double Protein Expression As Predictors of Outcome after Autologous Stem Cell Transplant for Patients with Relapsed/Refractory Diffuse Large B-Cell Lymphoma (DLBCL) who Undergo Intensive Consolidation Therapy (ICT) and Autologous Stem Cell Transplant (AutoHCT)

**Resident's name:** Bradley Hunter, MD, MPH

**Name of program:** Internal Medicine, Categorical

**Purpose:** For patients with relapsed or refractory DLBCL with chemosensitive disease after 2nd line (salvage treatment), AutoHCT is considered the standard of care. Risk factors for progression following AutoHCT include primary refractory disease and early relapse.

**Methods:** Consecutive patients who underwent ICT followed by autoHCT for relapsed/refractory DLBCL at our institution between 2005-2015 and had available tissue samples for review were included in our analysis. ICT was applied per institutional standard to patients with apriori identified high-risk features as described below. This chemotherapy step is utilized for stem cell mobilization following evidence of chemosensitivity and prior to undergoing AutoHCT. COO was determined using the Hans algorithm and DPP status using the Johnson criteria. Following CHR approval, patient’s charts and EMR were reviewed to ascertain baseline variables and outcome data. Response was determined using radiologic (CT) and metabolic (PET) imaging for all patients at the time of transplantation. Survival probability was estimated by the Kaplan-Meier method. Comparisons were made using the X2 test and Fisher’s exact test, where appropriate.

**Results:** A total of 35 patients were included in this analysis. Out of those, 30 patients received a high-dose etoposide and ara-C-based ICT regimen as described by Damon et al. 13/30 (43.3%) were female, 17/30 (56.7%) were male. Median age was 56 (range 34-68). The high risk features that lead to this treatment were: early.

**Conclusions:** Even though COO and DPP status are associated with inferior outcomes in the front-line setting of patients with DLBCL, data in the relapsed setting are limited. In a cohort of high-risk patients with relapsed DLBCL, we confirmed our previously described excellent outcomes with ICT in terms of increased CR rates prior to AutoHCT and a high rate of 2-year PFS. Moreover, while numbers are small, our study suggests that ICT leads to similar outcomes regardless of cell of origin or double protein expression status.
Abstract title: Assessing the effectiveness of new technologies approved for Medicare add on payments

Resident’s name: Timothy Judson, MD, MPH

Name of program: Internal Medicine, Categorical

Purpose: To determine the strength of evidence for effectiveness of technologies approved for New Technology Add-on Payments (NTAPs), and the applicability of these data to Medicare beneficiaries.

Methods: We analyzed Food and Drug Administration Summaries for all technologies approved for NTAPs and performed a systematic review of all pivotal efficacy studies supporting approval of these new technologies. We included all NTAPs from fiscal years 2001-2016. We abstracted data on characteristics associated with the quality of clinical studies such as randomization, blinding, use of controls, use of surrogate endpoints, funding source as well as demographic and clinical characteristics of the study population.

Results: There were 22 technologies approved for NTAPs. There were 17 new devices (9 cardiovascular, 4 neurologic, and 4 in other fields) and 5 small-molecule drugs or biologics. There were 27 pivotal efficacy studies (1.2 studies per technology) in support of the approvals. Thirteen of 27 studies (44%) were randomized, 9 of 27 (37%) were blinded, and 14 of 27 (52%) included active controls. Twenty-seven primary end points were identified, of which 10 (37%) were surrogate endpoints. Of the 19 technologies with investigator disclosure statements, principal investigators for 15 of these technologies (79%) had direct conflicts of interest. Of the 17 devices, 10 (59%) had at least one recall through December 31st, 2016. Of the 5 small-molecule drugs and biologics, 1 (20%) was removed from market after subsequent evidence of ineffectiveness and safety concerns.

Conclusions: Approval of technologies for Medicare NTAPs is often based on studies that lack adequate strength, may be prone to bias, and may not be generalizable to the Medicare beneficiary population. Technologies receiving NTAPs are often recalled or removed from the market, suggesting NTAP determination criteria may need reevaluation.
Abstract title: Impact of Clinical Decision Support in Electronic Medical Records for Pharmacist Therapeutic Interchange Programs

Resident’s name: Amy Kang, PharmD

Name of program: Pharmacy

Purpose: Therapeutic interchange (TI) is the substitution of medications that are therapeutically equivalent but chemically different. A built-in clinical decision support system in electronic medical records (EMR), including guidance on appropriate dose conversions from non-formulary to formulary medications, is proposed to maximize the efficacy and safety of TI while reducing costs. The objective of this study is to evaluate the efficacy, safety, and pharmacoeconomic impact of utilizing clinical decision support in comparison with pharmacist authorized interchange in EMR for TI programs at the University of California San Francisco Medical Center (UCSFMC) by comparing three different time frames—pre-EMR dose conversion guidance prescriber alert, post-EMR prescriber alert, and post-pharmacist-authorized TI.

Methods: This is a retrospective study to evaluate the efficacy, safety, and pharmacoeconomic impact of a three-phase TI program. This study evaluated the following class of medications: angiotensin-converting enzyme inhibitors (ACEIs), angiotensin II receptor blockers (ARBs), and 3-hydroxy-3-methylglutaryl-coenzyme (HMG-CoA) reductase inhibitors. Data collection periods include three different time frames: pre-EMR prescriber alert from November 1st, 2013 to January 31st, 2014 (period 1), post-EMR prescriber alert from November 1st, 2014 to January 31st, 2015 (period 2), and post-pharmacist auto-interchange from November 1st, 2016 to January 31st, 2017 (period 3).

Results: (preliminary): For all medication classes, a trend for improvements in formulary adherence were demonstrated from period 1 to period 3 (total period 1 vs 2 vs 3 (78.3% vs 97.6% vs 99.2%); ACEIs: period 1 vs 2 vs 3 (83.7% vs 98.2% vs 99.7%); ARBs: period 1 vs 2 vs 3 (90.4% vs 96.2% vs 99.5%); HMG-CoA reductase inhibitors: period 1 vs 2 vs 3 (73.0% vs 97.8% vs 98.9%)).

Conclusions: Clinical decision support with prescriber alerts and pharmacist-driven TI programs increase formulary adherence. Further data analysis is needed to better understand the efficacy and accuracy of clinical decision support in EMR for pharmacist TI programs.
Abstract title: Metabolic Acidosis Resolution in Premature Neonates

Resident's name: Kristine Keller, PharmD

Name of program: Pharmacy

Purpose: Extremely-low birth weight, premature neonates are at a higher risk for developing metabolic acidosis due to the buildup of lactic acid in the setting of deranged metabolism, electrolyte disturbances, and ineffective excretion through an underdeveloped kidney. The use of sodium bicarbonate to reverse metabolic acidosis has been associated with worsening acidosis, cardiac morbidity, and development of intraventricular hemorrhage. The objective of this study was to evaluate clinical markers of metabolic acidosis resolution using sodium bicarbonate versus sodium acetate in extremely low birth weight neonates.

