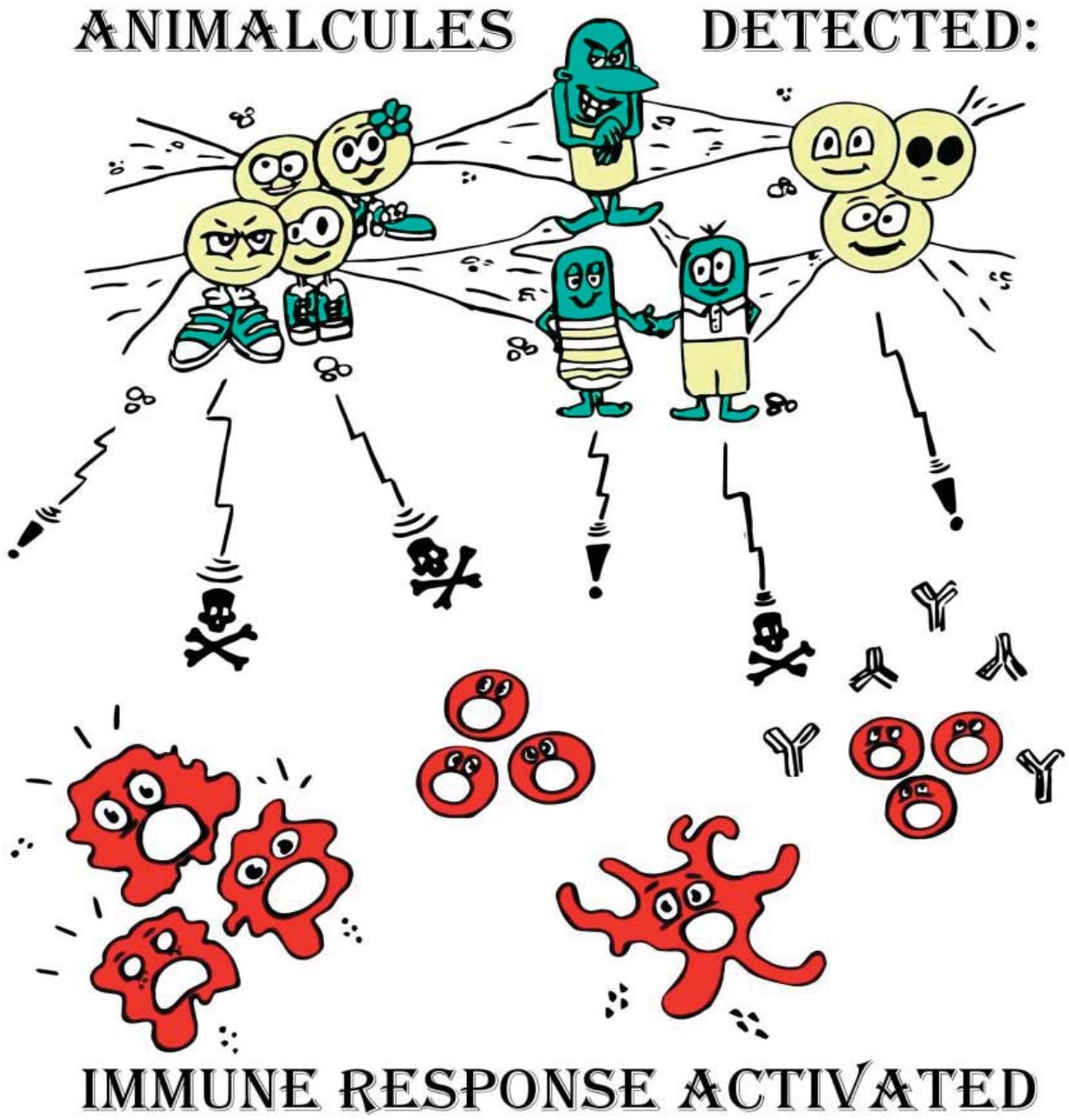
31st Annual Student Research Week



TEXAS TECH UNIVERSITY
HEALTH SCIENCES CENTER™

Graduate School *of* Biomedical Sciences

31st Annual Student Research Week
March 19-22, 2019
Texas Tech University Health Sciences Center (TTUHSC)
Lubbock, Texas

The Graduate School of Biomedical Sciences 2019 Student Research Week Committee

Co-Directors: Whitni Redman & Riccay Elizondo
Vice Director of Marketing: Ksenija Korac
Vice Director of Poster Competition: Josue Enriquez
Vice Director of Operations & Judging: Bradley Schniers

Website design and maintenance: Danny Boren, Graduate School of Biomedical Sciences
Communications and social media: Suzanna Cisneros and Amy Skousen, Office of Communications
Marketing; Leslie Fowler, Graduate School of Biomedical Sciences; Deidra Satterwhite, Office of Student Services
Speaker travel arrangements: Leslie Fowler, Graduate School of Biomedical Sciences
Abstract book design: Deidra Satterwhite, Office of Student Services
Student Research Week Banquet: Monica Sharma and Brianyell McDaniel Mims, Graduate School of Biomedical Sciences Graduate Student Association; Velia Martinez, Graduate School of Biomedical Sciences

The 2019 Student Research Week Committee would like to extend their warmest thanks to the following for their contributions and support in making Student Research Week a great success this year:

The Graduate School of Biomedical Sciences staff: Leslie Fowler, Pam Johnson and Velia Martinez
The Office of Student Services: Deidra Satterwhite
The Office of Communications and Marketing: Suzanna Cisneros, Amy Skousen, Zach Tijerina and Kami Hunt
The Office of the President: Didit Martinez
The School of Medicine Office of the Dean: Charity Donaldson
Educational Media Services: Neal Hinkle
The departments of cell biology and biochemistry, pharmacology and neuroscience, immunology and molecular microbiology, cell physiology and molecular biophysics, medical education and graduate medical education; Graduate School of Biomedical Sciences at Lubbock, Abilene, and Amarillo, the School of Medicine, the School of Nursing, the School of Health Professions, the School of Pharmacy, the Office of Interprofessional Education, and Texas Tech University.

Lou Diekemper Endowment fund for providing a travel scholarship.
Dr. Beverly Chilton for establishing the Bette B. Chilton scholarship in honor of her mother.

We also are very grateful to all the TTUHSC faculty and staff for their guidance and support.

Information about TTUHSC, including information about the Graduate School of Biomedical Sciences, can be found at www.ttuhsc.edu.

Friday, March 22, 2019

KEYNOTE LECTURES

Marvin Whiteley, Ph.D.

Time: 11:30 a.m. - 12:30 p.m.

Anice Lowen, Ph.D.

Time: 1:30 - 2:30 p.m.

STUDENT SPEAKERS

Time: 9 - 11:30 a.m.

Maternal Electronic Cigarette Use Can Enhance Offspring Susceptibility to Hypoxic-Ischemic Brain Injury

Ali Sifat, Graduate Student, Amarillo

Determining the effect of the WNT/Œ≤-catenin pathway on the ischemic blood-brain barrier in vitro and in vivo

Shyanne Page, Graduate Student, Amarillo

Assessing the Activity of CRF Neurons in the Central Amygdala Following Application of Kappa Opioid Receptor Agonist: A Novel Network in Pain Relief

Preston D'Souza, Medical Student, Lubbock

Effect of Trichuris co-infection on Sm-p80-based vaccine in baboons

Jordan May, Graduate Student, Lubbock

PEPT1 as a tumor promoter and novel drug target to treat pancreatic cancer

Bradley Schniers, Graduate Student, Lubbock

Stressful Aging in Yeast: Roles for SIR2 and Cell Growth

Jessica Smith, Graduate Student, Lubbock

Toxicity and Limitations of Glycoside Hydrolases in Dispersing Poly-Microbial Biofilms

Whitni Redman, Graduate Student, Lubbock

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TEXAS TECH UNIVERSITY
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Greetings!

It is my great pleasure to welcome everyone to the 2019 Student Research Week on March 19th-22nd. The theme for this year's 31st Annual Student Research Week event is **"Animalcules Detected: Immune Response Activated."** We are extremely proud this year to host two outstanding and highly distinguished keynote speakers: **Dr. Marvin Whiteley PhD**, Professor of Biological Sciences at the Georgia Institute of Technology, Co-Director, Emory-Children's CF Center (CF@LANTA), and Georgia Research Alliance Eminent Scholar; and **Dr. Anice Lowen PhD**, Associate Professor in the Department of Microbiology and Immunology at Emory University School of Medicine.

I am extremely indebted to the 2019 Student Research Week Organizing Committee: Whitni Redman (Co-Director), Riccay Elizondo (Co-Director), Ksenija Korac (Director of Marketing), Bradley Schniers (Director of Operations), Josue Enriquez (Poster Competition Coordinator), Monica Sharma (GSA President) and Brianyell McDaniel (GSA Vice-President). They have all done a tremendous job! I am particularly grateful for the hard work and assistance from Leslie Fowler, Pam Johnson, Deidra Satterwhite, Amy Skousen, Julie Forrest, Lisa Moran, the Department of Immunology and Molecular Microbiology, and the entire GSBS staff. They have all done a terrific job! Also special thanks to Dr. Matt Grisham, the host department chair, and Dr. Betsy Jones for coordinating activities with the School of Medicine, all faculty, staff, and GSBS students for their efforts and time. Finally, I would like to thank President Mitchell, Dean Berk, Dean Evans, Dean Smith, Dean Rice-Spearman, and Drs. Varma, Prien, Sizer, Ganapathy, Altenberg, Byrd, Philips, Thekkumkara, Neugebauer, Abbruscato, Dissanaike, Jumper, Srivastava, and Bergeson for their support that has made this event possible.

In addition, the GSBS and the GSA are very excited about hosting the sixth annual Student Research Week Banquet-World of Travel. Funds raised from donations and a silent auction will be used to support student scholarships. Special thanks to all donors for their help in making this special event possible. Our guest speakers will once again treat us with their "Reflections on Graduate Studies," with music, entertainment and dancing to follow! Special thanks to the GSA committee, especially GSA president Monica Sharma, for organizing and hosting the event this year.

In conclusion, our event kicks off with the Vendor Show on Tuesday, March 19th. Please come and attend all the great presentations. It is a wonderful opportunity to meet our students, learn about their work, and discuss research in general. Let's greet all of our speakers and celebrate our 31th Annual Student Research Week with a fully packed lecture hall.

Thanks much and all the best!

Brandt L. Schneider, Ph.D.
Dean of the Graduate School of Biomedical Sciences

TEXAS TECH UNIVERSITY
HEALTH SCIENCES CENTER™

Greetings,

Welcome to the 31st Anniversary of the annual Student Research Week (SRW)! This is an annual event that is organized and run by graduate students at the Texas Tech University Health Sciences Center (TTUHSC) Graduate School of Biomedical Sciences, Lubbock Campus. SRW brings together students from different TTUHSC schools and campuses and gives them a chance to showcase their research and projects they have worked on all year. During SRW, students will be able to visit with biomedical vendors, share a poster about their research, and learn about some of the latest scientific developments from distinguished visiting scholars.

Each year, SRW features a theme to highlight advances in a certain area of biomedical research. This year's theme is "Animalcules Detected: Immune Response Activated" and is hosted by the Department of Immunology and Molecular Microbiology. Two outstanding biomedical scientists will give keynote seminars on March 22nd, which will highlight this topic. Anice Lowen is an associate professor at Emory University. Lowen received her PhD in virology from the University of Glasgow and continued post-doctoral training at Mount Sinai School of Medicine in New York City where she researched influenza virus transmission. Her current research focuses on mechanisms of influenza virus evolution with an emphasis on reassortment and how this contributes to the viral ecology and epidemiology. Dr. Marvin Whiteley is a professor at the Georgia Institute of Technology. Whiteley received his PhD in Microbiology from the University of Iowa and continued his post-doctoral training at Stanford University. His current research focuses on the social interactions between bacteria in biofilms. Whiteley also serves as the co-director for the Emory- Children's Cystic Fibrosis Center. These two scientists are outstanding researchers, and we encourage everyone to attend their seminars and participate in the coffee session on Friday for interactive discussions about basic science and other related topics.

The SRW poster competition gives students the opportunity to present and discuss their research in a conference-like atmosphere. It has participation from several different TTUHSC schools and campuses and are proud to say that 253 students have signed up to participate this year. We recommend that everyone attend the open poster sessions from 12 – 1pm on Tuesday, Wednesday, and Thursday in the ACB lobby to learn about ongoing basic and clinical research projects and to identify research opportunities at different TTUHSC schools across multiple TTUHSC campuses.

SRW would not be possible without the tireless efforts of people working behind the scenes to make it a success. We would like to thank the faculty and staff of the Graduate School of Biomedical Sciences, the Offices of Student Services and Marketing and Communications, the School of Medicine, and the Department of Immunology and Molecular Microbiology. We would also like to thank President Mitchell and Drs. Schneider, Prien, Grisham, Berk, Varma, Ashcraft, and Jones. Lastly, thanks to you, a participant in the 31st annual Student Research Week. The ideas you share and the knowledge you gain are what make this event a success.

Sincerely,
The 31st Annual Student Research Week Committee

Riccay Elizondo, Whitni Redman, Ksenija Korac, Bradley Schniers, Josue Enriquez

31ST ANNUAL TTUHSC STUDENT RESEARCH WEEK SCHEDULE

TUESDAY, MARCH 19, 2019

9:00am - 12:00pm	***Vendor Show***	5th Floor BC
12:00pm - 1:00pm	***Open Poster Exhibit I***	ACB Lobby
1:00pm - 4:00pm	***Poster Session I***	ACB Lobby

WEDNESDAY, MARCH 20, 2019

9:00am - 12:00pm	***Poster Session II***	ACB Lobby
12:00pm - 1:00pm	***Open Poster Exhibit II***	ACB Lobby
1:00pm - 4:00pm	***Poster Session III***	ACB Lobby

THURSDAY, MARCH 21, 2019

9:00am - 12:00pm	***Poster Session IV***	ACB Lobby
12:00pm - 1:00pm	***Open Poster Exhibit III***	ACB Lobby
1:00pm - 4:00pm	***Poster Session V***	ACB Lobby
7:00pm	***SRW Banquet***	McKenzie-Merket Alumni Center

FRIDAY, MARCH 22, 2019

8:30am - 9:00am	***Continental Breakfast***	ACB 100
9:00am - 11:30am	***Select Student Presentations***	ACB 100
11:30am - 12:30pm	***Marvin Whiteley, Ph.D.***	ACB 100
12:30pm - 1:30pm	***Lunch***	ACB Lobby
1:30pm - 2:30pm	**Anice Lowen, Ph.D.**	ACB 100
2:30pm - 3:30pm	***Awards Ceremony***	ACB 100
3:30pm - 4:30pm	***Students' Coffee with the Speakers***	ACB 100

SPEAKERS

Marvin Whiteley, Ph.D.

Professor,
Georgia Institute of Technology

Dr. Marvin Whiteley is a tenured professor in the Bennie H. & Nelson D. Abell Chair in Molecular and Cellular Biology department at Georgia Institute of Technology. From 2013 to 2017 Dr. Whiteley served as the Co-Director for the Emory-Children's Cystic Fibrosis Center. He began his teaching career as an Assistant Professor in Microbiology at the University of Oklahoma Health Sciences Center in 2002, then moved up the ranks at the University of Texas at Austin as the Director of the John R. LaMontagne Center for Infectious Disease. Dr. Whiteley received his Ph.D. in Microbiology from the University of Iowa where he studied quorum sensing and biofilm development in Pseudomonas aeruginosa. He was a postdoctoral fellow at Stanford University followed by serving as a scientist for Cumbre Pharmaceuticals prior to his academic career.

Dr. Whiteley is a well-established scientist with over 100 publications. He is currently on three NIHR01 grants as well as grants from the Burroughs Wellcome Fund, Army Research Office, Human Frontiers of Science, and Cystic Fibrosis Foundation. He has mentored 5 post-doctoral fellows and 10 students. Dr. Whiteley has served on numerous grant review panels, serves as the Editor for Infection and Immunity as well as mBio, and currently has 2 patents. He has received many awards, Georgia Research Alliance Eminent Scholar being the most recent. Dr. Marvin Whiteley is a prime example as a reputable, well-known scientist.

Anice Lowen, Ph.D.

Associate Professor,
Emory University School of Medicine

Dr. Anice Lowen is a tenured associate professor in the Department of Microbiology and Immunology at Emory. Prior to her current position, Lowen completed her PhD with Richard Elliott on Bunyamwera virus at the University of Glasgow. She then continued her post-doctoral training with Peter Palese at Mount Sinai School of Medicine in New York City. Her current research at Emory focuses on the mechanisms of rapid influenza virus evolution and how it contributes to the ecology of the virus within the wide range of hosts it infects. Her work seeks to improve the understanding of viral reassortment at a fundamental level by defining the underlying factors that dictate the frequency of reassortment and the implications of reassortment for influenza A virus evolution.

As a junior investigator, Dr. Lowen has received numerous awards recognizing her devotion to research. She currently holds 4 NIH grants, and was elected into "The Emory 1%" for receiving a perfect score on a NIH grant application. In Dr. Lowen's relatively short career, she has acquired many accomplishments and continues to be an influential example for women in science.

JUDGES

Abraham Al-Ahmad, Ph.D.
Pharmaceutical Sciences

Frank Babb, M.D., FAAFP
Medicine

Rashmita Basu, Ph.D.
Healthcare Administration

Khalid Benamar, Ph.D.
Pharmacology and Neuroscience

Susan Bergeson, Ph.D.
Pharmacology and Neuroscience

Kishor Bhende, M.D.
Pediatrics

Yangzom D. Bhutia, Ph.D., D.V.M.
Cell Biology and Biochemistry

Ion Alexandru Bobulescu, M.D.
Cell Biology and Biochemistry

Jean-Michel Brismee, ScD, PT
Physical Therapy

Isabel Castro, Ph.D.
Immunology and Molecular Microbiology

Jane Colmer-Hamood, Ph.D.
Immunology and Molecular Microbiology

Gail Cornwall, Ph.D.
Cell Biology and Biochemistry

John W. Culberson, M.D.
Family and Community Medicine

Cornelia de Riese, M.D.
Obstetrics and Gynecology

Jeff Dennis, Ph.D.
Public Health

Quynh Hoa Do
Cell Biology and Biochemistry

Jannette Dufour, Ph.D.
Cell Biology and Biochemistry

Derek Fleming, Ph.D.
Surgery

Joe Fralick, Ph.D.
Immunology and Molecular Microbiology

Nadezhda German, Ph.D.
Pharmaceutical Sciences

Kerry K. Gilbert, ScD, COMT
Physical Therapy

Petar Grozdanov, Ph.D.
Cell Biology and Biochemistry

Josee Guindon, Ph.D., DVM
Pharmacology and Neuroscience

Ronald Hall, PharmD
Pharmacy

Abdul Hamood, Ph.D.
Immunology and Molecular Microbiology

George I. Henderson, Ph.D.
Pharmacology and Neuroscience

Aveline Hewetson, Ph.D.
Cell Biology and Biochemistry

Jody Janovick, Ph.D.
Cell Biology and Biochemistry

Guangchen Ji, Ph.D.
Pharmacology and Neuroscience

Cynthia Jumper, M.D., M.P.H.
Public Health

Min Kang, PharmD
Pediatrics

Audrey Karamyshev, Ph.D.
Cell Biology and Biochemistry

Gurvinder Kaur, Ph.D.
Cell Biology and Biochemistry

Michelle Keyel, Ph.D.
Cell Biology and Biochemistry

Lingkun Kong, M.D.
Opthalmology

Cassie Kruczek, Ph.D., M.S.
Medical Education

Koy Kubala, M.S.
Molecular Pathology

Subodh Kumar, Ph.D.
Garrison Institute on Aging

Hongjun (Henry) Liang, Ph.D.
Cell Physiology and Molecular Biophysics

Hairong Ma, Ph.D.
Cell Physiology and Molecular Biophysics

Clinton MacDonald, Ph.D.
Cell Biology and Biochemistry

Adebayo Molehin, Ph.D.
Internal Medicine

Srinivas Nandana
Pharmacology and Neuroscience

Madhusudhanan Narasimhan, Ph.D.
Pharmacology and Neuroscience

Volker Neugebauer, M.D., Ph.D.
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Kumar Palle, Ph.D.
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Hariharan Parameswaran, Ph.D.
Cell Physiology and Molecular Biophysics

J.A. Pradeepkiran, Ph.D.
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Courtney Queen, Ph.D.
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Sabarish Ramachandran, Ph.D.
Cell Biology and Biochemistry

Bhagavathi Ramasubramanian, Ph.D.
Garison Institute on Aging

Catherine Reppa, M.D.
Opthalmology

Ana M. Rivas Mejia, M.D.
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Pediatrics

Rebecca Sametz, Ph.D
Rehabilitation Counseling

Ariel Santos, M.D., MPH
Surgery

Toshihiro Sato, Ph.D.
Cell Biology and Biochemistry

Sathish Sivaprakasam, Ph.D.
Cell Biology and Biochemistry

Annette Sobel, M.D., M.S.
Graduate Medical Sciences, Strategic Partnerships

Sanjay K. Srivastava, Ph.D.
Immunotherapeutics and Biotechnology

Leslee Taylor, Ph.D., ATC, LAT
Athletic Training

Elena Tikhonova
Cell Biology and Biochemistry

Phat Tran, M.D.
Opthalmology

Manisha Tripathi
Pharmacology and Neuroscience

Ina Urbatsch, Ph.D.
Cell Biology and Biochemistry

Murali Vijayan, Ph.D.
Garrison Institute on Aging

Heidi Villalba, M.S.
Pharmaceutical Sciences

Margaret Vugrin, MPH
Public Health

Irfan Warraich, M.D.
Pathology

CRITERIA FOR CASE PRESENTATIONS

ANALYSIS/SYNTHESIS:

1. Includes data from 4 or more sources (explicity stated in the case study)
2. Reveals student's strengths, weaknesses, etc.

DIAGNOSIS:

1. Detailed description of consistencies or patterns leading to summary of the problem or situation.
2. Describes possible causes.
3. Includes other significant characteristics of the student.

INTERVENTIONS:

1. Includes five to six sessions.
2. Detailed summary of strategies and techniques used.
3. Strong plan.

EVALUATION:

1. Detailed summary of results.
2. Includes strong pre- and post-test evidence.
3. Includes decision for termination or referral.

REFLECTION:

1. Thoughtful description of the experience, the challenges, and the successes.

MICELLANCEOUS:

1. Text is well written.
2. Sections are labeled.
3. Minimal grammar or spelling errors.

CRITERIA FOR SCIENTIFIC RESEARCH

SIGNIFICANCE/ INTRODUCTION:

1. Significance of the work and why it is important to conduct this research is addressed.
2. Background information is clearly presented.
3. Hypothesis is clearly stated. (for science categories only)

ORGANIZATION

1. Methods utilized are clearly explained.
2. Presentation is well organized.
3. Student shows knowledge of the subject.

RESULTS:

1. Tables or graphs are used to enhance the presentation.
2. Presenter explains the figures and results.
3. Figures are appropriately formatted and clearly understood.

DISCUSSION/CONCLUSIONS:

1. Presenter summarizes findings clearly.
2. Presenter clearly explains what the findings mean and their significance.
3. Directions for future investigation or management of similar cases are indicated/discussed.

PRESENTATION /RESPONSE TO QUESTIONS:

1. Overall style of the presentation is effective (delivery/eye contact).
2. Presenter uses time effectively.
3. Presenter answers questions in an organized, concise, and accurate fashion.

COMMERCIALIZATION (IF APPLICABLE):

1. Presenter states how their research impacts the world.
2. Presenter states how the research could be a product.
3. Presenter states steps they would take to pursue commercialization.

PARTICIPANTS

GS1-2 Anderson, Trevor
GS1-2 Baishya, Jiwasmika
GS1-2 Bisht, Karishma
GS1-2 Brown, Timothy
GS1-2 Ellen, Christopher
GS1-2 Enriquez, Josue
GS1-2 George, Elizabeth
GS1-2 Hernandez, Sarah
GS1-2 Jackson, Benjamin
GS1-2 Katz, Courtney
GS1-2 Kopel, Jonathan
GS1-2 Korac, Ksenija
GS1-2 May, Jordan
GS1-2 Mazzitelli, Mariacristina
GS1-2 Mohiuddi, Ismail
GS1-2 Myers, Caitlyn
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GS1-2 Oliver, Darryll
GS1-2 Reese, Britney
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GS1-2 Schniers, Bradley
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GS1-2 Ximenez, Brandon
GS1-2 Young, Victoria

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GS3+ Bounds, Kayla
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GS3+ Stuebler, Antonia
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MS1-2 Aldrete, Jonathan
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MS1-2 Cao, George
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MS1-2 Dharmapandi, Gnanashree
MS1-2 Dhir, Nikita
MS1-2 Diaz, Rony
MS1-2 Domingo-Johnson, E.L.
MS1-2 D'Souza, Preston
MS1-2 Edwards, Samantha
MS1-2 Eslinger, Cody
MS1-2 Espinosa-Tello, Alejandro
MS1-2 Frost, Joshua
MS1-2 George, Asher
MS1-2 Gottam, Bhargavesh
MS1-2 Guerrero, Andres
MS1-2 Hanson, Keith
MS1-2 Helton, Tyler
MS1-2 Hope, Brianna
MS1-2 Hsu, Chia
MS1-2 Hussain, Shabab
MS1-2 Karimi, Alikhan
MS1-2 Khan, Aisha
MS1-2 Kopacz, Avery
MS1-2 Kubosumi, Aaron
MS1-2 Lara, Cain
MS1-2 Lee, Steven
MS1-2 Lee, Shannon
MS1-2 Lilley, Jennifer
MS1-2 Lin, Christine
MS1-2 Madison, Kyle
MS1-2 Maveddat, Ashley
MS1-2 Mendez, Emily
MS1-2 Moreno, Tanir
MS1-2 Murphy, Alexandria
MS1-2 Narayan, Monisha
MS1-2 Nesbitt, William

MS1-2 Nguyen, Tam
MS1-2 Omoruyi, Felix
MS1-2 Osemwengie, Bradley
MS1-2 Otih-Nimoh, Joseph
MS1-2 Owoade, Damilola
MS1-2 Peiris, Craig
MS1-2 Philip, Stacy
MS1-2 Pires, Brandon
MS1-2 Presto, Peyton
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MS1-2 Ramzanali, Saleena
MS1-2 Rivera, Elsy
MS1-2 Saleh, Adel
MS1-2 Sankoorikkal, Nikita
MS1-2 Scarbrough, Kirsten
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MS1-2 Smith, Nicholas
MS1-2 Steed, Joanna
MS1-2 Stewart, Caleb
MS1-2 Suryavanshi, Joash
MS1-2 Thompson, Christopher
MS1-2 Tran, James
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MS1-2 Yetter, Thomas
MS1-2 Young, Jonathan

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MS3-4 Baker, Bernadette
MS3-4 Blay-Tofey, Morkey
MS3-4 Brogan, Joshua
MS3-4 Burroughs, Chelsea
MS3-4 Byrd, Alyssa
MS3-4 Caballero, Beatrice
MS3-4 Callier, Kylie
MS3-4 Cervera, Jennifer
MS3-4 Cook, Elizabeth
MS3-4 Cox, Brittany

MS3-4 Dadashazar, Samareh
MS3-4 Danaj, Alexander
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MS3-4 Deleon, Sabrina
MS3-4 Dixon, Timothy
MS3-4 Eldem, Irem
MS3-4 Esquivel, Esteban
MS3-4 Fisher, John
MS3-4 Foley, David
MS3-4 Gavin, Meredith
MS3-4 Gonzales, Alan
MS3-4 Hess, Andrea
MS3-4 Hoang, Dustin
MS3-4 Holstead, Brady
MS3-4 Jacob, Daron
MS3-4 Kibuule, Grace
MS3-4 Kirkpatrick, Carson
MS3-4 Kureishy, Mohammad
MS3-4 Le, Audrey
MS3-4 Lindgren, Taylor
MS3-4 Lines, Jefferson
MS3-4 Lung, John
MS3-4 Lunney, Austin
MS3-4 Macleay, Katelyn
MS3-4 McCarthy, Brandon
MS3-4 Mitchell, Diana
MS3-4 Muysson, Marcella
MS3-4 Nguyen, Thinh
MS3-4 Opoku, Akwasi
MS3-4 Osinovsky, Jamie
MS3-4 Parikh, Niki
MS3-4 Pham, Theophilus
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MS3-4 Stamps, David
MS3-4 Tello, Nadia
MS3-4 Tsen, Adam
MS3-4 Willms, Joshua
MS3-4 Younes, Lena
MS3-4 Zhao-Fleming, Hannah

PHAR Ahmed, Ekram
PHAR Albekairi, Thamer
PHAR Anwar, Mohammad
PHAR Bagchi, Sounak
PHAR Brindle, Athena
PHAR Esfahani, Shiva
PHAR Greene, Carl
PHAR Kaushik, Itishree
PHAR Lahooti, Behnaz
PHAR Lee, YoonJung
PHAR Nozohouri, Saeideh
PHAR Page, Shyanne
PHAR Racheal, Grace
PHAR Ramachandran, Sharavan
PHAR Raut, Snehal
PHAR Reddy, Sreedhar
PHAR Rolph, Daniela
PHAR Sajib, Md Sanaullah
PHAR Sifat, Ali
PHAR Sivandzade, Farzane
PHAR Tuz, Fatema

R&CF Bokaie, Hassan
R&CF Clarke, Cameron
R&CF Homen, Dylan
R&CF Ibilor, Christine
R&CF Joginpalli, Sharanya
R&CF Johnson, Drew
R&CF Leach, Christopher
R&CF Lu, Ho-Cheng
R&CF Mbagwu, Chinyere
R&CF Ruiz, Anastasia
R&CF Schoof, Jacob
R&CF Schwalk, Audra
R&CF Schwartz, Cynthia
R&CF Seckel, Shannon
R&CF Shank, Sara
R&CF Song, Elisa
R&CF Stanley, Russell
R&CF Toledo, Almon
R&CF Valencia, Carlos
R&CF Thein, Kyaw
R&CF Vorakunthada, Yuttiwat
R&CF Ward, Jennifer

SHP Bassett, Cameron
SHP Chen, Yo-Rung
SHP Dewan, Birendra
SHP Drusch, Alexander
SHP Jin, Dongkwan
SHP Kapila, Jeegisha
SHP Liu, Yilan
SHP Murphy, Brandi
SHP Nichols, Charles
UNDG Aftabi, Ali
UNDG Brito, Maritza
UNDG Cristy, Shane
UNDG Gomez, Andre
UNDG Hilken, Tate
UNDG Keim, Klara
UNDG Kjellgren, Abbey
UNDG Little, William
UNDG Lopez, Andrea
UNDG Miller, Sarah
UNDG Nicholson, Makayla
UNDG Tudman, Jai'Cee
UNDG Welch, Garrett

JUDGING GROUPS

Judging Group 1A - Tuesday, March 19, 2019

(All the following times are PM!)

Poster	Time	Name
TU1	1:30-1:45	Dewan, Birendra
TU2	1:45-2:00	Kapila, Jeegisha
TU3	2:00-2:15	Jin, Dongkwan
TU4	2:15-2:30	Nichols, Charles
TU5	2:30-2:45	Bassett, Cameron
	BREAK	
TU26	3:00-3:15	Drusch, Alexander
TU27	3:15-3:30	Liu, Yilan
TU28	3:30-3:45	Chen, Yo-Rong
TU29	3:45-4:00	Toledo, Almond
TU30	4:00-4:15	Joginpalli, Sharanya

Judging Group 2A - Tuesday, March 19, 2019

(All the following times are PM!)

Poster	Time	Name
TU6	1:30-1:45	Clarke, Cameron
TU7	1:45-2:00	Mbagwu, Chinyere
TU8	2:00-2:15	Vorakunthada, Yuttiwat
TU9	2:15-2:30	Ibilor, Christine
TU10	2:30-2:45	Shank, Sara
	BREAK	
TU31	3:00-3:15	Ward, Jennifer
TU32	3:15-3:30	Schoof, Jacob
TU33	3:30-3:45	Song, Elisa
TU34	3:45-4:00	Bokaie, Hassan

Judging Group 3A - Tuesday, March 19, 2019

(All the following times are PM!)

Poster	Time	Name
TU11	1:30-1:45	Ruiz, Anastasia
TU12	1:45-2:00	Loya Valencia, Carlos
TU13	2:00-2:15	Seckel, Shannon
TU14	2:15-2:30	Schwalk, Audra
TU15	2:30-2:45	Leach, Christopher
	BREAK	
TU36	3:00-3:15	Stanley, Russell
TU37	3:15-3:30	Johnson, Drew
TU38	3:30-3:45	Schwartz, Cynthia
TU39	3:45-4:00	Homen, Dylan
TU40	4:00-4:15	Lu, Ho-Cheng

Judging Group 4A - Tuesday, March 19, 2019

(All the following times are PM!)

Poster	Time	Name
TU16	1:30-1:45	Young, Victoria
TU17	1:45-2:00	Schaubhut, Alexsandra
TU18	2:00-2:15	Jackson, Benjamin
TU19	2:15-2:30	Washburn, Rachel
TU20	2:30-2:45	Korac, Ksenija
	BREAK	
TU41	3:00-3:15	Kopel, Jonathan
TU42	3:15-3:30	Hernandez, Sarah
TU43	3:30-3:45	Schniers, Bradley
TU44	3:45-4:00	Katz, Courtney
TU45	4:00-4:15	Ellen, Christopher

Judging Group 5A - Tuesday, March 19, 2019

(All the following times are PM!)

Poster	Time	Name
TU21	1:30-1:45	Enriquez, Josue
TU22	1:45-2:00	Navarro, Stephany
TU23	2:00-2:15	Myers, Caitlyn
TU24	2:15-2:30	Bisht, Karishma
TU25	2:30-2:45	George, Elizabeth
	BREAK	
TU46	3:00-3:15	May, Jordan
TU47	3:15-3:30	
TU48	3:30-3:45	Mazzitelli, Mariachristina
TU49	3:45-4:00	

Judging Group 1A - Wednesday, March 20, 2019

(All the following times are AM!)

Poster	Time	Name
W1	9:00-9:15	Oliver, Daryll
W2	9:15-9:30	Mueller, Karl
W3	9:30-9:45	Macha, Shawn
W4	45-10:00	Hein, Matthew
W5	10:00-10:15	Pirayesh, Elham
	BREAK	
W6	10:30-10:45	Elizondo, Riccay
W7	10:45-11:00	Redman, Whitni
W8	11:00-11:15	Vartak, David
W9	11:15-11:30	Elmassry, Moamen
W10	11:30-11:45	Sikder, Mohd Omar

Judging Group 2A - Wednesday, March 20, 2019

(All the following times are AM!)

Poster	Time	Name
W11	9:00-9:15	
W12	9:15-9:30	Beasley, Kellsie
W13	9:30-9:45	Alqahtni, Abdulaziz
W14	9:45-10:00	Willms, Joshua
	BREAK	
W15	10:15-10:30	Dadashazar, Samareh
W16	10:30-10:45	
W17	10:45-11:00	Cervera, Jennifer
W18	11:00-11:15	Gavin, Meredith
W19	11:15-11:30	Asad, Usman
W20	11:30-11:45	Lunney, Austin

Judging Group 3A - Wednesday, March 20, 2019

(All the following times are AM!)

Poster	Time	Name
W21	9:00-9:15	Zhao-Fleming, Hannah
W22	9:15-9:30	Cook, Elizabeth
W23	9:30-9:45	Dixon, Timothy
W24	9:45-10:00	Hess, Andrea
W25	10:00-10:15	McCarthy, Brandon
	BREAK	
W26	10:30-10:45	Le, Audrey
W27	10:45-11:00	Kirkpatrick, Carson
W28	11:00-11:15	Kureishy, Mohammad
W29	11:15-11:30	Adams, Kaka
W30	11:30-11:45	Tello, Nadia

Judging Group 4A - Wednesday, March 20, 2019

(All the following times are AM!)

Poster	Time	Name
W31	9:00-9:15	Al Dogom, Sara
W32	9:15-9:30	Cao, George
W33	9:30-9:45	Smith, Nicholas
W34	9:45-10:00	Guerrero, Andres
	BREAK	
W35	10:15-10:30	Shabeneh, Obadeh
W36	10:30-10:45	Lara, Cain
W37	10:45-11:00	Saleh, Adel Alhaj
W38	11:00-11:15	Setterquist, Hana
W39	11:15-11:30	Ximenez, Brandon
W40	11:30-11:45	

Judging Group 5A - Wednesday, March 20, 2019

(All the following times are AM!)

Poster	Time	Name
W14	9:00-9:15	Turner, Austin
W42	9:15-9:30	Lilley, Jennifer
W43	9:30-9:45	Khan, Aisha
W44	9:45-10:00	Kopacz, Avery
W45	10:00-10:15	Thompson, Christopher
	BREAK	
W46	10:30-10:45	Murphy, Alexandria
W47	10:45-11:00	Peiris, Craig
W48	11:00-11:15	Quaraishi, Baseer
W49	11:15-11:30	
W50	11:30-11:45	

Judging Group 1B - Wednesday, March 20, 2019

(All the following times are PM!)

Poster	Time	Name
W51	1:15-1:30	Brown, Timothy
W52	1:30-1:45	Blanton, Henry
W53	1:45-2:00	McDaniel-Mims, Brianyell
W54	2:00-2:15	Bounds, Kayla
W55	2:15-2:30	Sharma, Monica
	BREAK	
W56	2:45-3:00	Stuebler, Antonia
W57	3:00-3:15	Liu, Xiaobo
W58	3:15-3:30	Roberts, Emma
W59	3:30-3:45	Mohiuddi, Ismail
W60	3:45-4:00	Ristic, Bojana
W61	4:00-4:15	Baishya, Jiwasmika

Judging Group 2B - Wednesday, March 20, 2019

(All the following times are PM!)

Poster	Time	Name
W62	1:15-1:30	Eldem, Irem
W63	1:30-1:45	Dash, Akshar
W64	1:45-2:00	Caballero, Beatrice
W65	2:00-2:15	Blay-Tofey, Morkeh
W66	2:15-2:30	Pham, Theophilus
W67	2:30-2:45	Saa, Lisa
	BREAK	
W68	3:00-3:15	Opoku, Akwasi
W69	3:15-3:30	Holstead, Brady
W70	3:30-3:45	Nguyen, Thinh
W71	3:45-4:00	Brogan, Joshua
W72	4:00-4:15	Fisher, John

Judging Group 3B - Wednesday, March 20, 2019

(All the following times are PM!)

Poster	Time	Name
W73	1:15-1:30	Aldrete, Jonathan
W74	1:30-1:45	Hanson, Keith
W75	1:45-2:00	Pires, Brandon
W76	2:00-2:15	Walterscheid, Brooke
W77	2:15-2:30	Wagner, Clayton
	BREAK	
W78	2:45-3:00	Eslinger, Cody
W79	3:00-3:15	Tran, James
W80	3:15-3:30	Boylan, Kathryn
W81	3:30-3:45	Anderson, Brittany
W82	3:45-4:00	Burden, Ryan
W83	4:00-4:15	Young, Jonathan

Judging Group 4B - Wednesday, March 20, 2019
(All the following times are PM!)

Poster	Time	Name
W84	1:15-1:30	Espinosa-Tello, Alejandro
W85	1:30-1:45	Madison, Kyle
W86	1:45-2:00	Domingo-Johnson, E.L.
W87	2:00-2:15	Nguyen, Tam
W88	2:15-2:30	D'Souza, Preston
W89	2:30-2:45	Stewart, Caleb
	BREAK	
W90	3:00-3:15	Bolton, Coy
W91	3:15-3:30	Frost, Joshua
W92	3:30-3:45	Mendez, Emily
W93	3:45-4:00	Maveddat, Ashley
W94	4:00-4:15	Nesbitt, William

Judging Group 5B - Wednesday, March 20, 2019
(All the following times are PM!)

Poster	Time	Name
W96	1:15-1:30	Helton, Tyler
W96	1:30-1:45	Dharmapandi, Gnanashree
W97	1:45-2:00	Hope, Brianna
W98	2:00-2:15	Amkiri, Nnana
W99	2:15-2:30	Osemwengie, Bradley
	BREAK	
W100	2:45-3:00	Alhaj, Sara
W101	3:00-3:15	Castaneda, Karen
W102	3:15-3:30	Moreno, Tanir
W103	3:30-3:45	Ahle, Daniel
W104	3:45-4:00	Gottam, Bhargavesh
W105	4:00-4:15	Narayan, Monisha

Judging Group 1A - Thursday, March 21, 2019
(All the following timings are AM!)

Poster	Time	Name
TH1	9:00-9:15	Miller, Sarah
TH2	9:15-9:30	Kjellgren, Abbey
TH3	9:30-9:45	Little, William
TH4	45-10:00	Lopez, Andrea
TH5	10:00-10:15	Gomez, Andre
	BREAK	
TH6	10:30-10:45	Hilken, Tate
TH7	10:45-11:00	Welch, Garrett
TH8	11:00-11:15	Aftabi, Ali
TH9	11:15-11:30	Tudman, Jai'Cee
TH10	11:30-11:45	Nicholson, Makayla

Judging Group 2A - Thursday, March 21, 2019
(All the following timings are AM!)

Poster	Time	Name
TH11	9:00-9:15	Keim, Klara
TH12	9:15-9:30	Brito, Maritza
TH13	9:30-9:45	Cristy, Shane
	BREAK	
TH14	9:45-10:00	Wagstaff, Rachel
TH15	10:00-10:15	Hussain, Shabab
TH16	10:30-10:45	Yetter, Thomas
TH17	10:45-11:00	Sankoorikkal, Nikita
TH18	11:00-11:15	Diaz, Rony
TH19	11:15-11:30	Steed, Joanna
TH20	11:30-11:45	Otih-Nimoh, Joseph

Judging Group 3A - Thursday, March 21, 2019
(All the following timings are AM!)

Poster	Time	Name
TH21	9:00-9:15	Almeida, Micah
TH22	9:15-9:30	George, Asher
TH23	9:30-9:45	Lara, Steven J.
TH24	9:45-10:00	Owoade, Damilola
TH25	10:00-10:15	Scarbrough, Kirsten
	BREAK	
TH26	10:30-10:45	Karimi, Alikhan
TH27	10:45-11:00	Philip, Stacy
TH28	11:00-11:15	Bunch, James
TH29	11:15-11:30	Ramzanali, Salena
TH30	11:30-11:45	Bihari, Sanyukta

Judging Group 4A - Thursday, March 21, 2019
(All the following timings are AM!)

Poster	Time	Name
TH31	9:00-9:15	
TH32	9:15-9:30	Burroughs, Chelsea
TH33	9:30-9:45	Deleon, Sabrina
TH34	9:45-10:00	Esquivel, Esteban
TH35	10:00-10:15	Cox, Brittany
	BREAK	
TH36	10:30-10:45	Slate, Rachel
TH37	10:45-11:00	Ali, Fahad
TH38	11:00-11:15	Parikh, Niki
TH39	11:15-11:30	Ruppert, Misty
TH40	11:30-11:45	Foley, David

Judging Group 5A - Thursday, March 21, 2019
(All the following timings are AM!)

Poster	Time	Name
TH41	9:00-9:15	
TH42	9:15-9:30	Jacob, Daron
TH43	9:30-9:45	Mitchell, Diana
TH44	9:45-10:00	Pillutla, Pranati
TH45	10:00-10:15	Tsen, Adam
TH46	10:15-10:30	Stamps, David
	BREAK	
TH47	10:45-11:00	Smith, Jessica
TH48	11:00-11:15	Pedroza, Diego
TH49	11:15-11:30	Reese, Britney
TH50	11:30-11:45	Anderson, Trevor

Judging Group 1B - Thursday, March 21, 2019

(All the following timings are PM!)

Poster	Time	Name
TH51	1:15-1:30	Esfahani, Shiva Hadi
TH52	1:30-1:45	Bagchi, Sounak
TH53	1:45-2:00	Racheal, Grace
TH54	2:00-2:15	Anwar, Mohammad
TH55	2:15-2:30	Reddy, Sreedhar
TH56	2:30-2:45	Sivandzade, Farzane
	BREAK	
TH57	3:00-3:15	Lahooti, Behnaz
TH58	3:15-3:30	Greene, Carl
TH59	3:30-3:45	Page, Shyanne
TH60	3:45-4:00	Ahmed, Ekram
TH61	4:00-4:15	Ramachandran, Sharavan

Judging Group 2B - Thursday, March 21, 2019

(All the following timings are PM!)

Poster	Time	Name
TH62	1:15-1:30	Raut, Snehal
TH63	1:30-1:45	Albekairi, Thamer
TH64	1:45-2:00	Kaushik, Itishree
TH65	2:00-2:15	Nozohouri, Saeideh
TH66	2:15-2:30	
	BREAK	
TH67	2:45-3:00	Rolph, Daniela
TH68	3:00-3:15	Lee, YoonJung
TH69	3:15-3:30	Sifat, Ali
TH70	3:30-3:45	Brindle, Athena
TH71	3:45-4:00	Sajib, Md. Sanaullah
TH72	4:00-4:15	Tuz, Fatema

Judging Group 3B - Thursday, March 21, 2019

(All the following timings are PM!)

Poster	Time	Name
TH73	1:15-1:30	Dhir, Nikita
TH74	1:30-1:45	Suryavanshi, Joash
TH75	1:45-2:00	Rivera, Elsy
TH76	2:00-2:15	Kubosumi, Aaron
TH77	2:15-2:30	Umelo, Jonathan
TH78	2:30-2:45	Preston, Peyton
	BREAK	
TH79	3:00-3:15	Lin, Christine
TH80	3:15-3:30	Edwards, Samantha
TH81	3:30-3:45	Lee, Shannon
TH82	3:45-4:00	Omoruyi, Felix
TH83	4:00-4:15	Hsu, Chia

Judging Group 4B - Thursday, March 21, 2019

(All the following timings are PM!)

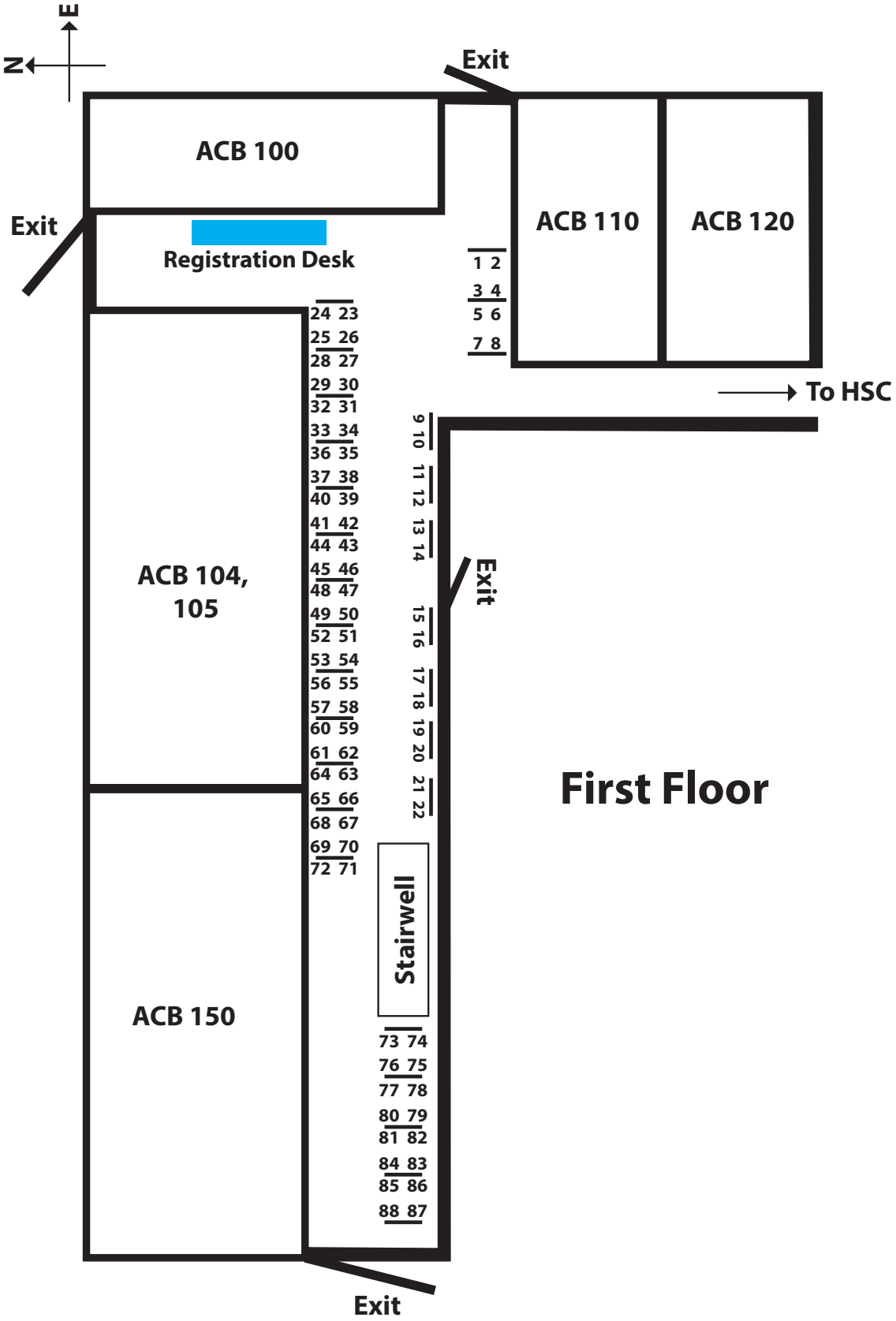
Poster	Time	Name
TH84	1:15-1:30	Lines, Jefferson
TH85	1:30-1:45	Muysson, Marcella
TH86	1:45-2:00	Danaj, Alexander
TH87	2:00-2:15	Rosales, Abigail
TH88	2:15-2:30	Gonzales, Alan
	BREAK	
TH89	2:45-3:00	Rittmann, Randall
TH90	3:00-3:15	Hoang, Dustin
TH91	3:15-3:30	Younes, Lena
TH92	3:30-3:45	Byrd, Alyssa
TH93	3:45-4:00	Callier, Kylie
TH94	4:00-4:15	Osinovsky, Jamie

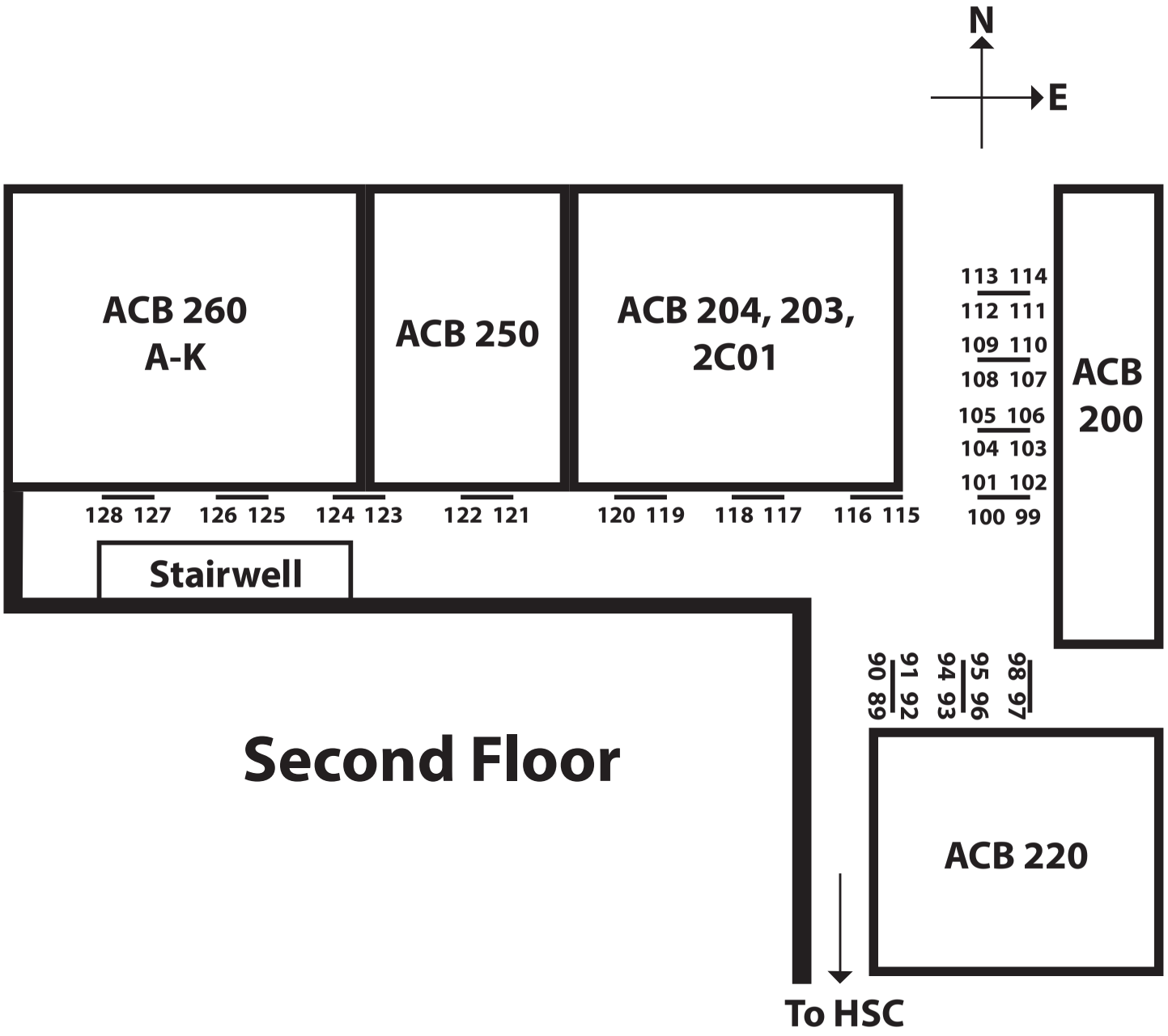
Judging Group 5B - Thursday, March 21, 2019

(All the following timings are PM!)

Poster	Time	Name
TH95	1:15-1:30	Abraham, Helayna
TH96	1:30-1:45	Macleay, Katelyn
TH97	1:45-2:00	Puccio, Olivia
TH98	2:00-2:15	Lung, John
TH99	2:15-2:30	Kibuule, Grace
TH100	2:30-2:45	Argue, Jay
	BREAK	
TH101	3:00-3:15	Anderson, Erika
TH102	3:15-3:30	Baker, Bernadette
TH103	3:30-3:45	Lindgren, Taylor
TH104	3:45-4:00	Brady, Rebecca
TH105	4:00-4:15	Raju, Sneha

POSTER LOCATIONS

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GRADUATE STUDENTS YEARS 1-2

GS1-2 ANDERSON, TREVOR

Expression and Characterization of Soluble Epitope-Defined Major Histocompatibility Complex (MHC) from Stable Eukaryotic Cell Lines

Wooster, Amanda; Anderson, Trevor; Lowe, Devin

The increased scientific understanding of CD8+ T cells under both normal and diseased states can be significantly attributed to the utilization of MHC class I-specific reagents such as fluorescently-labeled multimers (e.g., tetramers). Typically, these recombinant MHC class I-specific reagents are produced in bacteria following a lengthy purification protocol requiring additional non-covalent folding steps with exogenous peptide to permit complete molecular assembly. We have developed an alternative and more rapid approach to generating soluble and functional MHC class I molecules in eukaryotic lines such as CHO cells. This methodology results in the development of stable cell lines that reliably secrete epitope-defined MHC class I proteins into the tissue media for convenient purification and downstream modifications that include biotinylation and multimerization. Overall, the entire MHC class I complex is covalently linked, permitting loading of user-defined peptides with various affinities that can specifically engage a diverse set of CD8+ T cells. Additionally, these eukaryotic-derived MHC molecules may more accurately recapitulate binding dynamics with CD8+ T cells in relevant assays.

School: Graduate School of Biomedical Sciences | Campus: Abilene

GS1-2 BISHYA, JIWASMIK

Identification of Defensive Mechanisms in Pseudomonas aeruginosa Enabling Survival in Polymicrobial Growth with Fungi

J. Baishya, B. Perez, M. Zinah, J. P. Morris, K. P. Nguyen, C.a. Wakeman

Microbial communities are an amalgam of different species of microorganisms where some members of the community occupy overlapping niches. These microorganisms attempt to outcompete each other to reduce competition in terms of limited nutrients and space via secretion of a range of molecules. The functions of these molecules can range from being toxic (actively killing off competitors) to being protective (shielding the producer from anti-microbials) to enabling more efficient resource scavenging (potentially starving out competitors). The nature of these secreted molecules and interspecies interactions dictate the shape of microbial communities and, in some cases, the severity of disease within human hosts. In that direction, our lab is interested in identifying the genes encoding defensive molecules in Gram-negative bacterium Pseudomonas aeruginosa in response to fungal species it may encounter within the various environmental or infectious niches it occupies. P. aeruginosa, commonly isolated from soil and water habitats, is known to produce a plethora of virulent anti-microbials. However, not much is known about the defensive molecules it produces to protect itself from toxic molecules secreted by neighboring competitors. In our experiments, we have used GFP-labelled Cryptococcus neoformans as our model for discovering P. aeruginosa's defensive molecules via its interaction with the fungi. The soil fungus C. neoformans, known as the causative microbe for meningitis in immunocompromised human hosts, produces toxic molecules against human hosts and as well as microbial species. For our studies, we have co-cultured C. neoformans with a commercially available transposon-mutant library of P. aeruginosa to identify genes necessary for competitive growth. Mutants of P. aeruginosa depicting reduced growth in the primary screening have been subjected to secondary screening to further confirm the requirement of the deficient gene in P. aeruginosa,Äôs defensive mechanisms. On

School: Texas Tech University | Campus: Lubbock

GS1-2 BISHT, KARISHMA

Elucidating the Genetic Mechanisms Involved in Thermoregulation of Pseudomonas aeruginosa Biofilm Formation

K Bisht and J Rimbey and J L Moore and R M Caprioli and E P Skaar and C A Wakeman

Biofilms are groups of microorganisms that adhere to surfaces and interact with each other using an extracellular polymeric substance (EPS). Microorganisms have developed complex mechanisms to sense and react to their constantly changing environment under these conditions. One key regulatory cue for them is the temperature which can cause behavioral and morphological changes in the microbial communities. Pseudomonas aeruginosa is a common nosocomial bacterium, that can cause various serious diseases in infected humans. The severity of the infections is compounded by P. aeruginosa's ability to form robust biofilms in all the various niches it occupies. Biofilm-associated infections are particularly recalcitrant to clearance by both antimicrobial therapy and immune function. We hypothesize that the fluctuations in temperature in the different niches that P. aeruginosa occupies drive the formation of biofilms specifically adapted to survival within that environment. Using MALDI IMS, we have demonstrated that biofilms grown under these different temperature conditions exhibit dramatically different protein expression profiles, which supports the possible presence of unique temperature-specific biofilm adaptations. The objective of this project is to elucidate the genes involved in the temperature regulation of biofilm formation of P. aeruginosa.

For this purpose, a biofilm screen was run using a commercially-available transposon mutant library containing over 5,000 unique mutants of P. aeruginosa at four different temperatures (~25oC, 30oC, 37oC, and 40oC) to identify genes required for temperature-specific biofilm formation. Effectively this project will reveal the genetic mechanisms utilized by P. aeruginosa to establish biofilm growth at temperatures relevant to medical, industrial, and natural environments and will provide a wealth of information regarding the adaptive potential of P. aeruginosa towards the colonization of various niches including the human.

School: Texas Tech University | Campus: Lubbock

GS1-2 BROWN, TIMOTHY

The lactate receptor Gpr81 on non-cancer cells promotes an immunosuppressive phenotype in the tumor microenvironment

Timothy Brown, Sabarish Ramachandran, Vadivel Ganapathy

Cancer cells display a unique phenomenon in which, even in the presence of oxygen, cells switch from oxidative phosphorylation to glycolysis as the primary source of ATP with consequent production of lactic acid. This phenomenon, called the Warburg Effect, is a hallmark of cancer. Lactic acid has long been considered as the necessary end product of this metabolic switch, where lactic acid is effluxed out of tumor cells to prevent intracellular acidification. Recent evidence however suggests that lactate and the excess protons in the tumor microenvironment (TME) play an active role in tumor growth. In particular, lactate has been shown to function as an agonist for GPR81, a G-protein-coupled receptor expressed on the surface of tumor cells. This autocrine signaling of lactate promotes tumor growth and metastasis, as well as angiogenesis and immune evasion. The present study assesses whether tumor cell-derived lactate has any paracrine role via GPR81 in non-cancer cells present in the TME. We generated MMTV-PyMT-Tg mice, a spontaneous model for breast cancer, on Gpr81+/+ and Gpr81-/- backgrounds. The absence of Gpr81 reduced mammary tumor incidence, delayed tumor progression, and reduced lung metastasis. These data demonstrate the essential role of GPR81 in breast cancer growth and metastasis, but does not differentiate between Gpr81 in tumor cells versus Gpr81 in the TME. We then used the syngeneic transplant of the mouse mammary tumor cell line AT-3 into the mammary fat pads of wild type (WT) and Gpr81-/- mice to assess the involvement of Gpr81 in the TME. AT-3 cells are negative for Gpr81, and therefore our model limits Gpr81 expression to non-tumor cells in the host mouse. The growth of transplanted tumor cells was significantly reduced in Gpr81-/- mice than in WT mice. RNA-seq analysis of AT-3 tumors suggest an immunosuppressive function of Gpr81, where tumors grown in a Gpr81-/- background have much stronger gene expression profiles in T-cell signaling pathways.

