

2021

GME Resident Scholarly Activity Projects



FOREWARD

Congratulations Kaweah Health resident and faculty physicians! You continue to meet the rigorous standards of this graduate medical education program and you should be proud of the scholarly achievements showcased in this booklet.

Through these accomplishments, you have learned, measured and applied knowledge in new ways. You are contributing to the collective scientific knowledge of the world.

I am very excited to be able to support this quality work. By participating in the research and publication process, you demonstrate your abilities to make meaningful contributions within your own community, your areas of interest and throughout the world of health care. We are proud of you, and look forward to the differences you will make.

Sincerely,

Lori D Winston, MD FACEP
Vice President of Medical Education
Kaweah Health



Should we proceed? Marijuana-induced gastroparesis and the implications for Aspiration Risk in the NPO patient: A Case Report

INTRODUCTION

THC-induced gastroparesis is an underreported condition that poses an aspiration risk for the anesthesiologist.

BACKGROUND:

A 24-year-old male presents for an elective ORIF of a right fibula fracture. The patient endorsed daily marijuana use of 2 g/day for six years. His BMI was 22 and he denied any history that would present an aspiration risk. His last full meal took place at 2200 the night prior, which met standard NPO guidelines. Use of an LMA therefore seemed appropriate. After induction of anesthesia and LMA placement, gastric contents were noticed to be filling the LMA. The LMA was immediately removed and 25-50cc of gastric contents was suctioned from the oropharynx. RSI was then performed and the airway was secured with an ETT followed by placement of an orogastric tube, with 500 cc of clear gastric contents suctioned from the stomach. Bronchoscopy revealed no obvious gastric contents in the tracheobronchial tree. The patient maintained adequate O₂ saturation and ventilation throughout the case. At the case's conclusion, the patient was safely extubated and was brought to the PACU, where recovery was uneventful.

DISCUSSION:

Gastroparesis is a disorder characterized by the delayed gastric emptying of food in the absence of mechanical obstruction. It generally manifests in symptoms of early satiety, postprandial fullness or nausea and vomiting. Most frequently it is associated with Diabetes Mellitus or secondary to viral or idiopathic etiology. A lesser known cause of gastroparesis is THC use, an association that has been identified but rarely reported. While the anesthetic implications of THC use have been identified in regards to the respiratory and cardiac systems, there remain few case reports of THC induced gastroparesis as a cause of near-aspiration and the implications for anesthetic management.

IMPLICATIONS FOR PRACTICE:

This case raises important considerations for management of THC- dependent patients and the implications for aspiration risk. Until the true incidence THC- induced gastroparesis is known, it is prudent to take aspiration precautions in all patients who endorse THC use.

**Caitlin
Cammarano**

DO

Anesthesia

From Pneumonia to Myxofibrosarcoma: The Enigmatic Tale of an Obstructive Left Atrial Mass

INTRODUCTION/BACKGROUND:

Primary cardiac tumors are extremely rare entities with natural histories that have been poorly characterized. Malignant sarcomas are the second most common primary cardiac tumor behind atrial myxomas. Myxofibrosarcoma is exponentially more unique. According to a 2014 article, only 22 had been reported since 1963. Primary cardiac tumors in general are notorious for being “great mimickers.” Likewise, our patient was initially presumed to have community acquired pneumonia and tested positive for influenza, both A and B strains. After imaging, surgery, and initial interpretations by in-house pathology, our patient was presumed to have a benign left atrial myxoma, until a send-out pathology result confirmed diagnosis of myxofibrosarcoma. We present the course of this myxofibrosarcoma and discuss how the findings compare to the current body of case reports that exist.

METHODS:

A female in her fourth decade presented to the emergency department (ED) with three weeks of progressively worsening dyspnea, pleuritic chest pain and orthopnea. In 2017, she had a transthoracic echo (TTE) with no overtly concerning findings. Her dyspnea and pleuritic

chest pain worsened three weeks prior to admission, she was treated with a course of azithromycin, a rescue-inhaler and steroids. Refractory continued, she presented to our ED in respiratory distress with leukocytosis and a dual-positive test for influenza strains A and B, for which she was started on Tamiflu.

RESULTS:

Almost fifteen months after initial tumor resection, the patient had a negative repeat cardiac MRI at an outside facility. Four days after this she was re-hospitalized and a recurrent left atrial mass was present on CTA. Repeat echo demonstrated another obstructive, albeit smaller mass. The mass was once again resected but with the addition of cryoablation. Two months after discharge, the patient developed a third mass, with similar symptoms, prompting another hospitalization. During this third hospitalization the patient had a cardiac arrest, prompting transfer to the ICU, where she eventually expired after withdrawal of care.

IMPLICATIONS FOR PRACTICE:

Most sources agree that earlier diagnosis is essential for improved outcomes, as earlier surgery could positively impact on the length of survival, but due to the tendency of these tumors to recur, surgery has not had the same impact on mortality.



**Michael
Green**

MD

Anesthesia



**Albert
Aparicio**

MD

Emergency Medicine

Retrospective Evaluation of the Safety and Appropriateness of Mobile Crisis Disposition Decisions

INTRODUCTION/BACKGROUND:

There has been concern from the Emergency Medicine Physicians about safety of decisions made by the county Mobile Crisis team regarding the disposition of mental health patients who present to the Emergency Department.

METHODS:

This was constructed as an observational study conducted through retrospective chart review. There was no comparison group for this study. 12 months of data were examined, comprising 3406 adult encounters with a suspected primary psychiatric diagnosis.

RESULTS:

We found frequent discrepancies between decisions made by the Mobile Crisis team, Emergency Medicine physicians, and Psychiatry physicians. The study suggests that Emergency Medicine physicians can identify cases in which the decision of safe disposition made by Mobile Crisis would be eventually overturned by Psychiatry.

IMPLICATIONS FOR PRACTICE:

These differences of opinion put patients at potential risk of harm and increase lengths of stay within the Emergency Department.



**Benjamin
Camacho**

MD

Emergency Medicine

Identifying Communities at Risk for Hospitalization Due to COVID-19 Within Tulare County

INTRODUCTION/BACKGROUND:

During the height of the pandemic of 2020 and 2021, certain communities experienced increased risk of hospitalization, death or prolonged illness due to illness related to infection with the novel coronavirus (COVID-19). Some of these communities have been identified in previous studies and are based on age, gender, and self-identified ethnicity/race.

METHODS:

This investigation was designed as a retrospective cross-sectional study performed exclusively at Kaweah Health Medical Center in Tulare County, CA. The Kaweah Health Institutional Review Board approved this protocol and waived the requirement for informed consent.

RESULTS:

It is apparent that within the 33 Tulare County ZIP codes there is a high degree of variation and there are indeed areas of concern that reflect increased risk of hospitalization based upon geographic location.

IMPLICATIONS FOR PRACTICE:

These findings may help direct ongoing vaccination efforts, as the vaccine rate within the US has ultimately stalled, sagged, or in many cases, plummeted. These poor vaccination rates are likely multifactorial, and may in part be due to socioeconomic stressors that preclude households from taking the time from work to scheduled their vaccine and to take the time required for appropriate post-vaccination recovery. By identifying the above communities that have proven higher risk for COVID-19 related hospitalization, we may begin to focus mobile clinic and education efforts to those specific areas, rather than attempting large venue vaccination events that require transportation and time away from employment.



**Patsy
Chenpanas**

MD

Emergency Medicine

Predictors of Early Clinical Deterioration from the Emergency Department and Clinical Gestalt: A Prospective Case-Control Study

INTRODUCTION/BACKGROUND:

Rapid response teams (RRT) aim to reduce morbidity and mortality of hospitalized patients through early intervention on those who are clinically deteriorating. Identifying predictors of early deterioration of patients may improve quality and safety. The primary objective is to identify these predictors of RRT activation within 24 hours of admission. Secondary objectives are to detect differences in hospital length of stay (LOS), admitting diagnoses, and 30-day mortality in those with and without RRT (+RRT and -RRT). Last, we examine the predictive value of physician clinical gestalt on RRTs.

METHODS:

This was a prospective, observational case-control study by chart review of adult patients admitted at Kaweah Health Medical Center between December 2020 and March 2021. Exclusion criteria were age <18, admission to ICU, and direct transfer out of the ED. At time of admission, we performed chart review to collect eight VS used to activate a RRT at our hospital. To determine clinician gestalt, the physician was also asked if RRT would occur within 24 hours.

RESULTS:

199 patients met inclusion/exclusion criteria for analysis. No significant differences were detected in gender, age, or level of care between our groups. The groups differed in median heart rate and respiratory rate, but the difference was insignificant. There was a marginally significant association between COVID-19 as admitting diagnosis and RRT but no significant association between RRT and 30-day mortality.

IMPLICATIONS FOR PRACTICE:

Due to small sample size, our results did not show significant differences in gender, age, level of care, heart rate, respiratory rate, or length of stay between the +RRT and -RRT groups. However, our study was significant for three findings. First, there was a marginally significant association between an admitting diagnosis of COVID-19 and RRT. Second, patients deceased within 30 days had a significantly higher number of abnormal VS than patients who were alive at 30 days, suggesting a positive correlation. Third, results suggest that the clinical gestalt of emergency physicians at predicting who will not have an RRT is reasonably good, but may not be as good at predicting who will have an RRT.