Methods: This study utilized a prospective cohort (July 2016 - January 2017) with historical controls (July 2015 - June 2016). The primary safety outcomes were development of IVH as defined by hemorrhage grade, and mortality in first eight days of life. The primary efficacy outcome is the resolution of metabolic acidosis as measured by arterial blood gases over the first eight days of life. A mixed effects model was used to evaluate clinical markers of metabolic acidosis resolution.

Results: Forty-two (n=21 per group) patients were evaluated. The average weights of infants were 708g in the sodium bicarbonate group and 750g in the sodium acetate group. The average gestational ages were 25.6 weeks for the sodium bicarbonate group and 26.1 weeks for the sodium acetate group. The average dose provided were 2mEq/kg/day of sodium bicarbonate and 1.5mEq/kg/day sodium acetate on non-consecutive days. The median number treatment was 2 days for sodium bicarbonate and 4 days for sodium acetate. In the first eight days of life, the rate of death was similar between both groups.

Conclusions: Sodium acetate portends a similar likelihood of metabolic acidosis resolution as sodium bicarbonate. Although it would seem that sodium acetate did not provide mortality benefit in these patients, a small number of patients were evaluated and therefore statistical significance could not determine differences between groups.
Abstract title: Risk Factors for 30 Day Hospital Readmission in Patients Discharged on Outpatient Parenteral Antimicrobial Therapy (OPAT)

Resident’s name: Jennifer O. Kwon, PharmD

Name of program: Pharmacy

Purpose: Outpatient parenteral antimicrobial therapy (OPAT) allows patients to receive intravenous (IV) antimicrobial therapy in alternative care settings. OPAT programs have been shown to facilitate hospital discharge, improve patient satisfaction and quality of life. However, studies have shown that up to 20% of patients discharged on OPAT are readmitted to the hospital within 30 days. At the University of California, San Francisco (UCSF) Medical Center, about 500 patients are discharged on intravenous antibiotic therapy annually. At present, UCSF does not currently have an OPAT program and the readmission rate of patients discharged on home antibiotic therapy is currently unknown.

Methods: A retrospective cohort study of all patients discharged from the UCSF Medical Center on OPAT from January 1, 2015 to December 31, 2015 was performed. Subject inclusion criteria include: age 18 years old and receipt of OPAT in discharge summary. Exclusion criteria include: chronic prophylactic intravenous antibiotics for chronic suppression, initiation of OPAT as outpatient, discharged to skilled nursing facility, acute rehab, or other outside hospital and receipt of IV therapy other than OPAT. The primary objective of the study is to assess risk factors associated with 30-day hospital readmission in patients discharged on OPAT. Patients readmitted within 30 days of hospital discharge on OPAT will be compared with patients on OPAT who were not readmitted. The secondary objective is to perform a pharmacoeconomic analysis associated with the hospital readmissions. Data was collected and stored on a secure online database.

Results: A total of 582 patients were screened and 321 patients (55.2%) were discharged on OPAT from January 1, 2015 to December 31, 2015. From the patients discharged on OPAT, 90 patients (26.6%) patients were readmitted within 30 days. 8 patients had an ED visit but no 30-day hospital readmission. Results have not been completed and final results will be presented at the poster session.

Conclusions: In conclusion, we saw a 26.6% (n=90 patients) 30-day readmission rate in our patients discharged on OPAT therapy. These results are similar to what is currently found in the literature. However, this is a retrospective chart review and prospective trials need to be completed to validate our results. Also, we have not completed the results and final results are to be presented at the poster session.
Abstract title: Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) for Analgesia Post-Cerebrovascular Surgery: Safety & Efficacy

Resident’s name: Ngan (Catherine) Lai, PharmD

Name of program: Pharmacy

Purpose: Concerns about the effects of NSAIDs on renal function, platelet function, and bleeding complications limit their role in postoperative pain management. However, recent evidence and clinical experience suggest there is no increased risk of adverse events with short-term use of NSAIDs during the early postoperative period. NSAIDs may also have an opioid-sparing effect and decrease opioid side effects.

Methods: The safety and efficacy of NSAIDs for postoperative pain management in adult patients post craniotomy was evaluated through a retrospective cohort analysis pre- and post-implementation of an ordering protocol. The primary objective of safety was assessed by renal function. Secondary safety endpoints included bleeding complications and NSAID-related side effects. Efficacy was measured by opioid use in total morphine equivalents per day, opioid-related side effects, and hospital length of stay. Per the ordering protocol, neurosurgery vascular patients were evaluated for eligibility to use an oral NSAID as early as postoperative day one. Patients were excluded if they had contraindications to NSAIDs, less than one day of NSAID therapy, or known history of bleeding disorders or heart failure.

Results: In the 2013-2014 pre-implementation group, 74% (94/127) were eligible for the use of an oral NSAID and 35.1% (33/94) of those eligible were ordered an NSAID. In comparison, 68.9% (62/90) were eligible in the 2016 post-implementation group with 53.2% (33/62) ordered an NSAID. Preliminary results indicate no differences in renal function or bleeding complications.

Conclusions: The conclusion is contingent upon final results and analysis. It is anticipated that this study will contribute to the understanding of the risks and benefits of NSAID use for multimodal postoperative pain management in a neurosurgical patient population.
Abstract title: A Prospective, Multicenter Cohort Study to Compare Intramedullary Nail and Skeletal Traction for Femoral Shaft Fractures in Malawi

Resident's name: Brian C. Lau, MD

Name of program: Orthopaedic Surgery

Purpose: In low- and middle-income countries (LMICs) like Malawi, patients with femoral shaft fractures are most commonly treated with skeletal traction. Skeletal traction is the mainstay of treatment due to implant cost and availability, however, patients must remain in bedrest at least 6-8 weeks for fractures to heal. Intramedullary nailing, the treatment of choice in developed countries, has a more upfront cost for the implant but patients are able to ambulate within days from surgery and return to work sooner. No prospective studies have been conducted in resource-limited settings to compare patient-reported outcomes between these two treatments. The purpose of this study is to assess the quality of life of femoral shaft fracture patients treated by skeletal traction and Surgical Implant Generation Network (SIGN) intramedullary nail in a resource-constrained environment.

Methods: Enrollment for this multicenter, prospective cohort study began in February 2016. Consecutive adult patients with femoral shaft fractures (AO/OTA 32) treated by skeletal traction or SIGN intramedullary nail were enrolled at six hospitals in Southern and Central Malawi. Patients with polytrauma, surgical site infection, open fractures and pathologic fractures were excluded. Primary outcomes are the quality of life assessed by EQ-5D index (Zimbabwe) and EQ-5D VAS, as well as the Short Musculoskeletal Form Assessment (SFMA). Patients were administered the EQ-5D and SMFA at baseline, then all subjective and objective tests at six weeks, three months, 6 months and one-year postoperatively. Student t-test was used for comparison.

