



33rd Annual Research Day

Kalamazoo Community Medical Health and Sciences

Wednesday, May 13, 2015

8 a.m to 3:30 p.m.

The Fetzer Center
Western Michigan University
Kalamazoo, Michigan

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The complete program including abstracts is available on the Western Michigan University Homer Stryker M.D. School of Medicine website www.med.wmich.edu/research/research-day.

CME CREDIT

The evaluation of this activity will be done electronically through the WMed CME website:

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Western Michigan University Homer Stryker M.D. School of Medicine is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

Western Michigan University Homer Stryker M.D. School of Medicine designates this live activity for a maximum of five (5) AMA PRA Category 1 Credits. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Western Michigan University Homer Stryker M.D. School of Medicine is accredited by the Accreditation Council for Continuing Medical Education (ACCME). The Michigan Board of Nursing accepts continuing education credits from the ACCME.

DISCLOSURES

Please see the handout offered at the registration table for a listing of disclosure statements from today's presenters.

INTRODUCTION

RESEARCH, EDUCATION AND SCHOLARSHIP

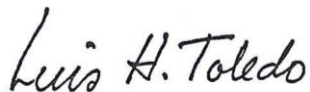
On this 33rd anniversary of Research Day, our institutions commemorate their commitment to maintaining the highest quality research and scholarship. Under the leadership and sponsorship of Western Michigan University Homer Stryker M.D. School of Medicine (WMed), we gather today to celebrate the extraordinary work being presented by faculty, residents, and students.

The commitment and participation of WMed faculty and the Kalamazoo scientific community continues with strong support. This year we had an overall submission of 129 abstracts of which 105 were accepted for inclusion in today's program. We appreciate the dedication and hard work of our academic participants.

Each research project was carefully reviewed by a panel of judges. Awards will be presented today to the best research studies in each of six categories as well as the top-scoring posters to celebrate the excellence of research, education, and scholarship.

The continuous support and collaborative efforts of Dale Vandré, PhD and Craig Beam, PhD are appreciated. Many insights pertaining to the organization and development of Research Day were incorporated as part of their recommendations during the planning of this event.

On behalf of WMed, Western Michigan University, and Kalamazoo College, the Kalamazoo Community Medical and Health Sciences Research Committee welcomes you. We hope you enjoy this rewarding day.

