The UCSF Clinical and Translational Science Training (CTST) program is pleased to provide the campus community with the SIXTH Annual Resident Research Symposium (RRSy) dedicated to the work of our residents. The mission of CTST, the training component of the 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 CTST program coordinates numerous didactic courses and mentoring programs for pre-doctoral health science students, residents, fellows, and junior faculty.

The primary goal of the **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.

Since the program's inception in 2007 several hundred residents across the UCSF campuses have participated in these programs. We thank you for joining us today to celebrate the accomplishments of this year's participants.

Douglas Bauer, MD  
CTSI Associate Director for the Resident Research Training Program

Emily von Scheven, MD, MAS  
CTST Resident Research Co-Director

Miriam Kuppermann, PhD, MPH  
CTST Resident Research Co-Director
Schedule of Events

4:30 pm  Welcome & Resident Research Program Overview
Emily von Scheven, Co-Director, CTSI Resident Research Training Program

4:45 pm  Comments by the Dean
Sam Hawgood, Dean, School of Medicine

5:00 pm  Resident Oral Papers
Moderated by Emily von Scheven, Co-Director, CTSI Resident Research Training Program

Speaker Name: Jennifer L. Jarvie, MD
Title: Prospective Association of Physical Activity and Markers of Inflammation and Insulin Resistance in Outpatients with Coronary Heart Disease: Data from the Heart and Soul Study
Residency Program: Internal Medicine
Research Mentor: Beth Cohen

Speaker Name: Rushi V. Parikh, MD
Title: HIV Elite Controllers have Lower Asymmetric Dimethylarginine and Improved Endothelial Function as Compared to Individuals with Treated and Suppressed HIV
Residency Program: Internal Medicine
Research Mentor: Priscilla Hsue

Speaker Name: David A. Solomon, MD, PhD
Title: Frequent Truncating Mutations of the STAG2 Gene in Bladder Cancer
Residency Program: Anatomic Pathology
Research Mentor: Todd Waldman

Speaker Name: Julian Villar, MD, MPH
Title: The Diagnostic Accuracy of Emergency Ultrasound for Acute Cholecystitis Using a Simplified Definition of a Positive Test
Residency Program: Emergency Medicine
Research Mentor: Ralph Wang

Speaker Name: Matt S. Zinter, MD
Title: Impact of Cancer Type on Complications and Outcomes in the Pediatric ICU
Residency Program: Pediatrics
Research Mentor: Anil Sapru

6:15 pm  Mentor of the Year Award
Recipient: Beth Cohen, MD

6:30 pm  Poster Viewing and Reception
Golden Gate Room
Mentor 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, the CTSI 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.

Beth Cohen, MD, MAS
Assistant Professor of Medicine
University of California, San Francisco
Department of Veterans Affairs Medical Center

Nominating Resident Comments:

“Beth has done an outstanding job of helping steer me towards a question that was my own and of interest to me. She has also done an outstanding job of guiding me through the project, doing just enough to point me in the right direction but while allowing me the freedom to figure it out and take the lead on the project. I've worked with many mentors, but Beth has definitely been the best at knowing how much guidance to provide”
Abstracts:
Oral Presentations

UCSF Resident
Clinical &Translational Research
Symposium

Wednesday, May 8th, 2013
Millberry Union Conference Rooms
**Abstract title:** Prospective Association of Physical Activity and Markers of Inflammation and Insulin Resistance in Outpatients with Coronary Heart Disease: Data from the Heart and Soul Study

**Resident's name:** Jennifer Jarvie, MD

**Name of program:** Internal Medicine

**Purpose:** Higher levels of physical activity are associated with lower rates of coronary heart disease (CHD). Prior studies have suggested this is in part secondary to lower rates of inflammation and insulin resistance in active versus sedentary individuals, but conclusions are limited by their cross-sectional designs. Additionally, little is known about how changes in physical activity can alter levels of inflammation and insulin resistance. Using a population of patients with known CHD, we sought to determine whether activity level was associated with markers of inflammation and insulin resistance over a 5-year period.

**Methods:** We used data from 656 participants in the Heart and Soul Study, a prospective cohort study of outpatients with documented CHD. Physical activity was evaluated at baseline and Year 5 by self-report of frequency of “activities such as 15-20 minutes of brisk walking, swimming, general conditioning, or recreational sports.” We classified participants with low versus high levels of activity based on prior definitions from this cohort that were associated with objective treadmill exercise capacity and risk of future CHD events. Comparing activity from baseline to Year 5 yielded 4 groups: stable low activity (n=151), high activity to low activity (n=110), low activity to high activity (n=60), and stable high activity (n=335). We compared Year 5 markers of inflammation (C-reactive protein [CRP], interleukin-6 [IL-6], and fibrinogen) and insulin resistance (insulin, glucose, and A1c) in the 4 activity groups using t-tests and developed linear regression models serially adjusted for potential confounding and mediating variables.

**Results:** At Year 5 there were significant differences between the 4 activity groups in mean CRP, IL-6, fibrinogen, insulin, A1c, and glucose, with those who increased their physical activity over time having lower levels of inflammation and insulin resistance than those with stable low or decreasing activity. Those with high activity at both time points had the lowest levels of these biomarkers. The differences in CRP, IL-6, fibrinogen, and glucose were not explained by adjustment for age, gender, aspirin use, BMI, smoking, and depression.

**Conclusions:** In this novel population of men and women with known CHD followed for 5 years, higher physical activity was associated with lower levels of inflammation and insulin resistance. These findings provide possible mechanisms for lower rates of CHD events in individuals who are more physically active compared to their more sedentary peers and optimistically highlights that individuals with CHD who increase their frequency of physical activity may improve their biological profile and reduce risk of further CHD events.
Abstract title: HIV Elite Controllers Have Lower Asymmetric Dimethylarginine and Improved Endothelial Function as Compared to Individuals with Treated and Suppressed HIV

Resident’s name: Rushi Parikh, MD

Name of Program: Internal Medicine

Purpose: A small proportion of HIV-infected adults are able maintain an undetectable circulating HIV RNA level in the absence of antiretroviral therapy (ART). Compared to uninfected persons, these “elite controllers” have elevated levels of certain inflammatory and immunologic markers as well as higher rates of atherosclerosis. However, endothelial function in this population has not been described. We investigated endothelial function in elite controllers, treated HIV-infected individuals (“ART-suppressed”), and controls using flow-mediated dilation (FMD) of the brachial artery, a physiologic measure of vascular reactivity, and plasma levels of asymmetric dimethylarginine (ADMA), an endothelial nitric oxide synthase inhibitor inversely correlated with endothelial function.

Methods: We measured FMD and ADMA in 25 elite controllers (19 men) and compared these values to those 82 uninfected controls and 177 ART-suppressed individuals. We adjusted for traditional cardiovascular (CV) risk factors in the comparison to controls and sequentially for CV and HIV-specific factors in the comparison to ART-suppressed individuals. Assessment of Endothelial Function FMD: High-resolution ultrasound of the right brachial artery was performed using a 10 MHz linear array probe (GE Vivid7 Imaging). A blood pressure cuff was inflated to suprasystolic pressures on the forearm for 5 minutes and then deflated. FMD was defined as the percent change in brachial artery diameter during reactive hyperemia one minute following cuff deflation. ADMA: Plasma levels of ADMA were measured using a high performance liquid chromatography protocol (Oxonon BioAnalysis).

Results: Elite controllers had significantly higher current and nadir CD4+ counts than ART-suppressed individuals. FMD was comparable in elite controllers and uninfected controls, while ART-suppressed individuals had a trend towards reduced FMD compared to elite controllers [median (IQR) 5.0% (2.2-7.4) vs. 3.9% (2.6-5.3), p=0.076]. Similarly, ADMA was also comparable in elite controllers and controls; however, elite controllers had significantly lower ADMA than that observed in the ART-suppressed group [0.42 µM (0.40-0.48) vs. 0.47 µM (0.42-0.53), p=0.0076]. This association remained significant after adjustment for CV risk factors [0.039 µM (0.0082-0.069), p=0.013] and HIV-related factors [0.042 µM (0.0083-0.076), p=0.015].

Conclusions: HIV elite controllers had significantly higher CD4+ counts and reduced levels of ADMA and displayed a trend towards improved FMD in comparison to ART-suppressed participants. Notably, ADMA remained significantly lower among elite controllers compared to ART-suppressed participants even after adjusting for current and nadir CD4+ count. These findings suggest that among HIV-infected individuals without detectable viremia, CD4+ depletion (i.e. immunodeficiency) and other unmeasured HIV-associated factors such a chronic inflammation may be important mechanisms of endothelial function. Lastly, the fact that elite controllers had similar FMD and ADMA to uninfected controls suggests that although HIV-associated inflammation in elite controllers may contribute to atherosclerosis over time, the immediate impact on vascular function is less evident.
Abstract title: Frequent Truncating Mutations of the STAG2 Gene in Bladder Cancer

Resident’s name: David Solomon, MD, PhD

Name of program: Anatomic Pathology

Purpose: Aneuploidy is one of the hallmarks of cancer, yet the underlying genetic mechanisms are still poorly defined. We have recently identified STAG2 as a gene that is somatically mutated in human cancer and whose inactivation leads directly to chromosomal instability and aneuploidy (Solomon et al, Science 333:1039-43, 2011). However, the complete tumor spectrum harboring STAG2 mutations and the clinical significance of STAG2 inactivation in cancer remain undefined.