School: Graduate School of Biomedical Sciences/ School of Medicine | Campus: Lubbock

GS1-2 ELLEN, CHRISTOPHER

Environmental and Physiological impacts on Assisted Reproductive Technologies

C.Ellen, S. Prien, L. Penrose

Looking to improve success rates of assisted reproductive technologies in humans and with the increasing number of reports indicating that environmental factors may be influencing reproductive capabilities, a chart review study was conducted to see how urban and rural environments affect a patient‚Äôs response to assisted reproductive technologies. This was in follow up to a previous study with this clinic population which demonstrated differences in semen parameters between urban and rural populations. In Vitro Fertilization (IVF) reports from 2014 to 2017 were analyzed to look for potential effects. To look for potential impacts, male patients‚Äô semen was assessed pre-wash and post-wash by comparing volume, concentration, and motility. Female patients‚Äô were assessed by looking at the number of oocytes recovered and subsequently fertilized by either IVF or Intracytoplasmic Sperm Injection (ICSI). Finally, embryos were assessed by comparing development, stage and grade. Results from male patients continued to show differences between urban and rural environments ($P < 0.05$), while in female patients only the number of oocytes recovered show a significant difference between rural and urban populations ($p < 0.01$). Oocytes fertilized, embryo development, stage and grade did not show a difference between urban and rural populations ($P = 0.241$). While data continue to support the impact of resident location on male fertility parameter, no such relationship was seen for female factors or embryo quality. Data for pregnancy outcomes is pending.

School: Texas Tech University | Campus: Lubbock

GS1-2 ENRIQUEZ, JOSUE

T cell-mediated bone marrow and splenic hypoplasia in a mouse model of acute graft vs. host disease

Josue Enriquez, Brianyell McDaniel Mims, Kathryn Furr and Matthew Grisham

A major limitation with use of hematopoietic stem cell transplantation to treat relapsing/ refractory hematological malignancies is the development of a potentially lethal, multi-organ inflammatory disorder called acute graft versus host disease (aGVHD). Acute GVHD-associated bone marrow (BM) suppression and lymphoid tissue (LT) hypoplasia creates protracted immunodeficiency that greatly increases the risk of infections, bleeding and death. Objective: We wished to define the role that allogeneic CD4+ T cells play in a mouse model of aGVHD-associated BM and LT aplasia that does not require lethal myeloablative conditioning. Methods: Allogeneic CD4+CD25- T cells (0.5x106 cells) obtained from Bl6-H2-Ab1bm12 (Bl6-BM12) donor mice were adoptively transferred into sub-lethally irradiated C57Bl/6J (Bl6) recipients. Mice were monitored daily for clinical signs of aGVHD. Results: Adoptive transfer of allogeneic but not syngeneic T cells induced a time-dependent loss of survival and remarkable reductions of cellularity in the BM and spleen. Virtually all mice engrafted with allogeneic T cells developed severe anemia at 15 days post transfer. Flow cytometric analyses revealed dramatic and significant losses of CD4+ T cells, myeloid cells and NK cells in the BM and spleen indicating aGVHD-mediated BM suppression and spleen hypoplasia. Interestingly, we observed little or no immune cell infiltration in the lungs, liver and skin of allogeneic engrafted recipients and no evidence of disease in any tissue of mice engrafted with syngeneic T cells. These data suggest that the major target tissues in this model of aGVHD are BM and spleen. Conclusions: When taken together, these data demonstrate that adoptive transfer of allogeneic CD4+ T cells into sub-lethally irradiated recipients induces aGVHD-associated immunodeficiency.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS1-2 GEORGE, ELIZABETH

A Meta-Analysis on Diet Interventions, Regular Exercise and Better Lifestyle Factors to Delay the Progression of Dementia In Elderly Individuals

Elizabeth George, P. Hemachandra Reddy

This study assesses the impact of healthy diets and regular exercise on dementia in elderly individuals and patients with early Alzheimer's disease (AD). Our presentation outlines strong evidence for various modifiable and non-modifiable risk factors associated with the reduced risk of dementia. Currently, health care costs for the 50 million people afflicted with AD are about $818 million and are projected to be $2 billion by 2050. Unfortunately, there are no drugs currently available that can delay and/or prevent the progression of disease in elderly individuals and in patients with Alzheimer's. The two key pathological hallmarks of the neurodegenerative disease are extracellular amyloid deposits and intracellular neurofibrillary tangles. Loss of synapses and synaptic damage are largely correlated with cognitive decline in Alzheimer's disease patients. This presentation also highlights major brain sites affected by AD. Synaptic damage and mitochondrial dysfunction are presented in early events of AD pathogenesis. Only about 1-2% of total AD patients can be explained by causal factors. Mutations in APP, PS1, and PS2 have been identified as genes involved in early onset AD. Several risk factors have been identified, such as Apolipoprotein E4 genotype, type 2 diabetes, traumatic brain injury, depression and hormonal imbalance are reported to associate with late-onset sporadic AD. Strong evidence reveals that antioxidant enriched diets and regular exercise reduces toxic radicals, enhances mitochondrial function and synaptic activity and improves cognitive function in elderly populations. Current available data on the use of antioxidants in transgenic mouse models of AD and antioxidant(s) supplements in diets of elderly individuals were investigated. The use of antioxidants in randomized clinical trials in AD patients was also critically assessed. This presentation discusses the current status of healthy diets and regular exercise on dementia in elderly individuals.

School: Texas Tech University | Campus: Lubbock

GS1-2 HERNANDEZ, SARAH

Regulation of alpha-Synuclein Expression at the Ribosome

Sarah Hernandez, Kristen Baca, Elena B. Tikhonova, Andrey L. Karamyshev

Intracellular aggregation of alpha-synuclein (aSyn) is associated with many neurodegenerative diseases, such as Parkinson's disease (PD). Despite many studies on aSyn, the mechanism by which it aggregates is still unknown. Our hypothesis is that alterations of interacting partners during translation leads to misfolding and aggregation of aSyn, causing disease. In PD, this alteration of interacting partners can be due to a mutation in aSyn itself (familial PD) or by defects in the interacting partners (sporadic PD). The major goal of this study is to use a candidate approach to identify possible interacting partners during translation for both wild-type and mutated aSyn. Candidates will include proteins or complexes that are involved in translation at the ribosomal level, such as the signal recognition particle (SRP), Hsp70, TRiC/CCT, etc. SRP is also involved in the Regulation of Aberrant Protein Production (RAPP) Pathway, where it functions with its counterpart, Ago2, to control the expression of misfolded proteins. We found that knocking-down SRP54, the nascent-chain binding subunit of SRP, affects both mRNA and protein expression of aSyn. Our results suggest that the targeting factor, SRP, and the RNA-silencing factor, Ago2, are involved in aSyn regulation, possibly at the level of translation. Determining co-translational interacting partners of aSyn is key in discerning the causes of aggregation and developing therapies against it.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS1-2 JACKSON, BENJAMIN

The Purification and Reconstitution of P-glycoprotein Into Lipid Nanodiscs Gives Insights Into ATPase Kinetics

Benjamin Jackson, Courtney Katz, Ina Urbatsch

P-glycoprotein (Pgp) is a membrane bound hydrophobic multidrug efflux pump that is naturally expressed in absorption barriers (intestinal lining, blood brain barrier,etc.) throughout the human body. These proteins function to efflux typically cytotoxic compounds as they pass through the membrane with very broad specificity, allowing the cell to establish a resistance to many different compounds. This has been shown to be the case in certain forms of cancer that gain Multidrug Resistance (MDR) against many different forms of chemotherapy. It is therefore greatly beneficial to study the kinetics of this protein as coadministration of Pgp inhibitors with typically effluxed chemotherapy drugs has been shown to increase the cytosolic and blood plasma levels of the drug, indicating that these methods can shift pharmacokinetics to more therapeutic outcomes.

In this study, Pgp was purified in a mild detergent to homogeneity, and then either assayed after simply mixing with liposomes (mixed detergent/lipid micelles), or reconstituted into a lipid nanodiscs using a membrane scaffold protein. These purified Pgp-lipid systems allow us to assay solely Pgp, free of any background ATPase activity; and in the case of the reconstituted Pgp-nanodic allow assays in a more naturally occurring lipid bilayer environment.

We utilize a facile Linked Enzyme ATPase assay (LE-Assay) to monitor ATPase hydrolysis as a function of Pgp substrate or inhibitor concentrations. Substrates stimulate ATP hydrolysis in a dose-dependent manner, while inhibitors can be assayed by competition with a good stimulator. Dramatic changes in activity and relative affinity were seen for many drugs when assayed in lipid nanodiscs. We find that the apparent binding affinity of purified Pgp-nanodiscs versus Pgp in mixed detergent/lipid micelles is about 10-fold higher for some known stimulatory substrates, while surprisingly some known stimulatory substrates, such a Hoechst, began to show inhibitory effects.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS1-2 KATZ, COURTNEY

Tryptophan Fluorescence to Monitor Drug Binding in P-glycoprotein

Courtney Katz, Ben Jackson, Joachim Weber, Ina Urbatsch

P-glycoprotein (Pgp) is classified under the ATP-binding cassette (ABC) transporter superfamily. Pgp is one of seven transporters involved in drug-drug interactions and in drug resistance, by pumping harmful substances out of the cell. Further exploring the mechanism how Pgp recognizes and exports a large variety of drugs, scientists can manipulate inhibitors to enhance drug treatment for cancer, HIV, cardiovascular diseases and more.

Tryptophan (Trp) is the dominant fluorescent amino acid. Trp fluorescence signal is very sensitive to changes in the environment, allowing trps to map out drug binding sites in Pgp. With eleven native trps in the wild type (WT) structure, background fluorescence is too high to follow these changes caused by individual trps. By removing 8 transmembrane domain trps, a low trp background (W(3Cyto)) has been generated and single Trp mutations were placed strategically surrounding theoretical binding site(s); which were identified by co-crystallization with known Pgp drugs.

Trp is a common fluorescence donor; when paired with Zosuquidar (fluorescence acceptor), a sufficient fluorescence resonance energy (FRET) pair is made (Ro = 27√Ö). WT and W(3Cyto) showed concentration dependent fluorescence quenching when titrated with Zosuquidar; a high affinity binding site around 0.08 ¬µM, with a second affinity site showing complete quenching around 6 ¬µM was seen.

QZ-Val (tricyclic polypeptide, Pgp inhibitor) was bound with single Trp mutations to identify binding site(s) by direct contact interactions. Single Trp mutations should show a curve between WT and W(3Cyto). A single Trp mutation (F979W) showed approximately 20% fluorescence quench in the presence of QZ-Val compared to W(3Cyto) background.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS1-2 KOPEL, JONATHAN

Suppression of the citrate transporter SLC13A5 expression in liver as a novel antidiabetic mechanism for metformin

J. Kopel, S. Ramachandran, and V. Ganapathy

Metabolic syndrome (MetS) is a growing health crisis; it refers to a constellation of metabolic/biochemical disturbances resulting from obesity, insulin resistance, and diabetes. Along with diet and exercise, metformin remains the sole first line-treatment for managing MetS-associated diabetes. Although studies have discovered several mechanisms for metformin's therapeutic action, no study has investigated metformin's action on the citrate transporter SLC13A5. Cytoplasmic citrate is an inhibitor of glycolysis and stimulator of gluconeogenesis; it is also the precursor for fatty acid and cholesterol synthesis. As these pathways are related to obesity, dyslipidemia, insulin resistance, and diabetes, we hypothesized that the actions of metformin might include suppression of SLC13A5 expression in liver. Metformin is an activator of AMP kinase. Therefore, we investigated the transport function, mRNA, and protein levels of SLC13A5 in the human liver cell line HepG2 following treatment with metformin and 5-Aminoimidazole-4-carboxamide ribonucleotide (AICAR) under high- and low-glucose conditions. AICAR is a pharmacological activator of AMP kinase. Our studies showed that treatment of the cells with AICAR reduced SLC13A5 expression and function in both high- and low-glucose conditions. Treatment with metformin also decreased SLC13A5 expression and function, but only in low-glucose conditions. Kinetic studies revealed that the inhibition of the transport function was noncompetitive, suggesting a decrease in the transporter density in treated cells. AMP kinase influences anabolic pathways via the transcription factors SREBP1/2. We found that treatment of HepG2 cells with Fatostatin, an SREBP-1 inhibitor, produced a 2-fold increase in citrate uptake. These studies reveal a novel mechanism for metformin as an antidiabetic drug, which involves suppression of SLC13A5 expression and function in liver.

School: Texas Tech University | Campus: Lubbock

GS1-2 KORAC, KSENIJA

Potential Role of SIRT1 Deacetylase in D52 Vaccine Induced Tumor Immunity

Ksenija Korac, C. Riccay Elizondo, Jennifer D. Bright, and Robert K. Bright

Vaccine induced immunity against tumor-self antigen D52 has proven to be promising against cancer without inducing autoimmunity. CD8+ T-cells that are elicited against tumor-self antigen D52 by vaccination have the ability to recognize cancer cells but not healthy cells that also express this self-antigen. Lysine deacetylases are enzymes that catalyze the removal of acetyl groups from lysine residues. The oncogenic tumor self-antigen D52 contains 19 lysine residues evenly distributed throughout the protein. We hypothesize that modification of amino acid residues within D52 differs between tumor cells and normal cells which influences the recognition of D52 (and the tumor cells) by CD8+ T-cells that are D52 specific due to emergence of pMHC I neo-ligands within D52 expressed by cancer cells. To test our hypothesis, we selected deacetylase SIRT1 in order to examine its expression in D52+ 3T3, 3T3mD52 and 4T1 cell lines. Based on our previous studies, endpoint RT-PCT showed that SIRT1 expression is increased in tumor cells when compared to the normal cells. Further examination of this enzyme in tumor cell lines could help identify variances in D52-K-acetylation that increase T-cell recognition to tumor self-antigens in general and D52 specifically without causing autoimmunity.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS1-2 MAY, JORDAN

Effect of Trichuris co-infection on Sm-p80-based vaccine in baboons

Jordan May, Adebayo Molehin, Weidong Zhang, Juan Rojo, Jasmin Freeborn, Justin Sudduth, Parth Patel, Afzal A. Siddiqui

Schistosomiasis is a Neglected Tropical Disease (NTD) caused by infections with the parasitic helminth Schistosoma in humans. To date, the vaccine antigen Schistosoma mansoni antigen (Sm-p80) has been shown to confer both prophylactic and therapeutic immunity in experimental models of schistosomiasis. Sm-p80 vaccine is now being developed under good manufacturing practices in preparation for Phase 1 human clinical trials later this year. Our previous vaccine efficacy trials of Sm-p80 have utilized standard strategies of vaccine administration to naive animals followed by schistosome cercarial exposure to evaluate the prophylactic efficacy. However, people living in schistosomiasis-endemic regions do suffer from other concomitant parasitic helminth infections. In this present study, we aimed to evaluate the efficacy of Sm-p80 vaccine formulated in Glucopyranosil Lipid Adjuvant Stable Emulsion (GLA-SE) against S. mansoni infections in baboons co-infected with a soil-transmitted helminth, Trichuris trichuria. We also investigated molecular mechanisms and epistatic interactions associated with co-morbidity and vaccine efficacy using systems biology approaches. Data obtained from this study, evidenced by worm and tissue egg burden, showed that Sm-p80 vaccine efficacy was significantly impaired in baboons with Trichuris co-infection when compared to those infected with S. mansoni alone. Preliminary analyses of the RNA sequencing data revealed unique differentially expressed genes (DEGs) and canonical pathways that may be associated with the loss of protective vaccine efficacy in the baboons with Trichuris co-infection. These DEGs could be used as markers predictive of vaccine efficacy or the loss of it and, overall, our study provides critical points of consideration in the field deployment and efficacy testing of not only schistosomiasis vaccine antigens but other vaccines as well.

School: Texas Tech University | Campus: Lubbock

GS1-2 MAZZITELLI, MARIACRISTINA

Group II metabotropic glutamate receptors, particularly mGluR2, in the amygdala regulate sensory and affective responses in a rodent model of arthritis pain

Mariacristina Mazzitelli and Volker Neugebauer

Pain is a multidimensional experience with an important averse-affective dimension. The amygdala plays a critical role in the emotional-affective aspects of behaviors and in pain modulation. The central nucleus of amygdala (CeA) serves major output functions, and neuroplasticity in the CeA is mechanistically linked to pain-related behaviors in different pain conditions. The activation of Gi/o-coupled group II metabotropic glutamate receptors (mGluR2 and mGluR3) can decrease neurotransmitter release and regulate synaptic plasticity. Evidence from preclinical studies suggests that mGluR2/3 may be a target for neuropsychiatric disorders and they can inhibit pain-related processing and behaviors. The contribution of mGluR2 and mGluR3 in the amygdala to pain-related behaviors remains to be determined.

Audible and ultrasonic vocalizations, and mechanical withdrawal thresholds were measured in normal and arthritic rats (5-6 h after induction of a mono-arthritis in the left knee joint with intra-articular kaolin and carrageenan). Systemic application (30 min before behavioral testing) of a group II mGluR agonist (LY379268 disodium salt) decreased the vocalizations and increased the spinal reflex thresholds of arthritis rats. To determine the contribution of mGluRs in the amygdala, a group II mGluRs antagonist (LY341495 disodium salt), a positive allosteric modulator for mGluR2 (PAM, LY487379 hydrochloride), or a negative allosteric modulator for mGluR2 (NAM, VU6001966) was applied stereotaxically into the right CeA by microdialysis. Blockade of mGluR2 with LY341495 or VU6001966 in the CeA reversed the effects of a systemically applied group II mGluR agonist. Activation of mGluR2 with LY487379 in CeA mimicked the effect of the systemically applied group II mGluR agonist in arthritis rats.

These results suggest that group II mGluRs, and particularly mGluR2, in the amygdala can regulate pain-related behaviors and play a major role in the effects of systemic group II agonists.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS1-2 MYERS, CAITLYN

The Epididymal Amyloid Matrix is a Novel Host Defense Structure

Caitlyn Myers, Gail A. Cornwall

The epididymis plays a critical role in protecting sperm from invading pathogens that can ascend the male tract and cause inflammation and infertility. Because of the blood-epididymal barrier, the epididymis has a limited adaptive immune system and must rely heavily on the antimicrobial proteins (AMPs) of the innate immune system. It is not yet known mechanistically how these AMPs function. However, in other organ systems some AMPs require an amyloid conformation for function. This includes Œ±-defensin 6 in the gut and AŒ≤ in the brain whose amyloids form nanonets that entrap pathogens. We previously established that a non-pathological, functional amyloid matrix is in the epididymal lumen and contains the amyloid forms of the CRES subgroup proteins (CRES, CRES2, CRES3, and cystatin E2), a reproductive subgroup within the family 2 cystatins of cysteine protease inhibitors. We hypothesize the epididymal amyloid matrix is a novel host defense structure that forms a protective net around spermatozoa and that traps and kills pathogens. Incubation of recombinant CRES with wildtype E. coli strain MM294 in CFU assays caused a significant decrease ($p<0.05$) in their survival compared to buffer control; further most AMP activity was associated with CRES amyloid and not monomeric forms. Further, transmission electron microscopy showed that CRES amyloid engulfed bacteria and appeared to disrupt membranes. The endogenous epididymal amyloid matrix also caused a profound decrease in the survival of MM294. Many functional host defense amyloid structures (nanonets, biofilms) also contain extracellular genomic DNA for stability. Using DAPI (DNA) and thioflavin S (amyloid) staining, we observed DNA in the epididymal amyloid matrix. When treated with DNAse I, the matrix dispersed. Taken together, these studies suggest the CRES-containing epididymal amyloid matrix is a novel host defense structure.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS1-2 NAVARRO, STEPHANY

Different uropathogens produce diverse biofilms on urinary catheters

Stephany Navarro, Jane Colmer-Hamood, Thomas Nelius, Abdul Hamood

Long-term indwelling urinary catheters (IUCs) are inserted into the bladder and remain there for extended periods to provide continuous bladder drainage. During or after catheterization, bacterial pathogens may enter the urinary tract causing catheter-associated urinary tract infection (CAUTI). CAUTIs are among the most common health care acquired infections with 70-80% associated with long-term IUCs. At different infection sites, bacterial pathogens are known to exist within biofilms that contribute to the ability of the pathogen to tolerate antibiotics. We hypothesized that, within the bladder and influenced by urine, bacterial pathogens will form biofilms with variable architecture on IUCs. To examine this hypothesis, we collected 95 bacterial isolates from patients who presented with CAUTIs at the Urology Clinic at TTUHSC. Escherichia coli (32%), Klebsiella pneumoniae (18%), Pseudomonas aeruginosa (7%), and Enterobacter cloacae (7%) were the predominate pathogens isolated. A majority of these pathogens were multidrug resistant. Using synthetic artificial urine medium, which closely mimics human urine and supports the growth of these pathogens, and the flow-through continuous-culture system, 6 selected isolates (3 E. coli, 1 K. pneumoniae, 1 P. aeruginosa, and 1 E. cloacae) were allowed to develop separate biofilms on 1.5-cm pieces of silicone catheter for 7 days. We stained the biofilms using the LIVE/DEAD BacLight bacteria viability kit and visualized them by confocal laser scanning microscopy. Additionally, we analyzed the biofilm structures using the COMSTAT2 program. The pathogens produced dense mature biofilms that varied considerably in their architecture as well as in the proportion of live and dead bacteria within the biofilm. Furthermore, the biofilms differed in their biomass and surface-to-volume ratios. These results suggest that urinary tract pathogens are capable of producing biofilms with different structures and densities on IUCs.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS1-2 OLIVER, DARRYLL

Mitochondrial and Biomolecular Pathogenesis of Alzheimer's Disease

Darryll Oliver; P. Hemachandra Reddy

Alsheimer's disease (AD) is the most common form of dementia, and is characterized by progressive loss of memory, particularly short-term and working memory, and cognitive function. For aging populations, particularly those with high prevalence of obesity, metabolic disorder, and diabetes, susceptibility to AD is of major concern. AD is recognized to develop either as early-onset or familial AD (FAD), or late-onset or sporadic AD (SAD). Histopathological examination of postmortem AD brains reveals proliferation of Amyloid-Beta (AŒ≤) and Phosphorylated-Tau (PœÑ) toxic proteins in affected regions of the brain. Significant contributors to FAD include mutations in PS1 and PS2 loci of Œ≥-secretase gene, and APP which cleaves to form toxic AŒ≤. SAD is induced by: the APoŒµ4 genotype, as well as polymorphisms in several gene loci, traumatic brain injury, stroke, metabolic syndrome, obesity, type-2-diabetes, and age related factors; especially oxidative stress and mitochondrial dysfunction. This presentation examines the factors that induce AD pathology, particularly molecular components contributing to mitochondrial dysfunction. Recent developments in understanding of healthy and diseased mitochondrial structure, function, physiology, dynamics, and mitochondrial DNA will be highlighted pertaining to environmental, and genetic factors contributing to early and late onset AD.

School: Texas Tech University | Campus: Lubbock

GS1-2 REESE, BRITNEY

Polymorphism on Codon 72 of p53 Gene Alters Immunity through Altered Macrophage Polarization.

Britney M Reese, Shanawaz M Ghouse, Bhaumik Patel, Jun Hung Cho, Magdalena Karbowniczek, Maciej Markiewski

A common single nucleotide polymorphism in the tumor suppressor gene p53 occurs at codon 72. There are two variants of this codon: a proline (P72) and an arginine (R72). Several groups have linked this polymorphism to increased risk of cancer, diabetes and metabolic diseases, however the effects of this polymorphism on immunity remains unclear. We hypothesize that this polymorphism may impact macrophage activation because mice that carried R72 of a humanized replica of Tp53 had impaired response to LPS challenge. To investigate the effects of this polymorphism on inflammatory activities of macrophages, we used a human p53 knock-in (Hupki) mouse model, in which bone marrow-derived macrophages were homozygous for either P72 or R72. When these macrophages were stimulated with either LPS or IL-4 to induce macrophage polarization, we found that macrophages that carry R72 are reluctant to become classically activated macrophages (M1) as demonstrated by the altered expression of M1 genes and reduced IL-12 expression. Mechanistically, reduced ability of R72 macrophages to become M1 cells was driven by decreased NF-ŒʃB transcriptional activity demonstrated by reduced NF-ŒʃB nuclear translocation and reduced NF-ŒʃB binding to p53 in R72 cell compared to P72 cells. We theorize that these defects in immunity may contribute to increased risk of cancer in individuals that carry R72 because tumor associated macrophages that play a pivotal role in cancer progression are immunosuppressive as a result of their inability to become M1 cells.

School: Graduate School of Biomedical Sciences | Campus: Abilene

GS1-2 SCHAUBHUT, ALEXSANDRA

Specific Gravity Device Can Predict Bovine Embryo Sex

Cara Wessels, Lindsay Penrose, Alex Schaubut, Sam Prien

Objective: The objective of this study is to determine if a Specific Gravity Device (SGD) can predict bovine embryo sex.

Design: Lab based trial of experimental device

Materials and Methods: Bovine oocytes were collected from ovaries and fertilized in vitro. Six hundred embryos developed into grade 1 or 2 blastocysts and were individually passed through SGD. Embryo descent times were measured and recorded in seconds and then used in an Embryo Prediction Algorithm (EPA) to predict embryo sex. Embryo sex was also determined by Polymerase Chain Reaction (PCR). Comparisons were made between EPA prediction and PCR values to assess the ability of the SGD to predict embryo sex.

Results: PCR data was obtained on 463 embryos. The EPA demonstrated significant differences between male and female embryos ($P<0.05$). The EPA demonstrated 65.3-78.4% accuracy selecting for female embryos. This suggests SGD can predict sex of preimplantation bovine embryos.

Conclusions: The SGD can detect embryo sex based on differences in embryo buoyancy. Theoretically, buoyancy reflects differences in chromosomal weight of X and Y sex chromosomes or developmental differences between male and female embryos. Data suggest a high degree of correlation between SGD and the PCR results suggesting the technology can provide a noninvasive means to differentiate female pre-implantation embryos without the use of pre-implantation genetic testing or sexed semen. On-going studies are assessing if improvements will allow predictive values for male embryos as well.

Support: The authors would like to thank the J.R. Simplot Company for funding of this project.

School: Texas Tech University | Campus: Lubbock

GS1-2 SCHNIERS, BRADLEY

PEPT1 as a tumor promoter and novel drug target to treat pancreatic cancer

Bradley K. Schniers, Yangzom D. Bhutia

Pancreatic ductal adenocarcinoma (PDAC) is the most lethal of all cancers. Gemcitabine is currently used as a first line therapy but with a very low success rate. With this projection in mind, it is imperative to discover a more effective treatment for PDAC. Our lab works on the Peptide Transporter 1 (PEPT1)/SLC15A1, which is expressed in the small intestine, kidney, and bile duct and transports a wide array of di- and tri-peptides and peptide-like drugs. Literature evidence has shown PEPT1 to be upregulated in some PDAC cell lines. Our aim was to first corroborate the literature evidence, then investigate if PEPT1 is a tumor promoter and finally understand the mechanistic aspect of its upregulation. Using quantitative PCR and Western blotting, we checked the expression of PEPT1 mRNA and protein. PEPT1 was selectively and significantly upregulated in cancer cells. Additionally, we performed radiolabeled glycylsarcosine (3H-Gly-Sar) uptake to check the functionality of PEPT1. The results of 3H-Gly-Sar uptake correlated with the protein expression in the cancer cells. It is known that tumor cells generate large amounts of lactic acid by accelerating aerobic glycolysis. Since PEPT1 is a proton-coupled transporter we hypothesized that lactate regulates its expression. To test this, we performed RT-PCR to check the expression of Pept1 in Gpr81/wildtype and Gpr81/knock-out intestinal samples. Surprisingly, we found that lactate/GPR81 complex regulates PEPT1 expression. Further, we found that lactate also increases the expression of MMP-1, which breaks down the extracellular matrix protein collagen into large peptides. These peptides could be further hydrolyzed into dipeptides by DPP-IV/CD26, which could be the mechanism to generate dipeptide substrates for PEPT1 and thereby couple the process to amino acid nutrition for pancreatic cancer cells. In summary, PEPT1 promotes pancreatic cancer and could be used as a drug target to treat PDAC.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS1-2 WASHBURN, RACHEL

Testing for the Development of Bacterial Resistance to Glycoside Hydrolases

Rachel L. Washburn, Whitni K. Redman, Derek Fleming, Kendra P. Rumbaugh

Chronic wounds are an enduring personal, medical, and economic issue due to their tendency to support persistent infections. Bacteria in chronic wound infections frequently live in biofilms where they are surrounded by a self-produced matrix of extracellular polymeric substances (EPS). The EPS inhibits the action of many antibiotics, acting as a protective shield surrounding bacteria. We have previously shown that certain glycoside hydrolases (GHs) can disperse biofilm-associated bacteria in vitro and in vivo by hydrolyzing Œ±-1,4 and Œ≤-1,4 linkages of EPS polysaccharides. These dispersed bacteria are then more easily killed by antibiotics. We postulate that GHs represent a promising new class of adjunctive agents that would increase antibiotic efficacy. Since GH‚Äôs are not bactericidal themselves, they should not put pressure on bacteria to develop resistance. However, this theory has not been experimentally tested. As the utilization of GHs in clinical settings requires repeated topical application to wound beds, the aim of this study was to test whether bacteria can evolve resistance to GHs. To accomplish this, Pseudomonas aeruginosa and Staphylococcus aureus were used to create polymicrobial in vitro biofilms. The biofilms were treated with 5% GH for two hours. Efficacy was determined by calculating the number of bacteria that dispersed from the biofilm. Bacteria treated with GHs were used to initiate new cultures and biofilms, which were treated with GHs in a reiterative process. After three repetitions, we saw that the percent of biofilm bacterial dispersion decreased about 20% and 30% for P. aeruginosa and S. aureus, respectively. Though preliminary, these data suggest that P. aeruginosa and S. aureus may develop resistance to GHs after repeated exposures, however further repetitions of this experiment are necessary to make a more valid resolution.

School: Texas Tech University | Campus: Lubbock

GS1-2 XIMENEZ, BRANDON

Understanding Patient and Physician Communication Preferences to Improve Patient Care

Brandon Ximenez, John W. Pelley, MBA, PhD

Differences in communication style preferences between patients and physicians offers an interesting educational opportunity to arm medical students with the knowledge of common patient preferences and strategies to communicate effectively. With the growing array of sources providing medical information, establishing effective communication strategies for new physicians is paramount to providing quality care. The patient perception of care depends inherently on the quality of the interaction between the physician and patient. The Expert Skills Program provides the underlying principles and preferred methods of obtaining information and making decisions based on Myers-Briggs Personality Types. This study utilized the Entrustable Professional Activities directives that establish basic competencies expected of medical residents involving core domains of communication and patient care to develop a survey tool. The tool was aimed at gathering student, patient, and physician communication preferences to determine trends and correlations. That data was used to develop strategies to instill a conscientious awareness of communication preference in new physicians to improve skills obtaining a focused patient history.

School: Texas Tech University | Campus: Lubbock

GS1-2 YOUNG, VICTORIA

Conformational Changes in the Na/K Pump First Loop

Victoria C. Young, Pablo Artigas

P-type 2 ATPases are active transporters that establish membrane gradients across all cell types. Subfamily members, sarcoplasmic-endoplasmic reticulum Ca^2+-ATPase (SERCA) and Na,K-ATPase (NKA), share structural similarities with an alpha catalytic subunit containing 10 transmembrane spanning regions (TM1-TM10) and a similar catalytic cycle, where both transit through cytoplasmic-facing E1 states and external-facing E2 states (which alternate between phosphorylated and dephosphorylated). Despite their similarity, E1 and E2 structures show that the TM1-TM2 region of SERCA moves inwardly in E1, a movement absent in NKA structures. To investigate the movement of NKA¸Äôs TM1¸TM2 and their connecting loop (L1-2), individual residues (from TM1¸Äôs Q124 to TM2¸Äôs L130), were individually mutated to a Cys; concurrently, a conserved Arg residue at 977 was also mutated to a Cys. We expressed these double Cys mutations in Xenopus oocytes, and used two-electrode voltage clamp to measure the effects disulfide bond formation on pump current (IP, activated by 10 mM K in 125 mM tetramethylammonium without Na) and the transient charge movement (QNa, in 125 mM Na without K) which reports the E2P¸Üî E1P(3Na) conformational change. Several double Cys mutants showed reduced IP and altered QNa in the presence of an oxidizing agent, indicating crosslinking, and one only crosslinked in E2P. Movement of the TM1-TM2 region was further investigated using voltage clamp fluorometry. The fluorophore tetramethylrhodamine maleimide (TMRM) was introduced at R977C and L1-2 residues were individually mutated to Trp. Quenching of TMRM when Trp is ~5.5√Ö away was used to follow state-dependent changes in distance. With TMRM in the external-most section of TM2, quenching in the presence of Na was observed in the E2P state (positive voltages), which demonstrates that the TM1-TM2 regions moves outward (toward R977) in E2 states, and inward (away from R977) in E1 states.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GRADUATE STUDENTS 3+ YEARS

GS3+ ALQAHTANI, ADULAZIZ

Recombinant S5 pyocin: A novel therapy for Pseudomonas aeruginosa infection

Abdulaziz Alqahtani, Randal Jeter, Jane Colmer-Hamood, Abdul Hamood

Complex wounds occur in the setting of chronic diseases such as venous insufficiency and diabetes and include vascular, diabetic, and pressure ulcers, and non-healing surgical wounds. Within chronic wounds, infecting bacterial pathogens often exist in protective structures termed biofilms. Pseudomonas aeruginosa is one of the most common bacteria isolated from chronic wounds. The multi-drug resistance of P. aeruginosa combined with the high cost of producing new antibiotics necessitates the search for other potential therapies. One such therapy is the utilization of pyocins, which are narrow-spectrum antimicrobials produced by P. aeruginosa to eliminate other competing bacteria. The colicin-like S-type pyocins are simple proteins that have different killing domains. Pyocin S5 is a 56-kDa pore forming enzyme that kills its target bacterium through membrane damage leading to leakage of intracellular compounds. In this study, we produced and purified recombinant pyocin S5 (rS5) and examined its inhibitory effect on biofilms produced by P. aeruginosa S5 sensitive strains. Using suitable primers, we synthesized a 1497-bp fragment carrying the intact S5 open reading frame. The fragment was cloned in-frame in the E. coli expression vector pBAD-TOPO and the cloning was confirmed by nucleotide sequence analysis. Through a standard expression protocol, we overproduced rS5, purified it by nickel-nitrilotriacetic acid affinity column chromatography, and confirmed the purification with SDS-PAGE. Using the zone of inhibition assay and rS5, we screened 51 P. aeruginosa clinical isolates: 7 were completely sensitive, 23 were partially sensitive, and 21 were resistant. The minimum inhibitory concentration for the rS5 sensitive strain CF2351 was 30 ¬µg/mL. At a concertation of 300 ¬µg/mL, rS5 eliminated mature biofilm formed by CF2351. These results suggest that rS5 could be effective in eliminating P. aeruginosa rS5 sensitive strains from an infected wound.

School: Texas Tech University | Campus: Lubbock

GS3+ BEASLEY, KELLSIE

Potential Pseudomonas aeruginosa regulatory proteins, including LasR, specifically bind to the upstream region of the phenazine operon.

Kellsie Beasley, Jane Colmer-Hamood, and Abdul Hamood

Pseudomonas aeruginosa is a Gram-negative opportunistic pathogen that causes bloodstream infections leading to sepsis and septic shock. A major P. aeruginosa virulence factor is pyocyanin, which is synthesized by different enzymes encoded by the phenazine operon (phz). Pyocyanin production is regulated by cell density-dependent quorum sensing (QS) transcriptional regulators such as LasR. Upon its activation by the autoinducer N-(3-oxododecanoyl)-L-homoserine lactone (3OC12-HSL), LasR binds to and activates its target genes. Using multiple transcriptional studies (qRT-PCR and transcriptional fusion analyses), we recently showed that human serum significantly enhances the expression of phz and QS genes at late stages of growth. We hypothesize that this regulation occurs through a serum-influenced positive or negative transcriptional regulator(s) that specifically binds to the phz upstream region (phz-UR). Such a regulator has not yet been identified at this time. Using DNA gel shift assays, we detected a specific gel shift band (SGSB) when we incubated the phz-UR probe with the lysate of an Escherichia coli strain carrying a lasR overexpression plasmid (DH5alpha/pECP8) that was grown in the presence of 3OC12-HSL. However, incubating the lysate of DH5alpha/pECP8 with a 15-bp probe containing one of two potential LasR binding sites within the phz-UR produced no SGSB. The phz-UR probe produced a SGSB when incubated with the total membrane, but not the clear lysate, of PAO1 that was grown in Luria-Bertani broth (LBB). In addition, the growth of PAO1 in LBB supplemented with human serum (LBBS) altered the migration of this band. Furthermore, we detected the same SGSB when we utilized the membrane fraction of the PAO1 lasR deletion mutant. These results suggest that: 1) upon its activation by 3OC12-HSL, LasR specifically binds to the phz-UR; 2) the membranes of PAO1 contain a LasR-unrelated phz-UR binding protein; and 3) serum influences this binding.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS3+ BLANTON, HENRY

Effects Of Cannabinoid Receptor Agonists On Ovarian Cancer Cell Xenografts Growth In Mice

Henry Blanton, Jennifer Lilley, Jennifer Brelsfoard, Jose-Luis Redondo, Isabel Castro, Kevin Pruitt, Josee Guindon

Ovarian Cancer is the fifth most common, and deadliest cause of gynecologic cancer among women, with projected cancer care associated costs reaching $173 billion in the US by 2020. There is an urgent need for novel analgesics to treat cancer and chemotherapy-induced chronic pain. The therapeutic use of cannabinoid-based therapies by cancer patients for their analgesic and antiemetic properties has been increasing, but the impact of long term cannabinoid-based therapies on tumor growth in the context of chemotherapy-treatment and/or cancer remains to be determined. Here we examine the anti-nociceptive effects of cannabinoid receptors agonists on chemotherapy-induced peripheral neuropathy and the effect of chronic cannabinoid agonist administration on tumor growth. Our results suggest that non-intoxicating cannabinoid receptor 2 (CB2) agonists are efficacious in treating neuropathic pain resulting from chemotherapy treatment. Unfortunately, our results also suggest CB2 specific agonists may enhance tumor growth through a hormonally-mediated mechanism. When compared to vehicle treated controls, mice treated with CB2 agonists showed larger tumor sizes, increased estradiol and marked changes in normal progression through the estrous cycle. This study supports the need for in vivo preclinical studies to improve our understanding and investigate further interactions between the endocannabinoid and hormonal system which should be carefully considered in the context of cancer treatment.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS3+ BOUNDS, KAYLA

BlastX, a novel antimicrobial agent, influences the wound healing process by altering the level of cytokines and chemokines within the wound

Kayla Bounds, Jane A. Colmer-Hamood, Matthew Myntti, Kandis Wright, Randall Jeter, and Abdul N. Hamood

Wound healing occurs through specific overlapping steps involving different host cell types and mediated by cytokines and chemokines (C/C) with pleiotropic functions. We previously showed by H&E staining that treatment with the novel antimicrobial agent BlastX decreased inflammation on day 1 post-injury (D1), increased angiogenesis and granulation tissue formation on D3, and enhanced keratinocyte hyperplasia on D7. Currently, we examined the influence of BlastX on the level of C/C affecting the stages of healing. We generated full-thickness skin wounds in mice and covered them with sterile gauze (NT), gauze plus polyethylene glycol base (PT), or gauze plus BlastX (BT). At D1, D3, and D7, the wound bed and margins were excised. Proteins were extracted from portions of the tissues for analysis of C/C levels by U-PLEX biomarker assay. Remaining tissues were formalin-fixed, sectioned, and stained specifically for M2 macrophages. On D1, levels of pro-inflammatory C/C CCL3, IL-1Œ≤, IL-6, IL-12p70, IL-17F, and CXCL1 were elevated with BT but lower than NT and PT; in contrast, the level of CXCL10 was increased. On D3, levels of the same C/C, now related to reepithelialization and angiogenesis, remained reduced in BT mice, while CXCL10 was elevated. On D7, levels of C/C responsible for keratinocyte hyperplasia were elevated by BT: GM-CSF, IL-17F, IL-6, and CXCL1. At D1, no M2 macrophages were observed; on D3, M2 macrophages were present in tissues of BT mice; while by D7, M2 macrophages were present in tissues from all treatments. These results suggest that BT prevents over-exuberant inflammation in a clean wound by reducing the level of pro-inflammatory cytokines while promoting the appropriate formation of blood vessels by increasing CXCL10 on D1; accelerates wound healing by enhancing the numbers of M2 macrophages on D3; and advances reepithelialization on D7 by increasing levels of C/C involved in keratinocyte hyperplasia.

School: Texas Tech University | Campus: Lubbock

GS3+ ELIZONDO, RICCAY

Characterization of CD8+ T cells elicited by tumor-self antigen D52 vaccination

C Riccay Elizondo, Jennifer D Bright, Robert K Bright

Cancer immunotherapy is a powerful treatment tool. The next generation approach is led by vaccination against overexpressed tumor-self antigens. In preclinical studies, vaccination against the tumor-self antigen D52 (D52) has been promising. However, T regulatory cells (CD4+) as well as interleukin-10 (IL-10) play a role in suppressing tumor immunity following vaccination. In previous studies, IL-10 deficient mice vaccinated against D52 provided a greater memory response against tumor recurrence compared to wild type mice. Therefore, we tested the hypothesis that CD8+ T cells producing IL-10 represent a distinct T cell population that may play a role in suppressing vaccine immunity. C57Black/6J mice deficient in IL-10 or interferon-gamma (IFN-Œ≥) were immunized with a murine D52-based vaccine. T cells were isolated and RNA was extracted from purified CD8+ T cells for sequencing and analysis. Of note, inducible co-stimulator (ICOS) and cytotoxic T lymphocyte antigen-4 (CTLA-4) were overexpressed in CD8+ T cells capable of producing IL-10 but deficient in IFN-Œ≥. These surface markers have been associated with CD4+ T regulatory cells suggesting that CD8+ IL-10+ T cells may be unique regulatory T cells. Targeting these molecules on CD8+ IL-10+ T cells in conjunction with vaccination against D52 may increase vaccine efficacy and overall tumor rejection.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS3+ ELMASSRY, MOAMEN

Novel markers for sepsis in Pseudomonas aeruginosa infected severely burned patients

Moamen Elmassry and Nithya Mudaliar and Jane Colmer Hamood and Michael San Francisco and John Griswold and Sharmila Dissanaike and Abdul Hamood

Sepsis—life-threatening organ dysfunction that may include kidney failure, cardiac abnormalities, and respiratory distress—leads to hospitalization of one million individuals in the US annually with a death rate of about 200,000. Sepsis in trauma patients is usually accompanied by bloodstream infection, often with Gram-negative bacteria such as Pseudomonas aeruginosa, which is frequently multidrug-resistant. We recently showed that, compared to its growth in whole blood from healthy volunteers, P. aeruginosa grown in whole blood from severely burned patients (SBP) significantly altered the expression of many of its genes in response to changes in levels of blood metabolites. We hypothesized that some host metabolites would be significantly reduced by bacterial consumption while bacterial metabolites would significantly increase during P. aeruginosa sepsis. Such alterations may serve as early markers for P. aeruginosa sepsis in SBP. We tested this hypothesis using the murine model of thermal injury, which mimics closely P. aeruginosa sepsis in SBP. Adult mice were thermally injured only or thermally injured and infected with P. aeruginosa and serum samples were collected after 24 hours. The levels of 531 metabolites within each sample were determined using gas chromatography time-of-flight mass spectrometry. Compared with thermal injury only, the levels of 15 metabolites were significantly increased (including thymidine, thymine, uridine, uracil, malic and succinic acids, trans-4-hydroxyproline, oxoproline, and glucose-6-phosphate) and those of 8 metabolites (including methionine, tyrosine, indole-3-acetate and indole-3-propionate) were significantly reduced in injured/infected mice. We suggest that some of these metabolites may serve as novel biomarkers for early diagnosis of sepsis in burn patients caused by P. aeruginosa.

School: Texas Tech University | Campus: Lubbock

GS3+ HEIN, MATTHEW

Kappa opioid receptor mediated disinhibition of amygdala CRF neurons

Matthew Hein, Vadim Yakhnitsa, Guangchen Ji, Edita Navratilova, Frank Porreca, Volker Neugebauer

Neuroplastic changes in the central nervous system have been implicated not only in pain conditions associated with an identifiable injury, but also in functional pain syndrome (FPS), in which the pain cannot be attributed to tissue pathology. Mechanisms of FPS remain to be determined, but these conditions are typically triggered by stress, which can advance the pain condition from episodic to chronic. Corticotropin releasing factor and its CRF1 receptor in the amygdala have been linked to emotional-affective behaviors and pain modulation. The amygdala is also a major site of opioid receptors, including G_i/o-coupled kappa opioid receptors (KOR). KOR activation by its endogenous ligand dynorphin or agonists can have adverse effects and oppose mu-opioid receptor-mediated actions. Here we tested the hypothesis that KOR activation disinhibits CRF neurons in the central nucleus (CeA) in uninjured rats. CeA serves major amygdala output functions.

Brain slice electrophysiology was used to determine the effects of a KOR agonist (U-69,593) on CRF-CeA neurons. To visualize these neurons, AAV-EF1a-DIO-mCherry was injected into the right CeA of transgenic CRF-Cre rats (4 weeks old). To allow optical activation of glutamatergic afferent input from the lateral parabrachial area (LPB), AAV5-ChR2-CaMKII-eYFP was injected into the LPB. Animals were allowed to recover for five to six weeks for viral expression. Whole-cell patch-clamp recordings of CRF-CeA neurons were used to measure neuronal excitability, evoked excitatory and inhibitory synaptic currents (EPSCs and IPSCs), paired pulse facilitation evoked by optical (LPB) or electrical (basolateral amygdala) stimulation, and spontaneous and miniature EPSCs and IPSCs. U-69,593 decreased glutamate driven IPSCs but had no effect on EPSCs or on excitability. The data suggest that KOR activation under normal conditions leads to synaptic disinhibition of CRF-CeA neurons, which could result in increased pain- and anxiety-like behavior.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS3+ LIU, XIAOBO

The Weakening of GABAergic Signaling May Play A Role in Epilepsy Caused by SLC13A5 Deficit

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Loss of function mutations of the human SLC13A5 gene causes Early Infantile Epilepsy and Encephalopathy type 25 (EIEE-25). However, the mechanisms of disease pathogenesis are poorly understood. SLC13A5 a Na+-coupled citrate transporter (NaCT), transports citrate into neurons. Intracellularly, citrate is used as a key energy source for mitochondrial respiration in neurons, and also a building block in the synthesis of neurotransmitters, fatty acids, and steroids. In human epilepsy involving loss-of-function mutations of SLC13A5, citrate deficiency could impact the availability of key neurotransmitters, including glutamate, GABA, and acetylcholine, thereby altering synaptic function, excitation/inhibition imbalance, and either weakened GABAergic function or enhanced glutamatergic function in causing SLC13A5-associated epilepsy. However, inhibitory neurons, especially in parvalbumin-positive (PV) interneurons, are more active and have a much higher energy demands than principal neurons. In this study, we used SLC13A5 KO mice to test the hypothesis that SLC13A5 deficiency impairs GABAergic signaling. We tested the hypothesis that SLC13A5 KO mice exhibit lower threshold to seizures induced by the chemoconvulsants pentylenetetrazole (PTZ) and pilocarpine (PILO) during Open Field Maze (OFM). Seizures were scored on a Racine scale (index of seizure severity, from 0 to 5). To PTZ (n=3), KO mice exhibited shorter latency to onset and increased severity of seizures. To PILO, KO mice exhibited increased seizure severity (n=4) at 0-10 min and 10-20 min. We found that KO mice are more vulnerable to both PTZ and PILO induced seizures compared to WT mice. In order to visualize PV interneurons in KO mice, we crossed the Slc13a5-/- mice with PV-tdTomato mice. Preliminary observations in KO mice show reduced tdTomato expression, which suggests impaired PV circuitry. In conclusion, these results suggest that loss of function of SLC13A5 weakening of GABAergic signaling, which could account for vulnerability to seizures induced by PTZ or PILO.

School: Graduate School of Biomedical Sciences | Campus: Amarillo

GS3+ MACHA, SHAWN

Constitutive DNA damage in cancer cells with the alternative lengthening of telomeres (ALT) phenotype sensitizes ALT cancer cells to p53 reactivation

Shawn Macha, Cody Eslinger, Balakrishna Koneru, C. Patrick Reynolds

Background: Most cancers express TERT and use telomerase to enable continual proliferation, but some cancers employ the non-telomerase ALT mechanism. ALT cells often have p53 dysfunction and evidence of constitutive DNA damage (that drives the ALT mechanism via ATM kinase) suggesting that they may be especially sensitive to restoration of p53 function.

Methods: The ALT phenotype was identified by detecting extrachromosomal telomeric DNA repeats (c-circles) using qPCR. TERT mRNA expression was measured using qPCR, cytotoxicity by DIMSCAN, DNA damage by immunofluorescence + fluorescence in situ hybridization (IF-FISH). The ATR/ATM kinase inhibitors used were VE-821 and KU60019. The p53 reactivator used was PRIMA-1MET.

Results: We assessed 18 ALT patient-derived cancer cell lines with p53 dysfunction, from neuroblastoma, osteosarcoma, rhabdomyosarcoma, lymphoma, leiomyosarcoma, ovarian, lung, and colon cancer against TERT-positive cell lines for cytotoxicity using the p53 reactivator PRIMA-1MET. Cytotoxicity of PRIMA-1MET in ALT cell lines was significantly greater compared to that seen in TERT-positive cell lines ($P = 0.0001$). Consistent with previous studies, these ALT cell lines had significantly higher constitutive DNA damage localized at the telomeres compared to TERT+ cell lines ($P<0.005$). ATM/ATR inhibition with KU60019 and VE-821 in ALT cell lines significantly ($P<0.001$) antagonized PRIMA-1MET cytotoxicity indicating that DNA damage signaling by ALT cancers mediated increased sensitivity to PRIMA-1MET. Further evidence for this can be seen when we induced DNA damage in a TERT-positive cell line, SK-N-BE(2) using an overexpression vector of ŒîBŒîM TRF2 and it sensitized the cells to PRIMA1-MET.

Conclusion: Our data suggest that ALT cancer cells are particularly sensitive to p53 reactivation due to the ongoing constitutive DNA damage that drives the ALT phenotype. These data identify ALT as a targetable molecular phenotype that spans a variety of cancer types

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS3+ MCDANIEL, BRIANYELL

CD4+ T Cells are both necessary and sufficient to induce acute graft vs. host disease in lymphopenic recipients

Brianyell McDaniel Mims, BS, Josue Enriquez, MS, Kathryn Furr, MS, and Matthew Grisham, Ph.D.

Allogeneic hematopoietic stem cell transplantation (HSCT) is a potentially life-saving treatment for refractory/relapsing hematological malignancies, blood disorders or autoimmune diseases. However, approximately 40-50% of patients undergoing allogeneic HSCT will develop a multi-organ, inflammatory disorder called acute graft vs. host disease (aGVHD). Experimental and clinical studies suggest that intestinal injury due to toxic, pre-transplant conditioning protocols (e.g. lethal irradiation and/or chemotherapy) may play a major role in the development of aGVHD. However, recent studies from our laboratory as well as others, suggest that this may not be the case. Objective: We wished to quantify and compare the onset and severity of aGVHD induced by the adoptive transfer of allogeneic T cells into untreated lymphopenic mice. Methods: Four million allogeneic or syngeneic CD4+CD62L+CD25- T cells were transferred (i.p.) into NK cell-depleted RAG1-/- mice or RAG2-/-IL2rŒ≥-/- double knock-out (DKO) mice and assessed daily for signs of aGVHD. Results: We found that adoptive transfer of allogeneic but not syngeneic T cells into NK cell-depleted RAG1-/- or DKO mice induced many of the clinical and histological features of aGVHD including weight loss, inflammatory cytokine production and tissue inflammation. In addition, adoptive transfer of allogeneic T cells into each recipient induced severe anemia as well as dramatic reductions in bone marrow and spleen cellularity. Conclusions: We conclude that na√Øve allogeneic CD4+ T cells are both necessary and sufficient to induce aGVHD in lymphopenic recipients in the absence of toxic, pre-transfer conditioning.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS3+ MOHIUDDI, ISMAIL

The DNA-dependent protein kinase activates OCT4-mediated expression of c-MYC in small cell lung cancer

Ismail S. Mohiuddin, Sung-Jen Wei, Min H. Kang

Small cell lung cancer (SCLC) comprises 15% of lung cancers and accounts for 30,000 deaths per year in the United States. Therapeutic advances in SCLC have been minimal compared to other cancers, and etoposide + cisplatin remain the mainstay of treatment for extended-stage disease. Along with the loss of both TP53 and RB ocurring in almost all cases of SCLC, the MYC family of oncogenes are commonly activated (MYCL or MYCN in classic SCLC and c-MYC in variant SCLC). Although high MYCL expression is more frequent, c-MYC expressing tumors are more metastatic and are associated with poorer outcomes. Genomic amplification of c-MYC is seen in 6-25% of SCLC primary tumors, but high c-MYC gene expression is more frequently seen, suggesting amplification-independent transcriptional activation of c-MYC. Our current study seeks to elucidate the mechanism of c-MYC transcriptional activation in SCLC. Screening of transcription factors identified OCT4 (encoded by POU5F1) binding to the DNA sequence of the MYC promoter region. A reporter gene assay confirmed that OCT4 induces MYC transcriptional activation. shRNA-mediated knockdown of POU5F1 decreased c-MYC. Mass spectrometry identified the DNA-dependent protein kinase catalytic subunit (DNA-PKcs, encoded by PRKDC) as a binding partner of OCT4, which was confirmed by subcellular fractionation co-immunoprecipitation. Using the PhosphoMotif Finder, we predicted and confirmed that DNA-PKcs phosphorylates OCT4 at its S93 residue. Here, we created six PRKDC fragment constructs and co-transfected each construct with POU5F1 in a SCLC cell line. We report the novel findings that OCT4 binds to DNA-PKcs near its C-terminal domain and that pharmacological inhibition of DNA-PKcs by NU7441 decreases pOCT4 S93-mediated c-MYC expression in four SCLC cell lines. In conclusion, we report a new pathway of c-MYC transcriptional activation by DNA-PKcs-mediated phosphorylation of OCT4 at S93 and have identified DNA-PKcs as a potential target in SCLC.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS3+ MUELLER, KARL

The Effects of C-Peptide Produced by Genetically Engineered Sertoli Cell on Endothelial Cells Damage Related Molecules in Hyperglycemic Environments

Karl Mueller, Jannette M Dufour

Hyperglycemia caused by type 1 or type 2 diabetes causes a phenotypic change in endothelial cells towards a vasoconstrictive, prothrombotic and pro-inflammatory environment. This endothelial dysfunction plays a critical role in the pathogenesis of diabetic neuropathy, diabetic nephropathy, diabetic retinopathy, and atherosclerosis. C-peptide, a coproduct of the insulin gene has been shown to have molecular and physiological benefits on endothelial cells in type 1 diabetes, however, it is not present in current insulin replacement therapy. Our lab uses genetically engineered immune privileged Sertoli cells as a vehicle to deliver the insulin gene. An adenoviral vector containing the insulin gene with furin modified cleavage sites was used to engineer neonatal porcine Sertoli cells (NPSC) to express insulin and C-peptide. We tested the efficacy of our engineered Sertoli cells (ESC) vs C-peptide (CP) or unengineered Sertoli Cell media alone (SC) on various genes endothelial cell genes in vitro, using high glucose and normal glucose controls. Our data demonstrate that C-peptide has significant decrease in cellular adhesion molecules ICAM-1, VCAM-1 and P-selectin. C-peptide also shows significant decreases in the vasoactive substances endothelin, and von Willebrand factor, and plasminogen activator inhibitor-1. These data make evident the beneficial effects of C-peptide generated by Sertoli cells on endothelial damage related molecules in vitro, and also demonstrate the potential of this treatment for diabetic cardiovascular disease.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS3+ PEDROZA, DIEGO

PGRMC1 influences breast cancer growth and progression by altering key molecular pathways

Diego A Pedroza, Ramadevi Subramani, Adriana Galvez, Alejandra B Bencomo, Rajkumar Lakshmanaswamy

Introduction: Increased expression of the progesterone receptor membrane component 1 (PGRMC1), a protein with the ability to interact and stabilize epidermal growth factor receptor (EGFR) is overexpressed in breast cancer tissue. Mechanism by which PGRMC1 influences breast cancer remains largely unknown. We, aim to investigate the signaling mechanisms of PGRMC1 in breast cancer cells.

Materials and Methods: A panel of non-malignant and malignant breast cell lines were cultured and screened for PGRMC1 expression. PGRMC1 overexpressing breast cancer cell lines were treated with AG-205 (PGRMC1 inhibitor) and siRNAs targeting PGRMC1. MTS, qRT-PCR, Western blot, immunofluorescence, flow cytometry and phosphor explorer antibody array, were performed.

Results: Increased PGRMC1 mRNA and protein levels were observed in ZR-75-1 and MDA-MB-468 cells, these results were validated and compared to online RNA-seq based gene expression analysis of breast cell lines and breast tumor data sets. Online databases demonstrated that PGRMC1 is overexpressed in multiple breast cancer subtypes. IHC, demonstrated strong staining for PGRMC1 in human breast cancer tissue compared to normal tissue. Treatment with both AG-205 and silencing PGRMC1 decreased cell proliferation, induced cell cycle arrest at the G0/G1 phase, promoted apoptosis and hindered the capability of the cells to migrate and invade. Phospho-specific antibody arrays demonstrated overall downregulation of the PI3K/AKT and EGFR signaling mechanisms following AG-205 and siRNA treatment. Furthermore, subcellular fractionation demonstrated specific subcellular localization changes of EGFR. Alteration in the expression of key markers of cell proliferation, apoptosis and cell cycle revealed that PGRMC1 inhibition decreases breast cancer proliferation.

Conclusion: Our data demonstrate that PGRMC1 plays a prominent role in regulating breast cancer growth and progression by altering the PI3K/AKT and EGFR signaling mechanisms.

School: Graduate School of Biomedical Sciences | Campus: El Paso

GS3+ PIRAYESH, ELHAM

In-vivo and in-vitro studies to identify the interaction site of the intracellular domain of serotonin type 3A receptor (5-HT3A-ICD) and chaperon protein RIC-3.