Results: Two hundred and sixty patients with femoral shaft fractures were screened at six hospitals and 125 meeting eligibility criteria were consented (100% enrollment rate). There were 70 (56%) treated definitively by skeletal traction and 55 (44%) treated by IM nail. The most common mechanism of injury was road traffic injury (84%). Average age, gender distribution, injury laterality, comorbidities, wage range, education level, smoking status, baseline EQ-5D, and baseline SMFA were the same between the two cohorts. At the time of this preliminary report, 62 patients reached six-week follow-up, 43 reached three-month follow-up and 18 reached six-month follow-up. No patients are yet eligible for one-year follow-up. Patients treated with IM nail reported better scores on the EQ-5D index (7 vs 12), EQ-5D VAS (88 vs 50), SMFA Functional Index (60 vs 92) and SMFA Bothersome Index (40 vs 84) at three-months postoperatively (p

Conclusions: The high screening, enrollment and preliminary follow-up rate demonstrate the feasibility of implementing a multicenter, prospective study in a resource-limited setting. The preliminary data suggest that up to six months postoperatively, patients with femoral shaft fractures report higher quality of life and functional outcome if treated with SIGN intramedullary nailing compared to skeletal traction. Although, there is a higher initial costs for the SIGN intramedullary nailing there may be an overall benefit to the patients' satisfaction, recovery, as well as limit lengthy hospitalizations.
Abstract title: Impact of Antipsychotic Therapy on QTc Prolongation in Critically Ill Patients

Resident's name: Sue Lee, PharmD

Name of program: Pharmacy

Purpose: Quetiapine is an atypical antipsychotic commonly utilized for the management of delirium in critically ill patients. Despite the known effect of quetiapine on QTc prolongation in the psychiatric patient population, this effect remains largely unknown in the critically ill patient population. The purpose of this study was to evaluate QTc prolongation following administration of quetiapine for the management of ICU delirium, and to assess the efficacy of telemetry to measure the QTc in comparison with EKG measurements.

Methods: This was a prospective, observational cohort study. The change in QTc from baseline was evaluated in patients after receiving 12.5 mg, 25 mg, and 50 mg doses. Patients were enrolled from October 2015 through March 2017. Change in QTc was compared with a control group receiving melatonin alone for ICU delirium. A validation study was completed prior to patient enrollment to assess accuracy of telemetry when compared to EKG to monitor QTc prolongation.

Results: In the quetiapine group, no significant change in QTc was observed from baseline to post-drug administration with a mean change of -2.0 msec (447.5 ± 52.9 msec vs. 445.5 ± 41 msec, p=0.81). Similarly, there was no significant change in QTc in the melatonin group with a mean change of -5.6 msec (462.4 ± 48.7 msec vs. 456.8 ± 44 msec, p=0.35). When comparing the quetiapine group to the melatonin group, there was no difference in mean change in QTc from baseline to post-drug administration (2.25 ± 52 msec vs. -5.6 ± 32 msec, p=0.73).

Conclusions: The results of this study demonstrate a non-significant statistical and clinical change in the QTc following quetiapine administration in critically ill patients. Routine QTc monitoring with EKG(s) following quetiapine administration may not be warranted.

Resident’s name: Aditi Murthy, MD

Name of program: Dermatology

Purpose: Vascular malformations present with pain, bleeding, disability and disfigurement in a subset of children. There is scant data available on safety and efficacy of laser surgery for symptomatic or disfiguring nonport-wine stain vascular malformations in children. The objective of this study is to determine the safety and efficacy of the 1064nm long pulsed neodymium-doped yttrium aluminum garnet (LP Nd:YAG) laser for treatment of symptomatic or disfiguring vascular malformations in children.

Methods: This is a retrospective review of 29 pediatric patients with vascular malformations who were treated with the LP Nd:YAG laser at UCSF. We recorded patient demographics, clinical features (body site and symptoms), prior treatments (surgery, sclerotherapy, other laser), treatment details (indications, number of treatments, laser equipment and parameters), clinical response and complications. An expert panel of 4 reviewers (2 pediatric dermatology laser surgeons, 1 adult dermatology laser surgeon, 1 general pediatric dermatologist) rated clinical improvement based on pre- and post-treatment photos using a 4 point scale: 0-25%-Poor, 26-50%-Fair, 51-75%-Good, 76-100%-Excellent. Only subjects (N=20) for whom adequate pre- and post-laser photos were available were rated. Reviewers were blinded to laser parameters and number of treatments.

Results: A total of 29 patients were included. The cohort consists of 17 patients with venous malformations, 5 with glomuvenous malformations, 5 with angiookeratoma circumscriptum/verrucous hemangioma and 2 with “other”. A majority were female (66%). Ethnicities represented were diverse including 62% Caucasian, 28% Hispanic and 7% Asian. 18 patients had a prior laser, excisional or sclerotherapy procedure. Average age at first treatment was 9.3 years old. The majority of malformations were located on the head and neck (48%) and extremities (31%). 10 patients had oral lesions. Most lesions treated were localized (45%) or regional (41%); 4 patients (14%) had diffuse body involvement. Bleeding (38%) and pain (34%) were the most common indications for treatment, and 48% had greater than 2 indications. The total treatments ranged from 1 to 16, with a mean of 4.6. Blinded assessment of clinical efficacy revealed good to excellent results in 66.7 % and poor to fair results in 25%. The overall rate of complications was 21%, with minor skin breakdown and blistering being most common.

Conclusions: This study reports the outcomes and safety of LP Nd:Yag laser used to treat a cohort of pediatric patients with non-port-wine stain vascular malformations. A majority of patients had an overall good to excellent response. Number of treatments required to achieve the desired outcome vary and may be related to lesional characteristics, body site and experience of the laser surgeon among other factors. Skin breakdown is a risk of LP NdYAG laser surgery. Managing expectations is an important aspect of performing non-curative laser surgery for children with vascular malformations. This report adds to the small body of literature on the utility and safety of LP Nd:YAG laser for disfiguring or symptomatic vascular malformations in children.
**Abstract title:** Evaluation of the Opioid-Sparing Effects of Scheduled Tramadol

**Resident’s name:** Kathie E. Nowicki, PharmD

**Name of program:** Pharmacy

**Purpose:** Post-operative multimodal analgesia has been shown to reduce opioid use and decrease length of hospital stay. Tramadol has been used postoperatively as an adjunct analgesic with the intent of reducing the use of more potent opioids and improving pain. At this time there is a lack of literature supporting this practice. The objective of this study is to determine if the addition of scheduled tramadol in the post-operative setting decreases the use of more potent opioids.

**Methods:** This retrospective chart review of adult orthopedic, neurospine, and general surgery patients admitted to the University of California, San Francisco Medical Center between December 2013 and August 2016 included patients receiving at least 4 consecutive doses of scheduled tramadol within 7 days of surgery. The primary outcome was opioid consumption before and after the initiation of scheduled tramadol, calculated in oral morphine equivalents (OME). Opioid consumption was measured post-operatively 24 hours prior to the start of tramadol, then 24 and 48 hours after scheduled tramadol initiation. Secondary outcomes included changes in daily average pain scores, naloxone use, and adverse events related to tramadol.

**Results:** A total of 132 patients were identified using medication administration reports. Of those patients, 97 were included in the final analysis. Subjects received an average of 128.6 mg OME during the 24 hours prior to tramadol initiation compared to 113.4 mg in the 24 hours after the addition of tramadol to their pain regimen (P=0.012). In the 48 hours after tramadol was started, the daily average use was 104.4 mg OME (P<0.0001). The daily average pain score decreased by an average of 0.43 points on standard pain score of 0-10 after tramadol was started (P=0.009).

