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# PERMIAN BASIN RESEARCH FORUM

April 20 & 21, 2017



TEXAS TECH UNIVERSITY  
HEALTH SCIENCES CENTER  
*at the Permian Basin*

# UTPB

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**PERMIAN BASIN**

# WELCOME

A portrait of Gary Ventolini, M.D., a middle-aged man with dark hair, wearing a black suit jacket, a red and white striped shirt, and a black tie. He is smiling slightly and looking towards the camera. The portrait is set against a brown background and is framed by a white hexagonal border.

Welcome to the 2017 Research Forum, this year for the first time being held jointly by Texas Tech University Health Sciences Center at the Permian Basin and the University of Texas of the Permian Basin. It is my honor to welcome you on behalf of those at TTUHSC at the Permian Basin to this multi-day research event. I hope that you enjoy the presentations and speakers and find the information presented enlightening and engaging.

Gary Ventolini, M.D., is the Regional Dean and Professor of Obstetrics and Gynecology at Texas Tech University Health Sciences Center at the Permian Basin. He came to the TTUHSC School of Medicine from the Wright State University Boonshoft School of Medicine, where he served as the Chair of Obstetrics and Gynecology for six years. Dr. Ventolini's education and experience are both vast and international. He received a Doctorate of Medicine & Surgery from the University of Padova in Padova, Italy. He also served on the faculty of Libre University in Cali, Columbia, before coming to the United States for post-graduate training in Family Medicine in Spartanburg, South Carolina and then joining the faculty of the University of Cincinnati School of Medicine. Dr. Ventolini is board certified in both Family Medicine and Obstetrics and Gynecology.



2017 marks the first year for the Research Days of Texas Tech University Health Sciences Center at the Permian Basin and the University of Texas of the Permian Basin to be combined into a 2-day Research Forum. The institutes of higher education in the Permian Basin do great work in research – from placental work and biofilm being done at TTUHSC at the Permian Basin to utilizing CARES data to develop a model of survival being done at UTPB.

At this Research Forum, the presentations are made by students and medical residents, these young researchers represent the future of science, the future of academia and the future of the institutes of higher education in the Permian Basin.

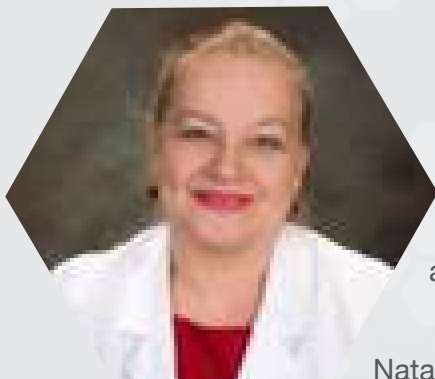
Thank you to all those attending this seminal event for academic and medical research in the Permian Basin. All those involved in the planning and execution of this event are excited for you to see the work of those at TTUHSC at the Permian Basin and UTPB and to perhaps learn something new.



**Michael S. Zavada, Ph.D.**  
University of Texas of the Permian Basin  
*Dean of the College of Arts and Sciences*

Michael S. Zavada, Ph.D. is Dean of the College of Arts and Sciences at the University of Texas of the Permian Basin. Dr. Zavada is also a professor in the Department of Biology at UTPB. He has been with UTPB since June 2015. He has a B.S. and M.S. from Arizona State University in Botany and Palynology. He also has a Ph.D. in Ecology-Evolutionary Biology from The University of Connecticut in Storrs in Connecticut. Dr. Zavada came to UTPB from Seton Hall University in Orange, New Jersey where he served as Dean of the College of Arts among other positions.

Dr. Zavada's research interests include Palynology, Paleoecology, Paleobotany, Plant Systematics, Ethnobotany, Origin and Evolution of Angiosperms and Ecology.



## Dr. Natalia Schlabritz-Lutsevich

### *Associate Regional Dean for Research*

Congratulations to all those presenting projects at the 2017 Research Forum. Your work and discoveries are so encouraging, well-earned and are greatly appreciated.

Natalia Schlabritz-Lutsevich, M.D., Ph.D., is the Regional Dean for Research and Associate Professor in the Department of Obstetrics and Gynecology at Texas Tech University Health Sciences Center at the Permian Basin. Dr. Schlabritz-Lutsevich's international medical training began at the State School of Medicine in Minsk, Belarus, where she graduated Summa Cum Laude with her M.D. She then completed a residency in Obstetrics and Gynecology and a fellowship in Laparoscopic Surgery and Reproductive Endocrinology (Germany, Professors: K. Semm and L. Mettler) and post-doctoral research training in Molecular Chronobiology (Germany, Dr. J. Olcese and Maternal-and-Fetal Medicine (USA, Professor G. Mari). Dr. Schlabritz obtained her Ph.D. in Reproductive Endocrinology in Minsk, Belarus. She was working at the University of Hamburg (Germany) before coming to the United States to join the perinatal research group of world-known expert Dr. P. Nathanielsz. Prior to coming to TTUHSC at the Permian Basin, Dr. Schlabritz-Lutsevich was an Assistant Professor at the University of Tennessee Health Science Center in Memphis. She is board certified in Obstetrics and Gynecology in Belarus and Germany.

## TTUHSC Research Department



**Top Row:** Gary Ventolini, M.D., Elihu Arzate, Maira Carrillo, Ph.D., Melissa Waggoner, Stacey Martinez, Natalia Schlabritz-Lutsevich, M.D., Ph.D.



Andrey Bednov, Ph.D.



Vanessa Montoya-Urbe

**Bottom Row:** Kushal Gandhi, Ph.D., Marcel Chuecos, Raju Suraparaju

# Texas Tech University Health Sciences Center at the Permian Basin *Research Advisory Committee*



Natalia Schlabritz-Lutsevich,  
M.D., Ph.D.  
Founding committee chair



Craig Spellman, Ph.D., D.O.



Erik Wilkinson, M.L.S.



Bobby Jain, M.D.



Bhargavi Kola, M.D.



Mary Mok, M.D.



Babatunde Jinadu, M.D.



Jennifer Hinojosa, R.N., C.C.R.C.



Maira Carrillo, Ph.D.



Lavi Oud, M.D.



Saju Joseph, M.D.



Vani Selvan, M.D.



Ramachandra Chemitiganti, M.D.



James Maher, M.D.



Kushal Gandhi, Ph.D.



Allen Zhong, MS4



Arpita Vyas, M.D.



Katherine Shreyder, M.D.

\* The members of the Research Advisory Committee will be serving as the judges for the TTUHSC at the Permian Basin poster presentations.



# Department Research Directors



## *Internal Medicine:*

Lavi Oud, M.D.

Dr. Lavi Oud is a Professor of Medicine, Chief of the Division of Pulmonary and Critical Care Medicine, Director of Research in Internal Medicine, and Director of Simulation-based training at Texas Tech University Health Sciences Center at the Permian Basin. Dr. Oud has been with TTUHSC at the Permian Basin since 1999.



## *Psychology:*

Shailesh "Bobby" Jain, M.D., MPH, ABDA

Dr. Bobby Jain is Associate Professor in the Department of Psychiatry, Division of Child & Adolescent Psychiatry at Texas Tech University Health Sciences Center at the Permian Basin. Dr. Jain has been with TTUHSC at the Permian Basin since 2009.



## *Surgery:*

Saju Joseph, M.D.

Dr. Saju Joseph is Vice Chairman and Associate Professor in the Department of Surgery at Texas Tech University Health Sciences Center at the Permian Basin. Dr. Joseph has been with TTUHSC at the Permian Basin since 2013.



## *Obstetrics and Gynecology:*

Natalia Schlabritz-Lutsevich, M.D., Ph.D.

Dr. Schlabritz-Lutsevich is the Regional Associate Dean of Research and Associate Professor in the Department of Obstetrics and Gynecology at Texas Tech University Health Sciences Center at the Permian Basin. Dr. Schlabritz-Lutsevich has been with TTUHSC at the Permian Basin since 2014.



## *Family and Community Medicine:*

Vani Selvan, M.D.

Dr. Selvan is Assistant Professor and Research Director in the Department of Family and Community Medicine at Texas Tech University Health Sciences Center at the Permian Basin. Dr. Selvan has been with TTUHSC at the Permian Basin since 2016.



## *Pediatrics:*

Arpita Vyas, M.D.

Dr. Arpita Vyas is Associate Professor in the Department of Pediatrics at Texas Tech University Health Sciences Center at the Permian Basin. Dr. Vyas has been with TTUHSC at the Permian Basin since 2016.



## **Rebecca Babcock, Ph.D.**

### *William and Ordelle Watts Professor*

Chair of Literature and Languages, University of Texas of the Permian Basin  
Director of Undergraduate Research

Dr. Rebecca Babcock is the William and Ordelle Watts Professor and the Chair of Literature and Languages at the University of Texas of the Permian Basin. She has a B.A. and an M.A. from the University of Massachusetts Boston and a Ph.D. from Indiana University of Pennsylvania in Indiana, Pennsylvania.



## **Aliethia Dean**

### *University of Texas of the Permian Basin*

Aliethia Dean is the assistant of Dr. Rebecca Babcock. A life-time resident of the Permian Basin, Miss Dean has an Associate's Degree from Midland College and is currently a double major in Sociology and English at the University of Texas of the Permian Basin. In the future, she plans to pursue a M.A. in technical communication and a Ph.D. in technical communication and rhetoric.



## **Melissa Waggoner**

### *Senior Editor*

Melissa Waggoner is the Senior Editor in the Department of Obstetrics and Gynecology at Texas Tech University Health Sciences Center at the Permian Basin. She has an M.S. in agricultural communications from Texas Tech University.



## **Elihu Arzate**

### *Administrative Business Assistant*

Elihu Arzate is an Administrative Business Assistant for the Research Department at Texas Tech University Health Sciences Center at the Permian Basin. He has an Associate's Applied Arts and Sciences Degree from Odessa College and is working towards a Bachelor's of Business Administration Degree in Marketing.



# SCHEDULE

**8:00 - 8:15**

Coffee & Pastries (*Posters and Pre-Recorded Presentation Viewing*)

**8:15 - 8:30**

Welcome – Associate Dean for Research - Natalia Schlabritz-Lutsevich, M.D., Ph.D.

## ORAL PRESENTATIONS

**8:30 - 8:45**

*"Biofilm and vaginal infections" –Short faculty presentation*

Gary Ventolini, M.D.

Regional Dean and Professor

Distinguished University Professor

Texas Tech University Health Sciences Center at the Permian Basin

**8:45 - 9:00**

*"Characterization of CB1 (Cannabinoid Receptor 1) Isoforms in Fetal and Maternal Tissues"*

Vanessa Montoya-Urbe, Kushal Gandhi, Ph.D., Stacy Martinez, M.S., Marcel

Chuecos, B.S., Maira Carrillo, Ph.D., Iram Rodriguez-Sanchez, M.D., Natalia

Schlubritz-Lutsevich

Department of Obstetrics and Gynecology

**9:00 - 9:15**

*"Increased Prevalence of Major Depressive Disorder in patients who get admitted with atrial fibrillation with worse outcomes"*

Zeeshan Mansuri, M.D., PGY-I, Kanwarjeet Brar, M.D., PGY-I, Hiren Patel, M.D.,

PGY-I, Mustafa Qureshi, M.D., PGY-I, Bobby Jain, M.D.

Department of Psychiatry

**9:15 - 9:30**

*"Impact of Influenza like illness on the Flu season in Ector County"*

Joshua Urteaga, M.D., PGY-II, Alana Waterford, M.D., Vani Selvan, M.D.

Department of Family and Community Medicine

**9:30 - 9:45**

*"IUD-induced liver injury"*

Hira Cheema, M.D., PGY-II, Yasir Ahmed, M.D., Ashutosh Gupta, M.D.

Department of Internal Medicine

**9:45 - 10:00**

*"Ultrasound evaluation of successful rescue cerclage"*

Gabrielle Rich, D.O., PGY-II, James Maher, M.D., Daniella Pino, M.D., PGY-I,

Lyndsay Ice Rodriguez, M.D., PGY-II, Randall Kelly, M.D., Natalia Schlubritz-Lutsevich, M.D., Ph.D.

Department of Obstetrics and Gynecology

10:00 - 10:15

*"Temporal trends in drug abuse in adults with acute myocardial infarction show worse outcomes"*

Hiren Patel, M.D., PGY-I, Zeeshan Mansuri, M.D., PGY-I, Kanwarjeet Brar, M.D., PGY-I,  
Mustafa Qureshi, M.D., PGY-I, Bobby Jain, M.D.

Department of Psychiatry

10:15 - 10:30

*"Is fatigue life-threatening?"*

Alfredo Iardino, M.D., PGY-I, J. Alejandro Preti, M.D., Viviane Bunin, M.D., Luan D. Truong

Department of Internal Medicine

BREAK

10:30 - 10:45 (Posters and Pre-Recorded Presentation Viewing)

10:45 - 11:00

*"How metformin fooled six physicians including two surgeons"*

Sajjad Ali, M.D., PGY-I, Nick Azarov, M.D.

Department of Internal Medicine

11:00 - 11:15

*"Gentian Violet: A Low-Cost Treatment for Onychomycosis?"*

Tamareal Ross, M.D., PGY-III, Tara Deaver, DPM, Vicky Bakhos Webb, M.D.,

Vani Selvan, M.D.

Department of Family and Community Medicine

11:15 - 11:30

*Faculty presentation*

Prakash Pai, Ph.D.

University of Texas of the Permian Basin

LUNCH

11:30 - 12:30 (Poster presentations after lunch)

KEYNOTE SPEAKER

12:30 - 1:30

**Keynote Address – "Brain plasticity in pain" Volker Neugebauer, M.D., Ph.D.**

(Auditorium)

Director, Center of Excellence for Translational Neuroscience and Therapeutics

Professor and Chair, Pharmacology and Neuroscience

Giles C. McCrary Endowed Chair in Addiction Medicine

Texas Tech University Health Sciences Center

1:45 - 2:00

*"Pregnancy-related maternal hepatic lipid accumulation, evaluated as hepato-renal ratio"*

Amanda Stuelpnagel, M.D., PGY-I, Daniella Pino, M.D., PGY-I, Marcel Chuecos,

B.S., Gary White, DVM, Raju Suraparaju, MBBS, Natalia Schlabritz-Lutsevich, M.D., Ph.D., James Maher, M.D.

Department of Obstetrics and Gynecology

2:00 - 2:15

*"Screening efficiency for Hepatitis C at Texas Tech Family Medicine clinic among Permian Basin population born 1945-1965"*

Nelson Garay, M.D., PGY-I, Suchal Karkera, M.D., PGY-I, Mocherla Bhavana, M.D.,  
Vani Selvan, M.D., Timothy Benton, M.D.  
Department of Family and Community Medicine

2:15 - 2:30

*"Trauma Care Education Protocol in Students"*

Nuvneet Khandelwal, MS3, Kanza Muzaffar, MS3, Alice Fa, MS3, Manisha Bhatia, Dinesh Vyas, M.D.  
Department of Surgery

2:30 - 2:45

*"Case Report and review: Clostridium difficile toxin reactive arthritis"*

Vicky Bakhos Webb, M.D., MBA, PGY-II, Linda Esteban, M.D., PGY-III, Nimat Alam, M.D.  
Department of Family and Community Medicine

2:45 - 3:00

*"DA Henderson and the World's largest quality improvement project" –Short Faculty Presentation*

Arun Mathews, M.D.

Inpatient Chief Medical Officer

Medical Center Hospital

BREAK

3:00 - 3:15 (Posters and Pre-Recorded Presentation Viewing)

3:15 - 3:30

*"Finding a rouge parasite in the wild west: Diagnosing a tropical disease in the Permian Basin"*

Hanna Kodeih, D.O., PGY-II, Gabrielle Rich, D.O., PGY-II, David Moore, M.D., Satish Mocherla, M.D.  
Department of Obstetrics and Gynecology

3:30 - 3:45

*"The effects of clinician age and gender on breastfeeding education"*

Jarrod Tunnell, MS3, Megan Mikesell, MS3, Veena Agusala, Bhargavi Kola, M.D.  
Department of Pediatrics

3:45 - 4:00

*"Therapeutic Hypothermia in management of cerebral malaria"*

AbdAllah Gad, M.D., PGY-I  
Department of Internal Medicine

4:00 - 4:15

*"Coral reef research at Midland College"*

Thomas Ready, Ph.D.

Assistant Professor of Chemistry

Midland College

4:15 - 4:30

Posters and Pre-Recorded Presentations – Upstairs Administration Building Hallway

4:15

AWARD PRESENTATIONS



**Volker Neugebauer, M.D., Ph.D.**

*Director, Center of Excellence for Translational Neuroscience and Therapeutics*

# KEYNOTE SPEAKER



Dr. Volker Neugebauer is the Director of the Center for Translational Neuroscience and Therapeutics, Professor and Chair of the Pharmacology and Neuroscience Department and the Giles C. McCrary Endowed Chair in Addiction Medicine at Texas Tech University Health Sciences Center. Dr. Neugebauer has an M.D. from the University of Würzburg, Germany and a Ph.D. (Medicine) from the University of Würzburg, Germany.

Dr. Neugebauer's research focuses on better understanding of brain plasticity and homeostatic imbalance in clinically relevant disorders, specifically on the systems and cellular neurobiology of the emotional-effective component of pain. He pioneered the field of pain-related neuroplasticity in the amygdala.

# JUDGES

## Oral Presentations



**Ramachandra Chemitiganti, M.D.**, chair of oral presentations  
*Department of Internal Medicine*

Dr. Chemitiganti is the Regional Chairman and an Associate Professor in the Department of Internal Medicine at Texas Tech University Health Sciences Center at the Permian Basin. He received his M.D. from Gandhi Medical College in Hyderabad, AP, India.



**James Maher, M.D.**  
*Department of Obstetrics and Gynecology*

Dr. Maher is an Associate Professor in the Department of Obstetrics and Gynecology at Texas Tech University Health Sciences Center at the Permian Basin and the Director of Maternal-Fetal Medicine at Medical Center Hospital. He received his M.D. at Medical Center Hospital of Georgia in Augusta, GA.



**Don Allen, Ph.D.**  
*University of Texas of the Permian Basin*

Dr. Donald M. Allen is the Ashbel Smith Professor of Biology at University of Texas of the Permian Basin. Dr. Allen is a member of the Association for Research in Vision and Ophthalmology. He has been published in Vision Research, Visual Neuroscience, and Experimental Eye Research. Dr. Allen was awarded the 2012 Regent's Teaching Award. His research interests focus on the field of retinal cell biology.



**Eneko Larumbe, Ph.D.**  
*Clinical Research Institute*

Dr. Eneko Larumbe is a biostatistician with the Texas Tech University Health Sciences Center Clinical Research Institute, in his position he works in the planning, scheduling, and/or supervising of research projects and the interpretation of results for publication. He has a Ph.D. from UNED.



**Thomas Ready, Ph.D.**  
*Midland College*

Dr. Thomas Ready is Assistant Professor of Chemistry at Midland College. Dr. Ready has a Ph.D. in Inorganic Chemistry from University of Massachusetts at Amherst and a B.S. in Chemistry from the University of Texas El Paso. He has conducted research on catalytic synthesis of polyolefins, functionalized silicone coatings, and anti-fouling marine coatings. His current research focuses on synthesis of new antibiotic molecules, the development of chemical anion sensors, and marine chemistry associated with coral reefs.

# JUDGES

## *Pre-Recorded Presentations*



**Bhargavi Kola, M.D., chair of pre-recorded presentations**  
*Department of Pediatrics*

Dr. Kola is the Vice Chair and an Assistant Professor in the Department of Pediatrics at Texas Tech University Health Sciences Center at the Permian Basin. She studied medicine at Gandhi Medical College in Hyderabad, India.