Elham Pirayesh, Antonia G. Stuebler, Michaela Jansen

The serotonin type 3A (5-HT3A) receptor is a homopentameric cation-selective member of the pentameric ligand-gated ion channel (pLGIC) superfamily. Members of this superfamily assemble from five subunits, each of which consists of three domains, extracellular (ECD), transmembrane (TMD), and intracellular domain (ICD). Previously, we have shown that 5-HT3A-ICD fused to maltose binding protein (MBP) directly interacts with the chaperone protein resistance to inhibitors of choline esterase (RIC-3), without the involvement of other protein(s). Additionally, we have also demonstrated that 5-HT3A-ICD is required and sufficient for the interaction between 5-HT3A and RIC-3. To elucidate the molecular determinants of this interaction we developed different MBP-fused 5-HT3A-ICD constructs by deletion of large portions of its amino acid sequence. We have expressed seven mutants in Escherichia coli and purified them to homogeneity. Using RIC-3 affinity pull down, the interaction of MBP-5HT3A-ICD constructs and RIC-3 is investigated. Furthermore, we co-expressed 5-HT3A and RIC-3 in Xenopus oocytes to study the interaction in-vivo by two electrode voltage clamp (TEVC) recordings. Full-length 5-HT3A-mediated currents are significantly reduced when RIC-3 is co-expressed. Here, we study if individual MBP-5-HT3A-ICD constructs compete with 5-HT3A receptor for interaction with RIC-3. Our results support the hypothesis that interaction of the 5-HT3A-ICD and RIC-3 is mediated by specific segments of the 5-HT3A-ICD as opposed to the complete domain. Further studies are directed toward identifying the exact interaction site of the 5-HT3A-ICD and RIC-3.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS3+ REDMAN, WHITNI

Toxicity and Limitations of Glycoside Hydrolases in Dispersing Poly-Microbial Biofilms

Whitni K. Redman, Derek Fleming, Kendra P. Rumbaugh

85% of all bacterial infections are biofilm-associated impacting 2% of the United States population at some point in their life. Biofilms are communities of microorganisms with a self-synthesized extracellular polymeric substance (EPS). EPS not only makes it difficult for immune cells to enter the biofilm, but also creates a challenge for antimicrobial agents to reach the infection. Previous studies have shown glycoside hydrolases (GHs) are effective in breaking the glyosidic linkages found within the EPS, dispersing the bacterial cells, and allowing antimicrobial agents in contact with the microbes. This study focuses on determining the safety of using GHs as well as comparing the efficacy of GHs in biofilm dispersal. Various concentrations of GHs were used to treat normal colonic epithelial (CoN) cell line CCD841. Cell toxicity was determined by completing a colorimetric assay using AlamarBlue. At a maximum concentration of 20%, 2x concentration used in vivo, 2x104 cells were seeded 48 hrs before one 90-minute treatment. Amylase and cellulase exhibited cell toxicity at 10% or higher and 5% or higher concentrations, respectively. 48-hour ex vivo biofilms were treated with 500 units/gram of various GHs for 4 hours to compare efficacy in biofilm dispersal. The efficacy of dispersing ex vivo Pseudomonas aeruginosa and Staphylococcus aureus biofilms varied greatly depending on the GH. Ex vivo clinical samples were treated with amylase or cellulase to determine targeted species as well as restrictions for each GH. Cellulase was effective in dispersing Klebsiella oxytoca while it did not effectively disperse bacteria from the phyla Firmicutes and Bacteroidetes. Amylase was not effective against Corynebacterium striatum but was effective in dispersing Proteobacteria phyla. In conclusion, GHs may show potential toxicity in vitro and each GH has their own limitations on efficacy depending upon which bacteria are present in the infection.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS3+ RISTIC, BOJANA

Increased risk of colitis and colitis-associated colon cancer in the mouse model of hereditary hemochromatosis

B. Ristic, S. Sivaprakasam, A. Hamood, K. R. Kottapalli, V. Ganapathy

Hereditary hemochromatosis (HH) is an iron-overload disease that causes tissue damage due to iron accumulation in toxic levels. The primary site of iron deposition in HH patients is liver, and therefore, liver cancer in these patients has been studied extensively. However, little is known about the iron-elicited colonic pathologies. We hypothesized that iron overload as observed in HH disrupts healthy colonic homeostasis and exacerbates the development of colitis and colon cancer. To test our hypothesis, we examined the progression and severity of colitis and colon cancer in Hfe^-/- mouse (HH model) and wild type control mice. Besides serum and liver, high concentrations of iron and heme deposits were found in the colon of Hfe^-/- mice. Experimental colitis was induced by administration of Dextran Sodium Sulfate (DSS) in drinking water. Colitis-associated colon cancer was initiated by the intraperitoneal injection of azoxymethane (AOM) and carcinogenesis in colon was driven by DSS administration. Colitis was more severe in the Hfe^-/- mice than in control. In addition, HH mice developed more and larger colonic polyps than control mice. 16S ribosomal RNA sequencing of fecal bacteria revealed that the microbiota composition of Hfe^-/- mice was altered to favor the pathogenic bacteria that belong to phyla Proteobacteria and TM7. In addition, the more bacteria adhered to colonic mucosal surface in Hfe^-/- mice than in control mice. Furthermore, we observed that the colonic epithelial cells of Hfe^-/- mice had a lower expression of antimicrobial peptides. Finally, HH mouse colon released higher concentration of the pro-inflammatory cytokines under conditions of inflammation that contributed to the development of an environment that is favorable to colitis and colon cancer. Thus, iron overload as seen in HH impairs colonic defense machinery and causes bacterial dysbiosis, thus providing ideal conditions for the development and progression of colitis and colon cancer.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS3+ ROBERTS, EMMA

Zonadhesin ontogeny reveals a unique reproductive contribution to the divergence of Eutheria

Emma K. Roberts, Steve Tardif, Emily A. Wright, Roy N. Platt II, Caleb D. Phillips, Robert D. Bradley, Daniel M. Hardy

Rapid evolution of egg recognition proteins in the sperm acrosome confers species specificity to fertilization that promotes prezygotic reproductive isolation in marine invertebrates. To determine if comparable prezygotic isolation may have contributed to speciation in mammals, we characterized the molecular evolution of zonadhesin, a large, mosaic protein in the sperm acrosome that mediates species specific adhesion to the egg's zona pellucida (ZP). Genome searches retrieved genes annotated as Zan in numerous mammals and non-mammals. Eutherian Zan loci exhibited conserved synteny among all species examined (112 species from 19 of 21 Orders), but Zan was notably absent from the corresponding syntenic region of a marsupial (opossum) and a monotreme (platypus). Presence of Zan-like coding regions in related loci of reptiles and fish suggested Zan arose by repurposing of a gene present in stem vertebrates that was lost in amphibia, birds, monotremes, and marsupials, yet was retained in Eutheria on acquiring a function in egg recognition. To examine Zan's possible contribution to Eutherian divergence, we compared predicted mRNA sequences from the 112 Eutherian species by Bayesian and maximum likelihood methods. Zan VWD domain sequence variation was phylogenetically informative, as species comprising all Eutherian Orders and Suborders formed monophyletic groups, and produced a superior tree (less than 5% unsupported nodes) to those obtained with other genes. Further, zonadhesin structural divergence, driven by positive Darwinian selection across all orders and by domain duplications and accelerated divergence rate in the Myomorpha suborder of Rodentia, produced dramatic species differences in the sizes of zonadhesin polypeptides in spermatozoa. Thus Zan's rapid molecular evolution produces structural and functional changes that confer species-specificity to egg recognition, which in turn promotes reproductive isolation and phylogenetic diversification in Eutheria.

School: Texas Tech University | Campus: Lubbock

GS3+ SHARMA, MONICA

Identification of novel post-translational acetylation of Dishevelled proteins in triple-negative breast cancer.

Monica Sharma, Deborah Molehin, and Kevin Pruitt

Dishevelled proteins (DVL in humans) are central mediators of Wnt signaling pathway. Although DVL proteins are versatile regulators of several cellular processes, little is known about their post-translational regulation. Acetylation is a reversible post-translational modification (PTM) which regulates function of several non-histone proteins involved in tumorigenesis. Since, we previously demonstrated the role of SIRT-1, a class III lysine deacetylase, in regulating DVL protein levels and its function, we reasoned that DVL could potentially be a substrate for SIRT-1 mediated deacetylation. Therefore, we wanted to explore the effect of multiple families of lysine deacetylases on DVL post-translational modification. Liquid chromatography mass spectrometry (LC-MS/MS) analysis revealed that DVL-1 is basally acetylated on K34, K69, K285, and K476 in MDA-MB-231 and MDA-MB-468 cells, and treatment with deacetylase inhibitors (such as SIRT-1 inhibitor i.e. EX-527, SAHA, and Panobinostat) further induce acetylation on K69, K60, and K5 respectively, in MDA-MB-468 cells. Furthermore, this report maps nine acetylation sites on DVL-1 in different oxygen tension. Interestingly, the acetylated lysine residues are present on highly conserved domains which are critical for DVL function. For the first time, this study uncovers acetylation as a novel post-translational modification on DVL proteins in triple-negative breast cancer cells.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS3+ SIKDER, MOHD OMAR FARUK

Amino acid transporter SLC6A14: a novel drug target for colorectal cancer

Mohd Omar Faruk Sikder, Sathish Sivaprakasam, Vadivel Ganapathy

SLC6A14 is a Na/Cl-coupled transporter for 18 of the 20 amino acids. This transporter shows significant upregulation in colorectal cancer (CRC). However, the relevance of this upregulation to disease progression is not known. We postulated that deletion of SLC6A14 or pharmacological blockade of its function would suppress CRC by depleting amino acids and suppressing mTOR signaling selectively in tumor cells. To test this postulate, we compared the development and progression of CRC in two different experimental models between wild type mice and Slc6a14-null mice. In both models (Apcmin/+ and DSS/AOM), deletion of Slc6a14 provided significant protection against colon cancer. To evaluate the impact of pharmacologic blockade of Slc6a14 on tumor growth, we used a syngeneic tumor mouse model with MC-38 cells (a mouse CRC cell line) injected s.c. in C57BL/6 mice. Blockade of Slc6a14 with alpha-methyltryptophan markedly reduced tumor growth. We then determined the transcriptome profiles of colonic epithelial cells from wild type and Slc6a14-null mice by RNA-seq. There were numerous genes differentially expressed in the null mice. Ingenuity pathway analysis (IPA) of these data revealed predictive activation of canonical AMPK signaling pathway, a tumor-suppressive pathway, in colonic epithelium of Slc6a14-null mice. We also found predictive inactivation of two important tumor-promoting cell-survival signaling pathways, ERK and EGF, in the colon of the null mice. Likewise, significant upregulation of APCDD1 in epithelial cells in null mice implies predictive suppression of canonical Wnt signaling pathway. There were also marked changes in fecal microbiota in null mice. We conclude that deletion of Slc6a14 or its pharmacological blockade protects against CRC by inducing amino acid starvation in tumor cells, thereby causing changes in multiple signaling pathways and in colonic microbiome. These studies identify SLC6A14 as a novel drug target for CRC.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS3+ SMITH, JESSICA

Stressful Aging in Yeast: Roles for SIR2 and Cell Growth

Jessica T Smith, Hui Hua, Isaiah Tates, Brandt L Schneider

Aging is inevitable yet stochastic. Thus, within any given population, life expectancy can vary tremendously,Äìeven in isogenic, wild-type yeast grown in uniform conditions. However, the mechanisms responsible for this observed variation are not well understood. Others & the Schneider lab have reported a correlation between cell size and lifespan: specifically, life expectancy increases in mutants or conditions that reduce cell size. Conversely, lifespan is frequently shortened in conditions that produce large cells. I examined the impact of cell size and growth rate on aging in a single population using a large set of wild-type replicative lifespan data from traditional plate assays. I confirmed that large cell size and excessive cell growth correlate with an increased rate of aging.

The Hormesis Theory of Aging suggests that low amounts of stress induce an adaptive response that promotes cellular repair and protection. In contrast, high levels of stress promote aging. I found that modest induction of sirtuin SIR2 correlates with higher lifespans, while further induction of SIR2 expression decreases lifespan. Overall, SIR2 displayed a trend of higher expression in longevity mutants and vice versa. In further support of hormesis theory, I found that combinations of longevity treatments frequently have a negative effect on lifespan. Based on these results I proposed that mild stresses in the form of single, mild mutations or treatments promote longevity, but inordinate stress promotes aging.

I reported the unusual discovery that combining longevity treatments can result in a faster cell cycle. I found that the shuttling of the cell cycle repressor Whi5is altered in longevity treatments. I concluded that the reduction of cell growth seen in many longevity treatments is brought about by alterations in cell cycle controls. Understanding the relationship between stress, growth, and longevity is vital to designing and implementing successful strategies to lengthen lifespan.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS3+ SUTEBLER, ANTONIA

A Comparison Between Homomeric and Heteromeric 5-HT3 Receptors in Response to the Antidepressant Bupropion

Antonia G. Stuebler, Michaela Jansen

The FDA-approved drug bupropion has been prescribed as an antidepressant (Wellbutrin) for over three decades, and more recently as a smoking cessation aid (Zyban). The presumed mechanism of action of bupropion was inhibition of norephinephrine and dopamine reuptake by their respective transporters. Recently, bupropion's non-competitive antagonistic effect was demonstrated in nicotinic acetylcholine receptors (Œ±1Œ≤ŒµŒ¥, Torpedo, Œ±1Œ≤Œ≥Œ¥, Œ±3Œ≤4Œ±5¬±Œ≤2, Œ±3Œ≤2, Œ±4Œ≤2, Œ±7) of the Cys-loop superfamily providing an alternate pharmacological pathway. Our laboratory has shown that another cation-selective member of the Cys-loop superfamily, the serotonin type 3 receptor (5-HT3-R), is modulated by bupropion at clinically relevant concentrations. Specifically, we determined that bupropion acts as a non-competitive antagonist at 5-HT3A subunits. 5-HT3-Rs are found pre- and postsynaptically, and are currently targeted by anti-emetics and irritable bowel syndrome treatments. They also hold promise as potential future targets for multiple neurological disorders, such as Alzheimer's disease, schizophrenia, and bipolar disorder. The 5-HT3-R family consists of Ô¨Åve different subunits (A-E) but the assembly of this receptor requires the 3A subunit, yielding either a homomer or heteromer with another subunit. To date, only the interaction of bupropion with the 3A subunit has been studied. Here, we extend our investigations to heteromeric 5-HT3AB-Rs, which are found in the central and peripheral nervous system, predominantly in the amygdala, caudate nucleus, and hippocampus. The functional interaction of bupropion with 5-HT3AB was characterized in Xenopus oocytes using two-electrode voltage clamp and patch clamp techniques. Docking studies and site-directed mutagenesis were used to identify the binding site/s in 5-HT3-R. Our studies confirmed that bupropion, similar to other non-competitive antagonists, evokes different responses in 5-HT3AB-Rs as compared to the homomeric 5-HT3A-Rs.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

GS3+ VARTAK, DAVID

Post-translational Regulation of MeCP2

Vartak D, Casas L, Pandey S, Simmons GE Jr, Malyarchuk S, Calhoun TN, Pruitt K

Methyl-CpG binding protein 2 (MeCP2) has gained prominence due to its connection to Rett syndrome, a X-linked disorder wherein mutations in MeCP2 have mild to debilitating clinical manifestations in young girls. In 2015, MeCP2 was implicated as an oncogene, known to be amplified in several cancers and plays an important role in tumorigenesis. MeCP2 is a key reader of normal and aberrant CpG methylation and is a complex transcriptional modulator influencing chromatin structure and transcriptional regulation, but surprisingly there exists a fundamental gap in the understanding of the underlying mechanisms of its regulation in the context of cancer. MeCP2 is known to undergo post-translational modifications (PTMs) like phosphorylation, acetylation, ubiquitylation etc. Because MeCP2 bridges information encoded in patterns of methylated DNA to epigenetic regulation, it is important to understand how novel PTMs affect its function. In this study we focus on a key lysine residue which is acetylated (K135) and use cutting edge techniques in the field to probe the role it plays in MeCP2 function and regulation. We hope to advance our knowledge and understanding in the field of cancer biology and epigenetics and help elucidate future therapeutic targets.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

PHARMACEUTICAL SCIENCES | SCHOOL OF PHARMACY

PHAR AKWII, GRACE RACHEAL

Small GTPase RhoA participates in Angiopoietin 2-induced lymphatic endothelial cell migration

Akwii R.G., Zahra F.T., Sajib M.S., Gibson, K., Tullar P., Mikelis C.M

Angiopoietin 2 (Ang2) is part of the Angiopoietin/Tie signaling pathway, involved in angiogenesis among other vascular functions. It is a ligand for the Tie2 receptor where it can act as an agonist or antagonist. The role of Ang2 has been referred as context-dependent in terms of cell type, Tie 2 receptor availability, remodeling or quiescent state, Ang1 and Ang2 levels and the presence of interacting proteins, such as integrins. Through this dual role, Ang2 constitutes a promising therapeutic target for anti-angiogenic therapy. Previous work has demonstrated that the small GTPase RhoA is activated by Vascular Endothelial Growth Factor (VEGF) and that VEGF-induced angiogenesis occurs through RhoA activation. Here we wanted to verify previous findings regarding Ang2,Äôs effect on basic endothelial cell functions of primary blood and lymphatic endothelial cells and explore a potential role of RhoA in the Ang2-driven pathways and biological functions. Ang2 activated RhoA in both primary blood and lymphatic endothelial cells in a dose dependent manner, however it induced cell proliferation and migration only of the lymphatic endothelial cells. Pharmacological RhoA inhibition or RhoA knockdown inhibited Ang2-induced lymphatic endothelial cell migration, indicating that RhoA participates in this process. To delineate the molecular signaling pathway, molecular biology approaches, including Tie1 and Tie2 receptor knockdown are in process and current work is focused on the elucidation of the exact role of RhoA on Ang2-induced lymphatic endothelial cell functions, as well as the signaling mechanisms. The involvement of RhoA on the biological functions driven by diverse growth factors highlights the potential of endothelial RhoA being exploited as a universal anti-angiogenic target.

School: Graduate School of Biomedical Sciences | Campus: Amarillo

PHAR ALBEKAIRI, THAMER

A Mechanism of Biphalin Entry to the BBB

Thamer Albekairi

The blood-brain barrier transporters have essential roles in transporting neuroprotective substance to the brain during ischemic stroke. The goal of this study was to understand the role of organic-anion- transporting polypeptide (OATP) in the transport of biphalin, an ultra-potent non-selective opioid receptor agonist, across the blood-brain barrier (BBB) during ischemic reperfusion injury. Endothelial cells from different sources, including B. end3, HCMEC/D3, and iPSCs derived brain microvessel endothelial cells (iPSCs BMECs), were screened for the expression of OATP using immunostaining, western blot, and flow cytometric analysis. The effect of oxygen-glucose deprivation (OGD) and reoxygenation on the expression of OATP-1A and its role in the uptake and transport of biphalin was measured in iPSC BMECs. The uptake and transport of biphalin were measured in the presence and absence of OATP substrate (10 ŒºM estrone-3-sulfate (E-3-S)) and OATP blocker (2 ŒºM rifampicin (Rif)) as well. For the uptake studies, cells were incubated with (E-3-S)/(Rif) 10 min before the addition of biphalin. For transport studies, 12 well plates transwell inserts were used using iPSCs BMECs. The cells were treated with substrate/blocker 30 min before transport studies performed. To measure the quantity of biphalin in cell lysate (uptake studies), in the transport buffer (transport studies), a highly sensitive LCMS/MS method was also developed. It was found that iPSCs BMEC and HMCEC/D3 cells express OATP comparatively higher than B.end3 cells. iPSCS derived BMECs expressed OATP-1A at both perinuclear and membrane region. After optimizing barrier properties, iPSCs BMECs were used for further uptake and transport studies. Uptake and transport studies demonstrated that biphalin uptake in the ECs and transport across the BBB decreased in the presence of OATP substrate/blocker. Further, we have also observed that 30 min reoxygenation after 6 hours of OGD increased the localization of OATP-1A fro

School: Graduate School of Biomedical Sciences | Campus: Amarillo

PHAR BAGCHI, SOUNAK

Combinatorial Multifunctional Therapy for the Treatment of NeuroHIV

Sounak Bagchi*,Rahul Dev Jayant (Ph.D.)

The emergence of highly active antiretroviral therapy (HAART) significantly has helped in reducing the prevalence and bettering the quality of life of HIV-infected individuals.The antiretroviral therapy (ART) mainly target active HIV-1 infection but fails to eradicate the latent virus from viral reservoirs [e.g., brain due to limited penetration across the blood-brain barrier (BBB)]. Also,due to neurocognitive issues (e.g. HIV associated neurocognitive disorder-HAND) during later stage of the disease also leads to issue of medication adherence.To overcome the BBB drug delivery, recently magnetic nanoparticles (MNPs) based sustained drug delivery systems have been successfully explored to deliver the drugs across the brain for targeting active and latent HIV. The main advantage of sustained MNP-nanoformulation is that they can deliver drugs across BBB, target HIV infected cells and release the drugs at a constant rate for a longer period to increase therapeutic adherence and can be helpful in eradicating the HIV reservoir without hampering the integrity of the BBB. As ART can't target the latent HIV reservoirs, recently, broadly neutralizing antibodies (bNAbs) have shown good efficacy in targeting the latent reservoir via binding the site of HIV-1 virus and neutralizes HIV-1 potently both in vitro and in vivo without causing apparent off-targeting effects peripherally but no report for CNS HIV-1 targeting is yet available. So, the objective of our work is to develop a sustained release nanoformulation (NF) consisting of different category of anti-HIV drugs and bNAb (3BNC117) for the treatment of NeuroHIV. The antiHIV drugs and bNAbs will be assembled on MNPs using Layer-by-Layer (LbL) nanoassembly for potential administration of once a month or more.The NF will be tested for drug loading capacity, in-vitro sustained release profile, and BBB transmigration assay along with in-vitro efficacy & cytotoxicity using HIV-1infected human primary microglial cells (p24 assay).

School: Graduate School of Biomedical Sciences | Campus: Amarillo

PHAR BRINDLE, ATHENA

Dietary Supplement and Medication Use and Knowledge in Collegiate Athletes of Rural West Texas

Athena Brindle Pharm. D Candidate, Dr. Sivaramakrishna Koganti, and Dr. Rubini Pasupathy

College athletes' use of dietary supplements and medication is a topic of interest for individuals who work directly with competitive athletes. The controversies of college athletes' use of dietary supplements and medications are primarily focused on the use to gain a competitive edge, i.e. doping. While performance enhancement is one outcome that can result from dietary supplement and medication use in athletes, a more concerning outcome is the side effects associated with these substances and the potential for long-term damage to their health. College athletes' lack of knowledge about the substances they consume increases the risk of harming their health and testing positive for banned-substances in their sport. The purpose of this study is twofold; the first is to evaluate college athletes' prevalence of the use of dietary supplements and medications. The second purpose is to investigate college athletes' sources of knowledge of dietary supplements and medications. A survey study of 755 National Collegiate Athletic Association (NCAA) registered athletes in two institutions of higher education in rural West Texas will be conducted. This specific athletic population has not been a focus in current literature and could give more insight on just how prevalent the use of dietary supplements and medications are in competitive athletes. Previous studies have evaluated the resources athletes use to ensure the safety of the substances they consume, revealing that pharmacists have been underutilized in this area. Pharmacists could assist in ensuring that dietary supplements and medications are appropriate for the athletes' medical needs and that the health benefits outweigh the risks that can occur with these substances.

School: School of Pharmacy | Campus: Abilene

PHAR CHOWDHURY, EKRAM AHMED

Blood-brain barrier permeability of [13C]sucrose in young adult and aged mice

Ekram Ahmed Chowdhury, Faleh Alqahtani, Behnam Noorani, Md Sanaullah Sajib, Constantinos M Mikelis, Reza Mehvar, Ulrich Bickel

Background: Aberrant expression of the RON receptor tyrosine kinase is a pathogenic feature and a validated drug target in various types of cancers. Currently, therapeutic antibodies targeting RON for cancer therapy are under intensive evaluation. Here we report development and validation of a novel humanized anti-RON antibody-drug conjugate for cancer therapy.

Methods: Antibody humanization was achieved by grafting sequences of complementarity-determining regions from mouse monoclonal antibody Zt/g4 into human IgG1/Œ∫ acceptor frameworks. Humanized Zt/g4 subclone H1L3 was conjugated with monomethyl auristatin E using a dipeptide linker to form H-Zt/g4-MMAE. Pharmacokinetic analysis of H-Zt/g4-MMAE was determined using ELISA and LCMS. Therapeutic efficacies of H-Zt/g4-MMAE were validated in vivo using three pancreatic cancer xenograft models. Toxicological activities of H-Zt/g4-MMAE were determined in mouse and cynomolgus monkey.

Results: H-Zt/g4-MMAE had a drug to antibody ratio of 3.77:1 and was highly stable in human plasma with a dissociation rate less than 5% within a 20 day period. H-Zt/g4-MMAE displayed a favorable pharmacokinetic profile in both mouse and cynomolgus monkey. In vivo, H-Zt/g4-MMAE inhibited pancreatic cancer xenograft growth with tumoristatic concentrations at 1~3 mg/kg bodyweight. Significantly, H-Zt/g4-MMAE eradicated tumors across multiple xenograft models. Moreover, H-Zt/g4-MMAE inhibited and eradicated xenografts mediated by pancreatic cancer stem-like cells and by primary cells from patient-derived tumors. Toxicologically, H-Zt/g4-MMAE is well tolerated in mice up to 60 mg/kg. In cynomolgus monkey, H-Zt/g4-MMAE up to 30 mg/kg had a manageable and reversible toxicity profile.

Conclusions: H-Zt/g4-MMAE is superior in eradication of pancreatic cancer xenografts with favorable pharmacokinetic profiles and manageable toxicological activities. These findings warrant the transition of H-Zt/g4-MMAE into clinical trials in the future.

School: Graduate School of Biomedical Sciences | Campus: Amarillo

PHAR GREENE, CARL

Use of Stem Cell Product for Chronic (Diabetic) Wound Healing

Carl Greene

Wounds that fail to show signs of significant progress towards healing for 30 or more days are considered to be chronic wounds. These wounds have failed to progress through the phases of healing in a sequential order and seem to be held up in one or more of the phases of healing, often times the inflammatory stage. Estimated annual costs of treating chronic nonhealing wounds is $31.7 billion with 15% of Medicare beneficiaries (8.2 million) being impacted by a nonhealing wounds annually. Surgical wounds and diabetic foot ulcers drive the highest total wound care costs, with diabetic wound infections having the second highest occurrence as there are 30.2 million Americans (12.2%) with diabetes.

Abnormal wound healing of diabetic wounds is associated with an abnormal cytokine profile found in the wound bed, which is complicated further by poor circulation. One example of this imbalance would be the suppression of TGF-ÔÅ¢1 induced gene expression by TNF-ÔÅ° resulting in a reduced expression of ÔÅ°-smooth muscle actin (ÔÅ°-SMA) in myofibroblast. This results in a hindering of cell migration along with extra cellular matrix composition.

Our project goal of addressing diabetic nonhealing wounds is to develop and formulate a therapeutic application using adult stem cell secretory products. Using dental pulp stem cells (DPSC,Äôs) supernatant, our lab has shown enhance healing in streptozotocin-induced diabetic NOD/SCID mice. Topical application of DPSC supernatant twice daily significantly accelerated the wound healing process (when compared to vehicle) through addressing wound bed cytokine profile abnormalities. Treatment reduces NF-ÔÅ´B phosphorylation in both mouse monocytes and myofibroblasts when exposed to pro-inflammatory cytokines such as IL-1 and TNF-ÔÅ°. Gene expression of the pro-inflammatory cytokine IL-6 was also attenuated by treatment. Expression of the anti-inflammatory cytokines TGF-ÔÅ¢1 and IL-10 saw an increase with treatment, even when in presence of the inf

School: Graduate School of Biomedical Sciences | Campus: Amarillo

PHAR HADI ESFAHANI, SHIVA

Is diminazene an activator of ACE2?

Shiva Hadi Esfahani, Srinidhi Jayaraman, Vardan T Karamyan

The aim of this study was to verify a recently reported effect of diminazene (DMZ) on activity of angiotensin-converting enzyme 2 (ACE2) and extend it to other peptidases from the same family of enzymes. To our surprise, DMZ did not enhance activity of ACE2 in assay conditions replicating that of the original study which reported activation of the peptidase with this agent. In addition, we observed inhibition of angiotensin converting enzyme2(ACE2), angiotensin converting enzyme (ACE), neurolysin (Nln), thimet oligopeptidase (TOP) and neprilysin (NEP) at high micromolar concentrations of DMZ. To verify that the observed discrepancy was not because of the recombinant ACE2 used in our study, additional experiments were carried out to confirm identity of this enzyme. In this set of experiments, we confirmed concentration-dependent activation of ACE2 by NaCl and inhibition of the enzyme by well-characterized inhibitors DX 600 and MLN-4760. In addition, identity of ACE2 was confirmed by immunoblotting with use of a specific polyclonal antibody against the peptidase. While we continue our studies to clarify the noted discrepancy, our current data indicate that DMZ does not enhance the catalytic activity of ACE2.

School: Graduate School of Biomedical Sciences | Campus: Amarillo

PHAR HOSSAIN, MOHAMMAD

Design and synthesis of dual-acting quorum sensing inhibitors to suppress the virulence program of Pseudomonas aeruginosa

Mohammad Anwar Hossain, Wei Li, Kendra Rumbaugh, Nadezhda A. German

Pseudomonas aeruginosa is an opportunistic bacterium causing recalcitrant infections in immunocompromised patients. It exerts its pathogenicity upon the releasing of virulence factors which lead to chronic infections, biofilm formation, and antibiotic resistance. LasR plays at the top of the quorum sensing hierarchy, but under stress conditions, PqsR plays the vital role in modulating the virulence factors. Therefore, attenuating LasR and PqsR with dual-acting inhibitors will substantially reduce the virulence program, biofilm formation, pyocyanin, and rhamnolipid production of P. aeruginosa, both in normal and stressed conditions. Using structure-based and fragment-based approaches, a series of novel inhibitors have been designed containing pharmacophore capable of LasR or PqsR antagonism. The analogs were docked into the ligand-binding domain of PqsR and LasR, and ligand-binding interactions were evaluated using StarDropTM. The top-scored compounds were synthesized and evaluated against P. aeruginosa PAO1 as an inhibitor of the virulence program. The dual-acting inhibitors were shown to not interfere with the bacterial growth in concentrations up to 100 ¬µM. In the whole-cell assay, synthesized analogs reduced the PqsR and LasR activity significantly: 13.4¬±2.91 to 27.53¬±2.76%, and 11.22¬±0.60 to 20.56¬±1.17% respectively at 10 ¬µM. The static biofilm assay using crystal violet staining showed inhibition of biofilm formation from 35.15¬±7.77% to 63.93¬±8.12%. The dual-inhibitors also reduced the production of pyocyanin up to 34.3¬±5.017% and rhamnolipid up to 22.73¬±8.88% (10 ŒºM). Altogether, this approach identified novel classes of quorum sensing inhibitors with the ability to disrupt the quorum sensing network, which was able to increase the efficacy of ciprofloxacin in an in-vitro combination treatment. The structure-activity relationship studies will lead to making the potent quorum sensing inhibitors fight P. aeruginosa-associated virulence programs.

School: School of Pharmacy | Campus: Amarillo

PHAR JACOB, JESNEY

Exploring the prevalence of diabetes mellitus, chronic kidney disease, or both in older adults with sepsis and impact on mortality

Jesney Jacob, Pharm D Candidate, Kalin Clifford, PharmD, BCPS, and Ronald Hall II , PharmD, MSCS

Introduction: Sepsis is defined by the Surviving Sepsis Campaign Guideline 2016 as a life- threatening organ dysfunction due to an impaired host response to infection. Mortality from sepsis is a serious concern in the intensive care unit. This study explores mortality trends in sepsis patients with diabetes mellitus (DM) and/or chronic kidney disease (CKD). Previous studies looking at all age groups have observed the highest mortality in CKD patients followed by those with DM. However, there are no data specific to older adults with sepsis.

Research Question or Hypothesis: Are DM, CKD, and/or both associated with an increased risk of mortality in older patients with sepsis?

Study Design: Retrospective analysis of adult patients, over 50 years of age, discharged from United States hospitals between 2003 and 2010.

Methods: We evaluated the US National Hospital Discharge Summary which includes data from 2003 to 2010. Participants were included if they were over 50 years of age and had an ICD 9 diagnosis code for sepsis and if they also had CKD and/or DM. Statistical analysis was performed using STATA version 15.

Results: The mortality rate of septic patients with DM was lower than non-DM patients, which is in accordance with previous studies. The mortality rate of septic patients with CKD was lower than non- CKD patients, which is not in accordance with previous studies. No conclusions can be made regarding the mortality rate of septic patients with both DM and CKD.

Conclusion: The information from this study will be used to help identify the impact of comorbid conditions (DM and/or CKD) on survival in older adults with sepsis.

School: School of Pharmacy | Campus: Dallas

PHAR KAUSHIK, ITISHREE

Repurposing neuroleptic drug for brain tumor therapy

Itishree Kaushik, Alok Ranjan, Blake Schwettmann and Sanjay K Srivastava

Brain tumor is considered one of the most aggressive and incurable forms of cancer. Majority of the brain tumors have a median survival rate of only 12%. Even though advanced treatments such as surgical removal, chemotherapy, and radiotherapy are available, brain tumor persists to be lethal. Obstacles associated with the current treatment options are recurrence, development of resistance and inability to cross the blood-brain barrier (BBB). BBB restricts the majority of drugs to reach the brain thus resulting in ineffective treatment. Pimozide (PMZ) is an antipsychotic drug used for the treatment of schizophrenia and chronic psychosis. In this study, pimozide has shown a significant reduction in the viability of U-87MG, U-251MG, DAOY and GBM28 cell lines with an IC50 ranging from 11¬µM to 20¬µM after 24 h of treatment. Pimozide-induced apoptosis in these cell lines as evaluated by FITC/Annexin assay and further validated by the cleavage of caspase 3 as well as PARP by western blot analysis. Pimozide treatment resulted in the concentration-dependent decrease in the expression of STAT3 signaling mainly targeting the anti-apoptotic markers BCl-XL, BCl-2, Survivin etc in U87MG, U251MG, DAOY, and GBM28 brain cancer cell lines, depicting a reduction in anti-apoptotic property of these cell lines. In addition, pimozide treatment also mediated a concentration-dependent increase of the autophagy markers in all the cancer cell lines tested. These results were also verified using specific autophagy inhibitors. Our results further demonstrated that the oral administration of pimozide (25mg/kg) inhibits the brain tumors in intracranial tumor model with no significant difference in the average weight of critical organs. It is important to note that pimozide is an FDA approved drug with no considerable toxicity. Overall, this study depicts that pimozide is a potential candidate to target brain tumors.

School: Graduate School of Biomedical Sciences | Campus: Amarillo

PHAR LAHOOTI, BEHNAZ

High Throughput Technique for Developing Non-viral Nanoparticles for gene delivery

Behnaz Lahooti and Rahul Dev Jayant (Ph.D.)

During ischemic stroke, oxygen and nutrient deficiency initiate secondary injury cascades, including intracellular sodium and excitotoxicity. All of these pathophysiologic processes contribute to cellular and vasogenic edema, which can be a primary reason for patient mortality after stroke. Neuropeptides play a significant role in different signaling pathways and their functions are terminated by endogenous neuropeptidases. Neurolysin (Nln), a zinc metallopeptidase, has been reported to play a crucial role in the improvement of stroke outcomes. Functional importance of this enzyme in post-stroke brain repair is due to its capability in processing a diverse group of neuropeptides, such as bradykinin, which has distinct functions in the development of inflammation, excitotoxicity, and cell death after stroke. The objective of our present study was to investigate the role of Nln through the deactivation of the neuropeptide substrates and subsequent reduction of brain edema after a model of ischemic stroke. For an ex-vivo model of ischemia, an acute brain slice model has been used. Brain slices were exposed to 1 hour of oxygen-glucose deprivation (OGD) condition followed by reperfusion (R) for 2 hours in the presence and absence of Nln substrates. We observed that the water content in slices increased when exposed to OGD/R compared to normoxia which further increased in the presence of Nln substrates during reperfusion, suggesting the role of Nln substrate in edema formation. Interestingly, the presence of rNln attenuated the enhanced edema formation by Nln substrates. These results indicated the role of Nln in reducing brain edema during ischemic stroke. Furthermore, we confirmed the hydrolysis of neuropeptides in the presence of Nln by using the LC-MS/MS method. These results imply that cellular edema formation after stroke can be worsened by common Nln substrates and treatment with rNln can attenuate cerebral swelling.

School: Graduate School of Biomedical Sciences | Campus: Amarillo

PHAR LEE, YOONJUNG

The anticonvulsant effect of physical activity differs between sexes in the mouse corneal kindling model

YoonJung Lee Alejandra Fernandez James Stoll

New approaches are essential to mitigate drug-resistant seizures. We previously showed that physical activity increased seizure (SZ) threshold (lower SZ frequency, severity, duration) in the corneal kindling model. A limitation of this study was only male mice were used. Therefore, using female mice, we tested if voluntary running reduced SZ threshold in chronic corneal kindling, a model for human partial epilepsy. Kindling was performed using CF1 mice as previously reported. To assess kindling development, mice were divided into two groups. Group A had access to exercise wheels while group B mice did not. After 3 weeks of physical activity, mice received twice daily electrical stimulation and seizures scored. Subsequently, kindled mice were tested for the effect of physical activity on seizure threshold using a repeated crossover experimental design. Mice were divided into two groups; one group received wheels, the other did not. After 3 weeks of physical activity, mice received 4 corneal stimuli over 2 days and the seizures were scored. In the second round, the groups were switched and SZ threshold was measured after 3 weeks. In the third round, these groups were reversed again and SZ threshold was measured 3 weeks later. Finally, the wheels were switched again and SZ threshold measured after 5 days, 13 days, and 21 days of exercise to test how quickly the exercise effect appeared or was lost. Physical activity delayed kindling development in both male and female mice. Female mice had lower SZ threshold than male mice that required fewer stimulations to be fully kindled. Furthermore, in each round, mice with wheels had significantly increased SZ threshold compared to sedentary that SZ threshold became stable after 21 days of exercise, demonstrating that this is a robust effect. When wheels were removed seizure threshold decreased, indicating that the effect of physical activity is reversible. Future studies will be directed to identify the mechanism(s) involved.

School: Graduate School of Biomedical Sciences | Campus: Amarillo

PHAR NOZOHOURI, SAEIDEH

Effect of neurolysin on cellular edema during ischemic stroke

Saeideh Nozohouri, Srinidhi Jayaraman, Bhuvaneshwar Vaidya, Vardan Karamyan, Thomas Abbruscato

During ischemic stroke, oxygen and nutrient deficiency initiate secondary injury cascades, including intracellular sodium and excitotoxicity. All of these pathophysiologic processes contribute to cellular and vasogenic edema, which can be a primary reason for patient mortality after stroke. Neuropeptides play a significant role in different signaling pathways and their functions are terminated by endogenous neuropeptidases. Neurolysin (Nln), a zinc metallopeptidase, has been reported to play a crucial role in the improvement of stroke outcomes. Functional importance of this enzyme in post-stroke brain repair is due to its capability in processing a diverse group of neuropeptides, such as bradykinin, which has distinct functions in the development of inflammation, excitotoxicity, and cell death after stroke. The objective of our present study was to investigate the role of Nln through the deactivation of the neuropeptide substrates and subsequent reduction of brain edema after a model of ischemic stroke. For an ex-vivo model of ischemia, an acute brain slice model has been used. Brain slices were exposed to 1 hour of oxygen-glucose deprivation (OGD) condition followed by reperfusion (R) for 2 hours in the presence and absence of Nln substrates. We observed that the water content in slices increased when exposed to OGD/R compared to normoxia which further increased in the presence of Nln substrates during reperfusion, suggesting the role of Nln substrate in edema formation. Interestingly, the presence of rNln attenuated the enhanced edema formation by Nln substrates. These results indicated the role of Nln in reducing brain edema during ischemic stroke. Furthermore, we confirmed the hydrolysis of neuropeptides in the presence of Nln by using the LC-MS/MS method. These results imply that cellular edema formation after stroke can be worsened by common Nln substrates and treatment with rNln can attenuate cerebral swelling.

School: Graduate School of Biomedical Sciences | Campus: Amarillo

PHAR PAGE, SHYANNE

Determining the effect of the WNT/Œ≤-catenin pathway on the ischemic blood-brain barrier in vitro and in vivo

Shyanne Page, Heidi Villalba, Abraham Al-Ahmad

The blood-brain barrier (BBB) is a selectively permeable barrier made up of tight junctions formed by endothelial cells that separates the circulating blood from the brain extracellular fluid. The primary function of the BBB is to limit the movement of xenobiotics from the blood to the brain. In the event of an ischemic stroke, the BBB opens allowing water and ions to enter the brain, leading to excitotoxicity and edema formation. Targeting opening of the barrier following ischemic stroke has become a focus of current stroke studies. It has been shown that the Wnt/Œ≤-catenin pathway is important for barrier formation during embryonic development, therefore, we hypothesized that activation of this pathway following ischemic stroke would attenuate barrier dysfunction. Brain microvascular endothelial cells (BMECs) derived from iPSCs were cultured and placed in ischemic stress for 6hrs, followed by an 18-hour period of reoxygenation. Wnt small molecule activators (CHIR99021 and SB216763) and inhibitors (XAV939, IWP-4, IWR-1) were introduced at different time points of differentiation, during ischemia, and during re-oxygenation. Transendothelial Electrical Resistance (TEER) and permeability were performed to assess barrier integrity following reoxygenation. For in vivo studies, C57 mice were subjected to one-hour ischemia by MCAO. At the time of re-oxygenation, mice were dosed with CHIR99021 (30mg/kg). 24-hours post-MCAO, TTC staining on brains was performed to determine infarct size and edema ratio. Despite observing a beneficial effect of the Wnt/Œ≤-catenin pathway on the barrier under normal conditions, we found that activation of Wnt ischemia/reoxygenation is detrimental to the barrier function in vitro, suggesting that Wnt may cross-talk with pathways known to affect barrier function following ischemic stroke, such as the HIF1Œ± pathway. Furthermore, we found that mice treated with CHIR99021 during reperfusion suffered increased incidence of hemorrhagic transformation.

School: Graduate School of Biomedical Sciences | Campus: Amarillo

PHAR RAMACHANDRAN, SHARAVAN

Re-positioning of novel anti-psychotic drug for pancreatic cancer treatment

Sharavan Ramachandran and Sanjay K. Srivastava

Despite major advances in cancer treatment, pancreatic cancer is still incurable and the treatment outcomes are limited. In the current study, we evaluated the anti-cancer effects of pimavanserin tartrate (PVT), a drug used for the treatment of Parkinson,Äôs disease psychosis. Our observations indicated that PVT significantly suppressed the proliferation of pancreatic cancer cells by inducing apoptosis without exerting any cytotoxic effects in normal human pancreatic ductal epithelial (HPDE6) and MRC5 lung fibroblast cells. Anti-proliferative and apoptosis-inducing effects of PVT were mediated by the inhibition of pAkt (Ser473), Akt, Gli1, Oct-4, SOX-2, NANOG, and c-Myc. Pharmacologically inhibiting or genetically knocking out Akt or Gli1 enhanced the growth suppressive effects of PVT in pancreatic cancer cells. Subsequently, we evaluated the effects of PVT in gemcitabine resistant cells. Our results demonstrated that PVT suppressed the proliferation and induced apoptosis in MIAPaCa2 gemcitabine-resistant cells in a concentration and time-dependent manner. Further mechanistic analysis indicated that PVT suppressed the phosphorylation of Akt at Ser 473 and inhibited the expression of Gli1, Oct-4 and c-Myc in MIAPaCa2 gemcitabine-resistant cells. Moreover, PVT increased the cleavage of caspase-3 and PARP as an indicator of apoptosis. Oral administration of PVT suppressed BxPC3 tumor xenografts by 50% in athymic nude mice. In another in vivo experiment, PVT treatment inhibited the growth of orthotopically implanted PANC1 tumors by 75%. In addition, PVT suppressed 54% of MIAPaCa2 gemcitabine resistant tumor growth in a subcutaneous xenograft model. Taken together, our results indicate that pancreatic tumor growth suppression by PVT is orchestrated by inhibition of Akt/Gli-1 signaling. Since PVT is already available in the clinic with an established safety profile, our results will accelerate its clinical development for the treatment of patients with pancreatic cancer.

School: Graduate School of Biomedical Sciences | Campus: Amarillo

PHAR RAUT, SNEHAL

Effect of presenillin (PS) mutations on the blood-brain barrier function in-vitro using patient-derived induced pluripotent stem cells

Snehal Raut; Ronak Patel; Dr. Abraham Al-Ahmad

Alzheimer's disease (AD) is the common neurodegenerative disease characterized by the progressive loss of hippocampal and cortical neurons, A key element of AD pathophysiology is characterized by the presence of senile plaques (formed by Abeta peptides aggregations) and neurofibrillary tangles (formed by hyperphosphorylated Tau protein). Although Abeta and Tau have been a target for several drug candidates, none of the current approaches was capable to yield into clinically validated treatment, therefore an important shift in paradigm is needed. More recently, non-neuronal approaches have been evoked, in particular, the contribution of the blood-brain barrier (BBB) in the pathophysiology of the disease. In this study, we investigated the effects of mutations on PSEN genes (a gene associated with familial form of Alzheimer) and from a healthy control on the blood-brain barrier phenotype using induced pluripotent stem cells (iPSCs). In this study, we have used two PSC lines from patients with familial form of AD and mutations in PSEN genes (PSEN1, PSEN2) iPSCs were differentiated into BMEC monolayers. We assessed the BMEC phenotype by immunofluorescence, barrier function by measuring transendothelial electrical resistance (TEER) and permeability, as well as changes in glucose metabolism and vesicle trafficking.

Results: Notably, both the control and PSEN2 BMECs showed tight monolayers (TEER>1000 Œ©.cm2) whereas PSEN-1 BMECs showed loose monolayers (TEER 150-200 Œ©.cm2). Similar outcomes were observed for fluorescein permeability. We have also noted alteration in drug efflux transporter activity and glucose uptake, as well as abnormal lysosomal pH in PSEN1 BMECs compared to control and PSEN2 BMECs. Discussion: Study constitutes the first report of the presence of BMEC phenotype associated with PSEN mutations at the BBB, in particular between PSEN1 and PSEN2 mutant carriers. We are currently further investigating such differences by increasing the number of of iPSC lines.

School: Graduate School of Biomedical Sciences | Campus: Amarillo

PHAR ROLPH, DANIELA

Ferutinin induces osteogenesis in dental pulp-derived stem cells and ferutinin-pretreated DPSC therapy attenuates osteoclastogenic markers in dexamethasone-induced osteoporotic mice

Daniela Rolph, Moonmoon Deb, Suman Kanji, Manjusri Das, Matthew Joseph, Reeva Aggarwal, and Hiranmoy Das

Osteoporosis is a skeletal disorder in which bone resorption by osteoclasts outpaces bone formation by osteoblasts, leading to brittle and fragile bones. It is the most common metabolic bone disorder, affecting over 10 million adults over 50 in the United States alone. In recent years, stem cell-based therapies have gained attention as viable options to treat degenerative diseases. In this study, we present evidence that dental pulp-derived stem cells (DPSCs) are activated to undergo osteogenic differentiation by the small molecule ferutinin. By western blotting, we demonstrated that ferutinin-treated DPSCs express increased levels of key proteins in the canonical Wnt pathway, which is essential for osteogenesis. Validation by RT-PCR revealed increased mRNA expression of the genes corresponding to those molecules. Furthermore, we analyzed the genes WNT3A and DVL3 by chromatin immunoprecipitation (ChIP) assay and found that active marks of both H3K9 acetylation and H3K4 trimethylation were significantly enhanced in these genes' promoter sites in ferutinin-treated DPSCs. These findings indicate that ferutinin increases Wnt pathway activity by epigenetic alterations that increase transcription of these genes. In addition, by western blotting and RT-PCR methods, we showed that the BMP2 pathway, crucial for osteoblastic differentiation and maturation, is activated in ferutinin-treated cells. In ferutinin-treated DPSCs, osteocalcin and collagen 1A1 expression are increased, as manifested by immunofluorescence staining. These proteins are secreted by osteoblasts and are important structural proteins in the bone matrix. Preliminary in vivo data provide evidence that ferutinin-pretreated DPSCs attenuated mRNA expression of NFATc1, a gene associated with osteoclast formation and activity, in bone marrow cells of osteoporotic mice compared to controls. Activated DPSCs therefore represent a potential novel approach for the treatment of osteoporosis.

School: Graduate School of Biomedical Sciences | Campus: Amarillo

PHAR SAJIB, MD SANAULLAH

Inhibition of Endothelial RhoA-ROCK pathway blocks cancer Metastasis

Md Sanaullah Sajib, Fatema Tuz Zahra, Jee Hyun Park, Racheal Akwii, Paul E. Tullar, Sanjay K. Srivastava, Ulrich Bickel, Constantinos M. Mikelis

Metastasis, the cause of more than 90% of cancer-related deaths, is the principal complication during cancer therapy. An important step in the metastatic process is the migration of the cancer cells through the endothelial monolayer during intravasation and extravasation. The molecular mechanisms underlying metastasis, especially the interaction of cancer cells with the endothelial lining of the vasculature, is poorly understood. It has been shown that endothelial RhoA-Rho kinase (ROCK) pathway is responsible for vascular permeability. In the present study, we investigate the role of this pathway in cancer cell trans-endothelial migration. In vitro, we used a quantifiable, highly reproducible, transwell-based, two-cell co-culture model of trans-endothelial migration, where GFP or RFP-expressing cancer cells transmigrate through an endothelial monolayer. Endothelial RhoA and the downstream signaling pathway were blocked by siRNA or pharmacological inhibitors. In vivo, endothelial specific RhoA-deficient mice were used in experimental metastasis models. A variety of different cancer cell lines of both murine and human origin were able to potently activate endothelial RhoA. RhoA knockdown or pharmacological blockade of the downstream signaling pathway in the endothelial cells decreased the trans-endothelial migration of several human and murine cancer cells in vitro. In vivo, endothelial RhoA deficiency significantly inhibited the number of lung metastases in intravenous and intracardiac experimental metastasis models, while treatment with a clinically relevant RhoA pathway inhibitor, Fasudil, decreased the metastatic colonization of both human and murine cancer cells, reinforcing the potential of Fasudil as an anti-metastatic drug candidate. Collectively, our findings highlight the role of endothelial RhoA-ROCK signaling in cancer cell trans-endothelial migration and metastasis

School: Graduate School of Biomedical Sciences | Campus: Amarillo

PHAR SIFAT, ALI

Maternal Electronic Cigarette Use Can Enhance Offspring Susceptibility to Hypoxic-Ischemic Brain Injury

Ali Sifat Saeideh Nozohouri Heidi Villalba Bhuvaneshwar Vaidya Thomas Abbruscato

Prenatal exposure to tobacco smoke and nicotine is believed to interfere with fetal brain development predisposing offspring to different neurobehavioral and neuropsychological disorders. Included in this is increased neonatal vulnerability to hypoxic-ischemic encephalopathy (HIE) which is a major cause of neonatal death and child disability in the US. These effects could be, in part, mediated by fetal nicotine exposure. Use of electronic cigarettes (e-Cigs), commonly known as vaping, has rapidly increased in recent times in the general population. E-Cig use during pregnancy is also increasing because of the addictive properties of nicotine along with the perceived safety of e-Cig use. In this study, we investigated the effects of maternal e-Cig use on neonatal brain development and HIE utilizing a combination of in vitro and in vivo models. Pregnant CD1 mice were exposed to e-Cig vapor (2.4% nicotine), equivalent to human exposures. Primary cortical neurons were isolated and cultured from e-Cig exposed fetus with subsequent exposure to oxygen-glucose deprivation followed by reoxygenation (OGD/R). HI brain injury was induced in 8-9 days old mouse pups by a combination of left common carotid artery ligation and 15 minutes exposure to 8% oxygen. We found that e-Cig exposed neurons demonstrated decreased cell viability and increased PARP1 expression in OGD/R condition. These effects were accompanied by decreased glucose uptake & glucose transporter expression and mitochondrial dysfunctions. Our preliminary data also indicate increased sensitivity to HI brain injury in prenatally e-Cig exposed mouse pups. Additionally, in utero e-Cig exposed offspring displayed hyperactivity at postnatal day 45 in the open field test. These results indicate that maternal e-Cig exposure could lead to offspring behavioral abnormalities and enhance HI brain injury. This study is instrumental in elucidating the possible deleterious effects of maternal e-Cig use in the general population.

School: Graduate School of Biomedical Sciences | Campus: Amarillo

PHAR SIVANDZADE, FARZANE

Assessing the Protective Effect of Rosiglitazone against Tobacco Smoke and Electronic Cigarette Induced Oxidative Stress Damage at the Blood Brain Barrier

Farzane Sivandzade Luca Cucullo

The content of tobacco smoking (TS) and also e-cigarettes (EC) are associated with vascular endothelial dysfunction in a causative and dose-dependent manner primarily related to the content of reactive oxygen species (ROS), nicotine, oxidative stress, and smoking-induced inflammation. It is well established that both TS and EC promote glucose intolerance and increases the risk of developing type-2 diabetes mellitus (2DM) with which it shares other pathogenic traits including the high risk of neurological and cerebrovascular disorders via ROS generation, blood-brain barrier (BBB) impairment and inflammation. Herein, we investigated the protective effect of rosiglitazone (RSG) against oxidative stress damage at the BBB by chronic TS/EC exposure. For this purpose, we assessed intracellular ROS generation and BBB integrity using immunofluorescence, western blotting, Intracellular ROS generation, and TEER measurement, as well as BBB permeability analyses using labeled dextran molecules. Experiments were conducted on TS/EC-exposed mouse brain microvascular endothelial cells (mBMEC-P3) treated with RSG (20 ŒºM based on cell viability evaluated by MTT cytotoxicity).Results were compared to corresponding untreated TC/EC exposed cultures. The results revealed that RSG as a peroxisome proliferator-activated receptor gamma (PPARŒ≥), activates counteractive mechanisms primarily associated with the Nrf2 and PPARŒ≥ pathway which reduced ROS generation and TS/EC toxicity at the cerebrovascular level. The results also confirm the RSG's role in the reduction of inflammation and oxidative stress and also suppression of tight junction (TJ) protein downregulation and loss of BBB integrity induced by TS/EC. In conclusion, RSG could be considered as a promising therapeutic potential to prevent TS/EC induced cerebrovascular dysfunction due to its protective effects through the activation of PPARŒ≥-dependent Nrf2 pathway.

School: Graduate School of Biomedical Sciences | Campus: Amarillo

PHAR SUTHE, SREEDHAR REDDY

Therapeutic Eradication of pancreatic Cancer by a Novel Antibody-Drug Conjugate Targeting RON Receptor Tyrosine Kinase, a Prognostic Bio marker for Shortened Patient Survival

Sreedhar Reddy Suthe, Hang-Ping Yao and Ming-Hai Wang

Background: Aberrant expression of the RON receptor tyrosine kinase is a pathogenic feature and a validated drug target in various types of cancers. Currently, therapeutic antibodies targeting RON for cancer therapy are under intensive evaluation. Here we report development and validation of a novel humanized anti-RON antibody-drug conjugate for cancer therapy.

Methods: Antibody humanization was achieved by grafting sequences of complementarity-determining regions from mouse monoclonal antibody Zt/g4 into human IgG1/Œ∫ acceptor frameworks. Humanized Zt/g4 subclone H1L3 was conjugated with monomethyl auristatin E using a dipeptide linker to form H-Zt/g4-MMAE. Pharmacokinetic analysis of H-Zt/g4-MMAE was determined using ELISA and LCMS. Therapeutic efficacies of H-Zt/g4-MMAE were validated in vivo using three pancreatic cancer xenograft models. Toxicological activities of H-Zt/g4-MMAE were determined in mouse and cynomolgus monkey.

Results: H-Zt/g4-MMAE had a drug to antibody ratio of 3.77:1 and was highly stable in human plasma with a dissociation rate less than 5% within a 20 day period. H-Zt/g4-MMAE displayed a favorable pharmacokinetic profile in both mouse and cynomolgus monkey. In vivo, H-Zt/g4-MMAE inhibited pancreatic cancer xenograft growth with tumoristatic concentrations at 1~3 mg/kg bodyweight. Significantly, H-Zt/g4-MMAE eradicated tumors across multiple xenograft models. Moreover, H-Zt/g4-MMAE inhibited and eradicated xenografts mediated by pancreatic cancer stem-like cells and by primary cells from patient-derived tumors. Toxicologically, H-Zt/g4-MMAE is well tolerated in mice up to 60 mg/kg. In cynomolgus monkey, H-Zt/g4-MMAE up to 30 mg/kg had a manageable and reversible toxicity profile.

Conclusions: H-Zt/g4-MMAE is superior in eradication of pancreatic cancer xenografts with favorable pharmacokinetic profiles and manageable toxicological activities. These findings warrant the transition of H-Zt/g4-MMAE into clinical trials in the future.

School: Graduate School of Biomedical Sciences | Campus: Amarillo

PHAR ZAHRA, FATEMA TUZ

The endothelial small GTPase RhoA regulates angiogenesis in certain pathological conditions

Zahra F.T., Sajib M.S., Ichiyama Y., Akwii R., Tullar P., Kubota Y., Mikelis C.M.

Angiogenesis is an important physiological process which takes place during embryonic development and in specific events during adult life. Imbalanced angiogenesis, however, is a characteristic of several diseases including cancer. The Rho family of small GTPases plays a central role in a variety of cellular processes necessary for vascular development and angiogenesis. Here, we aimed to identify the role of endothelial RhoA in angiogenesis under physiological versus pathological conditions and explore the underlying molecular mechanisms. To explore the role of RhoA during physiological angiogenesis in vivo, we generated endothelial RhoA-deficient mice and tested them for developmental and retinal angiogenesis. RHOA deletion in embryonic endothelial cells, although decreased survival did not affect embryonic development and no vascular deficiencies were identified in the mutant embryos. In the same context, inducible RhoA deficiency in the retinal vessels in different developmental days did not affect the retinal angiogenesis, demonstrating that RhoA is dispensable for physiological angiogenesis. Pathological angiogenesis is driven by the compensatory activity of several growth factors, among which, VEGF and bFGF are the two best-studied. RhoA has been shown to participate in VEGF-induced angiogenesis, which we also verified. Furthermore, we explored the role of RhoA bFGF-induced angiogenesis. bFGF induced RhoA activation in HUVECs and RhoA blockade abrogated bFGF-induced endothelial cell migration and tube formation in vitro and matrigel plug angiogenesis in vivo. Mechanistically, RhoA blockade did not affect bFGF-induced ERK and p38 activation, although JNK phosphorylation was partially inhibited. The above data denote that although endothelial RhoA does not affect physiological angiogenesis, it regulates both VEGF- and FGF-induced angiogenesis, rendering RhoA as an ideal candidate for anti-angiogenic treatment.

School: Graduate School of Biomedical Sciences | Campus: Amarillo

MEDICAL STUDENTS YEARS 1-2 | GRADUATE MEDICAL SCIENCES | PUBLIC HEALTH

MS1-2 AHLE, DANIEL

Daniel Ahle, Brianyell McDaniel, Matthew Grisham, Sharilyn Almodovar

Helayna Abraham, Debra Flores, PhD

HIV-infected individuals treated with antiretroviral therapy remain susceptible to non-opportunistic pulmonary diseases. While the contribution of HIV to pulmonary pathophysiology remains under investigation, dissecting molecular mechanisms in animal models remains a priority. Humanized mice (hu-mice) have helped this area of research, as they reconstitute human innate and adaptive immunity. However, one caveat is that hu-mice may develop graft-versus-host disease (GvHD), in which xenogeneic engraftments attack murine host tissues. Thus, GvHD may be a confounding factor when investigating pulmonary diseases that compromise vascular compliance in HIV-infected hu-mice. In this study, immunocompromised mice were engrafted with human hematopoietic stem cells and surgically implanted with human fetal thymic and liver tissue (BLT mouse model). BLT mice were inoculated with infectious HIV and lung tissues were harvested at the end of the study. Pulmonary vascular histopathology was compared to that of immunocompromised mice that developed GvHD after injection with human peripheral blood mononuclear cells (PBMC). Histopathological analyses of pulmonary vascular tissue of HIV-infected hu-mice demonstrated diffuse inflammatory infiltrates in pulmonary vessels, with significant thickening of the tunica media consistent with smooth muscle hypertrophy. Conversely, mice from the GvHD model exhibited distinct patchy inflammatory infiltrates resembling lung granulomas as well as prominent tunica media thinning, consistent with engulfment of the smooth muscle layers. This study demonstrates that the pulmonary vascular pathologies associated with GVHD and HIV infection are substantially different based on histopathology. These preliminary studies rule out GvHD as a confounding factor in HIV-associated pulmonary complications like pulmonary hypertension (PH) because the thin pulmonary vessels observed in GvHD are less likely to hold the high hemodynamic pressures featured in PH.

School: School of Medicine | Campus: Lubbock

MS1-2 AL DOGOM, SARA

Complications of Thyroid Surgery Retrospective Review of Cases Performed at Texas Tech University Medical Center

Student first Author Sara Al Dogom Principale Investigator Dr Joehassin Cordero Additional Investigator Dr Tam Nguyen

Thyroid surgery is performed in the U.S. on the daily basis. This type of surgery is afflicted by a variety of complications. The aim of our study is to analyze retrospectively the type and incidence of postoperative complications of thyroid surgery experienced by adult patients at Texas Tech University Medical Center for nearly the past decade. The study will include several types of thyroid surgery performed such as lobectomy, near total, total thyroidectomy, and parathyroidectomy.

School: School of Medicine | Campus: Lubbock

MS1-2 ALDRETE, JONATHAN

Subgaleal Osteolytic Pigmented Epithelioid Melanocytoma with Dural Infiltration

Pigmented Epithelioid Melanocytoma (PEM) is a recently described rare, dermatological tumor that shares common histological features with the epithelioid blue nevus and animal-type melanoma. Preliminary findings have shown the PEM to be prevalent within adolescents and young adults, mean age 28 years, with no predilection towards ethnicity or sex, and various locations throughout distal extremities. PEMs are also not correlated with sun exposure and display an indolent clinical presentation. Additionally, the PEM has been associated with a familial syndrome, Carney Complex, that encompasses many tumors including melanomas and schwannomas. Yet, the true nature of this tumor is not fully understood, and current clinical regimens involves careful observation due to unknown prognosis. A few case studies have given slight indication that PEM may be benign, because it rarely spreads past regional lymph nodes. Currently, this entity is classified as a low-grade tumor with metastatic potential.

This case encompasses a unique presentation of PEM that is not described in the literature. A 14-month old female presented to the clinic by her mother who noticed two holes in the back of the child's head. Neuroimaging revealed a subgaleal lesion and an open biopsy was conducted. Following biopsy, a diagnosis of PEM was established, and further investigation revealed the PEM to be a lytic lesion of the posterior parietal calvarium. Intraoperative findings uncovered further infiltration into the dura. Partial resection of the tumor ensued, with most of the tumor removed. Intraoperative decision to leave a portion of the PEM that adhered to the dura was made to spare the dura from incision. Due to the ambiguity of PEM prognosis, meticulous observation of the patient is being conducted. This case is unique as the PEM has shown a subgaleal location and presented as a lytic lesion of the skull and dura which has not been described by the literature to date.

School: School of Medicine | Campus: Lubbock

MS1-2 ALHAJ, SARA

Treatment of BRAF-V600E Positive Ganglioglioma with Vemurafenib: A Case Report

Alhaj, Sara; Urias, Eduardo; Belirgen, Muhittin; Healy, Austin; Al-Rahawan, Mohamad M.

Background: Mutations in genes involving the MAPK pathway have been investigated in multiple neoplasms. The discovery of BRAF-V600E mutations within this pathway has led to advancements in cancer treatment and survival through the development of targeted therapies. Targeting BRAF mutations using small molecule inhibitors, such as Vemurafenib, improved survival in melanoma and thyroid tumors. Several reports suggest a role of Vemurafenib in treating pediatric brain tumors; however, clinical trials are underway. More data exist on using Dabrafenib and Trametinib for this indication in adults.

Objective: To report our experience in using Vemurafenib as a monotherapy in a patient with BRAF-V600E positive pediatric cerebellar ganglioglioma, a low grade glioma.

Design/Method: We followed the disease course, progression, and treatment of a young female patient that was diagnosed with cerebellar ganglioglioma at 16 years of age. Upfront subtotal resection was followed by close observation. Three years after surgery, the patient experienced recurrent headaches with nausea and vomiting that suggested tumor progression. Increased enhancement and minor increase size were noted on MRI. Nextgen sequencing on the original biopsy revealed a BRAF-V600E mutation. The patient was started on Vemurafenib 550 mg/m2/dose orally BID.

Results: Symptoms resolved 1 month after starting treatment and after another month MRI showed decreased enhancement and stable tumor size. Toxicity was tolerated for 5 months before she developed optic neuritis. Blurred vision is a reported toxicity; however, optic neuritis is not.

Conclusion: Ganglioglioma with BRAF-V600E mutation had prompt response to Vemurafenib. Targeted therapy is more tolerated but not risk free. Continued tumor regression in our patient can solidify the role of Vemurafenib in pediatric cerebellar gangliogliomas but further studies are needed.