Methods: We used immunohistochemistry to screen a panel of 2,214 tumors from each of the major tumor types for somatic loss of STAG2 expression. Sanger sequencing of the STAG2 gene was performed on 111 urothelial carcinomas, and Affymetrix CytoScan HD Arrays were performed on STAG2 mutant tumors. Clinical data from patients with bladder cancer was correlated with tumor STAG2 status by IHC.

Results: Complete loss of STAG2 expression was discovered in 52/295 urothelial carcinomas of the bladder (18%) with only occasional loss in other tumor types including melanoma and Ewing’s sarcoma. DNA sequencing revealed somatic mutations of STAG2 in 23/111 urothelial carcinomas (21%), the majority of which were nonsense or frameshift mutations causing complete loss of STAG2 protein expression by IHC. Mutant tumors included 9/25 (36%) of pTa papillary non-invasive carcinomas, 6/22 (27%) of pT1 superficially invasive carcinomas, and 8/64 (13%) of pT2-T4 muscle invasive carcinomas. STAG2 mutation was frequently accompanied by p53 overexpression and numerous chromosomal copy number aberrations per tumor. In papillary non-muscle invasive tumors, STAG2 loss was a strong predictor of disease-free survival (p=0.05), whereas in muscle invasive tumors, STAG2 loss was a predictor of lymph node metastasis (p=0.02), disease recurrence (p=0.03), and cancer-specific mortality (p=0.03).

Conclusions: These findings identify STAG2 as among the most commonly mutated genes in bladder cancer discovered to date and demonstrate that bladder cancer is the first tumor type in which mutation of a gene directly controlling chromosome segregation is a predominant genetic lesion.
Abstract title: The Diagnostic Accuracy of Emergency Ultrasound for Acute Cholecystitis Using a Simplified Definition of a Positive Test

Resident’s name: Julian Villar, MD, MPH

Name of program: Emergency Medicine

Purpose: Cholelithiasis affects an estimated 20 million people in the USA yearly, 20% of symptomatic patients will develop acute cholecystitis (AC). A recent single center study estimating test characteristics of emergency ultrasonography (EUS) for the detection of AC, as defined by gallstones plus sonographic Murphy’s or pericholecystic fluid or gallbladder wall thickening, resulted in a sensitivity and specificity of 87% (95% CI 66-97) and 82% (95% CI 74-88), respectively. Prior studies estimating the test characteristics of EUS of the gallbladder have demonstrated excellent sensitivity for cholelithiasis, and a more modest sensitivity for AC using the standard definition. We hypothesized that using this simplified definition would result in superior sensitivity and negative predictive value for AC.

Methods: We conducted a secondary analysis to estimate the test characteristics of EUS for AC using a simplified definition of a positive test: the presence of gallstones alone. Clinical follow up and pathology reports were used as the reference standard.

Results: The overall prevalence of AC was 14% (23 pathology confirmed cases of 164 included patients). The sensitivity was 100% (95% CI 85.7-100), negative predictive value 100% (95% CI 92.2-100), specificity 54.6% (95% CI 46.8-62.6), and positive predictive value 26.4% (95% CI 18.3-36.6).

Conclusions: Simplifying the definition of the test findings on EUS to gallstones alone has resulted in an exam with excellent sensitivity and negative predictive value. If validated prospectively, these results indicate that the absence of gallstones on EUS would allow emergency physicians to exclude the diagnosis of acute cholecystitis in symptomatic patients.
Abstract title: Impact of Cancer Type on Complications and Outcomes in the Pediatric ICU

Resident’s name: Matt Zinter, MD

Name of program: Pediatrics

Purpose: Nearly 40% of pediatric cancer patients will have at least 1 PICU admission,1 accounting for 3% of all PICU admissions.2 Both aggressive disease pathophysiology and harsh therapies contribute to the risk of ICU admission and mortality. However, these risk-factors are distributed differently among patients with cancer, resulting in a heterogeneous patient population with variable outcomes. This presents an inherent challenge in evaluating and reducing morbidity and mortality in this vulnerable population.

For children with cancer, some of the risk factors for acquiring organ failure include myeloablative chemotherapy, mucositis, and tumor lysis syndrome.4,5 However, the full impact of both cancer biology and therapy toxicity on ICU diseases is not clear because no studies to date have evaluated the incidences of any of these comorbidities in the ICU setting relative to cancer type. Further, the studies that differentiate outcomes for these conditions among different cancer types have been limited by conflicting results and sample size of n<40. Known mortality risk-factors include the PRISM III score (an overall assessment of organ dysfunction), history of mechanical ventilation, history of bone marrow transplant, need for multiple vasoactive medicines, and blood culture confirmed fungemia.7-9 Unfortunately, the influence of cancer type on rates and outcomes of ICU comorbidities has not been determined and remains a significant barrier to both risk stratification and understanding unique organ failure pathophysiology in patients with cancer.

AIM 1: Compare PICU admission characteristics (rates, comorbid diagnoses, and illness severity) for oncology patients with different types of cancer.
AIM 2: Compare PICU outcomes (mortality, length of stay) for oncology patients with different types of cancer.

Methods: This is a retrospective multicenter-cohort analysis of 6,335 oncology and bone marrow transplant (BMT) patients ≥21yr accounting for 9,221 non-postoperative PICU admissions between 1/1/09 and 6/30/12 from 112 sites nationwide, extracted from the Virtual PICU Systems database. 11 oncology categories were used per the International Classification of Childhood Cancer-3; those who underwent BMT were grouped separately in the BMT category. Oncologic diagnoses of unclear malignant potential or primary location will be excluded from analysis. Organ failure and infectious diagnoses were assigned using ICD-9 diagnosis codes. We used χ2 tests to compare proportions within oncologic categories and multivariate logistic and linear regression to adjust for age, gender, severity of illness, and oncologic category.

Results: Median PICU length of stay (LOS) varied from 1.7 days for bone tumors to 3.8 days for neuroblastoma. PICU mortality was highest for BMT (17.1%), AML (11.4%), and retinoblastoma (11.1%), and lowest for neuroblastoma (4.1%) and renal tumors (3.4%) (p<0.001). On multivariate regression, the association of cancer type with mortality and LOS was independent of age, gender, and PRISM3 scores. Rates of ARDS were highest for hepatic tumors (28.0%), BMT (26.2%), and AML (21.0%) and lowest for neuroblastoma (7.6%) and germ cell tumors (5.7%) (p<0.001). Acute kidney injury was highest for BMT (16.1%) and AML (8.6%) and lowest for CNS tumors (1.4%) and retinoblastoma (0.0%) (p<0.001). Compared with ALL, the RR of heart failure was 2.6 for AML (p<0.001). Finally, sepsis was most frequent among AML (32.1%) and bone tumors (26.1%) and least frequent for CNS tumors (5.9%) (p<0.001), with widely variable pathogen burden. On multivariate analysis, the association of each comorbid diagnosis with cancer type was independent of age, gender, and PRISM3 score (p<0.001).

Conclusions: Organ failure and infections requiring ICU admission vary significantly among cancer patients and are independently influenced by underlying oncology diagnosis. Both cancer biology and treatment regimens may contribute to these findings. However, more research is needed to understand the pathophysiologic basis for these differences.
## Resident Research Training Program
### Resident Research Funding Award 2012 Recipients

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Abstracts:
Poster Presentations

UCSF Resident
Clinical & Translational Research Symposium

Wednesday, May 8th, 2013
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Abstract title: Treatment of Choice for Low AMH: IVF or IUI?

Resident’s name: Lusine Aghajanova, MD, PhD

Name of program: Anatomic Pathology

Purpose: Assisted reproductive technology success rates largely depend on ovarian reserve. Women with low anti-mullerian hormone (AMH) are usually advised to undergo in vitro fertilization (IVF) early because "they are running out of eggs". However, the benefit of this approach is unclear as poor responders consistently have low pregnancy rates. Therefore, our goal was to compare the outcomes of intrauterine insemination (IUI) and IVF, in women with low levels of AMH.

Methods: Retrospective chart review from January 1st, 2008 until October 4th, 2012 was performed. All patients with known AMH levels were included, and egg donor cycles were excluded. Canceled cycles were not excluded, but they were specifically annotated. Pregnancy was defined as a positive serum β-HCG. Patients were managed according to their physician's practice preferences. Data were analyzed by t test, Mann-Whitney U test for continuous variables and Chi-square test for proportions where appropriate.

Results: A total of 206 patients underwent IUI, whereas 167 patients underwent IVF. There was no significant difference in mean age, BMI, gravidity and parity between the two groups. Cumulative pregnancy rates (PR) between IUI and IVF cycles across all AMH levels were 61 (29.6%) and 82 (49.1%) respectively (P<0.001). A total of 67 women with AMH <1 underwent IUI, whereas 43 women with AMH <1 underwent IVF. Interestingly, there was no statistical difference in cumulative PR between IUI vs. IVF in women with an AMH of <1.0 (25.3% vs. 27.9%, respectively). The mean age for these two groups was also similar (37.8 ± 4.5 vs. 37.4 ± 4.5, respectively). The mean number of IUI and IVF cycles in women with an AMH <1 was 2.7 ± 2.0 and 1.5 ± 0.8, respectively.