**Jamie Hughes, Ph.D.**  
*University of Texas of the Permian Basin*

Dr. Hughes is an Assistant Professor of Psychology at the University of Texas of the Permian Basin. She has a Ph.D. from New Mexico State University, an M.S. from Illinois State University and a B.S. from Michigan State University.

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# PERMIAN BASIN RESEARCH FORUM ORAL PRESENTATIONS





## How metformin fooled six physicians including two surgeons

Presented by: Sajjad Ali, M.D., PGY-I; [sajjad.ali@ttuhsc.edu](mailto:sajjad.ali@ttuhsc.edu)

Faculty Advisor: Nick Azarov, M.D.

Department of Internal Medicine

**Introduction:** Metformin-associated lactic acidosis (MALA) is a rare adverse reaction and can mimic ischemic colitis. Patients with MALA most often report malaise, somnolence, nausea and abdominal pain. In severe cases, MALA may lead to hypotension, hypothermia, bradyarrhythmias or even death. The incidence of MALA is about 5.1 cases per 100,000 patient years. Despite this, MALA carries a disproportionately high per care mortality ranging from 25% to 50%.

**Case:** A 67-year-old Hispanic man presented to the Emergency Department with bloody diarrhea and diffuse abdominal pain for 5 days and confusion for one day. The patient's medical history was significant for diabetes mellitus type 2, hypertension, ischemic heart disease and hypothyroidism. The patient and family were unsure of his home medication. On physical examination, the patient was confused with a Glasgow Coma Scale score of 12, temperature of 96.5 F, blood pressure of 70/38 mmHg, pulse of 63/min, respiratory rate of 38/min and peripheral oxygen saturation 100% on 2L oxygen. The patient was cold and clammy, was mottled from his feet to mid abdomen. The patient had frank abdominal guarding with rebound tenderness and absent bowel sounds. Laboratory findings showed high anion gap metabolic acidosis of 30 mmol/L; pH 6.87 on arterial blood gas, serum potassium 7.5mmol/L; creatinine 13 mg/dl; lactate 9.01 mmol/l; white blood cell count 23.8 k/u/l; bands 4; and blood glucose 137 mg/dl. ICU and surgical teams were consulted for suspected acute ischemic abdomen. Initial resuscitation strategy included large volume crystalloids with pressors, empiric broad-spectrum antibiotics, and hyperkalemia treatment. The patient was emergently taken to the operating room and underwent exploratory laparotomy that was surprisingly negative for gut ischemia or any intra-abdominal pathology. At that time, alternative diagnosis of MALA was considered and due to severe acidemia and hyperkalemia, emergent hemodialysis initiated. Patient's blood pressure improved significantly and vasopressors were discontinued. Serum lactate level improved from 9.01 to 1.9 mmol/L after 24 hours of admission. Creatinine improved to near normal level upon discharge on hospital day nine. Hemodialysis was stopped. After 24 hours of admission, the patient's daughter brought a list of home medications that included metformin, glipizide, lisinopril, carvedilol, simvastatin, and levothyroxine.

**Discussion:** Our case report emphasizes the importance of early recognition and treatment of MALA. To our knowledge, this is the third published case of MALA presenting with suspected gut ischemia that led to exploratory laparotomy. Health care providers who are unfamiliar with the association of metformin treatment and MALA may not recognize the idiosyncratic and often nonspecific characteristics of this emergency condition. Recognition is critical, as symptoms can mimic numerous other clinical conditions, including acute abdomen. Timely hemodialysis forms the mainstay of MALA treatment.

## **Case Report and Review: Clostridium difficile toxin reactive arthritis**

**Presented by: Vicky Bakhos Webb, M.D., MBA, PGY-II; Vicky.bakhos@ttuhsc.edu**

**Co-authors: Linda Esteban, M.D., PGY-III, Nimat Alam, M.D.**

**Faculty Advisor: Nimat Alam, M.D.**

### **Department of Family and Community Medicine**

**Introduction:** Reactive arthritis secondary to *Clostridium difficile* toxin is usually not instantly recognizable due to the rare number of cases reported in literature. Reactive arthritis is most commonly attributed to genitourinary and enteric pathogens such as *Chlamydia*, *Salmonella*, *Shigella*, *Campylobacter*, and *Yersinia*.

**Case:** The patient, an 85-year-old Caucasian cachectic female with PMH of recurrent *C. difficile*, Microscopic Lymphocytic Colitis, HTN, COPD, and depression was admitted from a transferring facility due recurrent *C. difficile* infections for the past 3 months requiring IV metronidazole as well as by mouth Vancomycin. She was started on IV fluids, Vancomycin p.o 500 mg q.i.d , and Metronidazole 500 mg IV q.8.hrs and eventually Fidaxomicin (Defid) per GI recommendations. Six days after admission, patient started complaining of severe chest pain that radiated up to her left shoulder as well as a rash and swelling of the left shoulder. Cardiac workup was negative, left upper extremity X-rays and MRIs showed severe osteoarthritis, and fluid collection in the potential space of the glenohumeral joint and surrounding bursa suspicious of septic arthritis as well myositis and fluid edema around the intramuscular fascial plains. WBC on CBC that day was,13.1, CRP high sensitivity 184.2, quantitative CRP 19.1, and ESR18. Bedside aspiration of the left shoulder joint was also done that revealed turbid, yellow fluid with normal viscosity, with RBC of 6500, WBC of 4700, neutrophils of 92, and lymphocytes of 8; no crystals; suggestive of inflammation, not necessarily infectious.

**Results:** Patient was started on Naproxen 500 mg Q12hrs, Vancomycin dosed by our pharmacy and Zosyn 3.376 gm 8hrs.

CRP and CBC were noted to be trending down; CBC back to normal and CRP to 4.1, and synovial fluid cultures were followed that eventually showed no growth x 5days.

Patient's symptoms resolved after 48 hours of NSAID use.

**Conclusion/Significance:** It was concluded that our patient most likely suffered from inflammatory arthritis most likely secondary to *C. difficile* toxin Reactive Oligoarthritis. In our case, the patient had recurrent *C. difficile* diarrhea for over three months before signs and symptoms of sudden arthritic pain immersed. She had asymmetric oligoarthritis of her large joint (left shoulder) lasting about 48hrs after symptoms first appeared and nonsteroidal anti-inflammatory agent was started.

*Clostridium difficile* is most commonly associated with colonic manifestation. It may, however, also cause diseases in a variety of other organ systems included and not limited to osteomyelitis, cellulitis, soft tissue infections, appendicitis and reactive arthritis.

It is vital to recognize and correlate between colonic symptoms secondary to *C. difficile* colitis preceding complaints of joint pain and swelling.

## **IUD-induced liver injury**

**Presented by: Hira Cheema, M.D., PGY-II**

**Faculty Advisors: Yasir Ahmed, M.D., Ashutosh Gupta, M.D.**

**Department of Internal Medicine**

**Case:** We report the case of a 24-year-old female with medical history significant for hypertension and HSP as a child with no residual illness. Patient presented to the ER in Dec 2016 with complaints of epigastric pain radiating to right hypochondrium since 1 week. Also reported nausea and vomiting for the last 3-4 days. Patient denied consumption of alcohol, tobacco or recreational drugs. She did not report any recent travel or sick contacts and had not received any blood transfusions. No family history of liver disease. She had no rash or pruritis. She initially presented to an outside ER where and labs showed elevated liver enzymes. Labs at our ER showed HGB 12.8, HCT 38.3, RDW 17.1, platelets 331,000, T. bilirubin 11.2, direct bilirubin 7.9, AST 1712, ALT 13243, ALK phos 166, PT 14.5, INR 1.18, APTT 29.3 and serum ammonia 50. CT scan abdomen showed gall stones with possible cholecystitis.

Patient recently gave birth to a healthy baby girl in Sept 2016 with no postpartum complications. Her only medications during pregnancy were labetalol 200 mg PO bid and multivitamins. Labetalol was switched to metoprolol post-delivery. All lab work during pregnancy remained normal. A levonorgestrel intrauterine device was placed one month prior to ER presentation. On physical exam she was afebrile and vitals were normal. She had marked jaundice.

**Intervention:** We removed the IUD. Detailed diagnostic workup including hepatitis A, B, C, E, CMV, EBV, herpes simplex and HIV were normal. Acetaminophen level was normal. Autoimmune panel including ceruloplasmin, hemochromatosis mutations H63D, C282Y, S65C, F-actin (smooth muscle) AB, AMA, alpha 1 anti-trypsin, ANA, liver kidney microsome 1 AB, and ferritin level were normal.

MRCP showed contracted gall bladder with pericholecystic fluid and edematous change. Liver biopsy showed panacinar hepatitis with mild hepatocellular cholestasis. As outpatient patient's liver function tests started trending down within ten days after discharge. In a period of 2 months her LFTs returned to baseline.

**Conclusion:** In our case, the diagnosis of intrauterine device induced liver injury is based on patient's presentation following IUD placement, the resolution of signs and symptoms after IUD removal, liver biopsy findings and exclusion of other etiologies for acute liver injury. The pathogenesis remains unclear. Estrogens have been reported to cause intrahepatic cholestasis in pregnancy, OCP use or as hormone replacement therapy. There are previously reported cases on oral contraceptive induced liver injury, i.e. both estrogen and progesterone. We are reporting for the first time such association with IUD.

## Therapeutic Hypothermia in management of cerebral malaria

Presented by: AbdAllah Gad, M.D., PGY-I; Abdallah.gad@ttuhsc.edu

Co-authors: Sajjad Ali, M.D., PGY-I, Ramya Pabbathi, M.D., PGY-II

Faculty Advisors: Nikolay Azarov, M.D., Yasir Ahmed, M.D.

Department of Internal Medicine

**Introduction:** Malaria is a serious parasitic disease affecting over 200 million people worldwide and accounting for about half a million deaths every year. Malarial infections are uncommon in the United States. According to the CDC, about 1,500-2,000 malarial cases have been reported annually inside the US, almost all of them among recent travelers coming from endemic countries.

Cerebral malaria (CM) is a severe form of malarial infection usually caused by *Plasmodium falciparum*. It mostly presents in children, pregnant women or adults with depressed immunity. Despite proper management, mortality rates are still very high ranging between 15 and 25%. Poor outcomes are especially common among patients who present late, those who develop signs of cerebral edema and/or immunocompromised individuals. We present a case of a young adult who developed a severe form of CM and was successfully treated despite poor initial prognosis.

**Case:** A 32-year-old Caucasian male presented to the hospital with a 3-day history of high-grade fever, diarrhea and altered mental status. He had recently returned from Uganda where he used to work for the past 6 years in white water rafting. The patient had a history of two prior malarial episodes, which were properly treated and he was not on any antimalarial prophylaxis thereafter. Other medical history included prior schistosomiasis, ADHD and depression. Upon arrival to the emergency department (ER), the patient was found confused with a GCS score of 13/15 and was vitally stable. While in the ER, he suddenly developed a seizure episode, after which he became minimally responsive and was subsequently intubated for airway protection.

On physical examination, he was sedated, intubated and mechanically ventilated. Vital signs showed a temperature of 97.9 F, blood pressure of 110/69 mmHg, pulse of 111/min, respiratory rate of 22/min and peripheral oxygen saturation 100% on 28% FiO<sub>2</sub>. Pupils were equal and reactive. Other physical exam findings were unremarkable. Lab work was significant for WBC count of 8.6, hemoglobin of 9.6 and platelet count of 30. Peripheral blood smear was positive for malarial rings with 9.8% parasitemia. CT scan showed severe cerebral edema with early tonsillar herniation.

The patient was admitted to the ICU where he was placed on therapeutic hypothermia (32-34°C) along with hypertonic saline, mannitol and hyperventilation to halt the progression of cerebral edema. He received a 3-day course of Quinidine and a 7-day course of Doxycycline, which reduced his parasitemia levels from 9.8% initially to 1.3% 2 days later and undetectable by day 8. Repeat CT scan showed resolution of the brain edema on day 3. The patient was then re-warmed and subsequently extubated. He had no neurologic deficits, tolerated diet and was transferred to the medical floor where he gradually recuperated.

**Discussion:** Our case is an unusual presentation of a young immunocompetent adult who developed a severe form of CM despite prior malarial exposure. The patho-physiology of CM and associated brain edema is still not well understood. Many researchers suggested that the sequestration of infected RBCs inside small cerebral blood vessels would cause its occlusion resulting in brain ischemia. Parasitic release was thought to cause endothelial cell dysfunction and subsequent release of TNF- $\alpha$  and nitric oxide, which were believed to be the culprit behind the development of brain edema.

Therapeutic hypothermia (TH) has been well known to improve neurological outcome and decrease mortality in post cardiac arrest patients. [7,8] Recent evidence also supports the neuro-protective effect of TH for traumatic brain injury and acute stroke patients.

The role of TH in management of CM has not yet been documented. A recent in vitro trial suggested that *Plasmodium falciparum* growth was inhibited by medical hypothermia. This was in concordance with other in vitro studies suggesting similar effects with lower temperatures. During that trial, hypothermia had no negative impact on the activity of the anti-malarial drugs, namely: Chloroquine, mefloquine and dihydroartemisinin.

Inducing hypothermia in our patient, along with early aggressive management of his brain edema, proved to be effective, giving the antimalarial drugs more time to induce their effect. We believe a larger scale randomized control trial would yield higher evidence on the beneficial effect of TH as an adjunct measure in the management of patients with cerebral malaria.



**Screening efficiency for Hepatitis C at Texas Tech Family Medicine Clinic among Permian Basin population born 1945-1965**

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**Department of Family and Community Medicine**

**Introduction:** According to the Center for Disease Control (CDC) and the U.S. Preventive Services Task Force (USPSTF) Hepatitis C virus (HCV) infection was identified as one of the main cause for chronic liver diseases (CLD), end-stage liver disease (ESLD) leading to liver transplantation and hepatocellular carcinoma (HCC). Undiagnosed, untreated and late diagnosis of CLD, ESLD and HCC secondary to HCV increased the mortality and morbidity and financial burden to health care. In 2010 it was identified that hospital admissions with ESLD and HCC was in rise and attributed to the baby boomers (born in 1945 to 1965). In 2012-2013 CDC and USPSTF implemented HCV screening guideline to diagnose HCV early. A simple blood test: HCV antibody and HCV RNA quantitative to all population born in 1945 to 1965 as once in their life time would screen for HCV. As many were not being screened the implications secondary to HCV were emerging concern for the US Health Department, particularly Texas. Our project was designed to identify if our providers of Texas Tech Family and Community Medicine (TTFM) clinics at Permian basin were adhering to the HCV screening guidelines among the population born in 1945-1965 to diagnose HCV early.

**Methods:** Our study is a cross-sectional chart review with Institutional Review Board (IRB) approval (IRB #: L17-055). We identify the population born 1945-1965 from our Electronic Medical Records (EMR) who visited our clinic from the period of January 1<sup>st</sup> 2015 to December 31<sup>st</sup> 2015. Data on their demographics (age, gender, ethnicity), date of birth, number of clinic visits during this period, their HCV screening status by HCV antibody and HCV RNA quantitative, co-infected with HIV and Hep B, high risk behaviors like history of alcohol, intravenous drug, tattoos, blood transfusions, male sex with male, were collected. The data will be analyzed using SPSS to identify our providers screening efficiency for hepatitis c patients born in 1945 to 1965.

**Results:** Data collection and analysis is in progress and will be completed once data collection is completed. A total of 1490 patients were identified to be born in 1945 to 1965 from our EMR who visited our clinic from the period of January 1<sup>st</sup> 2015 to December 31<sup>st</sup> 2015. We expect that less than 20% population born in 1945 to 1965 to be screened for HCV.

**Conclusions:** Screening was the most common way for primary care providers to identify the HCV in this risk population born in 1945 to 1965. Though screening was the most common way to diagnose HCV early, ignorance of this population about the screening guideline, providers documentation deficiency about the HCV screening, physicians overlooking the patient's date of birth, Lack of expertise in diagnosis and management of HCV among the primary care providers are barriers for early diagnosis and proper HCV disease management. We plan to educate our providers and formulate an effective plan to increase the HCV screening in population born in 1945 to 1965.

## **Is fatigue life-threatening?**

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Atypical hemolytic uremic syndrome is a life-threatening disease affecting both pediatric and adult patients with a slight preponderance in younger patients and adult females. Uncontrolled activation of the alternative pathway of the complement system generates excess membrane attack complex causing renal endothelial damage and resultant microangiopathic hemolytic anemia. Our patient is a 42-year-old previously healthy Hispanic female long distance runner referred for evaluation of decreased stamina. At the time of presentation exam showed petechiae, subconjunctival hemorrhage, diminished breath sounds at the right base, abdominal distention, grade 2 bilateral ankle edema, and a few ecchymotic lesions in both upper extremities. Workup revealed anemia, thrombocytopenia, hypoalbuminemia, 24-hour urine protein of 1.4 Gr/24 hr. Peripheral blood smears showed polychromasia, anisocytosis, and ovalocytes, but no schistocytes or fragmented red blood cells. Normal LDH. CT scan of the abdomen showed diffuse lymphadenopathy and hepatosplenomegaly, and PET/CT scan revealed mildly enlarged lymph nodes in the axillary, retroperitoneal, pelvic regions, and spleen. Bone marrow biopsy demonstrated normal trilineage hematopoiesis, no evidence of B or T cell clonality, and no hemophagocytosis. Ferritin, elevated IL-2 receptor, and normal complement levels. Based on a working diagnosis of macrophage activation syndrome the patient was started on outpatient Prednisone at a dose of 1 mg/kg/day. Due to increased edema and worsened cytopenia's; the patient was admitted to the hospital for high-dose steroids, IVIG, and Rituximab. Proteinuria increased to nephrotic range (4.2 gr/24hr). Renal biopsy revealed features of thrombotic microangiopathy limited to the glomerular capillaries. ADAMTS13 was negative and a diagnosis of aHUS was made. Eculizumab was started at dose of 900 mg/week followed by maintenance doses of 1200 mg every other week. The patient continued Eculizumab, and one year later had normal blood counts and no clinical or laboratory signs of aHUS. Whole exome sequencing demonstrated mutation in SPTA 1 which has been associated with elliptocytosis 2, spherocytosis 3, and hereditary pyropoikilocytosis but has not been described in patient with aHUS.

## Trauma Care Education Protocol in Students

**Presented by:** Nuvneet Khandelwal, MS3; [nuvneet.khnadelwal@ttuhsc.edu](mailto:nuvneet.khnadelwal@ttuhsc.edu)

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**Faculty Advisor:** Dinesh Vyas, M.D.

**Department of Surgery**

**Background:** Trauma is a significant cause for morbidity worldwide in the pre-hospital period. Multiple studies show that prompt, well-executed pre-hospital care by first responders can lead to a reduction in mortality. We focused on developing confidence and competency of trauma management skills through a multi-tier innovative First Responder Trauma and Emergency Care Program to a group of future trainers and trainees in a fast growing economy with limited resources. This is a unique program taught in native, lay-person language that aims to improve patient care during critical pre-hospital time to reduce patient mortality through implementation of a four-tiered trauma education program: Massive Open Online Course (MOOC) Trauma Training, Acute Trauma Training (ATT), Broad Trauma Training (BTT), and Cardiac and Trauma Training (CTT). This program has been successfully studied to be efficacious in competency and confidence in multiple critical care skills. Basic trauma management skills were specifically targeted to assess confidence among individuals who could equip growing regions with the ability to address critical care needs in the pre-hospital period.

