



2018  
Kern Medical  
Research Forum

# Introduction

Welcome to the 18th Annual Kern Medical Research Forum.

The purpose of the Kern Medical Research Forum is to foster in-depth comprehension of research, and promotion of scholarly pursuits among residents, faculty, physicians, medical students, nurses, pharmacists, physical therapists, and mental health clinicians for the advancement of medical science. The Forum serves to highlight research activities of Kern Medical and associated staff, and recognize special contributions and innovations to health care and medical education.

Research and scholarly activity are inclusive requirements of all approved residency-training specialty programs at Kern Medical. Participation in medical and scientific research contributes to the advancement of high quality patient care and serves to recognize Kern Medical as a best practice, science-based, tertiary referral center.

Prior to this evening, we received multi-patient studies and unique case report abstracts representative of the scholarly activities in the majority of the residency specialties. The multi-patient abstracts were blind-scored; the top scoring abstracts were chosen for the oral presentation competition. A research-experienced jury panel will score the presentations.

We would like to acknowledge the hard work of all the participants, faculty and staff. The achievements reflected in the posters displayed and the program presentations represent resident and faculty commitment to scholarly activities.

**Russell V. Judd MS**  
Chief Executive Officer

**Ruby Skinner MD FACS FCCS FCCM**  
Chair, Institutional Review Board

# 2018 Research Forum Program

## Wednesday, May 2, 2018

**5:00 – 6:00 PM**

### **Poster Review Session**

**5:30 PM**

#### **Opening Remarks**

Ruby Skinner MD FACS FCCP FCCM  
*Chief, Division of Trauma; Director, Surgical ICU; Chair, Institutional Review Board*

Russell V. Judd MS CEO  
*Kern Medical*

**6:00 PM**

#### **Excellence in Research Presenters**

Jorge Almodovar MD, Department of Surgery  
*The application of minimally invasive surgery for acute traumatic injuries: outcomes at a level II trauma center*

Tanya Anand MD MPH MT(ASCP), Department of Surgery  
*Results from a quality improvement project to decrease infectious related ventilator events in trauma patients at a community teaching hospital*

Andrew Fischer MD, Department of Emergency Medicine  
*Comparing the use of IV anxiolytics plus standard analgesic care versus standard analgesic care alone in controlling severe, acute pain in the emergency department*

Rajinder (Nikky) Kaur PharmD, Department of Clinical Pharmacy  
*Clinical Outcomes of Pharmacist-led Diabetes Clinic*

#### **Excellence in Research Judges**

Everardo Cobos MD FACP  
*Chair, Department of Medicine; Chief, Division of Hematology/Oncology*

Shahab Hillyer MD  
*Department of Surgery, Division of Urology*

Garth Olango MD PhD  
*Department of Psychiatry, Program Director, Child and Adolescent Psychiatry Fellowship Program*

**6:45 PM**

#### **Faculty Research**

Everardo Cobos MD FACP  
*Chair, Department of Medicine; Chief, Division of Hematology/Oncology*  
*Understanding and Demystifying the role of Immunotherapy in Cancer*

**7:15 PM**

#### **Judging Panel Results and Awards**

Ruby Skinner MD FACS FCCP FCCM  
*Chief, Division of Trauma; Director, Surgical ICU; Chair, Institutional Review Board*

Erica Easton, Executive Director  
*Kern Medical Foundation*

# Resident Presenter Profiles



**Andrew Fischer MD**

Department of Emergency Medicine  
Medical School: Jefferson Medical College  
College: University of California, Berkeley  
Hometown: San Diego, CA  
Next Stop: ER Physician at both Tri-City Medical Center, Oceanside, CA and Kaiser Permanente San Diego Medical Center, San Diego, CA



**Jorge Almodovar MD**

Department of Surgery  
Medical School: American University of the Caribbean  
College: University of Southern California  
Hometown: Valencia, CA  
Next Stop: Florida Hospital, Orlando FL



**Tanya Anand MD MPH MT(ASCP)**

Department of Surgery  
Medical School: St. George's University School of Medicine  
College: Loma Linda University  
Hometown: Diamond Car, CA  
Next Stop: Surgical Critical Care, Acute Care Surgery/Trauma Fellowship, University of Arizona



**Rajinder (Nikky) Kaur PharmD**

Department of Clinical Pharmacy  
Pharmacy School: Thomas Jefferson University  
College: University of California, Los Angeles  
Hometown: Riverside, CA  
Next Stop: Remain in Bakersfield to work in the Kern Medical Pharmacy

# Faculty Presenter Profile



**Everardo Cobos, MD, FACP**

Chair, Department of Medicine & Chief, Division of Hematology/Oncology

Dr. Everardo Cobos, MD, FACP, is a specialist in hematology and oncology who joined Kern Medical as Chair of the Department of Medicine in September of 2016. Dr. Cobos earned his Bachelor of Science degree from the University of Texas-El Paso and his medical degree from the University of Texas Health Science Center-San Antonio. He completed his internship at the Texas Tech University Health Sciences Center in El Paso and subsequently served as a U.S. Army general medical officer in South Korea.

He completed his Internal Medicine residency and hematology-oncology fellowship at Letterman Army Medical Center. He underwent additional specialized training in bone marrow transplantation at the Fred Hutchinson Cancer Center in Seattle.

Dr. Cobos is a board-certified diplomat in Clinical and Applied Thrombosis, Hemostasis and Vascular Medicine and holds lifetime board certifications in hematology, oncology and internal medicine.

He received the President's Distinguished Professor and Distinguished Clinician awards from the Texas Tech University School of Medicine, and was named Hispanic Physician of the Year in Lubbock. He holds memberships in a range of professional organizations and serves on numerous academic, professional and civic boards on the local, state and national levels.

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# Department of Clinical Pharmacy

# Evaluation of isavuconazole and posaconazole for the treatment of coccidioidomycosis

**Presenter:** Janet Yoon PharmD

**Faculty Sponsor:** Jeff Jolliff PharmD BCPS BCACP AAHIVP CDE

*Janet Yoon PharmD<sup>1</sup>, Jeff Jolliff PharmD BCPS BCACP AAHIVP CDE<sup>2</sup>, Brittany Andruszko PharmD<sup>3</sup>, Arash Heidari MD<sup>4</sup>*

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## **INTRODUCTION**

Valley fever, also known as coccidioidomycosis, is a systemic fungal infection endemic to the southwestern United States. In 2016, there was an estimated 2,238 cases of Coccidioidomycosis in Kern County alone. The management of coccidioidomycosis consists of triazoles (ie, fluconazole and itraconazole) or amphotericin B with limited case reports that show benefit with posaconazole for coccidioidomycosis refractory to first line agents. There are no published studies regarding the use of isavuconazole.

## **PURPOSE**

The purpose of the study is to evaluate the treatment of severe coccidioidomycosis.

## **METHOD**

Retrospective chart review was conducted on patients prescribed posaconazole or isavuconazole at Kern Medical outpatient pharmacy between January 1, 2013 and December 31, 2017. Outcomes were assessed using the Mycosis Study Group (MSG) score (ie, a composite score for symptoms, serology, radiographic findings) and the documented impressions of treating medical practitioners. Simple descriptive statistics were used to summary data. Mann-Whitney U Test was used to calculate p values.

## **RESULTS**

Of the 75 patients who received treatment during this period, 15 patients who received isavuconazole and 30 patients who received posaconazole (suspension n=11 and tablets n=19) met study criteria. After a median duration of 8 months of isavuconazole, 73.3% were improved overall and 26.6% had a stable outcome. In the posaconazole suspension group, 81.8% were improved and 18.2% were stable. 78.9% were improved and 21.1% were stable in the posaconazole tablet group. The average change in MSG score in isavuconazole is 2.73, 2.68 in posaconazole tablets, and 3.45 in posaconazole suspension.

## **DISCUSSION**

Posaconazole and isavuconazole appear to be effective antifungal agents in the treatment of coccidioidomycosis. Posaconazole showed similar efficacy to a previous study that compared posaconazole with fluconazole at Kern Medical, where posaconazole had 78% improved outcome and fluconazole had 83% improved outcome. Majority of the patients had improving titers and/or MSG score. There were several limitations to the study. As a retrospective case series, the application of MSF score was difficult due to the variation of documentation of symptoms and timing of laboratory studies. Since there was no medication washout period between two therapies, clinical improvement may be a result of the first treatment rather than the second. Due to the high price, patients encountered limits to their insurance coverage, which led to noncompliance.

## **CONCLUSIONS**

Posaconazole and isavuconazole are reasonable options for treatment of severe coccidioidomycosis refractory to standard treatment. Prospective comparative trials are required to provide further insights into their efficacy and utility.

# Weight-based dosing vs standard care nomogram for IV heparin

**Presenter & Principal Investigator:** Jasmine Ho PharmD  
**Faculty Sponsor:** Jeff Jolliff PharmD BCPS BCACP AAHIVP CDE

*Jasmine Ho PharmD<sup>1</sup>, Nadia Moghim PharmD<sup>2</sup>, Jeff Jolliff PharmD<sup>3</sup>, Jessica Beck PharmD<sup>4</sup>*

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*<sup>3</sup> Clinical Pharmacy Residency Program Director; Adjunct Professor of Pharmacy Practice, University of the Pacific*

*<sup>4</sup> Director, Pharmacy Services*

## INTRODUCTION

Unfractionated heparin is a high-alert medication due to its significant risk of causing life-threatening bleeding or thrombosis. Since heparin is a high-alert medication, cautious monitoring, prescribing, and administering of the medication are important in preventing fatal adverse events. Kern Medical has two heparin protocols: venous thromboembolism and acute coronary syndrome. The protocols provide targeted therapeutic range, dosing, and monitoring parameters. Prior to 2016, heparin dosing was based on standard care nomogram. However, studies showed that weight-based nomogram may be more effective.

In July 2017, a new heparin protocol was implemented with changes for weight-based dosing. This study aims to assess the efficacy of weight-based dosing for IV heparin compared to the standard care nomogram.

## PURPOSE

To evaluate the effectiveness of weight-based dosing compared to the standard care nomogram for unfractionated heparin.

## METHOD

For standard care nomogram, 30 charts were retrospectively reviewed from January 2016 to June 2016. For weight-based nomogram, 23 charts were retrospectively reviewed from July 2017 to November 2017. Exclusion criteria include different target aPTTs, indications not in protocol, lack of documentation, and discontinuation after one dose. The results of the time in therapeutic range and time to first therapeutic aPTT will be compared.

## RESULTS

	Standard care (N=30)	Weight-based (N=23)
Total hours on drip (Mean)	60.6 (14-283)	52.98 (6-236.5)
Total hours therapeutic on drip (Mean)	29.8 (0-128) 41.5%	32.45 (0-160.17) 57.0%
Mean time to first therapeutic aPTT (hours)	16.4 (3-79)	13.28 (6-32)

## DISCUSSION

The total therapeutic hours on heparin drip was greater in weight-based nomogram than the standard care. Weight-based dosing had less time to first therapeutic aPTT compared to standard care. Because the weight-based dosing protocol did not have education campaign, some IV heparins were incorrectly administered, which could have influenced the data. Statistical analysis could not be performed. Safety measures was also not measured.

## CONCLUSIONS

Weight-based nomogram has greater total hours in therapeutic aPTT and took less time to first therapeutic aPTT on heparin drip compared to the standard care nomogram. More studies and statistical analysis needs to be done in order to compare the nomograms.

# Clinical outcomes of pharmacist-led diabetes clinic

**Presenter:** Rajinder Kaur PharmD

**Faculty Sponsor:** Jeff Jolliff PharmD BCPS BCACP AAHIVP CDE

Rajinder Kaur PharmD<sup>1</sup>, David Lash PharmD MPH CDE<sup>2</sup>, Jeff Jolliff PharmD BCPS BCACP AAHIVP CDE<sup>3</sup>

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## INTRODUCTION

Diabetes mellitus is associated with substantial morbidity and mortality. Diabetes affects an estimated 30.3 million people in the US, 7.2 million of those being undiagnosed. Diabetes mellitus causes a significant economic burden when left untreated. Healthcare effectiveness data and information set (HEDIS®) is a standardized set of performance measurements developed by the National Committee for Quality Assurance (NCQA) to ensure that comprehensive diabetes care is delivered.

## PURPOSE

The objective of this study is to evaluate the effect of pharmacist-led diabetes clinic enrollment on patients with uncontrolled diabetes.

## METHOD

This retrospective study evaluates outcomes for patients referred to a clinical pharmacist for management of diabetes. Data collected included adults between 18 and 75 with the diagnosis of type 1 or type 2 diabetes mellitus during the period of January 2012 through March 2018. The primary outcome will assess mean change in hemoglobin A1c (A1c) and glycemic control in terms of mean change in A1c and proportion of patients who attain HEDIS goal A1c of <8.0%. Secondary outcomes evaluate change in BMI, maintaining blood pressure <140/80, routine foot exams and routine eye exams. Exclusion criteria includes initial A1C<7%, change in service to high risk Reach/Grow clinic, non-compliance with visits, and pregnancy.

## RESULTS

A total of 264 patients were screened between the periods of January 2012 through March 2018, 111 patients were excluded. The mean A1c at entry was 10.02 +/- 1.99% and the mean A1c at the end was 8.23 +/- 1.61 % which reflects a mean reduction in A1C of 1.8%(p<0.001). The HEDIS goal of A1c <8% was achieved in 50.3% of the studied population post enrollment. The mean change in BMI was 0.38 kg/m<sup>2</sup>. In the study population a foot exam was completed within the last year in 73 % of the study population. Additionally, an eye exam was completed within the last year for 43% of the population.

	Entry	End	P-Value
Mean A1c	10.02 (1.99)	8.23 (1.61)	P<0.001
HbA1c poor control >9% (n)	62.09% (95)	28.80% (44)	P<0.0001
HbA1c controlled <8% (n)	16.3% (25)	50.3% (77)	P<0.0001
Blood Pressure <140/90 mmHg	55% (85)	70% (108)	P=0.0049
BMI in kg/m <sup>2</sup>	33.72(7.79)	33.34 (7.52)	P=0.7068
Eye Exam		43% (65)	
Foot Exam		73% (93)	

## **DISCUSSION**

Patients enrolled in the Clinical Pharmacy Diabetes Clinic had significantly improved glycemic control, with a mean reduction in A1c of 1.8% ( $p < 0.001$ ) from baseline. The HEDIS goal of A1C  $<8\%$  was met in only 16.3% of patients prior to clinic enrollment, compared to 50.3% post enrollment ( $p < 0.0001$ ), NCQA defines poorly controlled diabetes as any patient with A1c  $>9.0\%$ , and sets the national benchmark to be less than 43.3% of the diabetic population. Prior to enrollment, 60.7% of patients were poorly controlled with A1c  $>9.0\%$ , whereas only 28.8% remained poorly controlled after enrollment ( $p < 0.0001$ ). The HEDIS goal of blood pressure less than 140/90 was met by only 55% of the population prior to enrollment, compared to 70% post enrollment ( $p = 0.0049$ ). Although this study did exclude patients who were non-adherent with scheduled clinic visits, defined as no clinic visit for greater than 9 months, it did not exclude patients who were non-compliant with the prescribed medication management plan, therefore potentially underscores the true impact of pharmacist led intervention. No significant change in BMI was noted, and this could be due to the mechanism of action of prescribed therapy of antidiabetic agents such as insulin which typically causes weight gain.