Conclusions: Pregnancy rates with IVF decrease with decreasing AMH as expected. Importantly and surprisingly, pregnancy rates between IUI and IVF at low AMH levels (<1) were not found to be significantly different. This preliminary study, which to our knowledge is the first to look at this relationship, suggests that IUI—which is less invasive and less costly—may be a preferred treatment in women with low AMH levels.
**Abstract title:** Role of Endorectal MRI and MRSI in Defining the Dominant Intraprostatic Lesion in Prostate Cancer: Quantitative Analysis of Imaging Contour Compared to Whole-Mount Histopathology

**Resident’s name:** Mekhail Anwar, MD, PhD

**Name of program:** Radiation Oncology

**Purpose:** Dose escalation in prostate cancer has been shown to have improved biochemical control, but increasing the dose to entire prostate risks toxicity to the urethra, bowel, bladder and neurovascular bundles. Therefore there is considerable interest in increasing the dose delivered to the dominant intraprostatic lesion (DIL) via external beam radiotherapy or brachytherapy. While endorectal MR imaging (MRI) and MR spectroscopic imaging (MRSI) allow non-invasive identification of prostate cancer with improved tumor localization, staging, and volume estimation, the role of endorectal MRI and MRSI in defining the margin of the DIL has not been reported. Therefore we undertook this study to investigate the role of endorectal MRI and MRSI in defining the contours and margins of the DIL in patients with prostate cancer by comparing them to their whole mount histopathological tumor maps. We hypothesize that with appropriate selection criteria and margins, the DIL can be accurately delineated for treatment planning.

**Methods:** We retrospectively identified 20 patients with prostate cancer (median age 62 yrs [54-71]; median PSA 5.8 [1.0-13.4]; median Gleason 7 [6-9]), pT2a-pT3a) who underwent endorectal MRI and MRSI prior to radical prostatectomy and subsequent creation of detailed histopathological tumor maps from whole-mount step sections. Two experienced radiologists independently reviewed all MR images and contoured all suspected clinically important (= 0.5 cm3 with concordant spectroscopic abnormality) tumor foci. For correctly identified tumor foci, a custom-designed deformable co-registration in MATLAB was used to calculate the margin of error between the imaging and true histopathological tumor border at both capsular and non-capsular surfaces.

**Results:** 15 patients met radiographic criteria, of which 10 different treatable tumor foci were correctly identified by one or both readers, for a total of 18 independently contoured lesions. A total of 1094 points on the drawn contours were analyzed (447 and 647 on the capsular and non-capsular surfaces, respectively). There was no significant error in outlining the capsular border, but 9 out of 18 lesions had errors on the non-capsular border where the contour underestimated the true tumor extent. For these 9 lesions, the median underestimation error was 2.4 mm [0.3 mm - 7.3 mm]. Expanding the contour by 5 mm and 8 mm at the non-capsular surface included 95% and 100% of tumor volume not initially covered within the MR contour, respectively.

**Conclusions:** This study shows, that in carefully selected patients, contours of the DIL drawn on T2-weighted MRI series can be highly accurate and encompass the tumor volume with only minimal margin expansion. Adequate tumor coverage can be ensured if the treatment contour at the non-capsular margin is expanded by 5 mm, with the capsular edge anatomically bounded the by prostate capsule.
Abstract title: A Method to Estimate Inguinal Hernia Epidemiology Adjusted for Population Age Structure in Tanzania

Resident’s name: Jessica Beard, MD, MPH

Name of program: Surgery

Purpose: Surgical conditions represent a significant source of global disease burden. Little is known about the epidemiology of inguinal hernia in resource-poor settings. We present a method to estimate inguinal hernia disease burden in Tanzania.

Methods: Using data from the United States National Health and Nutrition Examination Survey (NHANES) prospective cohort study and Tanzanian demographic figures, we calculated inguinal hernia incidence and prevalence in Tanzanian adults under three surgical rate scenarios. Gender-specific incidence figures from NHANES data were adjusted according to Tanzanian population age structure. Hernia duration was adjusted for Tanzanian life-expectancy within each age group.

Results: The prevalence of inguinal hernia in Tanzanian adults is 5.36% while an estimated 12.09% of men have hernias. Today, 683,904 adults suffer from symptomatic inguinal hernia in Tanzania. The annual incidence of symptomatic hernias in Tanzanian adults is 163 per 100,000 population. At Tanzania’s current hernia repair rate, a backlog of 995,874 hernias in need of repair will develop over 10 years. 4.4 million disability adjusted life-years would be averted with repair of prevalent symptomatic hernias in Tanzania.

Conclusions: Our data indicate the extent of inguinal hernia disease burden in Tanzania. By adjusting our figures for the age structure of Tanzania, we have demonstrated that while the incidence of symptomatic cases may be lower than previously thought, prevalence of inguinal hernia in Tanzania remains high. This approach provides an update to our previously described methodology for calculation of inguinal hernia epidemiology in resource-poor settings that may be used in multiple country contexts.
Abstract title:  Erasing Trauma: Tattoo Removal as a Healing Intervention

Resident’s name:  Rhea Boyd, MD

Name of program:  Pediatrics

Purpose:  Studies have shown an association between tattoos and other high risk behaviors including substance abuse, violence, carrying weapons, sexual activity, eating disorders, suicide, and intimate partner violence. Developmentally, adolescents are a population who are at-risk for participating in similar high risk behaviors. Targeting adolescents with tattoos in a tattoo removal clinic may be an effective strategy to address high risk behaviors, prevent negative outcomes associated with those behaviors, and support youth seeking a new start. The purpose of this study is to elucidate the motivations and attitudes of at-risk adolescents seeking tattoo removal.

Methods:  We adapted and administered a validated tool to all patients (ages 18y-25y) seen at the San Francisco General Hospital’s tattoo removal clinic from November 2012 - February 2013. The tattoo clinic survey includes patient demographics, high risk behaviors, motivations for tattoo acquisition and removal, and interest in selected support services for high risk behaviors. Patients were excluded who were less than 18 years of age and non-English speaking. UCSF Committee on Human Research approval was obtained.

Results:  Preliminary review of the data indicates 47% of patients are Hispanic and approximately 50% are male and 50% female. The average age of participants was 21. Approximately 70% of participants completed high school but less than 15% were enrolled in college. 92% were low income and 80% live with their parents. 55% had 5 or more tattoos and were 14-16 years of age at acquisition of their their first tattoo. 50% indicated peer pressure, gang affiliation, or the influence of drugs/alcohol as the impetus for tattoo acquisition. 68% indicated a life transition (graduating high school, starting a family, seeking employment) and 70% indicated seeking independence from peers, as the impetus for seeking tattoo removal. 65% reported an interest in receiving GED classes, job counseling, sexual transmitted disease testing, and substance abuse counseling as a part of their clinic visit.

Conclusions:  Screening youth seeking tattoo removal for high risk behaviors and providing social services and primary care in a tattoo removal clinic may enable providers to better serve this population’s needs. Future work includes educating residents, faculty, and staff about the links between tattoo and other high risk behaviors and building upon the established rapport between the tattoo removal clinic and the community by engaging these youth in support services that enable them to heal from past trauma and pursue healthy lifestyles.
Abstract title: Use of Vancomycin Continuous Mediastinal Irrigation

Resident’s name: Jon Cokley, PharmD

Name of program: Pediatrics

Purpose: Staphylococcus aureus associated mediastinitis following cardiothoracic surgery is associated with increased morbidity and mortality, and length of hospital stay. Continuous vancomycin mediastinal irrigation has an increased risk for cardiac tamponade and systemic absorption in pediatric due to their smaller chest capacity. The purpose of this study is to assess the use of vancomycin mediastinal irrigation in post-surgical pediatric patients.

Methods: Post-surgical cardiac patients with suspected mediastinitis or associated risk factors were included. Patients with known vancomycin allergies were excluded. Continuous mediastinal irrigation was administered at a rate of 2-6 mL/kg/hr over three to five days. Systemic vancomycin was not an inclusion criterion. Accumulation was assessed by obtaining serum levels following irrigation initiation.

Results: Two patients at risk for mediastinitis received therapy. Patient A (9 months old, s/p truncus arteriosus repair, baseline SCr 0.59 mg/dL) received irrigation at 7.4 mL/kg/hr for fever and delayed closure; systemic vancomycin 15mg/kg every 12 hours started 24 hours prior to irrigation. Following a trough of 21 mg/L, the rate decreased to 3.7 mL/kg/hr and dosing extended to every 24 hours; irrigation discontinued after 43 hours. Subsequent levels were appropriate once systemic therapy adjusted, continuing five days. The patient expired from chronic respiratory failure 172 days following therapy. Patient B (8 years old, s/p TGA/VSD repair, and normal renal function) received irrigation at 3 mL/kg/hr for an infected pacemaker; systemic vancomycin 15mg/kg every 8 hours started 4 hours after irrigation initiation. The level 4.5 hours after the first systemic dose was 20 mg/L, with a subsequent trough 13 mg/L suggesting negligible absorption. Irrigation continued 78 hours with appropriate subsequent levels. The patient discharged after seven days.

Conclusions: Vancomycin mediastinal irrigation can be administered to pediatric patients at risk for mediastinitis safely. This is a reasonable approach for qualifying patients. One patient may have had elevated levels due to systemic dosing frequency; patients with renal dysfunction may be at greater toxicity risk from combined therapy. Patients without renal dysfunction tolerate mediastinal irrigation with negligible systemic absorption.
Abstract title: Cocaine Exposure Is Common and Associated with Increased Odds of Death in Patients with Severe Cardiomyopathy in San Francisco

Resident’s name: Joseph Ebinger, MD

Name of program: Internal Medicine

Purpose: Cocaine abuse is a major public health problem in the United States. Approximately 1.5 million Americans over age 12 currently use cocaine, with 637,000 individuals using cocaine for the first time in 2010. Cocaine has been associated with dysfunction of multiple organ systems, including the heart. However, few studies have specifically examined cocaine-associated cardiomyopathy. We sought to test the hypothesis that characteristics of cocaine users with cardiomyopathy differ from other patients with cardiomyopathy.