**Objective:** The purpose of this study is to evaluate confidence in management of critical care among trainers and trainees in a limited resource setting. This educational session was also intended to test proof of concept that this type of training would be successful in populations of school teachers and students.

**Methods:** The current study was conducted in New Delhi, India as part of this four-tiered trauma education program in 47 individuals. Confidence in 10 essential trauma care skills were assessed in pre and post training using a non-mandatory anonymous survey questionnaire. Comparison of pre- and post-training assessments of confidence were analyzed using Wilcoxon matched-pairs signed-ranks test.

**Results:** A Wilcoxon Signed-Ranks Test indicated that post-training confidence was statistically significantly higher than pre-training confidence: maintaining airway ( $Z = -4.77$ ,  $P < 0.001$ ), hemorrhage ( $Z = -4.97$ ,  $P < 0.001$ ), fractures ( $Z = -4.69$ ,  $P < 0.001$ ), cervical spine injury ( $Z = -5.01$ ,  $P < 0.001$ ), chest injury ( $Z = -4.73$ ,  $P < 0.001$ ), IV line placement ( $Z = -5.04$ ,  $P < 0.001$ ), extrication ( $Z = -3.65$ ,  $P < 0.001$ ), scene assessment ( $Z = -4.42$ ,  $P < 0.001$ ), triage ( $Z = -3.46$ ,  $P < 0.001$ ), and communication ( $Z = -3.73$ ,  $P < 0.001$ ). The highest increases in competence were observed in chest injury and IV line management, with lowest increases in triage and communicating.

**Conclusions:** Targeting teachers and students specifically creates an integrated learning environment within the community. Future program expansion using this “trainees-to-trainers” model offers an exponential growth model. Knowledgeable members of the lay population appropriately triage and manage traumatic healthcare incidents can improve morbidity and mortality in high-acuity, low-access-to-care, pre-hospital situations in both rural US and abroad.

## **Finding a Rouge Parasite in the Wild West: Diagnosing a Tropical Disease in the Permian Basin**

**Presented by: Hanna Kodeih, D.O., PGY-II; [hanna.kodeih@ttuhsc.edu](mailto:hanna.kodeih@ttuhsc.edu)**

**Co-authors: Gabrielle Rich, D.O., PGY-II, David Moore, M.D., Satish Mocherla, M.D.**

**Faculty Advisor: David Moore, M.D.**

**Department of Obstetrics and Gynecology**

Tropical diseases are a rare occurrence in the Permian Basin. We present a case of a pregnant female traveling from Nigeria with a severe malarial illness. This case reviews her presentation, diagnoses, treatment, and outcomes. This case reviews how to manage exotic and uncommon diseases using the expertise of the CDC. Multidisciplinary care is also needed for pregnant women with severe illnesses with good communication leading to improved patient care.



**Increased Prevalence of Major Depressive Disorder in patients who get admitted with  
Atrial Fibrillation with worse outcomes**

**Presented by: Zeeshan Mansuri, M.D., PGY-I; Zeeshan.mansuri@ttushc.edu**

**Co-authors: Kanwarjeet Brar, M.D., PGY-I, Hiren Patel, M.D., PGY-I, Mustafa Qureshi, M.D.,  
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**Faculty Advisor: Bobby Jain, M.D.**

**Department of Psychiatry**

**Objective:** To determine the trends and impact on outcomes of Atrial Fibrillation (AF) in patients with preexisting Major Depressive Disorder (MDD).

**Background:** While postAF MDD has been extensively studied in the past, contemporary studies including temporal trends on the impact of preAF MDD on AF and postAF outcomes are largely lacking.

**Methods:** We used the Nationwide Inpatient Sample (NIS) from the Healthcare Cost and Utilization Project (HCUP) from years 2002-2012. We identified AF and MDD as a primary and secondary diagnosis respectively using validated International Classification of Diseases, 9th Revision, and Clinical Modification (ICD9CM) codes. We used the CochraneArmitage trend test and multivariate regression to generate adjusted odds ratios (aOR).

**Results:** We analyzed a total of 3,887,827 AF hospital admissions from years 2002-2012 of which 6.78% had MDD. Proportion of hospitalizations with MDD increased from 4.93% in 2002 to 14.19% in 2012 ( $p$  trend < 0.001). Utilization of Atrial Cardioversion was lower in patients with MDD (34.37% vs. 40.52%,  $p$  < 0.001). In hospital mortality was significantly lower in patients with MDD (aOR 0.749; 95%CI 0.664-0.846;  $p$  < 0.001) but discharge to specialty care was higher (aOR 1.695; 95%CI 1.650-1.741;  $p$  < 0.001). In addition, median length of hospitalization (2.5 vs. 2.13 days;  $p$  < 0.001) and median cost of hospitalization (28,246 vs. 22,663;  $p$  < 0.001) was higher in hospitalizations with MDD.

**Conclusions:** Our study displayed an increasing proportion of patients with MDD admitted due to AF in the last decade with lower mortality but higher morbidity post-AF. In addition, there was significantly less utilization of Atrial Cardioversion in this population along with higher median length and cost of hospitalization. There is a need to explore the reasons behind this disparity in outcomes and Atrial Cardioversion utilization in order to improve postAF outcomes in this vulnerable population.

## Temporal trends in drug abuse in adults with acute myocardial infarction show worse outcomes

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**Faculty Advisor:** Bobby Jain, M.D.

**Department of Psychiatry**

**Objective:** We sought to determine temporal trends, invasive treatment utilization and impact on outcomes of preinfarction drug abuse on Acute Myocardial Infarction (AMI) in adults

**Background:** Drug abuse is an important risk factor for AMI. However, the temporal trends in drug abuse on AMI hospitalization outcomes in adults has not been yet delineated.

**Methods:** We used the Nationwide Inpatient Sample (NIS) from the Healthcare Cost and Utilization Project (HCUP) from year's 2002-2012. We identified AMI and Drug Abuse as a primary and secondary diagnosis respectively using validated International Classification of Diseases, 9th Revision, and Clinical Modification (ICD9CM) codes. We used the Cochran-Armitage trend test and multivariate regression to generate adjusted odds ratios (aOR).

**Results:** We analyzed a total of 7,174,274 AMI hospital admissions from year's 2002-2012 of which 1.67% had Drug Abuse. Proportion of hospitalizations with Drug Abuse increased from 5.63% in 2002 to 12.08% in 2012 ( $p$  trend  $< 0.001$ ). Utilization of Coronary Artery Bypass Grafting (CABG) was lower in patients with Drug Abuse (7.83% vs. 9.18%,  $p < 0.001$ ). In-hospital mortality was significantly lower in patients with Drug Abuse (aOR 0.811; 95%CI 0.693-0.735;  $p < 0.001$ ) but discharge to specialty care was higher (aOR 1.076; 95%CI 1.025-1.128;  $p < 0.001$ ). In addition, median cost of hospitalization (40,834 vs. 37,253;  $p < 0.001$ ) was higher in hospitalizations with Drug Abuse.

**Conclusions:** We demonstrate that an increasing proportion of ADULTS admitted with AMI have drug abuse over the decade. However, drug abuse has a paradoxical association with mortality in ADULTS. Drug abuse is associated with lower CABG utilization and higher discharge to specialty care along with a higher mean cost of hospitalization. The reasons for the paradoxical association of drug abuse with mortality and worse morbidity outcomes need to be explored in greater detail.

## Characterization of CB1 (Cannabinoid Receptor 1) Isoforms in Fetal and Maternal Tissues

Presented by: Vanessa Montoya-Uribe

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Faculty Advisor: Natalia Schlabrtiz-Lutsevich, M.D., Ph.D.

Department of Obstetrics and Gynecology

**Introduction:** Endogenous Cannabinoid system (ECS) plays an essential role in reproduction. Cannabinoid receptor 1 (CB1R) has been identified in maternal and fetal peripheral tissues such as adipose, hepatic, and pancreatic islets, both in murine and baboon models. Transcript variants encoding CB1R have been recognized as CB1<sub>a</sub>R and CB1<sub>b</sub>R in adult hepatocytes and  $\beta$ -cells and proposed as pharmacological targets for treatment of metabolic conditions. However, much information concerning the characterization of these two receptor isoforms in baboon (*Papio* spp.) is yet to be elucidated. Considering this, the purpose of this study was to characterize the expression of both CB1<sub>a</sub>R and CB1<sub>b</sub>R isoforms, isolated from fetal and maternal tissues in a baboon (*Papio* spp.) model.

**Materials and methods:** Maternal and fetal tissues [brain, placenta, maternal liver (ML), and fetal liver (FL)] were available from the tissue bank (*Papio* spp.). In order to assess the expression of the CB1R protein variants, Western blot (WB) was performed. A ChemiDoc-It<sub>TS3</sub> Imager and Image J software were used to quantify proteins expression. Followed this, immunohistochemistry assays would permit visualize the co-expression of both CB1<sub>a</sub>R and CB1<sub>b</sub>R isoforms on placental tissue slides. Specific antibodies and blocking peptides were used. TaqMan mix (Roche, Applied Sciences, Indianapolis, IN, USA) and SYBR Green mix (Kapa Bio systems Inc. Woburn, MA, USA) were used for qRT-PCR and data were collected using LightCycler® 96 (Applied Biosystems/Roche, USA).

**Results:** CB1R (~58 kDa) was expressed in several tissues studied. CB1<sub>a</sub>R mRNA isoform showed expression in placental tissues, however, CB1<sub>a</sub>R protein isoform (~46 kDa) was only expressed in brain tissues. On the other hand, CB1<sub>b</sub>R protein isoform (~49 kDa) was expressed in FL compared to ML tissues as well as mRNA isoform. Protein isoform of CB1<sub>b</sub>R was not expressed in brain. Two more CB1R isoforms were found over-expressed (~30 kDa and ~33 kDa) in male and female fetal liver tissues.

**Conclusion:** Our study is the first one to demonstrate the expression of CB1R isoforms in fetal liver tissues compared to placental, brain, and maternal liver tissues.

## Ultrasound evaluation of successful rescue cerclage

Presented by: Gabrielle Rich, D.O., PGY-II; [gabrielle.rich@ttuhsc.edu](mailto:gabrielle.rich@ttuhsc.edu)

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Department of Obstetrics and Gynecology

**Introduction:** Cervical cerclage has been used for over 60 years for the treatment of cervical insufficiency for prevention of the preterm delivery. Over the ensuing years there has been however substantial controversy regarding selection criteria for this procedure and what the best approach to the patient with known or suspected cervical insufficiency would be. Several selection criteria such as patients' history (more than 2 preterm births) and physical cervical evaluation have been applied during the past decades.

A short cervix on transvaginal ultrasound is known to be associated with an increased risk of preterm delivery. The addition of ultrasound evaluations of the cervix has been useful in selecting the patients with a history of a prior loss who would likely benefit from a cervical cerclage. There is no apparent benefit to cerclage in a patient with a short cervix alone who lacks a history of a prior preterm birth as most of these women with a short but closed cervix will deliver after 34 weeks. Randomized trials of cerclage for a short cervix alone have not consistently shown an increase in number of deliveries at term.

A rescue cerclage is one placed on an emergent basis in at a previable gestational age when cervical effacement and dilation occur in the absence of labor, abruption, or infection. A randomized trial of rescue cerclage is unlikely to be completed due to the scarcity and clinical heterogeneity of this patient population. However, several cohort studies suggest that rescue cerclage is a benefit to select patients in the clinical scenario of threatening preterm delivery prior to 24 weeks of gestation, with advanced cervical dilation and protrusion of the amniotic sac at or below the external os of the cervix. Severe funneling is seen on transvaginal ultrasound. The risk of delivery in the next 10-14 days is high in this setting with expectant management.

There is evidence that placing a rescue cerclage suture high in the cervix is more likely to be associated with successful pregnancy prolongation. Recently, the finding of a large (> 105 degree) utero-cervical angle (UCA) has been shown to significantly increase the likelihood of subsequent preterm delivery. This risk is synergistic with the findings of a short cervix and appears to markedly increase the risk of preterm delivery in the setting of a short cervix.

Therefore the aim of this study as a part ongoing quality improvement efforts was to evaluate ultrasound cervical parameters in patients, undergoing cerclage.

**Methods:** We retrospectively reviewed the ultrasound information on several patients who presented with advanced cervical dilation prior to 24 weeks (N=7) and confirm that all had a UCA greater than 105 degrees. Rescue cerclage was performed in five patients who were felt to be good candidates and consented to surgery. Our protocol was to administer pre-operative antibiotics and post-operative indomethacin for 7 days post-surgery. A single prolene McDonald cerclage was placed as high as possible in the cervix. Intraoperative ultrasound was used to assess the adequacy of the cerclage placement with a successful stitch having the following characteristics. The anterior arm of the suture is less than 5 mm from the inferior edge of the bladder. The posterior arm of the cerclage is in the upper 1/3 of the posterior cervix. The postoperative cervix will have greater than 2 centimeters below the stitch and the prolapse of the membranes will be successfully reduced.

**Results:** All 5 successful cerclages were found to restore the UCA to less than 95 degrees. Three patients have delivered and two pregnancies are ongoing. All three patients delivered at greater than 35 weeks with two out of three delivering at term. The mean increase in gestational age was 13 weeks following the stitch in these delivered patients.

**Conclusions:** The use of intraoperative ultrasound has been shown to be beneficial. It provides immediate feedback on the location of the stitch and the degree of success at restoring the normal pelvic anatomic relationship. It appears that in addition to confirming that the stitch is high in the cervix, ultrasound can allow evaluation of the UCA which is helpful in quantifying the success of the cerclage at restoring the normal anatomic relationship between the cervical canal and the lower uterine segment.



## **Gentian Violet: A Low-Cost Treatment for Onychomycosis?**

**Presented by:** Tamareál Ross, M.D., PGY-III; tamareal.ross@ttuhsc.edu

**Co-authors:** Tara Deaver, DPM, Vicky Bakhos, M.D.

**Faculty Advisors:** Tara Deaver, DPM and Vani Selvan, M.D.

**Department of Family and Community Medicine**

**Background:** Onychomycosis is the most common nail disorder in adults that can be painful and cosmetically displeasing. It is an infection that primarily involves dermatophytes with the most common organisms being *Trichophyton rubrum*, *Trichophyton mentagrophytes*, and/or *Epidermophyton floccosum*. Current treatment, with side effects and high cost, involves topical antifungals, oral antifungals and/or surgery. However, with its low cost and its antifungal properties, we propose that gentian violet (GeV) can decrease or stop the growth of common dermatophyte species involved in onychomycosis.

**Methods:** Stock cultures of dermatophytes *Trichophyton rubrum*, *Trichophyton mentagrophyte*, and *Epidermophyton floccosum* were purchased and streaked on Sabourand dextrose agar plates as follows for each dermatophyte: one plate with only the organism, two plates with a blank antimicrobial disk, two plates with antimicrobial disk soaked in 1% GeV, and two plates with antimicrobial disk soaked with 2% GeV; a total of seven plates for each organism. All plates were placed in a 30°C incubator and checked every two days for growth of the organism and re-growth with the clearance zones being measured on day 4 and day 20 for each organism and for both 1% GeV and 2% GeV antimicrobial disks; a total of 4 plates for each organism.

**Results:** For *T. rubrum*, the zones of inhibition from GeV-soaked antimicrobial disks ranged from 30-35mm. For *T. mentagrophyte*, the zones of inhibition from the GeV-soaked antimicrobial disks ranged from 24-28mm. There was not a significant difference between the 1% and 2% GeV plates for all *T. rubrum* and *T. mentagrophyte*. The results from *E. floccosum* species are delayed given the slow growth of the species in comparison to *T. rubrum* or *T. mentagrophyte*. Therefore, the results of *E. floccosum* will continue to be observed for the duration of the study.

**Conclusions:** Given the results, gentian violet, either 1% or 2%, may be a low-cost adjunct treatment for onychomycosis. Further studies are needed to draw further conclusions. Therefore, we plan to conduct future trials on actual nail specimens.

## **Pregnancy-related maternal hepatic lipid accumulation, evaluated as hepato-renal ratio**

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**Faculty Advisor:** James Maher, M.D.

**Department of Obstetrics and Gynecology**

**Introduction:** Nonalcoholic fatty liver disease (NAFLD) is the most prevalent form of liver disease in the developed countries and has been related to obesity, insulin resistance, and type 2 diabetes. The incidence of hepatic steatosis in the population can be as high as 20-30% and 75-92% in the morbidly obese patients. Pregnancy per se is associated with such liver pathologies as acute fatty liver of pregnancy, intrahepatic cholestasis of pregnancy, and HELLP syndrome all of which are associated with hyperemesis gravidarum. Increased hepatic fat accumulation is also a promoting factor for development of viral hepatitis. The diagnosis of fatty liver using liver ultrasound in pregnant women is challenging and is not a validated methodology. There is an urgent need to validate the current methods and establish new ones to diagnose these conditions in pregnancy.

**Materials and methods:** Five non-pregnant and five pregnant baboons near term underwent ultrasound examination as described previously (Ultrasound Obstet Gynecol. 2005 Sep;26(3):252-7). The ultrasound images of maternal liver and kidney in one view were analyzed, using Image J program (NIH).

**Results:** Tissue echogenicity was increased in pregnant compared to non-pregnant animals (Fig.1).

**Conclusion:** Pregnancy-related hepatic fat accumulation is independent of maternal diet and could be evaluated applying hepato-renal ratio during routine ultrasound examination.

## **The Effects of Clinician Age and Gender on Breastfeeding Education**

**Presented by:** Jarrod Tunnell, MS3; jarrod.tunnell@ttuhsc.edu

**Co-authors:** Megan Mikesell, MS3, Veena Agusala, Bhargavi Kola, M.D.

**Faculty Advisor:** Bhargavi Kola, M.D.

**Department of Pediatrics**

**Background:** While breastfeeding contributes to beneficial health outcomes for both child and mother, rates of breastfeeding and exclusive breastfeeding drop steadily from birth through the 6th month of life. Individual-level support and education interventions positively impact the rates of any and exclusive breastfeeding.

**Objective:** To determine the association between a clinician's age, gender, and breastfeeding education rates.

**Methods:** A retrospective chart-review of 241 0-1 month well-child visits of 3 doctors and 2 PAs over a 6 month period. We compared each provider's patient population based upon patient ethnicity and sex, mother's age, parity status, mode of delivery, and type of feeding. We also compared the frequency with which each provider discussed breastfeeding. We used the Kruskal-Wallis test to analyze the differences in all variables between the providers with a significance level set at 0.05.

**Results:** Patient ethnicity/race was assigned as follows: 84% Hispanic, 9.9% White, 4.7% Black, and 1.4% other. For all providers, the ethnicity/race distribution was not significantly different ( $p=0.447$ ), and neither was the distribution of female (56%) and male (44%) patients ( $p=0.540$ ). No statistically significant differences in mother's characteristics were found. Significant differences were found in breastfeeding discussion ( $p<0.001$ ). Provider 1, a female MD <40 yoa, discussed breastfeeding significantly more often than provider 2, a male MD >40 yoa, ( $p<0.0001$ ) and provider 5, a female PA <40 yoa, ( $p=0.0001$ ). Also, provider 3, a male MD <40 yoa, discussed breastfeeding significantly more often than provider 2 ( $p=0.0004$ ). Provider 4, a female PA <45 yoa, was not significantly different from any of the other providers with respect to breastfeeding discussion rates. No significant differences were found between providers in the type of feeding chosen by their patients.