## **CONCLUSIONS**

Overall, outcomes data from Pharmacist led diabetes clinic exhibits excellent care provided by the clinical pharmacy team. Overall there was a mean reduction in A1C of about 1.8%, without excluding non-compliance with the prescribed medication management plan. This data suggests pharmacist-led diabetes clinic improves achievement of NCQA quality benchmark goals in addition to maintaining preventative measures of diabetic foot exams and eye exams at 73% and 53% of the studied population, respectively.

# Evaluation of 2<sup>nd</sup> generation triazoles in the treatment of coccidioidomycosis

**Presenter:** Janet Yoon PharmD

**Faculty Sponsor:** Jeff Jolliff PharmD BCPS BCACP AAHIVP CDE

Janet Yoon PharmD<sup>1</sup>, Jeff Jolliff Pharm BCPS BCACP AAHIVP CDE<sup>2</sup>, Brittany Andruszko PharmD<sup>3</sup>,  
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## INTRODUCTION

Valley fever, also known as coccidioidomycosis, is a systemic fungal infection endemic to the southwestern United States. Although most cases are self-limiting and restricted to the lungs, the disease can disseminate to the bone, soft tissue, and central nervous system in severe cases. The management largely consists of triazoles (i.e., fluconazole and itraconazole) or amphotericin B. In severe infections, these options are not always fully efficacious or well tolerated leading to failure. Newer triazole antifungals, such as posaconazole, have demonstrated benefit in patients who have failed conventional therapy. However, outcomes data is somewhat sparse. Isavuconazonium, a prodrug of isavuconazole, has shown favorable side effect profile and efficacy against *Coccidioides* species in vitro. However, there are no published studies regarding its efficacy in vivo. Any treatment outcomes data with these agents would contribute significantly to the limited scientific body.

## PURPOSE

To evaluate the treatment of coccidioidomycosis with 2nd generation triazoles.

## METHOD

Retrospective chart review was conducted on patients taking posaconazole or isavuconazole between January 1, 2013 and April 18, 2018. For all identified patients, the outcomes were assessed using the Mycosis Study Group (MSG) score (i.e., a composite score for symptoms, serology, radiographic findings) and the documented impressions of treating medical practitioners. For CNS patients, separate predefined point system was used to compute the point total.

## RESULTS

Of the 82 patients who received treatment during this period, 15 patients who received isavuconazole and 31 patients who received posaconazole (suspension n=12 and tablets n=19) met study criteria. After a median duration of 10 months of isavuconazole, 73.3% were improved overall and 26.6% had a stable outcome. In the posaconazole suspension group, 83.3% were improved and 16.6% were stable. 78.9% were improved and 21.1% were stable in the posaconazole tablet group. The median change in MSG score was 3 in the isavuconazole group, 3 in the posaconazole tablet group, and 5 in the posaconazole suspension group.

Table 1	Initiation of Refractory Tx MSG Score (Median ,IQR)	Last Visit MSG Score (Median, IQR)	Change	P-value
Isavuconazole	5 (3.5-7.5)	2 (2-3)	3	0.00328
Posaconazole Suspension	6.5 (3.5-8.5)	1.5 (1-3)	5	0.00338
Posaconazole Tablet	5 (3.5-7.5)	2 (1-2.5)	3	0.0002

Table 2	First Recorded MSG Score (Median, IQR)	Initiation of Refractory Tx MSG Score (Median, IQR)	Last Visit MSG Score (Median, IQR)	Change	Overall Improved
<b>Lungs</b>					
Isavuconazole	5 (4.5-6)	4 (4,7)	2 (1-2)	2 (2-6)	100%
Posaconazole Suspension	9 (8-10)	6 (4.5-7.5)	2 (2,2)	4 (2.5-5.5)	100%
Posaconazole Tablet	8 (5.75-9.75)	5.5 (2.25-8.75)	1 (0.75-1.5)	3.5 (1.5-6.25)	75%
<b>Skin or Soft Tissue</b>					
Isavuconazole	7.5 (5.75-9.25)	5 (4-6)	2 (2,2)	3 (2-4)	100%
Posaconazole Suspension	6 (6-6)	8 (7-9)	4 (3-5)	4 (4-4)	100%
Posaconazole Tablet	4 (4,4)	4.5 (4-6)	2.5 (2-3)	2.5 (1.75-3.75)	100%
<b>Bone</b>					
Isavuconazole	8.5 (7.75-9.25)	6.5 (5.5-7.25)	2 (2-2)	3.5 (2-5.25)	100%
Posaconazole Suspension	9 (9-10)	7.5 (6.25-8)	1 (1-3.25)	5.5 (2-6)	83.3%
Posaconazole Tablet	7 (5-8)	5 (4-5)	1 (1-2)	2 (2-3)	77.7%
<b>CNS</b>					
Isavuconazole	6 (3.75-7.5)	4.5(2.5-5)	3 (1.25-4.75)	0 (0-2.25)	33.3%
Posaconazole Suspension	1 (1-1)	2.5 (1.75-3.25)	0.5 (0.25-.75)	2 (1-3)	50%
Posaconazole Tablet	3 (2.5-3.5)	4 (2-6)	1 (0.5,1.5)	3 (1.5-4.5)	50%

## DISCUSSION

Overall, favorable outcomes were seen in patients treated with isavuconazole and posaconazole with statistically significant reductions in overall MSG severity scores seen with each agent. Posaconazole showed similar efficacy to a previous study, in which posaconazole had 78% improved outcome. Overall skin and soft tissue coccidioidomycosis was associated with the best improvement; 100% improved. Pulmonary disease had 8 out of 9 improved. Bone had three patients who were stable. CNS was associated with the least improvement. 6 out of 10 CNS patients were stable. Two patients started with MSG score of 0. The remaining two patients had MSG score of 1 and 2 with CSF titer <1/2. This study had limitations of being a single center study and being retrospective in nature, making the application of points to arrive at MSG score difficult due to variable documentation of symptoms and timing of laboratory studies. Since there was a lack of medication washout, there is a potential for clinical improvement to be a result of the prior treatment rather than second.

## CONCLUSIONS

Posaconazole and isavuconazole are reasonable options for treatment of severe coccidioidomycosis refractory to standard treatment. Prospective comparative trials are required to provide further insights into their efficacy and utility.

# Department of Emergency Medicine

# Investigation of wait times in emergency department triage area

**Presenter:** Vikram Shankar MD

**Principal Investigator & Faculty Sponsor:** Sarah Gonzalez MD

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## **INTRODUCTION**

The purpose of this quality improvement project was to evaluate how wait times in the Emergency Department (ED) could be decreased by increasing efficiency of the triage and registration process.

## **PURPOSE**

Data was collected by research assistants (RA) at triage in the Kern Medical Emergency Department from January 8, 2017-September 14, 2017, between 0600-2100. Data was collected each quarter over a 2-week period. ED triage staff was blinded to the study.

The time from when the Quick Look RN (QLRN) saw a patient until Registration was the first data collection. Time from Registration until time patient was triaged was used to calculate the Registration to Triage wait times. The Time to Room (TTR) is the time from when the patient saw the QLRN until they were placed in an exam room or into the Intermediate Care Center (ICC) internal waiting room, and at this point were available to be seen by a provider. This TTR was documented by the RA, which was in real time, and was compared to the Length of Stay (LOS) time that was documented on the McKesson tracking board. These two times were compared to see the difference in what the actual time was as recorded by the RA, and the time shown on the McKesson tracking board.

## **RESULTS**

Mean Values of all 3 data collections

- QLRN to Registration time: 11.81 minutes
- Registration to Triage time: 18.8 minutes
- QLRN to available to be seen by provider time: 52.29 minutes
- LOS McKesson board and real-time discrepancy: -12.72 minutes

## **DISCUSSION**

Further studies can be done to track the exact discrepancy and ways that this can be changed and improved. This data can be used to improve the efficiency of the triage and registration process in the ED.

## **CONCLUSION**

The study showed a time discrepancy between the actual wait time from seeing the QLRN and the TTR when looking at the actual time recorded by the RAs, and the documented LOS time on the McKesson tracking board. Patients waited 10.19 to 15.76 minutes longer than what was shown on the McKesson board.

# Comparing the use of IV anxiolytics plus standard analgesic care versus standard analgesic care alone in controlling severe, acute pain in the emergency department

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**Principal Investigator & Faculty Sponsor:** Rick McPheeters DO

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## INTRODUCTION

Controlling acute pain remains a common and challenging problem in the emergency department (ED). Undertreating pain can lead to poor patient satisfaction and unnecessary suffering. However, excessive analgesic treatment can be dangerous and still does not guarantee that the patient will have satisfactory pain control. In the pediatric, dental, and anesthesia literature, combining anxiolytics and opioid analgesics has been shown to control acute pain better than single-agent opioids.

## PURPOSE

Our study seeks to determine whether a combined, anxiolytic plus opioid analgesic, treatment offers a clinically significant improvement over the standard of care, analgesic only, treatment for acute pain in the ED.

## METHOD

This is a small sample analysis of an ongoing prospective, single-blinded randomized clinical trial. We enrolled opioid-naïve patients complaining of severe acute pain 7/10 or higher and then surveyed their pain levels with a 0-10 cm visual analogue scale (VAS) at 30 minutes, 1 hour, 2 hours, and 4 hours after administration of pain medication. A pain level of 4 cm or below represented successful control of pain. The intervention group received both an IV standard 2 mg dosage of the anxiolytic midazolam and a standard analgesic dosage of 0.1 mg per kg of IV morphine, while the control group only received morphine per standard of care. The number of patient requests for additional morphine and the total amount of morphine administered were also tracked for both groups.

## RESULTS

Simple multivariate analysis was performed to analyze the data. There was no significant improvement in pain at 30 minutes, 1 hour, 2 hours, or 4 hours in the control group. However, the intervention group had significant improvement in their pain scores compared to the control group at all time intervals ( $P < 0.05$ ,  $n=28$ ) (Figure 1). Additionally, the control group required more morphine during their ED course and more frequent morphine redosing than the intervention group ( $P < 0.05$ ). Furthermore, the intervention group had their pain successfully well-controlled faster and had a higher proportion of patients with well-controlled pain compared to the control group (Figure 2). Moreover, there were no adverse events with the concomitant administration of midazolam and morphine.

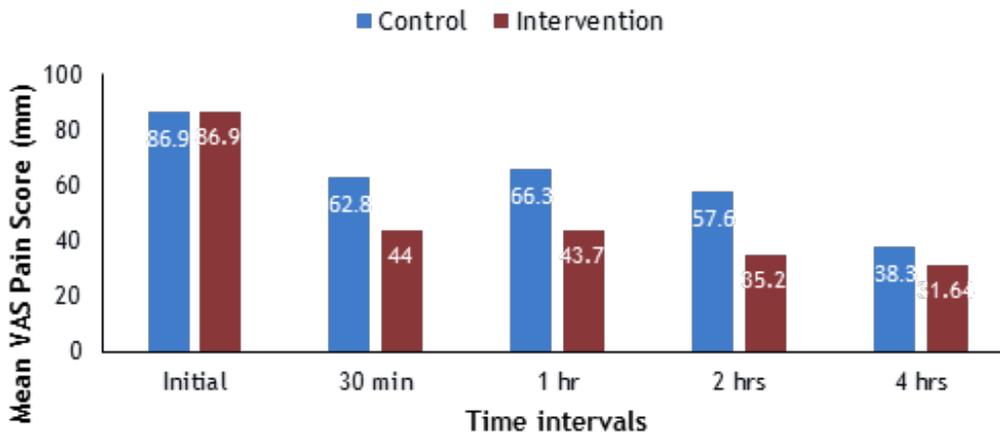
## DISCUSSION

Our data corroborates findings in the dental, pediatric and anesthesia literature that combining an anxiolytic with an analgesic provides better pain control than an analgesic alone. The intervention group had their pain well controlled faster and required less morphine. However, more research will be needed to identify safe monitoring parameters in the ED given recent FDA warning on the combine use of benzodiazepines and opioids. Also, the use of non-benzodiazepine anxiolytics and non-opioid analgesics should be explored to see whether combination treatments with these agents also produce superior effect than single agent analgesics.

## CONCLUSIONS

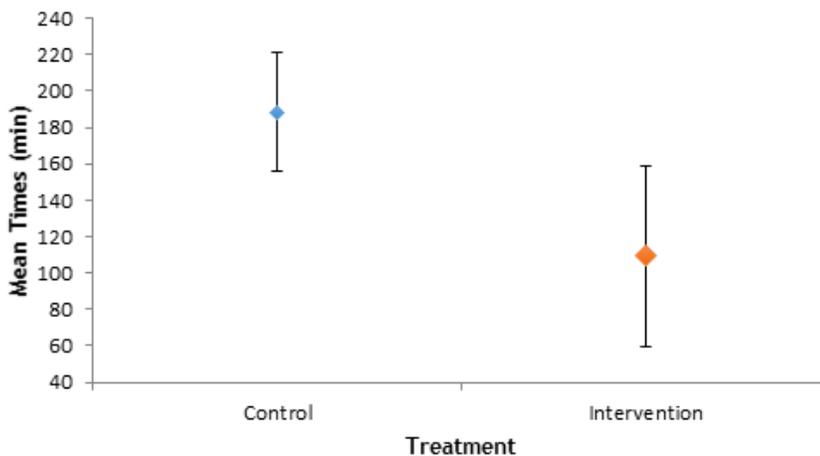
Incorporating anxiolytics in the management of acute pain in the ED may lead to better and faster pain control.

## Mean VAS Pain Scores Over Time



**Figure 1.** The mean pain level according to the visual analog pain scale per control and intervention treatment groups at each time interval.

## Mean Times to Pain Control



**Figure 2.** Mean time to pain controlled equal to or less than 4/10 for both control and intervention treatment groups. The means are represented by the markers and the error bars represent the 95% confidence interval (n=28).

# Massive emphysematous pyelonephritis

**Presenter:** Natalie Peña-Brocket MS RA

**Principal Investigator & Faculty Sponsor:** Adria Ottoboni MD

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## INTRODUCTION

Our case presents an image of a condition that is rare and particularly severe, as shown by free air not only in the right renal parenchyma, but also extending outside the capsule, around the renal vasculature, and into the left perirenal space

## PURPOSE

A 58-year-old male presented to an outside hospital with altered mental status and right flank pain for three days. Septic work up, including computed tomography of the abdomen and pelvis, were significant for diabetic ketoacidosis, pyelonephritis, and significant air replacing much of the right kidney, consistent with emphysematous pyelonephritis.

The patient was transferred to our facility for a higher level of care. The patient was stabilized, given intravenous (IV) antibiotics, and admitted to the intensive care unit with a diagnosis of septic shock secondary to emphysematous pyelonephritis.