*Shared project with Jeff Wells, MD.



**Nicole
Guillen**

MD

Emergency Medicine

Do Automated Reminders to Review Patient List Improve Emergency Department Resident Efficiency?

INTRODUCTION/BACKGROUND:

The Emergency Department (ED) is laden with numerous distractions at any given time, and navigating the work flow in an efficient manner is an important skill every Emergency Physician or Advanced Provider must master. To the authors' knowledge, there has been no research to identify ways to improve how efficiently a resident works amid these distractions. This study tests whether the addition of an hourly automated reminder for residents to review their patient list improves how quickly a patient is discharged, admitted, and/or decreases their total time in the ED.

METHODS:

Resident physicians at a single community ED were randomly assigned two groups: the intervention group which received automated hourly notifications within the electronic medical record (EMR) to review their patient list for those whose work-up is completed, and the control group which received no notification at all. We prospectively analyzed records for 25,255 encounters with 19,264 individual patients seen by 64 different residents over the study period from 9/11/2019 to 2/29/2020. Three-level mixed effects regression models were used to examine whether

notifications improved ED Length of Stay (ED-LOS), Turn Around Time to Discharge (TAT-D), or Turn Around Time to Admission (TAT-A).

RESULTS:

There was no statistically significant difference in ED-LOS or TAT-D between groups, but the average TAT-A was 20.00 minutes longer in the intervention group compared to the control group ($p < 0.001$), after accounting for patient- and resident-specific effects. Secondary analysis demonstrated no statistically significant effect of residency specialty on the effect of notifications on ED-LOS, TAT-D or TAT-A.

IMPLICATIONS FOR PRACTICE:

Automated hourly notifications within the EMR reminding residents rotating in the ED to review their patient list did not reduce the ED-LOS, TAT-D or TAT-A. In our study, the TAT-A was 20.00 minutes longer in the intervention group compared to the control group. It is unclear whether this represents an unintended effect of the automated reminders or is simply a spurious correlation, and further investigation is warranted to elucidate this finding.



**Travis
Helm**

MD

Emergency Medicine

Buprenorphine Prolongation of QT Interval Leading to Torsades des Pointes

INTRODUCTION/BACKGROUND:

A 40-year-old female admitted to emergency department from jail with a chief complaint of an thigh abscess where heroin was injected. Additionally, she had complaints of nausea, vomiting and chills. The patient was tremulous, actively vomiting, with bilateral upper extremity piloerection, tearing and frequently yawning.

METHODS:

A Suboxone (8mg buprenorphine- 2mg naloxone) sublingual tablet was administered; approximately thirty minutes later the patient lost consciousness while speaking to the police officer. A code blue was called. Patient initially noted to be in ventricular tachycardia and underwent several rounds of ACLS; the rhythm eventually changed into a polymorphic ventricular tachycardia consistent with torsades des pointes and intravenous magnesium was given with the achievement of spontaneous circulation. The patient's post-cardiac arrest electrocardiogram showed sinus tachycardia at 125 beats-per-minute with a QTc of 439 msec. After admission it was discovered that an exacerbating factor of

prolonged QTc is that she was also given a dose of ondansetron prior to transfer to the emergency department which was not originally reported.

RESULTS:

As health care providers attempt to solve the current opioid addiction crisis, another is being produced; how to safely detoxify patients from these drugs. The standard of care is shifting from referral to outpatient therapy to initiating treatment in acute care settings and with it must come an understanding of the risks of treatment, though buprenorphine is considered relatively safe.

IMPLICATIONS FOR PRACTICE:

Not every patient administered buprenorphine in the emergency department is at risk for developing torsades, but it is important to remember the inciting factors for those who may be. If a patient has already received drugs that may have prolonged their QT interval, if they are malnourished and may have hypokalemia, if they have liver disease or a history of prolonged QT; an EKG and a second thought may be warranted.



**Priscilla
Henson**

MD

Emergency Medicine

Readmission rates after phenobarbital for outpatient treatment of alcohol withdrawal

INTRODUCTION/BACKGROUND:

The aim of this study is to determine the readmission rate of patients diagnosed with alcohol withdrawal who are discharged from the emergency department after treatment with phenobarbital compared to those treated with benzodiazepines alone.

METHODS:

A single-center retrospective observational study was conducted through chart review and examined all-cause readmission rates and cause-specific readmission rates for both groups.

RESULTS:

Of the group that received phenobarbital 49.15% were readmitted to the emergency department within 30 days (N=29), compared with 50% of the patients that received benzodiazepines without phenobarbital (N=73). In the benzodiazepine group 5% of readmissions were due to trauma (N=4), 32% were due to alcohol withdrawal (N=23) and 63% were due to other causes (N=46).

In the phenobarbital group only 14% of readmissions were due to trauma (N=4), 28% were due to alcohol withdrawal (N=8) and 59% were due to other causes (N=17).

IMPLICATIONS FOR PRACTICE:

Treatment of alcohol withdrawal with phenobarbital in patients discharged from the emergency department resulted in a similar readmission rates compared to patients treated with benzodiazepines alone. When examining specific causes, the phenobarbital group had higher rates of trauma readmissions and lower rates of alcohol withdrawal readmissions.



**Theresa
Kim**

MD

Emergency Medicine

Case Report: Acute Pancreatitis Following Administration of the COVID-19 Vaccine

INTRODUCTION/BACKGROUND

Several vaccines have been linked to the development of acute pancreatitis, which in turn can have significant morbidity and mortality.

CASE REPORT:

In this report, we present a woman who unfortunately developed acute pancreatitis several hours after receiving her first dose of the BNT162b2 mRNA vaccine for the coronavirus disease of 2019 (COVID-19), without any other clear cause of her pancreatitis, such as the more common conditions of cholelithiasis and heavy alcohol use.

IMPLICATIONS FOR PRACTICE:

To our knowledge, this is the first case of pancreatitis following administration of this specific vaccine, and it is therefore essential to document its occurrence



**Benfie
Liu**

DO

Emergency Medicine

Patient Care Advocates Impact in the Emergency Department

INTRODUCTION/BACKGROUND:

Kaweah Delta's Emergency Department (ED), located in Visalia, California, utilizes patient care advocates (PCA) to help connect patients after their ED visit with their primary care physician. From November 2018-February 2021, 5,464 patients were identified for navigation with an average of 195 patients every month.

METHODS:

Three comparison groups with 143 patients each were made from patients visiting the ED between April 2019 and January 2020. Group 1) Patient care advocate made patient's appointment (PCA). Group 2) Patient made appointment themselves (PAT). Group 3) Patient did not make any appointment or did not answer PCA calls (NA). Crosstabulation, chi-square tests, and analysis of variance were used to analyze demographic or outcome variables. Poisson and logistic regression examined associations with return ED visits.

RESULTS:

Patients with a higher number of historic ED visits in the past 6 months had more recurrent visits in 72 hours (5.5 vs. 3.6, $p < .001$) than those without. Those patients with higher prior ED visits also had significantly correlated recurrent visits in the next 30 days (Correlation: 0.5, $p < .001$). Return ED visits within 72 hours of initial visit did not differ across the groups ($p = .573$). The expected count for the PAT group in number of recurrent ED visits was 1.95 (exponentiate (0.67) = 1.95) higher than for PCA group. The expected log count for the NA group in the number of recurrent ED visits was 2.89 (exponentiate (1.06) = 2.89) higher than for PCA group.

IMPLICATIONS FOR PRACTICE:

Patients who frequent the ED are more likely to return to the ED. The patient care advocate program has a positive impact in helping reduce ED return visits.

23-year-old male with acute lung injury after using a tetrahydrocannabinol-containing vaping device: A case report

INTRODUCTION/BACKGROUND:

Vaping associated lung injury (VALI) is a newly emerging disease process with the potential for serious health implications and high mortality, even despite the lack of underlying lung disease. We present a case of a young otherwise healthy patient suffering from tetrahydrocannabinol (THC) VALI.

METHODS:

A 23-year-old male with a past history of THC vaping, benzodiazepine, and methamphetamine abuse presented to the emergency department (ED) with a complaint of “feeling malnourished” over the past five days, along with associated fevers, cough, and vomiting. His past medical, surgical, family, and social history was significant only for the recent use of marijuana vaping pens. Upon initial presentation, the patient appeared to be in significant respiratory distress. A computed tomography (CT) scan of the chest demonstrated diffuse central predominant interstitial opacities and he was admitted to the medical intensive care unit (ICU), where he was eventually intubated for hypoxic respiratory failure. No other cause of his respiratory failure was found, and it was ultimately felt that the patient had been suffering from VALI.

RESULTS:

THC containing vaping products have become more widely available for consumption, which was helped in part by the legalization of marijuana for either recreational or medical use by the majority of states in the United States. There have subsequently been many identified cases of respiratory distress and lung injury in patients with recent vaping product use. These were first described and identified by the CDC in 2019, with 68 deaths reported thus far. The mechanism of injury in acute lung injury after vaping remains poorly understood. Diagnosis is supported mainly by recent (within 90 days) use of vaping product, diffuse lung opacities on radiography, exclusion of lung infection by sputum cultures, blood cultures, BAL, or other diagnostic criteria, and the absence of a likely alternative diagnosis.