**Conclusions:** While this study found significant differences in breastfeeding education rates among providers, we need data from additional providers before making more generalized claims. Regarding clinician gender, provider 1, a female MD <40 yoa, did discuss breastfeeding more often than provider 2, a male MD >40 yoa, and no male provider discussed breastfeeding significantly more than a female provider. Provider 1's rates, however, were not significantly different from provider 3's, a male MD <40 yoa. Regarding age, providers 1 and 3 had significantly higher rates than provider 2, who is the only provider >40 yoa. This study is the first of its kind to consider the effects of clinician gender and age on breastfeeding education. The authors wish to acknowledge the contribution of the Texas Tech University Health Sciences Center Clinical Research Institute for their assistance with this research.

## Impact of Influenza like illness on the Flu season in Ector County

Presented by: Joshua Urteaga, M.D., PGY-II; [joshua.urteaga@ttuhsc.edu](mailto:joshua.urteaga@ttuhsc.edu)

Co-authors: Alana Waterford, M.D., Vani Selvan, M.D.

Faculty Advisor: Vani Selvan, M.D.

Department of Family and Community Medicine

**Background:** Influenza like illness (ILI) is a contagious, acute respiratory infection caused by any virus which is usually clinically diagnosed. Influenza (Flu) is an acute viral contagious infection caused by influenza viruses diagnosed by “Flu tests”. Cold season usually starts late October peaks up during December, January sometimes extends up to March and April. Flu and ILI are in full swing during the cold season. Flu vaccine protects people from Flu especially people at high risk with comorbidities. With adequate Flu vaccine coverage the flu incidence should be lower and higher ILI incidences. With no clear differentiation between flu and ILI except for the flu test, decreased flu vaccine coverage it is hard to predict by symptoms. Since 2009 Centers of Disease Control (CDC) surveys the entire nation weekly by spotting trends and outbreaks for Flu and ILI. This year Texas is one of 14 states with a high ILI activity. By this study we at Texas Tech Family and Community Medicine (TTFM) clinic in Permian Basin propose to see the rate of flu vaccination, Flu and ILI incidence and its impact on flu season.

**Methods:** During the current flu season from October 2016 to September 2017 subjects that are presented to a TTFM clinic in Permian Basin with Flu like symptoms (fever, sore throat, myalgia, fatigue, or cough) are being point of surveillance to Texas Health Department/ CDC. Subjects presented to TTFM clinic with Flu like symptoms were tested by rapid-influenza diagnostic testing's (RIDTs) nasal swab. If RIDTs results are positive the patients were diagnosed as Flu and if negative as ILI. The demographics (age, sex, race, and ethnicity) along with their flu vaccination status, comorbid conditions (history of asthma, COPD, DM, tobacco use, pregnancy or immune compromised status) were collected during their RIDT. All data were collected and basic statistical analyses were done to identify the vaccine coverage in our population and the impact of ILI on Flu during the flu season. This study was done after Quality Improvement approval (QIRB APPROVAL#:17011)

**Results:** Flu Vaccine coverage in the TTFM clinic was only 8.2% for this season 2016-17. Total of 235 patients presented to our clinic with Flu like symptoms (fever, cough, sore throat, body aches, vomiting or diarrhea), who were subjected to RIDT. Among them 84% were RIDT negative, were diagnosed as ILI. The ILI impact each month during Flu season was an average 3% each month with Std dev of 0.017. Only 12% of ILI was vaccinated. Flu was diagnosed in 16% (with Flu A in 16.5%, Flu B in 7.6%, both flu A and B 2%). Only 1.2 % who was vaccinated was Flu positive. (3 people one Flu A and B and 2 Flu A). Patients who presented with comorbidities were 13% out of which (81% were non -vaccinated). Flu positive in patients with comorbidities were 21% and all were non- vaccinated. Non-influenza viruses causing influenza like illness did not have a predilection toward any race, ethnicity or sex. The most common age group presented was Age 5-24 = 40%, next common age group was 0-4 with 26%. Age >65 was 4.2% and all were not vaccinated. Most of them were healthy.

**Conclusion:** Based off the preliminary results on this 2016-2017 flu season, ILI is driving the majority of our clinic visits this flu season. Being Flu vaccinated provides substantial protection. High risk people with comorbidities need to be vaccinated. Insight and awareness about ILI to health care professionals are essential. Although surveillance is ongoing and the final verdict is soon to come, ILI seems to take the lead in spreading misery in Ector County, Texas and United States.



# ADDITIONAL SPEAKERS



**Arun Mathews, M.D.**

*Inpatient Chief Medical Officer, Medical Center Hospital*

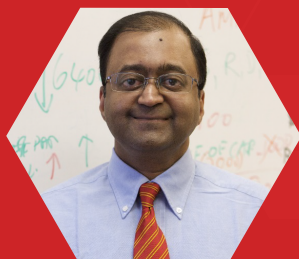
Dr. Arun Mathews is the Inpatient Chief Medical Officer at Medical Center Hospital. Dr. Mathews received his M.D. from the Royal College of Surgeons in Ireland in 2001 and completed a residency in Internal Medicine at Good Samaritan Hospital in Baltimore, Maryland. He completed a year in medical informatics at Johns Hopkins Hospital in Baltimore. Prior to joining Medical Center Hospital, Dr. Mathews was a Clinical Assistant Professor and Hospitalist Fellowship Training



**Thomas Ready, Ph.D.**

*Assistant Professor of Chemistry, Midland College*

Dr. Thomas Ready is Assistant Professor of Chemistry at Midland College. Dr. Ready has a Ph.D. in Inorganic Chemistry from University of Massachusetts at Amherst and a B.S. in Chemistry from the University of Texas El Paso. He has conducted research on catalytic synthesis of polyolefins, functionalized silicone coatings, and anti-fouling marine coatings. His current research focuses on synthesis of new anti-biotic molecules, the development of chemical anion sensors, and marine chemistry associated with coral reefs.



**Prakash K. Pai, Ph.D.**

*Associate Professor of Finance, University of Texas of the Permian Basin*

Dr. Prakash Pai is Associate Professor of Finance at the University of Texas of the Permian Basin. Dr. Pai has an MBA, M.S. and Ph.D. from Kent State University in Kent, Ohio and a B.C. and M.C. from Bangalore University.

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# PERMIAN BASIN RESEARCH FORUM POSTER ABSTRACTS



**Cutaneous Hemangioma: Multiple Presentations**  
**Presented by: Vicky Bakhos Webb, M.D., MBA, PGY-II,**  
**Co-authors: Bhargavi Kola, M.D., Vani Selvan, M.D.**  
**Faculty Advisor: Bhargavi Kola, M.D.**  
**Departments of Pediatrics**

Infantile hemangiomas are common benign neoplasms composed of proliferating endothelial-like cells that occur in approximately 10% of children. Most of the time, these cases require referral to specialists due to the fact that most pediatricians don't feel comfortable treating them, especially that there are currently no uniform guidelines for treatment.

This article sheds light on 3 different cases of hemangiomas that were presented in rural clinics and were treated with low dose propranolol.

First case, is an 8-month-old girl born prematurely at 32 weeks gestation and was noticed to have a small strawberry-colored tumor over the left side of her neck that was increasing rapidly in size. The infant was referred to a pediatric dermatologist and was started initially on 0.25 mg propranolol daily and eventually dosage was increased to 0.5 mg twice a day. The growth was noted to stabilize over time however no significant reduction in size was observed.

The second case presents an 8-week-old girl, born full term, with no complications, came for her 2-month well-baby checkup with complaints of prominent clear discharge from her right eye. MRI of the brain showed capillary hemangioma and the baby was referred to a pediatric ophthalmologist. She was then started on propranolol 3mg/kg/day that was eventually tapered to 2 mg/kg/day. A follow up MRI 2 months later showed a slight reduction in the bulk of the hemangioma and the mass effect of the lesion to the right globe appeared to have improved after the propranolol treatment.

The third case presents a 2-month-old girl, born full term with no complications. Her mother had first noticed an abdominal mass at about 4 weeks of age that was progressively increasing in size. The patient was referred to a pediatric dermatologist for hemangioma of the anterior abdominal wall and was started on propranolol 2.8 mg twice a day that was eventually increased to TID, when reduction of size started occurring. A follow up ultrasound will determine the effect of Propranolol treatment.

Propranolol seemed to have impressive effects on our cases, and even though its use has grown in the recent years, a consensus about dosages to regress or even stabilize the size of the tumors have not been reached. An algorithm that would assist pediatricians in managing such cases is crucial especially in rural areas where specialists are hard to get to.

**Syncytiotrophoblast micro-particles (STBM) as a pioneering approach for breast cancer prevention and treatment**

**Presented by: Eugenia Banina, M.D., PGY-I**

**Co-authors: Natalia Schlabritz-Lustevich, M.D., Ph.D., Anton Kosov, M.D., PGY-I, Kanza Musaffar, MS3, Alice Fa, MS3, Carlos Salomon, Ph.D.**

**Faculty Advisor: Natalia Schlabritz-Lutsevich, M.D., Ph.D.**

**Departments of Internal Medicine and Obstetrics and Gynecology**

**Background:** Breast cancer is the most frequently diagnosed malignancy globally. In 2016 there were almost 250 thousands new cases of breast cancer diagnosed in United States with approximately 40 thousands deaths from this disease. Today's cohort of young women faces an approximate 10% lifetime risk of breast cancer. Among risk factors attributed to the development of breast cancers there are genetic, dietary, hormonal, and environmental influences. However, several factors have been shown to have negative or protective impact on development of breast cancer. Multiple epidemiological studies have revealed that women who had preeclampsia during their pregnancies have lower lifetime risk of breast cancer development.

The molecular pathophysiology of preeclampsia involves release of microparticles containing antiangiogenic proteins sFlt-1, sEng and pro-inflammatory cytokines by placental syncytiotrophoblast which play crucial role in development of poly-organ damage. However, angiogenesis is a key process in carcinogenesis and disruption of it leads to delay in cancer cells growth and proliferation or even death of cancer cell. Therefore, systemic release of these microparticles could, in theory, function in breast tissue, either preventing the formation or inducing the regression of preexisted tumorigenic lesions that otherwise might progress over time to overt disease.

**Hypothesis:** Strong data collected indicates that preeclampsia -specific microparticles shed by the placenta into maternal bloodstream contain active anti-angiogenic factors , apoptotic bodies and microRNAs , which have been described to regulate breast cancer cells growth. Hence, there should be a protective effect of the placental microparticles obtained from women with preeclampsia and from in vitro placental hypoxic preparation on breast cancer development.

**Methods:** 3.1 We will isolate placental microparticles from the following sources: 1) serum of women with preeclampsia and normotensive women carrying male and female fetuses and 2) placental perfusate obtained in the normoxic and hypoxic conditions. After isolation and characteristics of protein, lipid and micro-RNA profile, the microparticles will be injected in NSG immunodeficient mice respective to experiment design. The distribution of microparticles will be traced *in vivo*, using an IVIS® Kinetic immune-fluorescent markers.

3.2 We will establish a colony of NOD.Cg-Prkdcscid Il2rgtm1Wjl/SzJ mice. These animals will be randomly divided up in two groups, A and B, with three subgroups each, including several control animals.

3.3 We will introduce placental microparticles derived from women with normotensive pregnancies or preeclampsia to the first and second subgroup of group A respectively. The third subgroup in Group A will serve as a control (Tong, Mancy, et al. "In vivo localization and vascular effects of nano-vesicles derived from normal first trimester human placentae." *Placenta* 45 (2016): 67). 100K cells of MCF7 breast cancer cell line will then be transplanted to the fatty extremity of the inguinal fat pad in all Group A mice, close to the flank, with the aim of providing a semi-appropriate niche. There is evidence that fat pads provide a more tumorigenic environment. The cells will be in 50% growth factor reduced matrigel (BD) in a final volume of 100 uL. For acceleration of growth, a silastic estrogen pellet (17B E2, 0.72mg/90d slow release pellet, Innovative Research of America) will be implanted. Animals will be weighed daily. Tumors will be measured daily over 4-5 weeks using a combination of calipers and bioluminescence. 3.4 Group B mice will be injected with the of MCF7 cell line as the first step, following the same protocol mentioned in 3.3. Subsequently we will transplant placental microparticles derived from women with normotensive pregnancies or preeclampsia to group B animals with established tumors (around 150 mm<sup>3</sup>). Animals will be weighed daily. Tumor size will be measured with a digital caliper daily and volumes will be calculated using the modified ellipsoid formula. Tumors will be measured until they reach a maximum size of 1500 mm<sup>3</sup>, if animals exhibit distress indicated by a >20% weight loss, or if tumors ulcerate - in which case mice will be humanely euthanized.

**Expected results:** We expect results will confirm the protective effect both of plasma microparticles obtained from women with PE and from in vitro placental hypoxic preparations on breast cancer progression. These results will open the venue of breast cancer prevention and treatment.



## Relationship between obesity and clinical outcome in patients with ARDS admitted to the ICU

**Presented by:** Ana Ramirez Berlioz, M.D., PGY-II; [ana.ramirez@ttuhsc.edu](mailto:ana.ramirez@ttuhsc.edu)

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Gerardo Catalasan, M.D.

**Faculty Advisor:** Gerardo Catalasan, M.D.

**Department of Internal Medicine**

The prevalence of obesity has been rapidly increasing over the past couple of decades in developed countries. This becomes problematic because of the comorbidities associated with this body habitus. Obese critically ill patients who develop acute respiratory distress syndrome (ARDS) seem to have better clinical outcomes despite having longer hospital stays and being at a greater risk for developing this condition when compared to their lean counterparts.

**Research Design and Methods:** This is a retrospective observational cohort study that will analyze patients with ARDS, as defined by the Berlin Criteria, admitted to the Intensive Care Unit (ICU) at Midland Memorial Hospital (MMH) from the year 2000 to the year 2016. Preparation for the study and data collection will begin in January 2017 and analysis will finalize in May 2017.

**Main Hypothesis:** Obese patients with ARDS have a better clinical outcome when compared with their lean counterparts and will have a higher tidal volume on mechanical ventilation earlier on in their course.

**Specific Aims/Purpose:** Demonstrate that critically ill obese patients that develop ARDS have better clinical outcome, as defined by their discharge disposition, when compared to their lean counterparts.

**Justification:** Prior studies have shown that obese patients with ARDS may tolerate higher tidal volumes (TV) than their lean counterparts, even up to 12 ml/kg of predicted body weight; thus, these settings are likely to be started earlier on in this patient population. It has been inferred that the start of higher tidal volumes in the setting of ARDS may be a protective factor and help reduce mortality. This will be the first step on a large scale study to determine what are the protective factors of obesity in the setting of ARDS.

## Preventing Primary Cesarean Section: A Quality Improvement Study

Presented by: Brittany Brothers, M.D., PGY-III

Faculty Advisor: R. Moss Hampton, M.D.

Department of Obstetrics and Gynecology

**Introduction:** The goal of Healthy People 2020 is a cesarean section rate of 23.9% in women who meet the criteria of being a Nulliparous Term Singleton gestation in a Vertex presentation (NTSV). As of 2007 the current rate is 26.9%. Of those women who undergo a primary cesarean delivery, about 90% will go on to have a repeat cesarean. There is an increased risk of maternal complications with cesarean section, especially with multiple cesarean deliveries. Therefore an effective strategy is needed to safely avoid primary cesarean delivery. In February 2012, the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development, the Society for Maternal Fetal Medicine, and the American College of Obstetricians and Gynecologists held a workshop focused on identifying factors leading to and opportunities to reduce unnecessary primary cesarean delivery and develop practice recommendations. Some of these measures put forth by a joint Eunice Kennedy Shriver National Institute of Child Health and Human Development Society for Maternal-Fetal Medicine and American College of Obstetricians and Gynecologists Workshop include the rate of non-medically indicated cesarean section and induction of labor, and rate of cesarean delivery for non-reassuring fetal heart rate by NICHD category.

**Objective:** To determine whether the implementation of a labor protocol, based on definitions from the Consortium on Safe Labor (CSL), will reduce the cesarean section rate among a nulliparous term singleton vertex (NTSV) population.

**Methods:** This is a Quality Improvement project with the purpose of assessing a change in the Primary Cesarean Section rate. The following outlines the components of this project.

A formal educational lecture took place on October 26, 2015 for the Texas Tech University Health Sciences Center at the Permian Basin Obstetrics and Gynecology residents and faculty providing information about the standardized labor management protocol for low risk, nulliparous, singleton, term, vertex pregnant patients based on recommendations from the joint workshop.

Medical records were reviewed and data collected for a period of 3 months before and after the implementation of this standardized protocol.

**Preliminary Results:** Our hypothesis is that application of this standardized protocol will result in a decreased Primary Cesarean Section rate among the NTSV population. Preliminary data collection shows a total of 70 nulliparous, term, singleton, vertex deliveries prior to the institution of the labor protocol in the months of November 2014-January 2015. Forty eight of these deliveries were vaginal and 22 deliveries were via cesarean section giving a pre-intervention primary cesarean rate of 31.4%. After the institution of the labor protocol, there were a total of 80 NTSV deliveries during the months of January 2016 - March 2016. Seventy of these deliveries were vaginal while 10 deliveries were via cesarean section. The post-intervention primary cesarean rate is 12.5% ( $p = 0.0054$ ). Data collection is ongoing.

**Discussion:** An effort to reduce the primary cesarean section rate may have a significant effect on reducing maternal morbidity. With the advent of Value Based reimbursement, the NTSV rate may have far reaching financial implications. The implementation of a standardized labor protocol in the NTSV population based on recommendations from the Consortium on Safe Labor has dramatically reduced the primary cesarean section rate for our institution according to preliminary data. The post-intervention primary cesarean rate of 13.25% is well below the 23.9% Healthy People 2020 goal. With further data collection we expect to find a statistically significant decrease in the primary cesarean section rate.

**Scratching beneath the surface of an itch that will not abate: A case of Lichen Simplex  
Chronicus in a Young Female**

**Presented by: Hanna Kodeih, D.O., PGY-II**

**Co-authors: Vicki Burton, MS3, Hanna Kodeih, D.O., PGY-II, Gary Ventolini, M.D.**

**Faculty Advisor: Gary Ventolini, M.D.**

**Department of Obstetrics and Gynecology**

Perianal disease in young women offers a wide range of differential diagnoses and often offers a conundrum to practitioners in terms of identification and management. We present a case of a young female who presented on multiple occasions to clinic with perianal and vulvar pruritis who was eventually diagnosed with lichen simplex chronicus. Her initial presentation and confounding factors led to a delay in the diagnoses. This case highlights common pitfalls in correctly diagnosing vulvar and peri-anal dermatologic conditions. A review of literature also reviews important differentials, pathophysiology, and considerations when facing a patient with a distressing but unclear vulvar and/or perianal disorders.

## **Tysabri-induced hepatotoxicity in an elderly patient with multiple sclerosis**

**Presented by: Guillermo Cazares, M.D., PGY-II; Guillermo.cazares@ttuhsc.edu**

**Co-authors: Nimat Alam, M.D., Ikemefuna Okwuwa, M.D.**

**Faculty Advisors: Nimat Alam, M.D. and Ikemefuna Okwuwa, M.D.**

### **Department of Family and Community Medicine**

**Introduction:** Multiple sclerosis (MS) is a chronic, disabling disease with several treatment options available. People with MS typically develop symptoms in their late 20s, experiencing visual and sensory disturbances, limb weakness, gait problems, and bladder and bowel symptoms. They may initially have partial recovery, but over time develop progressive disability. The cause of MS is unknown. The introduction of several new oral agents and the impending introduction of several more have increased the choice of MS therapies available to neurologists. Natalizumab (Tysabri), an  $\alpha$  4-integrin antagonist is approved for treatment of patients with active relapsing-remitting multiple sclerosis.