## DISCUSSION

Our case presents an image of a condition that is rare and particularly severe, as shown by free air not only in the right renal parenchyma, but also extending outside the capsule, around the renal vasculature, and into the left perirenal space (Figures 1 & 2). Emphysematous pyelonephritis is a relatively rare infection, seen only 1-2 times per year in a typical busy urological department in the United States. It affects patients with diabetes in 95% of cases. E. coli and klebsiella account for over 90% of cases, although proteus mirabilis, pseudomonas, and streptococcus are also seen. Gas accumulates due to rapid necrosis of the renal parenchyma and perirenal tissue, as opposed to gas appearing as a byproduct of anaerobic bacteria as is the case in necrotizing fasciitis. The condition is fatal if not treated appropriately, and the mainstay of treatment is nephrectomy in conjuncture with antibiotics for severe disseminated infection.

## IMAGES

Figure 1: Coronal view of a CT of the abdomen and pelvis; in the lung showing bilateral emphysema;  
Figure 2: Axial view of CT of the abdomen and pelvis without contrast showing emphysema replacing the right kidney

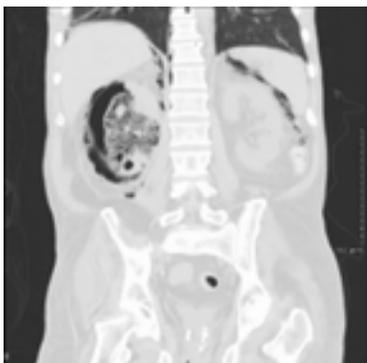


Figure 1

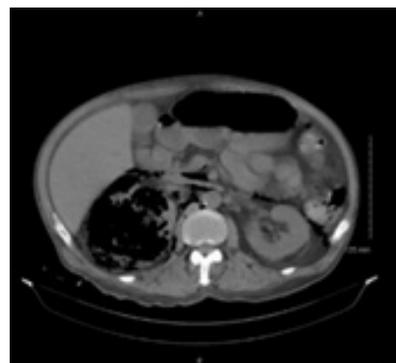


Figure 2

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# Tumoral calcinosis: Early detection and effective treatment can reduce morbidity

**Presenter:** Roxana Ardebili MS

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## INTRODUCTION

Tumoral calcinosis (TC) is characterized by calcium phosphate deposition in periarticular soft tissue, developing gradually over several years. It can be easily missed until large masses are noticed around weight bearing joints, restricting the range of motion. Hips and shoulders are most often involved. TC is a rare condition with controversial pathogenesis. Patients are predominantly of sub-Saharan African descent, and present with hyperphosphatemia and normocalcemia. TC can be subdivided into primary and secondary varieties; primary TC is relatively poorly understood and may be due to familial defects of metabolism or transport of phosphorus. We present a case of the secondary variety- TC associated with chronic renal failure resulting in hyperparathyroidism. In the past, these cases have been regarded as irreversible due to ineffective medical management and frequent recurrence after excision.

## PURPOSE

A 40yo male with extensive past medical history significant for ESRD on hemodialysis presents with bilateral shoulder pain, progressively worsening over the past 3 months. Shoulders appear to have multilocular, cystic masses that are hard but mobile. They are mildly tender to palpation, without erythema, warmth, or ulceration. Symptoms include decreased range of motion secondary to the swelling around the shoulder joints, and intermittent pain that wakes the patient at night. CMP is significant for phosphorus 8.3, BUN 55, creatinine 8.97, GFR 8, while calcium was within normal range of 8.7. Radiographic studies of the left shoulder showed amorphous cloud-like calcification overlying the acromioclavicular joint and distal clavicle which measures 12.5 x 7.7 cm, while studies of the right shoulder reveal similar results measuring 10 x 5.3cm. The patient has been worked up for similar shoulder pain several times in the past, most recently one year before this presentation, at which time smaller calcifications were present, but no treatment was provided. IRB approval was obtained prior to creating this case study.

## DISCUSSION

Although TC is rare, ESRD patients are at an elevated risk. It is significant to be aware of this condition in the population in order to avoid delays in treatment. Further, most research on this topic has included patients with familial defects of phosphate metabolism. I believe it would be imperative for more research to be done involving ESRD patients in order to better understand the natural history of the disease as well as the optimal treatment.

## CONCLUSION

Previous literature suggests that most patients with secondary TC do not respond to medical management. Due to the metabolic nature of the disease, surgical excision of the calcifications often results in recurrence. However recent studies have shown that treatment with a phosphate binder, Sevelamer, along with dietary phosphate restriction can be sufficient to cause regression of the masses over several years. Calcium phosphate is readily exchanged with calcium and phosphate in the depleted serum. Further, refractory cases can be treated with subtotal parathyroidectomy, resulting in rapid regression of the masses over the course of a few months. Since the ESRD patients are at an increased risk of developing TC, they would benefit from early diagnosis and treatment to prevent disfigurement and suffering.

# Tracheal bronchus

**Presenter & Principal Investigator:** Adam Johnson MD  
**Faculty Sponsor:** Rick McPheeters DO

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## **INTRODUCTION & PURPOSE**

This case was chosen due to its rare anatomical variation and opportunity to educate other physicians.

*Chief complaint:* Status epilepticus and abnormal lung sounds after intubation.

*History of Present Illness:* A 47-year-old-male with a past medical history of chronic alcoholism and possible seizure disorder presented to the Emergency Department (ED) via ambulance for a grand mal seizure witnessed by a bystander. It was reported that he had been having multiple episodes of seizures preceding this event. While in the ED, the patient continued to be altered and suffered multiple seizures. The patient was intubated for airway protection. A chest radiograph was taken before and after intubation. The patient had normal lung sounds before intubation and absent lung sounds in the right upper lobe afterwards.

*Physical Exam Prior to Intubation:* B/P 116/75, Temp 101, Pulse 104, RR 16. SpO<sub>2</sub> 100% room air. General – nonresponsive and post-ictal, no distress. Neuro – altered, unresponsive, nonverbal with minimal moans and eye opening to noxious stimuli, withdrawal noted in all extremities. Respiratory – breath sounds clear and equal bilaterally, no respiratory distress.

*Physical Exam After Intubation:* B/P 119/76, Temp 98.3, Pulse 105, RR 16. SpO<sub>2</sub> 100 on 100% FiO<sub>2</sub>. General – patient intubated and sedated. Respiratory – absent breath sounds right upper lung; after endotracheal tube retracted 2 cm, clear and equal lung sounds throughout.

*Initial Chest Radiograph:* showed no acute disease. Post-intubation chest radiograph demonstrated right upper lobe consolidation with volume loss. This was not present on the initial film. Tip of the endotracheal tube was 10 mm above the carina. Chest radiograph after endotracheal tube retracted two cm showed partial resolution of the right upper lobe consolidation.

## **DISCUSSION**

What etiology can explain this patient's post-intubation radiographic finding? Aspiration or abnormality such as tracheal bronchus. What kind of lung sounds or physical exam findings would you expect with this abnormal chest radiograph? Increased fremitus on the side with consolidation, dullness to percussion, absent breath sounds or crackles, or increased vocal resonance

It is generally important to repeat radiographs after certain procedures, especially with intubation. In our case, the patient was found to have an anatomical variant called a tracheal bronchus. In 0.1 to 5% of the population there is a right superior lobe bronchus arising directly from the trachea proximal to the carina. It can have multiple variations and, although usually asymptomatic, it can be the root cause of emphysema, atelectasis, hemoptysis and persistent or recurrent pneumonia. Computed tomography is the best modality for assessing the anatomy and allows direct visualization and orientation of the anomalous bronchus. It is important for physicians whom perform advanced airway management to be knowledgeable about this anatomical variant, so that prompt recognition can prevent delays in diagnosis and management in the acute care setting.

## **CONCLUSION**

Significant change in lung sounds after intubation can alert us to complications; if lung sounds are abnormal in the right upper lobe it could be due to a tracheal bronchus. Knowledge of anatomical variations and complications of procedures can allow for quick identification, management and improved outcomes.

# Ultrasound guided “EASY IJ” vs traditional central venous access

**Presenter:** Larissa Morsky MD

**Faculty Sponsor:** Daniel Quesada MD

*Larissa Morsky MD<sup>1</sup>, Daniel Quesada MD<sup>2</sup>, Phillip Aguiñiga-Navarrete RA<sup>3</sup>, Laura Castro RA<sup>3</sup>,  
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## **INTRODUCTION**

Difficult peripheral intravenous access causes significant delay in evaluation and treatment of patients in the Emergency Department. When traditional alternative approaches fail (external jugular vein or ultrasound guided peripheral vein catheterization), Central Venous Line Placement (CVLP) has been the standard procedure to obtain venous access. CVLP can be costly, time consuming, and uncomfortable for the patient given the extended measures taken to prevent infection. A small number of studies have shown that an “easy IJ” catheter (or Ultrasound Guided Internal Jugular (IJUG) catheter) can be safely and timely placed, and accessed for a short duration of time without an increased risk of infection or line failure. The IJUG catheter seeks to provide an alternative method to gain intravenous access when a traditional peripheral IV is not an option. The current literature on this technique is limited by small sample sizes and has only been evaluated when performed by experienced emergency medicine physicians.

## **PURPOSE**

Our study will compare time to complete procedure, pain as perceived by patient, complication rates and number of attempts between IJUG catheterization vs CVLP. This study is novel in that it will also compare measures between residents of varying training levels (PGY II-PGY IV) and faculty physicians. Finally, we will assess the viability of the line for up to 72 hours.

## **DISCUSSION**

Our study evaluated the success and complication rates associated with IJUG catheterization in a cohort of patients with failed attempts to obtain peripheral IV access. This poses to be the largest study to date evaluating this procedure and, to our knowledge, the only one which accounts for training level and compares outcome measures to a control group (CVLP). Initial success rates of IJUG line placement were non-inferior when compared to central lines with no difference between residents in various levels of training. There was a mean procedure time ratio of 1:2, respectively. We have not yet encountered any cases of arterial puncture, pneumothorax, line failure or insertion site infection in either group.

## **CONCLUSION**

Our study will support and build on what has been evident in the literature thus far. The IJUG technique is an efficient and rapid alternative for establishing effective IV access in patients who lack suitable peripheral venous access. Moreover, this procedure can be safely and effectively performed by both experienced and resident Emergency Medicine physicians.

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# Severe necrotizing fasciitis with atypical presentation

**Presenter:** Samuel Lohstreter MD

**Principal Investigator & Faculty Sponsor:** Rachel O'Donnell MD

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## **INTRODUCTION**

Necrotizing fasciitis (NF) is an uncommon disease of soft tissue infection characterized by rapidly progressing necrosis of the skin, fascia, subcutaneous tissue, and muscle. NF can be somewhat indolent and difficult to detect and is often misdiagnosed with diseases such as cellulitis, and thus requires a high degree of clinical suspicion. Symptoms can include skin erythema, crepitus, bullae formation, edema, and pain out proportion to exam. The main stay of treatment is surgical debridement with supportive IV broad-spectrum antibiotic therapy and IV fluids. We report an atypical case of a patient with NF along the fascial planes of the chest and right upper extremity in a diabetic patient caused by intravenous and intramuscular drug use. Photographic signed consent was acquired from the patient, including IRB approval for the case report.

## **PURPOSE**

A 31-year-old male with a past medical history of diabetes mellitus type 2 diagnosed in July 2016 and intravenous drug use presented to Kern Medical with several days of worsening upper extremity pain. He reported having injected heroin several days prior and noticed a rapid progression of pain, erythema, and swelling to the bilateral upper extremities. The patient's initial clinical exam was somewhat suspicious for NF given presentation of severe circumferential erythema and induration as well as severe pain to those areas. Initial laboratory results displayed hyponatremia 113, hyperglycemia 740, and bandemia; initial x-ray imaging of the chest and right upper extremity (Image 1) showed extensive subcutaneous air tracking along the facial planes.

General surgery was immediately consulted for prompt surgical debridement, as well as incision and drainage of a large abscess of his left shoulder. The patient was started on penicillin, gentamycin and clindamycin and admitted to the general surgery service where he was taken to the operating room for serial debridement of bilateral upper extremities. Once extubated and stable, the patient was discharged with home health arrangements up to help with daily wound dressing changes as well as diabetic education.

## **DISCUSSION**

While a somewhat uncommon condition, it is rare for a patient to present with the severe extent of disease, complicated by hyperglycemia greater than 700 and multiple surgical debridement and survive with minimal lasting morbidity. While it is difficult to diagnose NF in its early stages due to minimal specific signs and symptoms, the extensive amount of ectopic subcutaneous air was essentially diagnostic of necrotizing fasciitis.

## **CONCLUSION**

NF has a high mortality rate, and can often be difficult to diagnose due to non-specific signs and symptoms. Early surgical debridement is the gold standard of care, and the disease requires a high degree of clinical suspicion. In this case, the patient had severe extent of disease and survived with minimal morbidity despite the extensive nature of his disease as well as complicating severe uncontrolled diabetes.



**Image 1.** Subcutaneous air tracking along the fascial planes of the right upper extremity

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# Pulmonary artery dissection: case report and literature review

**Presenter:** Phillip Aguiniga-Navarrete

**Principal Investigator & Faculty Sponsor:** Daniel Quesada MD

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## **INTRODUCTION**

Pulmonary artery dissection (PAD) is a rare condition usually diagnosed in patients exhibiting pulmonary arterial hypertension (PAH). Trauma-induced pulmonary artery dissections are an extremely rare incidence in the literature. Most patients with PAD aren't diagnosed until post-mortem due to the condition being evinced as cardiogenic shock or sudden death when the dissection progresses rapidly. We report a case of pulmonary artery dissection developing secondary to thoracic trauma, including a review of the literature.

## **PURPOSE**

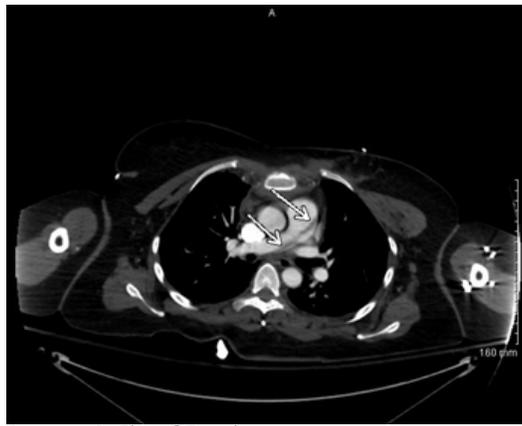
A 43-year-old restrained female passenger with an unremarkable past medical history was involved in a frontal high-speed motor vehicle accident (60 mph) with another vehicle presented to our facility. The patient had reported loss of consciousness on impact. She was extricated and ambulated by emergency medical services. The driver of the vehicle was deceased on scene. Upon arrival, she was alert and fully oriented (GCS 15) complaining of sternal and abdominal pain due to significant thoracoabdominal trauma. She denied: palpitations, shortness of breath, numbness or tingling. Vitals signs were unremarkable. The patient was screened via chest and pelvic x-ray which displayed multiple rib fractures. The CT pulmonary angiogram displayed a post traumatic pulmonary artery dissection (Image 1). Other CT findings included multiple (C5-C7) right transverse process fractures.