IMPLICATIONS FOR PRACTICE:

THC associated VALI is currently being investigated by the Center for Disease Control and Prevention (CDC). In the meantime, physicians should consider vaping to be a public health emergency.



Carli Nichta

MD

Emergency Medicine



**Stephanie
Songey**

DO

Emergency Medicine

Posterior Sternoclavicular Dislocation: A Case Report

INTRODUCTION/BACKGROUND

Posterior sternoclavicular dislocations are very rare and pose immediate threat to mediastinal structures should a patient sustain this type of injury.

CASE REPORT:

This case report discusses the presentation and diagnosis of a young male who presented with isolated right arm swelling after blunt trauma one day prior while participating in a bull riding rodeo event. He was diagnosed with posterior right sternoclavicular joint dislocation with compression of the left brachiocephalic vein that was seen on computed tomography (CT) angiogram study. Patient was transferred to a tertiary care center for a higher level of care and definitive reduction management.

IMPLICATIONS FOR PRACTICE:

How should the results affect practice? Any history of blunt shoulder trauma or direct sternoclavicular trauma with symptoms to suggest compression of mediastinal structures should make one suspicious for posterior sternoclavicular dislocation. Evaluation is best made by computed tomography (CT) scan. Reduction should be performed by an orthopedic surgeon in the operating room with cardiothoracic surgery available for any vascular compromise that may occur.

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IMPLICATIONS FOR PRACTICE:

Due to small sample size, our results did not show significant differences in gender, age, level of care, heart rate, respiratory rate, or length of stay between the +RRT and -RRT groups. However, our study was significant for three findings. First, there was a marginally significant association between an admitting diagnosis of COVID-19 and RRT. Second, patients deceased within 30 days had a significantly higher number of abnormal VS than patients who were alive at 30 days, suggesting a positive correlation. Third, results suggest that the clinical gestalt of emergency physicians at predicting who will not have an RRT is reasonably good, but may not be as good at predicting who will have an RRT.

*Shared project with Patsy Chenpanas, MD.

**Jeff
Wells**

MD

Emergency Medicine



**Dane
Zappa**

DO

Emergency Medicine

Residency Peer Review: Utilizing A Just Culture

INTRODUCTION/BACKGROUND:

Peer review in the field of medicine describes the process of investigation and evaluation among physician colleagues regarding medical decision making and the delivery of care. The primary goal in these meetings is to identify fallouts in communication, decision making and patient care that led to suboptimal patient outcomes. As such, the history of peer review is fraught and the perception of it is controversial. Peer review is commonly seen as a punitive measure designed to identify and correct “problem physicians”. This perception creates a difficulty in exposing doctors-in-training to peer review because it is accepted that medical residents will make mistakes and learn from them in the course of their training. Therefore, inviting residents to the classical peer review process for learning errors would be unfair and likely viewed as punishment. Peer review remains an important part of medicine after training, serving as a platform for education of quality improvement and patient safety (QIPS) and residents should have some exposure to the process in a safe manner. Being that it is poorly studied in residency, there are opportunities to facilitate an evolution in the archaic structure of peer review to expose residents to it safely while still addressing cases considered fallouts.

METHODS:

We propose a project that utilizes Just Culture as a way to maintain a safe environment for residents to discuss poor patient outcomes and substandard delivery of care in a constructive environment by encouraging the emphasis of system-level issues that may have contributed to those outcomes. We surveyed resident participants to ensure that this procedure maintained a level of safety that provided comfort in discussing sensitive issues and experiences.

RESULTS:

Most significant/salient results

We found that we were successfully able to maintain an environment that was considered to be safe as well as identify system-level issues for further study.

IMPLICATIONS FOR PRACTICE:

Although we picked the Just Culture algorithm as our guiding principle to keep discussion constructive, it would be interesting to study this adapted method with other residency sites utilizing a different algorithm in the QIPS education process.



**Ann-Gelle S.
Carter**

MD

Family Medicine

Scoping Review of Outpatient Diabetic Retinopathy Screening

INTRODUCTION/BACKGROUND:

The objective of this scoping literature review of current evidence was to identify practice models for improving outpatient screening of diabetic retinopathy in the community setting.

METHODS:

A systematic search was performed using PubMed and the Cochrane Library databases. Articles were reviewed from 2000-2019 using keyword combinations of screening, diabetic, retinopathy, telemedicine and primary care. Twenty-seven articles met inclusion criteria. Additional filtering was done to improve availability of full text articles. The search was supplemented by scanning reference lists of relevant reviews for a final review of 10 articles. The most recent search was performed on June 15, 2020.

RESULTS:

Comparing several large studies from around the world including the U.S., U.K., Australia, Africa and France, the most commonly utilized approach for improving annual screening at the population level included collaboration between

primary care providers and implementation of remote retinal imaging modalities. On average approximately 20-25% of successfully screened patients were diagnosed with diabetic retinopathy and subsequently referred to ophthalmology providers.

IMPLICATIONS FOR PRACTICE:

The evidence evaluated in this scoping review suggests that to improve outpatient diabetic retinopathy screening, a collaborative approach between primary care providers and remote retinal imaging services offers the best model to improve capture rates in community settings.



**Faiza
Nawaz**

MD

Family Medicine

Peritonitis from *Leclercia adecarboxylata*: An emerging pathogen

INTRODUCTION/BACKGROUND:

Leclercia adecarboxylata (L adecarboxylata) is a gram-negative bacillus which can rarely cause infections in humans, particularly in immunocompromised individuals. Peritonitis is a very serious complication that is often responsible for catheter loss and switching the dialysis modality in patients undergoing peritoneal dialysis. There has been increased recognition of peritonitis caused by rare organisms. We report a case of 48-year-old female patient, who presented with abdominal pain and cloudy effluent.

METHODS:

A 48-year-old female with history of end-stage renal disease secondary to diabetic nephropathy presented with nausea, vomiting, fever, and abdominal pain for two-day duration. Patient has been on automated peritoneal dialysis for 2 years and never had an episode of peritonitis. Patient lives in a ranch home and takes care of cattle. Other medical problems include the following: hypertension, diabetes, anemia of chronic disease, and coronary artery disease.

RESULTS:

Peritoneal dialysis effluent showed elevated WBC with cell count of 2200 cells/ μ L (with 96% neutrophils). Gram stain revealed >100 WBC, and no organisms seen. Patient received empirical treatment with intraperitoneal Vancomycin and Ceftazidime. Effluent grew gram-negative bacilli, which was identified as L adecarboxylata by VITEK mass spectrometry using Matrix Assisted Laser Desorption Ionization Time-of-Flight (MALDI-TOF) technology. The organism was reported to be pan sensitive to antibiotics. Intraperitoneal antibiotic therapy was narrowed to Cefazolin, which was continued for 3 weeks. Posttreatment peritoneal dialysis effluent was clear, with WBC count of 2 cells/ μ L and repeat fluid culture was negative.

IMPLICATIONS FOR PRACTICE:

Leclercia adecarboxylata is a rare cosmopolitan organism, but capable of causing serious and life-threatening infections. Microbiological techniques have been successful in identifying this organism more frequently. Prompt diagnosis and timely intervention will prevent further complications as in our patient.



**Daniel
Proctor**

MD

Family Medicine

Assessing social determinants of health in the Visalia family medicine resident clinic population used a modified WellRx screening survey

INTRODUCTION/BACKGROUND:

Social determinants of health represent a complex set of issues that primary care providers frequently encounter but appear to have limited interventions to offer. Social determinates of health negatively affect medical outcomes in a variety of clinical scenarios. Many efforts have been made at the hospital and Emergency department level to address patients' social needs. Few studies have been done on interventions at the primary care clinic level and many clinics might feel they lack knowledge of their patient's issues, resources to help patients, or that it is not their role to address these. The WellRx study in Arizona utilized a survey-based needs assessment to identify their patients' social needs and a similar survey could be replicated in the central valley population. This study is designed to evaluate if using a brief needs-assessment survey of patients at a primary care clinic can effectively identify care barriers related to social determinates of health and provide the clinic with a way to assist in meeting those needs.

METHODS:

The purpose of this study is to identify the social needs of the SHWC resident clinic population

using a survey that assesses several different categories of possible need. The survey will examine areas including income, food insecurity, housing, transportation, employment, substance use, safety and others using focused questions in a brief survey that can be completed before their regular medical visit.

RESULTS:

Gathering this data will serve multiple purposes including understanding the local social determinants of health better, identifying areas for future SHWC interventions, improving resident physician awareness of patient's social needs, creating a framework for future clinic studies, and gathering a clinic population baseline to assess the success of future interventions. By identifying social needs in the SHWC clinic population, the researchers hope to gain insight into more effective ways to meet these needs in the future.

IMPLICATIONS FOR PRACTICE:

By identifying social needs in the SHWC clinic population, the researchers hope to gain insight into more effective ways to meet these needs in the future.