School: School of Medicine | Campus: Lubbock

MS1-2 ALHAJ SALEH, ADEL

Safety Of Over Sewing The Reinforced Staple Line Vs Reinforced Stapler Only In Sleeve Gastrectomy; Comparing Two Surgeons' Techniques In A Single Institution

Adel Alhaj Saleh, MD; Michelle Estrada, MD; Grant Sorensen, PhD;Amir H Aryaie, MD

Background: In sleeve gastrectomy (SG) only reports comparing over sewing the staple line versus stapler only are available in the literature. No data comparing reinforced stapler only vs. over sewing a reinforced staple line is yet available. To determine whether over sewing the reinforced staple line would minimize unfavorable outcomes in 30-day after SG.

Methods: We analyzed the data of SG patients performed by 2 bariatric surgeons in our institution. Surgeon A only used reinforced stapler while Surgeon B added over sewing to the reinforced staple line. Outcomes compared included, readmission, reoperation, leak and bleeding. Univariate analysis, was done. T-test and Chi square were used for comparing continuous and categorical variables respectively and Fischer's exact test for significance, P value < 0.05 was considered significant

Results: Ninety two patients underwent SG, between 2016 and 2018 were identified. Twenty seven cases performed by Surgeon A vs. 65 by Surgeon B. Demographics, comorbidities, and other variables were comparable between the 2 groups. (Table 1). No statistical difference in the compared outcomes in both groups. (Tables 1-2). However Surgeon B has 1 case of mortality, 7 cases of readmission for different reasons, 4 cases of leak, 1 case of bleeding, and 4 cases of reoperation.

Conclusions: Although there was no statistical significance in all the variables compared between the 2 groups, a trend toward higher rate of complications was noted with over sewing the reinforced staple line, hence it did not prevent the occurrence of bleeding or leak after SG.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

MS1-2 ALMEIDA, MICAH

Evaluating the Effectiveness of Interprofessional Education on First-Year Medical Student Learning Outcomes

Daniel R. Webster, PhD, Micah Almeida, R. Lisa Popp, PhD, Tammy Carter, PhD

A one-month study was conducted between students at Texas Tech University Health Sciences Center School of Medicine (TTUHSC SOM) following an Interprofessional Education (IPE) event with the TTUHSC School of Health Professions. The purpose of this study was to compare the learning outcomes of first-year medical students that participate in experiential versus self-directed learning groups. A pre-quiz was administered to both learning groups. The pre-quiz consisted of questions on standard clinical laboratory science diagnostic testing. Following the pre-quiz, both groups were provided with a clinical case study. Students were given a survey to select the preliminary diagnosis and laboratory tests to order based on the information gathered from the case study. Students in the experiential group then rotated through stations on several disciplines of laboratory testing led by TTUHSC Clinical Laboratory Science students. Students in the self-directed group researched clinical diagnostic testing independently. This was followed by a post-quiz and a survey to select the final diagnosis and laboratory tests to order. Afterwards, students were given the correct diagnosis and explanation of the most effective laboratory tests to order. Students were not given the answers to the pre-quiz nor were they given the answers to the post-quiz. One week later, a second post quiz containing sentinel questions from the original post-quiz was issued to the both groups. Students were given a third post-quiz two weeks after the second post quiz was administered. The data gathered from the quizzes during the study will be analyzed to determine the effectiveness of experiential learning in comparison to self-directed learning outcomes.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

MS1-2 AMAKIRI, NNANA

Amyloid Beta and MicroRNAs in Alzheimer's Disease

Nnana Amakiri, Aaron Kubosumi, James Tran, and P. Hemachandra Reddy

Alzheimer's disease (AD) is a progressive multifactorial neurodegenerative form of dementia. Due to the progressive degeneracy of the brain seen in this disease, AD is characterized by memory loss, numerous cognitive impairments, and changes in personality, thought, and behavior. Early on, AD has a substantial impact on one's daily routine by affecting areas of the brain that control memory, executive cognition and visuospatial awareness. Personality, behavior, and language impairments tend to occur much later in the progression of AD.

AD is recognized as a disease especially prevalent in the elderly. Due to advances in healthcare the average lifespan of human beings has rapidly increased. As a result, AD's impact on our world today is also increasing. Due to this growing aging population, AD has become a major public health concern, with global costs in 2018 estimated at around $1 trillion. Unfortunately, there is a lack of effective prevention methods and no cure to combat this growing health concern. Because of its growing worldwide medical and financial burden it,Äôs important to understand the different ways AD presents itself, the disease at the molecular level, and the modifiable and non-modifiable factors contributing to the characteristic features of AD. Currently, there are no early detectable biomarkers and drugs that can delay and/or prevent disease process.

The purpose of this research is to highlight recent developments in AD, including 1) amyloid beta (AŒ≤) toxicity, 2) abnormal APP processing, 3) discovery of microRNAs & miRNAs biogenesis, and 4) involvement of miRNAs in aging and AD, particularly with abnormal APP processing and AŒ≤ formation. This poster also summarizes miRNAs as potential biomarkers for AD.

School: School of Medicine | Campus: Lubbock

MS1-2 ANDERSON, BRITTANY

Trends In LGTBI Education

Brittany Anderson

Lesbian, gay, bisexual, transgender, and intersex (LGBTI) issues are on the rise across the United States permeating every area including healthcare. This group faces disparities in healthcare and barriers to access including, but not limited to, lack of knowledge on the part of providers and lack in undergraduate medical education. A study showed medical schools devote a median of 5 hours to the education on the care of LGBTI people and transgender related issues were the least likely to be taught. Since, the Association of American Medical Colleges has made attempts to improve education on LGBTI but studies indicate that this group continues to have difficulty accessing treatment by well-informed providers. Many health care professionals are unsure of how to appropriately communicate (i.e. inclusive terminology, appropriate pronouns) and provide desired medical interventions. This is likely due to several causes including lack of provider education during residency, lack of faculty who are comfortable and willing to teach LGBTI issues, and lack of perceived need to offer education on this topic. As society has become more accepting of the LGBTI community, the expectations regarding health care has equally increased. In order to examine the disparities in physician knowledge and concerns in the medical process involved in gender reassignment we will develop a pro and con discussion. From this discussion we hope to draw attention to the needs of educating our students, residents, and attending physicians to the LGBTI community. A national survey of respective groups (Undergraduate and Graduate Medical Education) is being planned.

School: School of Medicine | Campus: Lubbock

MS1-2 BIHARI, SANYUKTA

Sm-p80-specific antibodies play significant role in protection against Schistosoma mansoni challenge infection in mice

Sanyukta Bihari, Adebayo J. Molehin, Afzal A. Siddiqui

Schistosomiasis, a disease caused by parasitic helminths belonging to the genus Schistosoma, currently affects over 240 million people worldwide with the majority being school-aged children. The effect of schistosomiasis control programs predicated on mass administration of praziquantel have been suboptimal due to lack of sustainability, inadequate coverage and unabated re-infection rates. Therefore, there is an urgent need for the development of an effective schistosomiasis vaccine. The general consensus in the field is that progress towards schistosomiasis elimination will only be achieved via integrated control measures with an effective vaccine serving as a fulcrum. Several vaccine efficacy studies by our group have demonstrated that the large subunit of Schistosoma mansoni calpain, Sm-p80, conferred immune protection against S. mansoni infections in rodents and non-human primate model of infection and disease. Mixed Th1/Th2 immune responses in immunized animals have been implicated in vaccine-mediated immunity. However, the mechanisms involved in Sm-p80-mediated immune protection are poorly understood. In this study, we evaluated the role(s) of passively-transferred Sm-p80-specific antibodies in protection against S. mansoni infections in C57BL/6J female mice. The mice passively-transferred with Sm-p80-specific antibodies had a significant worm burden reduction of 53.7% ($p=0.034$) at necropsy when compared to their control counterparts. We also observed moderate reduction in liver egg burden (36%) and intestine egg burden (10%) indicating an anti-pathology efficacy role for Sm-p80-specific antibodies. Cytokine expression profiling as determined by qRT-PCR showed an upregulation of Th2-specific cytokines, such as IL-4, IL-5 and IL-10 in experimental mice. Cumulatively, our study showed that Sm-p80-specific antibodies play significant role in schistosomes parasite killing and that the protection observed may be associated with the elevated levels of Th2 cytokines.

School: School of Medicine | Campus: Lubbock

MS1-2 BOLTON, COY

Ion selectivity and stoichiometry of the a H-K-ATPase

Coy Bolton, Dylan J Meyer, and Pablo Artigas

The non-gastric H-K ATPase (ngHKA) is the closest relative of the Na-K ATPase (NKA), although the function of the ngHKA is comparatively much less understood. A testament to the close homology of these two pumps, the catalytic Œ± subunit of ngHKA readily associates with the NKA √ü1 subunit to form a functional, HKA that can be inhibited by high concentrations of ouabain, an NKA inhibitor. Despite this close structural similarity, the two pumps each transport distinct ion types. The ngHKA functions to export H+ and import K+ ions, in an electroneutral manner, within the distal colon and collecting duct of the nephron. It is currently thought that the ngHKA helps to facilitate K+ reabsorption in the kidney, and its expression is in fact upregulated in hypokalemic states. The ngHKA is also expressed in the choroid plexus and skin. Attempts to categorize the physiological role of the ngHKA are complicated by the fact that several studies demonstrate it to be capable of exporting Na+ ions. In order to elucidate on some of the unknowns surrounding the ngHKA pump, two electrode-voltage clamp electrophysiology of Xenopus laevis oocytes was utilized as a means to study its ion selectivity and kinetics. Experimentation controlling for extracellular ion concentration demonstrated that, although the overall function of ngHKA is electroneutral, this protein has ouabain-sensitive electrogenic reactions dependent upon varying levels of extracellular Na+, K+, and H+. To explore the dependence of ngHKA cycle function on voltage-dependent partial reactions we began our studies with an electrogenic mutant (K793A) and moved to using the electroneutral wild type ng-HKA. Comparison between results with K793A and wild type contribute to understanding the determinants of ion selectivity and stoichiometry of ngHKA.

School: School of Medicine | Campus: Lubbock

MS1-2 BOYLAN, KATHRYN

Knowledge and Attitudes of Medical students about the HPV Vaccine

Dr. Fatma Levent, Kathryn Boylan MS2

Human Papilloma Virus is an STD that causes genital cancer. The preventative vaccine has proven successful, but the rate for the HPV vaccination is low due to socioeconomic status, race, religion, and beliefs. A physician's attitude about the vaccine also plays a major role in how patients and/or parents view the vaccination. A survey was created using Google Forms and e-mailed to first through fourth year medical students. Beliefs regarding the vaccine were surveyed, and the results were analyzed in a spreadsheet. Statistics were used to summarize the attitudes about the vaccine. The data was further analyzed for association between attitudes and beliefs with respect to whether the subject has children, his or her year in school, and specialty of interest. Of the 192 student responses, 97.4% believe that healthcare providers should recommend the HPV vaccine to their patients, and that both boys and girls should receive the vaccine. 61.5% of students believe that if a healthcare provider recommends the HPV vaccine, the patient is more likely to receive the vaccine. 83.3% of students are likely to recommend the vaccine to their current/future patients. 11% of students are uncomfortable discussing the HPV vaccination with future patients and their parents. 31.3% of students who do not support the HPV vaccine believe that it will encourage patients to start having sex earlier. 86.4% of students believe that the main barrier to vaccination is parental reluctance to discuss issues about sexuality and sexually transmitted infections. Out of the students surveyed, 49.5% have personally completed the vaccination process. 27.6% of students are married, and 13% have children. 4.7% of students have an interest in Internal Medicine, and 4.2% show an interest in OB/GYN. TTUHSC medical students support the administration of the HPV vaccine, and believe that a physician's attitude regarding the vaccine can impact patient compliance.

School: School of Medicine | Campus: Lubbock

MS1-2 BUNCH, JAMES

Efficacy of Clinical Skills Education For First-Year Medical Students Using Simulated Emergency Department Patient Encounters

James Bunch, Thomas Pressley, Daniel Webster, Gregory L Brower

The field of medical education is constantly evolving based on assessment of the effectiveness of emerging educational methods. One potential avenue for improving medical education is improving clinical reasoning through early clinical exposure. Early clinical exposure has been linked to improved performance in the third and fourth years of medical school, as well as improved attitudes toward medical education, and additionally has the potential to improve retention of important physiological concepts in undergraduate medical education. First-year medical students at TTUHSC SOM participate in Emergency Department (ED) Simulations during the Major Organ Systems (Systems Physiology) block, and again in the second year as part of the Systems Disorders block, with the goal of improving retention of clinical pathophysiology and quality of diagnostic reasoning. In a preliminary study we endeavored within Institutional guidelines to improve the quality of early clinical exposure, and in a second phase further refined the metrics used to gauge student success. Student performance was assessed by a pre- and post-test focused on clinical management of emergent disease and evaluation of clinical write-ups (i.e., SOAP notes) documenting the simulated patient encounters. Student performance on the post-test was significantly higher ($p<0.05$) than achieved on the pre-test for the material covered during the course. However, no improvement was seen on concepts which were not covered either in class or by a simulation during the course. These findings suggest that participating in ED simulations contributed to improved diagnostic reasoning skills and retention of clinical knowledge in first-year medical students at our Institution. Positive student feedback also indicated a perceived value to the simulated patient encounters and points to the efficacy of integrating exposure to clinical pathology and diagnostic imaging at an earlier point in the undergraduate medical curriculum.

School: School of Medicine | Campus: Lubbock

MS1-2 BURDEN, RYAN

Using a Retrospective Approach to Maximize Integration of Healthcare Measures and Compliance Standards within the TTUHSC Correctional Managed Health Care Program

Ryan Burden

OBJECTIVES This project sought to create and implement a more effective data integration network by retroactively evaluating data metrics currently in use within the TTUHSC Managed Health Care program.

BACKGROUND TTUHSC Correctional Managed Health Care program is responsible for the health care of a significant portion of the offender population throughout the West Texas sector. Effective communication and accurate reporting of health information is of critical importance and can directly affect the overall outcome of patient health management. Negative factors such as barriers to information access and inconsistent reporting have made the accurate sharing of information between the many health care sites challenging and untimely.

AIM The aim of this project was to help enhance correctional health's ability to access, analyze, and distribute meaningful and decisive data. The purpose was to make meaningful data more transparent and easily accessible, thereby leading to more effective sharing of information and resource allocation.

METHODS Preliminary data from individual units making up the TTUHSC Correctional Managed Health Care program were retroactively obtained from monthly scorecards. These scorecards were used as benchmarks set of data to which we compared resulting levels of compliance before and after the implementation of a centralized data interface. We hypothesized that once the centralized data interface was created and then implemented, we would see the compliance rates increase for each specific metric at each individual correctional unit.

RESULTS/CONCLUSIONS Preliminary modifications within the TTUHSC Managed Health Care program using a hybrid form of integrated data sets have shown to be more promising at delivering effective and timely data. It can be reasonably concluded that future integration of both retrospective and prospective analysis would lead to managed care systems that are more effective at providing healthcare and meeting set standards.

School: School of Medicine | Campus: Lubbock

MS1-2 CAO, GEORGE

Improving Outcomes for Lower Extremity Joint Replacement Patients Through Fracture Care Pathways and Medical Informatics

George Cao

Lower extremity joint replacements (LEJR) are the most common inpatient surgical replacements for Medicare beneficiaries and are a potential area for standardization to improve patient outcomes and reduce healthcare costs. Only four years ago, according to the Centers for Medicare & Medicaid Services (CMS), knee and hip surgeries amounted to over 400,000 procedures, resulting in a cost over $7 billion in hospitalizations. Even though these surgeries amount to over a quarter of all fracture-related surgeries performed, the quality of care and recovery length lack standardization and vary greatly among hospitals as well as providers. For major hospitals, CMS mandated implementation of the Comprehensive Care for Joint Replacement Model (CJR) to mend the issues between the quality of care and the need to standardize it. Through regional performance metrics, CJR has incentivized the standardization of patient outcomes and hospital performance for problem areas in LEJR care. Furthermore, healthcare systems have realized that utilization of medical informatics and care pathways enable their systems to meet these new stringent standards. Our department used medical informatics to identify potential problem areas. Additionally, we created a best practice hip fracture pathway to serve as the model for protocol creation in regional hospitals of the St. Joseph Healthcare System.

School: School of Medicine | Campus: Lubbock

MS1-2 CASTANEDA, KAREN

Breast-Conserving Surgery in Male Breast Cancer Becoming More Frequent in the United States

Yana Puckett, MD, MBA, MPH, MS; Karen Castaneda; Theophilus Pham; Catherine A. Ronaghan, FACS

Background: Male breast cancer (MBC) is a rare disease, comprising only 1% of all incidents of breast cancer diagnosed in the United States. Most of the treatment strategies for male breast cancer are based on the studies of female breast cancer and modified radical mastectomy (MRM) remains the standard of care for virtually all the MBC cases. Breast-conserving surgery (BCS) in MBC has been coming to the forefront as a reasonable treatment option. We elected to compare surgical outcomes between BCS and MRM in male breast cancer.

Methodology: National Surgical Quality Improvement Program (NSQIP) database was analyzed for the year 2015. We reviewed all male breast surgical patients. Mastectomy for gynecomastia, simple mastectomy, and radical mastectomy was excluded from analysis. Partial mastectomy (with and without) axillary lymph node biopsy were compared to MRM. Chi-square and independent t-tests were used to compare the two variables for demographics, comorbidities, postoperative complications.

Results: A total of 175 patients underwent breast surgery for MBC in 2015. BCS was performed on 101 males (57.7%) and MRM was performed on 74 (42.29%). Patients that underwent MRM were older than the patients that underwent BCS (57 versus 66 years, respectively) ($P<0.0001$). Comorbidities were overall similar in both groups. Postoperative complications were overall not statistically different. Patients that underwent BS had shorter length of hospital stays ($P<0.0001$) and were more likely to have been operated on under MAC or IV sedation (14.85% vs 0%) ($P<0.0001$).

Conclusion: BCS in male breast cancer is frequently performed in the United States with similar surgical outcomes and shorter length of stay as MRM.

School: School of Medicine | Campus: Lubbock

MS1-2 DHARMARPANDI, GNANASHREE

Concussion Experience of Medical Students and Residents

Gnanashree Dharmarpandi, B.S., Jennifer Mitchell, M.D., Kelly Mitchell, M.D., TTUHSC

Mild traumatic brain injuries that appear innocuous on diagnostic tests may have neurologic manifestations that affect daily functioning. According to research conducted in the past year regarding return to work outcomes, there is a significant portion of individuals affected with mTBIs with post-concussion syndrome, which involves persistent physical, cognitive and emotional symptoms. This phenomenon greatly affects productivity and quality of life and research into patterns of occurrence and optimal recovery times would contribute to developing better protocols for managing cases of this nature. The purpose of this study is to determine the effect of mild traumatic brain injury (mTBI) on the health outcomes and return to work considerations of medical students and residents. The research will involve a survey of residents and students affiliated with Texas Tech University Health Sciences Center (TTUHSC) who have experienced concussions in the past year. This case series will involve chart review and patient interview to determine the nature of the incident, the care they have received, and the effect of the injury on their work and education. The data collection for this research project is still underway.

School: School of Medicine | Campus: Lubbock

MS1-2 DHIR, NIKITA

Medical versus Surgical Therapies for Pump Thrombosis: Mortality Assessed by Meta-Analysis

Nikita Dhir, Dr. Nandini Nair

Purpose: Thrombus formation is the most feared complication that impact clinical outcome in ventricular assist device patients. This study is a meta-analysis which compares mortality in medical versus surgical therapies for pump thrombosis.

Methods: Records were identified using PRISMA guidelines for literature search (PubMed, Google Scholar). Subjects >age18, supported on a continuous flow device who experienced a pump thrombosis event at least once were included. Subjects <18 and supported on pulsatile pumps were excluded. Risk of bias was assessed using the Newcastle -Ottawa scale. Statistical analysis was performed on Stata 13.1 for Mac (StataCorp., College Station, TX). Freeman-Tukey double arcsine transformed proportions were calculated to stabilize variances and avoid estimates out of the 0 to 1 range Publication bias was assessed by Begg and Mazumdar test and Egger regression test.

Results: 70 records were identified from 2002 to 2016 and 15 were selected for analyses. We extracted 29 groups (n=405), 14 were classified as medical treatments and 15 as surgical. Of these, 6 medical treatments used TPA, 8 non-TPA treatment, 7 performed surgical treatment, and 8 reported crossover medical to surgical treatment. No significant bias was noted in medical (Egger's test bias = 0.63, p = 0.201; Begg-Mazumdar Kendall's tau=12, p= 0.542) or surgical studies (Egger's test bias =-0.20, p = 0.522; Begg-Mazumdar Kendall's tau=-11, p= 0.621). Both medical (I^2= 84.25%, p<0.01) and surgical (I^2= 60.4%, p<0.01) studies showed significant heterogeneity. (Figure1) The test for heterogeneity between sub-groups did not find statistically significant differences (I^2 = 0.67%, p=0.41). No differences in mortality were noted between medical and surgical treatments.

Conclusion: The lack of differences noted in mortality may be due to sample size and heterogeneity in the protocols used. This is an important observation that needs further investigation in larger prospective studies.

School: School of Medicine | Campus: Lubbock

MS1-2 DIAZ, RONY

The use of an online interactive module to review topics of diabetes for the United States Medical Licensing Examination (USMLE) Step 1

Rony Diaz, Jannette Dufour, Ph.D., Lillian Ene

Diabetes is becoming a common health issue in the United States. Due to its familiarity in clinical medicine, topics about this disease are commonly covered in first-year medical courses and are tested in the United States Medical Licensing Examination (USMLE) Step 1, which is taken during the second year of medical school. Medical students cover the basic concepts of this disease about a year before they take their USMLE exam and risk the possibility of forgetting key general principles. At the Texas Tech University Health Sciences Center (TTUHSC), interactive online modules have been effective resources for students to get a more detailed understanding of various topics in medicine. Based on these observations, we hypothesize that by providing these as review modules they will help medical students understand the topics associated with diabetes for their success in the tested material on board exams, and to provide a better understanding of this disease in clinical medicine. The module will utilize PowerPoint 2013 and the interactive e-learning tools of Adobe Captivate 8. The online interactive module will provide a single source with high-yield information on the medical topics of the pancreas and diabetes that include, but are not limited to the basic anatomy, physiology, and pathology of the disease. The review module can be completed at the student's own pace, with the option to navigate through the different sections to guarantee full comprehension of the material. The effectiveness of the project will be measured through short assessments that medical students will take before and after completion of different sections in the module. The module will also include clinical vignette-style practice question that will assimilate questions on the USMLE to provoke critical thinking of the content covered. The goal is to have this module available to medical students during year 1 and the next academic year to use in their preparation for their board exam.

School: Graduate School of Biomedical Sciences| Campus: Lubbock

MS1-2 DOMINGO-JOHNSON, E.L.

Peripheral Nerve repair with Nerve Allograft versus Synthetic Conduits and Nerve Autografts.

E.L. Domingo-Johnson, Desirae Mckee MD

Introduction: There are three main methods used to repair injured nerves. Autografts are harvested directly from another location on the patient. The tissue is patient specific, is comprised of nerve cells, and readily accessible. However, the patient would be losing nervous tissue from the donor site and will also need to heal the area. Nerve conduits are made of synthetic materials and used to promote healthy nerve regeneration. There are limitations to the type and size of injuries that nerve conduits can be used for. Nerve allografts provide a readily available option. It is composed of decellularized and cleansed extracellular matrix recovered from human donor peripheral nerve tissue. It provides the tissue specific benefits of an autograft with the availability of nerve conduits. In addition, the patient is spared from having to act as a self-donor.

Methods: In this retrospective and prospective cohort series, we identified patients who underwent peripheral nerve repair by two fellowship trained surgeons at our institution. Comparisons were made between the groups with respect to demographic data, comorbidities, complication and reoperation rates, length of injury and follow up outcomes.

Keywords: Nerve Allograft, Nerve Conduit, Nerve Autograft, Nerve repair

School: School of Medicine | Campus: Lubbock

MS1-2 D'SOUZA, PRESTON

Assessing the Activity of CRF Neurons in the Central Amygdala Following Application of Kappa Opioid Receptor Agonist: A Novel Network in Pain Relief

Preston D'Souza, Takaki Kiritoshi, Vadim Yakhnitsa, Volker Neugebauer

Chronic pain is a major health care issue with limited treatment options outside of prescribing opioids. Our previous work on pain mechanisms has identified the amygdala, a limbic brain region known for its role in emotions and memory, as a key player in emotional-affective aspects of pain and pain modulation. Specifically, the main output region of the amygdala (central nucleus, CeA) has been linked to the processing of nociceptive information and to pain behaviors through numerous interneuron networks including cells like corticotropin-releasing factor (CRF) neurons. Recent evidence suggests that activation of kappa-opioid receptors (KOR), Gi coupled metabotropic receptors, has opposing effects to mu-opioid receptor agonists, such as morphine, on CeA output. Thus, a KOR antagonist could potentially mitigate pain. This study tested the effects of a KOR agonist (U-69,593) on CeA output neurons, specifically CRF cells, using in-vitro calcium imaging.

A genetically encoded calcium indicator (GCaMP6f) was injected stereotaxically into the right CeA of transgenic CRF-Cre rats. After 4-6-weeks to allow sufficient time for expression, brain slices containing the amygdala were obtained and CRF cells were visualized with multiphoton microscopy. Trains of electrical stimuli (5Hz) were delivered to the dorsomedial fiber tract providing nociceptive input from the parabrachial nucleus (PB) to the CeA. Calcium signals were measured in CRF neurons continuously before, during and after agonist perfusion. We found that CRF neurons displayed synaptically-evoked activity following PB stimulation. Synaptically evoked activity increased during agonist perfusion.

These findings support the novel concept that KOR in the amygdala contribute to pain amplification and open an avenue for KOR antagonists as novel pharmaceuticals to mitigate pain.

School: School of Medicine | Campus: Lubbock

MS1-2 EDWARDS, SAMANTHA

Internal Medicine Weight Based Demographics

Dr. Drew Payne, Dr. Marcella Rivas, Samantha Edwards, Sharan Bijlani, Hannah Fairley, Nathan Lloyd

Obesity is a contributing factor to many disease processes and continues to rise nationwide. The aim of this study was to estimate frequency and prevalence of obesity and its association with congestive heart failure, diabetes mellitus, obstructive sleep apnea, hypertension, and myocardial infarction in West Texas adults. Data were extracted from Texas Tech HSC internal medicine clinic from January 1st, 2016 through March 31st, 2018 (n= 9,528). Average levels of income based on zip code were also extrapolated. We found statistically significant differences ($p<0.001$) in all variables except MI ($p=0.055$) and ethnicity ($p=0.054$). We observed lower prevalence in our sample of any degree of obesity in males compared to females (43.8% vs. 48.6%), and particularly in the highest degree of obesity (20.1% vs. 27.4%). Male gender was slightly associated with lower weight, OR=0.92 (95% CI: 0.85,Äì0.99). Similarly, younger age (OR=0.96, 95% CI: 0.94,Äì0.98) and higher income level of residency area (OR=0.96, 95% CI: 0.94,Äì0.98) were found to have unadjusted very small protective effect on heavier weight status. Among health status predictors, we found that OSA (OR=4.56, 95% CI: 4.02,Äì5.17) was largely associated to heavier weight status. Diabetes (OR=2.01, 95% CI: 1.86,Äì2.17), HTN (OR=1.88, 95% CI: 1.73,Äì2.03), and HLD (OR=1.56, 95% CI: 1.44,Äì1.68) also showed a small effect-size association with heavier weight status. The effect size of CAD (OR=1.11, 95% CI: 1.01,Äì1.22) was small, and MI did not show any association with weight status. The frequency and prevalence of obesity continues to increase in West Texas adults. Comorbidities with significant morbidity and mortality are linked to obesity. Income is a protective characteristic and likely allows access to more effective preventive interventions. Access to these preventive interventions are needed to slow the rising prevalence of obesity and its comorbidities.

School: School of Medicine | Campus: Lubbock

MS1-2 ESLINGER, CODY

Alternate telomere lengthening (ALT) cancers are a cross-disease discrete molecular phenotype with high intrinsic resistance to DNA damaging agents that may be reversible by ATM kinase inhibitors.

Cody Eslinger, Balakrishna Koneru, Shawn Macha, Austin Turner, Mikal Ramon

In order to maintain proliferation, cells require the ends of chromosomal DNA to be lengthened to avoid degradation. Stem cells as well as many cancers use an enzyme known as telomerase to ensure indefinite growth. However, some cancers use a non-telomerase mediated telomere lengthening mechanism known as ALT. The mechanism behind ALT activation in cancer cells is not well understood, although it is thought to be homologous recombination mediated. In normal cells and cancer cells that maintain telomeres, DNA damage induces ATR or ATM kinases to repair single or double stranded breaks, respectively. Previous studies have indicated that ALT+ cells, which dysfunctional telomeres which are detected by the cells as intrinsic DNA damage which drives the ALT phenotype by activation of DNA repair pathways. Using a novel specific marker for ALT (C-circles) our lab has recently identified ALT patient-derived cell lines and xenografts from a variety of cancer types, including neuroblastoma, osteosarcoma, rhabdomyosarcoma, lymphoma, and leiomyosarcoma. Using these preclinical models, we have shown that cell lines from ALT cancers manifest resistance to single agent ATR/ATM inhibition as well as to standard chemotherapy. However, small molecule ATM kinase inhibitors reverse resistance to DNA-damaging chemotherapy in ALT+ cancer cell lines. We have shown that the C-circle assay can specifically detect ALT cancers in patient tumor samples. Thus, ALT cancers are a discrete molecular phenotype of cancer that spans many traditional histological cancer types and may be especially susceptible to use of ATM kinase inhibitors for reversing drug and radiation resistance that is a hallmark of ALT+ cancers.

School: School of Medicine | Campus: Lubbock

MS1-2 ESPINOSA-TELLO, ALEJANDRO

STAT3: protein-protein interactions on ribosome

Alejandro Espinosa-Tello, Alexander Ha, Elena Tikhonova, Andrey Karamyshev

Cancer is the second leading cause of death in the US. Development of new approaches for cancer treatments is a high priority. It has been found that cancer is linked to expression of the STAT3 gene (Signal Transducer and Activator of Transcription 3). Abnormal upregulation of STAT3 is associated with uncontrolled cell growth, cancer progression and linked to 70% of tumors. It was demonstrated that STAT3 knockdown reduced abnormal cell growth, decreased tumor progression in mice and induced apoptosis of cancer cells thus making STAT3 a potential target. However, recent studies had shown that direct inhibitors of STAT3 activity did not work for cancer treatment. New strategies addressing biogenesis of STAT3 are needed.

In this project we are studying the early events of STAT3 translation and protein-protein interactions on ribosomes. Our work focuses on detection of cotranslational STAT3 interactions, identification of its interacting partners and verification of role of these interactions. To study protein interactions, we developed a system for in vitro translation of STAT3 protein. We used three different sources of ribosome and found that the Rabbit Reticulocyte Lysate system provided the best expression. Next, photocrosslinking was used to visualize protein-protein interactions. Specific amber mutations were introduced into STAT3 to direct incorporation of a Lysine tRNA with a covalently attached photocrosslinking probe. At different stages of translation newly synthesized STAT3 can interact with different binding partners therefore we introduced amber mutations at different positions. Our results showed that this approach allowed detection of STAT3 interactions on ribosome. Furthermore, we observed various protein complex profiles at different stages of STAT3 translation, suggesting that multiple proteins are interacting with STAT3 during synthesis. The future direction will include identification of these protein partners and elucidating their role as po

School: School of Medicine | Campus: Lubbock

MS1-2 FOLEY, DAVID

Retrospective radiographic bilateral comparison of index to middle finger ratios (2D:3D) in adults.

David Foley, MBA, MSIII; Allison Gracey, BA/BS, MSIII; Cameron Cox, BA; Brendan Mackay, MD, Faculty

Introduction: The primary aim of the study is to quantify the degree of left-right symmetry between the 2D:3D metacarpal (MC) ratios. This information will determine the utility of the contralateral hand as a control in surgical interventions of the MCs and further understanding of hand morphology.

School: School of Medicine | Campus: Lubbock

MS1-2 FROST, JOSHUA

Possible Clinical Implications of Peripheral Zone Changes Depending on Prostate Size

Joshua Frost, Werner de Riese, Lisa Smith

Numerous studies have observed an inverse relationship between the extent of Benign Prostate Hypertrophy (BPH) and the incidence of prostate cancer (PCa). Despite this relationship being well documented within the literature, only few studies have explored specific mechanisms by which BPH and PCa may affect one another. One possibility has been brought up that growth in the transition zone due to BPH may cause pressure induced changes in the peripheral zone triggering fibrotic changes and causing gland atrophy within the peripheral zone, an area where 80% of cancer occurs. To shed more light on this phenomenon we studied the quantitative and qualitative histo-antomical changes that occur in the peripheral zone associated with BPH.

39 patients with small, medium, and large prostates were selected who had undergone radical prostatectomies between 2008 and 2016. The dorsal aspect of the peripheral zone of each prostate was examined in the 4:00, 6:00, and 8:00 positions of the two slices that represented the most equatorial areas of the prostate. At each location, changes in the peripheral zone were recorded by measuring the thickness of the capsule (peripheral fibrotic layer) and the extent of gland atrophy.

Results from the study revealed two major findings. First, multiple regression analysis demonstrated a strong, positive relationship between prostate size and average capsule thickness with a Pearson coefficient of .71, (p .05). Second, the extent of fibrotic material was spatially associated with changes of the glands within the peripheral zone. Unlike the round, full glands found in normal areas of the peripheral zone, glands surrounded by fibrosis were elongated and atrophied.

The results indicate that BPH may cause significant changes of the glands in the peripheral zone, the area where most prostate cancers develop. These changes with atrophy of the glands could potentially explain the inverse association of BPH and the incidence of prostate cancer.

School: School of Medicine | Campus: Lubbock

MS1-2 GEORGE, ASHER

The Public Health Impact of Stigma on the Current Opioid Crisis

Asher K. George & Jeff Dennis, PhD

Background: Opioid use in the United States has increased substantially in recent decades due to a combination of the availability of both prescription opioid pain medication and black tar heroin. It is widely recognized that these two sources, broadly defined, have had an enormous impact on the growth of the current opioid epidemic. A distinguishing feature of this epidemic from most substance use disorders is that many cases of opioid dependence originate with a doctor's prescription. Therefore, a greater understanding of the stigma surrounding addiction from iatrogenic origins is needed. In the case of opioids, misrepresentations of research findings have also played a substantial role in their proliferation. Relating to the stigma of specific addictions, some clinical professionals and organizations have advocated for an adjustment of the language used to discuss addiction and treatment. To play a meaningful role in addressing the opioid epidemic, public health must promote an accurate representation of research findings and also use the most up-to-date terminologies surrounding addiction.

Aims: This study considers the theoretical underpinnings of stigma relating to opioids and follows with an exploration of how opioid use is described in public health discourse.

Data & Methods: We analyze five years of articles from the American Journal of Public Health (AJPH), the flagship journal in public health. We identify the number of articles using terms such as "opioid use" and "opioid abuse" to find out how well research terminologies have kept up with public health discourse on the opioid epidemic.

Results: Preliminary results suggest that the AJPH follows terminology standards for the term "substance use disorder" in most cases, although the term "substance abuse" remains prevalent in recent years. Public health research and practice should work to maintain currency with terminologies associated with clinical best practices in the study of addiction and treatment.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

MS1-2 GOTTAM, BHARGAVESH

Mysterious identity: The CD206+ population in surviving allogeneic Sertoli cell grafts is neither macrophages nor dendritic cells

Bhargavesh Gottam, Kandis Wright and Jannette Dufour

Sertoli cells (SCs) are immune privileged cells in the testis that protect germ cells. Interestingly, SCs survive long-term post-allotransplantation (transplantation between the same species) without immunosuppressive therapy. However, current human transplantation recipients require life-long immune suppressive therapy to prevent tissue rejection with varying success. Therefore, by understanding the mechanisms by which SCs evade immune rejection, methods to improve human transplantation survival requiring little to no immunosuppressive drugs can be developed. Either primary SCs (pSCs) or mouse SC line (MSC-1) cells were transplanted underneath the kidney capsules of mice. The grafts were collected between days 1-20 post-allotransplantation and the immune cells present in the grafts were characterized. The grafts predominantly contained macrophages, which can be M1 (pro-inflammatory) or M2 (CD206+, F4/80+; anti-inflammatory). M2 macrophages were present throughout the surviving pSC compared to rejected MSC-1 cell control grafts. Interestingly, there were CD206+ cells in both grafts that were not macrophages. Since dendritic cells (DCs) express CD206 and are in the grafts, we further tried to identify if the CD206+ cells were DCs by immunohistochemistry. DCs (CD11c+) were seen in the middle of the pSC grafts at day 14 (D14) post-allotransplantation and at D14 and D20 in the MSC-1 grafts. CD206+ cells appeared near the edges of the grafts. Although there were CD11c+ CD206+ cells at D14 and D20 in both grafts, the majority of the CD206+ cells were not DCs. These data suggest that the role of macrophages, DCs, and other immune cells in the grafts is complex and requires further study. Future studies will identify CD206+ cells and characterize the DCs as mature, immature, or regulatory. Overall, if the mechanisms mediating SC survival post-allotransplantation become clearer, transplantation survival can be much improved without the use of immunosuppressive drugs

School: School of Medicine | Campus: Lubbock

MS1-2 GUERRERO, ANDRES

Auditory Cues as Reminders to Head Scan at Intersections: A Pilot Study

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Introduction: Driving is essential to patient autonomy. Recently, there has been an increase in the number of studies evaluating the effects of HH (Homonymous Hemianopia), on driving performance. In this study we investigate the ability of individuals to complete a full head scan during a driving simulation, differentiating between scenarios in which these participants were unrestricted in their field of vision or were simulated to have an HH.

Methods: We ran thirty-two (n=32) trials with individuals in whom we simulated HH. In each trial an auditory cue was randomized to come from either the left or right of the individual to instruct them to complete a full head scan once they reached an intersection. This was done to determine the parameters of a safe and functional auditory cue. Individuals,Äô pupils and head movements were tracked during simulations to accurately record head scan times. Each individual was subjected to four trials driving with: a normal field of vision in no-traffic conditions, a normal field of vision in traffic conditions, with simulated HH in no-traffic conditions, and with simulated HH in traffic conditions. Two sets of these trials were run with the cue given at 50m and 30m from the intersection.

Results: Reaction time across conditions was about 0.70s. The reaction time of individuals in no-traffic conditions regardless of field of vision was 0.71s, and those in traffic conditions regardless of field of vision was 0.67s. The reaction time of individuals with unrestricted field of vision regardless of traffic conditions was 0.64 s, and those with simulated HH regardless of traffic conditions was 0.74s. The reaction time of individuals given the cue at 50m was 0.70, and 0.68 for those given the cue at 30m.

Conclusion: The data demonstrate no significant difference in reaction times between any of the parameters tested, including traffic vs. no-traffic conditions, free vs. unrestricted field of vision, and a 50m vs. 30m intersection distance.

School: School of Medicine | Campus: Lubbock

MS1-2 HANSON, KEITH

Child Abuse and Deformational Plagiocephaly in a West Texas Hospital System

Keith Hanson, Preston D'Souza, Pranati Pillutla, Peyton Presto, Brandon McCarty, and Laszlo Nagy, MD

Intro: The aim of this study was to assess deformational plagiocephaly's (DP) predictive value in neglect and physical abuse (NAT) within the pediatric population. In addition, we sought to characterize the prevalence of DP and NAT for our hospital's mostly rural catchment area.

Methods: Data on hospitalized patients diagnosed with NAT and/or neglect between 2012-2018 was collected via retrospective chart review. All enrolled children were under the age of 4 years old at the time of diagnosis, and those without legible head CTs or MRIs during their initial hospitalization were excluded. Utilizing neuroimaging, we calculated the Cranial Vault Asymmetry Index (CVAI) and Cranial Index (CI) for each patient to assess for DP. Differences between the two groups were assessed using Wilcoxon rank sum test for continuous variables and Fisher's exact test for categorical variables. A p-value of 0.05 or less was considered statistically significant. All analyses were conducted using SAS 9.4 (Cary, NC, USA).

Results: The prevalence of DP within the combined cohort of NAT and Neglect patients is 21%, similar to that reported in the literature for the general population (20-50%). There was no significance between the prevalence of DP and a history of NAT ($p>0.1$) or Neglect ($p>0.1$). Furthermore, there was no correlation between CVAI index and characteristics of initial presentation or history of trauma for either NAT (p-value: 0.359 and 0.250 respectively) or Neglect groups (p-value: 0.116 and 0.770 respectively).

Conclusion: While there are many limitations to this study, our results suggest that abused children are no more likely to have history of DP than the general population, and the degree of DP is not associated with severity of trauma history or initial presentation. We hope the results of this study promote future investigations for unique and subtle predictive factors of child abuse/neglect.

School: School of Medicine | Campus: Lubbock

MS1-2 HELTON, TYLER

Lone Star Peripheral Arterial Disease Registry (For PAD-CLI Diagnosis, Treatment and Outcomes)

Tyler Helton, Rasikh Ajmal, Mohammad M. Ansari

Introduction: Peripheral artery disease (PAD) is a prevalent and under-diagnosed disease. The etiology of this disease consists of atherosclerosis in the vasculature of the extremities and can cause many symptoms ranging from mild claudication to ischemia, necrosis and subsequent limb amputation. The study of PAD is an important area of research in cardiology as there is relatively little information on the outcomes of PAD treatment. There are only two known registries, but no registries in West Texas region where the disease is almost an epidemic due to high incidence of risk factors like DM, HTN, HLD, CAD, and smoking history. Therefore, the focus of this project is to compile the Lonestar PAD Registry, a quality initiative. This registry will contribute to further research, quality improvement, and better metrics and guidelines when addressing PAD patients in West Texas.

Methods: For the purpose of our quality control initiative, data collection was collected in fields consisting of patient's co-morbidities, demographics, presence of symptoms, ulcers, gangrene, Rutherford classification, ultrasound use, access site location, vessel lesion location, balloon and stent type, length and diameter of the stent or balloon used, type of atherectomy device used, type of crosser that was used, access site closure device used, and patient presentation and outcomes. Follow up includes management of disease and incidence of amputation, myocardial infarction, stroke and death.

Conclusion: This registry will contribute to further research, quality improvement, and better metrics and guidelines when addressing PAD patients in West Texas. Data collection is still ongoing, and currently has over 1,000 interventional procedures compiled from 2013 to 2018. The registry will soon have 5 consecutive years of data to make comparisons, and understand the disease prevalence in our community for the very first time.

School: School of Medicine | Campus: Lubbock

MS1-2 HOPE, BRIANNA

Risk factors and associations with surgical site infections after cesarean sections at a local facility

Cornelia De Riese, MD, Gillian Graham, MD, Katie MacLeay, MS3, Brianna Hope, MS2

Cesarean sections are one of the most frequently performed major operations in the United States with a rate of 32.8% of all deliveries in 2010. Following UTIs, surgical site infections (SSI) are the second most common complication, occurring in 3-15% of cases, and can lead to severe complications including sepsis, necrotizing fasciitis, and death. SSI contributes to prolonged hospital stays and long-term disabilities, which are major contributors to economic burdens to patients and society. Several parameters have been discussed in the literature as possible associated factors, such as blood loss/transfusion, use or lack of antibiotic prophylaxis, duration of operation, type of anesthesia used, and co-morbidities of the patient. The goal of this study is to identify specific local risk factors that are contributing to our high wound infection rate. Secondary outcomes are to focus on which of these factors can be modifiable in order to decrease the incidence of post cesarean surgical site infections. In this study we performed a retrospective cohort chart review of 525 females age 12-45 years of age who underwent cesarean section at University Medical Center from January 1, 2017 to December 31, 2017. We reviewed corresponding clinical charts to extract parameters that could contribute to increased infection rates. Our results showed twenty (3.8%) out of 525 women presented with positive wound infection after C-section. We found significant differences between two groups for the following variables: diabetes ($p=0.013$), anesthesia ($p=0.032$), and wound class ($p<0.009$). While we cannot often control type of anesthesia used or blood loss in surgery depending on the circumstances, there are other factors that could possibly be modified to reduce the risk and incidence of post-cesarean wound infections such as BMI and optimization of diabetes that could potentially minimize the prevalence of SSIs.

School: School of Medicine | Campus: Lubbock

MS1-2 HSU, CHIA

Role of Advanced Neuroimaging in the Diagnosis of Parry Romberg Syndrome

Chia Hsu, BS; Roy Jacob, MD; Usiakimi Igbaseimokumo, MD

Parry-Romberg syndrome is a rare disease characterized by progressive facial hemiatrophy, skin changes, and associated with neurological symptoms such as seizures, migraines, and hemiplegia. It is a neurocutaneous disorder associated with a rare subtype of linear scleroderma called “en coupe de sabre”.

We report the case of a 16-year-old teenager who presented with headache and blurred vision in the left eye and dizziness. Clinical examination was unremarkable other than facial asymmetry. Lab workup was negative.

A brain MRI for headache evaluation demonstrated extensive white matter changes in the left cerebral hemisphere extending into the left basal ganglia, left midbrain, and the pons. Imaging findings were concerning for gliomatosis cerebri, a high grade brain tumor. Subsequently, repeat brain MRI with contrast, MRI perfusion, and diffusion tensor imaging were performed, as well as a facial CT.

Diffusion tensor imaging demonstrated asymmetrically decreased white matter tracts in the left cerebral hemisphere. MRI perfusion using dynamic susceptibility contrast technique demonstrated asymmetrically decreased cerebral blood flow ipsilaterally. MR spectroscopy demonstrated no abnormal metabolite spectrum. Hence, the imaging findings were not compatible with gliomatosis cerebri.

Subsequently, CT of the face demonstrated left hemifacial atrophy with asymmetric thinning of the calvarium as well as hypoplasia of the left hemimandible.

The constellation of findings was indicative of Parry Romberg syndrome. There is no specific test to diagnose this condition, making initial diagnosis difficult. Medications such as methotrexate, as well as phototherapy, have been tried for treatment. Plastic surgery has also been performed for the reconstruction of the hemifacial atrophy.

This case highlights the role of advanced neuroimaging, including MRI perfusion and diffusion tensor imaging, in the diagnosis of this rare entity and potentially other rare neurological diseases.

School: School of Medicine | Campus: Lubbock

MS1-2 HUSSAIN, SHABAB

Benefits of Cardiovascular Learning Modules for Major Organ Systems

Shabab Hussain and Dan Webster PhD

At Texas Tech University Health Sciences Center School of Medicine (TTUHSC SOM), online learning modules have found increasing popularity as a means of developing a better understanding of complex lecture concepts presented in Clinically Oriented Anatomy (COA) and Biology of Cells and Tissues (BCT). However, these first-year medical school courses rely more on memorization than on conceptual understanding, the latter of which is the primary focus of Major Organ Systems (MOS). Of the units presented in MOS, topics related to cardiovascular physiology seem to elude students as seen in past NBME performance and subjective evaluations. We attribute this performance deficit not only to the volume of information presented, but also to the difficulty of the engineering concepts that are integral to fully understanding cardiovascular physiology. In order to rectify these issues, 7 online interactive learning modules were designed to thoroughly explain important concepts presented in cardiovascular physiology. These modules differ from previous modules in that they rely on building and applying concepts rather than memorizing high-yield terms. In addition, these modules take the time to explain topics such as circuits and fluid dynamics that are not presented in class to provide better understanding. We hypothesize that introducing these online learning modules to the TTUHSC SOM Class of 2022 will increase student understanding of topics in cardiovascular physiology and increase their confidence in applying associated engineering concepts to new problems. In order to quantify this, we will collect pre-/post-test data to gauge any changes in performance and collect responses from a subjective survey evaluation at the end of the unit to evaluate student confidence and feedback to these new modules. We plan to use this data to demonstrate that detailed learning modules for such an integration heavy class can and should be implemented in upcoming years for other units in MOS.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

MS1-2 KARIMI, ALIKHAN

Acinetobacter baumannii differentially regulates its transcriptome during its growth in blood from severely burned patients

Alikhan Karimi^1, Moamen Elmassry^2, Sharmila Dissanaike^3, John Griswold^3, Jane Colmer-Hamood^4,5, and Abdul Hamood^3,4

The multidrug-resistant Gram-negative bacterium Acinetobacter baumannii (AB) is one of the main causes of infections of traumatic wounds and burns. AB rapidly disseminates within the host leads to bacteremia, sepsis and shock. Depending on the route of infection, mortality rates in patients with AB bacteremia vary from 30 to 75%. At this time, little is known regarding the pathogenesis of AB during septicemia in severely burned patients (SBP). We hypothesized that changes in the blood of SBP affect the expression of AB genes. To address this hypothesis, we grew AB strain A118 in whole blood from either SBP or healthy volunteers (HV) and examined the global gene expression using RNA-seq technology. Compared with its growth in blood from HV, the growth of AB in blood from SBP significantly altered the expression of 524 genes, upregulating the expression of 168 genes (including genes for nitrate [5], histidine degradation [3], and macrolide-specific efflux [2]) and downregulating the expression of 356 others (including genes for iron acquisition and transport [9], type VI secretion system [9], capsule formation [5], and type 1 pilus assembly [5]). To confirm these results, we analyzed the expression of some of these genes using qRT-PCR. As in the RNA-seq analysis, the level of xxxA, yyyB, zzzD, and, aaaZ expression was significantly reduced. These results suggest that during systemic infection in SBP and to adapt to the burn-induced changes in blood, A. baumannii either up-regulates or down-regulates the expression of numerous genes related to virulence, antibiotic resistance, and anaerobic respiration.

School: School of Medicine | Campus: Lubbock

MS1-2 KHAN, AISHA

Takayasu Arteritis Presenting as Atypical Kawasaki Disease

Aisha S. Khan, BS^1; Roy Jacob, MD^3; Fatma Levent, MD^2

Takayasu arteritis is an inflammation of large systemic vessels which is a very uncommon disease in children. We report the case of a 12-year old female who presented with fever lasting 8 days, weight loss, headache, and intermittent right foot and ankle pain. Upon further inquiry, fatigue, and left ankle joint pain were also noted. Inflammation markers including erythrocyte sedimentation rate (ESR), C-Reactive Protein (CRP), and platelets were elevated. Cultures remained negative for any microbial growth. An initial Echocardiogram (ECHO) demonstrated a dilated proximal left main coronary artery measuring 5 mm with no aneurysms detected. These abnormal findings suggested a primary diagnosis of atypical Kawasaki's disease. A second ECHO performed before discharge revealed stable, a 5-mm dilated left main coronary artery. Approximately one month later, the patient,Äôs coronary enlargement was reported to have regressed with lower reactive marker values. Patient presented for follow-up with a nodule on her right arm and right flank region. A Magnetic Resonance Imaging (MRI) with contrast of ankle and joint revealed enhancement and edema around the posterior tibial artery of the distal leg, at the tibiotalar joint, and surrounding the peroneal nerve in the distal leg and ankle. A Computerized Tomography (CT) angiogram of her chest, abdomen, and pelvis were performed which demonstrated abnormal thickening of large and medium-sized vessels in the chest, abdomen, and pelvis as well as mild narrowing of the infrarenal abdominal aorta. Irregular renal involvement was also noted. These abnormal findings were indicative of Takayasu arteritis.

Patient received intravenous immunoglobulin (IVIG) and high dose aspirin for treatment of initial diagnosis of atypical Kawasaki's Disease. Her fever resolved and foot and ankle pain improved upon completion of IVIG administration. In light of abnormal imaging findings, she was referred to Pediatric Rheumatology for further evaluation.

School: School of Medicine | Campus: Lubbock

MS1-2 KOPACZ, AVERY

Foramen size as a potential risk factor for febrile seizure development in the pediatric population

Peyton Presto, Keith Hanson, Mark Stephens, Nikki Tangella, Benjamin Elberson, Preston D‚ÄôSouza, Avery Kopacz

Febrile seizures have been shown to occur in 2-5% of children between the ages of 6 months to 5 years, making them the most common seizures of childhood. These seizures occur in young children who experience a fever but exhibit no evidence of intracranial infection or acute neurological illness. It has been shown that the likelihood of experiencing a febrile seizure increases with the child's temperature as opposed to the rate of temperature rise. Febrile seizures can be classified as either simple or complex depending on length of the seizure and duration between seizure reoccurrence. Risk factors identified through review of relevant studies include male sex, developmental delay, family history, day care attendance, viral infections, certain vaccinations, and zinc and iron deficiencies. However, no investigation has been conducted to explore foramen size and associated venous drainage as a potential risk factor for experiencing febrile seizures. Of particular interest are the parietal foramen, which conducts the parietal emissary vein (PEV), and the condylar canal, which conducts the occipital emissary vein (OEV). Emissary veins lack valves, which allows them to play a crucial role in selective brain cooling via a bidirectional flow of cooler blood from the head's evaporating surface. If the cranial apertures conducting these veins are narrowed, the cerebral venous outflow is potentially reduced and therefore unable to cool the brain as rapidly as expected, leading to a febrile seizure. To explore this possibility, we conducted a retrospective chart review of all febrile seizure patient cases at the University Medical Center (UMC) and Covenant Medical Center (CMC) in Lubbock, Texas, over the past seven years. The area of the parietal foramen and condylar canal in febrile seizure patients is contrasted to those of similar-aged trauma patients. Our findings will help guide further work in the detection and prevention of febrile seizures.

School: School of Medicine | Campus: Lubbock

MS1-2 KUBOSUMI, AARON

Mitochondrial MicroRNAs in Aging and Alzheimer's

Kubosumi, A. Reddy, PH.

Mitochondrial dysfunction is a hallmark of Alzheimer's and other neurodegenerative diseases. In recent years, microRNA's (miRNA) have been implicated in many disease processes and their roles in these processes have increasingly been explored. However, not much is known about the role of mitochondrial specific miRNA's in Alzhiemer's disease. We hypothesized that mitochondrial miRNA's are misregulated in Alzheimer's disease. We selected 9 mitochondrial miRNAs that have been shown to be misregulated in various disease states and began searching for misregulation in APP and Tau mice compared to wild type mice. This process involved harvesting tissue from different sections of the mice brains (cortex, hippocampus). We then isolated the miRNAs from these samples, transcribed the miRNA to cDNA, and ran qt-pcr on our samples against primers of our selected mitochondrial miRNAs. We found misregulation of certain mitochondrial miRNA's compared to the wild type mice.

School: School of Medicine | Campus: Lubbock

MS1-2 LARA, CAIN

Prevalence of mental health symptoms in U.S. emergency departments: Findings from 2009-2015 NHAMCS data

Cain Lara, Obi Udensi, Hijab Ahmed, Bianca Patel, Jeff A. Dennis

Background: Hospital emergency departments (ED) in the United States serve health needs ranging from urgent trauma cases to basic health care among individuals who have poor access to primary care. Since they serve a large population with a vast range of health problems, it is important to understand how EDs triage their mental health patients in comparison to those who suffer from other complications. Past research has found mental health ED visits have increased in both pediatric and adult populations. However, research exploring the full scope of ED visits for mental health concerns is lacking in the United States.

Research question: This study explores the assignment of triage scores and wait times in emergency department visits where the sole reason for visit is identified as a mental health issue, compared to visits where mental health is identified along with a physiological health issue.

Data & Methods: Data for this study include all individuals age 18+ in the 2009-2015 National Hospital and Ambulatory Care Survey, a nationally representative sample of emergency department visits collected annually. Each case provides up to three reasons for visit entered during the triage process, and individuals are given a score for their urgency to be seen ranging from 1 (Immediate) to 5 (non-urgent).

Results: Preliminary findings identified about 3% of all emergency department visits involved some type of mental health concern, with about half of those being a visit where mental health concerns were the only presenting issue. This percentage translates to about 3 million ED visits per year for mental health symptoms. The average triage score for adults for whom a mental health concern was the sole reason for visit was 2.8, significantly lower than the average of 3.3 in the non-mental health sample (lower score=more urgent).

Discussion: Ongoing analysis will examine how mental health issues are handled in the ED, including wait times, diagnoses, and medications.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

MS1-2 LARA, STEVEN

Breast Cancer Mortality of Rural West Texans in High-risk Hale County

Steven Lara MPA MPH Aamrin Rafiq BSc Summre Blakley MDc Drew Rasmussen MPHc Afrina Hossain MD Lisaann Gittner PhD and Hafiz Khan PhD

Objectives: To understand the relationship between sociodemographic and prognostic variables on breast cancer outcomes in an underserved area, Hale County in West Texas, which experiences higher age-adjusted mortality rates compared to the state average.

Methods: Hale County breast cancer data (1995-2014) was obtained from the Texas Cancer Registry. Using SPSS software, descriptive and inferential statistical methods were used to detect significant relationships. T-tests were used to find significant differences among racial/ethnic groups. 95% Confidence Intervals of the Hazard Ratios and Kaplan Meier Curves were used to compare all cause death, breast cancer death, and other cause of death.

Results: White Non-Hispanic women (WNHs: n=266, 65.5%) experienced the highest survival times (2754 ¬± 2074 days) while White Hispanics (WHs: n=115, 28.3%) experienced the lowest (2370 ¬± 2060 days). Survival times among WNHs showed significant differences, including ages <45 vs 75+ (p=0.01), 45-55 vs 65-75 (p=0.02), and 55-64 vs 64-74 (p=0.05). Survival times for private and public insurance showed significant differences (p=0.01) compared to no insurance/unknown for both WNHs and WHs. For both races, stage of cancer revealed significant differences in survival time, including both in situ and localized vs distant metastasis (p=0.01). Hazard Ratios revealed that distant metastasis was significant (p=0.0001) for all three death variables with unstaged breast cancer as a reference group. Only WNHs experienced significant differences in survival times in zip codes 79311 and 79072 vs other (p=0.03 and 0.04, respectively). In line with increasing cancer death rates in rural vs urban Texas counties, Hale County showed higher breast cancer mortality rates and breast cancer distribution varied based on race/ethnicity.

Conclusions: Characterization of geographic cancer hot spots may indicate interventions that can address racial/ethnic disparities in rural breast cancer survivorship.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

MS1-2 LEE, SHANSHAN

Radiological findings supporting the diagnosis of tertiary syphilis

Shanshan Lee Mark Lacy MD Roy Jacob MD Fatma Levent MD

Introduction: Syphilis is an ancient, sexually transmitted disease caused by the spirochete Treponema pallidum. The course of the disease has several different stages, including primary, secondary, latent, and tertiary. From 2015 to 2016, the total cases of reported syphilis in the United States has increased by 17.8% reaching 8.7 cases per 100,000 population. Cases of tertiary stage also rose by 17.2%, mirroring the increase of rare manifestations of the disease. Sometimes syphilis presents with focal neurologic signs.

Observations/Case presentation: A 34 year-old African-American, Human immunodeficiency virus (HIV)-negative man presented to clinic with a two-week history of blurry vision in the left eye and a droopy left upper eyelid. On examination, his visual acuity was 20/30. While lifting the upper eyelid, he was able to fully abduct his gaze but other extraocular motions were limited. Binocular diplopia and Argyll-Robertson pupil, where the pupil does not react to light, were also present. Subsequent magnetic resonance imaging showed an abnormal enhancement in left middle cerebral peduncle with involvement of cisternal segment of the left oculomotor nerve. Vasogenic edema was present in the left middle cerebral peduncle extending into the left aspect of midbrain. Syphilitic gumma lesion was suspected and infection confirmed by various laboratory tests including serum rapid plasma reagin (RPR), cerebral spinal fluid (CSF) venereal disease research laboratory test (VDRL), and CSF fluorescent treponemal antibody absorption test (FTA-ABS).

Conclusion: Neurosyphilis should be suspected in patients with neurological signs and symptoms. A combination of serum non-treponemal screening and treponemal confirmatory tests, CSF analysis, and radiographic imaging can be useful during diagnosis. Empiric antibiotic treatment and close observation of the patient,Äôs response should be pursued first before considering other options.

School: School of Medicine | Campus: Lubbock

MS1-2 LILLEY, JENNIFER

Comparison of TD47 and MCF-7 response in estrogen in SHO mice.

Jennifer Lilley, MS; Jennifer Brelsfoard, MS; Josee Guindon, PhD

Murine animal models are an invaluable resource for testing in the lab and is the foundation for translational research. Mice can serve as a conduit for oncological testing and pre-clinical research for potential chemotherapy drugs. Likewise, it is important to test the efficacy of the mouse model before starting a project to assess the success rate of inoculation of tumor cells. Our lab is investigating which breast cancer tumor cell lines best grow on SCID immunocompromised mice using the TD-47 and MCF-7 breast cancer tumor cell lines. Each tumor injection, whether TD-47 or MCF-7, contain half SH-DVL3 (dishevelled segment polarity protein 3) cells and half NTC (non-targeting control) cells. TD-47 is a cell line of ductal carcinoma of the mammary gland and is known to respond to progesterone in the presence of estrogen. MCF-7 is a cell line of adenocarcinoma of the mammary gland. MCF-7 is not known to respond to progesterone. We hypothesize that the DVL knock down cells with grow at a slower rate and have smaller overall tumors than the NTCs. To compel growth, we inject daily estrogen or androgen and measure tumor size daily to determine which hormone will best aid in growth. Additionally, daily vaginal lavages are taken to observe the estrus cycles and whether or not the tumor and injected hormones have an affect. These tumor cells also contain luciferase to better visualize growth via IVIS imaging.

School: School of Medicine | Campus: Lubbock

MS1-2 LIN, CHRISTINE

Figurate Erythema for Twenty Years

Christine P. Lin, BA, Patrick M. Mulvaney, MD, Christine G. Lian, MD, Fei-Shiuann Clarissa Yang, MD

BACKGROUND: Diffuse large B-cell lymphoma (DLBCL) is the most common and aggressive type of non-Hodgkin lymphoma in adults. If the skin is involved, DLBCL commonly manifests on the legs as papules, nodules, or indurated plaques, but there are few reported cases of DLBCL presenting in an annular or figurate configuration. We report a case of annular-appearing Primary Cutaneous DLBCL, Leg Type (PCDLBCL-LT), a subtype of DLBCL, which led to delayed diagnosis and treatment.