## **DISCUSSION**

A large percentage of reported PADs are a complication of PAH that lead to a pulmonary artery pseudo or false aneurysm. PADs have also been associated with congenital heart defects such as patent ductus arteriosus, which can lead to suspended high pulmonary artery flow rates and pulmonary hypertension. COPD has also been repeatedly correlated to the condition; though, this group of patients rarely report PAD. Although few cases are present in the literature, to our knowledge, this is the first report of a patient with a trauma induced pulmonary artery dissection surviving an injury with multiple secondary injuries and surgeries.

## **CONCLUSION**

Pulmonary artery dissection is a very rare and not fully understood condition that should be suspected in any patient with acute or chronic pulmonary hypertension, chest pain, hemodynamic compromise, dyspnea or substantial thoracoabdominal trauma. While previously diagnosed post mortem, recent trends in publications suggest that with more sophisticated medical technology and a better understanding of the etiology of the condition has resulted higher patient survivorship. These increases in patient survival have resulted with conservative management and surgery; however, risk of rupture remains in patients who are treated with the former.



**Image 1:** The CT pulmonary angiogram displayed a post traumatic pulmonary artery dissection (arrow)

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# Invasive fungal sinusitis minimally evident by physical examination

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## INTRODUCTION

We describe a case of chronic invasive fungal sinusitis (IFRS), presenting with minimal physical examination findings. Photographic signed consent was obtained from the patient, including IRB approval for this case report.

## PURPOSE

A 35-year-old female with a history of intracranial fungal abscess with surgical resection in 2007 presented to our facility with a headache for four months. Her headache was located along frontal sinuses. Vital signs were normal. Head examination was significant for minimal left maxillary swelling with mild tenderness to palpation (Figure 1). A fibrotic scar was present from previous craniectomy. Nasal turbinates were normal appearing. Neurologic examination was non-focal. CBC and electrolytes were within normal limits. Ct of the face showed ethmoid and maxillary sinus bone destructions with extension into the right frontal lobe and surrounding fascial structures, consistent with severe fungal disease (Figure 2). Inpatient nasal endoscopy with biopsy showed fungal elements consistent with *Aspergillus* species.

## DISCUSSION

The extensive and severe nature of this patient's pathology was not appreciated by physical examination. *Aspergillus* species, *Fusarium* species, the Mucorales, and dematiaceous (brown-black) molds are among the most common causative agents of invasive fungal sinusitis<sup>1,2</sup>. The chronic course is typically greater than 12 weeks and takes an indolent form which may present with little or no systemic signs or symptoms.<sup>2,3</sup> Therefore, the emergency physician must maintain a high index of suspicion for such pathology.

## CONCLUSION

In general, invasive rhinosinusitis is difficult to cure and survival rates are poor. Long term sinonasal complications may develop.<sup>6</sup> Because of poor prognosis, early diagnosis and aggressive treatment is necessary. A high index of suspicion for invasive fungal infection should be maintained in patients complaining of sinus symptoms including facial pain and headache, especially in the setting of immunocompromised status.



**Figure 1.** Minimally evident presentation of invasive fungal infection.



**Figure 2.** Mass with extension into ethmoid and maxillary sinuses

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# Calciphylaxis (Calcific uremic arteriolopathy) in an ESRD patient

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## **INTRODUCTION**

A condition with a high mortality rate, calciphylaxis is a rare and dire complication of chronic renal failure characterized by vascular calcium overload. We present a case of systemic calciphylaxis with deep vascular and dermal complicity. Photographic signed consent was obtained from the patient, including IRB approval for the case report.

## **PURPOSE**

38-year-old male with a past medical history of uncontrolled DMT2, HTN, and ESRD, not on dialysis, presented to our facility with two weeks of SOB, productive cough, bilateral lower extremity edema, diffuse rash on upper and lower extremities and severe penile pain and dysuria.

## **DISCUSSION**

Calciphylaxis was once thought to be a rare complication of ESRD, but is becoming more common, possibly secondary to increased recognition of symptoms. Optimal treatment is not yet known, but some treatment pathways include sodium thiosulfate and non-calcium-containing phosphate binders such as sevelamer, cinacalcet, for patients with elevated PTH, hyperbaric oxygen and sterile maggot therapy. Pathophysiology is not fully understood; though clinical manifestations result from reduction in arteriolar blood flow. Medial vessel calcification occurs first. Ongoing vascular endothelial injury results in cutaneous arteriolar narrowing and hypercoagulable state that cause tissue infarction. Deep vascular involvement will subsequently lead to limb ischemia.

## **CONCLUSION**

Calciphylaxis was once considered to be a rare complication of ESRD, but has become more common, possibly secondary to increased recognition of symptoms. In this case, findings incorporated arteriolar calcifications resulting in necrotic skin lesions including deep vascular calcifications that were identified easily with plain film. Clinical suspicion of calciphylaxis must remain high in ESRD as early diagnosis and intervention can help prevent amputation.

# Gastric volvulus in 11-month-old male

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## INTRODUCTION

We describe a case of a pediatric gastric volvulus with intermittent intussusception. Consent was obtained, including IRB approval for the case report.

## CASE PRESENTATION

11-Month old male brought in by mother for 1-day history of abdominal distension and anorexia associated with increased fussiness and multiple bouts of non-bloody diarrhea. Mother denied any associated vomiting but did endorse recent URI-like symptoms. The child was born prematurely at 33 weeks and spent 1-month in the neonatal intensive care unit. On physical exam, vital signs were; 99.5 F, Pulse 140, and blood pressure of 157/83. The patient was awake and sobbing, noted to have a distended abdomen with diffuse tenderness and hypoactive bowel sounds. A KUB radiograph (Images 1-2) showed severe gastric distension with normal bowel gas pattern concerning for gastric volvulus.

The patient was transferred to Valley Children's Hospital in Madera for higher level of care. A KUB upon arrival there showed gastric decompression with NG tube extending into stomach. An abdominal ultrasound showed transient small bowel to small bowel intussusception in the left lower quadrant which spontaneously reduced during the course of examination.

An upper gastrointestinal series-small bowel follow-through (UGIS-SMFT) was performed to rule out malrotation. The UGIS-SMFT was reported as negative for malrotation but showed evidence of GERD. Patient was discharged the following day with diagnosis of abdominal distension concerning for gastric volvulus with intermittent intussusception and moderate dehydration.

## DISCUSSION

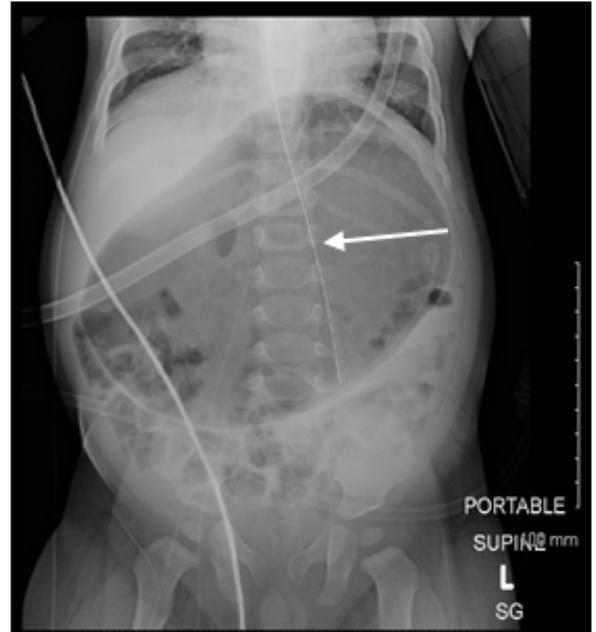
There have been 581 cases of gastric volvulus in children published in English between 1929 and 2007 of which 252 were acute and 52% were younger than one year of age.<sup>2</sup> The most common presentation of acute gastric volvulus is a child <5years old with non-bilious emesis, abdominal distension, abdominal pain, and is often associated with deformities of adjacent organs or abnormalities of one of the four gastric ligaments .<sup>1</sup> Acute diagnostic modalities include an acute abdominal film, chest x-ray, upper GI series with contrast, and abdominal ultrasound .<sup>3-4</sup> A nasogastric tube should be placed to decompress the proximal obstruction created by the closed loop. Definitive treatment for acute gastric volvulus remains emergent surgical repair in the form of gastropexy.<sup>5</sup> Some authors have advocated for consideration of emergent endoscopic reduction,<sup>6</sup> however this approach seems to be associated with a high rate of early recurrence even when successfully performed.<sup>7</sup>

## CONCLUSION

Cases of gastric volvulus with intermittent intussusception, to our knowledge, have not been reported in the literature.



**Image. 1.** KUB of a 11-month old male with evidence of severe abdominal distention indicative of severe gastric volvulus.



**Image. 2.** KUB with evidence abdominal distension status post nasogastric tube placement (white arrow)

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# Massive right breast hematoma

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## INTRODUCTION

We present a case of a female with a large breast hematoma resulting from blunt chest trauma displaying significant pan-computed tomography (pan-CT) findings with minimal secondary injuries. Photographic signed consent was obtained from the patient, including IRB approval for the case report.

## CASE PRESENTATION

A 53-year-old restrained obese female driver with a history of hypertension, congestive heart failure, and generalized anxiety disorder was involved in a high-speed motor vehicle accident (45 mph), rear-ended by another vehicle traveling at an unknown speed. Airbags deployed on impact. No loss of consciousness was reported. She was extricated and ambulated by first responders 20-minutes after arrival.

Upon arrival, she was awake alert and fully oriented (GCS 15) complaining of severe right breast pain. She was tachycardic (BP: 128/60, HR: 110-120, RR: 18). Her primary survey was intact and her secondary survey was significant for ecchymosis to her right breast. Her right breast was swollen, tense and exquisitely tender (Image 1)



**Image 1:** lateral view, right breast hematoma



**Image 2:** MRI shows large hematoma, right breast

No evidence of trauma to her extremities were observed.

Given her history of CHF, a judicious initial bolus of 500ccs of normal saline were given. However, her blood pressure subsequently decreased with a recorded low of 99/72, which responded to a 1-liter normal saline bolus. A pan-CT scan demonstrated a 10.5cm x 12.7cm x 18cm breast hematoma (Image 2). Remarkably, no evidence of concomitant intra-abdominal and intrathoracic bleeding or injuries were reported by radiology interpretation. The trauma surgeon took on surgical management by direct ligation of an artery laceration in the pectoralis major muscle. Pertinent intra-operative findings were; 1500cc of hematoma in the breast consistent with the patient's class 3 hemorrhage. Three units of PRBC were transfused and an additional 500ccs of normal saline.

## **DISCUSSION**

Breast hematomas are relatively uncommon among female patients with blunt chest trauma, occurring in less than 2% of female blunt chest trauma cases, according to a systematic review at a large level 1 trauma center<sup>1</sup>. Further, more than 93.5% were managed expectantly with only 6.5% requiring an invasive intervention, most of which were performed by endovascular arterial embolizations<sup>1</sup>. In our case, the images indicate a hemodynamically compromising breast hematoma in a patient where no other injuries were found on a pan-CT scan (Image 2). To our knowledge, this is the only reported case of female with a massive breast hematoma resulting from blunt chest trauma demonstrating no other radiographically or physically-evident injuries and class 3 shock requiring open surgical intervention.

## **CONCLUSION**

Cases of isolated large breast hematomas causing class 3 shock, to our knowledge, have not been reported in the literature. It is hoped that by publishing this case report with supporting images, other emergency medicine physicians will have increased index of suspicion for acute breast hematomas in cases where other body compartments have no evidence of injury.

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# Tuberculous psoas muscle abscess and thoracic osteomyelitis case report

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## INTRODUCTION

We present a case report of a patient who presented with right sided inguinal pain that was ultimately diagnosed with a tuberculous psoas muscle abscess concurrent with thoracic osteomyelitis.

## PURPOSE

This case report describes the uncommon and interesting simultaneous combination of these two pathological entities, psoas muscle abscess and Pott's disease (Image 1-2). The case is also instructive due to its delayed diagnosis of its causative organism, *Mycobacterium tuberculosis*. We also present the radiographic findings in the case and discuss the diagnostic difficulties associated with non-pulmonary tuberculosis.

## DISCUSSION

Tuberculosis remains an important threat to public health, both worldwide and in the U.S. As such, it is important that emergency medicine practitioners remain vigilant regarding the diagnosis of mycobacterium tuberculosis regardless of its sometimes uncommon presentations.

Psoas muscle abscess (PA) is a rare diagnosis, but even more uncommon in combination with Pott's disease of the spine as a presentation of tuberculosis. Psoas muscle abscess is a rare disease that can be difficult to diagnose and has a myriad of inciting causes, including Crohn's disease, appendicitis, septic arthritis, sacroiliitis, and diverticulitis.

## CONCLUSION

Emergency medicine physicians should be aware of this condition so that they are appropriately educated regarding disposition and appropriate diagnostic modalities regarding tuberculosis and Pott's disease.



IMAGE 1





IMAGE 2



# A rare case of a very large appendicolith in a pediatric patient with clinical appendicitis

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## **INTRODUCTION**

Acute appendicitis is one of the most common surgical emergencies worldwide, affecting nearly 7% of the world's population. In the pediatric population, it most commonly affects older children ages 10-20 and is very rarely seen in children less than 2 years old. Appendicoliths can often precipitate acute appendicitis in pediatric populations. The significance of appendicolith size as a factor in triggering acute appendicitis and their relationship to severity of symptoms remains uncertain.

## **PURPOSE**

We present the case of uncomplicated appendicitis in a pediatric patient in attempt to better understand the significance of appendicolith size in acute appendicitis. Although appendicoliths often precipitate acute appendicitis, most patients with appendicoliths remain asymptomatic. In adult patients, a giant appendicolith is described as those measuring over 2 cms, and are extremely rare. Minimal literature exists describing giant appendicolith in the pediatric population. A study by Jabra et al. studying appendicoliths in children using CT scans, showed that when associated with abdominal pain there is a 90% probability of acute appendicitis in these patients as well as increased risk of appendiceal perforation.

A 9-year-old male with no significant PMH presented to ED for acute right lower quadrant abdominal pain, which he said was present for 1 day. He reported associated fever, nausea with 3 episodes of vomiting and loss of appetite, denied any change in bowel habits. The pain was described as achy in nature, graded as 8/10. Stated that pain was aggravated by any movement and unrelieved by rest. On physical examination patient was in moderate distress secondary to pain and abdominal examination revealed hypoactive bowel sounds, soft and non-distended abdomen with tenderness to deep palpation in the RLQ. Positive McBurney's point tenderness, Rovsing's sign, rebound tenderness and Obturator sign. Laboratories revealed significant leukocytosis of 13. CT abdomen revealed a large appendicolith, measuring up to 1.6 cm, with associated dilation of distal appendix where there were several smaller liths, fluid and air- suggestive of early appendicitis. The patient was admitted to general surgery and underwent an uncomplicated laparoscopic appendectomy.