**Daniela
Rangel Orozco**

MD

Family Medicine

Acute Interstitial Nephritis after Phentermine Use

INTRODUCTION/BACKGROUND:

Acute interstitial nephritis (AIN) encompasses acute kidney injury with histological findings of interstitial inflammation, edema and tubulitis. Many medications are associated with AIN, one that does not often make the published list is Phentermine. Phentermine is one of the most commonly prescribed weight loss medications in the U.S. and is indicated as a short-term adjunct to a multimodal weight loss plan.

METHODS:

During an inpatient nephrology rotation at we received a consult for a 22 year old woman who presented to the emergency department with back pain, abdominal pain, nausea, vomiting, and inability to tolerate oral intake. She was found to have acute kidney injury (AKI) and proteinuria and admitted for further work up. It was discovered she took phentermine for two weeks consecutively and then intermittently four months prior to presenting to the emergency department. Renal function labs, antibodies, ultra sound and biopsy were obtained. Renal biopsy pathology results were consistent with pathological findings of AIN including interstitial inflammation, edema, and lymphocytic infiltrates. A case report of drug-induced AIN secondary to phentermine was prepared in accordance with the CARE guidelines.

RESULTS:

This case report adds information to two additional reported cases of AIN in the literature resulting from phentermine use alone and a second case resulting from the combination of phentermine and phendimetrazine. This begs the question of whether phentermine induced AIN is more common than previously thought but has not been widely identified and reported

IMPLICATIONS FOR PRACTICE:

Based on our experience with this case we recommend that primary care providers prescribing phentermine take a thorough history prior to prescribing the medication to assess for any possible predisposing factors to AKI such as personal or family history of any renal dysfunction, obtain baseline renal panels and trend renal function while patients are on phentermine. Likewise we recommend further study to identify and quantify phentermine induced AIN.



**Mara
Santa Maria**

MD

Family Medicine

Complete Resolution of EVALI in a Young Woman with Corticosteroids and Non-Invasive Respiratory Support

INTRODUCTION/BACKGROUND:

At the onset of 2020, the Central Valley of California, with its relatively young population and high levels of smoking and vaping was poised to be severely impacted by a syndrome now known as E-cigarette Vaping Associated Lung Injury (EVALI). EVALI is a term used to describe the more than 2000 e-cigarette and vaping associated lung injury case of Acute Respiratory Distress Syndrome (ARDS) reported to the CDC as of August 2019. At the time of this report, (Dec 2019) at least 48 patients have died from EVALI despite maximum medical therapy.

METHODS:

Beginning in November 2019, the Family Medicine inpatient team at KDHC identified a small number of EVALI cases. Among these was a young postpartum woman presenting with shortness of breath without identifiable cause. The speed with which she deteriorated suggested inhalation injury, but she denied smoking, drug use or exposure to nearby forest fires. A case report was prepared in accordance with CARE guidelines.

RESULTS:

This case report describes the complete resolution of EVALI in a young woman after a short course

of corticosteroids and noninvasive respiratory support. Despite a careful interview, we show how the patient's perceptions of vaping as benign and "natural" initially delayed her diagnosis, but ultimately allowed the team insight into the relative clandestine production and dissemination of vaping cartridges in the community.

IMPLICATIONS FOR PRACTICE:

Like other diagnoses of exclusion, EVALI remains poorly understood and likely underdiagnosed. We seek to inform clinician of this emerging disease and suggest early corticosteroids as a reasonable therapy as we encourage further study.

QUOTE:

"What you know is dangerous to your enemy, what you think you know is dangerous to yourself"
– Master Splinter

POST-RESIDENCY:

Dr. Santa Maria will be entering a fellowship in Hospice and Palliative Medicine at UCSF/Fresno.



**Linh
Tran**

MD

Family Medicine

Urinary Incontinence

INTRODUCTION/BACKGROUND:

Urinary incontinence can affect various age groups in addition to the elderly. Prevalence is thought to be underestimated. Management often starts conservatively, and should be individualized to the patient and the type of incontinence that is being treated. This review paper explores the diagnosis, management, prognosis, and other related aspects for the different types of urinary incontinence: stress, urge, mixed, overflow, and functional.

METHODS:

Twenty-four articles from the PubMed database pertaining to the various types of urinary incontinence were reviewed to produce this summative work on the topic of urinary incontinence.

RESULTS:

The literature reinforces that management of urinary incontinence should follow a graduated approach, usually starting with conservative management. Further management should be patient-specific and subtype-specific.

IMPLICATIONS FOR PRACTICE:

The literature suggests that management of urinary incontinence should start conservatively, but take into account patient circumstances and the specific type of urinary incontinence being treated so that patients have the best outcomes with minimal adverse effects and complications.



**Jason
Wong**

MD

Family Medicine

Recommended Curriculum Guidelines for Family Medicine Residents: Practice-based Learning and Improvement

INTRODUCTION/BACKGROUND:

More and more, physicians are being asked to help improve the quality of health care provided to patients. They are often part of a team comprised of physicians, nonphysician health care professionals, and medical and non-medical support staff. Training and education in quality improvement and performance improvement and evidence-based medicine methodology will help physicians become effective members and leaders of their health care teams.

METHODS:

The family medicine curriculum must include structured experience in several specified areas. Much of the resident's knowledge will be gained by caring for ambulatory patients who visit the family medicine center, although additional experience gained in various other settings (e.g., an inpatient setting, a patient's home, a long-term care facility, the emergency department, the community) is critical for well-rounded residency training. The residents should be able to develop

a skillset and apply their skills appropriately to all patient care settings.

RESULTS:

This curriculum in practice-based learning and improvement trains family medicine residents to improve their own patient care practices using evidence-based medicine, systems-based practice, and quality improvement and performance improvement.

IMPLICATIONS FOR PRACTICE:

Many of the attitudes, knowledge, and competencies in the curriculum are integrated into quality improvement and performance improvement and evidence-based medicine. Medical information systems greatly enhance the ability of the physician to measure and improve performance and to access the best evidence available for medical decision-making.



**Setare
Eslami**

MD

Psychiatry

A Misleading Catatonia Presentation in a Schizophrenic patient

INTRODUCTION/BACKGROUND:

Creutzfeldt-Jakob disease is a rare disorder of the central nervous system. Its initial diagnosis may be obscured by its variable presentation as it is called the “great mimicker”. This case report discusses a misleading presentation of catatonia in a patient with a known history of schizophrenia; a patient who was initially diagnosed with catatonia secondary due to acute exacerbation of psychosis however soon thereafter was discovered to have sporadic Creutzfeldt-Jakob disease.

METHODS:

A 71-year-old Caucasian female with known past medical history of diabetes II, COPD, HTN and past psychiatric history of schizophrenia was brought to ED with a family member for progressive confusion, refusing to eat or drink over the course of one week. Collateral information from the daughter was suggestive for rapid cognitive decompensation from baseline and inability to perform basic and instrumental ADLs for the last three months. Patient started to exhibit unusual bizarre behaviors of wandering in the street two weeks prior to admission simultaneously when she stopped taking all of her medications.

RESULTS:

A Mayo clinic autoimmune encephalopathy panel was sent to the national prion disease for RT-Quic, tau and neuron-specific enolase. The results were positive and suggestive for probable sporadic Creutzfeldt Jakob disease. Patient was transferred to hospice for palliative care based on family decision and unfortunately, she passed away one month after her discharge.

IMPLICATIONS FOR PRACTICE:

In conclusion, our experience with this patient showed that in any adult patient with catatonic state or who presents with rapid deterioration of cognitive state, CJD should be considered. Psychiatric symptoms including catatonic state may be the initial clinical presentation of the disorder. Normal workup including imaging or serology tests can be misleading and when the cognitive symptoms, unusual psychiatric symptoms or catatonic symptoms fail to respond to psychotropic treatment, possibility of CJD should be kept in mind and followed with serial EEGs and newer specific tests.

Time For A New Paradigm – American Academy of Addiction Psychiatry (AAAP)

INTRODUCTION/BACKGROUND:

Over the last 5 years, membership for the AAAP has greatly increased in size. Concurrently, the incidence of substance use disorders (SUDs) in society continues to increase. Deaths from drug-related overdoses, mostly opioids, are also on the rise. The life expectancy in U.S. declined for the second year in a row due to reasons directly, or indirectly, related to SUDs. A record number of more than 64,000 Americans died of drug overdoses in 2015. For such an unprecedented problem, maybe it's time to consider an unprecedented solution.

METHODS:

Several opportunities exist to improve AAAP's visibility within other medical specialties as well as to improve access to care for SUD sufferers:

1. Continue to increase AAAP membership. We need more AAAP members to actively disseminate the importance of screening for SUDs to other health professionals and to benefit from the training and resources of AAAP in order to expand to their clinics, hospital systems and other collaborative teams.
2. Advocate for an expanded addiction training curriculum for medical students and residency programs. It is important to increase the emphasis of addiction training in medical schools and residency programs.

3. Continue to lobby and expand on our interactions with the local legislature to expand funding and efforts for SUD resources. a. There is evidence of cost effectiveness for addressing SUDs assertively. It is economically feasible, sustainable and has a great return of investment.

4. Collaborate with other medical specialties in expanding their knowledge of addictions through seminars and symposiums.