CASE: A 49-year-old man from New England presented with a twenty-year history of pink, non-scaly, arcuate and figurate plaques on the right thigh, unresponsive to mid-potency topical steroids. In the last year prior to presentation, two nodules developed within the plaques. The patient denied having fevers, night sweats, pruritus or weight loss. He denied history of tick bites. No lymphadenopathy was appreciated. Biopsies showed superficial to deep dermal perivascular lymphocytic infiltrate comprised of atypical lymphocytes with round to irregular nuclei, dispersed to vesicular chromatin, occasional single nucleoli and moderate amounts of pale eosinophilic cytoplasm. Immunohistochemistry revealed CD20-positive B-cells that stained positively for Bcl-2, Bcl-6, and MUM-1, and negative for CD10. Staging for this patient revealed no extracutaneous disease. The patient underwent six cycles of R-CHOP (rituximab, cyclophosphamide, doxorubicin, vincristine, prednisone) plus radiation resulting in complete radiographic remission and resolution of all visible cutaneous findings.

CONCLUSION: It has been suggested that annular-appearing DLBCL may represent transformation of an indolent follicular lymphoma to DLBCL, which may have occurred here given the prolonged clinical course. The clinical differential for figurate erythema is relatively small and easily distinguished by pathology. However, we need to be aware that DLBCL can present in an annular or figurate configuration to not delay diagnosis and therapy.

School: School of Medicine | Campus: Lubbock

MS1-2 MADISON, KYLE

Effect of chronic unloading of the heart using durable left ventricular assist device (LVAD) on thyroid function: A single center retrospective analysis

Kyle Madison, Dr Nandini Nair

In animal models of heterotopic cardiac transplanted rats, chronic cardiac unloading induces reductions in Ca2+ handling and myocyte contractility, which are associated with the shift of myosin heavy chain (MHC) isozymes and altered expressions of Ca2+ cycling-related proteins. Chronically downloaded hearts also show alterations in thyroid hormone metabolism. However, such investigations are lacking in chronically downloaded hearts using LVADs in the end-stage HF population. A retrospective analysis of decoded data of all heart failure patients who underwent LVAD insertion from July 2016 to Feb 2018 was conducted. The levels of TSH, T3 and T4 pre LVAD insertion were assessed to predict 1 and 2 year survivals. Comparison of pre and post TSH, T3 and T4 levels was also done at different time intervals [30,60,90,120 days]. No differences were noted in T3, T4 and TSH levels pre and post LVAD implant. T3,T4 and TSH levels pre implant failed to predict survival at 1 and 2 years post LVAD implant $p>0.1$. In this small cohort of patients at a single center, thyroxine levels were not influenced by LVAD insertion suggesting that thyroid hormone levels were unaffected by this treatment modality.

School: School of Medicine | Campus: Lubbock

MS1-2 MAVEDDAT, ASHLEY

The influence of rurality and travel time on pediatric cancer survival in a regional pediatric oncology center over the period of 2003-2014

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BACKGROUND: Over the last quarter century, pediatric cancer outcomes and survivals have significantly improved. We assessed demographics of pediatric cancers at regional cancer center as well as differences in mortality and survival by rurality and travel time. METHODS: Data was from 248 pediatric cancer patients aged 0-19 years from Covenant Medical Center during the period of 2003-2014. Chi-square test and t tests were used to identify differences in cancer types and demographics between patients from rural or urban areas as well as travel time to this medical center. Cox proportional hazards regression was used to model the association of cancer survival with rurality and travel time. RESULTS: The mean age at diagnosis of patients was 8.8 years with 59% of them being males and 85% from Texas. Overall, 24% of patients had Leukemia, 11.3% had Lymphoma, 15.3% had central nervous system tumors and 32.3% had solid tumors. A greater proportion of rural cancer cases were from Texas compared to other states (99 vs. 83%, p=0.001). Patients who traveled more than a 1 hour to get to the treatment center were diagnosed with pediatric cancer at an earlier age compared to patients who travelled ,â§ 1 hour (7.8 vs. 9.7 years, p=0.017). Rural residents travelled longer hours to the treatment center than urban residents (1.43 vs. 0.99 hours, p=0.001). The overall 5-year survival was 85.8% (Rural: 88.4% vs urban: 84.2%, p= 0.539). There was no difference in pediatric cancer survival regardless of type of cancer by rurality or time travelled treatment center.

CONCLUSION: Significant differences in the age at diagnosis and distance travelled to the treatment center between cases from rural and urban counties did not significantly influence the overall survival for pediatric cancer in this regional pediatric oncology center.

School: School of Medicine | Campus: Lubbock

MS1-2 MENDEZ, EMILY

Evaluation of Methamphetamine Prevalence Rates in an Indigent-Care Clinic via Retrospective Chart Review

Aisha S. Khan; Emily Mendez; Hillary Powers; Katie Miller; Zach Sneed, Ph.D., Fiona Prabhu, MD.

Identifying substance use in a given population allows for the development of targeted intervention therapies, both pharmacologic and non-pharmacologic, to address the staggering epidemic rates. Psychostimulant related deaths increased more than 250% from 2008 to 2015 with amphetamine use being the fourth most common reason to seek drug treatment in the United States, after alcohol, opioid, and marijuana use1.

The purpose of this project was to conduct a retrospective chart review within a one-year time frame from May 2017 through May 2018 at the TTUHSC Free Clinic located in Lubbock, Texas. Specifically, the objectives were as follows:

1. To identify the past month and past year incidence rates of methamphetamine use at an indigent-care clinic;

2. To identify prevalence rates for methamphetamine use among the clinic population;

3. To identify the clinic rate of return for patients with recent methamphetamine use.

Outcome measurements deployed in this study include all of the following: relevant DSM5 diagnostic codes/labels, health history forms; data from clinical interviews, positive endorsement on DSM5 Cross-Cutting Symptom Measure. We are almost finished with the data analysis phase of this project. Our early review of the data indicates that the local findings far exceed expectancies, suggestive of an epidemic.

In alignment with the clinic,Äôs goal of transitioning patients to long-term, sustainable health care, this study provides preliminary data on the astronomical incidence as well as prevalence rates of methamphetamine use in the working poor and homeless population. Methamphetamine use significantly complicates patient health and histories. Results from this study provide important considerations for current clinical record keeping as well as allow for more comprehensive patient-centered care. Furthermore, targeted intervention and referral to treatment models may develop from up-to-date, precise epidemiologic figures.

School: School of Medicine | Campus: Lubbock

MS1-2 MORENO, TANIR

Testing the beneficial effects of Sertoli cell-secreted C-peptide on cardiovascular related complications.

Tanir Moreno, Bilkis Mitu, Gurvinder Kaur, and Jannette Dufour

Cardiovascular disease (CVD) is the leading cause of death among people with diabetes. Current insulin replacement therapies do not include C-peptide, which is a co-product of proinsulin. C-peptide has been shown to reduce high glucose (HG)-induced production of inflammatory cytokines. Transplantation of destroyed islet cells is the most physiological way to deliver insulin and C-peptide but is hindered by rejection. Immune-privileged Sertoli cells (SCs) can survive long-term when transplanted across immunological barrier, thus making SCs an excellent candidate for cell-based gene therapy. Previously, we have demonstrated that genetically engineered SCs, expressing insulin and C-peptide, transiently lowered blood glucose levels in diabetic mice. In this project, we are exploring the benefits of SC-secreted C-peptide as a novel therapy that may lower the risk of CVD. To test this hypothesis, we first generated a dose response curve to establish an optimal dose of C-peptide. Specifically, human umbilical vein endothelial cells (HUVECs), cultured in HG media, were treated with different concentrations of C-peptide (CP). HUVECs cultured in HG media alone were used as control. After 24hrs, RNA was collected and RT-qPCR was performed. C-peptide significantly decreased the expression of adhesion molecule (ICAM), proinflammatory cytokine (IL1b) and upregulated the expression of master anti-oxidant gene (Nrf2l2), at a concentration ranging from 0.5-5nM. Based on this information, HUVECs were treated with SC media containing secreted C-peptide (SCP) at concentration ranging from 0.5-5nM. SCP also significantly reduced the expression of adhesion molecules (ICAM and AGER) and upregulated the expression of master anti-oxidant gene (Nrf2l2) as compared to control. No effect on pro-inflammatory cytokine (IL1b) or vasoconstrictor (endothelin) was detected. This suggests that genetically engineered SCs, secreting C-peptide, have the potential for lowering the risk of CVD.

School: School of Medicine | Campus: Lubbock

MS1-2 MURPHY, ALEXANDRIA

Perception of Veteran's Healthcare in Medical Education

Alexandria Murphy, Rebecca Kernan, Ellen Wilson, Sterling Rosqvist, Tate Leatherwood, Zachary Mkhantar

Lubbock announced that we will be welcoming our new VA Hospital that will be across the street from UMC and TTUHSC. The new clinic is projected to serve 20 counties in west Texas, expanding greatly their patient population. With the expansion of the VA clinic students at the TTUHSC will be allowed to rotate at the new clinic. Veterans face many different challenges in medicine than their civilian counterparts. Since there will be an increase in student interaction with veterans, it is important for medical students to understand the specific health needs of veterans. We seek to identify how confident medical students and residents feel in dealing with the specific healthcare needs of veterans. We also reached out to veterans of the community to seek their perceptions on how their specific medical needs are being met currently. Looking forward we hope to bring awareness to students to help provide the best level of care to the veteran population and to create open communication with the veteran population in expectation of the new neighboring VA clinic.

School: School of Medicine | Campus: Lubbock

MS1-2 NARAYANAN, MONISHA

Molecular Pathogenesis of Gouty Arthritis in Hemochromatosis: The Role of ABCG2-Mediated Uric Acid Efflux

Monisha Narayanan, Bojana Ristic, Dr. Vadivel Ganapathy

Hemochromatosis is caused by mutations in the iron-regulatory gene HFE, and its clinical manifestations are primarily produced by iron-induced oxidative stress. ABCG2 is an efflux pump which could impact iron homeostasis due to its heme exportation, and preliminary studies show down-regulation of Abcg2 in Hfe-null mice, a model for hemochromatosis. ABCG2 also effluxes uric acid, and mutations in ABCG2 cause excess uric acid and arthritis. As such, iron-induced oxidative stress may not be the only factor responsible for gouty arthritis in hemochromatosis; increased uric acid may also contribute to the etiology, as iron is required to promote the uric acid crystal formation causing gouty arthritis.

We hypothesize that the etiology of hemochromatosis-induced arthritis involves both excess iron caused by loss of function in HFE and excess uric acid caused by down-regulation of ABCG2. This hypothesis was tested by comparing plasma and tissue levels of uric acid in Hfe-null mice to those in wild type mice. The uric acid concentration was significantly higher in Hfe-null serum, colon, and ileum as compared to their age-matched controls. Therefore, we hypothesize that complete deletion of ABCG2 will enhance the uric acid accumulation in wild type and, more significantly, in Hfe-null mice. We have started this study by measuring the uric acid levels in Abcg2-null mice and comparing them to age-matched wild type mice. Surprisingly, uric acid levels were found to be significantly lower in the colon and jejunum of 4-month-old Abcg2-null mice when compared to the controls. Future studies will measure uric acid levels in older Abcg2-null mice, as uric acid accumulation may not occur until a later age, and in Hfe/Abcg2-double knockout mice, for which a model has not yet been generated. These studies will improve understanding of the etiology of hemochromatosis-induced arthritis and may suggest a combination of iron and uric acid reducing medications to better treat the disease.

School: School of Medicine | Campus: Lubbock

MS1-2 NESBITT, WILLIAM

Visceral fat is associated with high-grade complications in patients undergoing laparoscopic or robotic-assisted partial nephrectomy for small renal masses

William Nesbitt, B.S.; Pranav Sharma, M.D.

Introduction: We sought to identify the relationship between subcutaneous and visceral obesity with high-grade postoperative 30-day complications in patients undergoing laparoscopic or robotic-assisted partial nephrectomy.

Methods: We retrospectively identified 98 patients from 2014-2017 who underwent laparoscopic or robotic-assisted partial nephrectomy for a renal mass due to suspected renal cell carcinoma. Patients were stratified based on presence or absence of high-grade (Clavien >IIIa) complications within 30 days of surgery. Means were compared with the independent T-test and proportions with chi-square analysis. Multivariate logistic regression was performed to determine independent predictors of high-grade postoperative complications.

Results: Mean nephrometry score was 6.7 with 21 (21.4%) patients having hilar tumors. Mean EBL was 207 cc, mean OR time was 223 minutes, and mean warm ischemia time was 23 minutes. The majority of patients had clear cell RCC (n=83 [84.7%]) and pT1a disease (n=76 [77.6%]) with negative margins (n=89 [90.8%]). Five (5.1%) patients experienced a high-grade postoperative 30-day complication after surgery. Mean visceral fat index was an independent predictor of high-grade complications within 30 days of surgery (OR: 1.02 [95% CI: 1.002 ,Äì 1.03]; p=0.027).

Conclusions: Visceral fat is associated with high-grade postoperative 30-day complications in patients undergoing laparoscopic or robotic-assisted partial nephrectomy. Visceral obesity, therefore, should be considered a poor prognostic indicator in patients undergoing surgical treatment for a small renal mass.

School: School of Medicine | Campus: Lubbock

MS1-2 NGUYEN, TAMMINH

Utilization of DABRA (New Innovative Laser Technology) to Treat a Challenging Complex Peripheral Arterial Occlusion to Save a Limb from Amputation

Tam Nguyen, Zain Ali; Mohammad M. Ansari, MD

Introduction: Peripheral artery disease is a disease in which patients are left with various consequences including possible loss of limb. There are many solutions for patients due to the various techniques and innovative devices. Our case presents a difficult left lower extremity occlusion with presentation of acute limb ischemia.

Case: Male age 55, presented to ER with acute left foot pain along with a cold foot. Physical exam showed weak left popliteal pulse. CT angiogram concluded Rutherford IIb acute limb ischemia and no flow beyond the ankle. After reviewing the images, the decision was made to intervene in the popliteal thrombotic occlusion. Given the amount of clot burden, an Angiojet thrombectomy device was used. It showed slight flow to posterior tibial but anterior tibial and peroneal arteries were not visualized. Given the residual thrombus, an EKOS MicroSonic catheter was used. The next morning, angiography showed only slight improved flow. A Penumbra catheter was then used for suction of the thrombus. Angiography then showed slight improvement, but not a significant difference in flow. DABRA, a new device utilizing laser thrombectomy, was then used to lyse the clot. This was successful, with subsequent angiography showing resolution of the occlusion and 0% residual stenosis. The patient showed significant improvement, reported no pain, and was discharged the following day.

Conclusion: Our case illustrates the use of innovative technology, using the new laser (DABRA catheter system), for thrombectomy to facilitate a difficult lower extremity occlusion with significant clot burden. Utilizing the device prevented the patient from having to undergo amputation. This is a glaring example of how innovation in the field of medicine and new technologies are integral to the development of future medical treatment.

School: School of Medicine | Campus: Lubbock

MS1-2 OMORUYI, FELIX

Homomeric and Heteromeric 5-Hydroxytryptamine type 3 Receptors

Felix Omoruyi, Antonia Stuebler, Michaela Jansen

The pentameric ligand-gated ion channel (pLGIC) superfamily includes the nicotinic acetylcholine (nACh), 5-Hydroxytryptamine type 3 (5-HT3), …£-aminobutyric acid type A (GABAA), and glycine receptors. Together they are responsible for fast synaptic neurotransmission in the central and peripheral nervous system. Dysfunction of these receptors has been linked to several neurological disorders, and targeting these receptors could be a potential treatment for anxiety, depression, and an alternative to antipsychotics drugs. These channels are made up of five homologous subunits surrounding a central ion channel pore, each with three domains, extracellular, transmembrane, and intracellular.

The 5-Hydroxytryptamine type 3 (5-HT3) receptor is a cation-selective pentameric ligand-gated ion channel that can be found pre- and postsynaptically. Clinically, they are currently targeted by anti-emetics and irritable bowel syndrome treatments. 5-HT3 receptors also hold promise as potential future targets for multiple neurological disorders, such as Alzheimer's disease, schizophrenia, and bipolar disorder. The 5-HT3-R family consists of Ô¨Åve different subunits (A-E) but the assembly of this receptor requires the 3A subunit, yielding either a homomer or heteromer with another subunit. Here, we explored the significant differences between the homomeric 5-HT3AR and heteromeric 5-HT3AB receptor, which are found in the central and peripheral nervous system, predominantly in the amygdala, caudate nucleus, hippocampus, and the enteric nervous system. After expression in Xenopus oocytes, their differences in agonist response and kinetics were characterized using two-electrode voltage clamp recordings. In the future, we want to evaluate how drugs, for example the antidepressant bupropion, differentially modulate these two receptors.

School: School of Medicine | Campus: Lubbock

MS1-2 OSEMWENGIE, BRADLEY

Management of postsurgical donor site pain in burn injuries using a preoperative combination of bupivacaine plus liposomal bupivacaine injections

Bradley Osemwengie, Grant Sorensen PhD, John Griswold MD

Introduction: The skin graft donor site is often the most painful part of the healing process in a postoperative burn victim. Solutions such as adrenaline-lidocaine subcutaneous infiltrations have proven to be effective. In spite of all of this, standard of care at burn centers across the U.S. is currently just a wound dressing. Other procedures and strategies have been employed for managing donor site pain. A common concern is the duration of postoperative analgesic effects that persist in the patient in order to offer pain relief. The rapid loss of analgesia at the donor site is associated with increased pain which may be accompanied with decreased patient satisfaction, longer hospital stays, difficulties with dressing changes, comorbidities, and increased cost of care.

We propose that the combination bupivacaine plus liposomal bupivacaine injections will have a longer-lasting analgesic effect that reduces postoperative donor site pain and pain medication use compared to standard wound care using opticell dressing.

Methods: The study is a prospective, randomized design with each patient being randomly assigned to either a treatment or control group. Both groups will receive the standard of care opticell wound dressing, but the treatment group will receive the additional pre-surgical analgesia injections. The treatment group will receive a dose of 0.04 ml/cm2 (0.52mg/cm2) of bupivacaine and liposomal bupivacaine injections prior to skin harvest (4). Post-operatively, the wound will be managed using the standard opticell wound care dressing. The control group will receive the standard of care, which consists only of postoperative wound care using opticell dressings. Self-reported donor site pain score will be recorded at the following intervals: postoperative day 1 at donor site outer dressing removal, as well as the mornings of postoperative day 2, 3, and 4. A final donor site pain assessment will be collected on day 7.

School: School of Medicine | Campus: Lubbock

MS1-2 OTI-NIMOH, JOSEPH

Using Transesophageal Echocardiography (TEE) Simulation to Improve Learning Outcomes in Preclinical Medical Students

Joseph Oti-Nimoh, Clayton Wagner, Greg Brower PhD

Learning modules that are incorporated into the TTUHSC ,Äì School of Medicine (SOM) curriculum are designed to help students better understand key concepts that are covered during lecture and clinical sessions. Learning modules outlining transthoracic echocardiography (TTE) paired with interactive standardized patient (SP) encounters are currently part of the SOM,Äôs preclinical curriculum; however, these learning resources are not as readily available for transesophageal echocardiography (TEE). Incorporation of a TEE simulation into the preclinical curriculum could be beneficial for a variety of reasons. One of the primary goals of development of this activity is to expand understanding of ultrasonography, specifically echocardiography (echo), among preclinical medical students. With SPs, preclinical medical students can only perform TTE and can only visualize normal anatomy. Using the Heartworks simulator in the TTUHSC SimLife center, both TTE and TEE can be performed. One of the primary advantages of using TEE over TTE arises from the close anatomical relationship between the esophagus and the heart. This close anatomical relationship negates the necessity for a low frequency transducer, which is used for TTE, and thus allows the use of higher frequencies while imaging which equates to better resolution and clearer echocardiograms. We believe that the high resolution that is associated with TEE could improve understanding of how echo can be used to visualize cardiac and aorta-related structures. Additionally, the Heartworks simulator has the capacity to simulate cardiovascular (CV) related pathology. We believe that simulating CV pathology with TEE simulation will improve medical student learning outcomes as it pertains to CV pathology. We do not believe that echo simulation using the Heartworks simulator should supplant SP encounters, but it could serve as an adjunct to the SP echo experience that is already incorporated into the preclinical curriculum.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

MS1-2 OWOADE, DAMILOLA

Disparities in colorectal cancer incidence and survival by rural/urban residence in west Texas region compared to the rest of Texas (2005-2015)

Damilola Owoade, MPH(c) 1; Kishor Bhende, MD 2; Theresa Byrd, DrPH1; Duke Appiah, PhD MPH1

1 Department of Public Health, Texas Tech University Health Sciences Center, Lubbock TX; 2 Department of Pediatrics, Texas Tech University Health Sciences Center, Lubbock TX

Introduction: In Texas, colorectal cancer is ranked as the third in both cancer incidence and the cause of mortality. Rural counties are known to have higher burden of cancer deaths. The west Texas region (WTR) is one of the most medically underserved regions of Texas. Therefore, we evaluated the incidence and survival for colorectal cancer cases in rural and urban counties in WTR compared to the rest of Texas.

Methods: Data were obtained from the Texas Cancer Registry. Survival estimates were obtained using the Kaplan-Maier methods. Cox regression models were used to identify potential factors that explained the disparities in mortality among persons with colorectal cancer by region.

Results: During the years of 2005-2015, 190,891 colorectal cancer cases were recorded. The age-adjusted incidence was higher in urban than rural counties (33.8 vs. 7.1 per 100, 000) while the age-adjusted mortality was higher for rural counties; with the highest proportion of mortality observed in rural WTR (53%). A greater proportion of cases in rural counties developed cancer at an earlier age, were current smokers and lived in high poverty locations compared to urban resident colorectal cancer cases. The 5-year survival was lower for rural counties regardless of region. Compared to urban residents living in non-WTR, the hazard ratios for mortality for urban counties in WTR was 0.99 (95% CI: 0.97- 1.02); rural-WTR was 1.09 (1.04-1.15) and rural counties not in WTR was 1.11(1.08-1.13). After controlling for age, sex, race/ethnicity, tumor stage at diagnosis, body mass index, smoking and county level poverty, there was no significant difference in the risk of mortality among cancer cases from rural or urban counties ($p>0.05$).

Conclusion: Intervening in behavior and lifestyle factors offers an opportunity to reduce the disparity in survival among rural and urban residents of Texas, regardless of region.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

MS1-2 PEIRIS, CRAIG

Pituitary hyperplasia: A clinical and imaging chameleon.

Craig D. Peiris, MS; Muhittin Belirgen, MD; Roy Jacob, MD

Enlargement of the pituitary gland is usually associated with pituitary adenomas, a condition less frequent in the pediatric population. Pituitary hyperplasia is an under-recognized cause of pituitary enlargement. Pituitary hyperplasia can rarely simulate a pituitary adenoma in children. The best-known example of pituitary hyperplasia relates to Nelson syndrome in which the expansion of the pituitary into adjacent structures occurs following bilateral adrenalectomy for Cushing's disease.

We report the case of an 11-year-old girl with new-onset seizures. She was started on phenytoin for seizure control. An MRI demonstrated a greatly enlarged pituitary, measuring 15 mm in the cranial to caudal dimension, abutting the optic chiasm. The patient had intact visual fields. A second MRI with contrast revealed a homogeneously enhancing pituitary gland raising suspicion for pituitary hyperplasia.

Subsequent testing revealed a markedly elevated TSH value of 610ÔÅ≠U/mL normal range less than 5ÔÅ≠U/mL. Serum prolactin level was also elevated at 54.4 ng/mL normal range less than 23ng/mL. Specifically, it is important not to mistake the elevated prolactin due to hypothyroidism with a prolactinoma. Phenytoin can impact free T4 estimation; however, it does not affect TSH values. The marked elevation of TSH in this patient is consistent with severe primary hypothyroidism. The patient was started on thyroid hormone replacement. Follow up MR imaging after three months showed pituitary gland size had decreased to 7 mm in the cranial-caudal dimension with a resolution of the mass effect on the optic chiasm. At last, follow up the patient is doing well.

This case highlights the uncommon presentation of pituitary hyperplasia mimicking a pituitary mass. It is vital that surgery is not performed for pituitary hyperplasia.

School: School of Medicine | Campus: Lubbock

MS1-2 PHILIP, STACY

Unilateral Tessier 7 Cleft: Case Report of Z-plasty with Geometric Broken Line Repair and Literature Review

Stacy Philip, Dr. Cynthia Schwartz, Dr. Winslo Idicula, Dr. Joshua Demke

Introduction: Tessier clefts are rare, with an incidence of only 1.43 to 4.85 per 100,000 live births, and Tessier 7 clefts comprise only 0.3-1.0% of the total spectrum of facial-cleft deformity. Facial clefts typically run parallel to relaxed skin tension lines (RSTLs), whereas Tessier 7 clefts are perpendicular to these lines. Z-plasty, w-plasty, mucosal triangular flaps, Pfeiffer wavy incisions, and straight-line closures have been reported in the literature for reparation, though undesirable scars may result. Geometric broken line closure (GBLC) creates a randomly irregular scar by interdigitating triangles and trapezoids in a random pattern to optimize the ultimate scar.

Case Presentation: We present a review of the literature and a case of a four-month-old female patient with Goldenhar, right-sided Tessier 7 cleft, macrostomia, preauricular appendages, a branchial cleft remnant on the right cheek, and a type 1A laryngeal cleft, for which a combined z-plasty and GBLC were chosen for surgical repair. The Tessier 7 cleft involved muscular diastasis at the commissure extending laterally toward the tragus. We describe a novel reconstruction technique wherein z-plasty reorients part of the scar parallel to RSTLs, and GBLC further camouflages the scar perpendicular to RSTLs.

Conclusion: Z-plasty repositions a portion of the scar to be parallel to the eventual nasolabial fold and RSTLs. GBLC further breaks up a scar that is otherwise both linear and perpendicular to RSTLs by creating small geometric shapes, making the scar less noticeable. We present this case to expand the armamentarium of surgical options to address Tessier 7 clefts.

School: School of Medicine | Campus: Lubbock

MS1-2 PIRES, BRANDON

A Student-Generated, Peer-Led Teaching Activity for MSK and Bone Disorders

Brandon Pires, Kristie Benejan, Taylor Brown, Jacob Darter, Chandon Loya, Emily Mendez, Jackson Reynolds, Joshua Sorenson, Gurvinder Kaur, Cassie Kruczek, Jennifer Mitchell, David Edwards, Betsy Jones

Background: TTUHSC School of Medicine has a 3-year MD curriculum leading to FM residency, the FMAT program. An 8-week course between the M1 and M2 years includes one week devoted to the MSK system. Immediately following, FMAT students participate in the Multisystems Disorders block with their peers in the traditional curriculum, including MSK and bone disorders.

Methods: For this initiative, FMAT students developed a student-generated/ led activity for the MSD course. Objectives were to assess whether FMAT students 1) develop proficiency in MSK exams and clinical reasoning; 2) can serve as effective peer teachers; and 3) perform better on relevant block exams compared to peers. At the beginning of the 2018 FMAT1 course, students measured their baseline knowledge and skills about MSK conditions and tests. During FMAT MSK week, they developed a teaching case for bone disorders for a peer-led session in the fall MSD course. Outcomes include FMAT and traditional student performance on pertinent exam questions during the MSD course.

Results: Significant improvement on MSK related questions was observed following peer-led instruction; however, no significant difference in scores on summative and formative assessments was observed between groups. Insignificant differences in scoring are likely attributable to the in-house unit exam content being broader than the scope of a single STS session. Some limitations include varying population sizes between groups with presenters making up the smallest sample (n=30) and most affected by variations in scores. Also, the formative assessment included questions not specific to STS session material.

Discussion: Future iterations should include feedback for each presentation, appropriateness to the current block material, and feedback of the presenter groups. While significant score improvement was not observed, overall, the presentations were regarded as useful and enjoyable and promoted independent learning.

School: School of Medicine | Campus: Lubbock

MS1-2 PRESTO, PEYTON

Sex differences in fear extinction learning ability predict pain behaviors

Peyton Presto Guangchen Ji Volker Neugebauer

Sex differences in pain and disorders such as depression and anxiety are now being recognized. Pain and fear may share neurobiological mechanisms such as plasticity in emotional networks that include the amygdala. The amygdala plays a key role in fear conditioning and has emerged as an important node of emotional-affective aspects of pain modulation. Impaired fear extinction learning, which involves prefrontal cortical control of amygdala processing, has been linked to conditions such as posttraumatic stress disorder (PTSD). Here we tested the hypothesis that fear extinction learning ability can predict certain aspects of pain-related behaviors of rats and that these may be different in female and male rats. We correlated fear extinction learning in adult male and female rats with behavioral outcome measures before and after induction of an arthritis pain model. Auditory fear conditioning, extinction, and extinction retention tests were conducted using two chambers. There was no difference in fear learning between male and female rats. The majority of rats (78% male, 73% female) showed a quick decline of freezing level during extinction training and retention (FE+) whereas a smaller group of rats (22% male, 27% female) maintained a high freezing level (FE-). Male and female FE- rats had lower open-arm preferences in the elevated plus maze or shorter center duration in the open field test than FE+ rats, reflecting anxiety-like behavior, but there were no significant differences in sensory thresholds and vocalizations between FE+ and FE- types under normal conditions. In the arthritis pain model, male and female FE- rats developed higher levels of vocalizations and anxiety-like behavior than FE+ rats, but there were no differences in mechanical reflex thresholds. The data may suggest predictive value of fear extinction ability for emotional-affective pain aspects in male and female rats, and greater vulnerability of female than male rats with lower extinction ability.

School: School of Medicine | Campus: Lubbock

MS1-2 PUNGWE, PRISCA

The Role of PEPT1 in Pancreatic Cancer

Prisca Pungwe, Yangzom Bhutia

Pancreatic ductal adenocarcinoma (PDAC) is the most lethal of all cancers with a 5-year survival rate of less than 5%. Hence, there is a need for early diagnosis and better therapeutic strategies to improve outcomes. Literature review has shown the upregulation of oligopeptide transporter, PEPT1 (SLC15A1) in many cancers including pancreatic cancer. However, an in-depth study about the role of PEPT1 in pancreatic cancer has not been fully investigated. With this in mind, the study was to investigate the role of PEPT1 in pancreatic cancer growth and promotion. To do this we first checked the expression of PEPT1 (SLC15A1) at the transcriptional level in ten human pancreatic cancer cell lines (AsPC-1, BxPC-3, Capan-1, Capan-2, CFPAC-1, HPAFII, MIA PaCa-2, Panc-1, Panc10.05, and SU.86.86 as well as in two normal pancreatic ductal epithelial cell lines (HPDE and hTERT-HPNE). Interestingly, we found a significant tumor specific upregulation of PEPT1 in pancreatic cancer cell lines. Data was confirmed using patient-derived xenografts (PDXs) from pancreatic adenocarcinoma. Our next aim was to check the PEPT1 expression and perform a functional assay to corroborate the protein amount to its function. Western blotting was performed in two pancreatic normal cell lines vs. ten pancreatic cancer cell lines. PEPT1 protein was not expressed in both normal cell lines but a significant amount of protein was found in AsPC-1. PEPT1 was also found to be expressed in Capan-1, Capan-2, CFPAC-1, and SU.86.86 but at a lower intensity to Aspc-1. The role of PEPT1 is to transport dipeptides/tripeptides into the cell using a proton gradient and in order to be functional the transporter needs to be expressed at the plasma membrane. Radiolabeled glycyl sarcosine uptake was done in cell lines positive for PEPT1 protein. Though the glycyl sarcosine uptake was observed in these cells, it was highest in AsPC-1. Our future aim is to check localization of PEPT1 using immunofluorescence.

School: School of Medicine | Campus: Lubbock

MS1-2 QURAISHI, BASEER

Transanal Extraction of a Retained Laparotomy Sponge 8 Months Following Cesarean Section After Transmural Migration into Distal Rectum.

Baseer Quraishi MS1, Vincent Athas MS4, Marsha Perales MD, Catherine Ronaghan MD, FAC

Despite improvements in surgical instrument counts, retained foreign bodies remain a cause of morbidity and even mortality in the surgical patient. Retained foreign bodies made of cotton, such as sponges, are termed gossypiboma or textiloma. Retention of such foreign bodies lead to vague symptomatology often attributed to other conditions. This case report with literature review presents a young female patient with complete transmural migration of a retained surgical sponge with subsequent transanal extraction. Initial presentation was characterized by vague symptoms resembling chronic urinary tract infection. After 8 months, abdominal radiograph was obtained which demonstrated a retained sponge in the gastrointestinal tract. Bowel wall was intact. The patient was scheduled to consult surgery but presented to the ER with rectal pain and the sponge was transanaly removed without complications. Retained foreign bodies remains a rare but important causes of long term sequelae to surgical procedures.

School: School of Medicine | Campus: Lubbock

MS1-2 RAMZANALI, SALEENA

Chagas Disease in Texas

Saleena Ramzanali, Jordan McKinney, Fatma Levent MD

BACKGROUND: Chagas disease is spread by a parasite, Trypanosoma cruzi, that is transmitted via exposure to feces of infected bugs succeeding bug bites, blood products, and organ transplants. Chagas disease is endemic in 21 Latin American countries, and due to the migration of people from endemic areas to non-endemic areas the concern for Chagas disease is growing worldwide. Studies estimated 23 million people in the United States were born in Mexico, Central or South America, and estimated 300,000 people infected with Chagas Disease living in the United States. Furthermore, 48 of 97 Texas counties were found to have T. cruzi ,Äì infected vectors.

OBJECTIVE: The objective of this study was to assess existing academic literature regarding Chagas disease in Texas.

DESIGN/METHODS: A literature search was done on PubMed to find studies that evaluated the prevalence of Chagas disease in Texas. A search was done on Medical Subject Headings (MeSH) database with terms of Chagas disease, Texas, and prevalence.

RESULTS: 15 studies met our inclusion criteria, but only 7 articles investigated the human population. Studies identified Texas as a high-risk area due to the percentage of residents living in poverty and the number of foreign-born residents. Studies suggested that areas along the Texas-Mexico border as well as Texas cities such as Dallas, Houston, and San Antonio have high prevalence of T. cruzi in screened blood donors. Only one study was found to have information about prevalence in West Texas.

CONCLUSIONS: Our review suggested that the presence of Chagas disease in Texas is a known public health concern, but areas without high population densities, such as the majority of West Texas, have not been investigated regarding Chagas disease. More studies are needed in order to assess the prevalence of Chagas disease in the entire state of Texas, especially in high risk populations.

School: School of Medicine | Campus: Lubbock

MS1-2 RIVERA, ELSY

Carbidopa, A Target Drug with Possible Immune Modulatory Properties

Elsy Rivera

Carbidopa is a drug that is currently in use in conjunction with DOPA decarboxylase for Parkinson's disease. On its own, Carbidopa has shown promising results in treating pancreatic cancer and experimental autoimmune encephalitis in mice. Not surprisingly, Carbidopa has worked to delay Type 1 diabetes, yet another example of an autoimmune disease.

Although the mechanism by which Carbidopa functions to alter the immune system remains elusive, the goal of the project is to elucidate the mechanism by which Carbidopa halts autoimmunity. Mouse dendritic cells (cell line DC 2.4) were used to determine Carbidopa's ability to suppress the immune system. To find whether Aryl hydrocarbon Receptor activation or iron chelation are responsible for immunosuppressive effects, both of these pharmacological functions of Carbidopa will be tested.

During the course of this experiment, Carbidopa treated cells in intervals of 3 and 6, hours with subsequent immunostaining, were assessed for AhR translocation to the nucleus in order to see if Carbidopa is affecting AhR activation in this case.

The measured mRNA levels of Cyp1a1 (AhR target) using RT-PCR were of very low concentrations in mouse dendritic cells to see any results. Our cDNA was built from the incubation of Carbidopa in intervals of 3 and 6 hours along with a control group. Other primers that are AhR targets are currently under investigation to indirectly test whether AhR is upregulated or activated. One of said primers, SLC7a5, is showing encouraging results as of yet.

As a future project, after Carbidopa's effect on AhR is established in dendritic cells, we will use AhR antagonists to see whether IDO1 expression and Treg expression are halted. Concurrent with this experiment, Carbidopa's iron-chelation properties will be tested using desferoxamine to compare the effects of Carbidopa on dendritic cells. Results from this study will aid in the treatment and improvement of autoimmune disease management.

School: School of Medicine | Campus: Lubbock

MS1-2 SANKOORIKKAL, NIKI

MOS Clinical Applications for NBME: Review with ESP Practice

Nikita Sankoorikkal, John Pelley, MBA, PhD

Standardized testing in medical school, including the NBME exam (National Board of Medical Examiners) and USMLE Step 1 (United States Medical Licensing Examination) assesses critical analysis skills by presenting questions in the form of clinical case vignettes. This format assesses integrative thinking, a skill emphasized by AAMC's list of Entrustable Professional Activities for students to demonstrate prior to residency. Integrative thinking is also the foundation of the Question Analysis method from the Expert Skills Program (ESP), which encourages students to analyze rationales for both correct and incorrect answers.

Performance outcomes of Question Analysis have proven to be successful in Clinically Oriented Anatomy, based on personal communication. The goal of this project is to evaluate this method in Major Organ Systems (MOS). Teaching students how to analyze questions effectively will lead to increased use of this active learning method. A comprehensive review module correlated to MOS content will be provided to voluntary students to prepare for the NBME final. The module provides a concise review of major clinical concepts relevant to each analyzed question. Analysis of the question stem and of each answer is included, guiding students in learning the Question Analysis method. Assessment of all answers promotes interactive effective learning by honing students' ability to break down questions and integrate thinking from clinical correlates reviewed earlier.

Data will be collected through administration of a survey designed to assess students' attitudes and perceptions of the module. We will evaluate their expectations regarding application of this method to future courses and its contribution to their critical thinking abilities. By guiding students in learning and practicing integrative thinking, this module aims to provide students with skills needed for higher order reasoning required for the MOS NBME, USMLE, and decision-making as future physicians.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

MS1-2 SCARBROUGH, KIRSTEN

Approaching Sexual Health at a Religious Institution

Kirsten Scarbrough

Sexual health, particularly at religious institutions, can be a highly sensitive and controversial topic. In the Fall of 2018, Abilene Christian University hosted its 112th Summit event with the theme of Wholeness in a Broken World: Together through the Power of the Spirit. Summit is a religious-based program designed to provide education to the Abilene community, primarily the university students, which allows an individual to grow in their spiritual walk by addressing real-world issues. One area of wholeness the university focused on was "Sexual Wholeness in a Broken World." The Summit committee wanted to address the topic of sexual wholeness in a respectful manner and be a part of promoting a safe environment for discussion in the religious institution. Goals included creating introductory videos to topics and a handout which provided local resources that students could access. A coffee shop setting created a familiar environment for students where videos on 7 topics were introduced at a self-guided pace. Topics included Staff Conversations, Singleness, Married Couples, LGBT+, Pornography, Sexual Assault, and Human Trafficking. An introductory and conclusion video were also provided for everyone to watch as well. After watching the videos, individuals were asked to fill out a survey, participate in a prayer wall if they wanted, and given a "menu" filled with campus and local resources. Overall, there were 42 participants in The Dwelling Place of which 32 had participated in surveys. Overall, there was a recognition of the student's need for sexual health and wholeness education. This was just one step to gradually overcoming barriers. Similar conversations must be had to address sexual health in primarily college students at religious institutions in a way that is respectful not only to students but honoring the University's values as well.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

MS1-2 SETTERQUIST, HANA

The effect of mild, chronic sleep restriction on kidney function

Hana Setterquist, Marie Pierre St-Onge

Background: Observational evidence suggests a relation between short sleep duration and chronic kidney disease. However, there is little experimental evidence on the effects of sleep on kidney function in healthy individuals.

Objective: To evaluate the effect of chronic, short sleep duration on glomerular filtration rate.

Methods: Thirty-one healthy, normally sleeping (7-9h/night) participants without chronic kidney disease (CKD) or diabetes (20 women) were randomized to 6 wk of habitual sleep (HS) or sleep restriction (SR= HS -1.5 h) in a crossover outpatient design. Kidney function was measured using estimated glomerular filtration rate (eGFR) at baseline and endpoint of each sleep phase.

Results: After 6 wk of chronic, mild SR, eGFR was 123.9 +/- 19.4 mL/min/1.73m^2 as compared to 120.8 +/- 18.4 mL/min/1.73m^2 after 6 wk of HS (p=0.155). There was no significant difference in change from baseline in SR, -0.7 +/- 17.3 mL/min/1.73m^2 as compared to HS, -4.3 +/- 12.7 mL/min/1.73m^2 (p=0.345). When stratified for sex, age, and BMI, a significant difference was seen between endpoints in women and in participants >30 years of age. For women only (n=20), endpoint eGFR in SR was 128.3 +/- 17.3 mL/min/1.73m^2 as compared to 122.4 +/- 21.3 mL/min/1.73m^2 in HS (p=0.049). However, there was no significant difference in change from baseline in SR in women, 0.3 +/- 12.2 mL/min/1.73m^2 as compared to change from baseline in HS, -5.4 +/- 14.1 mL/min/1.73m^2 (p=0.267). In participants >30 y (n=12), eGFR after SR was significantly higher than after HS (126.9 +/- 20.3 mL/min/1.73m^2 versus 119.5 +/- 20.2 mL/min/1.73m^2, respectively) (p=0.049). For participants >30 y, there was a trend for an increase in eGFR from baseline with SR relative to the reduction observed with HS (5.5 +/- 18.8 mL/min/1.73m^2 versus -3.9 +/- 11.4 mL/min/1.73m^2, respectively) (p=0.080).

Conclusion: Mild sleep restriction did not have a significant effect on kidney function in healthy individuals.

School: School of Medicine | Campus: Lubbock

MS1-2 SHABANEH, OBADEH

Gender Differences in Prevalence of Myocardial Infarction in Rural West Texans

Obadeh Shabaneh MPHc Aamrin Rafiq BSc Drew Rasmussen MPHc Summre Blakely MDc Hafiz Khan PhD Lisaann Gittner PhD and P Hemachandra Reddy PhD

Heart disease is the leading cause of death in the United States. Incidence rates of myocardial infarction (MI) in rural West Texas signify a lack of effective, risk-specific prevention programs. The purpose of this study was to identify gender-specific risk factors for MI in rural West Texans as well as identify the nature of the distributional pattern of risk parameter gender differences. Hospital patient data for those with and without a history of MI were obtained from the Project FRONTIER (Facing Rural Obstacles to Healthcare Now Through Intervention, Education, and Research) database, which aims to observe the long-term impact of a variety of chronic diseases in rural West Texas counties. We used statistical software, such as SPSS, R, and WinBUGS to detect and understand the nature of MI risk factors. Statistical methods like t-tests, Chi-squared, logistic regression, and a Bayesian approach were utilized to analyze data. Additionally, to reduce multicollinearity, we conducted correlation analysis among independent variables and removed variables that had variance inflation factors (VIF) greater than 3. Various MI significant risk factors were obtained for both males and females. For females, they were systolic blood pressure ($p = 0.002$), diastolic blood pressure ($p = 0.004$), pulse ($p = 0.015$), and smoking ($p = 0.002$). Male risk factors included glucose ($p = 0.022$), age ($p = 0.050$), body fat ($p = 0.034$), and smoking ($p = 0.017$). The mean risk parameter followed a normal distribution while the precision parameter depicted skew for both genders. Since gender-specific differences in MI risk factors exist, incorporating such variables can guide relevant policymaking to reduce MI incidence in rural West Texans. Since smoking is a risk factor for both genders, we recommend population-based epidemiologic research to estimate the potential benefit of targeted health care and public health efforts within rural West Texas communities.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

MS1-2 SMITH, NICHOLAS

Water Softener Combinations Promote Growth of Pseudomonas

Cody Fell, Dr. Kendra Rumbaugh, Nicholas Smith

Pseudomonas aeruginosa is an opportunistic pathogen that has a prominent role in nosocomial infections. It's success as an opportunistic pathogen is greatly enhanced by its ability to make biofilms, which are polysaccharide-rich structures that surround and protect the bacteria. Patients that are immunocompromised or have other underlying issues commonly become infected with this organism. Hospital staff have procedures in place to eradicate bacteria throughout the hospital in order to prevent nosocomial infection, but despite these efforts, many patients still become infected P. aeruginosa. We have seen persistent high levels of P. aeruginosa infections at our institution (TTUHSC and UMC), which exceed national levels. Our hypothesis for this study was that the increased rates of P. aeruginosa infections are at least in part due to the type of water softeners used by the city and UMC. Specifically, we propose that chloramine, used by the city, and phosphates, used by the HSC, may promote biofilm growth and support the persistence of P. aeruginosa. By testing the growth of P. aeruginosa biofilms in vitro, we observed that the presence of both a phosphate and nitrogen source promoted the growth of biofilms. Our results support current efforts being made by the institution to alter water-softening strategies.

School: School of Medicine | Campus: Lubbock

MS1-2 STEED, JOANNA

Implementing Audio Study Aid to Help Stimulate Learning

Joanna Steed, Greg Brower, DVM, PhD, and Dan Webster, PhD

First-year medical school students at Texas Tech University Health Science Center must complete a block entitled “Major Organ Systems” (Systems Physiology). Throughout this course, they are expected to integrate previous knowledge with new information. They must also participate in several additional activities that include ultrasound and Emergency Department Simulations. Due to the vast amount of information needed to study, many students find it difficult to find time to learn and integrate the information due to external factors such as long drives to school or the need to travel back home periodically. Therefore, audio segments were made through a free recording service, Audacity ¬Æ, to provide a way to study “on the go.” Each audio is about fifteen minutes in length and provides high yield information, that students can listen to in their own time. The set-up of each audio starts with a question, then discusses high yield topics from lecture, and finally discusses the initial question’s correct answer. The audio is self-paced with the options to speed up the content or pause when necessary. In order to determine the effectiveness of audio learning, the students will be given a questionnaire after using the audio segments. The plan is to provide a few audio samples to a beta group during the renal unit, and then make more available for the students in the upcoming years. This new learning modality is predicted to improve learning during the Systems Physiology Block.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

MS1-2 STEWART, CALEB

Diabetes Distress and Socioeconomic Factors: A Cross Sectional Survey in West Texas

Caleb Stewart, David S. Edwards MD

Diabetes distress is a distinct psychological diagnosis associated with living with type two diabetes, and consists of emotional burden, physician-related distress, regimen-related distress, and interpersonal distress. Diabetes distress has been clinically associated with poor glycemic control and self-care, with estimated prevalence in studies ranging from 18-36% of patients. In conjunction with surveying other social determinants of health, we used seven questions from the Diabetes Distress Screening Scale to determine if there was any correlation between socioeconomic factors such as a lack of transportation or employment/income, demographic data, and control of diabetes. We hypothesized that the prevalence of diabetes distress would be increased in patients with lack of reliable transportation and patients of low socioeconomic status. The research design was a cross sectional study in which a survey in Spanish or English was administered by medical students at ten clinics across the state of Texas. Inclusion criteria were patients over the age of 18 with type 2 diabetes diagnosis. Statewide analyses are pending, as data is continuing to be collected until n is sufficient for a measure of validity. Local data (n=18, means age 59.7, 50% female) showed: 39% of patients reported moderate to severe regimen related distress; 44% reported moderate to serious emotional burden, 0% reported moderate to serious physician-related burden; 17% reported moderate to severe interpersonal distress. 50% of patients had uncontrolled diabetes (HgbA1C>9). Overall, 67% of patients with uncontrolled type 2 diabetes responded yes to at least one measure of diabetes distress, but no patients had transportation issues. Diabetes distress is associated with adverse effects on patient outcomes. With increased awareness of this diagnosis, healthcare providers can be more ready to acknowledge patient distress, and help ameliorate it.

School: School of Medicine | Campus: Lubbock

MS1-2 SURYAVANSHI, JOASH

Age-Appropriate Pediatric Sports Patient-Reported Outcome Measures and Their Psychometric Properties: A Systematic Review

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Background: There has been an increase in clinical studies focusing on physically active children and adolescents. These studies include investigations of patient reported outcome measures (PROMs). While the use of PROMs in pediatric orthopaedics has been increasing, PROMs are often inappropriately applied to study populations in whom they are not specifically validated. The purpose of this study was to establish a comprehensive list of pediatric and adolescent-validated PROMs and catalog their psychometric.

Methods: A systematic review of articles in PubMed, Embase, and Cochrane was performed to identify articles developing and validating PROMs appropriate for use in pediatric sports medicine research. The inclusion criteria were: age <18 years old, the use of surveys and questionnaires, and the presence of sports-related injuries. The psychometric properties of included PROMs were entered into an electronic database.

Results: Our search strategy identified a total of 14,708 unique articles. One-hundred and thirty-nine studies (0.9%) were included in the final data analysis. Forty-seven distinct PROMs were identified, as well as 160 cross-cultural adaptations. While all PROMs were validated in physically active subjects, only 12 (26%) measures were specifically validated in active children. Thirty (64%) PROMs were HRQoL measures, 13 (28%) were psychosocial measures, and 4 (9%) were activity scales. No studies validated PROMs for use in wrist/hand injuries and only one PROM each was valid for hip, back/spinal injuries, and foot and ankle injuries in pediatric sports.

Conclusions: This systematic review yielded 47 unique PROMs reliable and valid for use in pediatric and adolescent sports medicine. This study unifies clinicians and researchers in using age-appropriate measures while also identifying areas that are still in need of appropriate PROMs for young athletes, allowing for more effective research and patient care.

School: School of Medicine | Campus: Lubbock

MS1-2 THOMPSON, CHRIS

Incidence of Depression in Medical Training: a longitudinal study

Christopher Thompson, James Bunch, Paul Duggan, Allison Perrin

Medical students and residents are faced with substantial academic, psychological, and existential stressors during and after medical school. Resultantly, it has been previously shown that medical students are at an increased risk of developing depression as well as feelings of burnout relative to the general population. Additionally, prior studies have suggested that students' mental health declines once beginning medical school and typically remains reduced throughout medical training. This phenomenon may lead to an increased risk of adverse outcomes personally and in the context of medical training and physician retention. It is therefore prudent to study the prevalence of symptoms and incidence of depression among students across the years of medical training. We are conducting a longitudinal observational study to evaluate the incidence of sadness and depression among medical school students, both undergraduate and graduate, at Texas Tech University Health Science Center School of Medicine, across multiple years using self-reported data from the PHQ-9 questionnaire. All data will be statistically analyzed using STATA 13. It is expected that there will be a significant difference in the incidence of depression with respect to time. Future research will focus on the utilization of this difference in the development of targeted interventions to reduce symptoms of depression and burnout.

School: School of Medicine | Campus: Lubbock

MS1-2 TRAN, JAMES

Screening for Diagnostic Markers of

James Tran, Hemachandra Reddy, Subodh Kumar, Nnana Amakiri, Aaron Kubosumi

Alzheimer's disease,the most common cause of dementia, is caused by progressive neurodegeneration of the brain leading to consequences such as but not limited to: memory loss, decreasing cognition, and changes in personality and behavior. Key histologic findings in post-mortem AD brain samples are amyloid plaques and neurofibrillary tangles consisting of denatured tau. It is projected that AD costs in the United States alone will total to an estimated $277,000,000,000. Currently, AD is a diagnosis of exclusion as there are no methods of detection to confirm AD other than post-mortem brain tissue samples. Additionally, there is no strong evidence for a prevention or treatment for AD. As such, microRNA are brimming with potential not only as a probable diagnostic tool for AD and many other diseases but also as a therapeutic mechanism which may be able to combat AD. This group has purified mRNA from 4 wild-type and 4 tau-pathology mice cerebral cortex and hippocampus samples for real time quantitative PCR analysis to detect the presence of differential miRNA upregulation or downregulation between healthy control and AD mouse model brains. Specifically, presence or absence of miR-125b, miR-34a, miR-219, miR-9, miR-206, miR-146a, and miR-15/107 may elucidate more information as to how tau becomes hyperphosphorylated and aggregates into tangles in AD and may shed information into mechanisms which can be upregulated or downregulated in order to relieve or prevent the symptoms and progression of AD.

School: School of Medicine | Campus: Lubbock

MS1-2 TURNER, AUSTIN

Alternative Lengthening of Telomeres: Frequency of a Possible New Therapeutic Target

Austin Turner

Immortalization is a key to cancerous transformation. Telomerase is often expressed to achieve this, preventing the loss of DNA material after multiple rounds of mitosis. The Alternative lengthening of telomeres (ALT) pathway is a method of immortalization utilizing non-chromosomal circular DNA molecules to replicate and arrange telomeric DNA (C-Circles) rather than telomerase. ALT can present insensitivity to treatment due to lacking telomerase and a high degree of DNA damage tolerance, but may present new targets for therapy. This project intended to identify the presence of ALT in patient derived cell lines, for use as research models, and in patient tumor samples to elucidate the clinical frequency of ALT.

DNA was extracted from frozen cell pellets as well as from patient tissue samples, and run in a PCR using a bacterial circular DNA polymerase to amplify telomeric DNA contained in C-Circles. The results were assessed using QT-PCR against established ALT positive and negative controls. Samples were also investigated for telomerase expression using RT-PCR for telomerase mRNA, and telomere length, using QT-PCR. ALT positivity was determined by the presence of C-Circles at greater than 1/3 of positive control, telomerase negativity, and a high degree of telomere content.

The cell study included 286 cell lines and found positivity in 1 breast, 3 colon, 1 lung, 3 lymphoma, 1 myeloma, 4 osteosarcoma, 1 ovarian, 7 neuroblastoma, 3 rhabdomyosarcoma, and 1 leiomyosarcoma lines. The patient study has run 53 samples of colon, PNET, and pancreatic cancers, finding 1 positive PNET.

These results show that while ALT is rare, it can exist in many cancer types, may be more prevalent that thought, and the estimate of prevalence from the cell study may underestimate the true prevalence as ALT cancers often do poorly in culture. Cell lines and patient samples continue to be screened, and work has been done to extract DNA from patient samples for eventual screening.

School: School of Medicine | Campus: Lubbock

MS1-2 UMELO, JONATHAN

The role of Sm-p80-specific antibodies in protection against Schistosoma mansoni challenge infection in mice

Jonathan Umelo1,2, Adebayo J. Molehin1,2 and Afzal A. Siddiqui1,2

Schistosomiasis remains a major global health issue caused by parasitic helminths belonging to the genus Schistosoma. There are 3 major schistosome species that can cause infection in humans. Schistosoma mansoni, the major cause of schistosomiasis in Africa and South America, will be the focus of this study. S. mansoni lives in fresh water snails. The cercariae (infectious form) emerges from the snail and contaminates fresh water. The cercariae penetrates the skin of individuals who come in contact with the contaminated water leading to intestinal disease. Over 240 million people are estimated to be currently infected worldwide with the majority being school-aged children. Current control measures centered on mass drug administration of praziquantel are inadequate due to lack of sustainability, inadequate coverage and sustained re-infection rates. Hence, there is an urgent need for the development of an effective schistosomiasis vaccine for long term protection. In addition, experts believe that elimination of schistosomiasis is only feasible through an integrated approach combining current control measures with an effective schistosomiasis vaccine. Previous vaccine efficacy studies by our group have shown that the large subunit of Schistosoma mansoni calpain, Sm-p80, conferred immune protection against S. mansoni infections in rodents and non-human primate models of infection and disease. A balanced Th1/Th2 immune response in immunized animals are thought to be associated with immune protection against schistosomiasis. However, our understanding of the mechanisms involved in Sm-p80-mediated immune protection is limited. In this present study, we evaluated the role(s) of passively-transferred Sm-p80-specific antibodies in vaccine-mediated immunity against S. mansoni infections in C57BL/6J mice. We report a significant worm burden reduction of 53.7% ($p=0.034$) in experimental mice compared to their control counterpart. We also observed moderate reduction in liver egg burden (36%) and intestine egg burden (10%) demonstrating improved efficacy of Sm-p80-specific antibodies. Data from cytokine expression profiling shows that Th1-specific cytokines, IFN-g, IL-2 and TNF-α, are associated with the protection observed. Overall, our study showed that Sm-p80-specific antibodies play an important role in vaccine-mediated protection against schistosomiasis.

School: School of Medicine | Campus: Lubbock

MS1-2 WAGNER, CLAYTON

Using Systematic Oral Care to Prevent Hospital-Acquired Pneumonia in Non-Mechanically Ventilated Patients: A Preliminary Study

Clayton Wagner, Brandon Bradley, Alec Egan, Clarissa Ramirez, Elmira Ahnood, Maricela Chavez, Cynthia Jumper, MD, MPH

In March of 2015, a research article was released which showed significant reductions in Hospital Acquired Pneumonia (HAP) rates over a two-year period following implementation of a simple oral hygiene protocol in admitted non-ventilated patients. A series of similar studies have been performed in a variety of hospital settings in the years since and have yielded similar results. This basic element of care appears to make a significant impact on HAP rates, though its role is not definitive. This study sought to determine HAP rates among admitted patients at UMC in Lubbock, TX and to advocate for policy changes, if warranted. Our group approximated UMC's HAP rates using semiannual American College of Surgeons (ACS) NSQIP reports, as well as MedMined quarterly nosocomial infection marker (NIM) scorecards from January 2015 to April 2017. ACS guidelines for the avoidance of respiratory complications and primary literature were compared with UMC policies. Using the aforementioned resources, a new policy for systematic oral care in non-ventilated patients was then produced. We determined that from January 2015- April 2017 UMC had rates higher than NSQIP expected rates for HAP. NIM scorecards showed that HAP represented approximately 20% of the total recorded nosocomial infections at UMC over the same time period. Additionally, there was no policy for routine oral hygiene for admitted, non-ventilated patients. Our group brought these results to the attention of UMC's administration and then produced an oral care policy which was ultimately approved by the surgical ICU nursing unit-based council and was subsequently made into a hospital-wide protocol. HAP is a significant cause of morbidity and mortality nationally. Recent studies have shown the connection between routine oral care and the avoidance of HAP in non-ventilated patients. We hope the implementation of our oral care protocol will have significant influence on HAP rates among patients at UMC.

School: School of Medicine | Campus: Lubbock

MS1-2 WAGSTAFF, RACHEL

Accuracy of Spot,Ñ¢ Vision Screener in Detecting Refractive Errors in Adults

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Introduction: Refractive errors are among the most common causes of vision impairment worldwide. Millions of people lack access to standard equipment needed to detect and correct these errors. The Spot,Ñ¢ Vision Screener (SVS) is used to accurately detect refractive errors in children, but has not been evaluated for use with adult patients. The purpose of this study is to evaluate the accuracy of the SVS as a quick, portable method to measure refractive errors among adults.

Methods: Adult patients referred to Bascom Palmer Eye Institute,Äôs tertiary clinic between July 2017 and February 2018 were screened to participate. A Bland-Altman analysis was used to assess the level of agreement between the refractive error measurements of the SVS and the Retinomax K-plus3 (RKP) autorefractor of the right eyes. A range of agreement was defined as mean difference ¬± 2 standard deviations.

Results: 173 participants (54% female) with an average age of 51.6+19.1 years were included. The mean difference of spheric equivalent (SE) between two methods was -0.16+1.0 D. Strong agreements were found between values of sphere and cylinder measured by these two methods, except in patients with high myopia (above -5.00 D). The SVS was unable to capture measurements for 16 out of 35 pseduophakic patients.

Discussion: The SVS showed good agreement in a general population of adults with various eye conditions, and could be a good first line measurement to detect refractive errors in adults living in rural or remote areas.

Conclusion: The SVS may be used as a first measure to detect refractive errors in adults, with the exception of patients who are pseudophakic or who have myopia above -5.00 D.

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School: Graduate School of Biomedical Sciences | Campus: Lubbock

MS1-2 WALTERSCHEID, BROOKE

SOX-10 Staining in Dermal Scars

Behrens, E, Boothe, W, D'Silva, N, Walterscheid, B, Watkins, B, Tarbox, M

Background: Positive staining of SOX10 and the S100 protein are often used in the evaluation of challenging melanocytic neoplasms including melanoma in patient samples. SOX-10 positivity of non-melanocytes in re-excision specimen could complicate the evaluation of invasive melanoma, with an invasive desmoplastic component. Therefore, quantifiable data regarding the positivity of SOX-10 in scars will help dermatopathologists better identify false positive staining. Methods: A retrospective analysis was performed on 50 re-excision specimens from 2013 to 2017, with a diagnosis of squamous cell carcinoma (SCC) or squamous cell carcinoma in situ (SCCIS). Blocks of re-excision specimens containing scars were stained with SOX-10; results were evaluated by a board-certified dermatopathologist. The sum of the five highest numbers of highpower field (HPF) counts as a proxy for "SOX-10 stain factor," and cell morphological features were analyzed. MART-1 and CD68 immunohistochemical staining were performed to study possible lineage of these SOX-10 positive cells. Results: All 50 specimens demonstrated varying degrees of SOX-10 positivity for histiocytes. SOX-10 positive histiocytes were present in 86% of re-excision scar tissue, of these 71.3% had spindle- or angulated shaped nuclei, and 61.8% had nuclear sizes larger than typical lymphocytes (7 ÔÅ≠m). Within the same area of scars, CD68 staining found within the scar is floridly positive, where as MART-1 staining was overwhelmingly negative. Conclusions: This study illustrates a potential diagnostic pitfall of using SOX-10 to evaluate re-excision specimens of melanocytic neoplasms and also suggests a previously undescribed staining pattern of SOX-10 positive cells in scars that are not melanocytes. We postulate that such SOX-10 positive cells may represent a small fraction of histiocytes routinely found in scar tissue.