**Case Presentation:** A 72-year-old female with past medical history of multiple sclerosis, rheumatoid arthritis, hypertension and depression came to the emergency department with nausea, vomiting, abdominal discomfort, dizziness and lightheadedness for 3 days prior to admission. Her home medications were Lisinopril 5 mg daily, Cymbalta orally 30 mg capsule in the morning and 60mg capsule at night, Detrol LA oral 4 mg 1 capsule extended release 24 hours daily, Tysabri 300mg IV she takes that once every 28 days (day 5 post administration), Tylenol 1300 mg oral as needed and Tramadol oral 50 mg 1 tablet oral 2 times per day for her home medications. During emergency department evaluation, she described her abdominal pain as "just discomfort" with a 2/10 intensity in the right upper abdominal quadrant. Laboratory blood work was ordered. Urinalysis was negative for nitrates and leukocyte esterase. CT scan was done showing normal gallbladder, liver and some minor colonic diverticulitis. An ultrasound gallbladder was ordered, gallbladder was found to be enlarged with no wall thickening nor gallstones, common bile duct dilated 10.2 cm possible gallstone in CBD, pancreatic ducts slightly dilated 3.5 cm. A magnetic resonance cholangiopancreatography was ordered showing dilatation of common bile duct at 1.3 cm, tapering at the level of the ampulla with some moderate dilatation of the pancreatic duct 4 mm and trace edema. Possible choledocholithiasis with elevated liver enzyme diagnosis was made initially. Patient was then admitted to the floor and gastroenterology department was consulted for ERCP the following morning after admission. Gastroenterologist evaluated the patient and discussed imaging with radiologist determining that indeed there was a dilated common bile duct reported in the ultrasound and magnetic resonance imaging but according to radiologist there was no choledocholithiasis and a small tapering of CBD was seen with no intrahepatic dilatation which should have been the case if this was a chronic dilatation GI recommendations were to monitor liver function test, repeat ultrasound in the following days to evaluate if common bile dilatation would improve or if it dilatation persistent it might be very likely that patient could have a choledocal cyst and might need EUS/ERCP for further evaluation. An ultrasound was performed 2 days after admission showing the common bile duct prominent 10.2 mm possible gallstone present, gallbladder distended more than 10 cm, findings suggestive of choledocholithiasis. Patient remained stable, no fever, chills present since admission, abdominal discomfort was improved. Liver function tests improved significantly in the following days. She was discharged home on the third day from admission doing well.

**Discussion:** While there have been reported cases of varying degrees of hepatic injury following Natalizumab administration, with age range of 26-59 years and typical duration of dose to event usually after the 1st or 2nd infusion but has also been noted even after the 33rd infusion, we have been unable to find similar reports in the geriatric population. Our patient had symptoms suggestive of hepatotoxicity from Natalizumab administration after her 7th infusion.

Though generally well tolerated, safety concerns have long limited the use of immunomodulatory medication, Natalizumab, as a first-line therapy in the very early phase of multiple sclerosis when the inflammatory damage is believed to be more prominent. The etiology of hepatotoxicity is not fully understood but possible mechanisms include increased activity of autoreactive immune cells, toxicity or hypersensitivity due to a biologic agent selectively affecting the liver, new infection or activation of an atypical pathogen causing liver damage due to immunosuppression.

Educating patients about the risk of Natalizumab associated liver injury is important prior to starting therapy. Regular testing of ALT, AST, AP and bilirubin, at least monthly for the first six months, then six-monthly thereafter, probably can minimize Type A or dose-dependent reactions and a pre-treatment screen might be useful to eliminate other causes of liver test elevations in patients on treatment with  $\alpha$ 4-integrin.

Physicians should be aware of the hepatotoxic safety concerns of Natalizumab particularly in an elderly patient and act promptly to mitigate further liver damage. Serial follow up of the liver enzymes are recommended.



## **Role of octreotide in Heyde's Syndrome**

**Presented by: Hira Cheema, M.D., PGY-II**

**Faculty Advisors: Kalyan Chakralla, M.D., Yasir Ahmed, M.D.**

**Department of Internal Medicine**

**Case:** We report the case of a 76-year-old Caucasian male with a past medical history of chronic obstructive pulmonary disease on 2 L home oxygen, hypertension, carotid stenosis, and lupus (not on steroids). He was first referred for evaluation of multiple episodes of anemia secondary to GI bleeding that required monthly transfusions. At time of referral, patient denied abdominal pain, active bleed, usage of ASA or NSAID. Patient had also stopped taking warfarin 3 months prior, which was intended for management of carotid stenosis. Esophagogastroduodenoscopy (EGD) and colonoscopy done 2 weeks prior to time of referral were negative. Labs showed hemoglobin 8.7, hematocrit 26.9, RDW 16.4, platelets 237,000. Patient underwent elective EGD again and was found to have several actively bleeding arteriovenous malformations (AVM) in the stomach and first part of duodenum. The bleeding AVMs were successfully treated with argon plasma coagulation (APC). Patient was discharged to follow as outpatient. One month later the patient was admitted to the hospital due to worsening shortness of breath and had reported melena one week prior. HGB was 8.0. Repeat EGD showed bleeding angiodysplasia in duodenum, which were again coagulated. Decision was made to start the patient on intravenous octreotide 50 mg bid as outpatient. Patient was again admitted to the hospital for hypoxia and shortness of breath secondary to GI bleed after one month. At time of admission, patient had been on Octreotide for 2 weeks and complained about GI bleed symptoms. Laboratory showed HGB 6.7, HCT 21.5. Physical exam revealed grade 3 systolic murmur best heard at right second intercostal space. Echocardiogram showed severe aortic stenosis (AS) with valve area 0.92 cm<sup>2</sup>. Patient subsequently underwent bioprosthetic valve replacement. Patient also received 2 drug-eluting stents placements for coronary artery disease and started antiplatelet therapy with Plavix. The patient was admitted to the hospital about a month post bioprosthetic valve replacement due to anemia with HGB 5.5. The patient had been receiving blood transfusion every 2 weeks for 8 months due to chronic anemia. Repeat EGD noted multiple AVMs in the small bowel, which were controlled after APC.

**Final intervention and conclusion:** We are reporting for the first time the comparison between IV and IM octreotide in resolution of GI bleed due to angiodysplasia in patients with aortic stenosis. Patient in case received octreotide 50 mg IV bid for 2 months without significant relief in symptoms. Even after aortic valve replacement he had minimal resolution of bleeding on IV octreotide. We then started therapy with IM octreotide with a close follow up as outpatient. For the first 5 months patient on 20 mg octreotide did report some GI bleed and required monthly blood transfusions. However, after increasing dose to 30 mg IM per month his bleeding eventually resolved and he maintained a steady HGB from 10-12 in another 4 month follow up. During these 4 months patient did not require any blood transfusion. There are no reported studies that compare the difference between efficacy of IV vs. IM octreotide.

## Placental Leptin Protein Expression in Maternal Obesity

Presented by: Saloni Cholia

Co-authors: Marcel Chuecos, Peter Nathanielsz, M.D., Ph.D., Cun Li, M.D., Gary Ventolini, M.D.,

Natalia Schlabritz-Lutsevich, M.D., Ph.D.

Faculty Advisor: Natalia Schlabritz-Lutsevich, M.D., Ph.D.

Department of Obstetrics and Gynecology

**Introduction:** Maternal Obesity (MO) remains at epidemic dimensions in developed countries and exerts adverse consequences across the lifespan upon the mother, her fetus, the newborn, and later adult life. Leptin regulates appetite and metabolism and it is considered to be an “obesity hormone.” In obesity, the placenta is leptin resistant. We undertook this study to evaluate whether down-regulation of leptin protein expression is part of the mechanism of the leptin resistance process.

**Methods:** Two groups of pregnant female baboons (*Papio spp.*), non-obese (nOB) and obese (OB), were selected based on weight and obesity index at delivery by cesarean section at 165 days of gestation. Archived baboon placental tissues (PMC3011231) stained with leptin antibody were scanned using the NanoZoomer SQ (Hamamatsu, Middlesex, NJ), and quantified with Image-Pro Premier software (v9.2 Media Cybernetics, Inc. Rockville, MD, USA). The intensity of leptin staining, expressed as histoscore, and the number of leptin-positive cytotrophoblast (CT) cells were calculated.

**Results:** Maternal serum leptin concentration was lower in nOB ( $48.2 \pm 11.4$  ng/ml) animals compared to OB ( $116.4 \pm 12.4$  ng/ml) ( $p < 0.05$ ). There were no differences in fetal leptin concentrations between two groups. Leptin expression differences in histoscores will be reported as well as leptin-positive CT.

**Conclusions:** We confirmed elevated leptin concentration in obese mothers. The pathway, associated with leptin resistance should be characterized further.

**Keywords:**

Obesity, Placenta, Leptin

## Baboon placental endocannabinoid responses to maternal high fat diet

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Faculty Advisor: Natalia Schlabritz-Lutsevich, M.D., Ph.D.

### Department of Obstetrics and Gynecology

**Introduction:** The endocannabinoid system (ECS) is essential for fetal development and pregnancy maintenance. We described decreased fetal ECS tone in naturally obese non-human primates and in human pregnancy. This decrease was paradoxically associated with increased ECS tone, described in obese non-pregnant individuals. The **goal of this study** was to evaluate placental expression of ECS receptors CB1R and CB2R in an experimental model of a maternal high fat diet.

**Methods and Materials:** Baboons (*Papio spp*) were fed a diet of 45% fat (HFD; n=11) while controls (CTR; n=9) ate 12% fat for at least 9 months prior to conception. The placenta was collected at term via cesarean section and CB1R and CB2R expression were evaluated using immunohistochemistry, western blot, and RT-PCR methods.

Results: CB2R expression was increased in villi and decidual tissues of male fetuses of HFD fed mothers.

**Table 1.** CB1R and CB2R placental protein expression (histoscore) in male fetuses

	n	M (SEM)	n	M (SEM)	P	ES
<b>CB1R</b>						
Villi	4	54.54 (2.73)	4	59.83 (6.49)	0.77	-0.53 (-1.93- 0.92)
Decidua	3	46.88 (10.27)	5	45.26 (3.03)	0.45	0.14 (-1.31- 1.56)
<b>CB2R</b>						
Villi	4	89.78 (7.22)	5	100.4 (1.48)	0.086	-1.09 (-2.56- 0.5)
Decidua	4	62.65 (12.17)	6	85.14 (5.75)	0.088	-1.21 (-2.62- 0.29)

**Conclusions:** Increased CB2R expression is consistent with the pattern of inflammation associated with MO, thus it provides the pharmacological target for placental interventions in MO.

**Novel technology of the biofilm growth for evaluation of antimicrobial properties of  
*Lactobacillus Plantarium***

**Presented by: George Flores, MS3**

**Co-authors: Stacy Martinez, Abdul Hamood, M.D., Christophe Beloin, Natalia Schlabritz-  
Lutsevich, M.D., Ph.D., Gary Ventolini, M.D.**

**Faculty Advisor: Gary Ventolini, M.D.**

**Department of Obstetrics and Gynecology**

**Introduction.** Growth of the microbial biofilm represents the survival strategy for many bacterial species. Formation of the specific biofilms protects pathogenic bacteria from the influence of antibiotics and vice-versa – the components of the microbial biofilm could be used to combat antibiotic-resistant micro-organisms. Specifically the protective properties not associated with the acidic environment of *Lactobacilli species* has been recently described. It has been suggested, that the ability of *Lactobacilli* to combat infection have been associated with the biofilm production. However, the understanding of the mechanism has been hampered by the absence of the reliable methods to produce and quantify amount of the biofilm *in vitro*.

**Objectives.** Here, we describe for the first time application of the novel technology, developed at the *Luis Pasteur Institute* (France) to produce biofilm by *Lactobacilli Plantarum*.

**Material and methods.** The setup of the biofermenter is presented on Fig.1. Briefly, the biofilm was grown during 48 hours' time period in the conditions of the constant flow of the media (2 ml/min). The presence of *Lactobacilli* species was confirmed by RT-PCR with the specific primer-set

**Results.** During 48 hours in the culture we were able to produce measurable amount of the biofilm (Fig.2), which was specific for *L. Plantarum* (Fig.3).

**Conclusion.** This is the first report of the successful biofilm growth using this novel technologies, which could be applied for the different aspects of treatment of antibiotic resistant infections and for understanding the biofilm formation in different settings.



## **Disseminated Nocardiosis Associated with Infliximab Use in Ulcerative Colitis**

**Presented by: Orlando Garner M.D. PGY-1; [orlando.garner@ttuhsc.edu](mailto:orlando.garner@ttuhsc.edu)**

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**Department of Internal Medicine**

**Introduction:** Opportunistic infections become a concern when patients with inflammatory bowel disease (IBD) are treated with TNF-alfa inhibitors. Use of these drugs has become more commonplace and with it, the incidence of life threatening infections by unusual bacteria, such as *Nocardia* spp. A high level of suspicion is warranted.

**Case Presentation:** We present a case of a 57-year-old African American female with past medical history of ulcerative colitis (UC) and associated arthritis treated with infliximab and prednisone who presented to the emergency department with acute onset of chest pain and shortness of breath, in addition to a two-week history of productive cough. Physical examination revealed oxygen saturation of 88% on room air, temperature of 98.5F, respiratory rate of 24, decreased breath sounds and crackles bilaterally, and a white blood cell count of 31,980. She was admitted with the diagnosis of community acquired pneumonia (CAP) and was pan cultured. Blood cultures grew *Nocardia farcinica*. She was treated with trimethoprim-sulfamethoxazole (TMP-SMX), to which the patient responded favorably but developed severe hyponatremia leading transfer to the intensive care unit. After the patient was stabilized, she was discharged to senior care with lifelong TMP-SMX therapy and infliximab was held.

**Discussion:** To our knowledge only one case of disseminated nocardiosis associated with the use of infliximab for ulcerative colitis has been reported in the literature. The treatment of choice is TMP-SMX but in our patient her course was complicated by hyponatremia, a rare side effect of this antibiotic. Patients placed on TNF-alfa inhibitors should be followed up closely due to the increased risk of infectious disease with atypical organisms. Antibiotic therapy should be started very cautiously since TMP-SMX is an often used antibiotic that can produce very adverse side effects, including hyponatremia.

## Vertebral Artery Thrombosis in Chronic Idiopathic Thrombocytopenic Purpura

Presented by: Zakaria Hindi, M.D, PGY-I; zakaria.hindi@ttuhsc.edu

Department of Internal Medicine

**Introduction:** Immune thrombocytopenic purpura (ITP) is an autoimmune hematological disorder that causes decreased production and destruction of platelets leading to thrombocytopenia. Although thrombocytopenia usually causes hemorrhagic problems, thrombotic events like strokes, although rare, can still occur. Management of thrombotic events in patients with ITP differs from that of patients with normal platelet count function and count.

**Case description:** A 32 year old female with a history of ITP presented with ischemic stroke. The patient was treated in the hospital with IV immunoglobulin, discharged to a rehabilitation facility, and had complete resolution of symptoms when examined at a follow up visit 3 months later.

**Conclusion:** Although stroke in patients with ITP is very rare due to thrombocytopenia, it has been reported in several other published cases, and is likely associated with increased platelet microparticle levels, a byproduct of platelet destruction. While usage of anti-platelet therapy in such patients is debated, immunosuppression therapy has been the mainstay treatment in all published cases.

**Keywords:**

Idiopathic thrombocytopenic purpura, vertebral artery thrombosis, stroke, ITP

## **Burning Fat with Steroids**

**Presented by: Alfredo Iardino, M.D. PGY-I; [alfredo.iardino@ttushc.edu](mailto:alfredo.iardino@ttushc.edu)**

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Atheroembolism is a rare but feared complication of arteriography, causing a myriad of signs and symptoms including livedo reticularis, abdominal pain, cyanosis of the toes, and renal injury. Main cause is a rupture of atherosclerotic plaque in vessel walls and its embolization to small diameter vessels affecting more frequently skin and kidneys. Here we present a 69 year-old Hispanic male with past medical history of hypertension (HTN), type 2 diabetes mellitus (T2DM) and unstable angina (UA) status post drug eluting stent (DES) in the left anterior descending (LAD) coronary artery placement 10 days prior to admission, who arrives to the emergency department with intense diffuse sharp abdominal pain, nausea, vomiting, oliguria and lower extremity pain. Physical examination disclosed livedo reticularis in lower extremities, tender abdomen with decreased bowel sounds, and fundoscopy positive for a Hollenhorst crystal observed in right inferotemporal quadrant and increased creatinine and BUN. Patient was treated with methylprednisolone 125 mg TID which improved patients abdominal symptoms, renal function and skin findings. He was discharged 16 days later with prednisone 50 mg po and was followed up over a year with resolution of initial symptoms. Management of atheroembolism is usually supportive and depends on the affected organ, to our knowledge there are no studies that have evaluated treating this complication with anti-inflammatory therapies, specifically steroids. Here we present a patient whose clinical course was improved by trial of intravenous steroids followed by a course of oral steroids. Further studies should be made to successfully treat this feared complication.

## Fatal interactions

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### Department of Internal Medicine

Ergotism is an ischemic complication due to vasoconstriction of the vessel all around the body, due to ingestion of Ergotamine, a drug commonly used for migraines. Ergotamine is a ergopeptide part of ergot family of alkaloids that shares structural similarities with serotonin, dopamine, norepinephrine which favors vasoconstriction. Its metabolized in the liver by Cytochrome P450 3A4 (CYP3A4), which is why it's contraindicated in drugs that inhibit this pathway. We present a 34 year-old Hispanic male positive for Human Immunodeficiency Virus (HIV) treated with Saquinavir, Ritonavir (RTV) and Abacavir/Lamivudine for the past six years who presents to the emergency department complaining of pain on left foot accompanied by swelling one week prior to admission. On examination: The left lower extremity was cold at touch with absence of dorsalis pedis and posterior tibial pulses. Arterial Doppler revealed absent arterial flow from the popliteal artery later confirmed by arteriography. Medication reconciliation revealed a recent prescription for migraine headache containing ergotamine which was filled a week prior to admission. Drug was immediately stopped and the patient was started on Cilostazol, Low molecular weight heparin and nitroglycerin patches on the affected limb with complete resolution of symptoms and arteriography findings two days later revealed good flow through the Left lower extremity. RTV is a protease inhibitor that is metabolized in the liver at the P450 isoenzyme; RTV inhibits CYP3A4 which is responsible for the metabolism of Ergotamine and will decrease its metabolism and increase its effects over the  $\alpha_1$ -receptor in the vessel causing generalized vasoconstriction, resulting in ergotism. A thorough history and physical examination is key in the evaluation of any patient and medication reconciliation is an often overlooked part, in our case it revealed an important drug interaction that saved a patient's limb.



## **Insulin for a broken heart**

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### **Department of Internal Medicine**

The no reflow phenomenon [NRP] is a microvascular obstruction that reduces flow to the myocardium after a coronary percutaneous intervention [CPI] and is usually managed with intracoronary infusion of vasodilator drugs such as Adenosine, Verapamil, Nitroglycerine, or Nitroprusside. We present a 65 Year old Hispanic male with no significant past medical history who presented to the emergency department with acute coronary syndrome [ACS] presenting as ST elevation myocardial infarction and complete AV Block due to a complete occlusion of right coronary artery (RCA) that after placement of drug eluting stent (DES) went into ventricular fibrillation which converted into normal sinus rhythm with early desynchronized cardioversion; patient became immediately hypotensive with a mean arterial pressure [MAP] of 46 mmHg. Intracoronary infusion of verapamil was given unsuccessfully and patient hypotension worsened for which triple vasoactive drug therapy was started with no improvement. MAP went down to 36 mmHg in maximum doses of vasoactive drugs; high dose insulin drip was started and 30 min later MAP went up to 67 mmHg with complete discontinuation of vasoactive drugs. Patient was discharged to medical floor four days after admission and home seven days later. Therapy with high regular insulin has shown to be effective in septic shock when patients are unresponsive to inotropic therapy. The anti-inflammatory effect of insulin suppressing tumor necrosis factor- $\alpha$ , interleukin-1, and intracellular adhesion molecules are thought to be the factors that aid in refractory shock. Studies with large populations are warranted to establish if insulin can be used routinely in patients that do not respond to vasoactive drugs, but it has been used successfully in the past and can be considered if conventional therapy fails.