Methods: We performed a retrospective chart review of all San Francisco General Hospital patients with an echocardiogram between July 2007 and Sept 2009 showing new moderate-severe or severe left ventricular systolic dysfunction. The Mann Whitney test was used to compare continuous variables while Fischer’s exact test was used to compare categorical data and calculate odds ratios.

Results: A total of 134 patients were included. 88 had a final diagnosis of non-ischemic cardiomyopathy (NICM) and 46 ischemic cardiomyopathy (ICM), where ICM was determined based upon either coronary angiography or chart review indicating prior diagnosis of coronary artery disease. Patients without evidence of significant coronary artery disease were categorized as having NICM. NICM was attributed to stimulant drug use in 49 and specifically to cocaine in 41 (48%), based upon patient report or positive urine toxicology. Compared to patients with NICM without stimulant drug use, patients with NICM who used cocaine were younger (50 vs. 59 years old p<0.01), had more hospital admissions (3.1 vs. 0.82, p<0.01), had more ED visits (7 vs. 1.6, p<0.01) during the two year study period and were more likely to be homeless (OR 8, 95% CI 3.0-22.0). Patients with NICM due to cocaine had a higher odds of mortality (OR 4.4; 95% CI 1.12-17.24) during the follow up period. There were no differences in gender, race, systolic blood pressure, creatinine, invasive hemodynamics, NYHA classification or need for ICU admission.

Conclusions: Cocaine use is common among patients with NICM evaluated at our institution. Patients with NICM and cocaine use were younger, were admitted more frequently during the follow up period and had an increased odds of death compared to non-stimulant drug users with NICM. Patients with NICM should be screened for cocaine use and should be offered cocaine abstinence counseling and treatment. Further study is needed to better understand the pathologic impact of cocaine and to define optimal treatment strategies for cocaine associated cardiomyopathy.
Abstract title: Investigating the Etiology of Oral Tongue Squamous Cell Carcinoma in Young Non-Smokers/ Non-Drinkers

Resident’s name: Daniel Faden, MD

Name of program: Otolaryngology

Purpose: Head and Neck Squamous Cell Carcinomas are the sixth most common cancer. These cancers typically occur in older men with medical histories significant for tobacco and/or alcohol abuse. Recently, an alarming increase in the incidence of Oral Tongue Squamous Cell Carcinoma (OTSCC) in young non-smokers/non-drinkers (YNSND) was identified. OTSCC in YNSND has a worse prognosis and lower overall and disease free survival rates compared to OTSCC in older smokers/drinkers. This more aggressive tumor phenotype, in concert with the young age of the patients and lack of known risk factors suggest the possibility of a virus driving tumor development. However, OTSCC in YNSND does not appear to be associated with HPV infection, contrary to Oropharyngeal SCC. We hypothesize that OTSCC in YNSND is biologically and etiologically distinct from OTSCC in older smoker/drinkers. We propose these tumors are related to infection with a pathogenic virus, causing a distinct mutational landscape and a more aggressive tumor phenotype.

Methods: RNA extracted from 19 fresh frozen OTSCC samples, one healthy tongue sample and one HPV positive oropharyngeal cancer, from three institutions, underwent deep sequencing on an Illumina Hiseq using established protocols. Average read depth per sample was 9,000,000. After filtering out all human, bacterial and phage aligning sequences, the remaining sequences were aligned to known viral sequences.

Results: HHV-4 was detected in two samples, HSV-1 in one sample, and HPV in the HPV positive oropharyngeal sample. No other viral RNA sequences were detected.

Conclusions: Currently, no causative virus for OTSCC in YNSND has been detected. Ongoing work includes examination of the status of P53 in tumor samples and de novo assembly of unaligned reads to look for novel viruses.
Abstract title: Perinatal and Neonatal Risk Factors Associated with ADHD in School-Aged Former Premature Infants

Resident's name: Kendell German, MD

Name of program: Pediatrics

Purpose: Children born prematurely are at increased risk of adverse neurocognitive outcomes. Recent research suggests that more subtle neurodevelopmental disorders, such as attention deficit hyperactivity disorder (ADHD), also occur at higher rates among children born prematurely. In this retrospective cohort study of infants born at ≤32 weeks gestation, we examined the relationship between perinatal/neonatal risk factors and ADHD in school-aged children who were born prematurely. We were particularly interested in the relationship between neonatal brain injury (intracranial hemorrhage (ICH), white matter injury (WMI) and ADHD.

Methods: We conducted chart review on all infants born at ≤32 weeks gestation between January 1998 and December 2008 who were discharged from the UCSF Intensive Care Nursery and who completed a Conner’s Rating Scale at school age through the High Risk Infant Follow Up Clinic. Data on the following neonatal/perinatal variables were collected: infant sex, maternal age, pregnancy-induced hypertension/pre-eclampsia (PIH), chorioamnionitis, necrotizing enterocolitis (NEC), infant infection, retinopathy of prematurity (ROP), bronchopulmonary dysplasia (BPD), ICH (on head ultrasound or MRI), WMI (on head ultrasound or MRI). The outcome variable was ADHD, which was defined as a Conner’s ≥65; analyses for overall ADHD and ADHD subtypes (combined type, inattentive type, hyperactive type) were performed. Odds ratios (OR) for hypothesized risk factors were calculated using univariate logistic models.

Results: The cohort consisted of 222 infants, 74 (33%) of whom had ADHD; of those with ADHD, 41% had combined type, 27% had inattentive type, and 32% had hyperactive type ADHD. In univariate analyses, the only variables that were predictive of overall ADHD were NEC (OR 4.1, p=0.015) and infant infection (OR 2.0, p=0.017). The only variable associated specifically with inattention was infant infection (OR 2.1, p=0.022). NEC was strongly associated with hyperactivity (OR 6.6, p=0.001); conversely, PIH appeared protective against hyperactivity (OR 0.41, p=0.041). Intracranial hemorrhage and white matter injury were not independently associated with ADHD or its subtypes.

Conclusions: ADHD is common in children born prematurely. The only perinatal/neonatal variables that were predictive of ADHD were NEC and infection. Interestingly, infection was more associated with the inattentive subtype and NEC with the hyperactive subtype. Surprisingly, there was no relationship between neonatal brain injury and ADHD. The mechanism underlying the association between prematurity and ADHD warrants further evaluation.
Abstract title: EMS-STARS: Emergency Medical Services Superuser Transport Activations – A Retrospective Study

Resident’s name: M. Kennedy Hall, MD

Name of program: Emergency Medicine

Purpose: To identify the predictor variables associated with increased use of emergency medical services (EMS) by patients =18 years of age in an urban EMS system in 2009.

Methods: Using the entire 2009 San Francisco Fire Department (SFFD) paramedic generated adult patient care charts, we reviewed predictor variables associated with frequent ambulance dispatch. We categorized EMS users by their number of EMS dispatches: low (1), moderate (2-4), high (5-14), and Superusers (=15) and sorted by paramedic primary impression. We compared the odds of alcohol use in each frequency group versus those of the low frequency group, and calculated Odds Ratios (OR) with 95% confidence intervals (95% CI). The financial impact of Superuser EMS transports was estimated using the mean Medicare ambulance national reimbursements supplied by the United States Government Accountability Office.

Results: The 43,559 EMS ambulance dispatches were generated by 31,462 adults resulting in 39,107 (90%) transports. The mean age was 54 (interquartile range (IQR) 37, 72), and 57% were male. The Superusers generated 2668 dispatches with 2574 (96%) transports. The mean age was 52 (IQR 44, 60), and 68% were male. EMS dispatches by user category sorted by paramedic primary impression are listed below.

Odds of alcohol use increased with the user dispatch frequency greater than one. Among moderate EMS users, the OR was 1.6 (95% CI 1.4-1.7). Among high EMS users, the OR was 3.9 (95% CI 3.6-4.3). Among Superusers, the OR was 8.51 (95% CI 7.8-9.3).

<table>
<thead>
<tr>
<th>EMS dispatches</th>
<th>Total Cost</th>
<th>Cost/Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low (1)</td>
<td>$9,674,065</td>
<td>$415</td>
</tr>
<tr>
<td>Moderate (2 to 4)</td>
<td>$3,734,170</td>
<td>$995</td>
</tr>
<tr>
<td>High (5 to 14)</td>
<td>$1,752,960</td>
<td>$3054</td>
</tr>
<tr>
<td>Superusers (=15)</td>
<td>$1,068,210</td>
<td>$11,127</td>
</tr>
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</table>

Conclusions: For all dispatch frequency groups, general medical problems predominate. Trends that are specific to dispatch frequency groups also exist: trauma was more common in low-use groups, whereas alcohol use was more common in higher-use groups. Comparing ORs, higher frequency dispatches were more likely to be associated with alcohol use. The cost per person for Superusers is roughly three to 26 times that of any other use group. Therefore strategies targeting frequent users, including alcohol reduction, may help to reduce a substantial burden placed on the EMS systems.
Abstract title: “Choosing Wisely” in an Academic Department of Medicine

Residents name: Jonas Hines, MD

Name of Program: Internal Medicine

Purpose: With unsustainably rising healthcare expenditures in the US, decision makers are increasingly focused on improving the value of healthcare, in part by reducing low-value medical testing. The “Choosing Wisely” campaign is an example of a multi-specialty effort to reduce unnecessary care. While physicians consistently agree that cost-consciousness is important physicians’ attitudes toward specific examples of low-value care are not known.