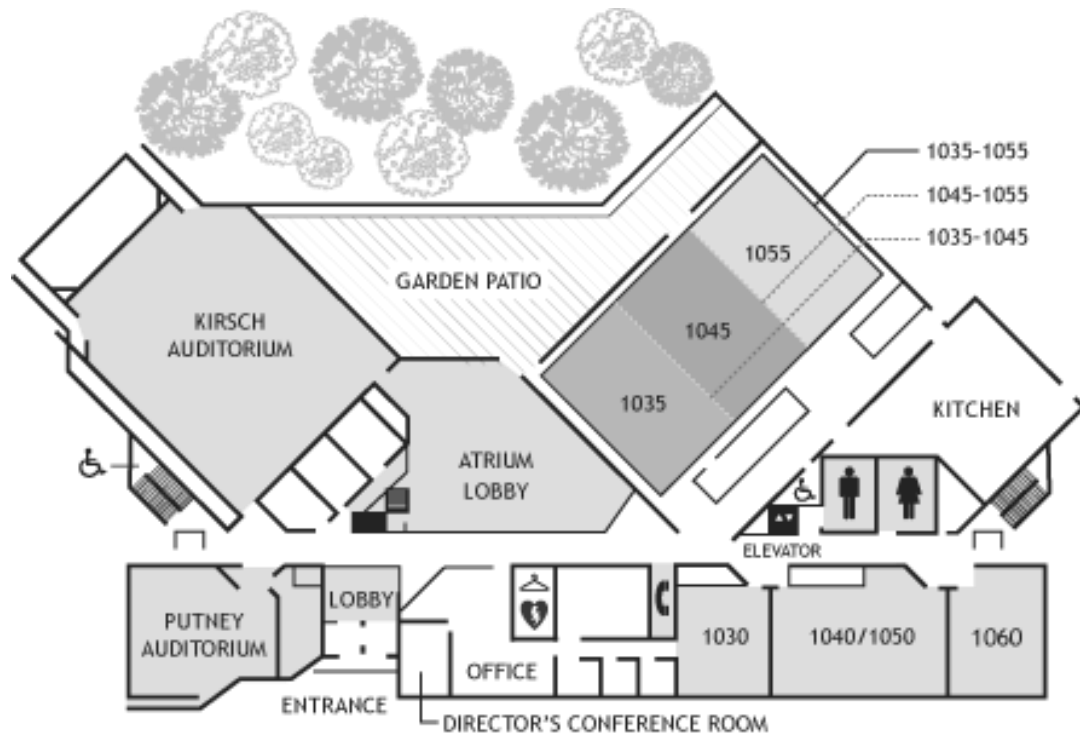


Luis H. Toledo, MD, PhD
Co-Chair, 2015 Kalamazoo Community Medical and Health Sciences Research Day

We wish to thank the following WMed professionals who dedicated their time to participate as abstract scoring judges or session moderators for today's event.

Robert Baker, MD	Donald Greydanus, MD	Vinay Reddy, MD
Susan Bannon, MD	John Hoyle, MD	Richard Roach, MD
Karen Bovid, MD	Mark Loehrke, MD	Ruqiya Tareen, MD
Joseph Chess, MD	Larry Lutwick, MD	Greg Vanden Heuvel, PhD
Martin Draznin, MD	Earl Norman, MD	Alan Wilke, MD
	David Overton, MD	

Fetzer Center Floor Plans



SCHEDULE

7:30 - 8:00 am	Registration Refreshments available in Rooms 1035/1045/1055	
8:00 - 9:35 am	Oral Presentation Session 1 Session 1A Session 1B Session 1C Session 1D	Putney Lecture Hall Rooms 1040/1050 Rooms 2016/2018 Room 2020
9:35 - 10:45 am	Poster Presentations Vendor Display Tables	Rooms 1035/1045/1055
10:45 - 11:40 am	Oral Presentation Session 2 Session 2A Session 2B Session 2C Session 2D	Putney Lecture Hall Rooms 1040/1050 Rooms 2016/2018 Room 2020
11:40 – 11:55 am	Break	
11:55 - 1:30 pm	Lunch / Keynote Speaker 2015 Dr. Robert P. Carter Research Lecture “The Cancer Epigenome” <i>Peter A. Jones, PhD, DSc</i> <i>Research Director and Chief Scientific Officer</i> <i>Van Andel Research Institute</i>	Kirsch Auditorium
1:35 - 4:00 pm	Oral Presentation Session 3 Presentation of awards to top-scoring abstracts from six topic areas As introduced by Hal B. Jenson, MD, MBA Founding Dean Western Michigan University Homer Stryker M.D. School of Medicine	Kirsch Auditorium
4:00 - 4:15 pm	Farewell and Thank-you	Kirsch Auditorium

KEYNOTE SPEAKER**The Dr. Robert P. Carter
Research Lecture**

This is the seventh year of this annual lecture supported by the Board of Western Michigan University Homer Stryker M.D. School of Medicine to celebrate the Research Day activities and to recognize Dr. Carter's commitment and support of research.

Peter A. Jones, PhD, DSc

Research Director & Chief Scientific Officer
Van Andel Research Institute

presents

“The Cancer Epigenome”

Peter A. Jones, PhD, DSc, is Research Director and Chief Scientific Officer of the Van Andel Research Institute. He also serves as a distinguished professor and as head of the Laboratory for Cancer Epigenomics.

Born, raised and educated in the former Rhodesia (now Zimbabwe), Jones received his doctorate in biochemistry from the University of London in 1973. He joined the University of Southern California in 1977, where he attained the rank of professor in 1985 and became director of the cancer center in 1993.