## **DISCUSSION**

Only 3 cases of giant appendicoliths (>2 cm) exist in literature, none of which were found in children. Of documented appendicoliths in children, mean diameter measured at 5.21 +/- 2.34 mm. Compared to this mean, our patient presented with an unusually larger appendicolith, measuring at 1.6 cm.

## **CONCLUSION**

No literature exists to define a giant appendicolith in the pediatric population, prompting an area for further investigation.

# Department of Medicine

# Erythema Sweetobullosum: A rare presentation of coccidioidomycosis

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## INTRODUCTION

Erythema Nodosum (EN) and Erythema Multiforme (EM) are known reactive cutaneous manifestations of acute infection with coccidioidomycosis. In endemic area these findings could be diagnostic in the presence of proper clinical presentation. In our experience we have observed unique form of cutaneous manifestation of acute coccidioidomycosis with blisters. This form of skin eruption was given different names such as toxic erythema in 1940 and recently sweet syndrome in 2005.

The term Erythema Sweetobullosum (ESB) was suggested first by David J. Elbaum in 1998 in San Joaquin Valley California in a 9 case series. This study showed in contrast to sweet syndrome in ESB histology appears to change based on when the patient is seen. Early on ESB shows lymphocytic dominance, later will be neutrophil rich and eventually histiocytic phase and even granulomatous.

## PURPOSE

Introduce an atypical presentation of acute coccidioidomycosis

## METHOD

Retrospective chart review

## RESULTS

6 cases are identified. Upon presentation they were between 27 to 47 years old half male and half female. In all cases ESB lesions were present as multiple tense erythematous plaques base with central crusting and surrounding cluster of vesicular formation. ESB lesions were located on bilateral upper and lower arms in all cases. IgM Immunodiffusion serology was positive in all cases. Chest x-ray was positive for infiltration or nodule or cavity in 5 cases. Eosinophilia was present in 4 cases (800-1600). All cases had EM and 2 cases had EN present. Histopathology in one case described as subepidermal vesicular dermatitis with lymphocytes and histocytes. No evidence of dissemination was found in all 6 cases. One case lost follow up but rest had significant clinical, radiological and serological response to fluconazole therapy with complete resolution of all skin manifestations.

## DISCUSSION

The various reactive manifestations of *Coccidioides* are Erythema Nodosum, Erythema Multiforme and Erythema Sweetobullosum. Erythema Sweetobullosum is a distinct manifestation that occur in the acute phase of the infection and is associated with good prognosis. All lesions resolved within weeks in our patients. It is very important to recognize these lesions in the proper clinical setting as it is a clear indication of an underlying Coccidioidomycosis infection. Even though the bullous lesions were extensive they regressed within few weeks and there is no known role for corticosteroids to reduce the inflammation.

## CONCLUSION

We are describing 6 cases of acute pulmonary coccidioidomycosis with unique reactive skin manifestation described as Erythema Sweetobullosum. The acknowledgment of skin findings assists in prompt clinical differentiation to make the diagnosis and initiate treatment.

# Systemic review of 30-day Internal Medicine hospital re-admissions; risk factors and prevention

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## INTRODUCTION

Hospital 30-day readmission rate is one of the main standards that hospitals follow to evaluate their performance, efficiency and patient satisfaction. Knowing that there is huge room for improvement in healthcare systems, decreasing 30-day readmission rates is a policy priority that hospitals implement to avoid penalties. In this study, we analyze 214 encounters of re-admission of the internal medicine department of the year 2016 with our main focus on 106 encounters of same diagnosis re-admissions.

## PURPOSE

To examine our current pattern of 30-day re-admission with same diagnosis to identify patients at risk of admission with the same diagnosis. What to do to prevent re-admission and how to improve Medicare response by reducing cost.

## RESULTS

There was a total of 214 encounters of re-admission to internal medicine department in 2016, 106 were admitted for the same diagnosis as discharged. Skin and soft tissue infection diagnosis (14%), followed by urinary tract infections (10%) were the most common diagnoses. Average admission age was 49 years. Dissecting the pool of patients we noticed that average length of stay was 5.4 days, 51% of the patients were of Hispanic race, 80% were females, 48% were unemployed, 58% had below normal albumin level, 42% were drug users, 70% were discharged home compared to 13% to skilled nursing facility. 20 encounters had hospital discharge follow-up prior to re-admission, none of the patients had meds-to beds as the program had not been implemented.

## DISCUSSION

In this study we examined factors that may have contributed to re-admission to the internal medicine service in 2016. Majority of patients had no outpatient follow-up or did not take medications as prescribed.

We were not sure whether patients were given appointments for follow up, but only 19% followed up after discharge. Also information regarding medication prescription was not available to tell us whether patient had not received the medication or did not take medication properly as advised.

We also tried to compare the rate of re-admissions months to assess whether having new residents has an effect on the rate.

## CONCLUSIONS

Risk factors for readmission to hospitals are multifactorial, however, severity of the disease suggested by albumin level, length of stay, discharge destination, drug use, inconsistent follow-up appointment and medication non adherence seem to have a correlation with same-diagnosis readmission within 30 days.

# Department of Obstetrics & Gynecology

# Can a fasting insulin level predict gestational diabetes?

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**Principal Investigator & Faculty Sponsor:** Kurt Finberg MD

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## **INTRODUCTION**

In the United States, screening for gestational diabetes mellitus (GDM) has typically been performed at 24-28 weeks with either the one-step or two-step approaches. Various other laboratory markers have shown promise in aiding in the screening and diagnosis of GDM.

## **PURPOSE**

The aim of this study is to determine if measurement of fasting insulin (FI) could predict abnormal results on 2-hour or 3-hour oral glucose tolerant tests (OGTT).

## **METHOD**

From November 2016 to June 2017, two cohorts of consecutive second and early third trimester pregnant patients were evaluated prospectively with fasting insulin levels at the time of either one step testing for gestational diabetes (fasting and 2-hour post 75-gram glucose challenge) or three-hour OGTT (after abnormal glucose screening with 50-gram glucose challenge). Gestational age, body mass index, fasting insulin levels and results of glucose tolerance testing were collected. Glucose levels for the 2-hour group were interpreted according to recommendations from the ADA, and glucose levels for the 3-hour group were interpreted according to the recommendations of Carpenter and Coustan.

Also, the homeostatic model assessment of insulin resistance (HOMA-IR), a model used to predict insulin levels due to insulin resistance, was calculated using the formula  $(FI)(FG)/405$ . In testing the viability of fasting insulin and HOMA-IR to predict gestational diabetes as compared to a 3HOGTT, two criteria were used in the analysis. Previous studies and meta-analysis have suggested that one abnormal value in 3HOGTT carries the same potential for adverse pregnancy outcome as the standard definition of GDM (2 abnormal values). Criteria #1 was defined as an abnormal value in any one of these indicators, and Criteria #2 was defined as any two abnormal values. The approach to the 3-hour analysis was identical to that of the 2-hour analysis but was repeated for both Criteria #1 and Criteria #2 using fasting insulin and HOMA-IR as individual predictors of gestational diabetes.

## **RESULTS**

Data was collected for 104 patients who received a 2-hour OGTT, and 115 patients who received 3-hour OGTT. Based on an ROC analysis, threshold values were determined for FI and HOMA-IR to predict GDM based on the 2HR test and Criteria #1 and #2 as outlined above for 3-HR. Those values were used to create indicator variables (1 if greater than or equal and 0 if less than the threshold value). All predictors were found to be statistically significant in a logistic regression model (all p-values  $\leq 0.0001$ ).

## **CONCLUSIONS**

Given the association between positive 2-hour OGTT test results and the 2-HR FI and HOMA-IR results, and the 3-hour OGTT results for both Criteria #1 and Criteria #2 the FI shows promise as a potential supplementary test in the diagnosis of gestational and overt diabetes mellitus in pregnancy. Our results suggest that further research is warranted to determine if use of the FI can help predict poor outcomes in the fetuses of mothers with abnormal OGTT results.

# Impact of Multidisciplinary Interventions on Exclusive Breastfeeding Rates

**Presenter:** Melissa Fujan DO

**Principal Investigator & Faculty Sponsor:** Thomas W Moxley MD

*Melissa Fujan DO<sup>1</sup>, Thomas W Moxley MD<sup>2</sup>*

<sup>1</sup> Chief Resident R4

<sup>2</sup> Associate Faculty

## **INTRODUCTION**

Given the recognized benefits of breastfeeding for the health of the mother and infants, the World Health Organization recommends exclusive breastfeeding for the first six months. However, the prevalence of exclusive breastfeeding is low in the United States and particularly low in low socioeconomic status patients. There is much interest in the effectiveness of breastfeeding promotion interventions on breastfeeding rates in early infancy.

## **PURPOSE**

To aim of this investigation was to compare which types of interventions - Health provider education, Lactation consultant coverage, or patient access to formula created the most significant impact on breastfeeding rates in the Central Valley patient population.

## **METHOD**

The hospital's monthly exclusive breastfeeding (from birth to discharge) rates were monitored from 2011 to 2018. Changes in exclusive breastfeeding rates before and after each intervention were compared using a Cumulative Effects Logistic Regression Model.

## **RESULTS**

For every 1.8 patients where staff received breastfeeding education that breastfeed exclusively, only 1 patient breastfeed exclusively that did not receive the benefit of these procedures. For every 3.6 patients once LC became available 7 days/week that breastfeed exclusively, only 1 patient breastfeed exclusively that did not receive the benefit of these procedures. For every 6.0241 patients that received Patient Education that breastfeed exclusively, only 1 patient breastfeed exclusively that did not receive the benefit of all new procedures implemented

## **DISCUSSION**

The study population benefited significantly from interventions resulting in increased exclusive lactation rates from delivery to discharge. It appears based on the data there was a correlation between the chronology of interventions and their effectiveness, with the early interventions having a weaker/not statistically significant impact while the final interventions had the strongest influence (increased exclusive breastfeeding rate by 15.29%).

## **CONCLUSIONS**

While all interventions resulted in increased rates of exclusive breastfeeding, the data demonstrated a higher impact on percent of mothers who were able to exclusively breastfeed with increased LC availability relative to all other interventions.

Conversely, all interventions were cumulative so it is not possible to isolate one intervention from another. Thus, having received the benefit of the prior interventions could theoretically lead to higher or lower responses to subsequent interventions. While the statistical analysis proved challenging, it might be concluded that multidisciplinary interventions provide the greatest benefit to the patient and newborn.

# Vulvar phyllodes tumor: An uncommon pathologic diagnosis in an even more uncommon location.

**Presenter & Principal Investigator:** Emily Howell DO

**Faculty Sponsor:** Thomas W Moxley MD

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## **INTRODUCTION**

Phyllodes tumors, a type of fibro-epithelial tumor, of the breast account for less than 1% of all breast neoplasms diagnosed. Even more rare are Phyllodes tumors of the vulva of which only 6 cases have been reported in the literature. The exact tissues of origin from which these vulvar neoplasms arise have been debated and were historically thought to originate from aberrant breast tissue from remnants of the milk-ridge. Current histologic theory now leans towards acceptance of origin from anogenital mammary-like glands.

## **PURPOSE**

In this case study, we present a 24-year-old, nulliparous female with a large vulvar mass appearing over 4-months duration and measuring 10x5cm. The patient complained of pain and irritation affecting her daily activities due to the large mass that had developed on her right labia majora. Surgical excision was performed and resulting pathology concluded the presence phyllodes tumor arising from anogenital mammary-like glands.

## **DISCUSSION**

Histological requirements for diagnosis of phyllodes tumors in the vulva are similar to characteristics in breast tissue and include characteristic leaf-like configuration as well as mesenchymal components with cellularity ranging from bland to moderately cellular with mitosis. In this case, the lesion was shown to have numerous leaf-like projections and bland stroma with few mitosis, features overall consistent with Phyllodes tumor. No adjacent normal appearing breast tissue was observed.

## **CONCLUSION**

Vulvar Phyllodes tumors are rare fibro-epithelial lesions with only approximately 6 cases being reported in the literature to date since 1947. These lesions have the ability to greatly affect a patient's activities of daily living and also their self-confidence due to the disfiguring nature and ill appearance in such an intimate area. Fortunately, complete surgical excision appears to be sufficient treatment. At worst, Phyllodes tumors of the vulva can recur but have yet to be described as malignant in contrast to their breast counterparts. Healthcare professionals should be aware of this rare pathological finding in cases of vulvar or perianal lesions and careful histologic classification is warranted.

# Department of Psychiatry

# Grassroots Approach to Mental Health Community Engagement & Education

**Presenter:** Carlos Fernandez MD

**Principal Investigator and Faculty Sponsor:** Garth Olango MD PhD

*Carlos Fernandez MD<sup>1</sup>, Mohammed Molla MD<sup>2</sup>, Garth Olango MD PhD<sup>3</sup>, Michael Kase MD<sup>4</sup>*

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## **INTRODUCTION**

Reducing disparities in mental health has become a national priority. As a result, a significant number of children with behavioral health issues go without diagnosis and treatment; frequently leading to potentially negative outcomes. The UCLA-Kern Medical, Child and Adolescent Fellowship Program initiated a grassroots community academic partnership educational campaign focusing on educating Kern Medical community members.

## **PURPOSE**

This project aims to provide mental health knowledge/education of common children's mental health topics with the goal to increase mental health literacy. By providing educational material we hypothesize that there will be a reduction in mental health stigma clarifying misconceptions while instilling positive attitudes toward children's mental health issues.

## **METHOD**

The study population is volunteer participants interested in learning about children's mental health. They will be provided two separate educational lectures focusing on Attention Deficit Hyperactivity Disorder and Depression with pre and post surveys to assess children's mental health knowledge, treatments, and recognition of common symptoms. The study will incorporate final data collection and statistical analysis to determine possible mental health literacy trends.

## **RESULTS**

The pilot study consisted of a total of 120 participants. Seventeen were evaluated according to the KADDS scale in the ADHD group. One hundred and three participants were evaluated according to the Depression-literacy scale in the Children's depression group. A paired t test was conducted for both scales. It was found that the p-value for the ADHD group was not significant, possibly due to small sample size. The p-value for the depression group was significant, indicating that our hypothesis was true.

## **DISCUSSION**

The pilot study was conducted to investigate if through community academic partnerships an impact could be made to increase mental health literacy. The research demonstrated that by actively going to communities and engaging community members themselves discussions can take start taking place to decrease mental health stigma and improve mental health literacy.

Through community academic partnerships there could be a conceivable improvement in people's outcomes who face mental health challenges through increasing education. By increasing mental health literacy, having early prevention, and early intervention discussions can take place with a more educated public helping decrease mental health disparities in California.

## **CONCLUSIONS**

Reducing mental health barriers and eliminating disparities is crucial in empowering patients and families. By utilizing a community academic partnership model, education can be provided in real time to the most vulnerable communities within California, helping improved outcomes of people and family members facing mental health challenges.