School: School of Medicine | Campus: Lubbock

MS1-2 YETTER, THOMAS

Integrating pathological radiographs to augment medical student learning experience in the Clinical Oriented Anatomy block

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The Texas Tech University Health Sciences Center School of Medicine curriculum starts with the 10-week block of clinically oriented anatomy. During this block, medical students learn about human anatomy through lectures and laboratory dissections. Additionally, students are provided with normal radiograph images online and are expected to interpret these radiographs in both the laboratory and written in-house exams. However, this block does not incorporate pathological radiograph images. At the end of the course, the students take a standardized anatomy exam through the National Board of Medical Examiners (NBME). Through personal interactions and end of the block reviews, students reported that they felt unprepared for certain questions on the NBME exam that use pathological radiographs that they have not seen before, causing stress and anxiety among the students. Based on this information, we hypothesize that providing online instructional modules on normal and pathological radiology will enhance the student learning, remove the stress and anxiety endured due to unseen pathological radiographs, thereby augmenting student performance on board exams. To achieve this goal, we have selected high yield clinical correlates with distinct radiological features that may be tested on the NBME or the United States Medical Licensing Examination. In the modules, we will present the relevant clinical information and then teach the normal and pathological radiology for each clinical correlate. These modules will be self-paced with the option to start and stop in the event of interruptions. These modules will be available to the incoming class as a part of their independent study sessions. The effectiveness of these modules will be determined by comparing the student performance on board exams to the previous years. Additionally, surveys assessing student perception on the effectiveness of the modules will be used.

School: Graduate School of Biomedical Sciences | Campus: Lubbock

MS1-2 YOUNG, JONATHAN

Differentiation of Patients with Vestibular Hypofunction vs Normal Subjects Using a Low Cost Small Wireless Wearable Gait Sensor

Jonathan H Young and Tam Q Nguyen and Amanda Rodriguez and Steven Zupancic and Donald YC Lie

Balance disorders present a significant healthcare burden due to the potential for hospitalization or complications for the patient, especially among the elderly population when considering intangible losses such as quality of life, morbidities and mortalities. This work is a continuation of our earlier works where we now examine feature extraction methodology on Dynamic Gait Index (DGI) tests and machine learning classifiers to differentiate patients with balance problems versus normal subjects on an expanded cohort of 60 patients. All data was obtained using our custom-designed low-cost wireless gait analysis sensor (WGAS) containing a basic inertial measurement unit (IMU) worn by each subject during the DGI tests. The raw gait data is wirelessly transmitted from the WGAS for real-time gait data collection and analysis. Here we demonstrate predictive classifiers that achieve high accuracy, sensitivity and specificity in distinguishing abnormal from normal gaits. These results show that gait data collected from our very low-cost wearable wireless gait sensor can effectively differentiate patients with balance disorders from normal subjects in real-time using various classifiers. Our ultimate goal is to be able to use a remote sensor such as the WGAS to accurately stratify an individual's risk for falls.

School: School of Medicine | Campus: Lubbock

MS3-4 ABRAHAM, HELAYNA

Pancreatitis versus Peritonitis: It is all in the gut feel

Helayna Abraham, Tarek Naguib, MD

Acute pancreatitis is an inflammation of the pancreas that is diagnosed by the presence of at least 2 of the 3 common criteria encountered in this condition: epigastric pain, computed tomographic (CT) findings, and elevation of amylase and lipase of at least 3 times the upper limit of normal value. Despite well-defined criteria the diagnosis of acute pancreatitis can be challenging due to the variation of diagnostic criteria from a person to another and the several conditions that can mimic its presentation. We report a case of acute pancreatitis that was initially diagnosed as peritonitis in person with End-stage renal disease (ESRD) on chronic cyclic peritoneal dialysis (CCPD) which has been previously reported in literature.

School: School of Medicine | Campus: Amarillo

MS3-4 ADAMS, KAKA

Scrupulosity-type OCD symptoms in a Child with Pediatric Acute Neuropsychiatric Syndrome (PANS) Following Acute Otitis Media (OME)

Adams KL, Kureishy MK, Ahmed AF, Chalia A, Rivera R

Pediatric Acute Neuropsychiatric Syndrome (PANS) is a rare clinical condition characterized by acute onset of OCD, tics, or other psychiatric symptoms due to infection. Scrupulosity-type OCD is characterized by excessive guilt and rumination over one's thoughts and actions, as well as compulsive behaviors such as confessions, prayers or rituals. We present a unique case of scrupulosity-type OCD symptoms caused by PANS following acute otitis media (AOM).

Our patient is a 5-year-old male diagnosed with AOM and prescribed amoxicillin by his pediatrician. The next day he began confessing things to his mother, which caused him great distress. He would whisper in his mother's ear all of the minor and major things that he considered "bad" ranging from wiping his hands on his pants instead of a napkin, to the extreme of homicidal ideation targeted at family members. These intrusive thoughts were confirmed to be ego-dystonic in nature. Due to unremitting symptoms, the parents brought him to medical attention a week later. Rapid strep and anti-DNAse B titers were negative. His family initiated cognitive behavioral therapy at home while awaiting psychiatric evaluation. These techniques focused on eliminating the thoughts through metaphorical examples. Frequency of confessions markedly decreased with these methods by two weeks. However, he developed somatic symptoms and tantrums. At one month, the child's tantrums and somatic symptoms had minimally improved.

Scrupulosity-type OCD has been well documented in adults, at times even drawing debate as to whether it merits its own distinct diagnosis from OCD. A thorough literature review has yielded no documentation of scrupulosity in children (Pubmed) despite multiple anecdotal references online, and no mention of scrupulosity in children caused by PANS (Pubmed). We recommend further investigation into the different presentations of OCD in children as well as the different presentations of OCD caused by PANS.

School: School of Medicine | Campus: Lubbock

MS3-4 ALI, FAHAD

Does Selective Use Of Hepatobiliary Scintigraphy (Hida) Scan, Following Equivocal Non-Diagnostic Ultrasonography In Patients With Acute Cholecystitis, Affect Outcomes

Fahad Ali, BA1, Amir Aryaie, MD1, Eneko Larumbe, PhD2, Mark Williams, MD1, Edwin Onkendi MD1

Introduction: Acute cholecystitis (AC) is diagnosed by characteristic gallbladder ultrasonographic findings (high specificity, low sensitivity). Hepatobiliary scintigraphy (HIDA) may be needed to confirm AC (higher sensitivity and specificity). The aim of this study was to assess the impact of the current selective use of HIDA scan for sonographically equivocal cases of AC on outcomes

Methods: A retrospective chart review of patients treated for AC at our institution (1/2015 to 12/2016) was performed. Patients were divided into 2 groups: the Ultrasound Only group (US-only) and the Ultrasound-HIDA group (US-HIDA). Timing of US and HIDA, and intervention for AC since presentation to emergency room (ER), and their impact on outcomes were analyzed. AC severity was graded per the TG13-Tokyo guidelines.

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Results: A total of 110 patients were analyzed. The 2 groups were statistically similar with regards to age, body mass index, ASA class II, III and IV, extent of leukocytosis at presentation and liver functions test levels at presentation. In the US-only group, diagnostic ultrasound was obtained sooner, [median of 3 (interquartile range, IQR 1.3-8.7) hours] from presentation

School: School of Medicine | Campus: Lubbock

MS3-4 ANDERSON, ERIKA

Contralateral Axillary Metastasis in ER Postive PR Positive Breast Cancer

Erika Anderson and Mary Grace Bridges MD

Contralateral axillary lymph node metastases are an uncommon finding in cases of breast cancer. Here, we report the case of a 61 year old female presenting with a right breast cancer with metastases to the contralateral axillary lymph nodes. The patient received neoadjuvant chemotherapy and a bilateral modified radical mastectomy. Immunohistochemical analysis revealed that the right breast cancer specimen was estrogen receptor (ER) positive and progesterone receptor (PR) positive but human epidermal growth factor receptor 2 (HER2) negative. Similarly, the left axillary lymph node specimen was ER and PR positive but HER2 negative. Further imaging and surgical investigation failed to reveal any evidence of primary cancer in the left breast.

School: School of Medicine | Campus: Amarillo

MS3-4 ARGUE, JAY

Eczema Herpeticum: Recognition and Treatment

Jay (Riley) Argue B.S., MS3 & Robert Alexander B.S., MS3 Mentor: Dr. Naqvi MD

Patients with atopic dermatitis are at risk of developing a secondary viral infection. One of the most severe forms of this secondary infection is with HSV-1 and this is called "eczema herpeticum." Patients taking immunosuppressive agents to treat their atopic dermatitis or other skin pathology are at increased risk of secondary infection. Eczema herpeticum presents with pain and rapidly expanding skin lesions secondary to HSV-1 spread. If the patient has severe eczema, differentiating eczema herpeticum may be difficult.

Case: A 15 year old male presented with a rash that started two days prior. Patient has a history of eczema but states this rash is unlike anything he's ever experienced before. He had moderate eczema at baseline. Two days prior, the patient developed a blistering rash that started on his hands and buttock as diffuse 1 cm pustules with a clear slightly yellow fluid accumulation underneath. They spread from his hands to his trunk and other extremities. Two to three hours after the pustules appeared they began to rupture and began to ooze a clear/yellow fluid.

Conclusion: Atopic dermatitis and other disorders of the skin predispose individuals to eczema herpeticum. A disease caused by the dsDNA virus Herpes Simplex of the family Herpesviridae. This disease is a dermatologic emergency that can lead to blindness and potentially death when misdiagnosed or improperly treated. The most common complication is bacterial superinfection and so an antibiotic regimen should be added, taking care to cover the most common culprit, Staphylococcus aureus. Diagnosis requires an index of clinical suspicion coupled with PCR and culture studies and treatment with acyclovir should be initiated immediately. Any patient presenting with papulovesicular lesions with punched out ulcers should be carefully evaluated for potential infection and treated accordingly.

School: School of Medicine | Campus: Amarillo

MS3-4 ASAD, USMAN

Paraneoplastic Eczematous Eruption Associated With Hodgkins Lymphoma

Usman Asad BS Brett Austin MD Ashley Sturgeon MD Cloyce Stetson MD

Hodgkin's disease (HD) is a common malignant lymphoma. Unlike other lymphoproliferative disorders, cutaneous involvement with HD is uncommon. We present a case of a 28-year-old Caucasian female who presented to our dermatology clinic with an 8 month history of lymphadenopathy of the right supraclavicular fossa, a 2 month history of lymphadenopathy of the right axilla and a severely pruritic eczematous dermatitis. She was initially prescribed antibiotics, but in the ensuing months, she developed a worsening diffusely pruritic rash. Skin examination was significant for multiple nummular eczematous scaly plaques distributed over the bilateral upper and lower extremities, abdomen, and right eye. Two 4mm punch biopsies were obtained of the skin of the left medial arm and left lateral calf. Regular epidermal acanthosis with spongiosis, moderate exocytosis of lymphocytes into the spongiotic epithelium, and a superficial perivascular lymphocytic infiltrate with rare neutrophils were observed. Histological findings were interpreted as a spongiotic psoriasiform dermatitis that was suggestive of subacute to chronic eczema or contact dermatitis. White blood cell count was 8.5 x 109/L, with 81.8% granulocytes and 14.5% lymphocytes, hemoglobin 12.2g/dL, and hematocrit 37.3%. Biochemical studies were within normal limits. A specimen from excisional biopsy of the right supraclavicular lymph node showed classical Hodgkin's lymphoma (nodular sclerosis type) positive for CD15 and CD30. The patient was treated with two cycles of adriamycin, bleomycin, vinblastine, and dacarbazine chemotherapy; her eczema and pruritus resolved after the second cycle suggesting a paraneoplastic phenomenon.

School: School of Medicine | Campus: Lubbock

MS3-4 BAKER, BERNADETTE

The Impact of Step Two Course on Step Two CS Outcomes and Satisfaction

Bernadette Baker

Step 2 CS is a significant component of a medical student's residency application. Residency program directors, in particular family medicine program directors, have cited this exam as being an important factor in both interview invitation and ranking applicants for match. Texas Tech Health Sciences Center School of Medicine students had a decline in performance from a 99% pass rate to a pass rate of 93% over a four-year period. In response, the Family Medicine Interest Group developed a Step 2 CS "crash course" in order to assist in preparation for this exam. Following the completion of the course, an anonymous survey was released in order to assess students' perceptions of the course. A Likert scale with measurements from 1-5 was used to evaluate the efficacy of the crash course and to determine if the course was beneficial to participants. Twenty-two responses were collected after the completion of Step 2 CS. Twenty-one of those respondents had received their scores and of those who had received their score, 100% were satisfied with their CS score. In addition, 54.55% responded that they would incorporate the learned skills into further patient encounters and 90.91% responded that they would recommend the Step 2 CS Crash Course to students preparing for Step 2 CS. Finally, 86.36% reported the course had a positive impact on their Step 2 CS preparation. Based on the results from the survey, it can be concluded that the Step 2 Crash CS course was successful in helping prepare the 2019 class for Step 2 CS. It is hoped that the crash course will continue to improve and expand due to its obvious benefit for students.

School: School of Medicine | Campus: Amarillo

MS3-4 BLAY-TOFEY, MORKEH

Government Political Structure and Gender Differences in Violent Death: A Longitudinal Analysis of Forty-Three Countries, 1960-2008

Morkeh Blay-Tofey, Phillip Marotta, Ph.D, Bandy Lee, M.D., M.Div, James Gilligan, M.D., Kelsey Schuder

Objectives: Little global and longitudinal scholarship exists on the relationship between regime type and mortality on a global level. The purpose of this study is to examine the effect of democracy on violent death rates (homicide, suicide, and combined) by gender (men and women).

Methods: Three measures of democracy were used to quantify regime type. Homicide and suicide rates were obtained from the World Health Organization. Multi-level regression analyses examined associations between regime characteristics and logged rates of homicide, suicide, and violent deaths. Models were adjusted for unemployment and economic inequality.

Results: Nations that scored higher on democracy indices, especially emerging democracies, experienced increased mortality due to violence. Women possessed higher rates of homicide and suicide in democracies compared to men.

Conclusions: Violent deaths appear to be more prevalent even in stable democracies, and women are more affected than men. This overturns the common assumption that democracies bring greater equality, and therefore lower death rates over long-term. Future analyses might examine the aspects of democracies that lead to higher rates of violent death so as to help mitigate them.

School: School of Medicine | Campus: Lubbock

MS3-4 BRADY, REBECCA

Giant Hepatic Cyst: A Case Presentation

Rebecca Brady, Niloy Ghosh, & Izi Obokhare M.D.

Case Presentation: A 28 year-old white female who presented to the hospital with a complaint of abdominal bloating, early satiety, anorexia and associated postprandial discomfort for 1 month. She had a similar episode 2 years prior. A CT scan done at that time showed a hepatic lesion measuring 17.2 cm x 16.5 cm x 12.0 cm in size. It was drained percutaneously by interventional radiology. CT obtained at this time revealed a hepatic mass measuring 19.5 cm x 18.3 cm x 11.9 cm (Figure 1). The mass was interposed between the left lobe of the liver, the stomach, and the body of the pancreas. There is associated mass effect on the liver, the stomach, the pancreas, and the transverse colon. The rest of the history, examination and liver function tests were negative except for a mildly elevated lipase at 165.

Discussion: The most common presentation of a simple hepatic cyst is a small cyst, measuring a few millimeters.1 Hepatic simple cysts are relatively uncommon, presenting in up to 1% of adults. The treatment of hepatic cysts is debated with current recommendations suggesting no treatment if the patient is asymptomatic and the cyst is <4cm. If the cyst is >4cm follow up with imaging studies is recommended at particular intervals to monitor the growth of the cyst. However, in a symptomatic patient with a growing hepatic cyst there is concern for neoplasm. Though not widely accepted, percutaneous drainage of the cyst can be used for diagnostic and therapeutic reasons.2 Various surgical procedures have also been suggested including drainage with or without injection of sclerosing agents, internal drainage with cystojejunosotomy, wide unroofing, and liver resection though there are no prospective studies comparing the various approaches.3,4,5,6. This patient was treated with laparoscopic hepatic cystectomy and the wall of the cyst and aspirate were both negative for neoplastic disease. She was discharged on postoperative day #1 and has been asymptomatic.

School: School of Medicine | Campus: Amarillo

MS3-4 BROGAN, JOSHUA

Acute Pancreatitis with Normal Amylase and Lipase

Austin Lunney, Mousab Diab, Joshua Brogan

Introduction: The diagnosis of acute pancreatitis is classically made clinically, but new technology has made it much easier. Guidelines now say that a patient has acute pancreatitis if they have two out of three criteria: upper abdominal pain, elevated pancreatic enzymes, and radiology showing evidence of pancreatic inflammation.

Case: We report a case of a man who presented to the emergency department with constant upper abdominal pain refractory to over-the-counter pain medication. He received a CT scan in the emergency department which showed fat stranding and inflammation of the pancreas with no evidence of cholelithiasis. His blood lipase and amylase were within normal limits but because he met criteria he was diagnosed with acute pancreatitis. He was given pain medication and was not allowed to consume anything by mouth. He made a full recovery and was released.

Discussion: Acute pancreatitis is a common problem globally. The worldwide most common reason for a patient to be diagnosed with acute pancreatitis is because of cholelithiasis or gallstones. It is important to keep acute pancreatitis in a differential diagnosis when evaluating a patient with upper abdominal pain even without elevated enzymes.

Conclusion: It is important to follow guidelines when evaluating a patient with upper abdominal pain. Even though this patient did not have elevated pancreatic enzymes, with lipase being the most specific test performed for acute pancreatitis, he did meet criteria for acute pancreatitis and was treated effectively.

School: School of Medicine | Campus: Lubbock

MS3-4 BURROUGHS, CHELSEA

Persistent MRSA bacteremia in neonate with pylephlebitis

Chelsea Burroughs, Fatma Levent, MD

While portal vein thrombosis is considered a known complication of umbilical vein catheter (UVC) placement, we describe a case of persistent methicillin-resistant Staphylococcal aureus (MRSA) bacteremia secondary to presumed septic portal vein thrombosis, or pylephlebitis, in a premature neonate in the setting of an MRSA positive umbilicus infection. Although pylephlebitis is a known cause of bacteremia, it is generally associated with gastrointestinal flora, however this is a case associated with MRSA. This case outlines our successful anti-coagulant and antimicrobial treatments with the objective of aiding earlier detection and treatment of similar cases.

School: School of Medicine | Campus: Covenant

MS3-4 BYRD, ALYSSA

Incidental Finding of Right-Sided Aortic Arch

David Foley, MS3^(1), Alyssa Byrd, MS3^(1), Chandralekha Ashangari, M.D.^(2), Muath Alsharif, M.D.^(2), Richard Murray, M.D.^(3)

(1)TTUHSC School of Medicine, (2) Internal Medicine Residency Program, Texas Tech University Health Sciences Center Amarillo, (3) Department of Radiology, Northwest Texas Healthcare System

Introduction: In this case, we explore an incidental finding of Right-Sided Aortic Arch (RAA). RAA is rare and can be associated with cardiovascular anomalies. Aortic malformation beginning in the 4th-7th weeks of embryogenesis is responsible for RAA. Generally, RAA is asymptomatic and found incidentally on radiology. In most cases, no further workup or management is needed. However, in the symptomatic patient, management should be focused on treating the underlying cause.

Case: A 71 year old, white, female with a past medical history of COPD, renal disease, atherosclerosis, inflammatory bowel disease, hypertension, and atrial fibrillation presented with vomiting and diarrhea. She was afebrile, hypotensive (79/40), and reported a cough. A CT of the thorax showed an isolated pulmonary nodule. Incidental Type 2 RAA was also noted. She denied dysphagia, dyspnea, angina, claudication, fainting, and edema. She denied pertinent family medical history. Her surgical history included carotid endarterectomy, appendectomy, and hysterectomy. Her medications included amiodarone, amlodipine, aspirin, clopidogrel, metoprolol, prednisone, and simvastatin. Her physical exam was unremarkable. Chemistry showed a BUN of 26 mg/dL and creatinine of 2.4 mg/dL and urine analysis demonstrated signs of acute kidney failure. She was given fluid resuscitation, and her blood pressure and acute kidney failure improved. She was discharged with a plan to follow up for evaluation of lung nodule.

Discussion: Generally, RAA is found incidentally on radiology and no management is needed. Literature provides examples of exploratory surgeries for mediastinal masses, barium swallows, and other testing on asymptomatic patients with incidental RAA. Our goal is to highlight that minimal management is needed in an asymptomatic patient to help avoid unnecessary procedures and costs.

School: School of Medicine | Campus: Amarillo

MS3-4 CABALLERO, BEATRICE

Open Abdomens with Ongoing Intraabdominal Pathologies Successfully Closed Using a Dynamic Tissue System and Biologic Xenograft

Beatrice Caballero MS, Yana Puckett MD, Michelle Estrada MD, Shirley McReynolds, Robyn E. Richmond, MD, Catherine A. Ronaghan MD, FACS

Introduction: Closure of catastrophic open abdomens (OA) after damage control laparotomy presents many challenges, particularly in complex pathologies that make achieving myofascial closure exceedingly difficult. This case series presents an alternative approach for definitive myofascial closure and accelerated wound healing in the setting of OAs with ongoing intraabdominal pathology. The implantation of Porcine Urinary Bladder Matrix (PUBM) allows for primary skin closure of contaminated wounds.

Methods: 5 patients managed with the ABRA Dynamic Tissue System (DTS) in combination with a PUBM xenograft. PUBM particulate is implanted directly on the myofascial closure. A PUBM 2-layer sheet is then placed subcutaneously utilizing a sutureless technique followed by definitive skin closure. Data was collected on the mechanism of injury, patient presentation, surgical management and patient outcomes via retrospective chart review. All 5 patients presented to our tertiary referral center with emergency general surgery issues or penetrating traumatic injuries. These patients had ongoing complex intraabdominal pathology, including a duodenal stump blowout, anastomotic failures (ileocolonic, colocolonic and hepaticojejunostomy/jejunojejunostomy) and a pancreaticoatmospheric fistula associated with multiple intraabdominal injuries sustained following an abdominal gunshot wound.

Results: Average maximum myofascial gap was 22.8 cm (range:11cm - 29cm). Average visceral extrusion was 9.2 cm (range:4cm ,Äì 13cm). The DTS remained in place an average of 11.6 days (range:8-14 days). Delayed primary myofascial closure was achieved in 5/5 patients (100%) with no fascial dehiscence or surgical site infection (SSI) observed.

Conclusion: This technique essentially eliminated the need for negative pressure wound therapy postoperatively. Utilization of DTS in conjunction with a xenograft combines both mechanical and biologic advantages in definitive closure and complete wound healing.

School: School of Medicine | Campus: Lubbock

MS3-4 CALLIER, KYLIE

Pilot Study to Assess Barriers to Colorectal Cancer Screening in Rural African American Populations

Jefferson Lines MS3, Kylie Callier MS3, David Foley MS3, Dr. Izi Obokhare MD

Previous studies have shown decreased rates of colorectal cancer (CRC) screening in underserved populations, African-Americans, and rural populations. In this descriptive study we aim to elucidate potential barriers to CRC screening for these populations by examining the shared experiences of members of a population who satisfies all three criteria, underserved African-Americans in the rural Texas panhandle.

In an effort to improve the outreach of our own CRC screening program, Get F.I.T. to Stay Fit, we recruited 12 members of an underserved, rural, African-American population to participate in focus group sessions, and relate their own experiences with CRC screening. The focus group consisted of 12 individuals, 6 females and 6 males, and lasted an hour and a half in length. We asked them to identify the barriers to CRC screening they have encountered in the past. The most commonly identified barriers were distrust of doctors, fear of unpleasant experiences when prepping for and undergoing CRC screening, misconceptions about the effectiveness of treatment in improving outcomes, lack of access and transportation, and social stigma regarding the invasive nature of colonoscopies.

While these individual experiences on barriers to CRC screening do not constitute a definitive solution to the problem, they do provide a productive starting point for further research and will be a launching pad for our work involving larger populations of rural African-Americans. By first examining the issue through the perspective of those most affected by it, it is our hope their experiences will help direct future research on CRC screening outreach towards beneficial, evidence-based outcomes.

School: School of Medicine | Campus: Lubbock

MS3-4 CERVERA, JENNIFER

Intractable Abdominal Pain In A 9 Yr Old: A Diagnostic Dilemma

Jennifer Cervera; Ngozi Eboh, MD; Daniel Hurst, MD

9 year old girl presented with progressively worsening severe abdominal pain, vomiting, headache, difficulty walking, and confusion for 3 weeks. At age 5 and 7 yrs, she presented with nearly identical symptoms and was diagnosed with Acute Disseminated Encephalomyelitis (ADEM) each time. After both episodes she returned to baseline without any residual neurological deficits. CSF studies were normal but MRI showed T2 hyperintense lesions in periventricular white matter tract, pons, and brainstem with normal cervical, thoracic, and lumbar spine. High dose steroids were started and then tapered with remarkable improvement. Of note she developed transient bilateral eye pain and blurry vision by day 3 which resolved after 24 hrs. Differential diagnoses included Multiple Sclerosis, Neuromyelitis Optica, and Acute Intermittent Porphyria. Lab results revealed positive oligoclonal bands in CSF, negative APQ4 antibodies, negative anti-MOG antibodies, low porphobilinogen level and negative 24hr urine random ALA analysis.

School: School of Medicine | Campus: Amarillo

MS3-4 COOK, ELIZABETH

The impact of obesity and sex on necrotizing soft tissue infection mortality

Hannah Zhao-Fleming, PhD, Elizabeth Cook, Armand Northcut, Diana Mitchell, Crystal Ike, Kendra Rumbaugh, PhD, Sharmila Dissanaike, MD

Necrotizing soft tissue infections (NSTIs) are rapidly progressive infections of the skin and underlying tissue. Despite aggressive treatment, mortality is still high (~25%). The focus of this study is to determine if obesity is associated with a worsened clinical outcome or prolonged hospital course in NSTIs. We conducted a retrospective chart review of NSTI patients presenting to University Medical Center in Lubbock, Texas from 2010-2017 (88 patients total). All patients had their BMI measured at intake and the decision to include a computed tomography (CT) scan was based on clinical judgement at the time of hospitalization. In patients who received a CT scan during their admission, abdominal fat thickness at vertebral level L4/L5 was measured. We found no association between either BMI or CT fat thickness at L4/L5 with mortality. Additionally, there was no association between our measures of obesity and most of our secondary clinical outcomes, including sepsis, total hospital length of stay (LOS), intensive care unit LOS, and antibiotic usage. There was a strong trend towards an association between increased BMI and development of acute kidney injury during the hospital stay (p=0.055). We also found that females had an increased central obesity (p=0.0279) and they were twice as likely to die from their infections as their male counterparts (27% vs. 15% mortality). With the same care, there are two contributing factors to clinical outcome in infections ,Äì host and microbiology. There may be a sex-based contribution to mortality, possibly linked to females having an increased central obesity, but the results of this study are not conclusive. A larger sample size may reveal certain associations not evident in this study, but host co-morbidities do not play a strong role in determining mortality. This suggests that the microbiology of the wound may play a larger role than previously understood, placing greater importance on identifying the microbes involved.

School: School of Medicine | Campus: Lubbock

MS3-4 COX, BRITTANY

Gender differences in knowledge and attitudes about HPV infection and vaccination among health care providers

Cox, Brittany; Kaur, Maninder; Weiser, Dana; Gomez, Viviana; Nur, Marcela; Levent, Fatma

Background: Human Papilloma Virus (HPV) is the most prevalent sexually transmitted infection worldwide. HPV is known to be the cause of cervical, oropharyngeal, anal and penile cancers. Vaccination is one of the few interventions shown to be effective at preventing possible future development of cancer. Initiation of the vaccine in eligible adolescents has varied among countries, populations, and genders. Effectiveness is likely to be suboptimal without completion of series within the recommended window, which was recently updated. Provider recommendation is one of the most important factors for initiation and completion of HPV vaccination.

Objective: The purpose of this study is to explore gender differences in knowledge and attitudes regarding the HPV vaccination among health care providers at an academic center in Texas.

Design/Methods: After obtaining IRB approval, health care providers were emailed an invitation to a Qualtrics survey regarding their knowledge and attitudes about HPV infection and the vaccine. Statistical analysis was performed with SPSS software version 23. Chi square analysis was used to compare groups, and a p value of <0.05 was considered statistically significant.

Results: No gender differences in knowledge about HPV infection or the vaccine were found among providers. Female providers were more likely to endorse earlier initiation of the vaccine when compared to male providers in both girls ($p=0.014$) and boys (0.006). Additionally, male providers were more likely to believe that once a girl is vaccinated against HPV, she may be less likely to engage in safe sex practices than female providers ($p=0.03$).

Conclusion(s): While providers sampled in the survey stated that they understood the appropriate vaccination guidelines and risks/benefits, provider attitudes and beliefs about the vaccine differed significantly related to the gender of the provider which might might further influence the initiation and completion of HPV vaccination.

School: School of Medicine | Campus: Lubbock

MS3-4 DADASHAZAR, SAMAREH

Chronic Granulomatous HSV Encephalitis in a Child

Samareh Dadashazar, Jovaria Khalid, Daniel Hurst, MD, Roy Jacob, MD, Fatma Levent, MD

Herpes simplex virus (HSV), type 1 and 2 are enveloped, double-stranded linear DNA viruses that infect the sensory nervous system after inoculation through the mucosa or breaks in the skin. Most neonatal infections with HSV are introduced during passage through the birth canal in a mother with active shedding of the virus, but infection can also be acquired transplacentally and postnatally after contact with oral or skin lesions. Encephalitis with HSV classically involves the temporal lobes but in neonates the entire brain can be involved. The clinical presentation includes irritability, lethargy, fever, poor feeding, and seizures within the first few weeks of life. Neonatal HSV encephalitis is typically an acute disease treated with intravenous acyclovir for a total of 21 days followed by prophylaxis until 6 months of age. Rarely, though, neonates have been found to develop a chronic granulomatous disease later in childhood in response to the infection, despite appropriate treatment.

We present a case of a 4-year-old female who is brought to the emergency department at University Medical Center for 1-minute tonic-clonic seizure, worsening right-sided weakness, slurred speech and left-eye ptosis. The patient was born vaginally at term to a mother with no prenatal care who tested positive for methamphetamines during pregnancy. Patient was diagnosed with neonatal HSV encephalitis as an infant leading to acquired right sided cerebral palsy, epilepsy, developmental delays, and recurrent herpes labialis despite appropriate treatment. After admission, extensive workup ruled out an infectious or autoimmune etiology of encephalitis and the patient was subsequently diagnosed with chronic granulomatous HSV encephalitis per magnetic resonance imaging (MRI). Patient was started on initially intravenous followed by mouth acyclovir. She has been on therapy for three months with clinical improvement.

We present this case to bring awareness and investigate potential treatments.

School: School of Medicine | Campus: Lubbock

MS3-4 DANAJ, ALEXANDER

Never-ending Nipple Discharge

Alexander Danaj, Haley Belt

Introduction: Galactorrhea is the spontaneous flow of milk from the breast, unassociated with childbirth or nursing, and can affect men or women for a variety of reasons. The most common cause for galactorrhea is idiopathic, meaning no identifiable cause is identified. Approximately 35% of galactorrhea is idiopathic. In these cases, prolactin may be found to be elevated (hyperprolactinemia) for an unidentified reason, or prolactin can be normal (euprolactinemia), such as in this patient. We presents an unusual case of a patient with euprolactinemic galactorrhea.

Case Report: Patient is a 34 year-old G5P3023 who presents in 2018 with a 5 year history of bilateral galactorrhea. Lactation ceased after she stopped breastfeeding her last child in 2011. Two years later in 2013 galactorrhea began. She had a detailed workup including TSH, prolactin, pituitary MRI, and mammogram, all of which were normal.

Discussion: The initial workup for galactorrhea is b-HCG, prolactin level, TSH, and renal function tests. In this patient, who did not take any medications, the b-HCG, TSH, and prolactin all returned normal. Brain MRI was normal supporting the absence of a pituitary adenoma. Therefore, she was diagnosed with idiopathic euprolactinemic galactorrhea. Most research has been done on patients with idiopathic hyperprolactinemic galactorrhea, however, one hypothesis for euprolactinemic galactorrhea is that prolactin receptors in the breasts are hyper-sensitive and react more to a normal level of prolactin in the body.

Conclusion: In idiopathic galactorrhea, since there is no identified underlying cause to treat, patients are advised to avoid breast stimulation as much as possible and can be prescribed dopamine agonist.

School: School of Medicine | Campus: Amarillo

MS3-4 DASH, AKSHAR

A Curious Case of Primary Pancreatic Lymphoma

Akshar Dash Francis Mogollon Duffo MD Fred Hardwicke MD Lisa Smith DO

Primary pancreatic lymphoma (PPL) is a rare case of pancreatic malignancy caused by a form of non-Hodgkin's lymphoma. Only a few cases of PPL have been reported with fewer than 2% of extra-nodal malignant lymphomas and fewer than 0.5% of pancreatic malignancies representing PPL. PPL presents with abdominal pain, weight loss, and jaundice; thereby, closely mimicking the symptoms of pancreatic adenocarcinoma. In addition, Carbohydrate Antigen 19-9 (CA 19-9), an important tumor marker for pancreatic adenocarcinoma, can also be elevated in PPL. Over 80% of cases involve a mass located at the pancreatic head along with enlarged retroperitoneal lymph node involvement. PPL is more responsive to chemotherapy than pancreatic adenocarcinoma, and therapy consists of the R-CHOP regimen for non-Hodgkin's lymphoma: Rituximab, Cyclophosphamide, Doxorubicin, Vincristine, and Prednisone. We report a case of a 77-year old man who was hospitalized for diffuse abdominal pain, jaundice, and weight loss. CT revealed a pancreatic mass with lung metastases and pancreatic and lung biopsies revealed Diffuse Large B-cell lymphoma, leading us to the diagnosis of PPL with lung metastases. Due to concerns for toxicity, the patient was treated with a modified R-CNOP regimen (Rituximab, Cyclophosphamide, Mitoxantrone, Vincristine, and Prednisone), which is an efficacious alternative to R-CHOP therapy for treating diffuse large B-cell lymphoma.

School: School of Medicine | Campus: Lubbock

MS3-4 DELEON, SABRINA

Drug-Induced Vasculitis in a Pediatric Patient Secondary to Montelukast

Sabrina Deleon, Latisha Mclaurin

Case presentation: 14-year-old male presented with palpable purpura and petechiae that began on the legs and spread to the abdomen, arms, and face. Past medical history includes seasonal allergies treated with fexofenadine and montelukast. On day six, patient was hospitalized for worsening intermittent abdominal pain, pain in joints, darkening of urine and worsening palpable purpura. Labs showed proteinuria, hematuria, mild leukocytosis, and elevated ESR. Initial clinical diagnosis was IgA vasculitis, Henoch-Schonlein purpura. Patient improved with steroid treatment; however, five days after the completion of treatment, the rash returned. The relapsing of the purpura was concerning for a possible drug-induced vasculitis or autoimmune vasculitis. Autoimmune studies were negative. Montelukast use in this patient began one week prior to the initial onset symptoms. Montelukast was discontinued as a possible inciting factor. Follow up two weeks later showed healing with no new purpura or petechiae and resolution of all other symptoms.

Discussion: The initial presentation is consistent with IgA vasculitis, but in two thirds of the cases with children there are no recurrent episodes. Montelukast, a leukotriene receptor agonist, was deemed the likely cause in this case due to timing and negative autoimmune studies. Montelukast's known adverse drug reactions include a variety of behavioral changes, drowsiness, neuropathies, seizures, and Churg-Strauss syndrome. A case has been reported of a cutaneous vasculitis secondary to another leukotriene modifier was with zafirlukast.

Conclusion: Small vessel vasculitis in pediatric patients can be linked to numerous etiologies. It is important when obtaining a patient history to be thorough especially the current medication regimen in order to rule out drug induced vasculitis. Montelukast was ruled as the likely cause of this drug induced vasculitis due to the resolution of symptoms after discontinuation.

School: School of Medicine | Campus: Lubbock

MS3-4 DIXON, TIMOTHY

A Case of Disseminated Cocciodiomycosis in a Nonimmunocompromised Patient in West Texas

Timothy Dixon, Brandon Mccarty, Austin Lunney

Pt is a 25yo African American male who presents to the ED with a painful abscess on his chest. He first noticed this abscess 3 days ago and stated that it was about 1cm in width. Today he states that it is now 3cm in width, has ruptured, and is now draining. The abscess is located on the anterior chest localized over the body of the sternum. He describes the pain from the abscess as a "deep burning pain" The pain was initially a 2/10 and is now currently a 7/10. The pain does not radiate. He noticed this when he was working his job as a truck driver in Midland, where he states he frequently is in dusty areas. Nothing seems to make the pain better or worse. Associated symptoms include a nonproductive cough. He denies fever, weight loss, dyspnea, or night sweats. He has had these symptoms on average 3x/year since 2014. Each of these symptoms have been followed up by a diagnosis of coccidiomycosis.

On physical exam an draining 2x2cm abcess was visible on the chest with surrounding erythema. He als had a large 12x14 mass over his righ scapula that was warm and indurated. A CT of the chest, abdomen, and pelvis was obtained.

The results showed densities in his thoracic cavity, abdomen, and pelvis, as well as sclerotic lesions on his bones. All of these findings were consistent with disseminated coccidiomycosis. The pt was screened for HIV, which was negative, and then started on IV Voriconazole. He was also consulted by surgery, who ended up draining the abscess on his back. Over the next two days his symptoms started to improve dramatically, and he was transferred to Midland to receive continued treatment with Voriconazole.

School: School of Medicine | Campus: Lubbock

MS3-4 ELDEM, IREM

Concurrent Airway Anomalies in an Infant Presenting with Croup

Usman Asad BS Irem Eldem MD Thinh Nguyen PhD Winslo Idicula MD Ngozi Eboh MD

We present a unique case of a two-month-old girl with two weeks of stridor initially diagnosed with croup which was worsened by Enterovirus infection. We suspected an underlying anomaly such as laryngomalacia due to unresponsiveness to racemic epinephrine and steroids. A bedside laryngoscopy revealed subglottic and infraglottic edema with minimal exudates on the vocal cords concerning for early tracheitis with concomitant viral infection. She was placed on sulbactam-ampicillin, ranitidine and steroids for 2 weeks but she developed worsening stridor once steroids were weaned. Upon further evaluation laryngoscopy revealed a subglottic cyst. Laser lysis of the adhesions and a subglottic cyst removal by microlaryngoscopy with balloon dilation was performed. During that procedure the patient was found to have a subglottic hemangioma. She was subsequently started on propranolol; she recovered well and was discharged home.

Airway hemangiomas are rare forms of infantile hemangiomas presenting most commonly at the subglottic region. Only 1.3% of infantile hemangiomas are subglottic hemangiomas. Biphasic stridor, barky cough, and respiratory distress are the initial symptoms. The symptoms, which worsen with viral infections, are absent at birth and mostly become evident at six months of age. They can be seen with cutaneous hemangiomas 50% of the time especially if in the beard region. PHACE syndrome, anatomic anomalies, and inflammatory processes are in the differential diagnosis. First line therapy is propranolol but surgical intervention is considered in acute respiratory distress with difficult intubation.

Although our patient was on the younger side for croup, our case demonstrates the importance of avoiding confirmation bias. A subglottic cyst and a hemangioma are rare causes of stridor but there should be a high index of suspicion especially in young infants with refractory stridor unresponsive to routine croup management.

School: School of Medicine | Campus: Lubbock

MS3-4 ESQUIVEL, ESTEBAN

Laparoscopic Omental Patch Reduces Length of Stay and Complications in Perforated Peptic Ulcer Disease: a SWSC Multicenter Study

E Esquivel, J Lung, A Alhaj Saleh, B Eaton, BR Bruns, G Barmparas, DR Margulies, A Raines, C Bryant, CE Crane, EP Scherer, TJ Schroeppel, E Moskowitz, J Regner, R Frazee, EM Campion, M Bartley, S Gordy, J Ward, S Dissanaike

Background: Randomized studies have shown benefit of Laparoscopic (Lap) repair of perforated peptic ulcer (PPU); however it is unclear how often these procedures are performed in general practice, and whether benefits are consistent across populations. The SWSC Multi-Center Trials Group sought to evaluate whether Lap omental patch repairs compared to Open improved outcomes in PPU

Methods: Data from patients who had omental patch repair for PPU at 9 SWSC institutions from 2011 -2018 were analyzed. Patients undergoing additional or alternate procedures, such as vagotomy or Bilroth II were excluded. Variables included demographics, Charlson Co-morbidity Index (CCI), operative time, 30-day complications, length of stay (LOS) and mortality. Analysis was performed with SPSS.

Results: Omental patch was performed in 465 patients: Open in 312 (67%) patients, Lap in 132 (28%) with 21(5%) patients converted from Lap to Open, who were excluded from analysis. Groups were similar at baseline, except Lap was more commonly performed in women (35% vs. 26%, $p<0.05$). Hypertension (45%) and diabetes (17%) were most common comorbidities in both groups, and 24% had a prior history of peptic ulcer disease. There was significant variability between centers in their utilization of Lap (0 ,Äì 64%).

Operative time was similar (101.5 min Lap vs 97). Complications at 30 days were lower in Lap (18.5% vs. 29.2%, $p<0.05$) as was unplanned re-operation (4.7% vs 13.4%, $p< 0.05$). Lap reduced LOS (8.2 vs 14 days, $p<0.05$) with no significant difference in re-admission (4.5% Lap vs 7.2%) or mortality (2.2% Lap vs 5.4%).

Conclusion: Laparoscopic surgery was utilized in less than a third of PPU patients. When successful it significantly reduced 30-day complications and nearly halved length of stay, with similar operative time. These results suggest Lap should be considered a first-line option in suitable PPU patients requiring omental patch repair.

School: School of Medicine | Campus: Lubbock

MS3-4 FISHER, JOHN

Fatal CNS Phaeohyphomycosis in 18 year old Immunocompetent Male

John Fisher MBA, Brady Holstead MS, Akwasi Opoku, Jacob Nichols MD, Mark Lacy MD

Phaeohyphomycosis is a dematiaceous fungal infection. The fungi spread to the CNS through the bloodstream, lymphatic fluid, or through direct inoculation. We report a young, 18-year-old immunocompetent male who presented to outside ED with headache, nausea, and vomiting and was found to have a brain mass on computed tomography. The brain mass was found to be central nervous system Phaeohyphomycosis, and the patient was found to have a history of intranasal marijuana consumption and thus a route for this soil bound dematiaceus fungi.

School: School of Medicine | Campus: Lubbock

MS3-4 GAVIN, MEREDITH

To Be or Not to Be: Contrast Induced Generalized Bullous Fixed Drug Eruption versus Stevens-Johnson Syndrome

Meredith Gavin, BS; Kendra Walker, BS; Leigha Sharp, MD; Emily Behrens, MD; Russell Akin, MD

A 59-year-old black female with a past medical history of hypertension, hepatitis C, and end-stage renal disease on hemodialysis presented to the emergency department with painful, dusky brown-red atypical targetoid macules and patches with superimposed tense bullae primarily on the bilateral lower extremities but also involving her upper extremities, trunk and face affecting 20% of total body surface area. Two days prior, the patient underwent a CT angiogram after complaining of a severe headache. During administration of an iodinated non-polar radiocontrast media (iohexol), she experienced discomfort and pruritus. That evening, she noticed a painful, pruritic rash on her lower legs that subsequently worsened the following day. Upon chart review, it was discovered that the patient had three previous episodes of a generalized, bullous eruption: after a thrombectomy, fistulogram, and an arteriovenous fistula revision. All of these procedures required iohexol administration. Biopsies taken after the second eruption demonstrated full-thickness epidermal necrosis, and she was diagnosed with Stevens-Johnson Syndrome (SJS) thought to be due to her allopurinol use. However, despite medical advice she continued taking allopurinol for gout and was without symptoms until the third eruption. Based on the clinical appearance and timeframe of the eruption after radiocontrast infusion, the patient was diagnosed with generalized bullous fixed drug eruption (GBFDE) due to iohexol. She was treated with topical clobetasol and radiocontrast was highlighted as an allergy in her medical record. Generalized bullous fixed drug eruption is a drug reaction with well-demarcated, dusky circular plaques and is often misdiagnosed as SJS due to the similarities in clinical and pathological presentation. We seek to highlight these similarities and differences to provide further diagnostic distinction. In addition, we provide a rare case report of GBFDE caused by iohexol.

School: School of Medicine | Campus: Lubbock

MS3-4 GONZALEZ, ALAN

Severe Hemolytic Jaundice due to ABO Incompatibility

Alan Gonzalez, Marcella Muysson, Austin, McCuistion, Dr. Naqvi

A 28-year-old G6P5015 delivered an early term average for gestational age female. The mother's blood type is O+ and the infant's blood type is B+ giving her an ABO incompatibility that required intense phototherapy and multiple doses of IVIg. Case reports demonstrating this level of severity and rapid onset of hyperbilirubinemia in a newborn with ABO incompatibility are extremely rare. We use this case to explore the debate between intravenous immunoglobulin (IVIg) and double volume exchange transfusion (DVET). More research is needed to understand if IVIg is effective in preventing the need for double volume exchange transfusion.

School: School of Medicine | Campus: Amarillo

MS3-4 HESS, ANDREA

Tube Feeding Through Surgery, Impact on Glucose Control and Insulin Therapy in Burn Patients

Andrea Hess, Chloe Cooper, Brianna Hope, Landon Hope, Clayton Wagner, Scott O¸ÄôBanion, PharmD, BCNSP, CNSC, Jennifer Kesey, MSN, RN, FNP-BC, John Griswold, MD, FACS

Vigorous nutritional support is vital to the recovery of burn patients. The hypermetabolic state of these patients drastically increases caloric needs, and every minute that they can be fed is valuable. Thus, it is imperative that nutritional status be at the forefront of their care. Enhanced Recovery After Surgery algorithms include a radical approach of feeding up to a major surgery under general anesthesia in certain elective cases, which has shown advantages such as earlier recovery of GI function and improvement of glucose management in diabetics. The UMC Burn Center has successfully fed many burn patients up to and through surgery. Many of these patients are good candidates for this perioperative feeding because endotracheal intubation and supine positioning reduce aspiration risk while anesthetized. In addition, many of these patients have diabetes and/or elevated blood glucose (BG) levels and require post-op insulin therapy. Our study was developed to see if BG management improved in patients who received enteral feedings within four hours of surgery. We also evaluated post-op insulin needs in the subset of patients who required it. Charts of UMC surgical burn patients from 1/1/14-12/31/16 with procedures in which feeds were both 1) stopped at least four hours prior to surgery ("unfed" control group) and 2) continued within four hours of surgery ("fed" test group) were reviewed. We compared post-op BG levels and insulin therapy between groups. Data collection yielded 32 patients with a total of 106 unfed and 92 fed procedures. Our data is currently being analyzed, but our preliminary impression is that there is a clinical difference in BG management and required insulin therapy between groups. Improved BG management and insulin therapy using perioperative nutrition could guide practices related to perioperative workup of burn patients. This is worth further investigation since better BG management has been associated with superior patient outcomes.

School: School of Medicine | Campus: Lubbock

MS3-4 HOANG, DUSTIN

Atypical left sub-sternocleidomastoid muscle neck lipoma with carotid sheath encroachment

Dustin Hoang, John Lung, Dr. Ferdinand Rico

Abstract: Atypical left sub-sternocleidomastoid muscle neck lipoma with carotid sheath encroachment

Introduction: Neck Lipomas are a rare, slow-growing, benign tumor that can be asymptomatic or cause many various neck symptoms including pain, dysphagia, hoarseness, etc. They can vary widely in their origin and distribution. Many asymptomatic neck lipomas are located in the subcutaneous tissue but can also be found within the musculature of the neck or invading through various structures.

Case Presentation: We describe a 30-year-old female patient that presented with mainly dysphagia due to a left anterior neck lipoma that was found to be encroaching on the carotid sheath. The patients neck lipoma was noticed for a few months before she came into for evaluation. The patient had a full range of motion in her neck and rarely complained of pain but did notice a lot of difficulty swallowing. The lipoma was located sub-sternocleidomastoid and extending to lung apex. The lipoma was fully extracted with good margins and the patient's symptoms resolved after surgical intervention

Discussion: There have been reports of various neck lipomas previously, but few large lipomas extending to the lung apex and requiring carotid sheath dissection have been described and reported in the literature. We report a surgical approach that identified various structures and potential complications that can arise in patients with a sub-SCM neck Lipoma.

Conclusion: Sub-SCM neck lipomas are rare and difficult benign tumors to resect. This case report is an example of what a presentation could look like and the surgical approach taken to remove it.

School: School of Medicine | Campus: Amarillo

MS3-4 HOLSTEAD, BRADY

Lambl's Excrescences Presenting as Infective Endocarditis

Dr. Ana Rivas Mejia MD, Dr. Aliakbar Arvandi MD, Brady Holstead MS, John Fisher MBA, Akwasi Opoku

The term Lambl's Excrescences (LE) refers to thin, hypermobile, filamentous extensions of cardiac valves. LE emerge as a result of endothelial damage due to valvular closure over the course of a lifetime. LE mainly occurs in the left heart due to the high-pressure gradient and are only found in the right heart in states of increased right heart pressure gradients found in disease processes such as pulmonary hypertension. Patients with LE are often asymptomatic, however LE must be distinguished from other heart pathologies such as endocarditis and fibroelastoma, as these cause cardioembolic disease. No treatment is needed in most cases of LE, but in cases where the diagnosis is unclear or the patient is symptomatic, treatment can include valvular debridement, antiplatelet therapy, or anticoagulation. In the proceeding sections, we discuss the case of a 45-year-old female whose imaging showed a filiform, hypermobile structure on transesophageal echocardiogram after presenting with a history of drug use, fever, and cardioembolic stroke.

School: School of Medicine | Campus: Lubbock

MS3-4 JACOB, DARON

Older patient age and longer duration of symptoms significantly increases perforation risk in appendicitis; time to operation and antibiotics do not.

Keith Hanson BA, Daron Jacob BS, Adel Alhaj Saleh MD, Sharmila Dissanaike MD

Introduction: Controversy exists regarding how quickly an adult with appendicitis requires surgery to prevent perforation and a higher risk of post-operative complication; the recent literature on antibiotic use as definitive treatment has complicated this question further. We hypothesized that longer time to surgery would be associated with an increased incidence of perforation in patients with an initial diagnosis of non-perforated appendicitis, regardless of timing of antibiotics.

Methods: A retrospective review of adult patients with acute appendicitis from 2012-2017 with initial CT read of non-perforated appendicitis. We measured reported time of symptom onset, presentation to ER, antibiotic administration and surgery to evaluate association with intra-operative diagnosis of perforation. A logistic regression model was used to test the relationship between risk factors and perforation.

Results: A total of 700 adult patients met inclusion criteria. Mean time from onset of symptoms to ER presentation of 26.2 hours (1-96). 84 (12%) patients had a perforation diagnosed intraoperatively, despite a report of non-perforated appendicitis on initial CT scan. Mean time to operation was 6.7 hours (1.72-24.5) and mean time from antibiotic administration to appendectomy was 2.5 hours (0 -23), neither was related to risk of perforation. However the perforated group had longer mean duration of symptoms (DOS), 36.5 versus 25.5 hours ($p<0.01$). Patients older than 45 years old had a 3-fold increase in intra-operative diagnosis of perforated appendicitis (OR=3.10, 95% CL (1.08, 8.90) p= <0 .01).

Conclusion: In a cohort of patients undergoing appendectomy within 27 hours of presentation, time to operation did not increase the rate of in-hospital perforation. However, older age and longer DOS were both significant risk factors. Our results indicate a benefit from expedient surgery in older patients, and those presenting with a longer DOS.

School: School of Medicine | Campus: Permian Basin

MS3-4 KIBUULE, GRACE

Atypical Kawasaki disease secondary to Streptococcal pyogenes pneumonia in a healthy female toddler

Grace Kibuule, Montana O'Dell, Vijay Linga

Group A Streptococcus (GAS, Streptococcus pyogenes) is a major cause of bacterial illness in children and adolescents. We report the case of a 2-year-old female who recently migrated from Guatemala that presented with GAS pneumonia with pleural effusion and empyema that received appropriate therapies of PE drainage, antibiotics and supportive care. Despite standard treatment of care, she continued to have recurrent high-grade fever with severe respiratory distress which required 12 days of care. Further laboratory studies, imaging, and physical presentation lead to a high index of suspicion for atypical Kawasaki disease. Our suspicion for atypical Kawasaki was confirmed with patient's immediate, positive response to treatment with IVIG and high-dose aspirin. Other possible etiologies including drug fever, sepsis, malignancy, tuberculosis, malaria, and endocarditis were ruled out. A literature search revealed very limited number of case reports showing an association between GAS pneumonia with pleural effusion and atypical Kawasaki disease in a healthy female toddler.

School: School of Medicine | Campus: Amarillo

MS3-4 KIRKPATRICK, CARSON

Incidental Superficial Leiomyosarcoma treated with Mohs micrographic surgery

Carson Kirkpatrick, BS; Brett Austin, MD; Jeannie Nguyen, MD; Leigha Sharp, MD; Ashley Sturgeon, MD; Cloyce Stetson, MD

We report a case of a 79-year-old male who presented for treatment with Mohs micrographic surgery (MMS) of a 20x12 mm erythematous eroded nodule on the left forehead with an initial biopsy diagnosis of poorly differentiated squamous cell carcinoma (SCC) with sarcomatoid transformation and spindle cell morphology. Due to clinical presentation and spindle cell morphology, the first stage involved debulking and was sent to pathology. No tumor was noted after two stages. Pathology showed malignant spindle cell tumor in the dermis with numerous atypical mitoses. Smooth cell actin was strongly and diffusely positive. CD10 showed focal positivity. Pancytokeratin showed tumor positivity of less than 10%. Thus, the final diagnosis of superficial leiomyosarcoma (SL) was made. SL is a rare neoplasm derived from smooth muscle making up about 3% of all soft-tissue sarcomas. Patients typically present in middle age with no gender preference. SL usually presents as a subcutaneous nodule or plaque commonly on extremities but can appear anywhere on the body. Histologically, SL appears as spindle cells with atypical mitoses. Thus, it can be mistaken for SCC if the differential is not kept in mind and immunohistochemistry not performed. Currently, treatment recommendations commonly include wide local excision with 1-5 cm margins with recurrence up to 40%. In last few decades, SL has been treated MMS with reports of recurrence of less than 20% and the advantage of tissue sparing. Our patient will be closely followed every six months to monitor for recurrence.

School: School of Medicine | Campus: Lubbock

MS3-4 KUREISHY, MOHAMMAD

Management of Bilateral Uveitis, Vitritis and Serous Retinal Detachment with Intraocular Ozurdex (Dexamethasone) Implant in a Patient with Monoclonal Gammopathy of Unknown Significance (MGUS)

Mohammad Khurram Kureishy, BS, Christopher Fuller, MD, Robert Wang, MD

MGUS (monoclonal gammopathy of unknown significance) has uncommonly been documented to have ocular effects in some patients including crystalline keratopathy and maculopathy_. Those involving uveitis, vitritis and retinopathy have been treated with systemic and/or topical corticosteroids, but consistently resulted in recurrence of disease_. To our knowledge, we present the first case of MGUS with bilateral uveitis, vitritis and retinopathy to be treated with intraocular Ozurdex (dexamethasone), and without recurrence of disease.

A 66-year old Hispanic male with history of MGUS and open-angle glaucoma presented with profound vision loss, eye pain, and floaters. Visual acuity bilaterally was 20/400, and optical coherence tomography showed undulating RPE and serous macular detachments. He was diagnosed with bilateral pan-uveitis, vitritis, and serous retinal detachment.

The patient was treated with Ozurdex in both eyes. Vitreous biopsy from the left eye showed cells positive for CD68 and CD3, and negative for CD20, as well as areas of non-specific IgG deposits. Congo red was negative. By two weeks, vision had improved to 20/70, the undulating RPE had largely flattened, and the sub-retinal fluid had disappeared. No signs of reactivation were present after two months.

In another patient with MGUS presenting with vitritis and retinal vasculitis, treatment was initiated with topical prednisolone in both eyes, but disease persisted_. Similarly, a patient with MGUS presented with iritis, vitritis and bilateral macular detachments, and was treated with both oral prednisone and topical prednisolone_. After initial resolution, symptoms recurred and rituximab was started. Vitreous biopsy was consistent with our biopsy results with the exception of CD3 negative cells.

We recommend further investigation into Ozurdex as a treatment option for this specific patient population, as well as further investigation into the pathophysiology between MGUS and ocular pathology.

School: School of Medicine | Campus: Lubbock

MS3-4 LACEY, ANGELA

Cu+ Deficiency Mimics Myelodysplastic Syndrome

Angela Lacey

A patient with a history of alcoholic substance abuse presents with nausea, vomiting, atrial fibrillation, and severe fatigue to the emergency center. The patient is subsequently found to have red blood cell transfusion dependent pancytopenia with no discernible bleed source. A bone marrow tap reveals myelodysplastic features with negative FISH and cytology results.

School: School of Medicine | Campus: Lubbock

MS3-4 LE, AUDREY

Developing a Database for Forensic Analysis: Impact of Exposure Time and Water Temperature on Scald Burns in Human Skin.

Audrey Le BA, Evan Nix BS, Natalie Tully BS, Sharmila Dissanaike MD

Introduction: It has been previously published that scald severity is related to water temperature and length of exposure in a logarithmic manner1. There have been numerous studies utilizing simulation to validate this model2, but minimal study has been done on human tissue. Additionally, other studies have shown that increasing the surface temperature of skin results in an increase in deeper tissue temperature as the exposure lengthens in time3. Therefore, the model will be challenged by exposing freshly amputated or otherwise surgically removed skin to discrete insults at given temperatures and times, and then determining how temperature and time alter scald severity.This study will make use of human skin that is removed in amputations, abdominoplasties, and panniculectomies to determine the relationship of time and temperature to scald severity.

Methods: Patients undergoing elective removal of healthy skin (eg. abdominoplasty) donated the removed tissue for this experiment. Immediately after surgical removal, skin was cut into 2cm x 2cm samples and was exposed to water baths of varying temperature for intervals starting at 1 second, and increasing in length by 1 second per trial until second and third degree burns were visualized, or a time period of 300 seconds was reached. Pictures were taken of skin samples before exposure, and then after 2¬∫ and 3¬∫ scalds had been visualized.

Results: Skin was obtained from 20 subjects varying in age and representing myriad racial and ethnic groups was obtained, of which 9 were excluded due to incorrect experimental technique and incorrect specimen location. As seen in Tables 1 and 2, time to 2¬∫ and 3¬∫ burn decreased rapidly as water temperature increased.

Conclusions: There is variability in time to scald in human skin at lower temperatures, which narrows with increasing water temperature. There are individual differences in time to scald which likely represent a complex interplay of a variety of patient-level factors.

School: School of Medicine | Campus: Lubbock

MS3-4 LINDGREN, TAYLOR

IgG4-Related Sclerosing Disease Involving The Extradural Tissue: A Diagnostic Challenge with Dramatic Response

Taylor Lindgren, MS4; Deborah Lin, MS3; Nooraldin Merza, MD, PGY2; Ahmed Taha, MD, PGY3; Mazin Saaldin, MD

Immunoglobulin G4 (IgG4)-related sclerosing disease is known for forming soft tissue mass lesions that may have compressive effects. The most frequently involved area is the pancreas presenting as autoimmune pancreatitis, and the disease may also present as sclerosing cholangitis or in salivary glands, lacrimal glands, or other tissues. In our case report, we describe a very challenging diagnosis of IgG4-related sclerosing disease affecting a 60-year-old female who presented with cervical spinal cord compression and multiple neurological features. After laminectomy and excision surgery, the mass was revealed to have dense lymphoplasmacytic cells infiltration and stromal fibrosis with IgG4 and plasma cells. The patient's neurological symptoms and ability to perform daily activities improved dramatically after starting pulse maintenance doses of steroids. This case was challenging and interesting because--while idiopathic hypertrophic pachymeningitis commonly causes spinal cord compression--there are no other cases that describe extradural IgG4-related sclerosing disease presenting with spinal cord compression. Thus, this unique case is important to keep in mind as a clinician, especially because of its dramatic response to treatment.

School: School of Medicine | Campus: Amarillo

MS3-4 LINES, JEFFERSON

Cranial Nerve Paralysis and Renal Cysts in a 16 Year-Old Male Leads to Identification of Mutations in HNF1Œ≤, NOTCH1, B3GALT6, and ZNF469

Jefferson Lines, Dr. Tetyana Vasylyeva, Dr. Alison Lunsford

Background: HNF1Œ≤-related maturity onset diabetes of the young (MODY5) is an uncommon non-autoimmune diabetes. MODY5 is often associated with renal anomalies and frequent de novo mutations. The recognition and diagnosis of this disease is made difficult by the heterogeneity of both clinical and genetic presentation. This case report documents an atypical presentation of MODY5 in a proband with a rare mutation in HNF1Œ≤, and demonstrates a possible connection between the disease process of MODY5 and several other concomitant genetic mutations found in the proband.

Case Presentation: A 16 year old male with renal cysts, liver cysts, carotid artery stenosis, cranial nerve paralysis, white matter lesions, dysuria, and hyperglycemia was found to have a rare heterozygous mutation in exon 2 of HNF1Œ≤ (c.544 C>T NM_000458.2 p.Gln182Ter). The p.Gln182Ter variant is predicted to cause loss of normal protein function either through protein truncation or nonsense-mediated mRNA decay, and is not observed in large population cohorts. This variant was interpreted to be a pathogenic variant. The patient was also found to have heterozygous variants of uncertain significance in NOTCH1, B3GALT6, and ZNF469 genes. NOTCH1 is a transmembrane receptor, and reduction in NOTCH1 signaling has previously been associated with cystic renal disease and tumorigenesis.

Conclusion: This case documents a proband with an atypical presentation of MODY5 who was found to have a rare HNF1Œ≤ mutation alongside other genetic mutations of uncertain significance. This report expands the range of clinical phenotypes that could be associated with MODY5 while simultaneously raising the possibility of a connection between those phenotypes and mutations in B3GALT6, NOTCH1, and ZNF469.