## **The effect of self-directed meditation on third year medical students**

**Presented by: Nuvneet Khandelwal, MS3; [nuvneet.khandelwal@ttuhsc.edu](mailto:nuvneet.khandelwal@ttuhsc.edu)**

**Co-authors: Bobby Jain, M.D., Maxine Zhou, MS3, Jaime Camacho, MS3**

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**Department of Psychiatry**

Mind-body training programs, such as Mindfulness-Based Stress Reduction (MBSR), are useful interventional tools, showing their effectiveness in different settings, particularly in the management of stress and quality of life. Mindfulness is the practice of bringing one's personal attention and focus on the present to improve psychological wellbeing. It is a form of lifestyle modification that shows some therapeutic applications and can help reduce symptoms of depression, anxiety, and stress. Past research studies have shown that with consistent mind-body training programs, medical students (3rd and 4th years) demonstrate improved distress tolerance and positive psychological well-being. While it is important to introduce medical students to coping mechanisms such as meditation through an elective or a group MBSR program, internalizing the technique to adjust to busy individual schedules adaptively is an important part of cultivating a regular, long-lasting practice with optimal benefits. While there have been many studies done elucidating the potential benefits of meditation techniques such as MBSR, gauging the effect of self-directed meditation techniques on stress and well-being of medical students has yet to be adequately determined. Medical students will be asked to participate in an 8-week self-directed MBSR program where they will meditate three times a week for 15-20 minutes. Meditations will be available on the website [palousemindfulness.com](http://palousemindfulness.com). We will measure mindfulness, perceived stress, and well-being using questionnaires at the beginning, week 4, and end of the 8-week period. This 8-week time period though not tested empirically, is recommended by most experts as adequate time to experience therapeutic experience of mindful meditation. Students will have numerical identifiers matched to the last 4 digits of their phone number in order to maintain confidentiality. Students will report compliance to the study by signing up for the meditation app "insight timer", which logs and records user meditations over time. This application is commonly used to measure time spend in medication. We have selected this application amongst others due to its free availability and ease of use. They will be allowed to create their own username to preserve confidentiality.

## **Multidisciplinary approach to the perinatal care of families affected by fetal anomalies**

**Presented by: Hanna Kodeih, D.O., PGY-II; [hanna.kodeih@ttuhsc.edu](mailto:hanna.kodeih@ttuhsc.edu)**

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**Faculty Advisor: James Maher, M.D.**

**Department of Obstetrics and Gynecology**

The prenatal diagnosis of a congenital anomaly occurs in 2-3% of all pregnancies and affects 120,000 births annually. Ultrasonographic diagnosis has dramatically changed the neonatal care of affected infants, allowing for effective matching of the delivery site with the neonate's post-delivery needs, when instability is anticipated. We believe our perinatal conference improves neonatal outcomes, resource utilization, and patient satisfaction. Additionally, this conference offers coordination of care essential for optimal delivery planning, patient education, and neonatal consultation. We would like to study these parameters.

**Methods:** At Texas Tech University Health Sciences Center School of Medicine Permian Basin Obstetrics and Gynecology Department, perinatal conference is a multidisciplinary conference which is used as a tool for: 1) Dissemination of information about complex problems to the health care team 2) Discussion of core needs and delivery plans, 3) Education in ultrasound for residents and faculty in families affected by fetal anomalies. This conference includes review of antenatal patients with fetal anomalies, followed by review of ultrasound images and discussion of care plan. Fetuses with structural problems often require delivery at a surgical center. This conference aids in avoiding inappropriate local deliveries, emergent delivery, and neonatal transport. This conference serves to facilitate communication on status of affected pregnancies, updates of delivered babies, and quality improvement opportunities for future infants. Results Retrospective analysis has shown fewer inappropriate deliveries and associated decrease in utilization of resources. Conclusions Prenatal ultrasound diagnosis of congenital anomalies in combination with multidisciplinary management provides a critical opportunity to improve patients' care and physician education.

## **A quality improvement study for seatbelt use in obstetric population**

**Presented by: Madeline Manning, D.O., MBA, PGY-IV; [madeline.meurer@ttuhsc.edu](mailto:madeline.meurer@ttuhsc.edu)**

**Faculty advisor: Michael Makii, M.D.**

**Department of Obstetrics and Gynecology**

**Introduction:** Motor vehicle accidents are the leading cause of death in the obstetric population.

Complications after a motor vehicle accident are serious and include placental abruption, preterm labor, uterine rupture, and maternal, fetal, and neonatal morbidity and mortality, which can be devastating without safety belt use. Seat belts have been proven as an important component to automobile safety for drivers and occupants of all ages. The rate of seat belt use was 84% nationwide and 93.7% in the state of Texas in 2011. It is imperative the obstetric patient receives proper safety belt education in their prenatal care.

**Methods:** This will be a quality improvement study assessing safety belt use, as driver or passenger, in the Texas Tech University Health Sciences Center of the Permian Basin obstetric population. In the University Women's Health Clinic, a pre-intervention quiz and inquiry about seat belt use in pregnancy will be performed at patient's initial prenatal care visit. Immediately following, an educational sheet of information regarding seat belt use and proper placement during pregnancy produced by the U.S. Department of Transportation will be given to the patient. The post-intervention quiz, identical to the previous quiz, will be administered in the third trimester in the clinic. The quiz was also produced as a part of the Buckle Up America campaign.

**Intended Outcome:** The intent is to increase seatbelt use and seatbelt knowledge in the obstetric population at Texas Tech University Health Sciences Center.

## **Itch without Rash: A case of Post Stroke Neuropathic Itch Syndrome**

**Presented by: Maria Montero, M.D., Geriatric Medicine Fellow; maria.montero@ttuhsc.edu**

**Co-authors: Jorge Alamo, M.D., Anna Francisco, M.D., Debbie Smith, D.O., Liliana Andrade, M.D.**

**Faculty Advisor: Liliana Andrade, M.D.**

**Department of Family and Community Medicine**

**Background:** Itch is a common dermatologic complaint in people over the age of 65 and it is usually accompanied by some sort of rash. When itch presents with no rash, can be a symptom of internal conditions such as biliary obstruction, renal disease, hyperthyroidism, and malignancy. It can also be related to psychiatric issues and in rare occasions neuropathic in origin. We present a case of a 66 year-old Hispanic female with Past Medical History of Post-Polio Syndrome, Pre-diabetes, hypothyroidism, and Stroke with complaint of chronic, constant, diffused pruritus, associated with pain, with no evidence of rash that started after she had her second stroke one and a half years prior. Several treatments were attempted with no success with the exception of mild alleviation with the use of Gabapentin and Ativan. Due to lack of improvement, skin Biopsy was performed which was normal.

**Methods:** Case Report.

**Discussion:** Itch perception utilizes many of the same neural pathways used in pain sensation. Neuropathic itch results from a lesion in the afferent sensory pathway. Post stroke neuropathic itch consists of excessive localized or generalized pruritus primarily in the side of the body contralateral to the cerebral lesion, it usually has subcortical or brainstem localization, and are most commonly caused by ischemic strokes.

Neuropathic itch and pain are complex conditions in which a specific trigger, neuronal damage, increases risk for symptoms in individuals with underlying susceptibility. In the case presented, our patient had an underlying neurologic condition (Post-Polio Syndrome) where there is chronic denervation and motor neuronal loss, who sustained 2 strokes, last one likely producing central and axonal sensitization of the small fibers causing chronic neuropathic itch syndrome.

**Conclusion:** Chronic pruritus can have a significant effect on quality of life, itching can be debilitating and cause depression. It is important for physicians caring for stroke patients to be aware neuropathic itch syndrome and to avoid ignoring the symptoms or pursuing unnecessary work-up for other etiologies.

Neuropathic itch has been associated with most of the major categories of neurological disease ranging from stroke, tumors and vascular malformations, to demyelinating disease and radicular compression.



# Increased Fraction of Cardiac Output toward Uterine Artery in Maternal Compromise in *Papio Spp.*

Presented by: Daniella Pino, M.D., PGY-I; daniella.pino@ttuhsc.edu

Co-authors: Natalia Schlabritz-Lutsevich, M.D., Ph.D., Maria Chavez, DVM, Anand Cholia, M.D., Gary White, DVM, Marcel Chuecos, Saloni Cholia, James Maher, M.D.

Faculty Advisor: Natalia Schlabritz-Lutsevich, M.D., Ph.D.

Department of Obstetrics and Gynecology

**Introduction:** Maternal vascular remodeling plays a central role in pregnancy development. Local (spiral artery) and central (maternal cardiovascular system) vascular beds undergo physiological changes that start in early gestation. Maternal cardiac output (CO) has been suggested as an index of fetal growth and maternal vascular resistance – as a screening tool of pre-eclampsia. Non-human primates – baboons (*Papio spp.*) have a type of placentation that is relatively similar to humans, however these species do not develop pre-eclampsia. The aim of this study was to evaluate pregnancy-driven blood flow distribution toward uterine artery (UtA) as a fraction of maternal CO in *Papio spp.*

**Methods:** Five non-pregnant and five pregnant baboons near term underwent ultrasound examination as previously described (Ultrasound Obstet Gynecol. 2005 Sep;26(3):252-7). The absolute blood flow was calculated using GE algorithm:  $QA \text{ (in ml/min)} = V \text{ (in cm/s)} \times \pi r^2 \times 60 \text{ s/min}$ ; where QA is the arterial flow, V is the time-averaged mean velocity, and r is the radius of the vessel. Data were analyzed using the Mann-Whitney U-test.

**Results:** The absolute and weight-adjusted UtA blood flow was increased in pregnant, compared to the non-pregnant animals, the ratio UtA/CO was higher in two animals with advanced reproductive age and cardiac pathology (higher number of pregnancies and vegetation on the aortic valve).

ID	P	Weight (kg)	UtA, blood flow		Aorta, blood flow		Fraction	Conclusions:
			ml/min	ml/min/kg	ml/min	ml/min/kg		
1	N	13.8	53.94	3.91	NA	NA	NA	The increase in the UtA/CO ratio could be a compensatory mechanism, ensuring fetal nutrient supply in compromised maternal conditions.
2	N	18.15	100.81	5.55	1718	94.65	5.87	
3	N	23.7	83.92	3.54	2360	99.57	3.5	
4	N	29.9	31.99	1.07	1338	44.75	2.39	
5	N	22.3	52.92	2.37	2492	111.75	2.12	
6	Y	15	86.14	5.74	2281	152.07	3.78	
7	Y	15.7	149.72	9.54	4635	295.22	2.2	
8	Y	16.6	164.22	9.89	1035	62.35	<b>15.87</b>	
9	Y	18.9	175.25	9.27	4824	255.24	3.6	
10	Y	23.1	148.4	6.42	1855	80.30	<b>8</b>	

## Comprehensive pain management versus standard pain management following cesarean delivery

Presented by: Gabrielle Rich, D.O., PGY-II; [gabrielle.rich@ttushc.edu](mailto:gabrielle.rich@ttushc.edu)

Faculty Advisor: David Moore, M.D.

Department of Obstetrics and Gynecology

Proposed project

**Introduction:** Opioid addiction is the second leading cause of maternal mortality in Texas. With maternal mortality on the rise in Texas, obstetricians have a responsibility to address this issue by trying to decrease narcotic use. Postoperative pain control is an important opportunity to make a change in narcotic usage. A comprehensive pain control protocol has been developed from general surgery literature that has been found to not only greatly decrease overall narcotic use but also to decrease the cost of postoperative care.

**Methods:** A randomized control trial will be used to evaluate postoperative pain in patients using our standard postoperative pain management verses the comprehensive pain management regimen following a cesarean delivery. Duramorph will be used in the spinal anesthesia to standardize baseline pain control in all our patients. The primary endpoint will be overall narcotic use. The secondary endpoint will be patient pain perception postoperatively.

**Results:** Data will be analyzed using the appropriately statistical models.

**Discussion:** Continued research is needed for obstetricians and gynecologists to decrease narcotic use in patients while still providing appropriate postoperative pain control.

## Teaching the cervical exam: A cost-effective simulation

Presented by: Lyndsay Rodriguez, M.D., PGY-II

Faculty Advisor: David Moore, M.D.

Department of Obstetrics and Gynecology

**Objective:** The purpose of this study is create a cost-effective tool for teaching interns, medical students, and nursing staff to examine cervical change during labor, specifically focusing on cervical dilation and effacement.

**Study Design:** Survey. Participants will be asked to compare 2 models that teach the cervical exam. They will rate each model on the Likert scale which assigns a number rating from most realistic to least realistic. They will be asked to compare various aspects of each model including appearance, texture, etc.

**Materials:** Tennis balls, Tortillas, Compass, Scissors, Glue, Tube socks

**Results:** The results of the survey will be used to determine which of the two models is most realistic. The models will also be assessed in terms of cost, reproducibility, and longevity. I hypothesize that I can create a model of equal value in terms of teaching accurate cervical dilation and effacement at a significantly reduced cost when compared to a store bought model.

## Haloperidol-Induced Dysphagia

Presented by: Talal Zahoor, M.D., PGY-I

Co-author: AbdAllah Gad, M.D., PGY-I

Faculty Advisor: W.R. Davis, M.D.

Department of Internal Medicine

**Introduction:** Difficulty in swallowing, also known as dysphagia, can present with detrimental complications such as choking, asphyxia, aspiration, and can also interfere with the ability to eat, leading to malnutrition. Drug-induced extra-pyramidal syndrome (EPS), specifically due to conventional neuroleptics, may cause acute dysphagia and has been reported in case reports, but the prevalence cannot be exclusively quoted, as dysphagia was not one of the end-points included in the original studies evaluating neuroleptic-induced EPS. Dysphagia is also a known complication of parkinsonism along with asymmetrical bradykinesia, rigidity, and tremor; however, it presents late in the course of the disease. We report a case of a 46-year-old male with onset of acute dysphagia receiving haloperidol for psychosis, with no previous similar symptoms or drug-induced parkinsonism.

**Case Report:** A 46-year-old Hispanic male with a known history of diabetes mellitus type 2, hypertension, depression, and psychotic disorder presented to the ER for a 5-day history of generalized muscle twitch with weakness and dysphagia to solids. The patient was recently admitted and discharged from a mental health facility for an acute psychotic attack, for which his dose of haloperidol was increased from 2.5mg to 10mg TID. Since discharge, the patient stated that he had not been able to swallow soft foods as it felt like the food would get stuck in his throat, but was still able to tolerate liquids and that his overall PO intake had been diminished. He recalled onset of dysphagia to be sudden with no similar symptoms in the past. He also reported twitching muscle spasms all over his body. On the morning of admission, he felt so weak that he was unable to ambulate requiring assistance to get out of bed. On physical examination, he was alert and oriented to person, place, and time. His speech was slurred and slow with reduced pitch. There was mild tongue and lower facial tremors, as well as diffuse upper and lower extremity twitches which were more evident with active movements. Strength was 3/5 in all four extremities.

On admission, he was found to be mildly hypokalemic with a K of 3.1, most likely due to poor oral intake, with no EKG changes. CT/MRI of the brain did not depict any signs of an acute cerebrovascular accident. Thereafter, haloperidol was discontinued and benztropine 2mg BID started. Patient's weakness, dysarthria, tremors, twitches, and dysphagia markedly improved by the day of discharge.

**Discussion:** EPS is known as a drug-induced movement disorder that induces akathisia, acute dystonia, parkinsonism, and tardive dyskinesia of which only the latter is irreversible. The main culprit of EPS in most cases is typical antipsychotics, and to a lesser extent with atypical antipsychotics. Dysphagia is not a well-known sequela of antipsychotics and so is not readily associated with EPS. In our patient, the dysphagia, tremors, and twitching all resolved with the discontinuation of haloperidol and initiation of benztropine which further supported our diagnosis of EPS. Often, dysphagia is thought to be due either to a neurological etiology or a mechanical obstruction. It is prudent to rule out etiologies such as stroke or malignancy as both can have a detrimental effect if missed. Clinicians should also be aware of antipsychotic-induced dysphagia which can be easily reversed, thus avoiding severe complications such as asphyxia and aspiration. The most valuable tool in identifying the most appropriate cause of dysphagia is to obtain an accurate and detailed history with high clinical awareness to include, but not limited to, antipsychotic-induced dysphagia. Treatment strategies that have been documented to resolve antipsychotic-induced dysphagia include discontinuation, lowering dose, and/or changing neuroleptic therapy.

## Association of ethnicity and hypogonadism in males with diabetes mellitus type 2 (DM2)

**Presented by:** James Wang, M.D., PGY-I; james-1.wang@ttuhsc.edu

**Co-authors:** Imran Khan, M.D, Nimat Alam, M.D., Ikemefuna Okwuwa, M.D.

**Faculty Advisors:** Nimat Alam, M.D. and Ikemefuna Okwuwa, M.D.

**Department of Family and Community Medicine**

**Background:** In recent years, hypogonadism has been reported to be an emerging risk factor for developing DM2 in males. Prevalence rates of hypogonadism among males with DM2 have been reported to be as high as 50%. In addition, the prevalence rate of DM2 is higher in Hispanic Whites (HWs) compared to Non-Hispanic Whites (NHWs), which has been attributed to a higher prevalence of MetS (metabolic syndrome) in HWs. As reported in several studies, HWs have a genetic predisposition to develop DM2. There are almost no studies on the prevalence rate of hypogonadism in HW particularly among Mexican Americans who make up the highest proportion of HWs in the US. Our resident outpatient clinics at the Texas Tech University Health Sciences Center in Odessa have a high volume of patients with DM2, 40% of which are Mexican Americans.

**Objectives:** The purpose of the study is to evaluate the difference in the prevalence rates of hypogonadism in DM2 males amongst Mexican Americans and NHWs.

**Methods:** A cross sectional study design was used. Study patients were asked to complete 3 validated questionnaires to monitor for issues related to hypogonadism: 1) the ADAMS questionnaire (androgen deficiency in aging males), 2) Berlin questionnaire, and 3) the PHQ-9 (patient health questionnaire). The following measures were analyzed: prevalence rate with confidence interval of hypogonadism, association between ethnicity and hypogonadism via Chi-square statistics, and logistic regression with all variables included.

**Results:** Eighty-three subjects were included in the analysis. The prevalence of hypogonadism measured by the ADAMS questionnaire was 87.5% and 87.9% in the NHW and HW populations. The p-value for the association of the ADAMS questionnaire, the Berlin questionnaire and PHQ9 versus ethnicity were 0.958, 0.753, and 0.909 respectively. The Chi-squared test for independence between ethnic and hypogonadism was 0.909.

**Conclusions:** No difference was found between in hypogonadism prevalence rates in males with diabetes mellitus type 2 in NHW and HW populations.