**Conclusions:** There was a statistically significant reduction in opioid use after tramadol was added to a patient’s post-operative pain regimen.
Abstract title: Utilization and Monitoring of Methadone in Pediatrics

Resident’s name: Sylvia A. Okrzesik, PharmD

Name of program: Pharmacy

Purpose: Methadone is an analgesic that is commonly utilized for opioid dependence and pain management. With its distinct pharmacokinetic and pharmacodynamic properties, it has served with great utility over other therapies in the pediatric and adult population. Literature has been established for cardio-toxicity correlated with methadone in the adult population. Prevalence of QT prolongation has not been reported in pediatric patients; however, 2% of patients utilizing methadone in opioid treatment programs have been reported to have prolonged QT intervals. In recent years, use of methadone has increased in the pediatric population, specifically in oncology patients who have high opioid tolerance and in critically ill patients who are being weaned from their pain management regimens.

Due to these adverse events occurring in adult patients, many pediatric societies have developed recommendations for monitoring patients that are on methadone. In 2014, the American Pain Society recommends obtaining a baseline ECG prior to starting therapy and follow up ECGs if patients reach max doses or present with signs, symptoms, and risk factors for having a prolonged QT. Although recommendations are available for monitoring patients on methadone, including timeframe of ordering electrocardiograms, little is known about compliance with these recommendations. The primary objective of this study is to determine the compliance of providers with established recommendations and the secondary objectives of this study is to identify characteristics of patients commonly prescribed methadone.

Methods: This retrospective chart review was conducted at UCSF Benioff Children's Hospital from January 2014-August 2016. Data was retrieved from a previously obtained dataset. Baseline demographics included age, gender, race, ordering of baseline ECGs, use of ECGs, methadone dose and changes dose were retrieved from this dataset. Statistical tests utilized to evaluate date included t-test for categorical data and multiple regression for variance.

Results: One hundred and twenty-six patients prescribed methadone during their admission were reviewed. There were three indications that methadone was prescribed: 57% were prescribed methadone for pain management, 41% were prescribed methadone for an opioid taper, and 2% were prescribed methadone for an alternate indication. Only 39% patients had baseline ECGs prior to starting Methadone therapy. The mean starting and ending dose were 1.5 mg and 2 mg respectively. The mean maximum total daily dose was 10 mg.

Conclusions: Data shows that monitoring was not consistently implemented in pediatric patients ordered Methadone. This data identified the patient’s commonly prescribed Methadone and which services require additional education for monitoring of Methadone.
Abstract title: FUERTE: A novel, school-based, trauma-informed group therapy intervention for recently immigrated youth

Resident’s name: Heyman Oo, MD, MPH

Name of program: Pediatrics

Purpose: FUERTE is a novel, school-based, trauma-informed group therapy program that was developed through a partnership with San Francisco Unified School District, San Francisco Department of Public Health, UCSF Pediatrics and various community-based organizations. The program's goal is to improve mental health outcomes for a high-risk population of recently immigrated youth, streamline referrals processes for community based resources and demonstrate the efficacy of a short-term school-based intervention.

Methods: Founding members of FUERTE (pediatricians) performed a needs assessment of barriers to care for this population through focus groups and literature reviews. We then partnered with child psychologists to create a group therapy curriculum based around 5 one-hour sessions. The impact of the FUERTE program is measured through a mixed-methodology evaluation consisting of quantitative symptomology scales (Pediatric Symptom Checklist 17 and Resiliency Scale 14) and qualitative group interviews.

Results: To date, over 40 community mental health providers have been trained as FUERTE facilitators. FUERTE was piloted with two groups spring 2016, and expanded to 3 SF high schools fall 2017 with a total of 34 youth (12 girls and 22 boys ages 14-19). Of the completed surveys, the average participant PSC-17 (validated screen of psychosocial problems) score decreased from 16.2 to 11.1 ($p$)

Conclusions: Initial data support that student participation in this novel program is associated with a significant decrease in PSC-17 scores. Further data to evaluate the impact of this program on school performance are pending. FUERTE intervention will be expanded to 4-5 high schools and 2-3 middle schools in Spring 2017. The finalized FUERTE curriculum will be disseminated on a national scale for open adaptation.
**Abstract title:** Administrative Claims Versus Surgical Registry: Capturing Outcomes in Total Joint Arthroplasty

**Resident’s name:** Joseph T. Patterson, MD

**Name of program:** Orthopaedic Surgery

**Purpose:** Administrative claims in total joint arthroplasty are used for observational studies and payment adjustments under the Comprehensive Care for Joint Replacement (CJR) legislation. Claims data have not been validated against prospective surgical outcome registries for primary total hip (THA) or knee arthroplasty (TKA). We hypothesized that significant differences in reported comorbidity and adverse event measures exist between administrative claims and prospective registry data relevant to payment adjudication under the CJR reimbursement model.

**Methods:** Comorbidities and outcomes in primary TKA and THA in the United Healthcare and Medicare Standard Analytic File 5% Sample insurance claims datasets (PearlDiver Technologies, Inc) were compared to age-matched cohorts from the National Surgical Quality Improvement Program (ACS-NSQIP) surgical outcomes data from 2007-2011 using comparable ICD-9-CM and CPT codes at 30, 90, and 360 days from index arthroplasty. Pearson’s chi-square test was used for statistical analyses.

**Results:** The total study population included 93,953 primary THA and 176,944 TKA patients. Primary TKA and THA patients in insurance claims cohorts had significantly fewer reported comorbidities, higher rates of surgical site infection, pulmonary embolism, wound dehiscence, thromboembolic events, and neurologic deficits, and lower reported rates of revision surgery than ACS-NSQIP cohorts within 30 days of primary total knee and total hip arthroplasty. Cumulative incidence of adverse events increased significantly from 30 to 365 days after primary arthroplasty.

**Conclusions:** We report significant discordance in the prevalence of patient comorbidities and incidence of adverse events in primary THA and TKA between ACS-NSQIP and the administrative claims data of Medicare and United Healthcare. These disparities have implications for observational outcome studies as well as payment adjudication under the CJR reimbursement model in total joint arthroplasty.
Abstract title: Hyperkyphosis and Aging in the Women’s Interagency HIV Study

Resident’s name: Anne M. Ritchie, MD

Name of program: Internal Medicine, Categorical

Purpose: HIV-infected women have lower bone mineral density (BMD) and a higher rate of fracture than uninfected women, but the contribution of HIV to hyperkyphosis is not known. Hyperkyphosis is a geriatric syndrome of multifactorial etiology including decreased BMD, vertebral fracture, and muscle weakness and is of significant clinical concern. Hyperkyphosis has been associated with decreased physical function, impaired pulmonary function, decreased quality of life, and increased all-cause mortality. We hypothesized that HIV infection would be associated with hyperkyphosis compared to uninfected women in a cohort of early postmenopausal women.

Methods: We compared the Cobb Angle (CA), a radiographic measure of kyphosis, in 130 HIV-infected and 70-uninfected participants of the Musculoskeletal (MSK) Substudy of the Women’s Interagency HIV Study (WIHS). The WIHS is a multicenter prospective study of the progression of HIV infection in women with and at risk for HIV. We performed logistic regression of demographic, lifestyle, body composition, and HIV-related factors to determine age-adjusted associations with hyperkyphosis, defined using a CA cut-off ≥40°, which has been validated in HIV-uninfected postmenopausal women.