Methods: We administered an electronic survey between August and October 2012 to faculty and trainees in the Department of Medicine at the University of California. No incentives were offered. Respondents considered eight scenarios from the American College of Physicians' (ACP) "low-value diagnostic tests." Additional questions assessed physicians’ perceived responsibility in addressing healthcare costs. All analyses were pre-specified and our Institutional Review Board granted exempt status to the study.

Results: 279 surveys were completed (response rate 30%). 169 (61%) respondents were faculty. 171 (62%) respondents identified themselves as generalists, and 153 (55%) respondents primarily practiced inpatient medicine.

Panel A of the figure depicts respondents’ views of the eight low-value care scenarios. 49-71% of respondents somewhat or completely agreed that these represented unnecessary testing. Conversely, 24-38% of respondents somewhat or completely disagreed that these represented unnecessary testing. In six of the eight scenarios, more faculty than trainees perceived the scenarios to represent low-value testing (P<.02 for all comparisons). Differences were not seen comparing generalists with specialists, inpatient versus outpatient setting, or across different hospitals.

Panel B of the figure depicts respondents’ attitudes toward cost-consciousness. Over 80% felt that physicians have the ability and responsibility to contain costs, and that physicians should teach trainees about costs. While more than 80% of respondents agreed it was reasonable to balance costs with patient welfare, 30% felt that it is the physician’s duty to offer an intervention regardless of cost. There were no differences among demographic groups.

Conclusions: In our academic internal medicine department, there was strong support for the role and responsibility of physicians in controlling medical costs. However, despite this support, a significant proportion of respondents disagreed with a sample of eight low-value diagnostic tests identified by an ACP working group. Training was the only demographic factor predicting support for low-value testing. This may relate to tolerance of uncertainty or lack of familiarity with the evidence underlying these scenarios. Several factors may bias our findings, including a single institution survey, low response rate and overrepresentation of generalists. As pressure to reduce costs in healthcare escalate, and stakeholders increasingly focus on value rather than simply quality, training institutions have a responsibility to integrate cost-consciousness as a core value, practice, and set of learning competencies.
Abstract title: Hippocampal Volume Recovery During Abstinence from Alcohol

Resident’s name: Michael Hoefer, MD

Name of program: Psychiatry

Purpose: There has been limited research into the premorbid (ie prior to first exposure) and environmental factors that regulate hippocampal response and recovery from exposure to alcohol. Previous reports show that alcoholic participants entering treatment demonstrate deficits in hippocampal volume and visuospatial memory during the first month of abstinence. Tobacco smoking has been found to have an additive deleterious effect on these indices in some studies. More recently, carriers of the methionine allele of the brain-derived neurotrophic factor (BDNF) gene showed impaired gray matter recovery in several brain regions during early abstinence. The goal of the present study is to explore the effects of environmental factors and a premorbid factor of BDNF genotype on hippocampal volume recovery and neurocognitive performance in alcoholic participants during extended abstinence from alcohol.

Methods: In this prospective cohort study, 121 alcoholics in treatment (76 smokers and 45 non-smokers) underwent structural magnetic resonance imaging, BDNF genotyping, and neurocognitive assessment after 1 week, 1 month, and 8 months of abstinence. Outcome measures were compared with 35 age-matched, non-smoking light-drinkers.

Results: Smoking and non-smoking alcoholics exhibited persisting deficits in hippocampal volume compared to controls during the study period and did not exhibit significant hippocampal volume recovery. BDNF met carriers showed impaired hippocampal volume recovery compared to non-carriers leading to smaller hippocampi at 8 months of abstinence. Hippocampal volume recovery correlated with improved visuospatial memory in alcoholic participants.

Conclusions: The present study demonstrates that alcohol and tobacco dependence are associated with enduring deficits in hippocampal volume for longer than previously reported. BDNF genotype appears to regulate hippocampal volume recovery after chronic alcohol exposure in a clinical population. Finally, in early abstinence the effects of premorbid factors, including BDNF genotype, on hippocampal recovery may be overshadowed by the recent chemical insult from alcohol and thus, future studies should consider focusing on extended abstinence to better characterize these effects.
Abstract title: Diabetes Self-Management Among Severely Food Insecure Adults

Resident’s name: Matthew Ippolito, MD

Name of program: Internal Medicine

Purpose: In clinical populations of adults with diabetes, food insecurity (FI) independently increases risk for poor diabetes self-management and poor glycemic control. Previous studies of diabetes self-management have been conducted in clinical-based samples and have been unable to examine severe FI. Our research aims are to determine the extent to which severe food insecurity increases difficulty with diabetes self-management, and to examine the prevalence of severe food insecurity among adults with diabetes seeking food assistance at food pantries in three states.

Methods: We surveyed adults queuing at food pantries in Texas, California, and Ohio (n=550). Eligible participants self-reported diabetes or had a point-of-care HbA1C test =6.5%. Participants were stratified by FI status: "no FI,” “mild FI,” or “severe FI.” We investigated unadjusted associations between FI and potential mediators of poor glycemic control: depressive symptoms (prevalence), diabetes self-efficacy (scored 1-10), diabetes distress (1-6), medication non-adherence (0-4), and financial tradeoffs between food and medicine (yes/no). We also examined HbA1c (%).

Results: The sample was 70% female, 54% Latino, and 8% African-American with a mean age of 58 years. The prevalence of mild FI was 41%, and severe FI 44%. FI was strongly associated with mediators of poor glycemic control (p<0.05 for all compared to no FI group), including higher depression (52% no FI, 64% mild FI, and 84% severe FI), poorer diabetes self-efficacy (means scores of 7.5, 6.9, and 6.5, respectively), greater diabetes distress (2.1, 2.9, and 3.3), greater medication non-adherence (0.8, 1.1, and 1.4), and more food-medicine tradeoffs (15%, 40%, and 57%). Mean HbA1c did not significantly differ (7.9%, 8.0%, and 8.1% respectively).

Conclusion: Severely food insecure adults with diabetes demonstrate substantial barriers to effective self-management. Efforts to disseminate diabetes self-management programs into low-income, community-based settings must address food affordability challenges.
Abstract title: Clinical Profiles in Injection Drug Users and Non-Injection Drug Users Admitted with Infections

Resident's name: Daniel Kievlan, MD

Name of program: Emergency Medicine

Purpose: Injection drug users (IDUs) are at increased risk of acquiring many infections. While previous studies have highlighted differences in specific infections (e.g., infective endocarditis) in IDUs vs non-IDUs, there is little research evaluating differences in the clinical presentations of IDUs versus non-IDUs across a variety of common infections.

The primary objective of this study was to characterize the types of infections among IDUs and non-IDUs at a county hospital. Additionally, based on previous research showing high rates of hyponatremia in IDUs with endocarditis or bacteremia, we hypothesized that IDUs would exhibit higher rates of hyponatremia and lower rates of leukocytosis than non-IDUs across all infections.

Methods: From June 2010 to June 2011, ED admissions logs at SFGH were utilized to identify patients with admitting diagnoses of either suspected or confirmed infections. IDU status was determined from both ED and inpatient charts. A structured chart abstraction tool and de-identified database of patient characteristics and clinical outcomes was generated based on review of ED and inpatient charts by two trained researchers. To ensure inter-rater reliability, each reviewer re-analyzed a portion of the other’s charts in a blinded fashion.

Results: For the 597 total participants, 189 were IDUs and 408 were non-IDUs. Table 1 shows basic background demographics and most common discharge diagnoses for IDUs and non-IDUs:

Table 1

<table>
<thead>
<tr>
<th></th>
<th>IDU</th>
<th>Non-IDU</th>
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<tbody>
<tr>
<td>Median age in years</td>
<td>(IQR) 45 (34-51)</td>
<td>50 (35-60)</td>
</tr>
<tr>
<td>Percentage male</td>
<td>72%</td>
<td>62%</td>
</tr>
<tr>
<td>Most common discharge diagnoses (n, percentage):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IDU</td>
<td>Non-IDU</td>
<td></td>
</tr>
<tr>
<td>Cellulitis (n=50, 26%)</td>
<td>Pneumonia (n=96, 24%)</td>
<td></td>
</tr>
<tr>
<td>Pneumonia (n=44, 23%)</td>
<td>Appendicitis (n=62, 15%)</td>
<td></td>
</tr>
<tr>
<td>Abscess (n=44, 23%)</td>
<td>Cellulitis (n=51, 13%)</td>
<td></td>
</tr>
<tr>
<td>Bacteremia (n=12, 6%)</td>
<td>Abscess (n=44, 11%)</td>
<td></td>
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</table>

For IDUs, 39% (95% CI 31.98-45.73%) presented with hyponatremia, compared to 27% (95% CI 23.12-31.72%) of non-IDUs. Leukocytosis was seen in 36% (95% CI 29.48-43.04%) of IDUs vs 53% (95% CI 47.85-57.49%) of non-IDUs.

Conclusions: IDUs were more likely to be discharged with a diagnosis of cellulitis, abscess, or bacteremia, while non-IDUs were more likely to be discharged with appendicitis. Cohorts were equally likely to be discharged with diagnoses of pneumonia. There were statistically significant differences in in the rates of hyponatremia and leukocytosis between IDUs and non-IDUs.
Abstract title: Acute Stroke Recognition by Paramedics after Regionalization of Stroke Care: Outcomes Based Study

Resident’s name: Sean Kivlehan, MD, MPH

Name of program: Emergency Medicine

Purpose: Early evidence supports regionalization of stroke care. While validated stroke tools exist for screening of stroke symptoms in the prehospital setting, system wide triage performance of prehospital providers in a regionalized system has not been reported. The objective of this study is to assess the diagnostic ability of prehospital providers, before and after regionalization of care, using outcomes based approach.