# Department of Surgery

# Results from a quality Improvement project to decrease infectious related ventilator events in trauma patients at a community teaching hospital

**Presenter:** Tanya Anand MD MPH

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## INTRODUCTION

Ventilator associated pneumonia (VAP) is difficult to eradicate in the high-risk trauma population. High rates of VAP are linked to increased morbidity and mortality and reimbursement may be impacted as it is considered preventable. Clinical protocols (VAP bundles) have evolved to minimize VAP, however the implementation may be challenging in hospitals with limited access to financial and education resources for medical staff

## PURPOSE

To evaluate the impact of a multidisciplinary program of evidenced based education and policy change on VAP prevention in trauma patients.

## METHOD

In 2009, we began to critically assess our outcomes in our high-risk trauma patients, and VAP rates were very high. A major contributing factor was thought to be the lack of evidenced based education for physician and nursing staff, as well as, an open intensive care unit (ICU) model where care was not uniformly evidenced based. A quality improvement project was developed by establishing a VAP prevention committee. The first project was to start a closed ICU multi-disciplinary model that was staffed by ICU trained physicians. Formal training and education for the nursing and physician staff for VAP bundle prevention, and ICU sedation based on the Society of Critical Care Medicine (SCCM) guidelines was then begun. An education grant enabled nursing and mid-level staff to attend regional trauma meetings, (2010-2014). Concurrently, the implementation of a formal VAP bundle began, and ICU sedation and mobilization practices were changed to reflect modern standards of care.

## RESULTS

During the study period (2009-2016) 2000 patients requires admission to our Level II trauma center. The mean ISS was 33 + 12, and there were 17% penetrating and 83% bling injuries.

The early compliance (2010) with the VAP bundle, and ICU sedation for ventilated patients was at 65%. Within one year (2011) of the implementation of education and policy changes, the compliance increased to >90%. Over the ensuing years compliance has been carefully trended and has remained at 100%, 2012- 2016.

All of the aforementioned interventions have resulted in a sustained dramatic decline in VAP, (2009/10-12%, 2011-3%, 2012 -2%, 2013-16 -0%.) These data are continuously trended and reviewed quarterly. Ongoing education and ICU policy development has become the mainstay of our trauma ICU program.

## CONCLUSIONS

The implementation of a ICU model staffed by trained critical care specialist, and concurrently the introduction of evidenced based care, imparted a culture of excellence resulting in favorable outcomes in high-risk trauma patients related to VAP prevention. Ongoing monitoring and education is required to sustain these promising outcomes.

# Preliminary results of focused anatomy education for trauma registrars to improve injury severity scoring accuracy

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## **INTRODUCTION**

Monitoring the validity of trauma registry data is an important component of any trauma program, and we routinely perform internal audits to check the accuracy of our data- base. The results of a routine internal audit of our trauma registry performed for a total of 244 patients admitted to our Level II trauma center from January 2017 to March 2017 revealed that 59% of errors were related to injuries, injury severity scores (ISS) and abbreviated injury scores (AIS). This pattern of error was documented in prior audits and thus we sought to address a presumed education deficit for our trauma registrars by focusing on trauma specific anatomy.

## **PURPOSE**

To evaluate the preliminary impact of advanced education for trauma registrars on injury coding accuracy.

## **METHOD**

An intensive curriculum was implemented which focused on teaching organ specific anatomy related to common traumatic injuries. A series of intensive lectures were given focused on organ systems, important anatomic relationships, and traumatic injuries inclusive of acute physiologic changes requiring intervention. Each organ system reviewed normal anatomy and function, and abnormal anatomic changes and function due to trauma. Resuscitation and surgical principles were also included in the teaching to tie together the injury identification, management and monitoring of specific injuries during all phases of care.

## **RESULTS**

Following the implementation of the intensive curriculum, we audited the trauma registry data for 207 patients admitted during April and May of 2017. There was a large improvement in the data accuracy for injuries, ISS and AIS, as the error rate decreased significantly to 22%,  $P=0.001$ . The trauma registrars also reported that knowledge acquired from the teaching facilitated their data acquisition.

## **DISCUSSION**

This education has been incorporated in the trauma program, and the registrars will continue to participate in the intensive curriculum. The lectures are offered weekly and the core curriculum is designed to covered all organ systems and common injuries. We plan on expanding the education to cover case specific analysis of complex injuries in which discrepancies were found during the routine data audits.

Internal audits will continue quarterly and the curriculum will be modulated to cover the education needs of the registrars.

## **CONCLUSIONS**

These preliminary data demonstrate that advanced education in trauma anatomy related to injury specific systems, resulted in a significant improvement in trauma registry injury severity coding. Prospective data and evaluation is warranted.

# Third space, where art thou?

**Presenter:** Tanya Anand MD MPH

**Faculty Sponsor:** Ruby Skinner MD FACS FCCP FCCM

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## **INTRODUCTION**

As surgical and critical care has advanced, so have resuscitation practices. This evolution stemmed from the curiosity with perioperative fluid distribution and its relationship to the degree of surgical stress. The concept and the existence of the third space had been a popular subject matter for a number of decades, and rightfully so, as it impacted the effect that a given fluid infusion may have, upon a patient. The idea of another compartment for intravascular fluid to distribute, gave us an explanation for extra-cellular fluid distribution in a non-functional space; though did focus on the important topic of capillary leak.

## **PURPOSE**

To review the historical significance of the extravascular "third space".

## **DISCUSSION**

Perioperative fluid management and its association with extracellular extravascular fluid redistribution has historically been studied through animal models and human experiments. In the 1960s, Shires utilized tracers to study the relationship between the degree of surgical stress and its relationship to fluid distribution. In his experiments, he noted a greater decrease in functional extracellular fluid in patients who had undergone a greater degree of surgical stress, thus leading to the conclusion of an internal redistribution of intravascular fluid. Splenectomized dogs and humans were also noted to have a 'disparate reduction of extracellular fluid' that could not be 'accounted for by external blood loss alone or by the shift of the extravascular extracellular fluid into the intravascular space. The concept of 2 liters of crystalloid to be given prior to blood for treatment of hemorrhagic shock evolved from this early data and has been the predominant mode for resuscitation for over 3 decades. Resuscitation strategies have evolved away from the excessive uses of crystalloid to whole blood component replacement with the avoidance of crystalloid, as military and civilian data has demonstrated improved survival and decreased morbidity when crystalloids are limited and blood loss is replaced with blood components mimicking whole blood.

## **CONCLUSIONS**

*Historical Significance:* The concept of the third space impacted fluid resuscitation practices and altered our perception of fluid distribution during acute surgical/traumatic stress. Its acceptance was important in our understanding of how various fluids distribute within different spaces, and how our body reacts to stress. Additionally, it changed the manner in which we viewed hemorrhage and the necessary resuscitation that followed. This knowledge also contributed to defining endothelial dysfunction, fluid losses and retention associated with severe sepsis. Modern concepts of resuscitation and advanced critical care techniques have evolved to counteract the need to "replace" extracellular losses with large volumes of crystalloid. Whole blood component replacement is now considered to be physiologic.

# Targeting the endothelium: Vitamin C as an adjunct in resuscitation related to burns, sepsis, and trauma.

**Presenter:** Tanya Anand MD MPH

**Faculty Sponsor:** Ruby Skinner, MD FACS FCCP FCCM

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## **INTRODUCTION**

Trauma, burns, and sepsis evoke a systemic inflammatory response that lead to increased permeability and fluid extravasation. A pivotal mechanism of inflammation is the generation of oxygen radicals and resultant endothelial injury. Vitamin C has the inherent ability as an oxygen scavenger and there is a growing body of data to support its role as an adjunct to mitigate the negative impact of inflammation on organ function.

## **PURPOSE**

To review and describe the existing literature supporting the role of Vitamin C as an adjunct for resuscitation in inflammation related to burns, sepsis and hemorrhage.

## **DISCUSSION**

Vitamin C is an electron donor whose function is to simply reduce molecules, including oxygen species. Hence its reputation as an anti-oxidant. It is an important cofactor in catecholamine, collagen, and peptide synthesis, and a "scavenger" of oxygen radicals in the endothelium. Ascorbate has been shown to lessen the morbidity associated with large volume resuscitation in burns, by moderating the inflammatory response and water retention. Thus, the morbidity associated with large volume resuscitation is limited. Consumption of ROS occurs via much needed co-factor production, as well as decreased cellular uptake is a key mechanism of Vitamin C in sepsis, which results in improving microvascular flow and end organ perfusion. Recently the results of a phase I safety trial for sepsis revealed, that patients receiving ascorbic acid had significant reductions in Sequential Organ Failure Assessment (SOFA) scores and inflammatory markers compared to the control group. Similar improvements in pressor requirements, vent days and risk of multi-organ failure were noted. Finally, in trauma, hemorrhagic shock is the leading cause of death in individuals between the ages of 5 and 44 and therapy has primarily been focused on controlling bleeding. The emerging role of Vitamin C in traumatic injury is limited primarily to animal studies and human studies for traumatic brain injury. The inflammatory mechanisms of traumatic hemorrhage are similar to burns and sepsis and there is a potential clinically beneficial role of using ascorbate in the acute resuscitation of traumatic injury.

## **CONCLUSIONS**

Vitamin C's role in minimizing the insult generated by oxygen radicals leads to a notable decrease in vascular permeability, resulting in increased vascular reactivity and more meaningful resuscitation. Studies in septic and burn patients, as well as numerous animal models have showed, the overall improvement in hemodynamic parameters and decline in necessary fluid resuscitation. There is promising early data for trauma resuscitation which may limit fluid requirements and preserve organ perfusion after hemorrhagic shock.

# First 100 robotic cases and implementation of a robotics curriculum in a general surgery residency

**Presenter:** Domenech Asbun MD

**Principal Investigator & Faculty Sponsor:** Andrea Pakula MD FACS

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## **INTRODUCTION**

The use of robotic technology is rapidly increasing among general surgeons but is not being routinely taught in general surgery residency. We aimed to evaluate our first 100 robotic cases during which time we developed a curriculum incorporating residents.

## **PURPOSE**

To evaluate our early experience with robotic surgery and evaluate outcomes related to implementing a residency curriculum with robotic surgery.

## **METHOD**

The first 100 robotic cases performed at our institution from 2016-2017 by two surgeons were analyzed. A residency curriculum was developed after the first 6 months. It consisted of online modules offered by Intuitive Surgical resulting in certification, simulator training and hands on workshops for cannula placement, docking, instrument exchange, camera clutching and other introductory tasks. Patient demographics, type of procedure, resident involvement, total operative and console times, length of stay, comorbid conditions and complications were evaluated.

## **RESULTS**

66 females and 34 males comprised this series with an average age of 44 years  $\pm$ 12. The majority of patients, 71% had comorbidities, with a predominance of hypertension and diabetes. The bariatric patients had an average BMI of  $48 \pm 10$ .

Cholecystectomies and Inguinal hernias comprised the majority of cases. Residents were involved in the last six months and participated in 40% of cases. There were no differences in operative times in cases with residents involved in the majority of procedures. There were 3 complications; postoperative ileus, a gallbladder fossa hematoma and an enterotomy. There was one early conversion to open in a complex foregut case and there were no deaths. (Table 1)

## **CONCLUSIONS**

The implementation of a robotic surgery program and resident curriculum was safe with similar outcomes related to operative times, complications and lengths of stay. As robotics continues to grow, residencies should have a curriculum incorporated. Further data is needed to determine residency learning curves between robotics and laparoscopy.

	Cholecystectomy	Sleeve Gastrectomy	RYGB	Revisional bariatric	Inguinal hernia	Ventral hernia	Paraesophageal hernia	Heller myotomy
# of Cases	30	22	5	4	18	16	4	1
Resident Involvement	67% (20/30)	55% (12/22)	40% (2/5)	50% (2/4)	22% (4/18)	38% (6/16)	25% (1/4)	0
Total OR time without resident (min)	58 ±19	91 ±28	193 ±29	230±12	155 ±75	172±82	277 ±93	99
Total OR time with resident (min)	64 ±34	111±28	214 ±23	119 ±6	127 ±42	179±64	250	n/a
p value	0.5	0.1	0.5	0.007	0.5	0.8	0.7	
Console Time without resident (min)	24 ±10	44±9	130 ±9	156 ±13	94 ±49	116±64	218 ±86	50
Console time with resident (min)	34 ±28	65 ±22	104±44	56 ±2	75 ±32	126±53	196	n/a
p value	0.16	0.01	0.4	0.008	0.5	0.7	0.7	

# The application of minimally invasive surgery for acute traumatic injuries: Outcomes at a Level II Trauma Center

**Presenter & Principal Investigator:** Jorge Almodovar MD  
**Faculty Sponsor:** Ruby Skinner MD FACS FCCP FCCM

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## INTRODUCTION

Minimally invasive surgery (MIS) is the standard approach for most of the surgical procedures performed by general surgeons. Traditionally the majority of operations for trauma are performed open due to the complexity of the cases, however, trauma surgeons are expanding their armamentarium to include MIS in a variety of acute procedures. We report our experience with the application of laparoscopy in a variety of trauma cases.

## PURPOSE

To describe our experience with applying MIS for acute traumatic injuries.

## METHOD

A retrospective review of trauma cases performed between 1/2012- 1/2016. During that time 52 laparoscopic cases were performed after traumatic injury. Patient demographics, injury severity (ISS), injury mechanisms, the types of procedures and outcomes will be described. Means and standard deviations were calculated and t test were performed. A p value of <0.05 was statistically significant.

## RESULTS

*Demographics-* A total of 52 trauma cases were performed laparoscopically during the study period. The majority were male, n=43 and the age was 29 SD 11. Obesity was documented in 30%, hypertension or CAD was in 20%, and substance abuse was in 44%. Blunt trauma was in 35% and penetrating 65%. The ISS was 15 SD 9.

*Surgical Procedures-* The majority, 85%, of the procedures were completed laparoscopically. Non- therapeutic laparoscopy was performed in 36%. Repair of diaphragmatic or traumatic abdominal wall hernias were 29%. Hematoma evacuation and control of bleeding was 15%. Control of solid organ bleeding and repair was performed in 11%. Intestinal repair occurred in 9%. For the cases that required open conversion ISS was 20 SD 7 vs. laparoscopic cases ISS was 12 SD 9, p=0.04.

*Outcomes-* The overall length of stay was 5 days SD 6. There was n=1 late death in a poly-trauma patient that required open conversion for complex solid organ and intestinal injuries. There was n=1 case of a community acquired pneumonia, and n=1 case of a recurrent pneumothorax.

## CONCLUSIONS

A descriptive series of trauma operations approached with MIS techniques is described. This cohort had high injury severity and a predominance of comorbid conditions. Laparoscopy was successfully applied in the majority of cases for a variety of therapeutic procedures and mortality and morbidity was low. MIS is safe and is gaining momentum for application in traumatic injury.

# CT imaging for trauma goes beyond injury identification: a descriptive analysis of incidental findings at a Level II Trauma Center

**Presenter:** Jose Diego MD

**Principal Investigator & Faculty Sponsor:** Ruby Skinner MD FACS FCCP FCCM

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## INTRODUCTION

Total body CT scans for trauma are being increasingly applied in the evaluation for trauma patients at risk for serious injuries based on high-risk injury patterns. The technologic advances associated with CT scans has improved the accuracy of injury diagnosis, and incidental non-trauma findings are being commonly encountered. Currently at our trauma center, when incidental findings are documented, patients are referred to their primary care physicians for follow-up, however documentation of the follow-up is limited.