Jones' research concerns how cancer-related genes become heritably silenced during carcinogenesis, resulting in functional inactivation. The primary focus of his research is on DNA cytosine methylation and how this process interacts with chromatin structure to ensure heritable silencing. He is also interested in translating basic scientific discoveries into clinical treatments, specifically for people with bladder cancer. He and his colleagues are working on drugs that can reverse silencing and turn genes back on again, and designing strategies where this kind of epigenetic therapy can be applied to the treatment of human cancers.

A past president of the AACR and deputy editor of *Cancer Research*, Jones is the author of more than 250 journal publications and book chapters and serves on several national and international committees, panels and editorial boards. He has received a variety of honors, including the University of Southern California Associates Award for Creativity in Research and Scholarship and the Outstanding Investigator Grant from the National Cancer Institute. Recently, Jones, along with his colleague Stephen B. Baylin, M.D., deputy director of The Sidney Kimmel Comprehensive Cancer Center at Johns Hopkins, received the Kirk A. Landon-AACR Prize for Basic and Translational Cancer Research.

ORAL PRESENTATIONS

SESSION 1 A - Community Research, Family Medicine	Putney Lecture Hall
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Moderator: Alan Wilke, MD – Family and Community Medicine

- 8:00 – 8:15 **Accidents with Biological Material Among Hospital Housekeepers in Brazil.** Priscilla S. F. Ream, Anaclara F. V. Tipple, Thais A. Salgado, Adenicia C. S. Souza, Sandra M. B. Souza, Helio Galdino-Junior, Sergiane B. Alves
- 8:20 – 8:35 **Different Pathways to Postpartum Depression: Early Onset versus Late-Onset Depression.** Catherine L. Kothari, Amy B. Curtis, R. Shama Tareen, Michael Liepman
- 8:40 – 8:55 **Mental Health Needs Loom Large for Victims of Partner Violence.** Pamela J. Wadsworth, Catherine Kothari, Jaclin Peterson, Grace Lubwama, Jennifer Frank Brenton
- 9:00 – 9:15 **WHO's Perinatal Periods of Risk Analysis: Mapping Kalamazoo's Infant Mortality Disparities to Community Action.** Catherine L. Kothari, Yasi Back, Deb Lenz, Lucinda Stinson, Nicholas Andreadis, Cheryl Dickson, Grace Lubwama, Jen Brenton
- 9:20 – 9:35 **A Case of Niacin Deficiency in an Alcoholic.** Hugh Wong, Imran Shafqat

SESSION 1 B - Pediatrics	Room 1040/1050
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Moderator: Donald Greydanus, MD – Pediatric and Adolescent Medicine

- 8:00 – 8:15 **Head Drop Episodes in a Toddler: A Case Report on Tuberos Sclerosis with Polycystic Kidney Disease.** Sonia Joychan, Emily Cordes, Alissa Welsh, Eric Bryant, Aaron Lane-Davies
- 8:20 – 8:35 **Positive Troponin in the Absence of Myocardial Injury in a Pediatric Patient: A Case Report.** Devika Malhotra, Emil Ebner, James L. Loker
- 8:40 – 8:55 **Persistently Patent Ductus Arteriosus: What Happens After NICU Discharge?** Matthew T. Siuba, Stephen L. McGinnis, Robin Fountain-Dommer, Andrea M. Scheurer-Monaghan
- 9:00 – 9:15 **Incidental Finding of an Arachnoid Cyst Status Post Mild Traumatic Brain Injury.** Thomas Pott, Silpa Nadella, Eric Bryant, Michelle Halley
- 9:20 – 9:35 **Non-Axial Osteomyelitis: A Rare Manifestation of Cat-Scratch Disease.** Sonia Joychan, Yamini Kuchipudi, Deepak Garg

SESSION 1 C - Orthopaedic Surgery**Room 2016/2018****Moderator: Joseph Chess, MD – Orthopaedic Surgery**