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# PERMIAN BASIN RESEARCH FORUM

## PRE-RECORDED PRESENTATIONS



## Effect of Instruction to Improve Stereotactic Skills Among OB/GYN Residents Using a Homemade Amniocentesis Phantom

Presented by: Sarah Burke, M.D., PGY-IV; sarah.burke@ttushc.edu

Faculty Advisor: James Maher, M.D.

Department of Obstetrics and Gynecology

**Background:** Ultrasound guided amniocentesis is procedure that requires advanced stereotactic skills to perform safely. Amniocentesis training is becoming difficult to obtain during residency with the emergence of non-invasive fetal testing, such as cell free fetal DNA. Even with increasing popularity of non-invasive fetal testing, amniocentesis is still needed to confirm karyotype abnormalities, assess for fetal lung maturity, diagnose fetal infection, and to guide management of fetal Rh isoimmunization. The stereotactic skills required to safely perform an amniocentesis require practice and repetition. An amniocentesis phantom would have the advantage of teaching stereotactic skills required for this procedure without exposing patients to potential discomfort or complications inherent in participation in resident training.

**Objectives:** This study aims to create a 3-dimensional training model, or a phantom, to simulate necessary stereotactic skills required to safely perform an amniocentesis.

**Study Design Methods:** The amniocentesis phantom was created with commercially available blocks of 10% ballistics gel (Clear Ballistics) and a 6qt plastic box (Sterlite). The gel was heated using a slow cooker. Black clothing dye was mixed into the heated gel solution. The gel was opacified with black clothing dye to create more realistic model in which the trainee would not be able to visualize the targets without the aid of the ultrasound. Small latex balloons were filled with colored water were placed into gel as it was poured into the mold. These fluids filled balloons served as the amniocentesis targets. The colored fluid in the balloons allowed for easy confirmation that trainee had hit the intended target. The balloons were positioned at varying depths in the gel to create a 3-dimensional phantom that would better approximate the challenges of performing a real amniocentesis. The gel was left in the plastic box mold overnight to set.

The residents were initially permitted to attempt to hit the targets under ultrasound guidance. Faculty observed these efforts and gave immediate feedback regarding technique. The number of needle insertions required to successfully hit each target was recorded. Following faculty instruction on how to properly hold ultrasound transducer and perform ultrasound guided localization, the residents were then permitted to reattempt the exercise on a new set of targets. The number of attempts to successfully hit the target following instruction were compared to those recorded from the attempts prior to instruction.

**Hypothesis:** We hypothesize that following formalized on amniocentesis technique will improve the accuracy, defined as the number of needle insertions required for successful needle localization. Additionally, we hypothesize that our phantom composed of ballistics gel will be an improvement over other ultrasound phantoms described in the literature.

## Time dependent fetal Raman spectroscopy (RS) fingerprints of placental hypoxia

Presented by: Kushal Gandhi<sup>1</sup>, Ph.D., post-doctoral research fellow; Kushal.gandhi@ttuhsc.edu

Co-authors: Paul Brownbill<sup>2</sup>, Ph.D., Gary Ventolini<sup>1</sup>, M.D., Moss Hampton<sup>1</sup>, M.D., James Maher<sup>1</sup>, M.D. and Natalia Schlabritz-Loutsevitch<sup>1</sup>, M.D., Ph.D.

Department of Obstetrics and Gynecology

<sup>1</sup>Texas Tech University Health Sciences Center at the Permian Basin, Odessa, TX

<sup>2</sup>University of Manchester, Manchester, UK

Faculty Advisor: Natalia Schlabritz-Lutsevich, M.D., Ph.D.

**Introduction:** Tissue metabolic profiles depend on metabolic rate, tissue composition and physiological status. The specific metabolic fingerprint could be used as a unique diagnostic tool. RS is the methodology, which allows an investigation of tissue physiology at the cellular and tissue levels, using photon scattering and has been gaining attention recently as an analytical tool in cancer and reproductive research. Taking in consideration the urgent needs to develop non-invasive methods for diagnostic of placenta's disturbances.

**Aim:** To analyze fetal RS in *in vitro* model of maternoplacental hypoxia in the ex vivo human dual placental perfusion model.

**Material and Methods:** Fetal venous perfusate was analyzed from a modified perfusion technique to achieve a mean soluble oxygen tension within the intervillous space (IVS) of 5-7% for normoxia (n=5) and <3% for hypoxia (n=6) as described in *Lab Invest.* 2014 Aug;94(8):873-80. In this published work the results showed a significant increase under hypoxia in the levels of different cytokines and markers of oxidative stress, including IL-6, IL-8, TNF- $\alpha$ , IFN- $\gamma$ , ET-1, malondialdehyde and 8-iso-prostaglandin F2 $\alpha$  in maternal venous samples and ET-1 in fetal samples at 360 min. A hand-held Raman instrument (Mira M-1, Metrohm, CA, USA) was used to analyze perfusates within borosilicate glass vials, inserted into vial holder for measurements at ambient temperature. Data was collected using Mira Cal software (Metrohm, CA, USA).

**Results:** We discovered two patterns in Raman spectra of placental hypoxia (n=6) and normoxia (n=5) perfusates. These two patterns in various wavelengths showed the differences in different forms and in amplitudes. Each peak in a Raman spectrum is associated with a unique part of the molecule and can be used for identification and confirmation by comparing with standard library spectra.

**Discussion and conclusion:** The two RS fingerprints patterns represent unique preliminary data, utilizing a potentially new obstetric technology, which could help diagnose the duration of placental hypoxia, ultimately providing novel targets for treatment and prognosis of placental related disorders.

## Evaluation of the thermal map of human placenta as the first step to in vivo application of infrared thermometry

Presented by: Jonathan Lugo, M.D., PGY-IV; [jonathan.lugo@ttuhsc.edu](mailto:jonathan.lugo@ttuhsc.edu)

Co-authors: Alan John, MS4, James Maher, M.D., Natalia Schlabritz-Lutsevich, M.D., Ph.D.

Faculty Advisor: Natalia Schlabritz-Lutsevich, M.D., Ph.D.

Department of Obstetrics and Gynecology

**Introduction:** The placenta is the primary fetal organ of respiration, metabolism, nutrition and excretion. The placenta responds to maternal conditions through the mechanism of changes in the blood flow, metabolism and morphology. Abnormal placental function is the fundamental cause of potentially life-threatening complications, such as pre-eclampsia, abruption, placenta previa and fetal growth restriction. Due to the unique structure of the human placenta, unique placental-specific parameters will need to be developed. One parameter is placental metabolism and capacity to serve as a radiator for the heat exchange between mother and fetus. The novel technology of termed infrared thermometry allows detection of the electromagnetic waves (heat) produced by metabolically active structures. We hypothesize that infrared thermometry could accurately estimate the placental heat map after placental delivery, which would depend on placental vascular tree morphometry. The aim of this study was to evaluate whether infrared thermometry could be applied to the estimation of the placental heat map.

**Materials and methods:** Placental temperature was measured within five minutes after delivery of the placenta, using (FLIRone FLIR Systems, Inc. (Wilsonville, OR, USA) in six placentas. The placenta was spread out with the maternal side visible (Fig. 1A). Two measuring tapes were placed along the x and y axis. The thermal image was taken from the height of 45 cm above the surface of the table. Three categories of the color intensities were investigated: for bright yellow (BY), yellow (Y) and orange (O). The image was analyzed through the provided software to estimate the temperature associated with the particular color (Fig. 1B). The percentage of each area was evaluated, using "Image J" program.

**Results:** The average temperature of the regions were  $36.3 \pm 0.5^{\circ}\text{C}$ ,  $34.7 \pm 0.3^{\circ}\text{C}$ , and  $31 \pm 1.2^{\circ}\text{C}$  for BY, Y and O respectively. The thermal areas were distributed as follows  $14\% \pm 13\%$  (BY),  $38\% \pm 13.5\%$  (Y) and  $47 \pm 8.6\%$  (O). The absolute surface areas were  $20 \pm 8 \text{ cm}^2$  and  $119 \pm 21 \text{ cm}^2$ .

**Conclusions:** The heat map of the placenta might provide useful tool for evaluation metabolically active placental tissue in utero.

## Perfusion of Human Placenta as a Model of Vascular Research

Presented by: Christina Prendergast, M.D., PGY-I; Christina.prendergast@ttuhsc.edu

Co-authors: Maira Carrillo, Ph.D., Andrey Bednov, Ph.D., Marcel Chuecos, James Maher,

M.D., Lee David Moore, M.D., Moss Hampton, M.D., Gary Ventolini, M.D.,

Natalia Schlabritz-Lutsevich, M.D., Ph.D.

Faculty Advisor: Natalia Schlabritz-Lutsevich, M.D., Ph.D.

Department of Obstetrics and Gynecology

**Introduction:** The early detection of placental dysfunction is critical for the fetal and maternal survival. Additionally the placenta is a highly vascular organ and has been used as a model for brain research and vascular responses. The structure and function of the placenta differs between male and female fetuses, which makes it a perfect model to study gender-dependent vascular responses. There are indeed obvious gender differences in vascular responsiveness and vascular metabolism, which has been identified in other vascular beds. The technique of placental perfusion *in vitro* provides a unique opportunity to evaluate the physiological responses to the vascular active substances and estimate the feto-maternal drug transfer.

**Methods:** After obtaining the informed consent, placenta was received after non-complicated cesarean section delivery, the fetal artery was immediately cannulated, followed by the cannulation of fetal vein (Figure 1 A). The cannulation and flushing re-established the circulation in one of the intact cotyledons (Figure 1 B) at which time it is placed into the perfusion chamber (Figure 1 B). The re-established circulation is open circle fetal circulation (Figure 2). A basal fetal arterial hydrostatic pressure (FAHP) was recorded (Figure 3). After baseline is established, KCl is added to induce vasoconstriction pressure is recorded using Lab Chart software (ADInstruments, U.S, Colorado Springs, Colorado). In addition to recording FAHP we also measure and record: temperature, pH, oxygen tension using Lab Chart. We also used the FLIR1 infrared technology to examine temperature of the sample which also

**Results:** The mean FAHP was  $35.3 \pm 5$  mmHg, mean weight of the cotyledons was  $44.0 \pm 4$  g. The temperature in the perfused cotyledon was constant throughout the experiment.

**Conclusions:** We were able to establish a baseline FAHP and subsequently induce vasoconstriction using KCl. Induction of vasoconstriction shows that the placenta is viable and metabolically active. Placenta perfusion is an excellent tool for the study fetal gender specific responses.



## Rare case of placental hepatocellular carcinoma

Presented by: April Riley, M.D., PGY-III; april.aguilar@ttuhsc.edu

Co-authors: Jerzy Stanek, M.D., Ph.D., Charles Burns, M.D., Edward Dick, Ph.D., Maira

Carrillo, Ph.D, James Maher, M.D., Natalia Schlabritz-Lutsevich, M.D., Ph.D.

Faculty Advisor: Natalia Schlabritz-Lutsevich, M.D., Ph.D.

Department of Obstetrics and Gynecology

**Introduction:** The transformation of placental cells into cells which resemble hepatocytes is an extremely rare event which has been described in only a few publications. The information about neoplastic transformation of such lesions is non-existent in any species studied.

**Case Description:** Here we describe the case of hepatocellular neoplastic placental transformation in a pregnant non-human primate at the end of gestation. Baboon (*Papio spp.*) was fed a high fat diet (45% fat) for a prolonged period of time which was started nine months preconception and continued during pregnancy. Placental slides were immunostained and evaluated by a board certified perinatal pathologist. Staining was strongly vimentin and INI1 positive, arginase positive, and glutamine synthetase positive. Vascular markers (CD31 and D240), S100, glypican, C-reactive protein, FABP, desmin, and beta-catenin were negative.

**Conclusion:** High fat diet is a possible risk factor for development of rare hepatocellular neoplastic placental transformation.

# SCHEDULE

**11:30 - 12:30**

*Poster Presentations – \*Kyle Beran - Master of Ceremonies*

**12:00 - 12:45**

*Lunch*

## ORAL PRESENTATIONS

**12:45 - 1:00**

*"The Experience of Intimate Partner Violence: Exploring the Relations Between Shame Proneness, Help-Seeking, and Leaving"*

Ayra Monica Cirilio

Faculty Advisor: Michelle E. Pence, Ph.D.

**1:00 - 1:15**

*"Preliminary Screening of Quorum Sensing in Environmental Isolates"*

Jeanette Karen Cala

Faculty Advisor: Athenia Oldham, Ph.D.

**1:15 - 1:30**

*"Salinity Effects of Flow Char of Polymer Solutions"*

Abdul Bari Wali

Faculty Advisor: Ahmed Kamel, Ph.D.

**1:30 - 1:45**

*"Confidence in Memory and Retention for Tests"*

Courtney Edmiston

Faculty Advisor: Emily A. Farris, Ph.D.

**1:45-2:00**

*"Novel Characterization of Silver & Gold Nanoparticles Utilizing a Laser System"*

Russel Maharaj\*

Faculty Advisor: Kyle Beran, Ph.D.

**2:00-2:15**

*"Regions of Reduced Cortical Thickness and Gray Matter Volume in Children with Dyslexia Compared to Typically Reading Controls"*

Lauren Wilson

Faculty Advisor: Dr. Emily A. Farris

**2:15 - 2:30**

*"Effects of Supercooling on Nanoparticle Morph"*

Jason Snitker\*

Faculty Advisor: Milka Montes, Ph.D.

**2:30 - 2:45**

*"Folk-Linguistic Perspectives of Oil Industry Personnel"*

Aliethia Dean

Faculty Advisor: Dr. Rebecca Babcock

**2:45 - 3:00**

*"Effects of Nanoparticles on Coral"*

Melissa Wood\*

Faculty Advisor: Milka Montes, Ph.D.

**BREAK**

**3:00 - 3:30 (Coffee and cake)**

**3:30 - 3:45**

*"The Victorio Peak, Cutoff, and Cherry Canyon Formations in the Apache Mountains near Van Horn, TX"*

Ben Cleveland & Craig Bennet

Faculty Advisor: Robert Trentham, Ph.D.

**3:45 - 4:00**

*"How do Cells Cope with Stress"*

April Smith, Alex Yaschenko, & Michael Blanco

Faculty Advisor: Samuel David, Ph.D.

**4:00 - 4:15**

*"Silver Nanoparticles Production by Bacteria and Optimization with Microwave"*

Hao-Yun Peng & Leslie Felix\*

Faculty Advisor: Mike Montes, Ph.D.

**4:15-4:30**

*"On War and Utopia"*

Austin Seth Trevino

Faculty Advisor: Rachel Martin Harlow, Ph.D. and Rebecca Babcock, Ph.D.

**4:30-4:45**

*"Energetic and Structural Analysis of Metallo-Heterofullerene Derivatives of C20: C19M (M = 3d Transition Metals)"*

Jordan McDonald\*

Faculty Advisor: Kyle Beran, Ph.D.

**4:45-5:00**

*"Augmented Reality Horror Game"*

Lucas Carlos

Faculty Advisor: Quan Yuan, Ph.D.

\* These students have posters over their projects as well.

### **University of Texas of the Permian Basin Acknowledgements**

A very special “thank you” to Dr. Diane Post as the founder of the Undergraduate Research Day.

Much appreciation to the Office of the Vice President and Provost for supplying lunch. Thank you to Dr. Mike Zavada, Dean of the College of Arts and Sciences and Dr. Juli Ratheal, Vice President for Graduate Studies and Research for their support of the Undergraduate Research Day.

Special recognition to Dr. Rebecca Babcock, Ms. Aliethia Dean and Mrs. Shelby Bullock for organizing and/or staffing this year’s events.

Much gratitude to the Undergraduate Research Committee who ensure the quality of the research presented: Dr. Kyle Beran, Dr. Joanna Hadjicostandi, Dr. Ann Maire Smith, Dr. Rachel Harlow, Dr. Vicki Johnson, and Dr. Prakash Pai.

Kyle Beran, Ph.D., will be serving as the master of ceremonies.

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# PERMIAN BASIN RESEARCH FORUM

University of Texas of the Permian Basin

## ORAL ABSTRACTS





## **Preliminary Screening for Quorum Sensing in Environmental Isolates**

**Presented by: Jeanette Karen Cala**

**Faculty Advisor: Athenia Oldham, Ph.D.**

**College of Arts and Sciences**

Quorum sensing (QS) is a method of communication utilized by bacteria to conform group-based gene expression according to their local population density. One method of determining the use of quorum sensing is through the observation of biofilm formation. The production of N-acyl homoserine lactones (AHLs), a form of quorum sensing signal molecules, allows for the formation of biofilms. Biofilms are characterized by colonization and attachment of bacteria on a surface. Thirty-three bacterial isolates acquired from US Navy ballast tanks were subjected to screening for AHLs through biofilm production. Three methods were used to detect and observe the formation of biofilms in each strain - (1) confirming the presence of floating films in a culture grown in a test tube, (2) looking for the formation of a pellicle, a crust of biofilm visible as a ring around the inside of the tube, and (3) measuring the absorbance of each strain in 96-well plates using crystal violet stain. Each of the methods was conducted using either marine media or marine + media. Out of the isolates grown in marine media, 30% produced floating films, 55% produced a pellicle, and 21% had an absorbance of  $>1$ . On the other hand, out of the isolates grown in marine + media, 64% produced floating films, 58% produced a pellicle, and 36% had an absorbance of  $>1$ . In marine media, 3% produced all forms of biofilm, while 9% produced all forms of biofilm in marine + media.

## **Augmented reality horror game**

**Presented by: Lucas Carlos**

**Faculty Advisor: Quan Yuan, Ph.D.**

**College of Arts and Sciences**

### **The Arrival**

Augmented Reality (AR) is a live view of real-world whose elements are augmented by digital information, such as text description, images, or GPS data. In this project, we investigate AR technology application on game development. Specifically, we propose to build a Survival mobile game using game engine *Unity* and augmented reality SDK *Vuforia*. The background story to the game is that there is an outbreak of experiments that should have been kept contained within the lab but managed to escape through carelessness. As a result, zombies are out in the real world with a thirst for blood and rapidly increasing in numbers. The user starts to get swarmed by those zombies, and in order to see them the user must physically turn around with their device. The purpose of the user is to attempt and survive the hoards for the longest possible time with a limited health bar.

**The experience of intimate partner violence: Exploring the relations between shame  
proneness, help-seeking and leaving**

**Presented by: Monica Ayra Cirilio**

**Faculty Advisor: Michelle E. Pence**

**College of Arts and Sciences**

The research I've begun working on examines female victims of intimate partner violence and their help-seeking behaviors. Specifically, my study examines three primary variables associated with the experience of intimate partner violence: likelihood to leave such a relationship, willingness to confide in others about the harmful aspects of the relationship (i.e., help-seeking behaviors), and shame-proneness. Two hypotheses were developed for testing:  
**H1:** As shame proneness increases, the likelihood of leaving a hurtful or harmful relationship decreases.

**H2:** As willingness to confide in others about a hurtful or harmful relationships increases, likelihood to leave the hurtful or harmful relationship will increase.