RESULTS:

The role of the membership committee is expanding beyond increasing enrollment. We hope to elevate the profile of AAAP by actively listening to the needs of our members and providing our members the tools necessary to improve our collaboration with other medical specialties and encourage interdisciplinary partnerships.

IMPLICATIONS FOR PRACTICE:

Success could be measured by greater interest in choosing a career focused on treating patients suffering from addiction, decreasing the incidence of SUDs and, more importantly, improving access to treatment for patients with SUDs.



**Rubina
Faizy**

MD

Psychiatry



**Kristine
Hwang**

MD

Psychiatry

The man who lived in the walnut; New onset perseveration and bizarre behaviors in a patient with manic symptoms

INTRODUCTION/BACKGROUND:

Korsakoff Psychosis is rare and preventable with timely and appropriate treatment once Wernicke's encephalopathy has been identified. However, it is quite common for Wernicke's encephalopathy to go undiagnosed, a portion of them only being found out post-mortem. There is insufficient evidence to guide treatment or prophylaxis and even less regarding treatments beyond thiamine once possible irreversible damage has been done.

CASE REPORT:

A 66-year-old-male with chronic alcohol use was hospitalized for altered mental status, worsening memory after withdrawal seizure. He was initially aphasic, generalized weakness had wide based gait. He was given only 200 mg daily thiamine for 5 days, memantine and low dose antipsychotic to control behavioral disturbances and subsequently discharged. The patient came back after about a week having developed bizarre behaviors walking miles across town without food or water, paranoid, elevated euphoric affect and rapid speech suggesting manic symptoms. Collateral obtained suggested possibility of undiagnosed bipolar disorder, recent starvation with more

alcohol than previously endorsed and exposure to heavy metal toxins. The patient was restarted on higher dose of parenteral thiamine. Other causes of delirium and primary psychiatric disorders were ruled out. Wernicke Korsakoff psychosis became the most likely diagnosis. There was some improvement with but because of the severity of symptoms, patient was started on Lithium for mania and eventually adjunct with Quetiapine for residual psychosis.

IMPLICATIONS FOR PRACTICE:

This case highlights the difficulty in identifying Wernicke's Encephalopathy (WE) from other causes of delirium. WE is a life-threatening medical condition that may lead to the neuropsychiatric disorder Korsakoff syndrome, also called Korsakoff psychosis. Korsakoff psychosis may lead to long-term deficits and reduce the quality of life for patients who develop this disorder. Therefore, it is important to continue to investigate and collect more data on treatment once Korsakoff Psychosis develops.

*Shared project with Sherry Kwon, MD



**Sherry
Kwon**

MD

Psychiatry

The man who lived in the walnut; New onset perseveration and bizarre behaviors in a patient with manic symptoms

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*Shared project with Kristine Hwang, MD



**Christine
Le**
MD

Psychiatry

Telehealth for Rural Diverse Populations: Cultural and Telebehavioral Competencies and Practical Approaches for Clinical Services

INTRODUCTION/BACKGROUND:

Rural health care settings are challenged to provide timely and evidence-based care, particularly for culturally diverse patients with behavioral health disorders. Telepsychiatry and telebehavioral health improve access to care and leverage scarce resources like specialty expertise and language interpreters. This paper focuses on the three questions, particularly related to medical settings: (1) What are the components of culturally competency clinical care and what fundamental approaches help providers? (2) What fundamental approaches like the cultural formulation interview and the bio-psycho-socio-cultural model help providers achieve it? (3) How do we link outcomes with culturally competent and telepsychiatric competencies?

METHODS:

The theme of the study is an exploration of the interface of depression, psychosis, culture, and telepsychiatry in a rural emergency department.

RESULTS:

Rural underserved patients need culturally competent care, which requires skills by all health care team members. Skill-focused training based on practical everyday practices, cases, and pedagogic methods can improve care and engage participants. Telepsychiatric care is similar to in person care, either requires integrated cultural and telepsychiatric skills. Educational and administrative adjustments are needed to promote culturally competent care, particularly by telehealth.

IMPLICATIONS FOR PRACTICE:

Rural populations need culturally competent care and teams with telepsychiatric skill sets increase access. More quantitative and qualitative research is suggested to improve the approach and better evaluate, administer, and finance services.



**Vahig
Manugian**

DO

Psychiatry

Reduction Of Restraints In A Private Psychiatric Hospital After Implementation Of Trauma Informed Care

INTRODUCTION/BACKGROUND:

Trauma Informed Care is an evidence based practice developed by a research community that include Substance Abuse and Mental Health Services Administration (SAMHSA), US Department of Health and Human Services (DHHS), and many other researchers. Trauma Informed Care is an organization structure and treatment framework that involves understanding, recognizing, and responding to the effects of all types of trauma. Trauma Informed Care also emphasizes physical, psychological, and emotional safety for both consumer and providers, and helps survivors rebuild a sense of control and empowerment.

METHODS:

The entire hospital staff of a 90 bed private hospital underwent extensive training in Trauma Informed Care. Specific training programs were developed for psychiatrists, nurses, case managers, social workers, and mental health workers. After the training was completed, the hospital rolled out the clinical Paradigm in January 2017.

RESULTS:

The annual restraint rated was reduced from 15.4/1000 to 13.3/1000. When each month was examined, there is a reduction of restraint rate in 8 out of 12 months. It appears that trauma informed care could be a potentially useful tool to reduce restraints and ultimately improve patient safety.

IMPLICATIONS FOR PRACTICE:

The Trauma Informed Care based clinical paradigm appears to be a promising tool for reducing the overall annual restraint rate. When each individual month is examined, the restraint rate was reduced 8 out of 12 months. Overall, the results are promising and suggest that further research into the implementation of Trauma Informed Care in inpatient psychiatric settings is warranted.



**Juan
Sosa**

MD

Psychiatry

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Rural populations need culturally competent care and teams with telepsychiatric skill sets increase access. More quantitative and qualitative research is suggested to improve the approach and better evaluate, administer, and finance services.

Negative Pressure Wound Therapy for Open Abdomen Treatment Analysis of Outcomes and Factors Affecting Fascial Closure

INTRODUCTION/BACKGROUND:

Negative pressure wound therapy (NPWT) is an important management strategy for wound coverage when fascial closure is deferred in patients following damage control surgery. We aimed to analyze risk factors contributing to complications, timing failure of wound closure and risk of fistula development in acute care and trauma settings.

METHODS:

Institutional IRB approval was obtained to query medical records of all patients with open abdomen (OA) management following damage control surgery requiring temporary abdominal coverage (TAC) with NPWT from January 2015 to July 2016. Patients were divided into 2 groups based on etiology - trauma (T=Group 1) and acute general surgery (GS=Group 2). Multivariate analysis of risk factors was performed.

RESULTS:

103 patients were identified with a mean age of 36+16 vs 51 +15 years ($p<0.01$) and mean BMI of 27 vs 30 for T and GS respectively. Comorbidities, age

and previous surgery were higher in GS compared to T, 8/40 GS (20%) vs 4/63 T (6.3%) $p<0.05$ but did not significantly impact fascial closure rates (9% vs 16% $p=0.32$), fistula formation (8.1% vs 5.0% $p=0.53$) or hospital readmission (21% vs 27.5% $p=0.44$).

IMPLICATIONS FOR PRACTICE:

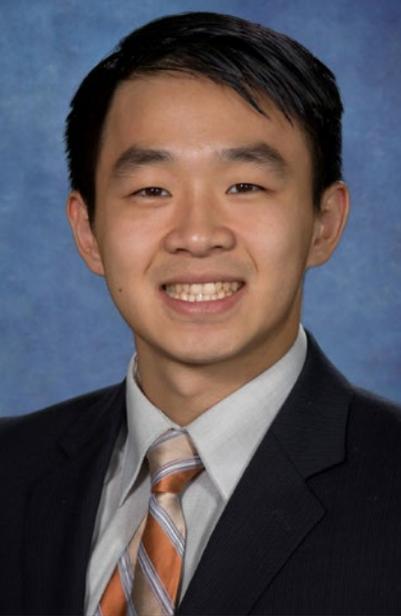
Open abdomen management of life threatening intraabdominal events with NPWT appears safe with a low re-operative and fistula rates for both T and GS patients. Primary fascial closure is achieved in the majority of patients in both groups however skin only closure and hospital readmissions trend higher in older GS patients. Further studies are needed to define patient population, guidelines and device application to optimize patient care.



Geoffrey Darby

MD

Surgery



**Kenny
Lee**

MD

Surgery

Thyroid Cancer

INTRODUCTION/BACKGROUND:

Thyroid cancer remains a rare malignancy, representing 1% to 4% of all malignancies in the United States. Chances of diagnosis have risen over the past several decades due to improved diagnostic modality and increased use of thyroid ultrasound, and death rates have remained stable. It is the fifth most common malignancy for females, with females having a 2 to 3 times greater chance of being diagnosed with thyroid cancer compared with males.

METHODS:

Most commonly, patients first present with a neck mass, which may represent a primary tumor or metastatic lymphadenopathy. Other times, the mass may be nonpalpable and found incidentally on neck imaging. For patients with a family history of thyroid malignancies, the RET oncogene or MEN2 elective early thyroidectomy may result in findings of early malignancies that are only observable through the microscope.