Results: Over half of women were African-American; the majority was overweight or obese (median BMI: 29kg/m2 in HIV-infected and 30kg/m2 in HIV-uninfected). HIV-infected and uninfected women had a median age of 50 and 49 years, respectively (range: 40 to 60 years) and by design of the MSK Study, in the early postmenopausal phase as measured by an undetectable anti-Mullerian hormone level. HIV-infected women had lower BMD than uninfected women. The median CA in HIV-infected women was 29° (interquartile range [IQR]: 23°, 35°) and 30° (IQR: 27°, 34°) in uninfected women, respectively; 10% of each group met the definition for hyperkyphosis with CA≥40°.

In age-adjusted analysis, HIV infection was not associated with greater hyperkyphosis (Odds Ratio [OR] 0.94; 95% Confidence Interval [CI]: 0.35, 2.5) when compared to those without HIV infection. Greater lumbar spine BMD remained associated with lower odds of hyperkyphosis (OR 0.75; 95% CI: 0.57, 0.99), after adjusting for age. Among HIV-infected women, greater lumbar spine BMD was associated with non-significantly lower odds of hyperkyphosis (OR 0.77; 95%CI: 0.54, 1.10). Greater CD4 was associated with greater odds of hyperkyphosis (OR 2.47; 95%CI: 0.88, 6.90), but the association did not reach statistical significance.

Conclusions: Contrary to our hypothesis, we did not find that early post-menopausal HIV-infected women had greater hyperkyphosis than uninfected women. As expected, lower lumbar spine BMD was significantly associated with hyperkyphosis. Further study is needed in a larger cohort of post-menopausal HIV-infected women as they age.
**Abstract title:** Ethnicity and Eating Disorders in Female Veterans

**Resident’s name:** Andrea Rosati, MD, PhD

**Name of program:** Psychiatry

**Purpose:** The purpose of this study was to examine the association between cultural background and eating disorders in female military veterans. Recent research suggests that ethnicity influences the prevalence of eating disordered behavior among non-military populations, though few studies have examined these relationships in the setting of military culture among veterans.

**Methods:** Female veterans (n=388) completed self-report measures of eating disordered behavior, including the Eating Attitudes Test-26, Eating Disorder Examination Questionnaire (EDE-Q), and Eating Disorder Screen for Primary Care (EDS-PC).

**Results:** Results showed that Caucasians reported significantly more eating disordered behavior than non-Caucasians on the EDS-PC (p

**Conclusions:** Ethnic differences in eating disordered behavior among female military veterans may be due to contributions of within-group cultural differences in norms and values around eating, as well as an interaction of ethnicity with military cultural influence. Findings suggest a role for culturally-informed treatment planning for eating disorders among veteran populations.
Abstract title: Clinicopathologic Review of Non-classic Lobular Carcinoma In Situ Variants at a Single Academic Center

Resident’s name: Eliah R. Shamir, MD, PhD

Name of program: Anatomic Pathology

Purpose: Pleomorphic (PLCIS) and florid lobular carcinoma in situ (FLCIS) are rare variants (vLCIS), considered to be more aggressive than classic LCIS (cLCIS) and likely non-obligate precursors to invasive carcinoma (IC). However, sequencing studies comparing paired vLCIS and IC have not been performed. Management of vLCIS is controversial due to lack of long-term follow-up data and a limited understanding of the natural history and optimal treatment of these lesions. We reviewed vLCIS cases diagnosed at our institution, with an attention to clinicopathologic features, outcomes, and treatment in order to help guide management. We further profiled the genomics of paired cLCIS, vLCIS, and IC in a subset of cases to better understand their genetic relatedness.

Methods: Clinical, radiologic, and pathologic findings from all vLCIS cases diagnosed on core biopsy (CB) and/or excision were reviewed, with a focus on demographics, presentation, and associated lesions (cLCIS, ductal carcinoma in situ [DCIS], IC). For a subset of cases of pure vLCIS on CB, we assessed upgrade rate, margin status, and treatment. Four cases of vLCIS (two PLCIS and two FLCIS) associated with IC were used for next-generation sequencing and copy number analysis of 480 cancer-related genes.

Results: Mean age was 59 (range 35-86). Of 89 total patients with vLCIS, 59 (66%) were PLCIS, and 30 (34%) were FLCIS. 66 (74%) were associated with IC (24 invasive lobular carcinoma [ILC], 26 pleomorphic ILC [PILC], 5 microinvasive LC, 4 invasive ductal carcinoma, and 7 IC with ductal and lobular features); 6 (7%) were associated with DCIS; and 17 (19%) were ultimately pure vLCIS without IC. Of patients with pure vLCIS on CB (n=21), 11 (52%) presented with calcifications; only one presented with a palpable mass and was PLCIS in a sclerosing lesion. All pure LCISv on CB represented the targeted lesion (n=21). In 18 (86%), synchronous cLCIS was also present. 91% of PLCIS (n=10) and 60% of FLCIS (n=6) underwent surgery, with an upgrade rate of 36% (1 DCIS, 1 PILC, 3 ILC). Final vLCIS margins were positive in one case. None received radiation (n=17), and 47% received endocrine therapy (n=8). No pure vLCIS recurred (mean follow-up 23 months). Sequencing of paired vLCIS and ILC demonstrated shared pathogenic mutations and copy number changes between the two components in all four cases. Two cases had synchronous cLCIS that was sequenced; in one, cLCIS was clonally related, and in the other, cLCIS was distinct.

Conclusions: In contrast to pure cLCIS, pure vLCIS on CB is typically the targeted lesion and not incidental. The upgrade rate of pure vLCIS on CB to IC on excision was 36%. No women with pure vLCIS at our center received radiation, but endocrine therapy was common. No pure vLCIS recurred. Overall, most vLCIS is associated with IC, most commonly PILC (39%) or ILC (36%). Our sequencing data provide evidence that vLCIS is clonally related to adjacent IC and at least in some cases may arise from the same precursor as synchronous cLCIS.
Abstract title: Who is the “Hospital-Dependent” Patient? Medical, Functional, and Social Characteristics

Resident’s name: Grant M. Smith, MD

Name of program: Internal Medicine, UC Primary Care

Purpose: As medical advances have increased the survival of older adults, there is an emerging population that depends on the hospital to maintain an acceptable quality of life. These patients have been labeled “hospital-dependent.” As incentives to reduce costs expand beyond preventing 30 day readmissions, understanding the factors that differentiate hospital-dependent patients from their peers will be important in developing targeted interventions. This study aims to identify the medical conditions, functional limitations, and social supports that differentiate hospital-dependent patients from their age and gender matched peers.