**The Victorio Peak, Cutoff, and Cherry Canyon formations in the Apache Mountains near  
Van Horn, TX**

**Presented by: Craig Bennett and Ben Cleveland**

**Faculty Advisor: Robert Trentham, Ph.D.**

**College of Arts and Sciences**

**Victorio Peak, Cutoff, and Cherry Canyon Formations in the Apache Mountains**

The Apache Mountains represent an extensively faulted and uplifted platform along the southern margin of the Delaware Basin. Equivalent outcrops in the Guadalupe Mountains have been extensively studied, but modern analyses of the Apache Mountains have been largely lacking. Our study area is located on the northwestern-most portion of the range, and is known to contain outcrops of the Victorio Peak, Cutoff, and Cherry Canyon Formations. The area has been studied previously (Wood, 1965), but the methods used have fallen out of favor over time, especially by the petroleum industry. The southern platform margin of the Delaware Basin has become a focus for unconventional resources, making it essential that the study area be reworked and integrated into the modern stratigraphic approach to shelf-to-basin evaluation. Two sections were measured in a dip direction. Both sections had been evaluated by Wood, but only the updip section was described in detail. In the past 50 years, modern techniques have supplanted those used in Wood's original work. Dunham's Carbonate Classification System had yet to be widely embraced, and Sequence Stratigraphy had not been developed. It was the goal of this project to re-establish Wood's measured section (MS1) and place it in a modern context, and apply these methods to create the first detailed study of Wood's basinward estimated measured section (MS2). Once established, these two sections will allow for an effective integration of Late Leonardian-Early Guadalupian stratigraphy of the platform-to-basin transition across this poorly understood portion of the Delaware Basin, as well as provide modern outcrop analogues for subsurface exploration.

The first, Measured Section One (M. S. 1), is known to contain the Victorio Peak and Cutoff Formations. It is characterized by a series of open marine, shoal, and tidal flat capped cycles, along with several siltstones. Measured Section Two (M. S. 2), approximately one mile north (basinward) of M. S. 1, contains both the Victorio Peak and Cutoff Formations, as well as the Cherry Canyon. This section is characterized by several shoal and open marine cycles, a series of large mound-like structures, and a cliff-forming shoal topped by more fine grained, less-resistant beds. An apparent shift away from purely carbonate deposition towards more siliciclastic content is of note higher in the section. Several cycles and cycle sets were identified in the two sections. Correlation, and creation a modern stratigraphic framework for the Apache Platform margin in Late Leonardian-Early Guadalupian time was completed.

## **Folk-linguistic perspectives of oil industry personnel and their families**

**Presented by: Aliethia Dean**

**Faculty Advisor: Rebecca Babcock, Ph.D.**

**College of Arts and Sciences**

The purpose of this research project is to determine whether insiders of the oil industry or their families believe that working in the oil industry influences language or dialect. The research is based on focus group interviews with oil industry personnel and their family members to analyze their opinions on if or how working in the oil industry has affected their language or dialect. The interviewees are of various ages, regions, genders, and backgrounds for having a diverse group of people to gather their perspective on whether they believe working in the oil industry has or has not altered how they communicate. The interviews were conducted through a folk-linguistics approach. Folk linguistics, also called perceptual dialectology, is the study of speakers' opinions and beliefs about language, language varieties, and language usage and is usually conducted in a natural or casual setting. There have been similar folk linguistic studies conducted and published such as "Folk-Linguistic Attitudes in Eastern Massachusetts" by Professor Rebecca Babcock and "Patterns of Innovation in the Language of the Oil Field" by Lalia Phipps Boone. There have also been similar studies done on oilfield linguistics such as "Beyond Four Letter Words: A Sociolinguistic Analysis of Humor in the Oil Fields" by Elizabeth Bilbrey McMellon. Gathering this data from non-linguists gives an invaluable insight into the paramount influence of the work environment on language.



## **Confidence in memory and retention for tests**

**Presented by: Courtney Edmiston**

**Faculty Advisor: Emily A. Farris, Ph.D.**

**College of Arts and Sciences**

The multiple-choice test is a common form of learning assessment in classrooms, and can help with long-term retention of information. The current study investigates how feedback following initial test items can influence a person's response and confidence on a later test, especially when the response to the initial test question was incorrect. Participants read passages, and then completed a multiple-choice test followed by a cued-recall test 5 minutes or 48 hours later. After each multiple-choice question, participants either received no feedback, the correct answer, a second chance to identify the correct answer, or a second chance followed by the correct answer. On both tests, after answering each question the participants provided a confidence rating on a scale of 1 (guess) to 4 (high confidence). First, it is hypothesized that correct answers on the initial test that are accompanied by low confidence ratings will be more likely to be retained on a later cued-recall test, if the participant received feedback to confirm that their answer was correct. Second, it is hypothesized that participants who receive feedback following an incorrect response on the initial test will be more likely to provide the correct response when the question reappears on the later test. Finally, it is hypothesized that the participant's confidence in their responses on the cued-recall test will be higher if the feedback received previously contained the correct answer. Data collection and analyses are ongoing. Yet, results can inform decisions regarding the best way to use tests to enhance long-term retention.

## **Novel characterization of silver and gold nanoparticles utilizing a laser system**

**Presented by: Russel Maharaj and Anthony Martinez**

**Faculty Advisor: Kyle Beran, Ph.D.**

**College of Arts and Sciences**

Nanoparticle size is principle in determining the type and field of application, whether it be in medicine as a drug transport system, used in manufacturing and materials to kill bacteria, to clean up environmental pollution in ground water, and incorporating into energy and electronics used to create solar cells. The purpose of this research project is to utilize a laser system that will record and measure wavelength spectra in order to characterize the physical parameters of silver and gold nanoparticles. The direct relationship between wavelength and nanoparticle size is employed to characterize the particulate system. The particle agglomeration (destabilization) of a nanoparticle suspension over time could be measured using this method and would determine the stability, usability, as well as help optimize the synthesis of the nanoparticles. Through this research an unknown nanoparticles' composition and size will be identified through the creation of a calibration curve. The calibration curve was created by measuring wavelength and scattering properties of known nanoparticles and their respective sizes through the implementation of a novel characterization technique employing a laser system.

**Energetic and structural analysis of Metallo-heterofullerene derivatives of  $C_{20}$ :  $C_{19}M$  ( $M=3d$  transition metals)**

**Presented by: Jordan McDonald**

**Faculty Advisor: Kyle Beran, Ph.D.**

**College of Arts and Sciences**

A significant amount of time and energy has been devoted toward the identification of derivatives of small fullerenic structures. These derivatives traditionally involve the analysis of endohedral and exohedral derivatives of the base fullerene by adding atoms of metals or nonmetals to the carbon structure. In some cases, one or carbon atoms in the cage have been substituted with small nonmetal atoms, such as boron or nitrogen, that result in a class of molecules called heterofullerenes. This research project utilizes density-functional theory (DFT) at the B3PW91/6-31G\* level to probe the structure and electronic properties of metallo-heterofullerene derivatives of  $C_{20}$ ,  $C_{19}M$ . The highly strained  $C_{19}$  open cage structure, consisting of nine pentagons and a single square, is converted into a closed cage fullerene derivative with the addition of a 3d transition metal (M). The energetic and structural analysis of the  $C_{19}M$  complexes encompass various ionizations and spin states for each metal. Preliminary results indicate that  $C_{19}Sc$ ,  $C_{19}Sc^{3+}$ , and  $C_{19}Ni$  are energetically and thermodynamically stable and occupy a minimum on the potential energy surface. Reaction energies ( $C_{19} + M \rightarrow C_{19}M$ ) indicate that energetics associated with the formation of  $C_{19}M$  is competitive with the comparable formation of  $C_{20}$  ( $C_{19} + C \rightarrow C_{20}$ ). Additionally, the three Sc-C bond lengths in  $C_{19}Sc$  are comparable to Sc-C bond lengths reported in other scandium-containing fullerene derivatives.

## **Silver nanoparticles production by bacteria and optimization with microwave**

**Presented by Lesley Felix and Hao-Yun Peng**

**Faculty Advisor: Milka Montes, Ph.D.**

**College of Arts and Sciences**

Nanoparticles have a large variety of potential applications in biomedical, industrial, electronic, and environmental fields. Since the production is increasing, researchers are seeking greener and more efficient ways to minimize hazardous chemicals for the production of silver nanoparticles. This project includes two methods to synthesize silver nanoparticles-using microorganisms and using microwave. Both methods are performed a time and temperature dependency study with constant parameters.

## **How do cells cope with stress?**

**Presented by: April Smith, Alex Yaschenko and Michael Blanco**

**Faculty Advisor: Samuel David**

**College of Arts and Sciences**

The aim of this project is to study the effect of stress on cells. Cortisol is a hormone that the body releases in response to stress. Literature shows that studying the activity of a particular protein (SGK) in NMuMg cells (a cell type that is used in stress studies) is altered. We studied the effect of cortisol on SGK activity in NMuMg cells. This line of investigation is unique and has never been attempted before. The knowledge to be gained here can be potentially used to alleviate the suffering of people whose cells are under stress (e.g. patients undergoing chemotherapy).



## **Effects of Supercooling on nanoparticle morphology**

**Presented by: Jason Snitker**

**Faculty Advisor: Milka Montes, Ph.D.**

**College of Arts and Sciences**

We present a method for controlling changes in particle morphology during ice segregation induced molecular assembly in gold and silver colloidal suspensions. Acrylate capped spherical silver nanoparticles (NPs) with a size distribution of  $14 (\pm) 2$  nm and BSA bioconjugated hexagonal gold NPs of sizes  $51 (\pm) 13$  nm were synthesized in aqueous phase and characterized using several techniques including transmission electron microscopy, surface enhanced Raman spectroscopy, electron dispersive spectroscopy, ultraviolet-visible spectroscopy, and X-ray diffraction. The colloids were then subjected to a process of directional solidification, performed in a specialized high pressure vessel under liquid nitrogen. Solid NPs were then harvested from the frozen colloids using a low-pressure sublimation chamber and characterized using the same methods mentioned above. The results show that we were able to modify the original morphologies to produce alternate shapes, including several interesting three-dimensional nanostructures.

## **On war and Utopia**

**Presented by: Austin Trevino**

**Faculty Advisor: Rachel Martin Harlow, Ph.D. and Rebecca Day Babcock, Ph.D.**

**College of Arts and Sciences**

This study was done to analyze select presidential speeches regarding conflict in the Middle East using critical discourse analysis in order to search for utopian rhetoric justifying military action. The coding searched for American values used to “rally the troops” and searched for binaries that create an “us vs. them” dichotomy to justify action. The United States has been involved in multiple ongoing conflicts in the Middle East for decades. These wars have drained the country financially, lost thousands of lives, and have brought out the worst in humanity. An understanding of presidential rhetoric regarding military action is necessary to understand future military action.

## **Salinity effects on flow characteristics of polymer solutions**

**Presented by: Abdul Bari Wali**

**Faculty Advisor: Ahmed Kamel, Ph.D.**

**College of Business and Engineering**

Polymers are considered as effective drag reducer in the oil and gas industry for few decades due to its viscoelastic properties that can suppress turbulence eddies and fluctuations and reduce friction pressure losses. Various factors affect rheology and flow properties of these fluids, which in turn affect its drag reduction behavior. This study is undertaken to better understand the effects of salinity on drag reduction characteristics. For this purpose, two widely used anionic AMPS copolymers; Nalco ASP-700 and ASP-820 are investigated. Various salts are used and proper amount of salts are mixed to prepare the test fluids. The salt matrix includes 2% KCl, 4% KCl, and synthetic seawater. For synthetic seawater many different recipes exist. The recipe adopted here includes 1.0 lb/bbl  $\text{Na}_2\text{SO}_4$ , 10.5 lb/bbl NaCl, and 0.4 lb/bbl  $\text{CaCl}_2$ . A 1/2-in. OD flow loop with a 15-ft straight tubing section and 19-ft coiled tubing section with a curvature ratio of 0.019 is used.

The results indicate that polymers are quite effective drag reducers under various conditions of increased salinity that can be encountered in many industrial applications. However, due to differences in molecular weight and molecular structure, different behavior is noticed. In addition, a decrease in drag reduction efficiency of these fluids is seen at increased salinity. A correlation between ionic strength and drag reduction efficiency is proposed.

**Regions of reduced cortical thickness and gray matter volume in children with dyslexia  
compared to typically reading controls**

**Presented by: Lauren Wilson**

**Faculty Advisor: Emily A. Farris, Ph.D.**

**College of Arts and Sciences**

Developmental dyslexia is a neurobiological reading disorder that impacts a person's ability to read and comprehend text, and is characterized with problems in decoding words. Previous research comparing children with dyslexia with age-matched children who do not have reading difficulties (i.e., typically reading controls) has observed differences in a distributed network of brain regions associated with reading. Specifically, children with dyslexia tend to have less gray matter in the left and right cerebellar anterior lobes, the left and right lingual gyrus (Eckert et al., 2007), and the left inferior parietal lobule (Hoeft et al., 2007), as well as a thinner cortex in the left fusiform gyrus, the post-central gyrus, orbitofrontal and rostral middle frontal cortex (William et al., 2017). In the current study, we used structural magnetic resonance imaging data and FreeSurfer analyses to investigate the extent in which regional variations in cortical thickness are observed in a group of 6- to 14-year-old children with dyslexia as compared to age- and sex-matched typically-reading controls. Cortical thickness measures provide an estimate for the size of brain structures and regional differences in cortical thickness provide evidence for neuroplasticity occurring based on one's experiences. It is hypothesized that the children with dyslexia will have less total gray matter volume, and regions of reduced cortical thickness as compared to the typically reading control children. Data analysis is ongoing. Yet, such studies provide more evidence for the neural signatures involved in the identification of reading disabilities and focus for reading intervention.

## **Effects of nanoparticles on coral health**

**Presented by: Melissa Wood**

**Faculty Advisor: Milka Montes, Ph.D.**

**College of Arts and Sciences**

Coral reefs are deteriorating world-wide, prompting some in the scientific community to call it a crisis. Specific research efforts have resulted in order to better understand what is causing the massive decline of coral reefs. Nanoparticles introduced to the ocean may have a negative impact on the health of coral reefs and marine life. Latest reports show that  $\text{TiO}_2$  nanoparticles penetrate human and rat cell wall through the Peyer's patches. Titanium dioxide ( $\text{TiO}_2$ ) is a nanoparticle commonly found in sunscreen which is introduced to the ocean when it washes off of divers and swimmers.

To measure the effect of  $\text{TiO}_2$  on coral, two identical tanks, Tank A and Tank B, were inhabited by *Favites Pentagona* coral. Laboratory grade  $\text{TiO}_2$  nanoparticles were introduced at 0.7mg/L into Tank B while Tank A remained unaltered as the control. Nanoparticle levels were monitored using visible absorption spectroscopy.  $\text{TiO}_2$  will not degrade so any change in the concentration will be indicative of possible uptake by the coral. Coral health was monitored by recording growth patterns using visual observation and measuring coral mass, length, and height. Tissue samples were examined via electron microscopy to determine if the coral has absorbed any nanoparticles.

Negative effects from introducing  $\text{TiO}_2$  nanoparticles are anticipated, based on recently reported research. It is expected that nanoparticles will be found in the tissue when examined microscopically and an overall decline in coral growth should be observed as a result of  $\text{TiO}_2$  dosing.



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# PERMIAN BASIN RESEARCH FORUM

University of Texas of the Permian Basin

## POSTER PRESENTATIONS



## **Dermatophyte Susceptibility to Gentian Violet**

**Presented by: Debbie S. Bannon**

**Faculty Advisors: Tamara Davault and Tara Deavers, DPM**

This study tested the susceptibility of dermatophytes to gentian violet. Dermatophytes are a fungus that thrive on the keratin substrate causing cutaneous infections such as onychomycosis, a fungal infection of the fingernails or toenails which can cause pain, discomfort and disfigurement.<sup>1</sup> Treatment of fungi can be difficult because fungi are eukaryotic as are human cells. Caution must be used to not cause harm to the patient when treating the fungus. Gentian violet (GeV) is a triphenylmethane dye that has been shown to have antifungal effects. Two dermatophytes, *Trichophyton rubrum* and *Trichophyton mentagrophyte*, were tested using a susceptibility test.<sup>2</sup> The susceptibility test was performed on Sabouraud Dextrose Agar (SDA) plates with an antibiotic disk soaked in GeV. The plates were then monitored for twenty days, and the zone of inhibition was measured every three to five days. The results determined that GeV did inhibit the growth of the two dermatophytes tested. Current treatments for onychomycosis are quite costly while GeV can be obtained over-the-counter and is inexpensive. This suggests that GeV be considered as an alternative treatment for onychomycosis.

## **The Latin American Woman and the Challenge of Finding her Identity**

**Presented by: Ruiz Janeth Garcia**

**Faculty Advisor: Professor Perla Abrego**

In the 20th century, many marginalized groups in Latin America were being represented and finally given a voice thanks to the writing of Hispanic authors. One these groups was the women who had been victims of an idealized image that was already constructed for them and were expected to fit. The female authors Alfonsina Storni, Delmira Agustini, Gabriela Mistral, Nancy Morejón and Rosario Castellanos, however, broke down these stereotypes through literature by exploring topics such as sexuality, motherhood and gender norms. In my research I analyze the messages that these Hispanic authors sent through their pieces and I compare the ideas of these women to the stereotypes reflected in the poems written by modernist writers Manuel Gutierrez Najera and Ruben Dario.

## Characterization of CB1 (Cannabinoid Receptor 1) in Fetal and Maternal Tissues

Presented by: Vanessa Montoya-Uribe

Co-authors: Kushal Gandhi, Ph.D., Stacy Martinez, Marcel Chuecos, Maira Carrillo, Ph.D.,  
Irám Rodríguez-Sánchez, M.D., Natalia Schlabritz-Lutsevich, M.D., Ph.D.

Faculty Advisor: Natalia Schlabrtiz-Lutsevich, M.D., Ph.D.

Department of Biology

**Introduction:** Endogenous Cannabinoid system (ECS) plays an essential role in reproduction. Cannabinoid receptor 1 (CB1R) has been identified in maternal and fetal peripheral tissues such as adipose, hepatic, and pancreatic islets, both in murine and baboon models. Transcript variants encoding CB1R have been recognized as CB1<sub>a</sub>R and CB1<sub>b</sub>R in adult hepatocytes and  $\beta$ -cells and proposed as pharmacological targets for treatment of metabolic conditions. However, much information concerning the characterization of these two receptor isoforms in baboon (*Papio* spp.) is yet to be elucidated. Considering this, the purpose of this study was to characterize the expression of both CB1<sub>a</sub>R and CB1<sub>b</sub>R isoforms, isolated from fetal and maternal tissues in a baboon (*Papio* spp.) model.

**Materials and methods:** Maternal and fetal tissues [brain, placenta, maternal liver (ML), and fetal liver (FL)] were available from the tissue bank (*Papio* spp.). In order to assess the expression of the CB1R protein variants, Western blot (WB) was performed. A ChemiDoc-It<sub>rs3</sub> Imager and Image J software were used to quantify proteins expression. Followed this, immunohistochemistry assays would permit visualize the co-expression of both CB1<sub>a</sub>R and CB1<sub>b</sub>R isoforms on placental tissue slides. Specific antibodies and blocking peptides were used. TaqMan mix (Roche, Applied Sciences, Indianapolis, IN, USA) and SYBR Green mix (Kapa Bio systems Inc. Woburn, MA, USA) were used for qRT-PCR and data were collected using LightCycler® 96 (Applied Biosystems/Roche, USA).

**Results:** CB1R (~58 kDa) was expressed in several tissues studied. CB1<sub>a</sub>R mRNA isoform showed expression in placental tissues, however, CB1<sub>a</sub>R protein isoform (~46 kDa) was only expressed in brain tissues. On the other hand, CB1<sub>b</sub>R protein isoform (~49 kDa) was expressed in FL compared to ML tissues as well as mRNA isoform. Protein isoform of CB1<sub>b</sub>R was not expressed in brain. Two more CB1R isoforms were found over-expressed (~30 kDa and ~33 kDa) in male and female fetal liver tissues.

**Conclusion:** Our study is the first one to demonstrate the expression of CB1R isoforms in fetal liver tissues compared to placental, brain, and maternal liver tissues.







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