- 8:00 – 8:15 **Effect of Real-Time Feedback on Screw Placement into Synthetic Cancellous Bone.** Peter A. Gustafson, Andrew G. Geeslin, David M. Prior, Joseph L. Chess
- 8:20 – 8:35 **Arthroscopic Treatment of Subjective Hip Instability in Patients with Cam Deformity and Non-operatively Treated Posterior Wall Fracture and Dislocation.** Nicholas Miladore, Andrew G. Geeslin, Thomas G. Ryan
- 8:40 – 8:55 **The Influence of Screw Placement in Subtalar Joint Arthrodesis.** Saif Alrafeek, James R. Jastifer, Peter Howard, Peter A. Gustafson
- 9:00 – 9:15 **Surgical Treatment of Degenerative Scoliosis.** Nicholas Miladore, Tyler Snoap, Joshua Ellwitz
- 9:20 – 9:35 **A Systematic Review of the Surgical Treatment and Outcomes of Posterolateral Corner Knee Injuries: Part I, Acute Injuries and Part II, Chronic Injuries.** Andrew G. Geeslin, Samuel G. Moulton, Robert F. LaPrade

SESSION 1 D - General Surgery**Room 2020****Moderator: Earl Norman, MD – General Surgery**

- 8:00 – 8:15 **Factors Associated with Hospital Readmission After Common Surgical Procedures?** Saad A. Shebrain, Brian C. Hill, Leandra H. Burke, Shivani Shah, Ethan J. Maltz
- 8:20 – 8:35 **Single Incision Laparoscopic Gastrostomy Button Placement: A Simple, Effective, and Inexpensive Technique.** Michael J. Leinwand, Kelsey S. Berndt
- 8:40 – 8:55 **A Case of False Gaseous Gangrene and Near Amputation: A Cautionary Tale.** Lauren Kwasny, Varinder S. Sidhu, Lisa A. Miller
- 9:00 – 9:15 **Obturator Bypass in Management of Infected Aortobifemoral Graft.** Julia J. Ng, Mark Rummel
- 9:20 – 9:35 **Nonunion Tibial Fracture Fixation with Intermedullary Nailing.** Christian W. Ertl, Kyle Harris, Brian Cheung.

SESSION 2 A - Emergency Medicine, Internal Medicine	Putney Lecture Hall
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Moderator: David Overton, MD – Emergency Medicine

- 10:45 – 11:00 **A Comparison of On-Scene Times for Out-of-Hospital Pediatric Cardiac Arrest Patients in a Statewide EMS Information System.** Emily M. Kraft, Emily Jonas, Kevin K. Putman, William D. Fales
- 11:05 – 11:20 **Primary Clear Cell Lung Cancer with Epidermal Growth Factor Receptor (EGFR) Mutation: The First Reported Case.** Devin Malik, Akshay Amaraneni, Sreenivsa Chandana
- 11:25 – 11:40 **Necrotizing Sarcoid Granulomatosis-A Rare Form of Granulomatous Lung Disease.** Ann-Marie Edwards

SESSION 2 B - Internal Medicine	Room 1040/1050
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Moderator: Mark Loehrke, MD – Internal Medicine

- 10:45 – 11:00 **A Hot Clot-Septic Pelvic Thrombophlebitis.** Ann-Marie Edwards, Mark Schauer
- 11:05 – 11:20 **Descending Necrotizing Mediastinitis: A Classical, Rarely Seen Entity.** Courtney Barrett, Larry Lutwick
- 11:25 – 11:40 **Stanford Type B Aortic Dissection in Loeys-Dietz Syndrome with a Repaired Stanford Type A Aortic Dissection.** Yashwant Agrawal, Bhavik Khajuria, Vishal Gupta

SESSION 2 C - Pediatric and Adolescent Medicine	Room 2016/2018
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Moderator: Martin Draznin, MD – Pediatric and Adolescent Medicine

- 10:45 – 11:00 **Periodic Fever Syndrome: A Case of TRAPS.** Sonia Joychan
- 11:05 – 11:20 **Genital Ulceration and Periorbital Edema as Atypical Presentations of Epstein-Barr Virus in Adolescent Females.** Christina D. Ball, Gonzalo Rodriguez
- 11:25 – 11:40 **De Novo Chromosomal 19 Partial Deletion of 19p13.11-p13.12.** Joseph Fakhoury, Thomas Pott, Seth Malin