## PURPOSE

To evaluate and document the incidence and patterns of incidental findings on CT scans obtained for trauma evaluation.

## METHOD

Following IRB approval, the trauma data base was queried for trauma patients evaluated in the emergency room with total body CT scans. There were n=313 CT scans that were reviewed for this study spanning a period from January 2015 to June 2017. CT findings were documented, including traumatic injuries, and incidental findings. Incidental findings were categorized as category I (potentially severe requiring additional workup), category II (diagnostic workup and follow up depending on symptoms), and category III (findings considered minor, no additional work-up).

## RESULTS

Demographics- Study subjects were n=313. The mean age of the cohort was 35 yrs., and injury severity score (ISS) was 9. Blunt mechanism comprised the majority 78%. Co-morbid conditions were tobacco use 20%, DM 15%, ETOH/Drug use 10%, CAD/HTN 10%.

CT findings – Incidental non-trauma findings occurred in 36% (n=113) of the CT scans reviewed for this study. Of those scans, there were n=165 incidental findings.

Category I findings were in 42%, n=70. They were comprised primarily of organ specific masses and nodules and examples are; Thyroid (n=21), Pulmonary (n=20), Liver (n=8), Kidney (n=8), Pancreas (1)}.

Category II findings were in 53% and involved organ and disease specific findings and examples are; {Hernias (n=16), Biliary DZ (n=12), Gynecologic (n=12), GU cyst (n=20), GU stones (n=4) Vascular (n=4)}. Category I findings were in 5% and included small organs cyst, or non-specific organ based findings.

## CONCLUSIONS

A descriptive evaluation of CT scan findings for trauma revealed that over one third of patients had incidental findings and almost 50% were clinically significant warranting follow-up. Further prospective study is warranted to evaluate the incorporation of referral based protocols to facilitate diagnostic evaluation and follow-up for patients with clinically significant incidental findings on CT scans for trauma

# A rare case of fusiform celiac artery aneurysm after penetrating trauma

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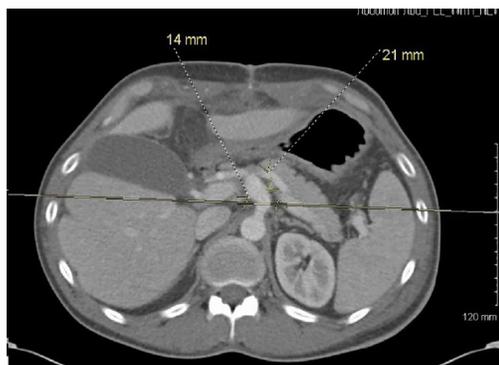
## INTRODUCTION

Visceral artery aneurysms (VAA) are a relatively uncommon clinical problem and aneurysms of the celiac artery make up only 4% of all visceral artery aneurysms. These often present at the time of diagnosis with either pain or rupture. Although they are rare vascular injuries, advances in imaging modalities have increased the incidental findings of these types of aneurysms.

**PURPOSE:** To describe a case of a rare injury to the celiac artery due to penetrating trauma.

## CASE PRESENTATION

We present a case of an otherwise healthy 30-year-old male with an asymptomatic, posttraumatic arterial aneurysm of the celiac artery, found incidentally four weeks after discharge. He had initially presented to our hospital after sustaining multiple gunshot wounds to the chest and abdomen. He underwent three abdominal operations for complex intestinal injuries and was managed with an open abdomen, and at the third operation his midline fascia was closed. His initial radiographic imaging did not demonstrate evidence of vascular injury nor was any found upon exploration. He was discharged after 18 days in the hospital. Four weeks later he represented with complaints of fever and flank pain for three days. He was found to have a fluid collection in the left paracolic gutter concerning for abscess. Incidentally he was also noted to have a 14-mm fusiform dilation of the celiac artery with proximal dissection. The abscess was drained percutaneously and he was then referred to vascular surgery for endovascular repair of the aneurysm.



**Fig. 1.** Axial view, illustrating celiac artery aneurysm

## DISCUSSION

Visceral artery aneurysms are rare and when identified often require early intervention. Posttraumatic etiologies are often due to penetrating trauma as in the case presented. Modern high-resolution imaging can identify those that are not yet symptomatic. Our case of a celiac artery aneurysm presented in an unusual manner, as it was discovered approximately one month after traumatic injury and one such explanation for the latent presentation is due to a blast injury from the missile.

## CONCLUSIONS

Celiac artery aneurysms are the rarest of the visceral artery aneurysms encountered in the clinical setting. Early recognition and intervention is paramount as mortality rates can reach up to 40 percent for ruptured vessels. Although there are no consensus guidelines which address this clinical problem, studies have shown that early endovascular management is effective management.

# Outcomes for open complex ventral hernia repairs with retromuscular biosynthetic mesh placement: our early experience.

**Presenter:** Daniel Delgadillo MD

**Principal Investigator & Faculty Sponsor:** Ruby Skinner MD FACS FCCP FCCM

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## **INTRODUCTION**

Optimal technique and mesh selection are still debated for complex ventral hernias. There is limited data on the use of biosynthetic meshes in high-risk patients.

## **PURPOSE**

We sought to evaluate our early experience and hypothesized favorable outcomes.

## **METHOD**

A retrospective review was conducted following IRB approval for ventral hernia repairs using a single biosynthetic mesh between January 2015 - November 2017. Patient and hernia details were characterized. Outcomes were evaluated.

## **RESULTS**

Patient Demographics- There were n=21 ventral hernia repairs identified. Male were n=10, and females n=11. Mean BMI was  $35 \pm 7.4$  kg/m<sup>2</sup> and age was  $47 \pm 13$  yrs. Comorbid conditions were: DM 33%, CAD HTN 38%. The majority, 52% had ASA scores of 3.

Hernia Characteristics: Grade 3 hernias were 80%, the remainder were grade 2. The mean defect size was  $533 \text{ cm}^2 \pm 500$ .

Repair for prior open abdomens were 42%, recurrent hernias 19%, incisional 14%, incarcerated 10%, parastomal 5%, primary ventral 5%.

Retromuscular mesh placement was performed in all abdominal cases; (TAR 62%, Rives-Stopppa 33%, Paraesophageal 5%)

Surgical site occurrences were in 19%, (SSI 9%, seroma 9%). Overall hospital LOS was  $5 \pm 3$  days. Ileus occurred in 19%. There was one post-operative death due to a fatal arrhythmia. There were no hernia recurrences.

## **CONCLUSIONS**

Complex hernia repairs using a biosynthetic mesh were conducted in a small cohort of high-risk patients. These data demonstrate good outcomes with limited morbidity and low mortality. There were no recurrences documented.

# Department of Nursing

# Fall Prevention in Medical Surgical Unit. Physical Activity Awareness.

**Investigator/Presenter Team:** Ana Ceja RN, Virender Kaur RN, Ramona Lake RN, Samantha Manuel RN  
**Departmental Sponsor:** Pamela Gavin RN BSN; NRP Coordinator

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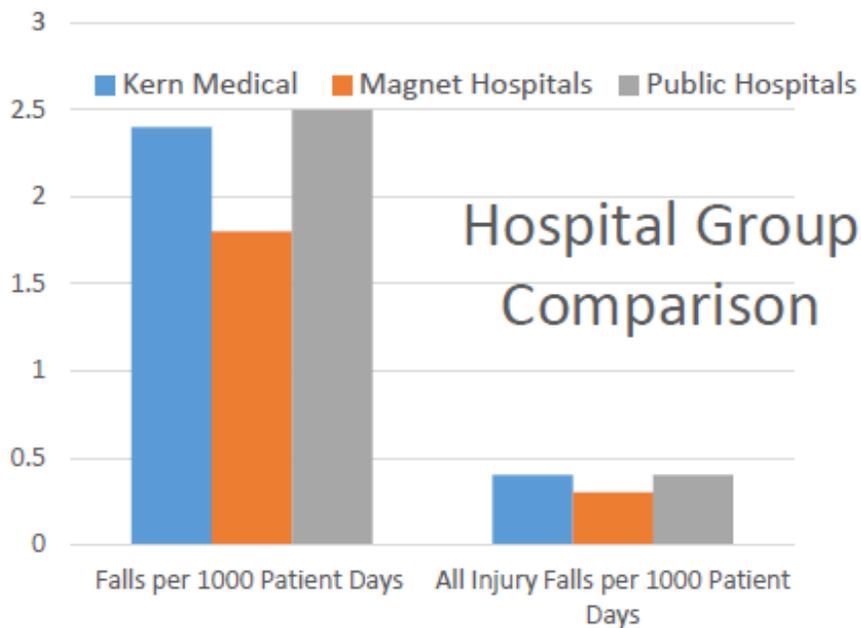
*<sup>1</sup> Cohort 1, Nurse Resident Program*

## INTRODUCTION

Most hospitals have implemented protocols and policies to prevent patients from falling. Kern Medical uses the John Hopkins Risk Assessment and implements practices based on the patients fall risk score. There are common interventions already in place to maintain patient safety, which include: bed alarms, color-coded socks, door signs, sitters and even physical restraints at times. An often overlook intervention are the benefits of patients receiving physical therapy.

## PURPOSE

We were interested in finding an association between patients fall risk and observing if a physical therapy consult was made or not. In search for a connection between patients fall risk and the benefits of physical therapy. A goal is to reach Magnet hospitals lower rate of falls and injury falls when compared to Kern Medical current rates and to overall public hospital rates. This is an awareness study to identify goals to decrease falls by increasing early mobilization and PT referrals.



**METHOD**

Data collected April/May 2017 in the Medical-Surgical and Telemetry units at Kern Medical for Physical Therapy Consult requests

**RESULTS**

Based on history of falls, diagnosis, medication, and orientation: 50% of the sample would qualify for PT consults, however, only 10% of those patients had physical therapy evaluations. Wake Forest Baptist Medical Center in North Carolina implemented a process resulting in greater communication between nursing and PT which led to routine mobility, balance and strengthening exercises and a 27% reduction in falls, and a 59% reduction in falls with injury (Health Research and Educational Trust, 2016).

**DISCUSSION**

At the time this study of utilization of Physical Therapy consultation for Med-Surg patients, was low; however, several suggestions to alter the referral pattern emerged: standardized valid and reliable screening tool utilized for every inpatient, nursing staff training for fall assessment and prevention, implementing fall risk during nursing handoff bedside communication, hourly rounding with scheduled/supervised toileting and continuous observation for cognitively impaired or high risk patients.

**CONCLUSIONS**

Almost all Med/Surg and Telemetry patients fall under moderate to severe fall risk. The group concluded that more study is needed to create evidence based protocol for early mobilization and physical therapy consults.

# Infant Driven Feeding in the Neonatal Intensive Care Unit

**Investigator/Presenter Team:** Maria Cabrera RN, Kristi Bean RN, Renae Chapa RN, Ashely Reyes RN  
**Departmental Sponsor:** Pamela Gavin RN BSN; NRP Coordinator

Maria Cabrera RN<sup>1</sup>, Kristi Bean RN<sup>1</sup>, Renae Chapa RN<sup>1</sup>, Ashely Reyes RN<sup>1</sup>

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## INTRODUCTION

Research shows that cue based feeding is beneficial in a variety of ways for the infant. In the search for evidence based nursing practice, team members observed that many NICU infants (<37 weeks of gestation) are volume fed. Volume based feeding has been shown to feed past the infant's interest and capability, producing stress cues such as coughing, pulling away, head turning, arching back, grimacing, drooling, tongue thrusting and O2 desaturation.

## PURPOSE

Our study seeks to assess current feeding practice accurately; longer term goals include improved feeding outcomes potentially resulting in fewer infants who manifesting feeding stress cues and improved weight gain. The long term goal is weight gain linked to decreased NICU length of stay.

## METHOD

The project is based on a unit survey, research and evidence –based practice opinion. Research was based on hospital policies, online publication and printed journal articles; all publications were current within the past 5 years.

## RESULTS

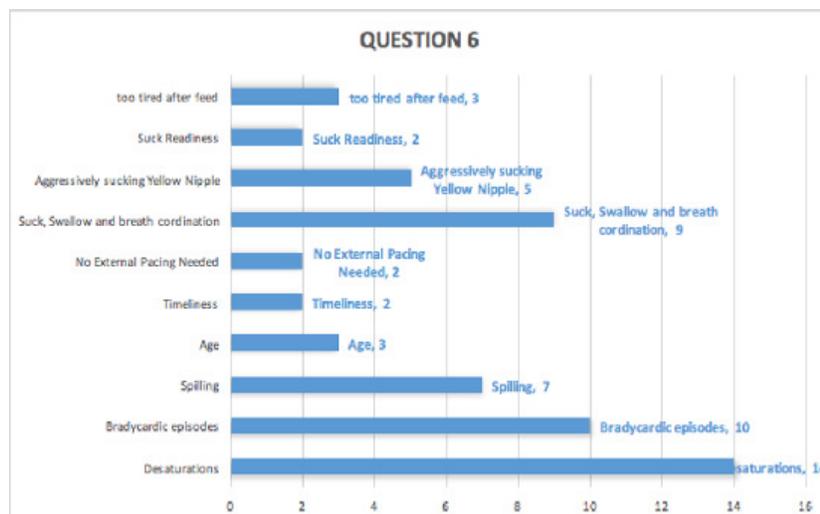
Survey questions 6 and 7 provided findings: Question 7 indicated 20% of babies were fed according to infant hunger cues. Question 6 indicated that in volume fed infants, 24 showed the least desired stress response, O2 desaturation.

## DISCUSSION

This project is the start of implementation of an infant-drive feeding program in NICU. Monitoring is ongoing to track growth/development and determination of readiness to feed. The constellation of infant stress cues shown in volume-fed NICU infants indicate that improved, evidence-based feeding practices can benefit infants and staff.

## CONCLUSIONS

Implementation of evidence based practice for NICU infant feedings can be accomplished through education and ongoing outcome monitoring to track infant growth, development with determination of readiness to feed and related weight monitoring included.



# Reducing hospital acquired pressure injury (HAPI) rates in the ICU and DOU

**Investigator/Presenter Team:** Mariah Cadena RN, Hanna Marroquin RN, Amanda Hanes RN, Emma Moser RN, Collin Norville RN

**Departmental Sponsor:** Pamela Gavin RN BSN; NRP Coordinator

*Mariah Cadena RN<sup>1</sup>, Hanna Marroquin RN<sup>1</sup>, Amanda Hanes RN<sup>1</sup>, Emma Moser RN<sup>1</sup>, Collin Norville RN<sup>1</sup>*

*<sup>1</sup> Cohort 2, Nurse Residency Program*

## INTRODUCTION

Hospital Acquired Pressure Injury (HAPI) prevalence is a nursing care-sensitive indicator demonstrating care impact on patients. Length of stay and morbidity events increase with HAPI occurrence, with 60,000 deaths/year identified in research literature.