RESULTS:

Surgical resection of differentiated thyroid cancer remains the mainstay of treatment in association

with RAI ablation and TSH suppression. Radiation and systemic chemotherapy seldom play a significant role in treatment, although they may be used in advanced cases refractory to conventional methods. The decision to use anyone or all three modalities is one that should involve the physician and the patient regarding the goal of care, future prognosis, risks of recurrences, ease of surveillance, and the relative costs and morbidities involved with each method.

IMPLICATIONS FOR PRACTICE:

Left alone, thyroid cancer can be locally invasive, into the airway, esophagus, or other nearby neurovascular structures. Distant metastasis most commonly involves the lung, bone, and other soft tissue structures. The prognosis for thyroid cancer can vary greatly, depending on its type, size, patient's age, and amenability to resection. In general, the prognosis is good, with up to 95% 5-year survival rate for patients across all ages and races, with worse prognosis given to patient's based on the size of the tumor, the presence of extra-thyroidal extensions or metastasis, older age, or unfavorable tumor types such as undifferentiated cancer.



**John
Popovich**

MD

Surgery

Sarcoma – A Continuing Education Activity

INTRODUCTION/BACKGROUND:

Soft tissue sarcomas (STS) are a group of more than 60 different neoplasms that can originate from any location throughout the human body, and they can affect individuals at the extremes of age. From skeletal muscle, adipose tissue, blood, and lymphatics to connective tissue and peripheral nerves; these neoplasms can span a range of clinical presentations from benign lipomas to aggressive metastatic angiosarcomas. The real challenge in diagnosing these conditions is that there are several, non-neoplastic conditions that mimic STS. Soft tissue sarcomas are separated categorically as trunk and extremity from retroperitoneum. The majority of STS occur spontaneously. However, germline mutations, radiation and environmental exposure(s) have been causative.

METHODS:

Several different STS subtypes can affect the trunk and, or extremities. The most common presentation is a patient with a painless mass which, upon initial evaluation, requires a detailed history and physical examination. Of note, there are several conditions that may mimic a soft tissue sarcoma. Some of these conditions are hypertrophic scars, hematoma, benign lipoma, cyst, abscess, and melanoma.

RESULTS:

Treatment consists of excision beyond the capsule of the tumor. There is some degree of clinical overlap with the potentially malignant form and most common soft tissue sarcoma, the liposarcoma. Liposarcomas are defined as those tumors which are greater than 10 cm in size, has thick internal septations and those lesions that are generally less than 75% adipose tissue. They represent 45% of retroperitoneal sarcomas. Treatment for the liposarcoma is surgical resection with wide margins. Local recurrence is common.

IMPLICATIONS FOR PRACTICE:

Soft tissue sarcomas (STS) are a group neoplasms that can affect individuals at the extremes of age and can originate from any location throughout the human body. These neoplasms can span a range of clinical presentations from aggressive metastatic angiosarcomas to benign lipomas. These need to be evaluated using imaging studies and biopsy (core needle biopsy or incisional biopsy). This activity illustrates the evaluation and management of sarcomas and explains the role of the interprofessional team in managing patients with this condition.



**Lucas
Toho**

MD

Surgery

Incidental metastatic renal cell carcinoma diagnosed after inguinal hernia repair: a case report

INTRODUCTION/BACKGROUND:

Inguinal hernia repair is one of the most common general surgical procedures performed in the United States, with approximately 800,000 cases performed annually. Following repair of inguinal hernia, the surgically excised hernia sac is routinely sent for pathological evaluation. Of these surgical specimens, less than 0.5% are found to contain tumor cells. Further, the incidence of metastatic tumors in surgical specimens obtained from inguinal hernia repair has been demonstrated to be as low as 0.07%. We describe a case of metastatic renal cell carcinoma diagnosed after microscopic evaluation of the hernia sac obtained from an inguinal hernia repair.

METHODS:

A 66-year-old male patient, with a past medical history significant for hypertension and hyperlipidemia, first presented to our emergency department on August 19, 2019. The patient was found to have an acutely incarcerated left inguinal hernia, which he noticed after a coughing fit. The patient was taken to the operating room and an open inguinal hernia repair with mesh (Lichtenstein technique) via a suprainguinal

incision was performed. During an inspection of the anteromedial aspect of the spermatic cord, an indirect hernia sac containing hardened omentum was identified.

RESULTS:

Postoperative pathology demonstrated fibroadipose tissue containing metastatic renal cell carcinoma, clear cell type with necrosis. Immunohistochemistry staining was positive for CD10 and PAX8, supporting the histologic diagnosis. At this time, the patient was referred to Urology and Medical Oncology for further workup and management. He was ultimately treated at an Academic Tertiary Referral Center, where he underwent an open left radical nephrectomy with inferior vena cava tumor thrombectomy.

IMPLICATIONS FOR PRACTICE:

Though findings of both primary and metastatic malignancy following repair of inguinal hernia are rare, the consequence of missing this diagnosis is grave. Universal surgical pathological workup of specimens from benign general surgical procedures should continue to be the standard of care.



**Regina
Brown**

MD

Transitional Year

Skin Classification Based On Color, Skin Hyperreactivity And Sun Sensitivity

INTRODUCTION/BACKGROUND:

Given the large global burden of atopic dermatitis, scar formation and skin cancer, there needs to be a standardized system for classifying skin types based on skin color, skin hyperreactivity and sensitivity to sun light. Skin hyperreactivity as used in this context focuses on atopic dermatitis and hypertrophic scars or keloids. Th2 cytokines including IL4 and IL13 play a key role in atopic dermatitis pathogenesis. Recent studies suggest increased IL4 and IL13 signaling in keloid lesions. There appears to be common immune cascades for atopic dermatitis and keloids.

METHODS:

In clinical dermatology, the Fitzpatrick skin classification system is commonly used for classifying individuals based on response to sun exposure and skin color⁴. However, skin color does not always correlate linearly with photosensitivity as there are dark skinned individuals who develop severe reaction to UV light and hyperpigmentation after exposure to visible light. Individuals with darker skin complexion are frequently not assessed for skin

cancer. The rate of mortality from melanoma skin cancer is higher in dark skinned individuals compared with lighter skinned individuals.

RESULTS:

There is a gap in clinical practice where the classic Fitzpatrick skin classification system is not adequately phototyping individuals of darker skin coloration. The Roberts skin classification system evaluates four elements including skin phototype, photoaging, hyperpigmentation and scarring, and is useful for predicting response to dermatologic and cosmetic procedures.

IMPLICATIONS FOR PRACTICE:

This continuing medical education (CME) article will attempt to classify skin by color, skin hyperreactivity and sun sensitivity as a means to contribute to the knowledge and practice gaps that exist in the field. This classification system will allow clinicians to predict individual's response to insult or injury including UV light, allergens, and surgical or cosmetic procedures.



**Scott
Daniel**

DO

Transitional Year

A Brain on Fire to Broken Legs: A Look into Encephalitis

INTRODUCTION/BACKGROUND:

Encephalitis is defined as inflammation of the cerebral parenchyma causing various neurological disturbances, including nausea, vomiting, hallucinations, delirium, irritability, headaches, photophobia, fatigue, muscle weakness, problems with coordination, gait disturbances, confusion, personality changes, memory loss, etc.

METHODS:

Diagnostics include MRI scan of the head, preferred over CT, checking for masses or abscesses. Encephalitis can often show non discrete hyperintensity on T2-FLAIR, making imaging findings only one of a few diagnostic criteria and not an absolute requirement for diagnosis. Although several encephalitic causes have more common presentation as is the case with HSV (temporal lobes) and Autoimmune (limbic). Chest Xray (searching once again for an infectious cause of encephalopathy).

RESULTS:

Data collected by Vora et al. using a Nationwide Inpatient Sample from 1998-2010, estimated the number of encephalitis associated hospitalizations:

- 263,352 total cases
- Average of 20,258 a year
- Fatal outcome in 5.8% of cases, with the large majority of those fatalities being immunocompromised patients with either HIV or who have received organ transplant. (10.1% and 17.1%, respectively)
- Etiology discovered in 50.3%, unspecified in 49.7%

IMPLICATIONS FOR PRACTICE:

Common things being common, it would give our patients the best chance at avoiding long term neurological sequelae, by treating the most common etiology, Herpes Simplex Virus. Treatment surrounding the initial use of Acyclovir, is a common theme and should be initiated as soon as encephalitis is expected, assuming your patient is not allergic to the medication. Antibiotics may also be initiated at the same time as Acyclovir, and often are, so as to cover any potential bacterial causes, more so for potential meningitis due to the large overlap in symptomatology.



**Alexander
Hamill**

DO

Transitional Year

Limbic encephalitis as a consequence of COVID-19 infection

INTRODUCTION/BACKGROUND:

As the number of worldwide coronavirus (SARS-CoV-2) cases increase, pulmonary manifestations and complications are well described. The emergence of neurologic features of the disease have more recently begun to appear in literature, but are still poorly understood. Most notably described are changes in executive function, agitation, and corticospinal tract signs. This brief case report describes a previously healthy woman who presented to the ED with syncope and altered mental status, who later tested positive for SARS-CoV-2 and was found to have MRI findings consistent with limbic encephalitis.