Methods: This is a cross-sectional study of all patients who were transported to hospitals in two Northern California counties by providers of a single EMS agency during a three year period. One county remained non-regionalized (NR) during the study period and the other initiated and completed regionalization (R) of the system during the study period. Patient demographic data, prehospital provider clinical assessment was obtained from the computerized prehospital transport records and physician diagnosis was obtained from statewide administrative patient discharge data. The data sources were linked using probabilistic linkage methodology. Patients >=18 years of age with validated ICD-9 code for stroke were included. We excluded inter-facility transports and direct admissions. Sensitivity, specificity and predictive values for were determined before and after implementation of regionalization. Data analysis was performed using SAS version 9.2.

Results: The total number of medical related EMS transports for 3 years was 310,731 and the number of patient discharges with a primary diagnosis of stroke was 10,298. We were able to link 3736 stroke records which indicate EMS use by 36% (3736/10,298) stroke patients. The sensitivity, specificity, PPV and NPV in the pre-regionalization phase was 28%, 80%, 53%, 58% and during the implementation phase of regionalization was 39% 78%, 57% and 63%. The performance in the NR County during the entire period was 23%, 76%, 40% and 58%.

Conclusions: Diagnostic accuracy remained low although improved prehospital provider performance was observed after regionalization of stroke care. Future studies need to confirm results in other counties and study trends in provider performance over time.
Abstract title: Occipital/Parietal Cortical Differences in Poor Sleepers

Resident’s name: Brian Mohlenhoff, MD

Name of program: Psychiatry

Purpose: Sleep facilitates memory formation and retrieval as well as memory consolidation and is vitally important to human health and cognition. Posttraumatic stress disorder (PTSD) is an anxiety disorder that frequently involved impaired or altered sleep patterns. Previous research has found volumes of the hippocampus to be smaller in subjects with PTSD. We hypothesized that hippocampal volume would be negatively associated, in this sample, with PTSD severity and that this correlation would be driven by subjective sleep impairment.

Methods: Magnetic resonance brain scans, T-1-weighted, were pooled from four data sets. All brain scans were collected on the same 4-Tesla machine. The pooled data set included a total of 187 subjects. PTSD severity was measured with the Clinician Administered PTSD Scale (CAPS, higher scores indicate more severe PTSD). Subjective sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI, higher scores indicate worse sleep). Data were analyzed using a package of voxel-based morphometry (VBM) tools available for SPM-8. Scans were smoothed, normalized to a standard brain space template and segmented into gray matter, white matter and cerebrospinal fluid. Gray matter segments were correlated with CAPS and PSQI scores from individual subjects to search for regions, a priori, in which gray matter volume was negatively correlated with higher CAPS and PSQI scores. Correction for multiple comparisons was made using the False Discovery Rate with height threshold of 3.

Results: We found no relation between gray matter volume and PTSD severity in our pooled data set using VBM at our predefined statistical thresholds. There was a significant negative correlation between gray matter volume and PSQI scores in the occipital/temporal area within a fissure bilaterally. This finding survived multivariate analyses using as nuisance variables study group, PTSD status, CAP score, gender, number of years of education and total intracranial volume.

Conclusions: In our study sample, VBM may have lacked sufficient sensitivity to reveal hippocampal volume differences correlated with PTSD severity. In this sample, changes associated with PSQI scores were a relatively robust finding, indicating that worse subjective sleep is likely associated with less gray matter in a particular area of the brain bilaterally. This area, in the depth of a fissure located in the occipital/temporal area, is near to areas of the cortex that have been implicated in facial recognition. Impaired facial recognition has been correlated with poor sleep quality. While causal mechanisms cannot be inferred from this study, it is possible that poor sleep leads to impaired facial recognition via alterations in the brain area identified in this study.
Abstract title: Weight and Emotional Well-Being in Teens

Resident's name: Karen Mu, MPH, PhD

Name of program: Psychiatry

Purpose: While causality between depression and obesity has not been determined, a strong relationship between depression and obesity has been delineated in all age groups bi-directionally; several studies in adults have found that obese individuals are about two times more likely to become depressed, while others implicate depression as a risk factor for obesity. Depression has been proposed as an indirect cause of obesity through increased emotional eating, decreased physical activity, and increased calorie-rich food intake. In turn, obesity is also hypothesized to lead to depression, with the stigma of obesity potentially causing discrimination by others that can lead to negative psychosocial outcomes, lowered self-esteem, stigmatization, and depressed mood. In the child and adolescent population, depression was found to be a predictor for increased BMI in adulthood even after controlling for socioeconomic status, particularly in adolescent females. In one study, non-obese adolescents with depressed mood at baseline showed a two-fold increase in age-adjusted BMI after one year. Physiologic consequences of childhood-onset obesity such as early puberty have also been correlated with psychopathology such as depression, substance abuse disorders, conduct disorder and eating disorders. In understanding the association between obesity and depression it is also important to assess the role of protective factors, often described as resilience, that may prevent their development or mitigate their effect. Individual resilience factors such as attitudes about personal competence, self-efficacy, assertiveness, and pro-social norms have been associated to mental health and may improve treatment strategies targeting depression and obesity as well as help prevent further negative health outcomes. This is the first study to determine the prevalence of depression and co-morbid anxiety disorders, substance abuse disorders and eating disorders as well as possible protective factors in overweight and obese adolescents in comparison to non-obese adolescents in the primary care setting, and the first necessary step in order to establish a Collaborative Care Model (CCM) approach to treatment in the primary care setting for this population.

Methods: This is a prospective two-phase cohort study of 300 overweight, obese and weight-normal adolescents aged 12-18 years at the UCSF and SFGH Teen Clinics. All teens will be invited to take part by study personnel during intake in the Teen Clinic. Exclusion criteria include non-English non-Spanish speaking, lack of consent, and unwillingness to participate. Parents will be consented and adolescents under 18 will be assented in English and Spanish. The consent will include disclosure that all questionnaires will be shared with their primary care provider (PCP) as this information is part of routine care, and that study researchers will obtain access to the subjects' medical charts to obtain information pertaining to BMI, labs, and obesity care, such as the WRAP survey (obesity care intake survey). The study screens for depression, co-morbid anxiety disorders, eating disorders, substance abuse disorders, and resilience factors using the following self-administered questionnaires: Patient Health Questionnaire (PHQ-9), Multidimensional Anxiety Scale for Children (MASC), SCOFF screen for eating disorders, and the CRAFFT screen for substance use disorders. The Resilience Scale (RS) and Individual Protective Factors Index (IPFI) will be used to evaluate resilience. All patients will be asked to undergo screening surveys, with a consecutive convenience sample in both clinics, and parental and patient consent will be obtained. Subjects that express positive suicidality during initial in-clinic screen will flagged and their primary care doctor will be notified immediately. The subject will be referred to Child Crisis emergency psychiatric services or for follow-up with Child and Adolescent Services as deemed necessary. In the second phase, a random set of 20 patients each that screen positive and negative for depression by PHQ-9 will undergo a standardized interview by blinded clinicians to validate results to ensure diagnostic accuracy, and will receive a $20 gift card. Interviewers will be clinicians trained by the PI for inter-rater reliability with inter-class correlation of 0.80 or above, the standard for all depression studies. Measures will be summarized to assess distribution, means, standard deviations, and correlations between the self-report measures using ANOVA and multiple regression analysis for the continuous variable outcome of the PHQ-9 score. Predictors will include BMI, site, ethnicity, SES, resilience, and interaction factors.

Results: This prospective study is currently in the CHR review process. Both sites are already using an obesity screening tool called the Weight Risk Assessment for Pediatrics/Adolescents (WRAP) survey, which is administered by paper or with a computer program designed by one of the co-investigators, Dr. Carolyn Bradner Jasik. The screen includes a patient survey of risk factors for obesity, past medical history of conditions related to obesity, family history, labs and BMI. The SFGH primary care pediatric clinics had 2430 primary care visits in 2010, 381 of which were among adolescents, with 68% Latino, 14% African-American, 11% Asian-American, and 2.6% Caucasian patients. 44.2% of these adolescents are either overweight or obese and would be eligible for a mental health screen in primary care.

Conclusions: Our hypotheses are as follows: 1) Overweight and obese teens have a higher incidence of depression and other co-morbid psychiatric illness than weight-normal controls. 2) Resilience is higher in non-depressed teens than in depressed teens. 3) Resilience is higher in weight-normal teens than in overweight and obese teens.
Abstract title: SportSmarts: A Conflict Resolution Program Through Soccer

Resident's name: Yamini Rao, MD

Name of program: Pediatrics

Purpose: The SportSmarts curriculum is a 6 week-long, twice per week school intervention adapted from a validated curriculum based on attribution error first developed by Dr. Cynthia Hudley, PhD in Education Psychology. Her theory is that aggressive children tend to misunderstand intent in situations of conflict. The curriculum is designed as a primary prevention model to reduce aggressive and violent behavior in elementary school aged children.

The purpose of our study is to demonstrate the effect of the SportSmarts curriculum on participating children’s understanding of intent, potential response to scenarios of conflict, and self reported aggression. Secondly, our purpose is to demonstrate the effect of the SportSmarts curriculum on participating children’s level of aggression as assessed by their teachers and coaches.

Methods: Experimental Group: SportSmarts students, grades 4-5 (n=76) in four SFUSD elementary schools that are predominantly Latino/a. The SportSmarts curriculum was conducted by staff and coaches of America SCORES, an established after-school program in the Bay Area. Control Group: Elementary school students, grades 4-5 (n~40) predominantly Latino/a who are participating in other America SCORES programs, but were not participants in the SportSmarts program.