School: School of Medicine | Campus: Amarillo

MS3-4 LUNG, JOHN

Doxorubicin-Induced Scleroderma with Internal Organ Manifestations Presenting as Shortness of Breath

John Lung BS, Nooraldin Merza MD, Nicoleta Rus MD, Rahul Chandra MD, Tarek Naguib MD

Background: Doxorubicin in a dose-dependent relationship causes dilated cardiomyopathy which results in congestive heart failure. An uncommon side effect of chemotherapy regimens is scleroderma-like changes in the skin that mimic limited or diffuse systemic sclerosis. We are unaware of any case reports linking doxorubicin to chemotherapy-induced systemic sclerosis.

Case Description: A 48-year old African-American female presented to the ER with worsening shortness of breath, orthopnea, and paroxysmal nocturnal dyspnea associated with palpitations, with a past medical history of sickle cell trait and stage III diffuse large-cell lymphoma diagnosed 11 years ago with successful completion of 6 rounds of R-CHOP. The patient had mild shortness of breath, breath sounds reduced at the left whole lung, and loud P2 crackles in the bilateral basilar lungs. The patient also had clubbing in the hands, toes, and sclerodactyly. The patient was diagnosed with pulmonary hypertension, pulmonary fibrosis, congestive heart failure, and with non-ischemic cardiomyopathy. The patient was diagnosed with scleroderma due to symptoms of sclerodactyly, and positive anti-scl-70 antibody.

Discussion: Our case showed a patient presenting with complications of drug-induced scleroderma with a positive anti-Scl-70 antibody that developed shortly after the completion of chemotherapy. Four years later, the patient's skin thickening was similar, and fewer signs of calcinosis seen clinically. The patient's subsequent admissions related to CHF exacerbations secondary to drug-induced scleroderma provided excellent clinical evidence to support the initial diagnosis of doxorubicin-induced scleroderma.

Conclusion: We report on a first-known case of drug-induced scleroderma induced by doxorubicin complicated with CHF, pulmonary hypertension, and pulmonary fibrosis. 4 years later the patient's scleroderma symptoms were unchanged, even after poor outpatient follow-up by the patient.

School: School of Medicine | Campus: Amarillo

MS3-4 LUNNEY, AUSTIN

Supraclavicular Lipoblastoma

Austin Lunney Karla Leal John Fitzwater

Introduction: Lipoblastoma is a rare soft tissue tumor that occurs mainly in the abdomen and extremities in infants and children, however, few cases have been found in the neck.

Presentation of case: We present a case of a 19-month-old male that had an enlarging mass on the left cervical region of his neck. He underwent an en bloc resection and pathology described a lipoblastoma. He had no post-operative complications.

Discussion: Although benign, lipoblastomas have an incredibly high recurrence rate if not resected completely. They can present anywhere in the body, but very few reports have been published in the cervical region of the neck. It should be on the differential diagnosis of a fatty mass in a child or infant.

Conclusion: It is important to understand the pathology and differential diagnosis of a lipoblastoma. A lipo-sarcoma is a malignant possibility of a fatty mass and must be ruled out as some types can resemble a lipo-blastoma pathologically.

School: School of Medicine | Campus: Lubbock

MS3-4 MACLEAY, KATELYN

MECP2 Duplication Syndrome: A Case Study in Childhood Seizures

Katie MacLeay and Jay Riley Argue; Mentor Dr. Naqvi

MECP2 Duplication Syndrome is characterized by duplications or triplication of the MECP2 gene, causing severe to profound intellectual disability in males. Females with this duplication are often asymptomatic or have very mild cognitive impairment. This syndrome, in addition to intellectual disability, is associated with infantile hypotonia, autism, poor speech development, recurrent infections, especially respiratory infections, neurological symptoms such as epilepsy or seizures, progressive spasticity, gastrointestinal motility problems, and even developmental regression in some cases. While most of the cases are inherited, with 100% penetrance in affected males, some de novo cases have been reported. Those males affected often have structural brain anomalies and distinct facial dysmorphisms. Feeding difficulties are often evident within the first few weeks of life due to the hypotonia leading to difficulty swallowing. This in turn also leads to comorbidities including gastro-esophageal reflux, failure-to thrive, and extensive drooling resulting in the need for nasogastric tube feedings. Up to 70% of affected individuals suffer from recurrent respiratory infections, while some also endure meningitis and urinary tract infections. The recurrent infections are thought to lead to further decline in the patient's neurological function and overall status, even leading to death.

We present a case study into the types of seizures patients with this syndrome can present with. Patients affected with this syndrome typically have neurological symptoms such as epilepsy or seizures, and our patient fit into this picture. Our patient is a 3 year old male who presented with recurrent tonic seizures and other typical sequelae of MECP Duplication Syndrome.

School: School of Medicine | Campus: Amarillo

MS3-4 MCCARTY, BRANDON

Comparison of Degenerative Changes in the Spines of 10-16 Year Old Children Presenting with Lower Back Pain based on BMI and Sport (Football, Baseball, and Gymnastics) Participation

Brandon McCarty, MS3; Laszlo Nagy, M.D.; Mark Stephens, MS4

Spinal degeneration has been suggested to be prevalent in both children who have elevated BMI and children who participate in football, baseball, and gymnastics. Although a recent study has focused on the spinal degeneration seen in adolescent motocross racers as compared to age-matched non-racers, it seems apparent that an investigation of the association between spinal degeneration and general youth sport participation is overdue. Since the sports of football, baseball, and gymnastics all are conceptually different in their approach to both competition and "game" play, it is interesting that all three have had evidence of spinal degeneration even though the mechanism of body movement throughout participation and risk factors of the three sports differ. However, an investigation in the overall presence of spinal degeneration in children presenting with lower back pain is not sufficient. For a successful study, the determination and comparison of spinal degeneration type among the three sport categories is needed so that educated conclusions can be drawn regarding the nature and prevalence of spinal degeneration within both the individual sport and through the comparisons of the sports to each other. To have reliable conclusions, the evidence of elevated BMI association with increased spinal degeneration severity must be accounted for and used to rule out other potential causes of spinal degeneration seen in youth sport participation since children of many shapes, sizes, and BMIs engage in youth athletics.

School: School of Medicine | Campus: Lubbock

MS3-4 MCKINNEY, JORDAN

Modernizing the Patient Onboarding Process: A Quality Improvement Project

Jordan McKinney, MBA; Brent Magers, MHA FACHE FHFMA; Erica McDonald, MBA; Fatma Levent, MD

BACKGROUND: The patient onboarding process is the sequence of steps involving the patient during an appointment to see a physician; these steps range from registration to billing. Typically, this process was performed with manual paperwork but, this method is outdated and prone to errors. In May 2017, Texas Tech University Health Sciences Center (TTUHSC) invested in an electronic onboarding platform (EOP) in order modernize this process. While there have been several studies performed at other health clinics supporting the use EOP, this was the first study to evaluate the effectiveness of an EOP at TTUHSC.

OBJECTIVE: To evaluate the impact of an electronic onboarding platform and determine if further implementation should be pursued at other clinical sites.

DESIGN/METHODS: This study used the Pediatric Pavilion at TTUHSC as a model since it was the first facility at TTUHSC to implement the EOP. Financial information from before and three months after implementation of the EOP and was analyzed with Microsoft Excel. In addition, patient satisfaction surveys were collected through EOP tablets and employee satisfaction surveys were collected through Survey Monkey.

RESULTS: Most importantly, collections per visit has increased following the implementation of the EOP. Financial calculations such as NPV, IRR, payback period, and break even analysis along with the upward trend of key financial ratios further demonstrated financial benefits of the EOP. In addition, the patient surveys and employee surveys showed satisfaction with the EOP.

CONCLUSIONS: Further studies are needed to recommend EOP implementation at all TTUHSC clinics. The effectiveness of the EOP could be dependent on the clinical site's implementation policy as well as the average age of the clinic's patients. In addition, studies should also be repeated at the TTUHSC Pediatric Pavillion when more data is available for analysis.

School: School of Medicine | Campus: Covenant

MS3-4 MITCHELL, DIANA

Laparoscopic Colectomies Associated with Decreased Retrieval of Twelve or More Lymph Nodes Compared to Open in Elective Colon Cancer Surgery

Yana Puckett, MD, MPH, MBA, MS; Diana Mitchell, MBA, RN; Theophilus Pham, MBA; Adel Alhaj-Saleh, MD; Amir Aryiae, MD, FACS

BACKGROUND: The use of preoperative bowel preparation is a heavily debated topic in colorectal surgery literature. Studies have suggested that excising 12 or more lymph nodes during colectomy in patients with colon cancer is associated with improved survival. To date, no study has investigated whether minimally invasive surgery affects ability to retrieve 12 + lymph nodes in elective colon cancer surgery. We elected to determine whether a difference exits on ability to retrieve 12 + nodes in elective colon cancer colectomies performed open vs. laparoscopic.

METHODS: The National Surgical Quality Improvement Program (NSQIP) database was analyzed for the year 2014, 2015. Inclusion criteria was Colon Cancer (ICD-9 Code 153.9), age greater than 18. Exclusion criteria was missing data. Data abstracted included number of lymph nodes retrieved and type of operation performed. Data was compared between patients that underwent laparoscopic colectomy compared to open colectomy. Binary logistic regression was used to identify confounding variables in retrieval of 12 + lymph nodes.

RESULTS: After accounting for missing cases, a total of 18,792 patients with a diagnosis of colon cancer were analyzed. Greater than 12 lymph nodes were retrieved in 88% (16,538) of patients. Overall mean of lymph nodes retrieved was almost the same between two groups 20(SD 11). However, open operative approach compared to laparoscopic was associated with 15% greater odds of retrieval of 12+ lymph nodes (OR 1.148; 95%CI (1.035-1.272); P=0.009).

CONCLUSION: Majority of colectomies, whether done open or laparoscopically, retrieve 12 or more lymph nodes. However, there are greater odds of retrieving more than 12 lymph nodes with open approach compared to laparoscopic.

School: School of Medicine | Campus: Permian Basin

MS3-4 MUYSSON, MARCELLA

Newborn care among refugee populations: a study of the influence of cultural background in West Texas

Marcella Muysson, Alan Gonzalez, Alyssa Byrd, Mubariz Naqvi MD

As health care providers, our cultural competency is challenged daily. In the community of Amarillo, TX, for every 100,000 local residents, there are about 254 refugees. The goal of this study is to learn more about newborn care traditions between these refugee groups when compared to the local native population in order to increase our awareness and ability to provide adequate health care.

Data was collected via surveys distributed among mothers of newborns in the postpartum unit of Northwest Texas Hospital (NWTH) in Amarillo, Texas during a period of six months (2018). Surveys will be provided in English and in the participants' primary language of Spanish, Burmese, Zumi, Chin, Karen, or Somali. The surveys were translated from English to these other languages by volunteers who were born in the country of origin and had received some level of education in the United States, as well as certified online translation sites. Questions center on demographic information and inquire about cultural traditions regarding newborn care experience by mother and father. The survey focuses on areas such as prenatal care, breastfeeding, baby's firsts and special traditions, newborn safety, umbilical cord care, and family involvement and bonding.

Results are focused on Spanish speakers (80 responses) and English speakers (175 responses). We found statistical differences in the number of women breastfeeding and more. We found a similar number of Spanish and English speakers will have a father involved in the infant's care and plan to have family or friends involved in the infant,Äôs care.

The study aims to find indications for improvement of the quality of care between physician and patient interactions.

School: School of Medicine | Campus: Amarillo

MS3-4 NGUYEN, THINH

Von Hippel-Lindau with early onset of hemangioblastoma and multiple drop-metastases like spinal lesions: A case report

Thinh H. Nguyen, PhD; Teresia Pham, MD; Thea Strickland, MD, MPH; Daniel Brewer, DO; Muhittin Belirgen, MD; and Mohamad M. Al-Rahawan, MD, MPH

Background: Hemangioblastoma is a rare tumor of the central nervous system (CNS), usually observed in patients with von-Hippel Lindau (VHL). The peak age for hemangioblastoma is 20 to 50 years of age. Surgical resection of hemangioblastoma is considered the standard of care but Everolimus, an mTOR inhibitor, was shown to be effective in a patient with VHL and multiple organ involvement. Objective: We present our 3-year experience of a female with a rare VHL mutation (c.337C>T) who was diagnosed with multifocal CNS and retinal hemangioblastomas at a young age. Case presentation: At 17-years of age, our patient presented with obstructive hydrocephalus due to a large cystic cerebellar mass. Imaging showed multiple lesions resembling drop metastases throughout her spinal cord. Pathological confirmation of hemangioblastoma on a cerebellar biopsy triggered testing for and diagnosing VHL. Subsequent multi-stage resection of her primary and drop-metastases like disease was done. Six months later, she presented with retinal hemangioblastoma while her other lesions were stable. After failing to follow for two years, she presented with multiple new brain, spine and retinal hemangioblastomas. Abdominal MRI showed a 14-mm enhancing nodule in the left lobe of her liver and multiple cystic lesions involving her pancreas. Surgical management of her extensive disease was deemed too risky. Results: Our patient had a rare VHL mutation and very aggressive disease. Surgical management was not feasible, but her systemic disease stabilized while on Everolimus for seven months. She had no significant toxicity; however, she developed new retinal lesions warranting ophthalmic cryotherapy. Conclusion: Our patient had multiple drop-metastases like spinal lesions, which has not been reported in the literature to be associated with hemangioblastoma. Her disease was very aggressive, and Everolimus stabilized it except in her eyes. More research on genotype/phenotype association is needed in VHL.

School: School of Medicine | Campus: Lubbock

MS3-4 OPOKU, AKWASI

Re-expansion pulmonary edema - a rare but fatal complication of thoracentesis

Akwasi Opoku BA, Kenneth Iwuji MD, John Fisher MBA, Brady Holstead MS

Re-expansion pulmonary edema (RPE) is a type of pulmonary edema that typically occurs unilaterally after re-expansion of a chronically collapsed lung. Rarely, it may develop soon after the removal of large volumes of pleural fluid. The clinical presentation ranges from asymptomatic, isolated radiographic changes to complete cardiopulmonary collapse. The exact pathophysiologic mechanism is complex and still not completely understood. To avoid complications and mortality, early detection, diagnosis, and subsequent treatment are crucial.

School: School of Medicine | Campus: Lubbock

MS3-4 OSINOVSKY, JAMIE

‚ÄúPerfluorocarbon OxycyteTM Improves Motor and Bladder Function after Spinal Cord Injury in a Dose-Dependent Fashion‚Äù

Seda Bourikian, Adly Yacoub, Kristina Fernandez, Mary-Grace Hajec, Katherine Poore, Harold F. Young, Bruce Mathern, and Jamie Osinovsky.

Ischemia and hypoxia play a key role in the initiation of the deleterious cascade occurring after spinal cord injury (SCI) resulting in neuronal damage. Enhancing oxygen delivery with Oxycyte, a third generation perfluorocarbon (PFC), can minimize loss of function. The dose-response effects and mechanism of neuroprotection of PFCs remains unclear. This study evaluated the dose response mediated effects of Oxycyte on motor function following a SCI. Ninety, adult Evans rats were randomly assigned to six experimental groups (n = 15 per group): (SH) group: laminectomy of T9-T10 with no SCI; (SCI) group: SCI with no treatment; (OXY) and (SAL) groups: SCI followed by a single dose of 2ml or 5ml/kg of Oxycyte or Saline respectively. Functional recovery was evaluated using the BBB scale and inclined plane test.

The 2ml and 5ml/kg Oxycyte treatment groups significantly improved the BBB locomotor scores (P<0.008), and the score of the 5ml/kg (10.83¬±2.23) dose was significantly higher than the 2ml/kg group (4.67¬±1.97). Oxycyte groups also showed higher mean angle values in an inclined plane test (P<0.005). These results demonstrate that Oxycyte administration after SCI improves functional recovery. The neuronal preservation is dose dependent.

School: School of Medicine | Campus: Amarillo

MS3-4 PARIKH, NIKI

A Case Analysis of Thromboangiitis Obliterans

Niki Parikh, MBA, MSBA; Franklyn Babb, MD, FAAFP

Thromboangiitis obliterans (Buerger‚Äôs disease) is a disease of small and medium-sized vasculature, mainly involving the distal upper and lower extremities in male patients under the age of 45. Smoking tobacco is considered to be a predisposing and triggering agent. This presentation discusses the case of JS, a 35-year old male patient who initially presented with a stroke, followed by pain and swelling in the upper extremity, and finally with pain, absent peripheral pulses, and necrosis of the left lower extremity requiring below knee amputation. This case is of interest due to the rarity of this disease in the developed world, the presentation of a stroke in a patient later diagnosed with thromboangiitis obliterans, and the use of a prostaglandin analog in treatment. This case highlights the difficulty of making the diagnosis of vasculitis and the time consuming, multispecialty approach that is required. The lack of subspecialists, lack of medical record integration, lack of communication between community hospitals, and the unavailability of the drug Iloprost negatively affected the patient‚Äôs outcome.

School: School of Medicine | Campus: Lubbock

MS3-4 PHAM, THEOPHILUS

Surgeons Maintained Focus Working 12-Hour In-House Shifts While Experienced Severe Decline in Focus Working 24-Hour In-House Calls

Yana Puckett, MD; Theophilus Pham, MBA; Beatrice Caballero, MS; Karen Castaneda, BS; Benedicto Baronia, MD; Sharmila Dissanaike, MD; Robyn E. Richmond, MD; Catherine A. Ronaghan, MD

Introduction: Visual eye-tracking is a research tool that records eye movement and can provide a dynamic measurement of a person's visual attention and focus. Little research exists on the impact of 24-hour in-house call on the surgeons. Chronic fatigue is a risk factor for burnout.

Physician burnout reaching epidemic proportions among physicians in the United States. 24-hour in-house call may be a risk factor for fatigue and physician burnout. Frequent 24-hour in-house call likely has a significant impact on surgeon well-being.

Methods: A prospective quality improvement project was performed on surgical residents and attending physicians (APs) working at a busy tertiary referral safety-net hospital with Level 1 trauma and burn centers. A visual tracking system was used to measure visual attention before and after a 12-hour in-house shift and a 24-hour surgical in-house call. Classifications of the test results ranged from 0-6: Severely Impaired- 0, Superior - 6

Results: 21 surgeons provided a total of 61 visual tracking tests for analysis. Study population was 46% men, with a median age of 31 years IQR (28-33).

Residents accounted for 48 tests, medical students for 2 tests, and attending surgeons for 11. Average hours of self-reported sleep before the shift/call was 6 IQR (6-7). There was almost no overall change in focus in individuals before and after a 12-hour in-house shift -0.06 (SD 1.9) Focus dropped by almost two full grades -1.8 (SD 1.6) after 24- hour in-house call ($p=0.013$). No significant difference was found in focus and attention scores between 12-hour day shift and 12-hour night shift. There was no significant difference in focus between male and female surgeons. There was no significant difference in focus between PGY level and attendings.

Conclusions: 12- hour shifts, whether during the day or overnight, may preserve visual focus in surgeons compared with 24-hour in-house calls.

School: School of Medicine | Campus: Covenant

MS3-4 PILLUTLA, PRANATI

Intrathyroidal Parathyroid Carcinoma: A Case Report and Comprehensive Literature Review

Pranati Pillutla, BS; Cynthia Schwartz, MD; Tam Nguyen, MD

Introduction: Intrathyroidal parathyroid carcinoma is a rare presentation of parathyroid malignancy. While it may be asymptomatic, it often presents with signs of hypercalcemia, including gastrointestinal disturbances and recurrent nephrolithiasis.

Case Details: A 31-year-old man with a past history of hyperparathyroidism managed with subtotal thyroidectomy and subtotal parathyroidectomy was noted to have persistent hypercalcemia and elevated parathyroid hormone. There was abnormal radiotracer uptake in the left thyroid gland. Neck exploration with left parathyroidectomy and revision thyroidectomy was performed. A candidate left inferior parathyroid was found within the remnant of the left thyroid lobe, and was identified as parathyroid carcinoma. Immunostains found a intrathyroidal parathyroid carcinoma with lymphatic space invasion. After surgery, his calcium and parathyroid hormone levels normalized.

Review: A systematic review of the literature identified 19 cases. 20 cases were analyzed, including our report. The average presenting age was 48 years (Range: 14-76). 65% (95% CI 43-82%) of patients were female. Intrathyroidal parathyroid carcinomas were found on the right lobe of the thyroid in 55% (95% CI 34-74%) of cases. The majority of these types of carcinomas occur in the inferior aspect of the thyroid (95% CI 53-89%). Of the reported cases, only one was associated with a MEN syndrome.

Conclusions: Intrathyroidal parathyroid carcinoma is a rare and challenging diagnosis due to similarities with more common endocrine abnormalities. Correct diagnosis requires high clinical suspicion and specialized stains. This review suggests the new finding that intrathyroidal parathyroid carcinoma is more common in the inferior parathyroids than the superior parathyroids. An inferior intrathyroidal lesion presenting with hypercalcemia may raise suspicion for intrathyroidal parathyroid carcinoma.

School: School of Medicine | Campus: Permian Basin

MS3-4 PUCCIO, OLIVIA

Incidental Finding Of An Anterior Mediastinal Mass Complicated By Acute Coronary Syndrome

Montana O'Dell, PGY1; Olivia Puccio, MS3; John Tohlen, PGY2; Thanuja Chandrasena, MD

Introduction: 58-year-old male truck driver presented to the ED with symptoms concerning for ACS and PE. CT angiogram showed incidental anterior mediastinal mass and no PE. Cardiothoracic surgery ensued, and the patient underwent both triple CABG and mass resection. Pathology identified the mass to be a mature cystic teratoma. The patient had no perioperative complications.

Case Report: 58-year-old male truck driver with PMHx of hyperlipidemia presented to the ED with a 4 day history of chest pain associated with dyspnea, orthopnea, and peripheral edema. Elevated serial troponins and abnormal EKG without ST elevation pointed towards ACS. Elevated D-dimer showed concern for PE, prompting a CT pulmonary angiogram and bilateral LE venogram. Imaging showed no evidence of PE nor DVT but did show a 3 cm mediastinal mass located left of the pulmonary artery, concerning for a teratoma or cyst. Cardiothoracic surgery was consulted, and a combined triple CABG and mass removal ensued.

Discussion: Germ cell tumors consist of a diverse group of neoplasms usually of gonadal origin and more rarely of extra-gonadal origin. Although the most common site for extra-gonadal tumors is the anterior mediastinum, such neoplasms still only make up 1-3% of all germ cell tumors. Among primary anterior mediastinal tumors in adults, 15% are germ cell tumors. Of those, 80% are benign teratomas. Benign teratomas are often found incidentally on imaging. Chest CT with contrast is the imaging modality of choice. These neoplasms are often asymptomatic but may potentially cause symptoms by mass effect. Surgical resection is the treatment of choice.

Conclusion: This patient's anterior mediastinal teratoma was uncovered by work-up of his symptoms of ACS and potential PE. It remains unclear whether his symptoms were caused by mass effect of the teratoma. A major cardiothoracic surgery ensued, with both triple CABG and excision of the neoplasm. The patient has a positive prognosis based upon resection.

School: School of Medicine | Campus: Amarillo

MS3-4 RAJU, SNEHA

Temporal Trends of Pediatric Hospitalizations with Acute Disseminated Encephalomyelitis in the United States

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Objective: To determine the temporal trends in the epidemiology of ADEM and its outcomes in the United States from 2006-2014.

Study Design: Pediatric Hospitalizations (,â§ 18 years) with ADEM were identified from the National (Nationwide) Inpatient Sample (NIS) for years 2006-2014. Trends in the incidence of ADEM with respect to age, gender, race, and region were examined. Outcomes of ADEM in terms of mortality, length of stay, cost of hospitalization and seasonal variation were analyzed. NIS includes sampling weight. These weights were used to generate national estimates. P-value < 0.05 was considered significant.

Results: Overall incidence of ADEM associated pediatric hospitalizations from 2006-2014 was 0.5 per 100,000 population. Between 2006-08 and 2012-14, the incidence of ADEM increased from 0.4 to 0.6 per 100,000 (P-trend <0.001). Blacks and Hispanics experienced a significant increase in incidence of ADEM during the study period (0.2 to 0.5 per 100,000 population). There was no sex preponderance and 67% of ADEM hospitalizations were <9 years old. Mortality remained stable from 2006-08 to 2012-14 (1.1 to 1.5%; P-trend 0.07). Median length of stay (LOS) remained stable from 2006-08 to 2012-14 (4.8 to 5.5 days; Ptrend = 0.3). However, median inflation adjusted cost increased from $11,594 in 2006-08 to $16,193 in 2012-14 (Ptrend = 0.002).

Conclusion: In this large nationwide cohort of ADEM hospitalizations, the incidence of ADEM increased during the study period. Mortality and length of stay (LOS) have remained stable over time, but inflation adjusted cost of hospitalizations increased.

School: School of Medicine | Campus: Amarillo

MS3-4 RITTMANN, RANDALL

Case Report: Peptic Ulcer Disease Disguised as Acute Cholecystitis

Randall Rittmann MS3, Rebecca Brady MS4, David Carlsen-Landy MS3, Max Schimelpfenig MS3, Dr. Muhammad Nazim

Case Presentation: A 69-year-old male first presented to the hospital with lightheadedness, achy abdominal pain, and cough. A chest X-ray showed changes consistent with COPD and a small infiltrate within the left lung base. After further workup in the emergency department, the patient received the diagnoses of pneumonia and dizziness along with prescriptions for appropriate antibiotics and orders to follow up with his primary care physician within one to two days.

Two days later the patient's doctor referred him back to the emergency department with now constant abdominal pain, continued cough, and a subjective fever. Subsequent workup included an abdominal CT scan which found evidence of cholelithiasis along with marked gallbladder wall thickening and surrounding inflammatory changes. At this point the diagnosis of acute cholecystitis was established and the patient was prepared for laparoscopic cholecystectomy.

Operative Findings: Upon inspection there were dense adhesions in the middle portion of the gallbladder which were partially taken down until they became too dense proximally to continue the dissection. At this point mucinous drainage was noted to be originating from the area of the dense adhesions and the case was converted to open. With further investigation, a perforated duodenal ulcer approximately 2.5 cm in diameter lay behind gallbladder. The gallbladder wall appeared to be intact but was secondarily inflamed from the perforated ulcer.

The decision was made to abandon the cholecystectomy and repair the duodenal ulcer with omental patching.

Discussion: This patient presented with a perforated duodenal ulcer that had adhered to the wall of the gallbladder causing secondary inflammation of the gallbladder wall leading to a diagnosis of acute cholecystitis rather than a perforated peptic ulcer.

School: School of Medicine | Campus: Amarillo

MS3-4 ROSALES, ABIGAIL

Laparoscopic Removal of a Primary Retroperitoneal Mucinous Cystadenoma: A Case Report

Allison Gracey BS BA; John Lung BS; Abigail Rosales MBA; Eva Bashover MD, FCAP; Muhammad Harris Nazim MD, FACS; Ferdinand Rico MD, FACS

Background: Primary retroperitoneal mucinous cysts are rare occurrences and benign mucinous cystadenomas are the rarest subtype. Case reports of mucinous cystadenoma with an origin from the mesentery are very rare with 19 cases reported. We present a case report about an innovative laparoscopic removal of a retroperitoneal mucinous cystic neoplasm.

Objective: To review the literature and present a case report of a laparoscopic removal of a retroperitoneal mucinous cystic neoplasm.

Methods: A 22-year-old female who presented with a two day history of bloating, mid-epigastric pain, and nausea without vomiting. A CT scan of her abdomen/pelvis showed a large possible mesenteric cyst. The surgical plan was for a laparoscopic excision with possible bowel resection. During the surgery the mass was observed to be retroperitoneal in nature, abutting the left colon. The cyst was successfully excised and placed within a surgical bag. It was then aspirated within the surgical bag and delivered out of the body.

Results: The final pathology report revealed a benign mucinous cystic neoplasm mesenteric in origin that was located in the retroperitoneum. Postoperatively, the patient was placed on the surgical floor where she progressed well and was discharged the following day.

Conclusion: Primary retroperitoneal mucinous cystic neoplasms rarely occur. Although there had been previous caution in using a laparoscopic approach due to potential seeding intraoperatively, we have shown through our case that it is possible to efficiently and safely use such an approach.

School: School of Medicine | Campus: Amarillo

MS3-4 RUPPERT, MISTY

Air Embolism Following Outpatient Procedure

Rubayat Rahman MD, Noella Vinan-Vega MD, Jeremy Thompson, Misty Ruppert, J. Drew Payne DO

Air embolism is a rare but serious complication of interventional procedures that occurs from the communication between air and the vasculature. In this report, we discuss the unusual case of a patient who developed a symptomatic venous air embolism after an interventional pain procedure. We present radiographic findings and discuss why the likely source of the air embolism was from obtaining intravenous access during her pain procedure. Since air emboli are often under-recognized but potentially fatal, this case emphasizes the importance of considering air emboli when neurological symptoms develop after vascular interventions.

School: School of Medicine | Campus: Lubbock

MS3-4 SAA, LISA

Popliteal Artery Entrapment Syndrome: Clinical Pearls

Lisa Saa, Peter K. Firouzbakht, Mohammad Otahbachi

Popliteal artery entrapment syndrome (PAES) is an uncommon cause of lower extremity claudication that is often overlooked as a possible differential diagnosis by healthcare providers. PAES most commonly presents in young men without risk factors for atherosclerotic disease. Dorsiflexion and plantar flexion can be performed during the physical exam of the initial visit if PAES is suspected. Angiography can then be used to diagnose PAES. Surgery provides a definitive treatment in most cases. It is important to maintain a high clinical suspicion of PAES when those with claudication and without atherosclerotic risk factors present to the clinic in order to prevent negative outcomes, including limb ischemia requiring amputation. Here we aim to highlight the clinical presentation, classification, imaging modalities, and treatment options for PAES in order to facilitate early diagnosis and management.

School: School of Medicine | Campus: Covenant

MS3-4 SLATE, RACHEL

Gunshot wounds in the pediatric population: Three unique traumatic injuries

Slate, R.A., Ronaghan, C., and Richmond, R.

Gun violence has become an increasingly popular topic of debate in today's political climate. Billions of healthcare dollars are spent each year treating victims of gunshot wounds. In the pediatric population, injury-related deaths have risen over the past several years, with accidental injuries as the number one cause of death in those over the age of 1. Firearm-related injuries are the second leading cause of injury-related death with approximately 19 children per day being treated for gunshot wounds. The average fatality rate for firearm-related injuries tops at 74% with boys being 6 times more likely to die from a firearm than girls. Suicide is now the second leading cause of death in adolescents with firearms as the leading method in those ages 15-19. Firearms have been the leading cause of homicide since 1999, accounting for 87% of deaths due to homicide. The following cases examine three pediatric patients suffering from gunshot wounds. The first patient suffered multicompartment thoracic and abdominal injuries after a drive-by shooting. She underwent emergent surgical management with post-operative complications of wound closure and abscess formation. The second patient was accidentally shot in the left flank with an air rifle. He sustained minimal renal and splenic injuries with the pellet resting posterior to the aorta. The third patient sustained a shotgun blast to the groin, suffering extensive tissue damage to his left medial thigh and a small burn injury. While many pellets were removed, radiographic evidence showed numerous retained pellets with concern for future lead poisoning, though his lead levels never reached high enough levels for treatment. Firearms cause significant threat to the livelihood and well-being of children in this nation. Morbidity and mortality from both accidental and intentional firearm use necessitates all healthcare providers to be actively involved with education on gun safety as well as prevention of accidental injuries.

School: School of Medicine | Campus: Lubbock

MS3-4 STAMPS, DAVID

Post-infectious cerebellar ataxia in a young adult: A rare presentation of Influenza

David Stamps MS4, Nimit Alam M.D.

After extensively investigating this topic, we believe better understanding and research into the mechanisms behind post-infectious cerebellar ataxia could lead to improved treatment for these patients. Here we describe a case of post-infectious cerebellar ataxia or post-infectious cerebellitis in a previously healthy young adult. The patient, a twenty-one-year-old female schoolteacher, presented to our emergency department following two weeks of confirmed influenza infection (based on rapid Influenza nasal swab testing) and flu-like symptoms. The patient had been treated with an adequate course of Tamiflu, but instead of recovering, her condition progressively worsened, with subsequent persistent neurological symptoms including ataxia, tremors, dysarthria, confusion, and headaches. Her symptoms were refractory to currently available therapies. The patient also developed cerebellar edema, which slowly improved over two weeks with corticosteroid therapy. Despite extensive testing for other etiologies that could explain her persistent neurological abnormalities, the only positive testing that could explain her symptoms was a positive viral nasal culture showing Influenza A H1N1, and CSF testing that showed non-specific inflammation. Clinicians should also be aware of the rare, but known possibility of encephalopathy in all age groups following Influenza infection.

School: School of Medicine | Campus: Permian Basin

MS3-4 TELLO, NADIA

Intentional Foreign Body ingestion: An Unusual Case of Hypopharyngeal Foreign Body Missed on CT

Nadia Tello, BS, MBA, Pranati Pillutla, BS, Rahul Varman, MD, Joshua Demke, MD

Intentional foreign body (FB) ingestion in adults is rare. Small FBs commonly lodge in the cervical esophagus and are generally detected on soft tissue neck films. We present an unusual FB ingestion leading to posterior pharyngeal perforations, requiring endoscopic removal using direct laryngoscopy (DL).

A 38-year-old schizophrenic male prisoner presented to the ED with shortness of breath after ingesting 8 chip and/or ramen bags and a plastic spoon in attempted suicide. He vomited the spoon prior to arrival, was intubated en route, and self-extubated almost immediately after arrival. Physical exam showed open-mouthed upright posturing and diffuse cervical and upper mediastinal subcutaneous emphysema.

CT neck/chest revealed extensive free air suggestive of aerodigestive tract perforation, though the report did not note FB. Swallow study showed filling defect of the left piriform sinus without obvious contrast extravasation from the pharynx or esophagus. Micro-DL and rigid bronchoscopy were performed, revealing two cephalocaudally-oriented posterior pharyngeal wall tears superior to the arytenoids. A plastic ramen wrapper was removed from the left piriform sinus. The piriform sinuses were diffusely edematous without obvious lacerations.

Cervical esophagoscopy was not performed given edema and absence of contrast leak on swallow study. An orogastric tube was placed endoscopically into the stomach via the left pyriform sinus. The patient was kept intubated in the ICU, with repeat imaging and DL scheduled. He was carefully monitored for signs of sepsis, abscess formation, or mediastinitis.

In summary, we present an unusual FB ingestion with posterior pharyngeal perforation. CT imaging showed diffuse subcutaneous emphysema, but neglected to note the FB in the left piriform sinus, which required endoscopic removal in the OR. Clinical suspicion for retained FBs should remain high in intentional FB ingestion presenting with signs of aerodigestive tract disruption.

School: School of Medicine | Campus: Lubbock

MS3-4 TSEN, ADAM

Finding the Missing Leak

Adam Tsen, Dr. Nimat Alam, Dr. Ajuwon Abudeen, Dr. Jinal Patel, Dr. Saba Kayani

Spontaneous CSF leak is an arcane disease that symptomatically results in spontaneous intercranial hypotension and orthostatic headaches. With a low occurrence rate spontaneous CSF leak is often misdiagnosed and evades physicians' lists of differentials.

A 49-year-old female was admitted to the emergency department for headache, diplopia, nausea, and vomiting. The symptoms had been going on for 3 weeks and no medication treatment alleviated her symptoms. The headaches were described as "pressure like" starting at her forehead plus her occipital with radiation towards the back part of her left eye. The patient has no significant past medical history and has never experienced these symptoms prior to 3 weeks ago. Labs were done on admission with the CBC revealing elevated Hemoglobin of 16.2, Hematocrit of 45.6, and WBC of 11.2. The CMP was all within normal ranges and urinalysis was inconclusive and negative. The patient did not present with a Kernig or Brudzinski sign and the rest of her physical exam was normal with the one exception of mild medial deviation of her left eye. The neurologist who was consulted ordered a Lumbar Puncture, MRA Brain, and MRV Head to aid in diagnosis as the patient as well as assess for other risks. The patient additionally had a CT head and MRI brain done 3 weeks ago while at her hometown hospital. The CT head was insignificant, but the MRI revealed disuse and uniform leptomeningeal enhancement. Here, the MRV Head fortunately was negative for venous sinus thrombosis, a problematic complication often seen in similar symptomatic patients. Furthermore, the Lumbar puncture and the

School: School of Medicine | Campus: Permian Basin

MS3-4 WILLMS, JOSHUA

Development of a premedical student volunteering/mentorship program designed to address the economic problem of the caregiver-patient ratio in skilled-care geriatric memory units

Willms J, Brown S, Chavez A, Zon A, Moseley K, Perez A, Wolpert J, Young K, Culberson J

Unpaid caregivers provided 18.4 billion hours of care to patients with age-related dementias in 2017.^1^ Despite this, the lifetime cost to a patient diagnosed with dementia for skilled care, medical attention, and housing is crippling, at approximately $341,840.^1^ Our objective was to develop an innovative way to provide supportive care for dementia patients without increasing the financial burden. We created a platform at a nursing home for premedical students to perform dementia caregiving tasks including emotional support, providing respite for paid caregivers, managing behavioral symptoms (aggressive behavior, feeling lost), feeding, and entertainment. Students also implemented a wheelchair exercise program and a music therapy project. We recorded the number of volunteers who attended each week through photography and an online database, documented custom project outcomes, and recorded time spent on leadership outside of volunteer events. Premedical students received "pay" for their work through improvements to their applications to medical school (volunteer hours in a healthcare setting). We calculated the estimated value of the care provided to patients and documented the benefits for the premedical students. Over the past three years, our group contributed ~1200 hours of unpaid care to dementia patients. We estimated the value of this care to be about $5046 per year. If similar groups were established at every US university, the value of this care would be $20,889,000 per year. The sustainability of our work was made possible by the mutually beneficial relationship between pre-health students and dementia patients. Memory patients need supportive care, and pre-health benefit from providing supportive care. Therefore, pre-health students are a currently untapped resource that if appropriately mobilized, could contribute 1,656,000 hours per year paid for in professional development, which does not increase the financial burden on patients or the US economy.

School: School of Medicine | Campus: Lubbock

MS3-4 YOUNES, LENA

Vulvar Leiomyoma, a case of a rare genital tumor

Lena Younes MSIII, Hena Tewari MD

Introduction: Leiomyomas are benign monoclonal tumors that arise from smooth muscle cells. Uterine leiomyomas the most common benign tumor in women, with a prevalence of 60-80% by the age of 50. Although extra-uterine leiomyomas are quite rare, vulvar leiomyomas are in fact the most common benign solid tumor of the vulva. The relative rarity and presentation as a painless, solid mass may lead to a misdiagnosis of a Bartholin cyst.

Case Report: A 74-year-old postmenopausal obese female presented with a left labial mass. The mass was present for the last 15 years but was progressively enlarging in the last three months. She denied any symptoms of pain, discharge, bleeding. She also denied any difficulty urinating or walking. The mass was lanced in the past year but did not resolve. On exam, there was vaginal atrophy and a left labial swelling measuring 10x8 cm. The mass was cystic and mobile. Incision and drainage of the mass was performed. Pathology of the specimen revealed a 3.5x2.5x1.7 cm tan-gray, rubbery, and homogenous tissue suggestive of a leiomyoma of the vulva; the report was also negative for malignancy.

Discussion: Leiomyoma arising within the external female genitalia are rare and often confused for other diagnoses such as Bartholin cysts. The presentation of these tumors can be difficult to distinguish from malignant tumors, and factors such as diameter, margins, and cellular atypia can suggest an atypical leiomyoma or leiomyosarcoma. Excisional biopsy is the most reliable way to establish the correct diagnosis, but in some cases, ultrasound and MRI can be used to help characterize the growth. Wide excision of the mass is the treatment of choice and has been shown to have low recurrence rates.

Conclusion: Although not prevalent in the literature, vulvar leiomyoma should be considered in the differential diagnosis in cases presenting with a genital mass.

School: School of Medicine | Campus: Amarillo

MS3-4 ZHAO-FLEMING, HANNAH

Creutzfeldt-Jakob disease presenting with recurrent falls, visual deficits, and altered mental status.

Hannah Zhao-Fleming Ph.D.*, Dominique Gagnon Ph.D.*, and Byungkwan Hwang M.D.
*co-first authors

Creutzfeldt-Jakob disease (CJD) is a rapidly progressive disease presenting with dementia, motor dysfunction, visual deficits, and akinetic mutism. Our patient was a 63-year-old Caucasian male inmate presenting with recurrent falls, visual deficits, altered mentation, and auditory and visual hallucinations. His past medical/surgical history was significant for adenocarcinoma of the lung, status post (s/p) lobectomy, bilateral cataracts, s/p removal, and right subdural hematoma. Physical exam was challenging because of his agitated and confused sensorium and his physical restraints. Exam was notable for visual deficits (slow light reflex, blurriness from left eye, no vision in the right), urinary incontinence, and muscle weakness noted by the Montfort physician. On admission to current hospital, our patient had a normal neurologic exam including intact cranial nerves II-XII. On hospital day 3, he developed abnormal bilateral movement of his upper extremities and fasciculations. Neurology, Infectious Disease, Psychiatry, Cardiology, and Ophthalmology were consulted. The differential diagnoses were encephalopathy (Wernicke's, metabolic, and viral), metastasis, stroke, and epilepsy. Numerous studies were obtained by the different teams at different time points; his tests were negative for cardiac arrhythmias, carotid stenosis, valvopathy, drugs of abuse, sexually transmitted diseases, infectious viral panel, and heavy metals. Magnetic resonance imaging (MRI) showed small lesions of the cerebellum consistent with metastasis or stroke and an overall picture suggesting hypoxic injury. Electroencephalogram (EEG) was consistent with non-specific cerebral dysfunction and no seizures were noted. Cerebral spinal fluid (CSF) analysis showed presence of coccidioidomycosis, as well as a higher than normal level of protein 14-3-3, which was received postmortem. Retrospectively, clinical presentation, MRI, EEG, and CSF findings were consistent with CJD.

School: School of Medicine | Campus: Lubbock

SCHOOL OF NURSING

NURSE CASTLE, LAURA & HIGGS, AMBER

Inhaled Corticosteroids Use in Pregnancy

School: School of Nursing

NURSE DUFFY, MELISSA & EARLE, BRYAN

Post Concussion Recovery In Adolescents – Is Rest The Best Recommendation?

School: School of Nursing

NURSE EDWARDS, ALISA & BRIONES, JESSICA

Concussion Management in Adolescents

School: School of Nursing

NURSE BROWN, DINA

A Comparison of Attention Deficit-Hyperactive Disorder (ADHD) Intervetions in Children Ages 6-12

School: School of Nursing

NURSE GUERRA, LISA & FINLEY, GESSICA

CAUTION!! Are you at risk for alert fatigue?

School: School of Nursing

NURSE DILLARD, DE VONN & THOMPSON, CATHERINE

Healing the Silent Victims: TF-CBT for Children of Incarcerated Parents

School: School of Nursing

NURSE HOBBS, STACY; STRAKER, MONIQUE & URBAN, LINDSAY

Trauma Focused Screening and CBT with Adolescents Living with HIV in Swaziland: A Student Perspective

School: School of Nursing

R&CF ATTIA, KHALED

IgA vasculitis in a patient on Etanercept therapy with MRSA Bacteremia and subsequent Vancomycin Exposure.

Khaled Attia, Drew Johnson, Keeley Hobart

Introduction: IgA vasculitis (Henoch-Sch√∂nlein purpura), an uncommon diagnosis in adult patients, is an immune-mediated vasculitis that leads to characteristic skin findings, arthralgias and, for adults, a high incidence of possible renal failure. It can be triggered by a wide variety of infectious and pharmaceutical agents. We report a case of an elderly man who presented to our service with the classic manifestations of IgA vasculitis with several possible causes, one of the most interesting being recent induction on a new TNF-alpha inhibitor, etanercept.

A 71-year-old male with Crohn's disease and rheumatoid arthritis on etanercept therapy presented to the hospital with a swollen right knee. He later developed petechiae and palpable purpura without thrombocytopenia. He was found to have MRSA bacteremia secondary to osteomyelitis. Hospital course was additionally complicated by acute renal failure, including proteinuria and hematuria, as well as gastrointestinal hemorrhage. Serum studies showed elevated IgA levels, and skin biopsy revealed a leukocytoclastic vasculitis. Patient was diagnosed with IgA vasculitis and started on glucocorticoid therapy which led to improvement in his dermatologic and renal manifestations. The etiology of this patient's leukocytoclastic vasculitis has many possibilities including vancomycin exposure, MRSA bacteremia, and use of a TNF-alpha inhibitor.

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF BOKAIE, HASSAN

Resource Utilization And Acute Management For Children Presenting To The Emergency Department (Ed) With Abdominal Pain

Hassan Bokaie, Lara Johnson

Abdominal pain is a common presenting complaint to the ED for children. Variation exists in both diagnostic and treatment approaches.

Objective: We sought to characterize resource utilization and patient management approaches in a representative sample of pediatric patients presenting to the emergency department with a chief complaint of abdominal pain.

Methods: We utilized the National Hospital Ambulatory Medical Care Survey emergency department sample from 2005-2015. We defined our population as having a reason for visit of abdominal pain or appendicitis with no indication of trauma or injury. key variables related to patient demographics. Additional variables include lab testing, imaging, medications and disposition as well as hospital demographics including status as a child-focused ED vs a general ED. All analyses were conducted using SAS 9.3 and SUDAAN 11.0 to account for the complex sample design.

Results: Our sample (n=5156) provides a national estimate of 1.9 million ED visits annually for abdominal pain during the study period. Most visits occurred in general EDs (n=4512, 88.2%). Few patients were infants or toddlers (age <2 years, n=151, 2.3%) and most were school age (6-12 years, n=1733, 34.8%) or adolescents (13-18 years, n=2343, 45%). The majority of patients did have some diagnostic testing (n=4247, 82.9%), and less than half had imaging (n=2289, 45%) or procedures (n=2096, 41.2%). Laboratory testing was commonly utilized (n=4247, 82.9%) as were medications (n=3964, 78.2%). Only 7.1% (n=422) required admission or transfer from the ED.

Conclusions: Abdominal pain remains a common complaint for pediatric patients. Most patients seen in the ED for these concerns do not receive imaging or procedures in the ED, but laboratory testing and medications are utilized frequently. As most patients are seen in general EDs, efforts to standardize diagnostic and management approaches should focus on care provided in those settings.

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF CLARKE, CAMERON

What Do Your Patients Think of You? An Analysis of 84,228 Online Physician Reviews

Eric Reuben Smith BS, Cameron Levi Clarke MD, Steven Linnemeyer BS, Michael Singer MD

Purpose: To analyze evaluations of ophthalmologists on two physician rating websites and understand what factors contribute to average rating.

Methods: We analyzed a total of 84,228 reviews on 3,968 ophthalmologists listed on Healthgrades.com and 3,404 on Vitals.com. Malpractice information, wait time, affiliation with academic hospital, personal information posted, and residency program attended were compared to rating scores.

Results: Ophthalmologists with malpractice history were rated lower than their peers, while those with shorter wait times and academic hospital affiliation had higher ratings (p<.01). Posting a biography or personal picture also increased the physician‚Äôs rating (p<.0001), and ranking of residency attended had no effect. Matching data from both websites, we found significant correlation between a physician‚Äôs number of reviews and average score.

Conclusion: Ophthalmologists may more efficiently use this resource through actively posting personal information and decreasing wait times.

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF HOMEN, DYLAN

The effects of upper limb neurodynamic mobilization on intraneural fluid dispersion in un-embalmed cadavers

Burgess NE, Gilbert KK, Sizer PS, Brismee JM, Sobczak S, Homen D, Kearns G

Cervical nerve root radiculopathy is a common cause of neck pain and can cause intraneural edema and impaired nerve function and movement. One strategy used to treat cervical radiculopathy is neurodynamic mobilization (NDM); however, little is known about the effect of this treatment on nerve tissue. Objectives: To investigate the impact of upper limb, median nerve-biased NDM on longitudinal intraneural fluid dispersion in the C5, C6, and C7 nerve roots in un-embalmed cadavers. Methods: Human cadaver specimens were dissected to expose and inject the C5, C6, and C7 cervical nerve roots with a dying agent. Averaged measurements of the most prominent proximal and distal borders of the initial longitudinal dye spread were taken. Specimens were then taken through 150 repetitions of upper limb, median nerve-biased NDM across a five-minute period followed by longitudinal dye spread re-measurement. Paired-samples t-tests with Bonferroni correction (alpha = 0.017) were used to compare pre- vs post-NDM dye spread measurements at C5, C6, and C7 nerve roots, and a one-way repeated measures ANOVA (alpha = 0.05) was used to examine differences between change scores for C5, C6, and C7 nerve roots. Results: Data was collected on 5 female and 3 male specimens with a mean age of 76.4 years and mean weight of 70.8kg. Median nerve-biased NDM resulted in significant intraneural longitudinal dye spread at C5 and C6 nerve roots (mean+-standard deviation dye spread of 0.6+-0.6mm and 3.6+-3.9mm respectively). Dye spread was not significant at the C7 nerve root (0.4+-0.7mm). There was no difference between C5, C6, and C7 nerve roots in longitudinal dye spread change between C5, C6, and C7 nerve roots. Conclusion: This study demonstrated that median nerve-biased NDM resulted in significant longitudinal intramural fluid dispersion in the C5 and C6 nerve roots. The results of this study support the use of NDM as a possible conservative intervention for cervical radiculopathy.

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF IBILIBOR, CHRISTINE

Impact of Retained Ureteral Stents on Long-Term Renal Function

Christine Ibilibor, Robert Grand, Cy Daneshfar, Werner deRiese, Cynthia Smith

Objectives: The current literature does not provide any data regarding the rate of chronic kidney disease associated with retained ureteral stents. Thus, we sought to determine the rates of major morbidities such as chronic kidney disease, and severe urinary tract infection caused by retained stents.

Methods: We retrospectively reviewed all records of patients at our institution who underwent ureteral stent placement and ureteral stent removal between January 2003 and October 2016. Of these patients, 34 were diagnosed with a retained ureteral stent defined as a stent in place for > 6 months. We selected 120 patients with a non-retained stent during this timeframe to serve as a control group. Our primary end-point was the rate of chronic kidney disease after ureteral stent removal.

Results: The median duration of ureteral stent in situ was 13.7 months (range of 6.4 to 146.1 months) in the retained group compared to a median of 32 days (2 days to 5.1 months) in the control group. Within the retained group, 9/34 (26.47%) with normal renal function prior to stent placement were diagnosed with chronic kidney disease after stent removal compared to 4/120 (3.33%) in the control group (odds ratio 8.64, 95% confidence interval 2.05-41.9, p = 0.0009).

Conclusions: Patient counselling and measures to ensure compliance with follow up are of paramount importance after stent placement as patients with a retained ureteral stent are at risk for chronic kidney disease despite removal of the retained stent.

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF JIN, DONGKWAN

Predicting Necessity of ICU Care for Acute Ischemic Stroke.

Dongkwan Jin, MD, Yazan J Alderazi, MD, Smathorn Thakolwiboon, MD, Walter Duarte-Celada, MD

Background and Purpose: With continuous rise in medical expense for stroke, there is a growing need for a strategy to safely triage patients with stroke among different levels of care. We studied on clinical variables to find characteristics which could be used to predict severity requiring high level of management in intensive care unit.

Methods: We retrospectively characterized consecutive patients who presented with acute ischemic stroke to a single comprehensive stroke center. 130 patients who were admitted within 2 days of stroke symptoms were enrolled for the study. Retrograde investigation was performed on demographic and clinical characteristics to find variables associated with critical conditions requiring ICU care.

Results: Initial NIHSS at presentation was found to be the single and only factor that is related to increased odd ratio of required ICU admission in patients with ischemic stroke in anterior circulation. NIHSS 6 and above began to show increasing necessity of ICU admission, and 14 or above among anterior circulation stroke showed strongest association with required ICU admission with odd ratio of 6.36, (95% confidence interval, 2.44 ,Äì 16.53, P-value < 0.001). Use of IV tPA or IA thrombectomy was not associated with critical conditions requiring routine admission to ICU. Presence of large vessel occlusion without corresponding high NIHSS did not show significant rise in the chance of critical conditions requiring ICU.

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF JOGINPALLI, SHARANYA

ANCA Associated Vasculitis Following Hematopoietic Stem Cell Transplantation

Dr. Sharanya Joginpalli, Dr. John Pixley

A 16 year old male who underwent a donor-related (brother) hematopoietic stem cell transplant for aplastic anemia due to paroxysmal nocturnal hemoglobinuria > 1 year prior was transferred to our children,Äôs hospital for new-onset fever, chills, cough, dyspnea on exertion and hemoptysis. Prior treatment for community acquired pneumonia was not effective. Initial laboratory analysis revealed a normal complete blood count and differential, elevated C-reactive protein (CRP) and elevated procalcitonin. Urinalysis was normal. Imaging revealed bilateral pulmonary infiltrates. Broad-spectrum antibiotics and anti-fungal agents were not effective. Studies to identify viral, bacterial, disseminated fungal, and mycobacterial infections were negative. Patient continued to deteriorate clinically requiring supplemental oxygen. High dose steroid therapy was initiated on hospital day 6. The patient rapidly improved on the second day of steroid administration. Due to positive response to steroids, rheumatologic studies were performed. Anti-myeloperoxidase antibody was positive at high titer while anti-proteinase 3, anti-glomerular basement membrane, anti-nuclear antibody and rheumatoid factor were negative. Sinus imaging demonstrated ethmoid, sphenoid and maxillary sinus mucosal thickening and fluid. Upon further history, mother noted a cousin who died of Wegener's disease. Recent chimerism analysis revealed >98% donor engraftment. Animal models of organ specific and systemic autoimmunity are transferable by bone marrow transplantation. We have identified two reports of ANCA associated vasculitis, one following an autologous and the other following allogenic bone marrow transplantation. This and the positive family history leaves open the possibility that susceptibility to ANCA associated vasculitis rests in the hematopoietic stem cell.

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF LEACH, CHRISTOPHER

An Unusual Cause of Neck Pain in a Crossfit Athlete

Naticia Mortensen MD; Christopher Leach MD; David Edwards MD, Keeley Hobart MD

History: A 32 year old healthy Crossfit athlete presented with a 3 day history of neck pain of moderate severity. He denied recent injury. The pain was non-radiating and accompanied by nausea and diffuse headache. He sought evaluation in our hospital's emergency department. We were called to evaluate him for hospital admission. ROS was significant for photophobia and body aches. He had no chronic medical conditions. Family history was non-contributory.

Physical Exam: Tmax 102.2¬∞ BP 131/76 mm Hg, HR 84 beats/min, RR 16 breaths/min, 97% on room air, BMI 31

He was in moderate distress due to neck pain. HEENT exam showed no trauma, MMM, EOMI, and PEERLA. The neck was rigid without tenderness. He had TTP of the paracervical muscles and bilateral upper trapezius muscles. No rashes. Neurologic exam: intact CN II-XII, no focal weakness, no sensory deficits, and negative Brudzinski's and Kernig's signs.

Differential Diagnoses: 1. Meningitis; 2. Subarachnoid hemorrhage; 3. Encephalitis

Tests and Results: CBC: WBC 11.7; RapidFlu test negative; CMP/lactate were unremarkable; Head CT: WNL; CSF: clear, WBC 225 (63% lymphs), RBC 10, glucose 55 mg/dl, protein elevated at 113 mg/dl. CSF culture negative. CSF PCR panel negative. CSF + West Nile IgM 4.84 (> 1.10 is +, neg for IgG).

Final Dx: Meningitis due to West Nile Virus

Discussion: Patient started on treatment with vancomycin, ceftriaxone, and acyclovir. He had improvement in nuchal rigidity and resolution of headache. Upon 48 hours of negative cultures, he was discharged to complete a 14 day course of acyclovir. The County Health Department was notified of West Nile Virus meningitis. Presence of West Nile Virus IgM in the CSF suggests infection since it does not cross the blood-brain barrier easily.

Experts estimate that only about 1% of West Nile disease presents with neurologic signs. Neuro-invasive disease carries a 9-15% mortality with up to 35% in the elderly

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF LOYA VALENCIA, CARLOS

When You Can't Just Walk It Off

Carlos Loya-Valencia, MD, Almond Toledo, DO, Jennifer Mitchell, MD; Jeff Paxton, MD, Cyrus Caroom, MD

20-year-old college male soccer athlete with acute right ankle pain after landing from a header while defending a corner kick during a soccer match. The pain was associated with an audible cracking sound leading to obvious ankle deformity. Initial field assessment revealed a right anterior-lateral ankle dislocation with concern for decreased perfusion as evidenced by sluggish capillary refill. Sideline reduction techniques were performed with restoration of brisk capillary refill and evidence of preserved sensation and motor function. After on-field reduction, the patient was splinted and transferred to a nearby Emergency Center. Imaging revealed an acute lateral and posterior malleolus fracture with evidence of syndesmosis widening. Furthermore, anterior subluxation was reduced under fluoroscopic guidance to an anatomical position. Surgical intervention was delayed allowing for edema to improve. Following an open reduction with internal fixation of the lateral malleolus, external rotational stress was applied which was noteworthy for persistent syndesmosis widening. For this reason, the posterior malleolus was fixed with screws in order to stabilize the posterior inferior tibiofibular ligament and restore syndesmosis stability.

The case of this 20-year-old male soccer athlete with a right ankle bi-malleolar fracture with syndesmosis instability, serves as a demonstration of the importance of sideline medical management and provides evidence for an alternative procedure to provide syndesmosis stability. Traditionally, syndesmotic instability requires fixation with position screws or a suture button if there is tibiofibular diastasis, a Maisonneuve fracture or persistent syndesmotic disruption after distal fibular fixation. However, in this Weber B3 injury, stability of the syndesmosis was successful via fixation of the posterior malleolus in order to support the posterior inferior tibiofibular ligament.

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF LU, HO-CHENG

Fatigue alters coordination variability during the Wingate Trials

HoCheng Lu, Josh Gills, Braden Romer, C. Roger James, and David Szymanski

INTRODUCTION: Neuromuscular fatigue is a risk factor for acute musculoskeletal injury. The effects of central and peripheral fatigue on motor coordination have been explored during prolonged locomotion. However, only a few studies have focused on the effects of fatigue induced by a short, high intensity exercise. PURPOSE: The purpose was to examine the effect of peripheral fatigue on coordination variability during the execution of a Wingate Test (WT) in men. METHODS: Twenty-three health males (height = 175.5 ¬± 7.4 cm, body mass = 76.4 ¬± 11.4 kg and VO2 peak = 55.4 ¬± 9.9 ml¬∑kg-1¬∑min-1) voluntarily participated in this study. Subjects completed VO2peak in the first session. After one-week recovery, subjects returned to complete the WT, which involved pedaling as fast as possible for 30 seconds. Two-dimensional sagittal plane kinematics were collected using motion capture camera recording at 120 Hz. A custom MATLAB program was utilized to calculate continuous relative phase (CRP) ratios representing inter-segment coordination. Sagittal plane segment angles and velocities were calculated to determine CRP mean and deviation phase (DP) of the thigh-shank and shank-foot. WT duration was divided into thirds as follows: Part 1: 0-10 seconds, Part 2: 10.1-20 seconds, and Part 3: 20.1-30 seconds. One-way repeated measures ANOVA was used to examine differences in both CRP mean and DP across temporal parts. RESULTS: A significant difference in the shank-foot CRP mean was observed between Part 1 (-40.85¬∞¬±12.58) and Part 2 (-45.99¬∞¬±9.51). A significant difference in the shank-foot DP was observed between Part 3 (24.39¬∞¬±4.39) and Parts 1 (21.40¬∞¬±3.84) and 2 (21.32¬∞¬±3.73). CONCLUSION: During high intensity cycling to fatigue, subjects showed significant alterations in coordination between the shank and foot. Altered coordination could indicate a greater demand on the hip and knee extensors, and result in increased injury risk.

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF MBAGWU, CHINYERE

Serotonin Syndrome An Often Overlooked Problem in the Palliative Care Population

Chinyere Mbagwu MD Palliative Hospice Fellow Texas Tech University Health Sciences Center Lubbock TX Joyce Hnatek MD Assistant Clinical Professor of Primary Care Texas AM Health Science Center College Station TX Kelly Klein MD FAAHPM HMDC Associate Professor of Family and Community Medicine Texas Tech University Health Sciences Center Lubbock TX

Objectives:
1. Recognition of increased vulnerability of palliative care population for serotonin syndrome
2. Awareness that serotonin syndrome is a spectrum and that presentation is often subtle
3. Recognition of treatment options for serotonin syndrome in palliative care population
4. Understanding alternatives to treatment of various illnesses by avoiding or altering medications that likely lead to serotonin syndrome

Background: Palliative care patients are exposed to many medications that predispose to serotonin syndrome (SS). Because this is not a prompt diagnosis that is considered, even when patients present with common symptoms, these patients are often misdiagnosed and inappropriately treated. Providers may not recognize patients are on medications that have high predisposition for causing SS that leads to inappropriate treatment, and may inadvertently prescribe more medications that make SS worse. This leads to false presumption of disease progression, terminal restlessness, and diminished quality of life.

Case Description: A 66M with metastatic stage IV NSCLC was admitted for pain crisis. His regimen was scheduled methadone and hydromorphone prn. During admission, methadone dose was increased and patient developed new symptoms of hyperreflexia, clonus, akathisia, fever, and confusion. In light of chronic use of paroxetine for PTSD along with newly added methadone, SS was suspected. Unwilling to stop paroxetine, patient was gradually weaned off methadone and remained on hydromorphone with good pain control. The patient‚Äôs symptoms resolved and he was A&O x 4 at time of discharge.