METHODS:

A 59-year-old female with a past medical history of hypertension, diabetes mellitus type II, and anemia was brought into the Emergency Department by ambulance after having a syncope episode while eating dinner in late 2020. In addition, she complained of a cough and chest “tightness.” She was recently discharged home 2 days prior after having been evaluated for another syncope episode. At that time, she was found to have severe orthostatic hypotension which improved with aggressive hydration. She was discharged with fludrocortisone with improvement in her

symptoms. Imaging studies at the time revealed severe cervical spinal stenosis, and Neurosurgery was consulted and recommended outpatient follow-up.

RESULTS:

Several days later patient’s respiratory status significantly worsened with increased oxygen requirements and clinical signs of respiratory distress. Repeat chest X ray showed whiteout of her right lung. Patient was intubated and transferred to the ICU.

IMPLICATIONS FOR PRACTICE:

This case is important because it supports recent literature suggesting neurologic manifestations may be the initial symptoms of COVID-19 infection, and provides insight into the neuroanatomy potentially affected by the virus. As such, in patients found to have encephalitis of the limbic system with other viral illnesses ruled out such as herpes simplex virus, SARS-CoV-2 infection is a reasonable diagnosis to consider. These findings may help explain some of the neurological symptoms observed in COVID-19 patients and may help inform diagnosis and measures to prevent infection.



**Gregory
Herting**

DO

Transitional Year

Barotrauma in Non-Invasive Ventilated COVID-19 Patients: A Case Series

INTRODUCTION/BACKGROUND:

We describe the presenting characteristics and hospital course of 7 novel coronavirus (COVID-19) patients who developed spontaneous subcutaneous emphysema (SE), pneumomediastinum (PM), and/or a pneumothorax (PX) in the absence of prior mechanical ventilation.

METHODS:

A total of 11 non-intubated COVID-19 patients (5 male, 2 female, median age 68 years old) developed SE, PM, and/or PX between March 14, 2020 – September 17, 2020 at a single-center health system in Visalia, California. Demographics (age, gender, smoking status, comorbid conditions, and BMI), clinical variables (initial temperature, oxygen saturation blood pressure, and symptoms), and laboratory values (white blood cell count (WBC), lactate dehydrogenase (LDH), C-reactive protein (CRP), D-dimer, ferritin, and procalcitonin) were collected. Chest radiography (CXR) were analyzed for SE, PM, and pneumothorax in each patient by a board-certified diagnostic radiologist.

RESULTS:

Five non-intubated patients developed PX (71%), four developed PM (57%), and three developed SE (43%). Patients developed some form of barotrauma on average 16.3 days after symptom onset. On average, noninvasive ventilation occurred for 7.3 days prior to barotrauma (HFNC, BiPAP, CPAP). Finally, average time from BiPAP to barotrauma was 3.4 days. One patient reported a history of smoking, one patient a current smoker, and the rest never smokers. The most common comorbidities in this cohort were hypertension and diabetes mellitus type II reported in three patients each. Six patients eventually expired during hospitalization.

IMPLICATIONS FOR PRACTICE:

SE, PM, and PX were observed in a cohort of 7 COVID-19 non-intubated patients without any known cause or history of invasive ventilation. Further investigation is needed to elucidate the underlying mechanism in this patient population.

*Shared project with Brent Twiford, DO.

Transient ECG Changes Associated with Right-Sided Pneumothorax – A Case Report

INTRODUCTION/BACKGROUND:

Relatively few cases have been reported of electrocardiographic findings associated with pneumothoraces. This case report seeks to add to the literature regarding the transient ECG findings associated with a right-sided tension pneumothorax. Based on our extensive review, these findings have not been previously documented.

METHODS:

The patient is a 76-year-old man who presented to our medical center for fatigue and shortness of breath. He was found to have COVID-19 pneumonia with associated hypoxia and admitted. His comorbidities included coronary artery disease, diabetes mellitus type 2, and hyperlipidemia. Baseline ECG obtained on the day of admission showed a normal sinus rhythm with no abnormalities.

RESULTS:

A central venous catheter was placed in the patient's right internal jugular vein, and the patient was started on norepinephrine and vasopressin for hemodynamic support. After placement, a portable supine chest x-ray was obtained. Imaging showed a new right tension

pneumothorax. An ECG was also collected at that time due to a new abnormal cardiac tracing seen on the cardiac monitor. It revealed an accelerated junctional rhythm, wide QRS complexes with a dominant S wave in V1 and broad monophasic R waves in the lateral leads suggestive of a new left bundle branch lead, left axis deviation, and ST depressions in the anterolateral leads. Regardless of the underlying mechanism, the ECG changes rapidly resolved after treatment of the pneumothorax.

IMPLICATIONS FOR PRACTICE:

This highlights an important lesson. The symptoms of pneumothorax often overlap with the symptoms of other life-threatening pathology such as unstable angina, acute myocardial infarction, or pulmonary embolism. As we have discussed, the ECG findings can also mimic these conditions. Inappropriately treating a pneumothorax with thrombolytics could be devastating. We hope that our readers are better informed about the ECG changes that can arise in right-sided pneumothorax. It is important to avoid misdiagnosis when presented with these findings, especially because of similar symptomatology.



**Ryan
Lee**

MD

Transitional Year

Rehabilitation of Hemorrhagic Stroke Related to Hypertensive Emergency in a Young Female with P-ANCA Nephritis - Case Report

INTRODUCTION/BACKGROUND:

P-ANCA associated vasculitis is an autoimmune disease characterized by systemic damage to small vessels of the body. Microscopic polyangiitis (MPA) and renal-limited vasculitis are the common diseases that arise from P-ANCA vasculitis. Rapidly progressive glomerulonephritis and alveolar hemorrhage are major complications of MPA.

METHODS:

A 19-year-old female with recent history of hypertension, renal impairment, and headaches was awaiting nephrology consult (delayed due to insurance issues) when she presented to the emergency department with acute left hemiparesis and lethargy. She was found to have hypertensive emergency and imaging revealed right basal ganglia intraventricular hemorrhage and renal failure, and after acute stabilization was transferred to inpatient rehabilitation.

RESULTS:

Throughout the workup and management of her nephritis and blood pressure, she participated in a comprehensive rehabilitation program. Amantadine and Methylphenidate were used to

address alertness and attention deficits which were barriers to therapy participation. She exhibited centrally mediated pain and headaches, which were responsive to non-pharmacologic modalities with occasional need for Fioricet for headaches.

IMPLICATIONS FOR PRACTICE:

Rare underlying causes, such as P-ANCA associated vasculitis, should be considered in otherwise unexplained cases of stroke. This case also emphasizes the importance of inpatient rehabilitation as a setting in which comprehensive evaluation and workup can be completed during acute recovery. It serves as a reminder to tailor care to the individual needs of the patient, especially in the treatment of young stroke patients.



**Timothy
Lee**

MD

Transitional Year



**Whitney
Liehr**

MD

Transitional Year

Transient ECG Changes Associated with Right-Sided Pneumothorax – A Case Report

INTRODUCTION/BACKGROUND:

Relatively few cases have been reported of electrocardiographic findings associated with pneumothoraces. This case report seeks to add to the literature regarding the transient ECG findings associated with a right-sided tension pneumothorax. Based on our extensive review, these findings have not been previously documented.

METHODS:

The patient is a 76-year-old man who presented to our medical center for fatigue and shortness of breath. He was found to have COVID-19 pneumonia with associated hypoxia and admitted. His comorbidities included coronary artery disease, diabetes mellitus type 2, and hyperlipidemia. Baseline ECG obtained on the day of admission showed a normal sinus rhythm with no abnormalities.

RESULTS:

A central venous catheter was placed in the patient's right internal jugular vein, and the patient was started on norepinephrine and vasopressin for hemodynamic support. After placement, a portable supine chest x-ray was obtained. Imaging showed a new right tension pneumothorax. An ECG was also collected at that time due to a new

abnormal cardiac tracing seen on the cardiac monitor. It revealed an accelerated junctional rhythm, wide QRS complexes with a dominant S wave in V1 and broad monophasic R waves in the lateral leads suggestive of a new left bundle branch broad, left axis deviation, and ST depressions in the anterolateral leads. Regardless of the underlying mechanism, the ECG changes rapidly resolved after treatment of the pneumothorax.

IMPLICATIONS FOR PRACTICE:

This highlights an important lesson. The symptoms of pneumothorax often overlap with the symptoms of other life-threatening pathology such as unstable angina, acute myocardial infarction, or pulmonary embolism. As we have discussed, the ECG findings can also mimic these conditions. Inappropriately treating a pneumothorax with thrombolytics could be devastating. We hope that our readers are better informed about the ECG changes that can arise in right-sided pneumothorax. It is important to avoid misdiagnosis when presented with these findings, especially because of similar symptomatology.