Survey Tool: Pre/Post Surveys (separated by 8 weeks of time) were administered to:
1) Students – 3 scenarios of conflict + validated self aggression scale
2) Classroom teachers – validated reactive and proactive aggression scale
3) America SCORES coaches – validated reactive and proactive aggression scale
Analysis: Mixed effects regression model over time, clustered by team/coach.

Results: Children rated by teachers in the most aggressive quartile are more likely to self-report more aggressive behavior in past week (re-run analysis), but have similar survey responses to their less-aggressive peers regarding conflict scenarios
• Students in the most aggressive quartile (as rated by teachers) had significantly improved teacher-rated proactive aggression (p = 0.036) and reactive aggression (p = 0.013) after the SportSmarts Program
• When looking at all students, there is a trend towards improvement in teacher and coach rated aggression, but the findings are not statistically significant. (Reg coeff: -0.429– -0.979)
• The student participants as a whole had no change in responses to scenarios, self-rated aggression, or teacher/coach-rated aggression. Control group data is still being collected and analyzed.

Conclusions: The SportSmarts Program is effective in improving the most aggressive students' tendency to both initiate and perpetuate violent behavior. This study suggests that further dissemination of this program locally and nationally to elementary schools may enact positive change in children’s behavior and level of aggression, with the ultimate goal of reducing adolescent and adult violence.
**Abstract title:** Pelvic Embolization for Intractable Post-Abortion Hemorrhage: A Long-Term Follow-Up

**Resident’s name:** Tami Rowen, MS, MD

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

**Purpose:** Uterine artery embolization (UAE) is safe and effective in treating post-abortion hemorrhage. The long-term effects of UAE for post-abortion hemorrhage have not yet been described. We sought to study changes in menses and fertility for women who had previously undergone an UAE for post-abortion hemorrhage.

**Methods:** We attempted to contact all patients who underwent a post-abortion UAE at our institution from 2001 to July 2012. Patients who consented to participate in the study were sent an anonymous survey with questions about side effects from the procedure and reproductive health since their admission. Descriptive statistics were used to analyze the responses.

**Results:** From 2001 to July 2012, 75 women underwent UAE, we attempted to contact by phone all women who provided non-confidential numbers (72). We successfully contacted 12 by phone (17%). Of those, 2 declined participation and 1 could not provide an address. The remaining 9 were mailed surveys. Of the 3 returned surveys, we found that all patients did return to their normal menses within 1 month. None attempted to conceive after the procedure and all were on effective birth control. 2 did report abnormal vulvar varices that developed post procedure. No other adverse side effects were reported. Data collection is ongoing and patients are now being contacted by phone to complete the surveys.

**Conclusions:** From 2001 to July 2012, 75 women underwent UAE, we attempted to contact by phone all women who provided non-confidential numbers (72). We successfully contacted 12 by phone (17%). Of those, 2 declined participation and 1 could not provide an address. The remaining 9 were mailed surveys. Of the 3 returned surveys, we found that all patients did return to their normal menses within 1 month. None attempted to conceive after the procedure and all were on effective birth control. 2 did report abnormal vulvar varices that developed post procedure. No other adverse side effects were reported. Data collection is ongoing and patients are now being contacted by phone to complete the surveys.
Abstract title: Frequency and Clinical Implications of Incidental New Primary Cancers Detected on True Whole Body FDG PET/CT Studies

Resident’s name: Ronnie Sebro, MD, PhD

Name of program: Radiology

Purpose: To investigate the frequency of newly discovered primary malignancies detected by Positron Emission Tomography/Computed Tomography (PET/CT) on oncologic subjects undergoing staging/restaging studies for a different malignancy, and to determine what proportion of these findings change clinical management.

Methods: Retrospective review of 556 subjects (804 PET/CTs) performed for oncologic staging/restaging. Incidental findings were followed up by a combination of clinical examination, biopsy, additional and/or follow-up imaging.

Results: 43 (7.7%) subjects had lesions that were suspicious for a newly discovered primary malignancy that was different from the malignancy for which the study was performed. 8 (1.4 % of 556) of these subjects had biopsy confirmation of an additional synchronous or metachronous primary malignancy. However, these lesions changed the clinical management in 18 (3.2% of 556) subjects. Subjects with early disease (Stage 1 and 2) based on the malignancy for which the study was performed were more likely to have these lesions biopsied, evaluated by clinical examination or additional immediate or follow-up imaging than subjects with advanced disease (Stage 3 and Stage 4), however this difference was not statistically significant (p = 0.18).

Conclusions: New primary malignancies are sometimes detected by PET/CT. Detection of these can lead to early detection and successful treatment of second malignancies. These new malignancies can change clinical management particularly in subjects with early stage disease.
Abstract title: Worsened Outcome after Intraoperative Re-rupture in Subarachnoid Hemorrhage Not Due to Increased Vasospasm

Resident’s name: Sunil Sheth, MD

Name of program: Neurology

Purpose: Intraoperative re-rupture during open surgical clipping of cerebral aneurysms in subarachnoid hemorrhage (SAH) has been shown to lead to worsened outcomes. This relatively frequent complication has a profound impact on patient outcomes, and can lead to a two-fold increase in the rate of in-hospital death and disability on discharge. The etiology of the clinical worsening following re-rupture remains unclear. One possible explanation is an increased rate of vasospasm secondary to vessel trauma and exposure to acute hemorrhage. Identifying an increased rate of vasospasm among patients with intraoperative re-rupture would justify early aggressive measures at preventing the delayed cerebral ischemia it produces. The purpose of this study is to evaluate whether intraoperative re-rupture of cerebral aneurysms in SAH leads to higher rates of subsequent vasospasm.

Methods: 501 consecutive patients treated with open surgical clipping for SAH were reviewed, and clinical and imaging data were collected. Angiographic vasospasm was defined as vessel narrowing thought to be consisted with vasospasm on angiography and symptomatic vasospasm was defined as angiographic vasospasm in the setting of a clinical change attributable to vasospasm. Rates of angiographic and symptomatic vasospasm among patients with and without intraoperative re-rupture were compared.

Results: There were no significant differences between the groups with and without rupture with respect to age, modified Fisher score, history of hypertension (HTN), or smoking. Angiographic vasospasm was seen in 65% of patients without re-rupture compared and 65% of patients with re-rupture (p=1.0, Fisher’s exact test). Symptomatic vasospasm was seen in 36% of patients without re-rupture, compared to 41% of patients with re-rupture (p=0.44, Fisher’s exact test). In multivariate analysis, higher Fisher score and higher Hunt-Hess score were significantly predictive of vasospasm whereas re-rupture had no effect.

Conclusions: Our study found no significant influence of intraoperative re-rupture during open surgical clipping on the rate of angiographic or symptomatic vasospasm. These results do not justify early targeted vasospasm therapy in these patients.
Abstract title: Evaluating Adherence to Guidelines for Troponin Assay Use in the Emergency Departments of Three Hospitals in a Major United States City

Resident's name: Sahael Stapleton, MD

Name of program: Internal Medicine

Purpose: Cardiac troponin I (TnI) has evolved into a high sensitivity assay for detecting myocardial damage. When combined with clinical presentation and electrocardiographic findings, TnI is effective for identification of acute coronary syndromes (ACS) including myocardial infarction (MI). Clinical experience suggests that TnI assays have proliferated to other non-validated uses; furthermore it is unclear how much the other essential components of investigation for ACS contribute to current patient evaluation. No retrospective reviews have evaluated whether patients for whom such studies are sent reflect recommended guidelines. This study will retrospectively evaluate practice patterns surrounding TnI assays in the emergency department (ED), and characterize the natural history of patients presenting to the ED who have TnIs drawn at 2 urban hospitals. This evaluation will inform clinical reasoning and creation of “standard of care” use of TnI assays. The protocolization of test ordering is one mechanism to efficiently and cost-consciously improve healthcare delivery. Research Question: How are Tn assays used in 2 hospital EDs to diagnose and treat ACS? Specifically, what percent of TnIs drawn in the EDs of these hospitals reflect current guidelines for such labs in patients who have these assays sent? Primary Aim: Characterize natural history of patients presenting to the ED who have TnIs drawn, irrespective of presenting symptoms, and to determine whether test utilization adheres to guidelines. Secondary Aims: How often is cardiac TnI elevated in suspected ACS and for non-ACS conditions where TnI was sent? How often does an elevated Tn in non-ACS result in additional invasive or non-invasive testing to investigate for coronary artery disease? How does the pattern of TnI usage differ between 2 distinct hospital populations? Primary Outcome: If a patient has a Tn assay sent, how often was it sent to assess for symptoms attributable to ACS versus non-ACS symptoms? The primary outcome of this analysis will be to quantify the degree of adherence to guidelines for the utilization of the Tn assay in the determination of ACS. Secondary Outcome: Evaluate interventions and further diagnostic study for suspected ACS.

Methods: Procedures for Gathering Data: We will utilize a health record electronic data service to extract data from medical records for each hospital. CHR approval has been obtained for the next year. Information will be recorded, de-identified, and stored in excel format. Data will be taken from 3/1/2008-3/1/2012. Variables to be extracted are: dates of service, hospital visited, age, race, sex, chief complaint presentation, admit diagnosis, Tn #1, Tn #2, Tn #3, number of Tn measurements to peak, location of initial Tn measurement, BNP's 1, 2, and 3, admit service, types of ECG change, comorbidities, labs on admission, history of prior MI, prior cardiac intervention (PCI/CABG), intervention on admission and outcome, ejection fraction demonstrated on echocardiogram, any changes made to CHF meds, any new meds and hospital days. Analytic plan: We will perform a logistic regression with elevated Tn as the categorical outcome and adherence to guidelines as a predictor. We will assess whether Tn elevation itself is a binary predictor of hospital admission, ACS, intervention, disposition and length of stay. We will control for historical, ECG, laboratory and patient data that may confound this relationship. We will perform a logistic regression for BNP controlling for the same data. We will confirm coronary artery disease with review of diagnostic testing in addition to medical records and ECG studies will be reviewed with an attending physician for accuracy.