Methods: This is a case-control study using survey data from the Health and Retirement Study (HRS) between 2000 and 2014. The HRS follows a cohort of adults age 50 years and older with comprehensive interviews conducted every two years. Hospital-dependent patients (cases) were identified as participants age 65 and older, who reported having 5 or more hospitalizations over the last two years on at least one HRS survey during the study period. Controls included participants who never reported 5 or more hospitalizations, matched to cases by age, sex, and interview year. Data was obtained from the first year of frequent hospitalization and the two prior interview waves, providing three time points for comparison. Two-tailed t-tests and chi-squared tests were used to compare medical conditions, functional limitations, and social supports for the year of first frequent hospitalization. The slopes of the prevalence of each of the variables generated from the three time points for cases and controls were compared.

Results: There were 31,437 participants in HRS between 2000-2014. More than 4% of these patients reported being admitted to the hospital 5 or more times within two years. Of these patients, 886 had data from the prior two interview waves and controls that could be matched on age, gender, and interview year. The mean age was 77 years (SD 7.9 years).

While nearly all of the medical conditions, functional limitations, and social support variables were significantly different between cases and controls at the time cases were first frequently hospitalized, only a few variables had significantly different trajectories. Compared to controls, hospital-dependent patients had significantly greater increases in rates of heart disease (p=0.0064), hearing impairment (p=0.0256), activities of daily living dependence (p

Conclusions: Patients who become hospital-dependent acquire functional limitations at a greater rate compared to their peers who do not become frequently hospitalized. While many interventions focus on controlling medical conditions, increasing focus on meeting the social and functional needs of older adults may help prevent frequent hospitalizations.
Abstract title: Predictors of Recurrence in Clinic-Performed Pterygium Surgery

Resident’s name: Catherine Sun, MD

Name of program: Ophthalmology

Purpose: A pterygium is a fleshy tissue growth on the cornea that afflicts approximately 10% of the population. Pterygia cause symptoms of chronic eye irritation and dryness, and can impair vision by causing astigmatism or covering the pupil. Surgery is currently the only effective treatment for pterygia, and recurrences are common after surgical removal. The large number of patients needing pterygium surgery creates a significant burden on the allocation of operating room time. In this prospective, observational study, we evaluate the predictors of recurrence after outpatient, clinic-performed surgery with conjunctival autograft for primary pterygium.

Methods: Patients with primary pterygium who underwent excision with sutured conjunctival autograft in the minor procedure room at the Zuckerberg San Francisco General Hospital were followed since June 2016. The procedure was standardized and performed by a PGY4 ophthalmology resident under the supervision of an attending. Exclusion criteria included large pterygia requiring amniotic membrane graft, double-headed pterygia and patients unable to tolerate clinic-performed surgery without monitored anesthesia care. The pre- and post-operative clinical care was standardized. The post-operative medication regimen was neomycin and polymyxin B sulfates and dexamethasone ointment followed by prednisone acetate 1% drops tapered over 10 weeks. The primary outcome was recurrence rate. Secondary outcomes included time to recurrence, intraoperative and postoperative complications, and image analysis as predictors of outcome. Data were analyzed using Fisher’s exact test or chi-square test for categorical variables and paired t-test for normally distributed interval variables.

Results: Of the 52 participants, 38 (73%) were female with a mean age of 50 years (SD 11.5 years). The majority had nasal pterygium (N=51) with a mean surface area of 16.36mm2 (SD 7.61). There were 15 recurrences (29%) occurring on average at postoperative month 4 (range 1 to 8 months). There were no intraoperative complications. Minor postoperative adverse effects included steroid-induced ocular hypertension in 11 (21%) patients who required topical medication and 2 (4%) patients with a mild allergic reaction to neomycin and polymyxin B sulfates and dexamethasone. There was a correlation between larger pterygium size and increased rate of recurrence (P=0.002). No correlation was found between recurrence and ocular hypertension (P=0.57), history of recurrence in the fellow eye (P=0.48), or older age (P=0.10).

Conclusions: Our clinic-based method of performing pterygium excision resulted in a recurrence rate of 29% at mean postoperative month 4, which is higher than rates reported in the literature using conjunctival autograft in an operating room setting (Cochrane Review 0-16.7% at month 3). The higher recurrence rate could be due to the patient population at a county hospital. The majority of the patients in our study did not speak English and may have had lower compliance rates with postoperative medications.
Abstract title: Does Cardiovascular Disease Risk in Postmenopausal South Asian Women Catch up to Men?

Resident’s name: Diana Thiara, MD

Name of program: Internal Medicine, UC Primary Care

Purpose: South Asians (SA) bear a greater burden of cardiovascular disease (CVD) and have the highest rate of mortality from ischemic heart disease than other ethnic populations in the US. While studies have identified some modifiable risk factors associated with cardiovascular disease in SA populations, no study has examined whether there is sex difference in subclinical atherosclerosis among postmenopausal women and similarly aged men.

Methods: We conducted a cross-sectional analysis including postmenopausal women and men age 50-84 years old without known cardiovascular disease from the Mediators of Atherosclerosis in South Asians Living in America (MASALA) study. Post-menopausal status was ascertained by self-report, and women with oophorectomy were excluded. High resolution ultrasonography was done to measure common carotid intima media thickness (CCA) and internal carotid intima thickness (ICA), and cardiac CT scan was performed to quantify coronary artery calcium (CAC). Regression models were used to examine the relationship between sex and ICA, CCA, and CAC, separately. Using multivariate analyses, we serially adjusted for traditional CVD risk factors (age, hypertension, diabetes, LDL, BMI, waist circumference, smoking, alcohol use, education, statin use, and family history of heart attack), behavioral factors (exercise and total caloric intake), psychosocial factors (depression, anxiety, burden and traditional cultural beliefs).

Results: Of 576 SA (44% women), men had a mean age of 62 and women 59 years (p

Conclusions: While older postmenopausal women have similar prevalence of carotid intima media thickness compared to men, the prevalence and extent of CAC remains higher in men. These findings suggest that South Asian women, like women in other race/ethnic groups, may not benefit from aggressive statin therapy for primary prevention of coronary heart disease.
**Abstract title:** Evaluation of a Newly Implemented Perioperative Antimicrobial Prophylaxis Guideline in Pediatric Patients Undergoing Cardiac Surgery

**Resident’s name:** Allyson M. Thrall, PharmD

**Name of program:** Pharmacy

**Purpose:** Antimicrobial resistance is a growing concern in the healthcare system. Antimicrobial prophylaxis for surgical procedures represents one of the most common indications for antibiotic use in the hospital. Surgical site infections (SSI) in cardiac surgery lead to major increases in patient morbidity, mortality, and financial cost, especially in the pediatric population. Multiple recommendations exist for safe and effective antimicrobial prophylaxis leading to a great deal of variability pertaining to antimicrobial prophylaxis regimens.

**Methods:** This is a retrospective, double cohort study that is a non-randomized comparison of patients prior to and following the implementation of a perioperative antimicrobial prophylaxis guideline specific to the pediatric cardiac intensive care unit at UCSF Benioff Children's Hospital. On September 1st, 2016, a new antimicrobial prophylaxis guideline was implemented which states that for any routine cardiothoracic surgery, patients will receive cefazolin for 24 hours only after surgery. This guideline was developed with the pediatric cardiac surgeons in conjunction with an antibiotic stewardship team based on current available evidence as well as surgeon preference. The primary objective of this study is to determine the efficacy of the guideline for the prophylactic use of perioperative antimicrobials in pediatric patients undergoing cardiac surgery by comparing rates of SSI before and after the implementation of the guideline. In the post-implementation group, antimicrobial prophylaxis was ordered by prescribers using a specific order set to encourage adherence with the current guideline.