**Jaclyn
Lundberg**

MD

Transitional Year

A Toolbox of Surgical Techniques for Palatal Fistula Repair

INTRODUCTION/BACKGROUND:

Oronasal fistula is a well-known complication of cleft palate repair. The overall incidence of oronasal fistula after cleft palate repair is between 5% and 6%, although fistula rates ranging from 0% to 60% have been reported. Fistula occurrence is related to several factors, including cleft type and severity, surgeon experience, and operative technique. Unfortunately, once a fistula forms, the risk of recurrence after surgical repair is high. While not all fistulae require secondary repair, many patients with fistulae will require treatment because of the negative effects fistulae have on speech articulation or reflux of liquids through the nasal cavity.

The objective of this study is to provide an inventory of oronasal fistula repair techniques alongside expert commentary on which techniques are appropriate for each fistula type.

METHODS:

A 4-stage approach was used to develop a consensus on surgical techniques available for fistula repair: (1) in-person discussion of oronasal fistula cases among cleft surgeons, (2) development of a schema for fistula management using transcripts of the in-person case discussion, (3) evaluation of the preliminary schema via a web-

based survey of additional cleft surgeons, and (4) revision of the management schema using survey responses.

RESULTS:

A schema for fistula management was developed, organized by fistula location. The schema catalogues all viable approaches for each location. For fistulae involving the soft palate, the schema stresses the importance of evaluating for velopharyngeal insufficiency (VPI) and incorporating VPI management into fistula repair. For fistulae involving the hard palate, the schema separately enumerates the techniques available for nasal lining repair and for oral lining repair in each region. The schema also catalogues the diversity of approaches to lingual- and labioalveolar fistula, including variation in timing, orthodontic preparation, and simultaneous alveolar bone grafting.

IMPLICATIONS FOR PRACTICE:

This study employed consensus methods to create a comprehensive inventory of available fistula repair techniques and to identify preferential techniques among a diverse group of surgeons.



**Grace
Park**

MD

Transitional Year

Diagnostic Imaging For Pediatric Ventriculoperitoneal Shunt Malfunction

INTRODUCTION/BACKGROUND:

A ventriculoperitoneal (VP) shunt placement is the main treatment for those in the pediatric population diagnosed with hydrocephalus, a condition where the cerebral ventricles are enlarged. One method of diagnosing a VP shunt malfunction is by indirectly evaluating intracranial pressure via imaging modalities including shunt series, CT, MRI and Optic Nerve Sheath Diameter (ONSD).

METHODS:

This systematic review and meta-analysis had two independent authors search through articles from PubMed, EMBASE and SCOPUS from their inception up to August 2017 to choose studies that included patients of at most 21 years of age with “symptoms of shunt malfunction.” Each study was filtered to minimize bias by examining four domains: 1) patient selection, 2) index test, 3) reference test, and 4) flow and timing. The sensitivity, specificity and both positive and negative likelihood ratios for each diagnostic imaging modality was also calculated and analyzed.

RESULTS:

Eight studies were included in the review with a combined sample size of 1906 of which 558 had a VP shunt malfunction. A positive shunt series, CT, MRI, or ONSD has a post-test probability of (23%–84%). The results showed that when looking at results from each diagnostic modality (shunt series, CT, MRI or ONSD), there lacked a consistent imaging modality that was distinguishable in ruling out VP shunt malfunction.

IMPLICATIONS FOR PRACTICE:

When comparing shunt series, CT, MRI and ONSD, there is no single modality that can rule out VP shunt malfunction and as such would require urgent neurosurgical referral.



**Aubtin
Saedi**

MD

Transitional Year

Cervical Spine Injury following Chiropractic Manipulation - A Case Report

INTRODUCTION/BACKGROUND:

Both acute and chronic neck pain is common among the general population. There has been an increase in patients seeking chiropractic evaluation and treatment for musculoskeletal complaints in recent years. The literature describes correlations between cervical spine injury and chiropractic manipulation, although the data is of variable quality with no clear consensus on the presence nor significance of this proposed relationship. We report a case of vertebral artery dissection and cervical spine fractures in a patient who underwent cervical spine manipulation by a chiropractor for neck pain.

METHODS:

A 68 year-old male presented to the emergency department for evaluation of left sided headache, facial numbness, neck pain, and intermittent paresthesias of the right upper extremity, all of which began four days prior to arrival when he had cervical spine manipulation by a chiropractor for acute-on-chronic neck pain. He had been visiting the chiropractor regularly for about 8 weeks for his chronic neck pain. The patient described a sharp “lightning shooting pain” with associated photosensitivity, numbness and tingling from the top of the left side of his scalp, to his face, mouth, and neck. The pain started immediately

after the chiropractor performed a cervical spine high velocity low amplitude (HVLA) distraction technique.

RESULTS:

Chiropractic techniques are a popular and useful modality in the treatment of various musculoskeletal pathologies. While they are generally regarded as being safe, there is no consensus on the frequency, severity, or risk factors for adverse events following manipulations. Due to its location in the neck and the relative rarity of manifesting symptoms, iatrogenic vertebral artery dissections may be underreported. Treatment typically involves cervical spine immobilization, anticoagulation and/or antiplatelet therapy, and prompt referral to neurosurgical and/or vascular surgery, depending on the location of the injury for definitive management.

IMPLICATIONS FOR PRACTICE:

Patients undergoing chiropractic manipulation should be informed of the potential risks and given instructions on specific symptoms that may suggest cervical spine injury. Lastly, in the event of adverse events, the diagnosing provider should notify the original practitioner who performed the manipulation of the patient’s diagnoses.



**Savannah
Truehart**

MD

Transitional Year

Ultrasound Guided Serratus Anterior and Erector Spinae Nerve Blocks in an Emergency Department to Reduce Opioid Use, Pain, Adverse Events, and Length of Stay

INTRODUCTION/BACKGROUND:

Rib fractures occur in at least 10% of traumatic injuries and thus are commonly seen in the emergency department. These injuries cause significant morbidity and mortality, primarily due to pneumonia secondary to hypoventilation due to pain, impaired gas exchange due to lung contusion underlying the fractures, and altered breathing mechanics. Pain control is a mainstay of treatment for patients with rib fractures in order to prevent the development of pneumonia. In the emergency department, the pain associated with rib fractures is commonly treated with opioids, which are known to be associated with significant complications including respiratory depression, sedation, dizziness, and physical dependence.

METHODS:

Regional nerve blocks are considered part of the standard of care in the treatment of rib fractures and are commonly used in the inpatient and perioperative settings. They have been shown to be highly effective in providing analgesia and improving respiratory function compared to traditional systemic therapies such as opioids.

RESULTS:

Case reports suggest that serratus anterior and erector spinae nerve blocks are safe and effective in reducing pain in the emergency department setting and may decrease opioid use. In a retrospective study, fascial nerve blocks such as serratus anterior and erector spinae plane blocks were as effective as traditional nerve blocks in reducing pain and improving respiratory function]. A prospective observational study showed that serratus anterior plane blocks could be incorporated into the emergency department workflow, improved pain, with no adverse events reported.

IMPLICATIONS FOR PRACTICE:

Preliminary evidence suggests that there is likely a significant role for fascial nerve blocks in contributing to pain control and decreasing opioid use for patients with rib fractures in the emergency department. In this study, we plan to measure the efficacy of the serratus anterior and erector spinae plane blocks compared to standard opioid analgesia on patient comfort, and secondarily on hospital length of stay and adverse events in the setting of a community emergency department with an emergency medicine residency program.



**Brent
Twiford**

DO

Transitional Year

Barotrauma in Non-Invasive Ventilated COVID-19 Patients: A Case Series

INTRODUCTION/BACKGROUND:

We describe the presenting characteristics and hospital course of 7 novel coronavirus (COVID-19) patients who developed spontaneous subcutaneous emphysema (SE), pneumomediastinum (PM), and/or a pneumothorax (PX) in the absence of prior mechanical ventilation.

METHODS:

A total of 11 non-intubated COVID-19 patients (5 male, 2 female, median age 68 years old) developed SE, PM, and/or PX between March 14, 2020 – September 17, 2020 at a single-center health system in Visalia, California. Demographics (age, gender, smoking status, comorbid conditions, and BMI), clinical variables (initial temperature, oxygen saturation blood pressure, and symptoms), and laboratory values (white blood cell count (WBC), lactate dehydrogenase (LDH), C-reactive protein (CRP), D-dimer, ferritin, and procalcitonin) were collected. Chest radiography (CXR) were analyzed for SE, PM, and pneumothorax in each patient by a board-certified diagnostic radiologist.

RESULTS:

Five non-intubated patients developed PX (71%), four developed PM (57%), and three developed SE (43%). Patients developed some form of barotrauma on average 16.3 days after symptom onset. On average, noninvasive ventilation occurred for 7.3 days prior to barotrauma (HFNC, BiPAP, CPAP). Finally, average time from BiPAP to barotrauma was 3.4 days. One patient reported a history of smoking, one patient a current smoker, and the rest never smokers. The most common comorbidities in this cohort were hypertension and diabetes mellitus type II reported in three patients each. Six patients eventually expired during hospitalization.

IMPLICATIONS FOR PRACTICE:

SE, PM, and PX were observed in a cohort of 7 COVID-19 non-intubated patients without any known cause or history of invasive ventilation. Further investigation is needed to elucidate the underlying mechanism in this patient population.

*Shared project with Gregory Herting, DO.