## PURPOSE

To apply current evidence based practice research for HAPI prevention with a team approach (Cohort 2 team) to reduce and/or eliminate HAPI events in ICU/DOU for the month of December, 2017. A second purpose was to provide HAPI data to the Quality Assurance Department.

## METHOD

A structured approach was initiated:

- As a turn team, we came in once a week for four hours to turn every patient in the ICU and DOU units for one month
- We assessed every patient from head to toe. We assessed every bony prominence, device related potential HAPI's, and ensured the correct preventative measures were being maintained
- Skin barriers such as silicone borders and non-border foam dressings were placed over the coccyx, heels, elbows, as well as any existing skin tears to maintain skin integrity
- We ensured that each patient had a moisture barrier cream available when needed, such as a zinc oxide barrier cream
- Devices such as nasogastric tubes, oxygen saturation probes, and oxygen delivery devices were routinely repositioned with appropriate skin barriers applied to prevent skin breakdown
- Patients were repositioned with foam wedges, heads offloaded with pillows or head cradles as needed, and heels and elbows offloaded with pillows and heel offloading devices.
- We collaborated with the RN's and Patient Care Technicians (PCT's) on the importance of turning and offloading heels and elbows to prevent skin breakdown

## RESULTS

Our results showed that during the period of our intervention in December of 2017, we successfully decreased HAPI's in the ICU and DOU. Our data shows that in correlation with additional PCT's, the ICU and DOU was able to prevent HAPI's for the months of October, November and December of 2017. Our team also alerted staff nurses and the specialized wound nurses of at-risk patients and which patients showed early warning signs of skin breakdown.

## DISCUSSION

Based on our research and the results of our evidence-based practice residency project, we would recommend the use of a turn team in the ICU and DOU to help prevention HAPI's (Pallares Janiec, H., 2016). Our satisfactory results provide evidence that a turn team is essential to preventing HAPI's and reducing overall HAPI rates. Recent research shows that specialized critical care wound teams reduce HAPI rates and contribute to improved HAPI healing for critical care patients (Pallares Janiec, H., 2016).

## CONCLUSIONS

We would also recommend that the ICU and DOU continue the use of extra PCT's; they provided ICU/DOU RNs with ability to turn patients as needed, help with applying preventative devices, and more time to focus on assessing the patient's skin.

# Security and Safety in the Emergency Department

**Investigator/Presenter Team:** Bridget Martinez RN, Spencer Carter RN, Cassandra Fincher RN, Lacie Thuren RN, Melissa Coter, RN, Zach Burk RN, Dannon Akins RN, Erica Zebrowski RN, Natalie Espericueta RN, Paige Coffee RN, and Leslie Martinez RN

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<sup>1</sup> Cohort 1, Nurse Residency Program

## INTRODUCTION

The effects of violence in a hospital setting can not only directly harm patients and staff physically/emotionally but can impact the ability of the nursing staff to care safely for patients, which places nurses in a vulnerable position. The clinical staff's exposure to violence with perceived limited resources makes this a provocative topic for emergency nursing. Trauma centers can be at risk for violence in the workplace; the type of injuries received, such as gunshot wounds, stabbings and assaults combined with staff ability to handle visitors and intruders from those events increases staff exposure to violence. Bakersfield has a much higher crime rate than the national average (Neighborhood Scout, 2017).

## PURPOSE

To identify safety and security concerns in the Emergency Department through review of current literature and a multi-disciplinary survey of staff.

## METHOD

Staff were asked to complete an opinion survey. The survey items are not tested for validity and reliability:

- Staff members include part-time and full-time nurses, patient care technicians, security personnel, and administrative personnel
- The survey contained 5 opinion questions and the 6th option offered space for comments or suggestions.

## RESULTS

70 staff members participated; 66 returned completed surveys. 74% of survey takers have feared for patient safety, 63% of survey takers have been physically assaulted, 20% believe current security measures are adequate, 98% believe better training and equipment would benefit security and a sense of safety. 70% of survey takers have had security staff respond in a timely manner while 89% have had nursing staff respond in a timely manner.

## DISCUSSION

Perceptions of lack of security and safety in the emergency department at Kern Medical were confirmed by the results of the study with 74% of participants stating they have feared for patient safety and 98% stating greater training and/or security/safety measures should be taken to improve the current measures in place.

## CONCLUSIONS

Safety and security staff needs are best addressed through the chain of command, with the project team providing as much evidence of the need for improved safety measures as they can. Also for consideration is to increase ProAct training, increase security rounding, weapon screening by metal detectors, and increase reporting of safety concerns to leadership.

# Reducing nulliparous, term, singleton, vertex (NTSV) cesarean section rate with mobility

**Investigator/Presenter Team:** Jessica Melendez RN, Jessica Gutierrez RN, Lindsey Bogner RN, Dalayne Nettles RN

**Departmental Sponsor:** Pamela Gavin RN BSN, NRP Coordinator

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*<sup>1</sup> Cohort 2, Nurse Residency Program*

## INTRODUCTION

Kern Medical has the highest cesarean section rate in NTSV mothers in Bakersfield and California has the highest rate (23.9%) in the United States. Can nursing improve the mobility of NTSV mothers and decrease the C-section rate in a high risk obstetrical mothers.

## PURPOSE

Our C-Section rate is documented in California Department of Health statistical reports. This study seeks to utilize the team's previous observations that L&D patients are not being repositioned as frequently as to help with their labor progress.

## METHOD

A structured educational approach was initiated:

- Provide resource information that even with epidurals, repositioning laboring patients is possible, especially because research shows that early labor epidurals slow down progress due to immobility
- Abundant evidence shows that different positions help the NTSV population and the multiparous population progress in labor faster (Image 1)
- Demonstrate peanut ball labor positions (Image 2) and present benefits: shorter labor, shorter pushing phase and anatomically improved pelvic positions; widening of the pelvic outlet.
- Provide the California Maternal Quality Care Collaborative "pre-cesarean checklist" and their "failure to progress" checklist that need to be followed before diagnosing NTSV population as candidates for cesarean section

## RESULTS

Two findings demonstrated success.

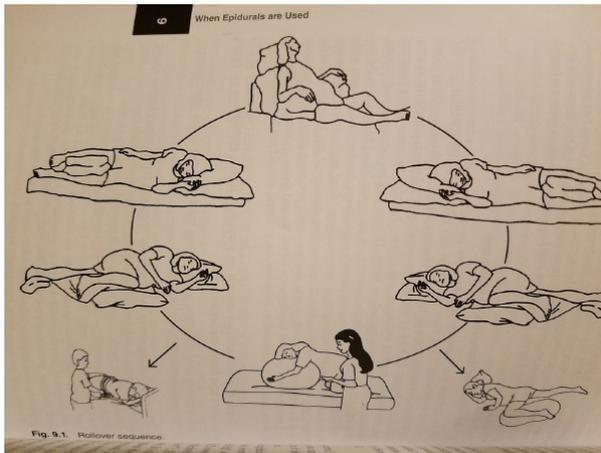
- Our staff nurses "strongly agreed" in post class surveys that the presentation helped them understand the importance of mobility and committed to reposition their patients every 30 minutes to every 1 hour as recommended by ACOG. (Graph)
- NTSV Cesarean Section rates have decreased since educating our Staff Nurses on mobility, and even more since implementing the use of the peanut balls. Delivery time for NTSV patients being induced have also been faster when using the peanut ball and repositioning or mobilizing than for those who do not.

## DISCUSSION

The team's goal is to reach a Kern Medical rate of 16.1% to 17.73% for NTSV C-sections; our NTSV C-section rate was 20.97% in December 2017 and 24.17% in January 2018. Modest change in December 2017 and bounce-back in January 2018 may have been due to the late implementation of pelvic expanding peanut balls (presently in use). However, in December we were below the National Goal of 23.9%.

## CONCLUSIONS

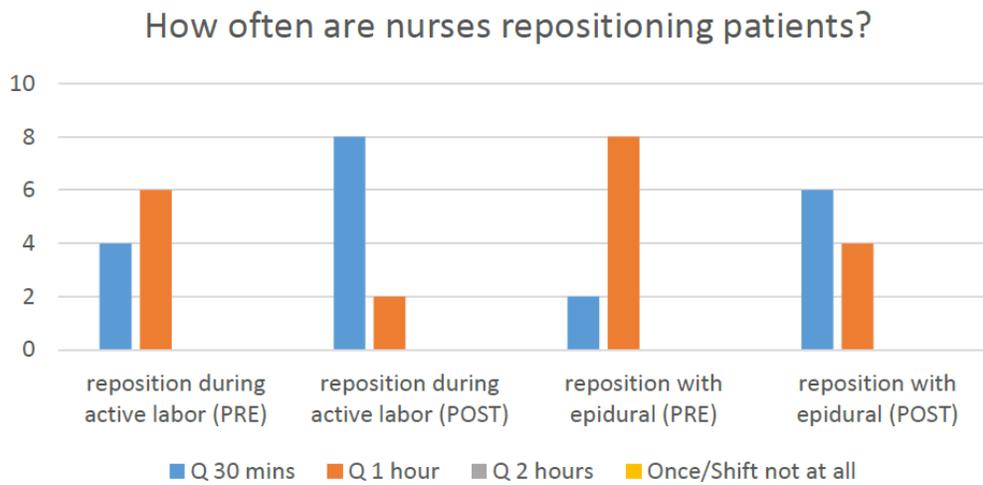
Monthly monitoring of NTSV cesarean section rates and nursing staff use of mobility to reposition mothers and peanut balls during labor may bring consistent reduction of NTSV C-section rates for Kern Medical.



**Image 1: Mobility Movements**



**Image 2: 19 positions during labor - peanut ball**



**Graph \_ Demonstrates that all NTSV patients were repositioned at least hourly in December 2017**

# Guest Presenter

# The Modified Early Warning System (MEWS) versus the 10 Signs of Vitality (10SOV): A comparison of two scoring tools to identify at-risk patients of clinical deterioration.

**Presenter:** Juan Arhancet DO  
**Principal Investigator:** Vicken Totten MD  
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## INTRODUCTION

Almost all hospitalized adults receive nursing care on the general medical-surgical floor during their stay. Observational studies have demonstrated that these admitted patients show physiologic signs of clinical deterioration as early as 24-hours prior to a serious clinical event that would require intervention. Deterioration is often presaged by abnormalities in various vital signs such as, respiratory rate (RR), oxygenation (O<sub>2</sub>), heart rate (HR), and mental status (MS), leading to increased morbidity and even mortality. In order to assist staff to notice the earliest signs of deterioration, scoring tools have been devised for acute-care hospitals as a way to detect which patients are at highest risk. The Modified Early Warning System (MEWS) is one such commonly used algorithm that is well studied and used by many hospitals. A different scoring tool, called the 10 Signs of Vitality (10SOV), is another. This study will utilize our hospital database to compare the two warning tools and to explore how each one performs at detecting early signs of deterioration.

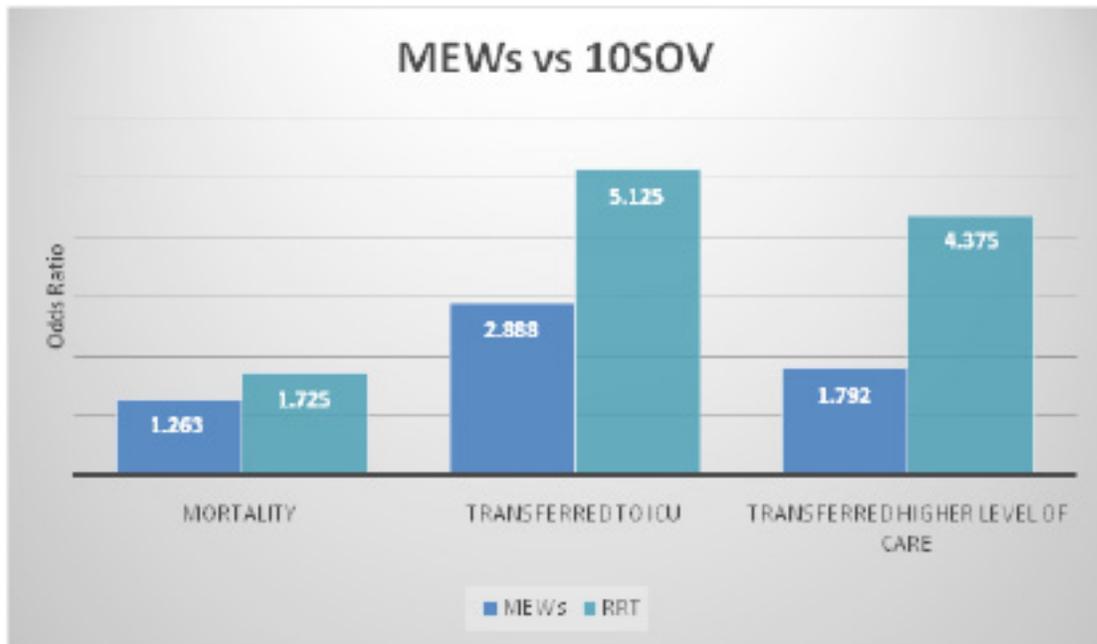
## PURPOSE

This process of early detection of patient deterioration followed by timely medical intervention is important for improving patient outcome. If one arm is afferent, the detection, and the other arm is the efferent, the RRT, this paper will focus on the efferent arm of the process in the hope of elucidating which scoring system is best at predicting at-risk patients.

## METHOD

An observational before and after comparison of outcomes in a 450 bed community hospital comparing the MEWS and the 10SOV. A total number of 1471 floor patients were observed between 2013 and 2016 and data for both MEWS and 10SOV were collected for each patient. A one-way ANOVA was conducted to determine whether adult patients (greater than 18 years old) admitted from the Emergency Department that received an RRT activation within 24 hours of admission to the medical/surgical floor, or intermediate care unit (ICCU), were transferred to the ICU within 24 hours of admission compared to those who did not receive an RRT within 24 hours.

## RESULTS:



## DISCUSSION

Our data shows that the 10SOV is superior in identifying patients who are greater risk of dying compared to MEWS. In addition, a patient who has met criteria for an RRT is more than five times likelier to be transferred to the ICU. This is a significant indication that the utilization of the 10SOV affects the trajectory of patients showing signs of clinical deterioration.

Meeting criteria for an RRT as outlined by the 10SOV is predictive of mortality, and anybody who meets two of the ten criteria has an increased 1.725 odds of patient death. With this increased risk of death, it is more appropriate for these at-risk patients to be transferred to the ICU.

## CONCLUSIONS

By utilizing readily available electronic data and easy to follow scoring systems for nursing, 10SOV is a better tool than MEWS at identifying at-risk patients. The use of the 10SOV to activate an RRT, or timely medical attention and intervention can be applied and scaled to other healthcare systems.

# Acknowledgements

## **Kern Medical**

**Russell V. Judd MS**  
*Chief Executive Officer*

**Glenn Goldis MD MMM**  
*Chief Medical Officer*

**Ruby Skinner MD FACS FCCP FCCM**  
*Chair, Institutional Review Board*

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