**Results:** The pre-implementation time period will range from September 1st, 2015 to March 1st, 2016 and the post-implementation time period will range from September 1st, 2016 to March 1st, 2017. Expected results include efficacy of the new guideline based on the rate of surgical site infections, compliance to the guideline, as well as antimicrobial stewardship outcomes. Data analysis is currently ongoing. Preliminary results from the first 3 months pre- and post-implementation demonstrate no significant increase in the rate of SSI after the implementation of the guideline (1.1% versus 2.1%). The major contributor to guideline non-adherence is the duration of therapy.

**Conclusions:** Final conclusions will be drawn once data analysis is complete. Preliminary results show that the use of prophylactic antimicrobial agents for a standard 24 hours post-operatively does not cause an increased rate of surgical site infections when compared to using a longer duration of prophylaxis. Pharmacists can play an integral role in the stewardship of antimicrobial prophylaxis for surgical procedures, especially in duration of therapy.
Abstract title: Streamlining Back Pain Clinic Visits

Resident's name: Jocelyn Tseng, MD

Name of program: Preventive Medicine

Purpose: Time pressure often limits the scope of outpatient visits for acute care issues, leaving little time for counseling, let alone preventive care. In a survey of Kaiser San Francisco Internal Medicine residents, history gathering was identified as one element of the outpatient patient-physician interaction that could be made more efficient. Eighty-three percent of residents surveyed agree that gathering patient history details can take too much time, and 87% of residents wish they had more time to counsel patients in their outpatient clinic visits. We examined the feasibility and impact of leveraging patient input with structured pre-visit questionnaires (PVQ). Our specific aims were: (1) develop and test a high-yield PVQ related to back pain, (2) optimize PVQ distribution channels, and (3) evaluate residents’ perceptions of how PVQs impact clinic experience.

Methods: We designed a back pain PVQ using expert consensus guidelines from professional organizations including the American Association of Family Physicians (AAFP). We distributed PVQ to English speaking patients presenting for back pain during resident internal medicine clinics. We utilized short plan-do-study-act (PDSA) cycles to iteratively evaluate clinic workflow and optimize PVQ distribution. We surveyed residents regarding patient’s use of the PVQ tool and benefit of PVQs for clinic visit efficiency and experience.

Results: From January 1 to March 15, 2017, there were nineteen resident clinic back pain visits and eleven completed back pain PVQ. All residents surveyed agree the PVQ streamlined their visits and all would like to continue using the back pain PVQs. After three iterative PDSA cycles, PVQ distribution was optimized by having medical assistants distribute the PVQ during patient rooming as opposed to having the front-desk check in staff administer the survey.

Conclusions: Our study suggests that PVQs positively impact residents’ clinic experience and are effective in improving the efficiency of patient visits. This study is an initial exploration of PVQ’s ability to streamline clinical decision making and enhance physician time spent on counseling and other interventions. In the future, expansion of PVQs to address additional chief complaints with new technologies, such as automated synthesis of patients' responses and integration with the EMR, could have tremendous impact not only on physician efficiency but also patient safety and quality.
Abstract title: Meta-analysis of Diet-Induced Obesity and the Gut Microbiome

Resident’s name: Vaibhav Upadhyay, MD, PhD

Name of program: Internal Medicine, Categorical

Purpose: Next generation sequencing technology has enabled analysis of the microbial community populating the distal gut. This community has been analyzed multiple times across a multitude of studies. The composition of diet, mouse strain background, and geographic location of follow up of these studies is quite variable. We sought to systemically analyze a collection of studies as a group to clarify microbial adaptation in response to diets designed to promote obesity.

Methods: A search term including combination of key phrases “high fat diet”, “microbiome”, “microbiota”, “diet induced obesity”, “ketogenic diet”, and “mouse gut genome” was entered into pubmed and the NIH sequence read archive on 12/19/2016 and 12/29/2016 respectively. This produced 193 articles and 38 separate projects obtained. Of these, 23 studies were pertinent to our analysis; we also included one study, which was highly relevant and left out of this search in addition to unpublished shotgun sequencing data. These data were downloaded and analyzed using R Studio 1.0.136 and R packages ggplot2, phyloseq, stringr, vegan, reshape2 and MicrobeR.

Results: These 20 studies included 39 different types of diet whose fat content ranged from 3.1% to 65%. Principle coordinate analysis reveal the two largest variables that generate clustering (PCoA1 and PCoA2) which explain 11.2% and 5.8% of variability in the data set correlate with study and diet respectively.

Conclusions: This study reveals a significant effect of study and diet on microbial community composition. To better appreciate the effect of diet in future studies of the murine microbiome, consensus on diet will likely help reduce variability between studies possibly explained by dietary fat content.
**Abstract title:** Clonidine Taper for ICU Patients on Prolonged Dexmedetomidine Infusions

**Resident’s name:** Dorothy Wang, PharmD

**Name of program:** Pharmacy

**Purpose:** Dexmedetomidine infusions in critically ill patients often exceed the manufacturer’s recommended duration of 24 hours. Recent data suggest that prolonged infusions may be associated with withdrawal symptoms, including agitation, diaphoresis, and other hypersympathetic responses. Clonidine has been shown to be safe and effective in transitioning off dexmedetomidine for sedation in the intensive care unit (ICU). However, little is known regarding the utility of clonidine in preventing withdrawal symptoms after prolonged dexmedetomidine infusions. The objective of this study is to evaluate the safety and efficacy of an enteral clonidine taper order panel in transitioning patients off prolonged dexmedetomidine infusions.

**Methods:** This was a retrospective study of ICU patients on prolonged dexmedetomidine infusions between June 2015 to February 2017 evaluating two cohorts, pre- and post-clonidine order panel initiation. Patients with concomitant benzodiazepine infusion or primary neurologic disease were excluded. The primary outcome was the proportion of patients transitioned off dexmedetomidine within 48 hours of starting clonidine. Secondary outcomes, including the proportion of “out-of-range” monitoring parameters of heart rate, blood pressure, RASS scores for agitation and oversedation, and pain scores, will be measured to indicate a safe and efficacious transition from dexmedetomidine to clonidine without adverse effects. Other secondary outcomes include cost, ICU length of stay, and hospital length of stay.

**Results:** Based on preliminary data, baseline characteristics for 20 pre-order panel patients and 12 post-order panel patients were similar. A higher proportion of pre-order panel patients were on opioids prior to dexmedetomidine. A higher proportion of post-order panel patients were on antipsychotics prior to dexmedetomidine and received concurrent propofol infusions. Preliminary results show that 100% of post-order panel patients were successfully transitioned off dexmedetomidine within 48 hours of starting clonidine, 91.7% within 36 hours, 83.3% within 24 hours, and 16.7% within 12 hours. Secondary outcomes are pending. Preliminary analysis suggests that ICU length of stay in the post-order panel cohort was one day shorter. No patients in either cohort experienced heart block.