Conclusion: A multidisciplinary approach with increased sensitivity for potential of SS, with early recognition and prompt treatment, leads to quick resolution of what can become an otherwise catastrophic outcome. It is imperative for palliative physicians to have a high index of suspicion for potential of serotonin syndrome with medications often necessary in palliative care

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF RUIZ, ANASTASIA

The effect of Marijuana on adolescent brain development

Anastasia Ruiz, Sarah Wakefield

Many adolescents have exposure to marijuana during the crucial years of brain development. This poster will gather current evidence based medicine in published literature, and discuss the effects of using marijuana on the adolescent brain.

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF SCHOOF, JACOB

Car Seat Safety. Can demonstration of proper technique increase parent's knowledge on car seats and proper car seat use?

Madison, Arrington; Schoof, Jacob; Foreman, Michael S.; Halfmann, Sara; Camp, Tammy; Robinson, Kirsten

More than 3,000 infants and children die every year in motor vehicle collisions. It has been found that up to 30% of parents do not use infant car seats properly.1 In a motor vehicle collision, the effectiveness of the car seat is decreased when used improperly, increasing risk of injury to the infant. We aimed to evaluate whether 1-on-1 instruction with a model car seat and doll would increase parent's knowledge on car seat safety and proper use.

Data was collected using a car seat scorecard when parents brought their infant back for a 2-3 day weight check following discharge from the newborn nursery. The score card assessed 6 subcategories of safety from 0 (least appropriate) to 2 (most appropriate) for a maximum score of 12. The subcategories were: car seat expiration, infant's position in the car seat, clothing bulkiness, chest strap tightness, position of center clip and presence of blankets or other suffocation risks. 120 scorecards were collected for baseline data. The 1st intervention used a model car seat with instruction doll that residents incorporated in their parent education prior to discharge from the newborn nursery. 62 scorecards were recorded for car seat use when infants returned for their weight check. A 2nd intervention incorporated an additional measure to the discharge education: turning the car seat upside down to aid parents in visualizing how tight the straps should be, with hopes to increase scores in the chest tightness subcategory. 51 additional scorecards were collected during this 2nd intervention cycle.

Baseline data showed an average total score of 8.8/12 with the lowest scoring subcategory being chest strap tightness. After the 1st intervention, the average total score increased to 10.55/12. The chest strap tightness remained the lowest scoring category, however the average score of the subcategory increased from 0.82/2 to 1.12/2. The percent increase of total score from the baseline to the 1st intervention was 19%.

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF SCHWALK, AUDRA

Tracheobronchial foreign body aspiration: The great mimicker

Audra Schwalk, Raed Alalawi

A 53 y/o male with COPD presented with a chronic cough. Chest CT showed a large area of bronchiectasis and infiltrate in the medial right lower lung field, right hilar LAD and a right hilar nodule measuring 2cm x2.3cm transversely, thought to represent a central malignancy. He had a 20 pack year smoking history. Physical exam was unremarkable. Bronchoscopy revealed an erythematous, fungating, polypoid lesion at the orifice of the RML. A foreign body was seen amidst the irritated bronchial mucosa. This foreign body was removed with forceps and was later identified as a drinking straw. Endobronchial biopsies were performed at the area of the FB removal to ensure no malignant changes were present. The patient continued to do well post-procedure and his cough resolved.

Tracheobronchial FB aspiration is uncommon and only accounts for about 0.16 to 0.33% of adult bronchoscopic procedures.1 A choking episode followed by coughing and dyspnea are often described, but not always. The retained FB can cause symptoms that mimic chronic conditions such as COPD, recurrent pneumonia1 and possible malignancy. Most episodes are seen in children, but up to 25% of cases involve adults,1 making the differential quite broad if there is a lack of acute symptoms. In adults, neurological deficits, altered mental status, impaired cough reflex and intoxication increase the risk of FB aspiration.1,2 If asymptomatic, FBs are often found incidentally on imaging. CXR will only identify FBs about 25% of the time, therefore chest CT is preferred.1 Chest CT often shows focal abnormalities such as: atelectasis, bronchiectasis, consolidation1 or findings suggestive of malignancy. Bronchoscopy with removal of the FB should be completed early after identification to prevent further lung damage.

FB aspiration is uncommon and can present as more common chronic conditions or even suggest malignancy.

School: Texas Tech University Health Sciences Center | Campus: Permian Basin

R&CF SCHWARTZ, CYNTHIA

A Novel Repair Method of Temporal Bone Encephalocele with Cerebrospinal Fluid Leak and Review of Literature

Cynthia Schwartz, MD, Pranati Pillutla, BS

Objective: To present a case of temporal bone encephalocele with cerebrospinal fluid (CSF) leak, demonstrate a novel repair method, and perform a literature review of repair techniques.

Patient: A 55 year old female presented with complaints of recurrent ear infections, aural fullness, and hearing loss. Her past surgical history included right canal wall up mastoidectomy and tympanoplasty and sinus surgery. A CT of the right ear showed significant tegmen tympani defects, suspicious for CSF leak. Upon operation, significant temporal lobe herniation into the mastoid cavity was noted, which was amputated. A cortical mastoid bone flap and two cartilage grafts were harvested and layered into the 7 mm by 2.5 cm defect. Norian Drillable (DePuy Synthes, Raynham, MA, USA) bone void filler was used as sealant. No leak was found upon inspection.

Results: Our patient has no evidence of CSF leak to date. The transcranial approach, transmastoid approach, or a combination are the most commonly described procedures to treat temporal bone encephalocele with CSF leak.

Conclusions: Using bone void filler, temporal lobe herniation and large CSF leak were resolved by a transmastoid approach. A MCF approach requiring cranioplasty, a surgery often needing placement of a lumbar drain, prolonged hospitalization, and the risks of brain retraction, was avoided. This case report, containing a novel use of bone void filler, suggests that patients with defects up to 2.5 cm may be able to avoid the MCF approach.

Level of Evidence - LEVEL V - Case study with no controls

IRB: Exempt

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF SECKEL, SHANNON

Perineal masses in the newborn: A case report.

Sonia G. Joseph, MD., Shannon M. Seckel, DO

Perineal masses in the newborn are a fairly rare finding that can result in a myriad of diverse diagnoses. The significance of isolated lipomas in this population is largely unknown, as there have been few documented reports of lipomas not associated with other malformations. In this case report, this 39 week gestational age female was found to have a benign perineal lipoma with the additional presence of an atrial septal defect (ASD). The patient underwent surgical removal of the mass at 2 months of life, tolerated the procedure well, and continues to follow with cardiology in the outpatient setting. To the best of our knowledge, this is the first case of a perineal lipoma noted in conjunction with a cardiac anomaly to be reported in the literature. Clinically, our investigation details the differential diagnosis and workup of these infants in order to highlight the importance of investigating for other anomalies and determining the need for surgical intervention.

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF SHANK, SARA

Improvement Of Sedated Mri Utilization In Pediatrics

Irem Eldem, M.D., Sara Shank, M.D., Summer Davies, M.D., Roy Jacob, M.D.

Background: MRI with sedation accounts for 23% of pediatric MRI studies with 31% of those being inpatient. Barriers to completion of an MRI in pediatric populations includes the frequent use of sedation and poor communication amongst pediatric hospitalist, anesthesia and radiology. In this project we sought to decrease NPO times for all pediatric patients undergoing sedated MRI in the inpatient setting to <8 hours.

Methods: We conducted a retrospective chart review of pediatric patients who had an MRI study ordered on pediatrics floor, PICU, NICU and as outpatient. The pre-intervention phase (August 2017) served as a control, and three PDSA cycles occurred over the post-intervention phase (September - December 2018). The first PDSA cycle entailed an in-house education provided to the pediatric residents regarding the scheduling and communication process for MRI studies. The second PDSA entailed education provided again to pediatrics resident involving inpatient MRI and sedation indications. The third PDSA cycle involved a standard order set that was recommended to all pediatric physicians detailing the fasting time protocol at UMC. QIRB approved project.

Results: Pre-intervention: 94 MRI studies were analyzed. 73% (n=79) of MRI studies were inpatient. 70% (n=55) of inpatient studies were ordered by pediatric floor and 30% (n=24) from PICU and NICU combined. Pre-intervention, only 57% (n=20) had NPO times prior to sedated MRI studies lasting less than 8 hours, which increased to 79% (n=11) post-intervention cycle 1, 65% (n=11) post-intervention cycle 2 and 75% (n=14) post-intervention cycle 3. Pre-intervention 57% (n=27) were sedated which significantly improved post-intervention cycle 1 to 30% (n=16), post-intervention cycle 2 to 54% (n=18) and post-intervention cycle 3 to 51% (n=20).

Conclusions: It is evident that the improvement of interdepartmental communication as well as MRI and sedation knowledge is essential for having reduced NPO times.

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF SONG, ELISA

How to Improve Medication Administration Sheet

Elisa Song, MD ; Michelle Tarbox MD

Texas Tech Dermatology Clinic is a busy outpatient clinic in which thousands of patients are seen each year. Many procedures are done in the outpatient setting - such as intralesional kenalog (ILK) or candin injection (immunotherapy)- on a daily basis. In order to perform the appropriate procedure - the medication being administered has to be matched to a diagnosis, using the ICD-10 system. In the past- frequent errors were created as the diagnosis code had to be individually looked up each time. A new and improved medication administration sheet was created where the most commonly used ICD-10 codes, along with frequently performed procedures- were all displayed on one sheet, in which the physician simply has to circle the diagnosis from a list. After this intervention- based on a post-intervention survey that was administered to both the physicians and other medical staff- it became clear that this method of medication administration facilitated and simplified the process. This new sheet has been used the dermatology for the past two years, and it continues to minimize errors.

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF STANLEY, RUSSELL

Investigation of PO agents for cystoscopic evaluation of ureteral jets

Russell Stanley, DO, Cornelia deRiese, MD, PhD, Ann Erickstad, MD,

Objective: This study evaluates oral agents used to visualize ureteral jets at the time of intraoperative cystoscopy. Agents examined by the study are oral pyridium and vitamin B riboflavin. The study looks to determine if administration of a standard oral dose of vitamin B riboflavin is a comparable oral agent to pyridium for evaluating patency of ureteral jets at the time of intraoperative cystoscopy.

Methods: A 3 arm double-blinded, randomized controlled pilot study was performed. Group 1 was administered pyridium, Group 2 was administered vitamin B riboflavin, and group 3 was administered thiamine as a placebo. The surgeons and patients were both blinded to the treatment. The agents were administered to the subjects on the morning of surgery 1 hour (+/- 15 minutes) prior to the procedure. A data sheet with a urine color scale was used intraoperatively as a grading system by the surgeons to grade the color of the urine jet and to evaluate the strength of the urine jet.

Results: The Cochran-Mantel-Haenszel for ordinal outcomes was used to compute the appropriate Chi-square test for equivalence between color intensity of the three groups. Early study results have found comparable results for urine color intensity for both vitamin B riboflavin and pyridium and overall the results showed that both agents produced a strong urine jet with moderate color intensity.

Conclusions: Vitamin B riboflavin is an appropriate comparable oral agent to pyridium for producing urine staining and evaluating the patency of ureteral jets at the time of cystoscopy.

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF TOLEDO, ALMOND

No Contact, Yet Two Surgeries?

AR Toledo DO, J Mitchell MD, M Phy DO and K Crawford MD

History: A 23-year-old college football player sustained a non-contact right knee injury during an outdoor team scrimmage. He had attempted to pivot and change direction with his right foot planted on a natural grass practice field when he felt a pop with associated pain. Medical staff noted a knee deformity with a posterolateral translation of the tibia. Had weak distal pulses compared to the contralateral extremity. Pulses returned to normal with successful reduction of the joint. He was placed in a knee immobilizer and transported to the hospital for further evaluation.

On-field Physical Exam: General: In considerable amount of pain; Musculoskeletal: Grossly deformed right knee with circumferential swelling; Vascular: Faint distal pulses; Physical Exam Status-post EMS Transport to ED; Vitals: BP: 151/96, HR: 78, RR: 18; General: Pain well controlled with narcotics; Cardiovascular: Normal distal pulses

Musculoskeletal: Right Knee - Skin intact. TTP along the lateral and medial joint line. Proximal tibia nontender to palpation. Compartments throughout the right lower extremity soft. Able to dorsiflex and plantarflex ankle symmetrically compared to left. Ligament exam limited secondary to apprehension and guarding

Neurology: Motor and sensory functions intact bilaterally

Test Results: CT Angiography Right Lower Extremity: WNL; MRI 1 day status-post injury consistent with ACL, PLC, and meniscal tears with PCL sprain

Diagnosis: Right knee dislocation

Discussion: A multiligamentous injury is rare in non-contact injury. Only two sports related non-contact knee dislocations case reports were located. Multiligament repairs performed in a single stage can have significant decreased ROM.

Treatment/Outcome: Patient was hospitalized and monitored. PLC repair 16 days after injury. Typical post surgical care with gradual start of rehab 2 weeks post-op. ACL reconstruction was performed when normal range of motion was recovered. He is actively rehabilitating to return to football

 School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF VORAKUNTHADA, YUTTIWAT

Clostridium Septicum Bacteremia Presenting As A Para-Neoplastic Sepsis

Yuttiwat Vorakunthada, Weerapong Lilitwat

A 58-year-old male with metastatic adenocarcinoma of the colon and the pancreas who presented with signs of severe sepsis on admission. His labs revealed leukopenia (WBC was 3,760/uL with an ANC of 2,100/uL), elevated pro-calcitonin (13.11 ng/ml), and elevated lactate (4mg/dL). The abdominal radiograph was unremarkable. Stool Clostridium difficile toxin PCR was positive. However, interestingly, his blood cultures grew Clostridium septicum. He was admitted to the MICU and treated empirically with vancomycin and metronidazole. His hemodynamic status improved with fluid resuscitation. Repeat blood cultures were negative, and he was discharged with oral metronidazole. Unfortunately, the patient has moved to California, and we could follow his disease course.

Clostridium septicum is a gram-positive, obligate anaerobic bacillus. Unlike other Clostridial species, Clostridium septicum does not appear to be a normal gut flora, but it can be found in soil and animals. It can be differentiated from the more common counterpart, Clostridium perfringens, by microscopic examination of subterminal spores. Factors that promote the growth and proliferation include tissue hypoxia from anaerobic glycolysis and outgrowth of blood supply by the proliferating tumor cells. Additionally, the production of various enzymes allows evasion of the host's immune response. In our patient, a combination of tumor necrosis and gastrointestinal mucosal damage from chemotherapy agents would account for this infection.

Clostridial septicum bacteremia should always be suspected in cancer patients who present with fever, malaise, and localized pain. On the other hand, previously healthy patients with Clostridium septicum bacteremia should also prompt physicians to perform workups for gastrointestinal, genitourinary, and hematologic malignancy. Rapid diagnostic tests for Clostridial infection is not available, and a high index of clinical suspicion is necessary for early diagnosis.

School: Texas Tech University Health Sciences Center | Campus: Lubbock

R&CF WARD, JENNIFER

Inter-professional Education in Long Term Care Setting

Jennifer D Ward, MD; John Culberson, MD; Rebecca Sleeper, PharmD

Background: Collaboration among medical professions is essential when caring for elderly patients in long term care. Without this approach, care is severely fragmented and unable to address the needs of individual patients. While this is difficult to stimulate in medical training, inter-professional education allow for the mimicking of this collaboration as students and residents learn to care for patients in a controlled environment (Solberg 2015). However, most medical learners have not had sufficient opportunity to interact with other healthcare professions (Montagnini 2014). To address this deficiency among Family Medicine residents at Texas Tech, the program has been working with doctoral pharmacy students for the past year with an informal collaboration in long term care. Previous studies have shown that more formal curriculum for learners improves the overall understanding of the inter-professional team and the objectives of the learning experience (Oliver 2011). Given that polypharmacy is a significant issue for long term care patients, a needs assessment for formal curriculum addressing the following educational objectives has been conducted: 1) Identification of polypharmacy 2) Evidence-based drug therapy 3) Objective measurement of drug efficacy and 4) Compliance with regulatory standards. Methods: 26 current Family Medicine residents of varying involvement with pharmacy students were surveyed from Texas Tech University HSC in Lubbock, TX. An 8-point online questionnaire utilized a 5 point scale to assess gains in knowledge. Results: While most residents indicated increase in knowledge of each objective from the interaction with pharmacy students (57-73%), residents felt the least comfortable with objective measurement of drug efficacy (¬μ=2.46) and regulatory standards in long term care (¬μ=2.15). Conclusions: Based on the results, Family Medicine residents have gained some knowledge of the educational objectives. Results of this needs assessment indicate

School: Texas Tech University Health Sciences Center | Campus: Lubbock

SHP BASSETT, CAMERON

A comparison of unembalmed and embalmed tissue stiffness: An in situ investigation of knee tendon, muscle, and ligament tissue.

Cameron Bassett PT DPT, Kerry Gilbert PT ScD, Troy Hooper PT ATC PhD, Roger James PhD FACSM

Introduction: Cadavers provide a valuable tool for education, clinical simulation, and research. This study measured tissue stiffness differences between unembalmed and embalmed knee tissues at various positions of knee flexion.

Materials and methods: Ten cadavers (5 unembalmed and 5 embalmed) were used to measure tissue stiffness in the Patella Tendon (PT), Vastus Medialis Oblique muscle (VMO), and Superficial Medial Collateral Ligament (sMCL). Intrarater reliability was established using the Interclass coefficient (ICC (3, 3)). Tissue measurements were performed using an Aixplorer¬Æ ultrasound scanner with Shearwave Elastography (SWE) for unembalmed and embalmed cadavers at five and 20 degrees of knee flexion. Data were analyzed using a two-way mixed ANOVA.

Results: Good reliability was found with SWE measurements of the PT (ICC (3, 3) = 0.969), VMO (ICC (3, 3) = 0.976), and sMCL (ICC (3, 3) = 0.826). Tissue stiffness measurements were significantly different between embalming conditions for the PT and VMO (PT: $p < 0.001$; VMO: $p = 0.008$) but not for the sMCL ($p=0.625$). No significant tissue stiffness difference was found between five and 20 degrees of knee flexion (PT: $p=0.473$; VMO: $p=0.598$; sMCL: $p=0.348$).

Conclusions: Tissue stiffness is reliability measured in PT, VMO, and sMCL with SWE. The embalmed cadaver tissues have higher stiffness measures than unembalmed cadavers with PT and VMO, but not for sMCL tissues. Five to 20 degrees of knee flexion does not change stiffness of the PT, VMO, or sMCL. We recommend embalmed cadavers for education and unembalmed cadavers for clinical simulation, and biomechanical research.

School: School of Health Professions | Campus: Lubbock

SHP CHEN, YO-RENG

Does Movement Strategy Change Y Balance Test Performance Variability? - A Pilot Study

Chen YC, Munger L, Hooper T, James R

Composite scores are the main outcome measurements in Y Balance Test (YBT). However, maximum reach distance may vary with different movement strategies. Observing performance variability (PV) may provide more valuable clinical information. Objective:A pilot study to analyze whether movement strategies(2) and testing directions(3) would change PV in YBT. Design:Controlled laboratory study. Participants:Eight healthy male volunteer subjects randomized into two groups.(age=25ÔÇ±1.83years, height=172.4ÔÇ±2.06cm, mass=71.7ÔÇ±4.25kg) Procedures:Two groups performed YBT standing on the dominant leg using both personal(P) and specific(S) strategies, but different orders (P-S versus S-P). Subjects were instructed to perform a regular YBT for P. Extra cues were given to control heel, knee, torso, trunk and hands for performing S. Directions, anterior(ANT), posterior-lateral (PL) and posterior-medial(PM), of nine reaching trials were randomized. Main Outcome Measures:Reach distances were standardized relative to the subject's leg length. Performance variability was defined by measuring Absolute Error (AE), by the following equation (AE=[,àëi=1 to 3 |xi - xÃÑ|]/3). Mann-Whitney U tests were used to examine if strategy order changed PV in each direction. A 2(strategies) by 3(directions) ANOVA was used to analyze whether these variables affected PV. Results:No statistically significant differences for strategy order were found in any direction (ANT:p=.632;PL:p=.520;PM:p= 603). No significant interactions (p=.645,ÔÅ®p2 =.061,Power=0.110) nor main effect for strategy(p =.642,ÔÅ®p2 .033,Power=0.071) were found, but a main effect for direction was observed(p =.008,ÔÅ®p2 =.501,Power =.861). Pairwise comparisons revealed a difference between ANT and PL (p =.008) Discussion:The statistical difference occurred between ANT and PL only. Conclusions:Our preliminary data showed that movement strategy order and type did not affect PV. However, PL distances were more variable than ANT and PM distances.

School: School of Health Professions | Campus: Lubbock

SHP DEWAN, BIRENDRA

Kinematic Validation of Postural Sway Measured by Biodex Biosway (force plate) and SWAY Balance (accelerometer) Technology

Birendra Madi Dewan, PT, BPT; Steven Sawyer, PT, PhD; Roger James, PhD; Neeraj Kumar, PT, PhD, NCS

Background: The Biodex Biosway¬Æ Portable Balance System and SWAY Balance¬Æ Mobile smartphone application (SBMA) assess balance function with force plate and accelerometer technology, respectively. The validity of these indirect measures of postural sway merit investigation.

Research Question: The purpose of this study was to investigate the concurrent validity of standing postural sway measurements by the SBMA and Biosway systems with kinematic measurements of the whole body Center of Mass (COM) derived from a motion capture system.

Methods: Forty subjects including 21 females participated in this study. Participants performed 10 standing balance tasks that included combinations of standing on one or two legs, with eyes open or closed, on a firm surface or foam surface and voluntary rhythmic sway. Postural sway was measured simultaneously from SBMA, Biosway and motion capture system. The linear relationships between the measurements were analyzed.

Results: Significant correlations were found between Biosway and COM velocity for both progressively challenging single and double leg stances (œÑb=.3 to .5, p<.01 to <.0001). SBMA scores and COM velocity were significantly correlated only for single leg stances (œÑb=-.5 to -.6, p<.0001). SBMA scores had near maximal values with zero to near zero variance in double leg stances indicating a ceiling effect. The results indicate that a force plate based Biodex Biosway is valid for assessing standing postural sway for a wide range of test conditions and challenges to balance, whereas an accelerometer-based SWAY Balance smartphone application is valid for assessing postural sway in progressively challenging single leg stance but is not sensitive enough to detect lower-magnitude postural sway changes in progressively challenging double leg stances.

Significance: Insights from this study, and further investigations in clinical populations, will be useful in the selection of clinical balance assessment instruments.

School: School of Health Professions | Campus: Lubbock

SHP DRUSCH, ALEXANDER

Three-Dimensional Spinal Mobilization Positions With And Without Manual Distraction Load Enhance Spinal Growth

Alexander Stephen Drusch MS, CSCS, Sohal S. Hallur, MSPT, Jean-Michel Brism√©e, PT, ScD, Phillip S. Sizer, PT, PhD, Fr√©d√©ric Dierick, PT, PhD, Birendra Dewan, PT, PhD (c), Paul Thiry, PT, PhD (c), St√©phane Sobczak, PT, PhD

Context: Three-dimensional (3-D) spinal positions are often used in daily life and as therapeutic positioning techniques by physical therapists to treat patients with low back conditions.

Objective: To investigate if spinal height increases using 3-D spinal positioning with and without manual distraction load and to assess the correlation between spine height changes and degrees of trunk rotation.

Methods: Fifty-six participants were randomly placed in one of two groups: (1) 3-D spinal positioning with manual distraction load, and (2) without manual distraction load. Spinal height was measured before and after the interventions using a stadiometer. Statistical Analysis: A 2 (Loading status: pre- versus post-intervention height) X 2 (3-D spinal mobilization position: with versus without manual distraction load) repeated measures Analysis of Variance (ANOVA) was used to identify significant interaction and main effects. Paired t-tests were used to calculate differences in spinal height changes between the two conditions. Pearson correlation coefficient was used to measure correlations between changes in spinal heights and degrees of trunk rotation.

Results: Mean spinal height increase with 3-D spinal positioning with and without manual distraction load was 6.30 mm (+/- 6.22) and 5.69 mm (+/-4.13), respectively. No significant interaction effect was present between loading status and 3-D spinal positioning but a significant main effect in loading status was. Paired t-tests revealed significant differences in spinal heights between pre-and post- 3-D spinal positioning with and without manual distraction load. No significant correlation was measured between trunk rotation and spinal height changes.

Conclusion: Both 3-D spinal positioning increased spinal height. Therefore, 3-D spinal positioning without manual distraction could be used in home settings to help maintain intervertebral disc (IVD) health.

School: School of Health Professions | Campus: Lubbock

SHP KAPILA, JEEGISHA

Intra-rater Reliability of Infraspinatus and Posterior Glenohumeral Capsule Shear wave Elasticity Measurement During Sustained Posterior Glide Mobilization.

Kapila, J, James, CR, Brism√©e JM, Gilbert KK, Hooper, TL

Background: Posterior shoulder joint capsule and infraspinatus stiffness are hypothesized causes of decreased mobility and function. Manual therapy may improve shoulder capsular flexibility by decreasing capsuloligamentous stiffness.

Purpose: The purpose of this study was to investigate the intra-rater reliability of shear wave elastography (SWE) of posterior shoulder capsule and infraspinatus elasticity measurements and humeral head position during a sustained posterior glide mobilization.

Methods: Eight subjects [4 Male & 4 Female; BMI= 25.7 (4.2)] aged 30-47 years (36.6) were recruited to establish intra-rater reliability of SWE elasticity measurements and humeral head position (ICC3,3). They were positioned in supine with the shoulder abducted to 45 degrees. An investigator applied sustained posterior gliding mobilization force (90 N) to the anterior shoulder for 30 seconds using a hand-held dynamometer. A second investigator place a 10-2 MHz linear ultrasound transducer on the posterior shoulder to evaluate humeral head displacement, infraspinatus tendon, and posterior capsule SWE elasticity measures before and during each mobilization.

Results: The ICC values for posterior capsule SWE elasticity at rest and during sustained posterior glide mobilization were 0.75 and 0.86, respectively. The ICC values for infraspinatus SWE elasticity during the same two conditions were 0.81 and 0.90. Humeral head position measurement reliability was 0.83 at rest and 0.74 during the posterior glide.

Discussion: Infraspinatus muscle and posterior capsule SWE elasticity measurement during posterior glide mobilization had good intra-rater reliability. Similarly, humeral head position during posterior glide mobilization had clinically acceptable reliability.

Conclusion: The SWE elasticity measurement is reliable to assess local tissue stiffness changes during movement. This technique may be useful for evaluating pathological joint tissue changes and responses to interventions.

School: School of Health Professions | Campus: Lubbock

SHP LIU, YILAN

Acoustic Analysis of Vowel Nasalization for Mandarin and English speakers

Yilan Liu, MA; James Dembowski, PhD, CCC-SLP

“Nasality” refers to nasal resonance in speech production. Variations in nasal resonance may characterize special populations, such as people with hearing loss and cleft palate, but may also reflect language differences. Nasal resonance may be estimated from specialized equipment (a nasometer) or from a standard acoustic signal. A pilot study found Mandarin speakers produced higher nasometer values (“nasalance”) than native English speakers on selected speech samples, but whether these values were evident in the acoustic signal was not explored. This project aims to compare nasalance scores to acoustic measures of nasality in Mandarin and English speakers. Acoustic measures are based on comparisons of the amplitude of the first vocal tract resonance or formant (sometimes labeled A1) with harmonics thought to reflect nasal resonance (usually labeled P0 and P1). The expectation is that acoustic values based on A1-P0/P1 differences, together with nasalance scores, will provide evidence of higher vowel nasalization in Mandarin speakers than English speakers.

School: School of Health Professions | Campus: Lubbock

SHP MURPHY, BRANDI

Graph Area Activations: An Investigation Using fMRI Techniques

Brandi Murphy, Eric Walden, Jiang Hu, Weihong Ning, & Nakul Padalkar

Graphs are strategic visual representations that offer meaning in various ways. Within the healthcare industry, graphs may be utilized to display information regarding a patient's health status. An audiogram is a graph consisting of lines that convey important health related information. This would be an example of graphical representation to display important information regarding a patient's hearing sensitivity. Audiologist use this graph to plot hearing sensitivity, counsel, and program hearing aids. Ear, Nose, and Throat physicians may use audiograms to assess treatment plans. Speech-language pathologists may incorporate the audiogram as counseling tools and establishing speech audibility for speech therapy. Educational staff may use this information to determine appropriate services to provide the student in the classroom. All of this information is extracted from one type of graph. Other professionals in the healthcare industry utilize different types of graphs on a daily basis. Understanding the way humans process graphical information is an important topic that has not been widely studied in the field of fMRI.

Neuroscience research has examined the human cognitive processes of face, body, and objects. Research has shown visual cortical area activations; known as the fusiform face area. This poses a question; if the brain has areas of activation related specifically to faces, are there areas in the brain related to graphs? Graphs have been present for hundreds of years and are observed on a regular basis. Has evolution created a ‚Äúgraph area‚Äù within the human brain? The goal of this study is to determine if the observation of graphs cause particular areas in the brain to activated consistently. We hypothesized difference activations between non-graph and graph presentations. Grasping a better understanding of graph cognition could potentially alter strategies in which these graphs are utilized in the healthcare industry.

School: School of Health Professions | Campus: Lubbock

SHP NICHOLS, CHARLES

Glenohumeral Joint Capsule Tissue Under Tension Loading Correlates Highly with Shear Wave Elastography: A Cadaveric Investigation

Nichols Jr CW, Brismée JM, Hooper TL, Bertrand-Grenier A, Gilbert KK, Sobczak S

Background: Joint capsular tissue restrictions result in joint range of motion (ROM) limitations. The effects of joint mobilization and tension loading on capsular tissue remain unknown. Ultrasound shear wave elastography (USWE) has been used in vivo to measure stiffness in organs, tendons, and muscle. However, no study has investigated the reliability and validity of USWE readings in measuring capsular tissue property changes against a reference standard.

Objectives: To investigate capsular tissue mechanical property changes using USWE and a durometer, a device validated to measure tissue hardness, under various tensile loads and determine USWE and durometer measurement reliability and correlation of USWE with durometer measurements.

Methods: The inferior glenohumeral joint (GHJ) capsule was harvested from 10 fresh human cadaveric specimens. Tensile loading was applied to the capsular tissue using one, three, five, and eight-kilogram (kg) weights with measurements taken during loading with USWE and a Shore A durometer.

Statistical Analysis: Descriptive statistics were calculated. The Shapiro-Wilk was performed to assess data normality. Reliability was established for the USWE and durometer using intraclass correlation coefficients (ICC3,5). A Pearson Product-Moment Correlation assessed the association of USWE with a durometer.

Results: Reliability for the durometer measurements was 0.90 (95% CI 0.79-0.96) and for USWE was 0.95 (95% CI 0.88-0.98), respectively with a Pearson Correlation Coefficient of 0.62 (CI 0.25-0.86) to measure tissue tension loading properties.

Conclusion: Both the durometer and USWE measurements were highly reliable and correlated moderately for measuring GHJ capsule elasticity. These results suggest that SWE can be used to assess joint capsule tissue properties changes during tension loading.

School: School of Health Professions | Campus: Lubbock

UNDG AFTABI, ALI

A Comparison Between Past, Present, and Future Treatments Against Poly-Microbial Chronic Wound- Associated Biofilms

Ali Aftabi, Whitni K. Redman, Angel R. Cueva, Kendra P. Rumbaugh

Chronic wounds have a high potential to become infected with pathogenic bacteria, that frequently leads to the development of biofilms. Biofilms are communities of bacteria that secrete an extracellular polymeric substance (EPS). Pseudomonas aeruginosa (PA01) and Staphylococcus aureus (SA31) are two virulent microorganisms that are frequently found in chronic wounds. Efficient treatment of biofilms is a difficult task since the EPS prevents therapeutic agents from reaching the bacteria. The biofilm-associated bacteria are metabolically inactive, further inhibiting the efficacy of therapeutic agents. Recently, there have been studies to suggest that the use of enzymes that degrade the EPS increases the efficacy of antibiotics. Various herbal-based essential oils have also demonstrated antibacterial properties, although there have been no studies suggesting these oils work against biofilm-associated bacteria. The aim of this study was to compare past (herbal remedies), present (antibiotics), and future (enzymes) treatments against biofilm-associated bacteria as well as to determine the essential oil with the highest antibacterial activity. In order to replicate the wound environment, we implemented an in vitro model previously described as the Lubbock Chronic Wound Like Media (LCWLM). This wound-like media contained both PA01 and SA31. 48-hour biofilms were treated with either essential oils, antibiotics, or enzymes. Percent dispersal was calculated using colony forming units (CFUs). To determine the essential oil with the highest antibacterial property, the zone of inhibition was calculated against 5 bacterial species. The essential oils worked as well as the antibiotics in the LCWLM, while the enzymes dispersed the most bacteria from the biofilm compared to antibiotics and essential oils. Out of the essential oils that were used in this study, Oregano and Cinnamon Bark were found to have the largest zones of inhibition.

School: Texas Tech University

UNDG BRITO, MARITZA

Effects of cycad toxins on the blood-brain barrier function in vitro using a human induced pluripotent stem cell-based model

Martiza Brito1, Glenn Kisby2, Abraham Alahmad1

Background:Cycads are a gymnosperm plant commonly found in the Northern Pacific region of the American continent and in Oceania. Cycad seeds have a documented neurotoxicity as such seed contains beta-methylamino-L-alanine(BMAA), cycasin and methylazoxymethanol (MAM). Such compounds are commonly associated with dog poisoning (due to ingestion of cycad seed), yet several studies highlighted a higher incidence of several neurodegenerative diseases (such as ALS and parkinsonism-dementia complex) amongst Chamorro people living in Guam compared to other populations. Yet, the effect of such toxins on the blood-brain barrier (BBB) remains documented. In this study, we investigated the toxic effects of cycad toxins on the human BBB function in vitro. Methods: Two induced pluripotent stem cells (iPSCs) cell lines were used in this study. Such cells were differentiated into brain microvascular endothelial cells (BMECs) and neurons using published protocols. Cells were treated with BMAA, cycasin, MAM for 24 hours at concentrations ranging from 10-1000microM. Barrier function was assessed by measuring changes in transendothelial electrical resistance (TEER) and fluorescein permeability. Barrier integrity was assessed by immunofluorescence, cell metabolic activity was assessed by MTS.Results: We observed no signs of toxicity in BMECs monolayers for concentrations up to 1000microM. Although we did not observe decrease in TEER, we noted an increased fluorescein permeability for BMAA, and in lesser extent for cycasin and MAM. We observed a discrete alteration in tight junction complexes. Notably, glucose uptake was significantly affected by 10¬µM concentrations. BMEC neuron co-cultures were significantly affected by such treatment. Conclusion:Our data indicates the presence of possible toxicity of cycad toxins, in particular by affecting the barrier function in BMECs and possibly impairing glucose metabolism and metabolic coupling. We are currently investigating extent of absorption.

School: Texas Tech University

UNDG CRISTY, SHANE

Ammonium sulfate is a potential alternative therapy to treat Pseudomonas aeruginosa infections

Shane Cristy and Kellsie Beasley and Abdul Hamood

Severe burns are characterized by the loss of the skin barrier and the concomitant depression of the local and systemic immune responses. Patients with severe burns are susceptible to bacterial infection which leads to sepsis, multi-organ failure, and death. Among the different pathogens that cause sepsis in burn patients is the opportunistic pathogen Pseudomonas aeruginosa which is inherently resistant to several antibiotics. The multidrug resistance of P. aeruginosa combined with the high cost of producing new antibiotics necessitates the search for potential alternative therapies such as compounds that reduce P. aeruginosa virulence without inhibiting its growth. Therefore, unlike antibiotics, P. aeruginosa mutants resistant to these compounds are unlikely to emerge. One such potential compound is ammonium sulfate [(NH^4)^2SO^4]. We hypothesized that (NH^4)^2SO^4 significantly reduces P. aeruginosa virulence without affecting its growth. Using suitable enzyme assays, we examined the effect of (NH^4)^2SO^4 on the production of LasB, LasA, pyoverdine, and pyocyanin by the virulent P. aeruginosa strain PAO1. In addition, using transcriptional fusion analyses, we determined the effect of (NH^4)^2SO^4 on the expression of several virulence as well as the virulence-related quorum sensing (QS) genes. Results showed that at concentrations of 12.5 mg/ml to 25 mg/ml, (NH^4)^2SO^4 had no significant effect on PAO1 growth but significantly reduced the production of LasB, LasA, pyoverdine, and pyocyanin. In addition, (NH^4)^2SO^4 significantly reduced the expression of lasR, lasB, and rhlR. (NH^4)^2SO^4 also significantly reduced the level of the PQS autoinducer produced by PAO1. Theses results suggest (NH^4)^2SO^4: 1) interferes with P. aeruginosa virulence by significantly reducing the production of different virulence factors, and 2) is a potential alternative therapy that may be used, in conjunction with lower doses of antibiotics, to treat P. aeruginosa infections.

School: Texas Tech University

UNDG GOMEZ, ANDRE

Bacterial fluorescence imaging detects planktonic bacteria and biofilm in vitro

Andre Gomez, William Little, Andrea J. Lopez, Klara C. Keim, Monique Y. Rennie, Liis Teene, Allie Clinton Smith

Chronic wounds commonly harbor polymicrobial biofilms, and certain combinations of microbes may result in more aggressive infections. Culture-based diagnostics identify dominant microorganisms as well as their antimicrobial susceptibility, however the lag time to obtain those results (3 days ‚Äì 4 weeks) significantly impacts wound care and treatment. Bacterial fluorescence imaging with the MolecuLight i:X imaging device uses safe violet light to detect fluorescent properties of bacteria. Many species of bacteria utilize aminolevulinic acid (ALA) to produce porphyrins, which fluoresce red under specific wavelengths of light. The MolecuLight i:X imaging device allows physicians to detect bacterial bioburden in a wound in real time, and can direct specimen sampling to the area with the heaviest bioburden, improving diagnostic capabilities. Prior work demonstrated its detection of bacteria from in vivo and in vitro monomicrobial planktonic cultures. We have investigated its capability to detect biofilm using our polymicrobial in vitro biofilm model, consisting of Bolton's broth and bovine plasma, which is representative of the chronic wound environment. Staphylococcus aureus, Escherichia coli, and Enterobacter cloacae were selected as representative wound pathogens. When grown in the in vitro wound-like model for seven days, followed by the induction of porphyrin production by the addition of ALA for 24 hours, we demonstrated that the device can readily detect bacterial fluorescence from both monomicrobial and polymicrobial biofilms. These data demonstrate that bacterial fluorescence imaging detects porphyrin-positive species of bacteria growing both planktonically and as a biofilm, as well as monomicrobial and polymicrobial communities, which further validates the clinical capability and relevance of the device for use in wound care.

School: Texas Tech University

UNDG HILKEN, TATE

Bactericidal Properties of Herbal-based Essential Oils and Their Efficacy Against Poly-Microbial Biofilms

Tate Hilken, W. K. Redman, K. P. Rumbaugh

Bacterial infections have impacted human health for hundreds of years. These infections were regularly treated with items found in the natural environment such as bark from trees, leaves from flowers, skin from fish, etc., but the discovery of antibiotics in the 1920,Äôs transformed how humans treated bacterial infections. Unfortunately, since the golden era of antibiotic development there has been a continual increase in antibiotic-resistant infections. The development of antibiotic-resistant bacterial strains has created a need for new treatment approaches to effectively ward off these ,Äúsuperbugs,Äù. Although there has been work done in the ethnobotany field studying the antimicrobial effects of various folklore herbal remedies in the form of essential oils, their efficacy against biofilm-associated bacterial infections have yet to be studied. Biofilms are communities of various microbes with a protective-self synthesized extracellular polymeric substance (EPS). 85% of infections are biofilm-associated and once a biofilm is established, it can become 1000x more resistant to antibiotics. This study focuses on testing the antibacterial ability of various essential oils on in vitro biofilms. To do this, the zone of inhibition was measured for each oil against various bacterial species to determine their antimicrobial efficacy against planktonic bacteria. Oreganum and peppermint worked as well as or better than the positive control of 300 ug/mL gentamicin sulfate against all species tested. Using the Lubbock Chronic Wound Like Media (LCWLM) that mimics biofilm structure in vitro, poly-microbial Pseudomonas aeruginosa (PA01) and Staphylococcus aureus (SA31) biofilms were treated. 5% Oreganum and 5% carrot seed were effective in killing PA01 while 5% peppermint was effective in killing SA31. Overall, this study suggests that essential oils can be as effective if not more effective against biofilm-associated bacterial infections than current antimicrobial agents.

School: Texas Tech University

UNDG KEIM, KLARA

The Clinical Significance of Staphylococcus aureus Small Colony Variants

Klara Keim and Dr. Allie Clinton Smith

A novel phenotype of Staphylococcus aureus (SA) called Staphylococcus aureus Small Colony Variants (SA-SCV) have been identified, principally associated with chronic and recurrent infections. This phenotype is induced spontaneously as a result of a combination of environmental stressors, including harsh conditions and polymicrobial interactions. SA-SCVs exhibit altered phenotypes as a result of metabolic dormancy caused by electron transport deficiency, leading to increased biofilm production and alterations to antimicrobial susceptibility. SA-SCVs typically exhibit altered colony morphology and biochemical reactions compared to wild-type S.aureus, making them difficult to detect via routine diagnostic procedures, and there is evidence that SA-SCVs can be unidentified or misdiagnosed in a clinical setting. The major clinical implication of SA-SCVs are inherent alterations in antimicrobial susceptibility and their contribution to chronic or recurrent infections, such as skin and soft-tissue infections, foreign-body associated infection, cystic fibrosis, sepsis. There is evidence that SA-SCVs contribute to patient morbidity and mortality as a result of diagnostic difficulties and limited treatment options. New detection methods may need to be developed that can be incorporated into routine diagnostics, which would allow for better assessment of specimens and introduce new considerations for treatment.

School: Texas Tech University

UNDG KJELLGREN, ABBEY

Inhibition Of Connexin Hemichannels By New Aminoglycosides Without Antibiotic Activity

Abbey Kjellgren1, Mariana C. Fiori1, Madher N. AlFindee2, Yagya P. Subedi2, Srinivasan Krishnan1, Cheng-Wei T. Chang2, and Guillermo A. Altenberg1

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Connexins hemichannels (HCs) from adjacent cells form gap junctional channels that mediate cell-to-cell communication. Abnormal opening of "free" undocked HCs can produce cell damage and participate in the mechanism of disorders such as cardiac infarct, stroke, deafness, skin diseases, and cataracts. Therefore, inhibitors of connexin HCs have great pharmacological potential. Antibiotic aminoglycosides (AGs) have been recently identified as connexin HC inhibitors, but their antibiotic effect is an issue for the treatment of disorders where infections do not play a role. Herein, we synthesized and tested several amphiphilic AGs without antibiotic effect for their inhibition against connexin HCs using a newly developed cell-based bacterial growth complementation assay. Several leads with superior potency than the parent compound, kanamycin A, were identified. Unlike traditional AGs, these amphiphilic AGs are not bactericidal and are not toxic to mammalian cells, making them better than traditional AGs as HC inhibitors for clinical use and other applications.

This work was supported in part by This work was supported in part by NSF Award CHE-1429195 for a 500 MHz Bruker NMR, American Heart Association Texas Affiliate Inc. grant 14GRNT18750014, and a TTUHSC Preliminary Data Grant.

School: Texas Tech University

UNDG LITTLE, WILLIAM

An investigation of Pseudomonas aeruginosa cyan fluorescence with the MolecuLight iX bacterial fluorescence imaging device

William Little Andrea J Lopez Andre Gomez Klara C Keim Monique Y Rennie Allie Clinton Smith

Chronic wounds are a current area of major clinical concern, resulting in immense morbidity and mortality of a large patient population annually. These wounds do not typically respond to normal courses of antimicrobial treatment and often require drastic therapies, including amputation of the affected limb. Many different bacterial species are known to cause infections in chronic wounds, with Pseudomonas aeruginosa often playing a major role in these wounds,Äô virulence and persistence. MolecuLight has developed a bacterial fluorescence imaging device to detect the fluorescent properties of many chronic wound pathogens to aid in real-time visualization and direct specimen sampling. Bacterial species that produce the exoproduct porphyrin will fluoresce red under the MolecuLight i:X device. While P. aeruginosa is a known porphyrin producer, this organism typically fluoresces blue-green cyan under the device both in vitro and in vivo. It is thought this is due to the production of additional exoproducts with fluorescent properties, such as pyocyanin. We have partnered with MolecuLight to elucidate the mechanisms of cyan fluorescence production of P. aeruginosa in order to optimize the detection and utilization of the device with P. aeruginosa-infected chronic wounds.

School: Texas Tech University

UNDG LOPEZ, ANDREA

The Clinical Significance of Polymicrobial Interactions on Antimicrobial Susceptibility in the Diagnostic Laboratory

Andrea J. Lopez, Mohamed Fokar, Andre Gomez, William Little, Allie Clinton Smith

Chronic wounds are a frequently encountered condition in healthcare, characterized as slow-healing, difficult to treat, and often harboring a polymicrobial, biofilm-associated bacterial infection. One well understood consequence of biofilm infection is that bacteria are protected by a self-produced extracellular matrix, significantly altering the efficacy of antimicrobial drugs. Another less well-studied condition present in biofilm-associated infections is their polymicrobial nature, which research suggests also significantly alters antimicrobial susceptibly. The current methodologies for antibiotic susceptibility testing in a clinical laboratory setting are performed by using a single species planktonic bacterial suspension and conducting a minimum inhibitory concentration (MIC) assay. Given that this protocol requires a single species suspension, but chronic wounds typically harbor a consortium of bacteria that can synergize their activities regarding antimicrobial susceptibility, we hypothesize that monomicrobial and polymicrobial MIC results may be significantly different. To study this hypothesis, we have chosen four common wound pathogens, Pseudomonas aeruginosa, Staphylococcus aureus, Enterococcus faecalis, and Acinetobacter baumanii, which often synergize to cause polymicrobial infections, and determined their antimicrobial susceptibility individually and in combination, imitating the wound environment. Our studies suggest that polymicrobial interactions do significantly affect antimicrobial susceptibility, which has important implications for clinical microbiology diagnostics.

School: Texas Tech University

UNDG MILLER, SARAH

Investigation of a Novel mRNA Quality Control Mechanism in Insulin Biosynthesis

Sarah Miller, Kristen Baca, Sarah Kader, Elena Tikhonova, and Andrey Karamyshev

Insulin is a peptide hormone secreted from pancreatic beta cells in response to increased levels of blood glucose after a meal. Via signal transduction pathways, insulin signals peripheral tissues to uptake and process glucose from the bloodstream. We propose that insulin depletion in cases of neonatal diabetes and mature onset diabetes of the young may be the result of a recently discovered protein quality control pathway during insulin's synthesis at the ribosome. Previous research has shown that the inefficient interaction of precursor secretory proteins with the signal recognition particle (SRP) leads to the preemptive degradation of their mRNA in a pathway known as RAPP, or the regulation of aberrant protein production.

We used site-specific photo-crosslinking to identify co-translational interacting partners in vitro with wild-type insulin and mutant insulin containing clinical mutations introduced by site-specific mutagenesis. Our data show a significantly diminished interaction between SRP and precursor insulin mutants with mutations that decrease the hydrophobicity of the signal sequence. To further test the role of RAPP in insulin biogenesis, we expressed wild-type and mutant insulin in cultured human cells and analyzed mRNA expression via RT-qPCR. Relative to wild-type, insulin mRNA expression for mutants decreased according to the severity of the mutation on SRP interaction. However, the knock down of an essential subunit of SRP resulted in only a fifty percent decrease in insulin mRNA. The data demonstrate that the RAPP pathway is involved in the molecular pathology of the disease-associated mutations in the insulin signal sequence and suggest the presence of the two mechanisms, SRP-dependent and SRP-independent, for its secretion.

School: Texas Tech University

UNDG NICHOLSON, MAKAYLA

Components of Cinnamomum verum (Cinnamon) and Salvia officinalis (Sage) Cytotoxic to Murine 4T1 Breast Cancer Cells

Makayla Nicholson, Jai'Cee Tudman, Adam Reinhart, Gary Gray

Recent data indicate 1 in 8 women will develop breast cancer in her lifetime. It is estimated that there will be 266,120 new diagnoses of breast cancer in 2018, and 40,920 women will die of breast cancer in 2018. In pursuit of new potential chemotherapy options to treat breast cancer, our lab has been working to identify components in medicinal plants that may be selectively cytotoxic to breast cancer cells. Ethanolic extracts of Cinnamomum verum (Cinnamon) and Salvia officinalis (Sage) were found to be cytotoxic to the 4T1 murine breast cancer cells as compared to a control epithelial cell line (EpH4-Ev). These cytotoxic effects were measured using CellTiter-Glo luminescent cell viability assays at various concentrations and treatment times. Both Cinnamon and Sage were shown to induce caspase 3 activity in 4T1 breast cancer cells but not in the epithelial control cells (measured by western blot analysis). Work is ongoing to purify the cytotoxic components of these plants and the mechanism(s) by which these components induce 4T1 breast cancer cell death. Bulk purification of these constituents is ongoing through flash chromatography and HPLC.

School: Texas Tech University

UNDG TUDMAN, JAI'CEE

Cytotoxic and apoptotic effects of gingerols (6, 8, 10) and shogaols (6, 8) on 4T1 breast cancer and EpH4-ev non-tumorigenic epithelial cell lines¬†

Jai'Cee Tudman, Makayla Nicholson, Alana Quackenbush, Parvin Mirzaei, Masoud Zabet-Moghaddam, Gary O. Gray, Adam J. Reinhart

Each year it is estimated that over 250,000 women in the United States will be diagnosed with breast cancer and more than 40,000 will die. Breast cancer is a very common cancer among women in the United States; 1 in 8 women will be diagnosed with breast cancer in her lifetime. Medicinal plants could possibly provide new treatments for cancer. Previous studies in our lab have shown that multiple plants have been found to be cytotoxic on the 4T1 murine breast cancer cell line, one of those plants being Zingiber officinalea (ginger root). This study sought to further investigate differential effects of ginger root on 4T1 murine breast cancer cells compared to the control, nontumorigenic cell line, EpH4-ev. Both cell lines were treated with various concentrations of ginger and it was found that ginger is more cytotoxic and apoptotic to 4T1 cells as compared to EpH4-ev cells. Since ginger exhibited this differential effect, we sought to evaluate cytotoxic and apoptotic effects of the major bioactive molecules 6-, 8-, and 10-gingerols, as well as 6-, and 8-shogaols. Both cell types were treated with various concentrations (100ug/mL, 50ug/mL, 10ug/mL, 1ug/mL, .1ug/mL, .01ug/mL) of each molecule. Gingerols and shogaols were more cytotoxic to 4T1 cells as compared to EpH4-ev cells. Additionally, we found through western blot analysis that gingerols and shogaols caused 4T1 cells, but not Ep-H4-ev cells to activate caspase-3 suggesting apoptosis was induced. Caspase-3 was most active with shogaols 6 and 8 as compared to the gingerols.

School: Texas Tech University

UNDG WELCH, GARRETT

Determining the Efficacy of Multi-Enzyme Cocktails to Degrade Biofilms

Garrett S. Welch, Whitni K. Redman, Derek Fleming, Kendra P. Rumbaugh

Bacteria in biofilms are more tolerant to antibiotics, antimicrobials, and host immune system defenses when compared to their free-floating, planktonic, counterparts. This increased tolerance has been attributed to the self-synthesized extracellular polymeric substance (EPS), made up primarily of exopolysaccharides and extracellular DNA (eDNA), as well as the physiological changes that occur in biofilm-associated bacteria. Due to this increased tolerance, treating biofilm-associated infections has proven difficult with traditional methods. Many researchers have begun to develop treatments that target the biofilm directly, reducing its integrity and dispersing the associated bacteria into their more susceptible planktonic form. This method of treatment focuses on using catabolic enzymes to target various parts of the EPS. Glycoside hydrolases (GH) target linkages in the exopolysaccharides while DNase targets linkages in the eDNA. We have previously shown that two GHs, Œ±-amylase and cellulase, reduce the integrity of the EPS and lead to bacterial dispersion. However, these enzymes are not universally effective on biofilms made by complex communities of bacteria, suggesting that multi-enzyme cocktails may be required. In order to determine efficacy, we subjected biofilms, grown in vitro either in multi-well plastic plates or in a clinically relevant wound model, to different enzyme cocktails containing cellulase, Œ±-amylase, xylanase, alginate lyase and/or DNase. We determined that the efficacy of enzyme cocktails depended upon the specific bacteria present, rather than the sheer number of species present. We next hope to test our cocktail in a murine wound model. By attacking different components of the EPS with multiple enzymes, we hope to create a cocktail that degrades the complex biofilms found in various human infections. We believe that a cost-efficient enzyme cocktail coupled with current antibiotics could combat biofilm-associated infections more effectively.

School: Texas Tech University

POSTER ASSEMBLY

GENERAL INFORMATION:

Your poster should be self-explanatory so that you are free to supplement and discuss particular points raised in inquiry. The poster session offers a more intimate forum for information discussion than a slide presentation. This becomes difficult if you are obliged to devote most of your time to merely explaining your poster to a succession of visitors. Your poster must include a statement to clarify the significance of your work: How does it fit into the big picture? Limit jargon usage. Judges and viewers are from varied backgrounds and may not be familiar with terms used in your field. Define all abbreviations used in your poster. Your main priority is to get your point across to the viewer and to fulfill the judging criteria. Many posters are on display in the basic science departments at any time. If this is your first time to present a poster, we recommend that you view these examples.

CREATING YOUR POSTER:

Although some bulletin boards are larger, the maximum bulletin board space allowed for your poster will be 44"Vertical X 44" Horizontal. Please do not write on or damage the bulletin boards.
Arrange materials in columns rather than rows. It is easier for viewers to scan a poster by moving systematically along it rather than zig-zagging back and forth in front of it.

Make sure that your poster includes the following information:

- **Title**
- **Authors (contributors to your work; your advisor)**
- **Institution where the work was performed**
- **Abstract/Introduction**

This should be placed at the upper left in large typeset. There is no need to include the abstract number as it will be on the bulletin board in the upper left-hand corner.

- The **Body** of the poster should contain figures, and may include a hypothesis, a methods/approach section, and a discussion.
- **Figures and Figure Legends**

Bear in mind that Figures may be viewed from a distance. To assist the viewer, you may indicate the correct sequence of your Figures with numbers or letters at least 1 inch high, preferably in bold print. Each Figure (graph, table, diagram, etc.) should have a heading and a brief summary.

Figure legends should be concise, describing the content of each figure and the conclusions derived from them.

- **Conclusions and Future Directions**

This should be placed at the lower right in large typeset.

MOUNTING MATERIALS:

If multiple pieces, they should all be mounted on colored poster board or matting materials. Other appropriate formats include the laminated/un-laminated "all in one or one piece" large posters. Push pins will be provided at your assigned bulletin board for hanging. You may want to group logically consistent sections or columns of the poster on backgrounds of the same color.

POSTER PLACEMENT AND REMOVAL:

All poster presentations, Tuesday - Thursday, will take place on the **1st and 2nd floor of the Academic Classroom Building (ACB) lobby**.

Please see below for instructions regarding your specific presentation time slot:

Tuesday, March 19, 2019, afternoon session (1:00 PM-2:00 PM)

Poster boards will be available for presenters to hang their posters on Monday evening at 5 PM. All presenters must have their posters in place by 8:30 AM Tuesday. Posters must be taken down by 5 PM on Tuesday. Any poster not hung or removed by this time will be disqualified- no exceptions.

Wednesday March 20, 2019, morning session (9:00 AM-12:00 PM) and afternoon session (1:00 PM-4:00 PM)

Poster boards will be available for presenters to hang their posters on Tuesday evening at 5 PM. All presenters must have their posters in place by 8:30 AM Wednesday. Posters must be taken down by 5 PM on Wednesday. Any poster not hung or removed by this time will be disqualified- no exceptions.

Thursday March 21, 2019, morning session (9:00 AM – 12:00 PM) and afternoon session (1:00 PM-4:00 PM)

Poster boards will be available for presenters to hang their posters on Wednesday evening at 5 pm. All presenters must have their posters in place by 8:30 AM Thursday. Posters must be taken down by 5 PM on Thursday. Any poster not hung or removed by this time will be disqualified- no exceptions.

PRESENTING YOUR POSTER:

If you are not in front of your poster at the beginning of your designated time you will forfeit your opportunity to present your poster. The total allotted time for each poster presentation will be ten (10) minutes. During that time, there will be no interruptions by the judges. Two (2) additional minutes of questions from the judges will follow each presentation. Point deductions will be enforced if the 12 minute time frame is exceeded.

In the case of group presentations, only one individual may verbally present their poster to the judges. However, the remaining members of the group may participate in discussions during the open presentation during the 'Poster Exhibit' (see below).

POSTER EXHIBIT SESSION

Similar to a conference poster session, the 'Poster Exhibit' serves as an open poster session for students to discuss their research with attendees. This event will follow the afternoon poster sessions on Wednesday and Thursday from 12:00 – 1:00 pm. THIS EVENT IS REQUIRED BY ALL PARTICIPANTS to be considered for poster competition prizes. We hold this session to encourage participants to learn about exciting new research and network with other students and professors.

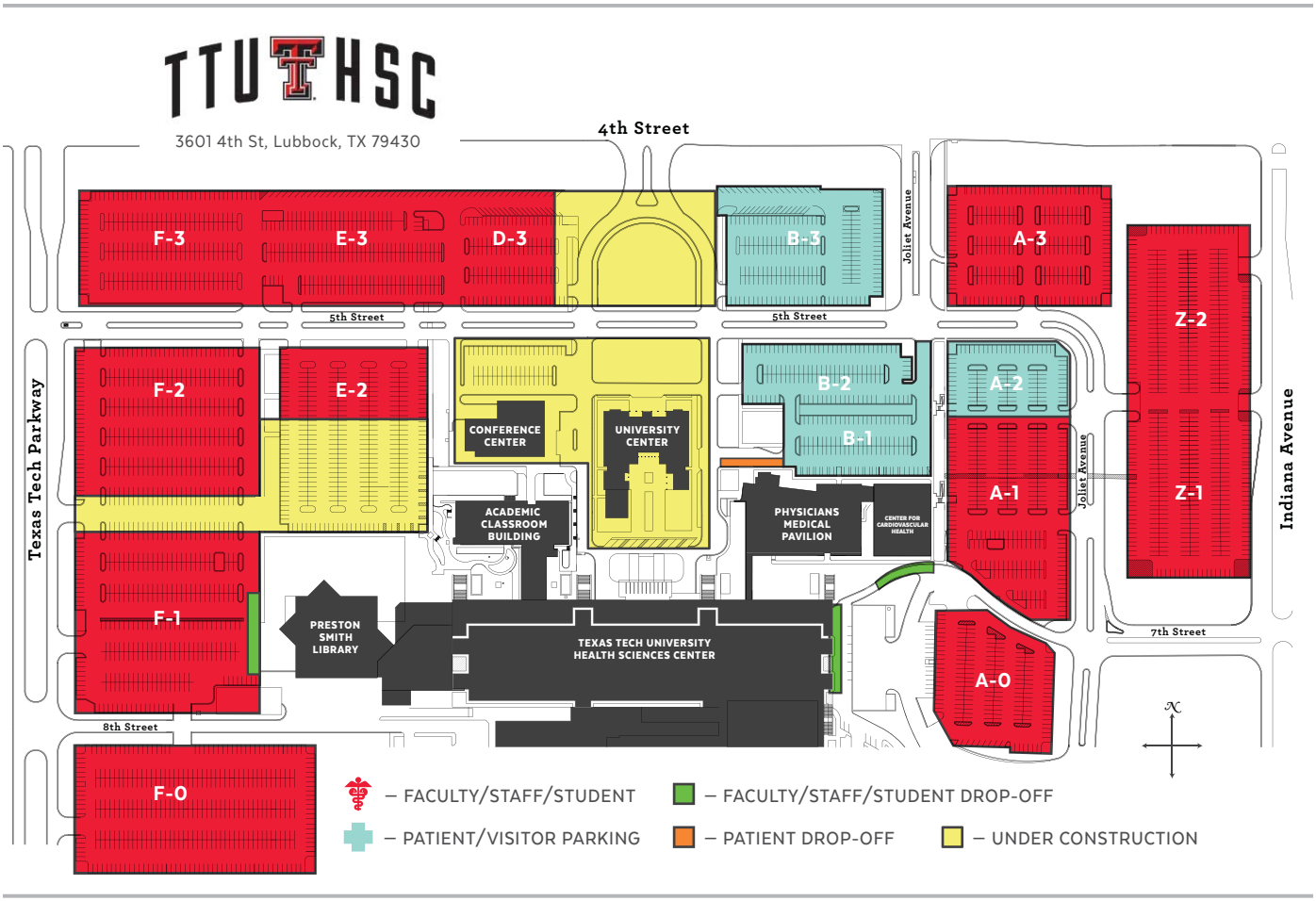
Please check the time and date of your poster presentation and attend your respective Poster Exhibit Session time below:

For all Tuesday (afternoon) poster competition participants:
Attend the Tuesday Poster Exhibit Session 12:00 – 1:00 PM

For all Wednesday (morning and afternoon) poster competition participants:
Attend the Wednesday Poster Exhibit Session 12:00 – 1:00 PM

For all Thursday (morning and afternoon) poster competition participants:
Attend the Thursday Poster Exhibit Session 12:00 – 1:00 PM

PARKING MAP



TTUHSC Students, Faculty, and Staff from Lubbock, Amarillo, El Paso, or Odessa with valid TTUHSC permits may park in Faculty/Staff/Student parking: F-0, F-1, F-2, F-3, E-2, E-3, D-3, A-0, A-1, A-3, Z-1, and Z-2.

Out of town guests and those without TTUHSC parking permits, including those with valid TTU permits may park in visitor parking: B-2, B-3, and A-2.

ADA parking is available in lots E-2 and B-1.

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