Results: During the time period there were 7590 emergency department visits for which a troponin was sent. The average troponin value for all emergency department visits where a troponin was sent was 1.79. During the time period there were 2306 admissions from the emergency department from which a troponin was sent. Average troponin value in the ED was 0.18. The average troponin value after being ruled in or ruled out for infarction was 2.75. An initial sample of the first 27 admissions was evaluated in order to facilitate planning for ongoing data abstraction. This initial group consisted of 6 patients (5 African American, 1 Asian) who constituted between 2 and 12 admissions. The average age for all admissions was 63.15 years. Average A1C for all admissions was 5.38. Average creatinine for all admissions was 2.26.

Conclusions: Initial data gathering is in process and will be ongoing for the next 1-3 months. After this short series of abstractions data are remarkable for each patient having multiple admissions. Additionally the patients also were notable for older age and decreased renal function. The remainder of the data abstraction will be necessary to validate and expand on these results.
**Abstract Title:** The Effects of Intranasal Oxytocin on Social Cognition and Social Approach Behaviors in Opioid-Dependent Patients

**Resident’s Name:** Christopher Stauffer, MD

**Name of Program:** Psychiatry

**Purpose:** Much has been written on the shared neurobiology of attachment and addiction. Some of the best treatments we have for addictive disorders involve strengthening meaningful attachments and enhancing social cognition, resulting in the reciprocal reduction of drug pursuing behavior and sensitivity to drug-related cues. Currently, no effective pro-social pharmacological treatment is available. The ultimate goal of this project is to improve substance abuse treatment by correcting social deficits using a novel pharmacological intervention. The neuropeptide oxytocin plays an important role in attachment and affiliative behavior in mammals. In animal models, chronic opiate administration profoundly alters the brain oxytocin system and has a deleterious effect on attachment behavior. Exogenous oxytocin reverses many of the behavioral sequelae of chronic opiates, including significant decreases in tolerance, withdrawal, and self-administration of opioids. In humans, oxytocin increases trust and improves social cognition in healthy and multiple patient populations. Although oxytocin may be a treatment option for social dysfunction in patients with substance abuse as well as a direct treatment of addiction, no studies have yet examined the effects of oxytocin administration in patients with substance use disorders.

**Methods:** We propose to test the efficacy of intranasal oxytocin in promoting social behavior at the expense of drug use-related behavior in 26 patients receiving methadone maintenance treatment (MMT) for opioid dependence. Oxytocin and placebo will be administered in a randomized, double-blind, counterbalanced order with a cross-over design, at least one week apart. We will examine if intranasal oxytocin administration reduces social cognitive deficits, reduces craving for opioids, and shifts implicit preferences from drug-related to social stimuli.

**Results:** The study is currently in process.

**Conclusions:** This research is a first step toward identifying if oxytocin is a useful adjunct treatment for substance use disorders that specifically target the social deficits of this illness. The results of this study will also give us valuable insight into the neurobiology of the interplay between addiction and attachment behaviors.
Abstract Title: Inverse Planned High-Dose Rate Brachytherapy for Locoregionally Advanced Cervical Cancer: the UCSF experience with 4-year Follow-up

Resident’s Name: Christopher Tinkle, MD, PhD

Name of Program: Radiation Oncology

Purpose: We present updated clinical outcomes of image-guided brachytherapy using inverse planning simulated annealing (IPSA) high-dose rate (HDR) brachytherapy boost for locoregionally advanced cervical cancer.

Methods: From February 2004 through September 2009, 111 patients with primary cervical cancer were treated definitively with IPSA-planned HDR brachytherapy boost (28 Gy in 4 fractions) after external radiation to a total tumor dose of 85 Gy (a/ß=10) at University of California San Francisco. We performed a retrospective review of our experience using image-guided brachytherapy. Of the patients, 72% had tumor size greater than 4 cm, 37% had nodal disease, and 15% had distant metastasis (para-aortic lymph nodes) at the time of diagnosis. Surgical staging involving pelvic lymph node dissection was performed in 14% patients, while 93% received concurrent cisplatin-based chemotherapy. Toxicities are reported according to CTCAE v4.0 guidelines.

Results: With a median follow-up of 41 months (range: 3 - 84 months), no acute or late toxicities of Grade 4 or greater were observed and Grade 3 toxicities (both acute and late) developed in 8 patients (1 constitutional, 1 hematologic, 2 genitourinary, 4 gastrointestinal). During the follow-up period, local recurrence developed in 5 patients (4 to 9 months after HDR boost), regional recurrence in 3 (4 - 16 months after HDR boost), and new distant metastasis in 30. The 4 year Kaplan-Meier estimates of local, regional and distant control of disease were 94.9%, 91.8%, and 69.8%, respectively. The overall and disease-free 4 year survival rates at 4 years were 64.1% (95% confidence interval of 54%-73%) and 61.2% (95% confidence interval of 51%-70%), respectively.

Conclusions: Definitive radiation by use of inverted planned HDR brachytherapy boost for locoregionally advanced cervical cancer is well tolerated and achieves excellent local control of disease. However, overall survival continues to be limited by the high frequency of distant metastasis.
Abstract Title: Outcomes of STEMI activations based on degree of CAD

Resident's Name: Tyson Turner, MD, PhD

Name of Program: Internal Medicine

Purpose: Autonomous activation of the cardiac catheterization laboratory may lead to emergent angiography for patients without obstructive coronary artery disease (CAD). Little is known about the clinical characteristics and long-term outcomes of patients with non-obstructive CAD or no evidence of CAD on angiography despite being clinically diagnosed with a STEMI by emergency medical personnel.

Methods: Subjects were identified within a registry containing consecutive patients that underwent emergent angiography for a potential ST-elevation myocardial infarction (STEMI) from October 2008 to July 2012. Vital status was obtained from the medical record and Social Security Death Index. Cox proportional hazards models were created to evaluate the relationship between the degree of CAD present and cardiovascular outcomes, including major adverse cardiovascular events and mortality.

Results: Among 539 patients that underwent emergent coronary angiography, 65 (12%) had no CAD, 110 (20%) had non-obstructive CAD, and 364 (68%) had obstructive CAD. Kaplan-Meier analysis of MACE stratified by degree of CAD demonstrated that patients with non-obstructive CAD (HR: 2.0) and obstructive CAD (HR: 1.9) have significantly increased risk as compared to patients with no CAD (p=0.02). The proportion free of death between patients with non-obstructive CAD and obstructive CAD showed no difference in multivariate analysis (HR: 1.9 vs 2.0, p=0.06).

Conclusions: Patients with non-obstructive CAD and obstructive CAD were found to have similarly increased risk as compared to patients having no CAD on emergent angiography, suggesting that the rate of major adverse cardiovascular events is comparable between these two populations. Closer follow-up is needed in patients found to have a non-obstructive lesion on emergent angiography following a STEMI diagnosis.
NOTES
Interested in Clinical Research During Residency?

Designing Clinical Research leads Residents through the essential components of writing a clinical research protocol, developed around their own clinical research question. Residents learn the fundamental principles of study design, subject selection, strategies for reducing bias and controlling for confounding, and how to perform a sample size calculation. The tangible product of the course is a 5-page clinical research protocol.

Residents may choose from two course options:

1) Traditional in-person version, August 2013
   • Monday and Wednesday from 9am-12 noon
   • Four weeks
   • Each session includes a 1 ½ hour lecture followed by a 1 ½ hour small group seminar lead by UCSF faculty
   • Residents must have 50% protected time to allow adequate time to attend classes, complete reading and homework assignments, and write their research project protocol
   • The August course application is available in mid-April of each year. Please go to http://www.epibiostat.ucsf.edu/courses/schedule/clin_research_predocs.html for more information

2) Online version, October 2013
   • This format provides a flexible schedule. Students must listen to pre-recorded lectures, complete homework, and participate in online discussions weekly
   • Four weeks
   • Residents must have sufficient protected time to allow adequate time to listen to lectures, complete reading and homework assignments, and write their research project protocol
   • The October course application is available in mid-June of each year. Please go to http://accelerate.ucsf.edu/training/designing-clinical-research-residents for more information.

Sponsored by the UCSF Resident Research Training Program, in collaboration with the Department of Epidemiology and Biostatistics, and the Clinical and Translational Science Institute at the University of California, San Francisco

For questions contact Christian Leiva: cleiva@psg.ucsf.edu
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<tr>
<th>Date</th>
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<td><strong>Saturday, May 4</strong></td>
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<td>8:00am-5:00pm</td>
<td>UCSF/SFSU Graduate Program in Physical Therapy Spring Symposium</td>
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<td><strong>Monday, May 6</strong></td>
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<td>2:00pm-5:00pm</td>
<td>Department of Clinical Pharmacy 14th Annual Spring Research Seminar</td>
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<td>12:00pm-4:30pm</td>
<td>Posterpalooza and the Pathways to Discovery Symposium and Awards</td>
<td>Millberry Union Gymnasium</td>
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<td>CTSI Resident Clinical &amp; Translational Research (CTR) Symposium</td>
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<td><strong>Thursday, May 9</strong></td>
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