**Conclusions:** An enteral clonidine taper appears feasible for transitioning patients off prolonged dexmedetomidine infusions. Anticipated results will contribute to greater knowledge of the safety and efficacy of enteral clonidine for this use.
**Abstract title:** Perivascular Delivery of Resolvin D1 Inhibits Inflammation and Neointimal Hyperplasia in a Rabbit Vein Graft Model

**Resident’s name:** Evan C. Werlin, MD

**Name of program:** Surgery

**Purpose:** The long-term success of interventions for peripheral arterial disease is limited by restenosis due to intimal hyperplasia, which we believe is caused by an aberrant, persistent inflammatory response. Specialized pro-resolving lipid mediators (SPM) such as resolvin D1 (RvD1), have been shown to counteract inflammation and promote the process of resolution. We investigate the effects of local perivascular delivery of RvD1 in a rabbit vein graft model.

**Methods:** Ipsilateral jugular veins were implanted as carotid interposition grafts via an anastomotic cuff technique in New Zealand white rabbits (3-4 kg; n=34). RvD1 was delivered (1mg) to the vein bypass grafts in a perivascular fashion via bi-layered biodegradable poly-lactic-co-glycolic acid (PLGA) wrap. Rabbits were sacrificed at either 3 or 28 days following bypass. Total leukocyte infiltration and macrophage infiltration were evaluated via immunohistochemistry (IHC) on grafts explanted on day 3. Cell proliferation was also evaluated via IHC on grafts explanted 3 and 28 days following bypass. Elastin staining was conducted on grafts harvested at 28 days post-bypass to evaluate neointimal hyperplasia (NIH).

**Results:** Ipsilateral jugular veins were implanted as carotid interposition grafts via an anastomotic cuff technique in New Zealand white rabbits (3-4 kg; n=34). RvD1 was delivered (1mg) to the vein bypass grafts in a perivascular fashion via bi-layered biodegradable poly-lactic-co-glycolic acid (PLGA) wrap. Rabbits were sacrificed at either 3 or 28 days following bypass. Total leukocyte infiltration and macrophage infiltration were evaluated via immunohistochemistry (IHC) on grafts explanted on day 3. Cell proliferation was also evaluated via IHC on grafts explanted 3 and 28 days following bypass. Elastin staining was conducted on grafts harvested at 28 days post-bypass to evaluate neointimal hyperplasia (NIH).

**Conclusions:** Conclusions: Local perivascular delivery of the pro-resolving lipid mediator RvD1 reduces neointimal hyperplasia following experimental vein grafting through a reduction of leukocyte recruitment and attenuated cell proliferation in the graft. Our study provides further support for the potential therapeutic role of SPM such as D-series resolvins in modulating vascular injury and repair.
**Abstract title:** Clinical Variables Moderating Response to Pharmacologic Treatment of Urgency-Predominant Urinary Incontinence in a Randomized Controlled Trial

**Resident’s name:** William D. Winkleman, MD

**Name of program:** Obstetrics, Gynecology and RS

**Purpose:** The diagnosis of urgency urinary incontinence (UUI) using a 3-item self-administered questionnaire (the 3 Incontinence Questions [3IQ]) has previously been shown to be a safe and effective way to initiate pharmacologic therapy in ambulatory women. This study examines clinical and demographic characteristics that are significant moderators of treatment response to pharmacologic treatment among women diagnosed with urgency-predominant incontinence by the 3IQ.

**Methods:** A multicenter, double-blinded, 12-week randomized trial of pharmacologic therapy for urgency-predominant urinary incontinence in ambulatory women diagnosed by the 3IQ was performed. Participants (N = 645) were assigned randomly to fesoterodine therapy (4-8 mg daily; N=322) or placebo (N=323). Urinary incontinence was assessed by 3-day voiding diaries and a “responder” was defined by the clinically meaningful threshold of >50% reduction in incontinence episode frequency compared to baseline. Clinical and demographic characteristics that may moderate treatment response were assessed by testing for interaction between characteristics and the intervention in logit models of responders while adjusting for clinical site.

**Results:** At baseline, participants were mean (SD) 56 (+14) years old, 68% were white race, and had 3.9 (+3.0) urgency incontinence episodes per day. There were no baseline differences in demographic, clinical or incontinence characteristics between the treatment and placebo groups or between responders and non-responders, including age, race/ethnicity, marital status, education, employment status, medical co-morbidities, alcohol use, or parity. There was an increase in the proportion of responders to fesoterodine with increasing age (p=0.04), increasing parity (0.04), and among married women (p=0.03), but no effect modification by race/ethnicity, education, employment status, alcohol or tobacco use.

**Conclusions:** In ambulatory women with urgency urinary incontinence, older age, being married, and higher parity significantly moderated and potentiated the effects of pharmacologic therapy on incontinence frequency. Overall this study identifies certain populations that may have increased responsiveness to treatment with antimuscarinic therapy and may be used to inform and guide future therapy.
Abstract title: A Look at the Proportion of Insulin Pump Order-Set Orders Written within 12 Hours from Hospital Presentation in Patients in the Emergency Department vs. the Perioperative Setting: A Pilot Study

Resident's name: Jessica R. Zook, PharmD

Name of program: Pharmacy

Purpose: When a patient comes to the hospital with a home insulin pump, the decision must be made whether or not to allow the patient to keep his or her insulin pump running in the inpatient setting. When the patient’s insulin pump is attached and running, a basal rate is continuously being infused into the patient. The Institute for Safe Medication Practice recommends that the decision to continue an insulin pump inpatient should be verified within 12 hours of hospital presentation by an endocrinologist, inpatient diabetes management service, or a physician with documented training in insulin pump management. At The University of California San Francisco (UCSF), a policy states that an endocrine consult is required to input insulin pump orders, which sometimes may result in a significant amount of time where the pump is running without a place for nursing to document. Additionally, per protocol at UCSF, a nurse is required to verify the pump settings (basal rate, carbohydrate ratio, high glucose correction ratio) with current insulin pump orders and document any boluses each shift.

Methods: The primary objective of this study is to determine the percent of time insulin order-set orders are written within the first 12 hours of presentation in patients admitted via the emergency department (ED) versus the perioperative pathway. Secondary objectives are to determine time from hospital presentation to insulin pump orders, nursing documentation compliance, blood glucose documentation, and excursion from euglycemia. Data was collected from June 2012 to August 2016 through retrospective chart review in 32 patients in the ED group and 16 patients in the perioperative group.

Results: In the ED and perioperative groups, 66.7% (20/32) and 81.3% (13/16) respectively had insulin pump orders written within 12 hours. The average time to insulin pump order was 13.4 hours in the ED group and 8.5 hours in the perioperative group. In the first 24 hours, 53.1% (17/32) had no nursing pump documentation in the ED group, while 6.25% (2/32) had documentation before admission and 40.6% (13/32) had documentation after admission. In the perioperative group, 37.5% (6/16) had no pump documentation, while 25% (4/16) and 37.5% (6/16) had documentation before admission and after admission respectively.

Conclusions: The results of this study suggest that the perioperative group has greater compliance to insulin pump orders being written within 12 hours, and a shorter average time to insulin pump orders written.