SESSION 2 D - Orthopaedic Surgery	Room 2020
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Moderator: Karen Bovid, MD – Orthopaedic Surgery

- 10:45 – 11:00 **Development of a Validated Finite Element Model for Fracture Plating.** Peter A. Gustafson, Paul Danielsky, James R. Jastifer
- 11:05 – 11:20 **Musculoskeletal Education During Medical School: A Survey of Allopathic and Osteopathic Medical Students.** Jason Habeck, Mubashir Saeed, Nicole Van De Velde, Toufic Jildeh, DJ Lombardo, Vani Sabesan
- 11:25 – 11:40 **Injury to the Profunda Femoral Vein: A Rare but Devastating Result of a Displaced Lesser Trochanter Fracture.** Jessica G. Kingsberg, Robert R. Gorman

SESSION 3 - Awards Presentation**Kirsch Auditorium**

**The following presentations represent the top-scoring abstracts
in each of the six topic areas.**

Together with Dean Jenson, we congratulate all of the authors on their fine work.

- 1:35 – 1:55 **Quality Improvement Research Award**
**Improving the Quality of Prenatal Care Provided at the WMed Family
Medicine Clinic.** Susan Jevert, Kanika Jaggi, Lauren Piper, Allan Wilke, Michael Clarke
- 2:00 – 2:20 **Clinical Research Award**
**Three Dimensional (3D) Printing and Virtual Surgery for Preoperative
Planning of Deformity Correction in Orthopaedic Surgery.** James R. Jastifer,
Peter A. Gustafson, Tyler Snoop
- 2:25 – 2:45 **Community Research Award**
**The High Cost of Crime Victimization Experienced by Mental Health
Consumers.** Catherine Kothari, Robert Butkiewicz, Jeff Patton
- 2:50 – 3:10 **Education Research Award**
**A Survey of Wilderness Medicine Curricular Content in Emergency Medicine
Residency Programs.** Elizabeth J. Aronstam, David T. Overton
- 3:15 – 3:35 **Basic Sciences Research Award**
**Biomechanical Consequences of Lateral Meniscal Posterior Root Avulsions:
Influence of the Menisconfemoral Ligaments and Anterior Cruciate Ligament
on Tibiofemoral Contact Mechanics.** Andrew G. Geeslin, David M. Civitarese, Travis
L. Turnbull, Grant J. Dornan, Fernando Fuso, Robert F. LaPrade
- 3:40 – 4:00 **Medical Humanities Research Award**
The Historical Evolution of Endoscopy. Sarah L. Ellison, Luis H. Toledo-Pereyra

POSTER PRESENTATIONS

Rooms 1035/1045/1055

1. **Trends in the Hospital Stay for Multiple Myeloma Patients as per the Healthcare Cost and Utilization Project-Nationwide Inpatient Sample Database.** Abhishek Seth, Karthik Kannegolla, Rakshita Chandrashekhar, Mark Schauer
2. **Properties of a Single Global Question in Faculty Evaluation of Psychiatry Residency Graduates.** Robert D. Strung, Kathleen A. Gross, Michael R. Liepman, Nauman Khan, Olga Hadden, Julie Coyle
3. **Visceral Heterotaxy Syndrome with Isolated Levocardia, Interrupted IVC, and Jejunal Atresia.** Devika Malhotra, Silpa Nadella, Andrea Scheurer-Monaghan
4. **Management of the Pediatric Patient at Risk for Type 1 Diabetes.** Silpa Nadella, Aditya V. Dewoolkar, Craig Beam
5. **Management Affecting Long Term Survival in Trisomy 13.** Silpa Nadella, Stephanie Ling, Anju Patel, Meveshni Govender, Dilip Patel
6. **Excellence in Adolescent Immunizations at Western Michigan University Homer Stryker M.D. School of Medicine.** Glenn Dregansky, Susan Jevert, Julius Ramirez
7. **The Contributions of Galen to Modern Anatomy and Physiology.** Luis H. Toledo-Pereyra
8. **ACGME Milestone Achievement through Simulation: Development of an Extensor Tendon Repair Simulation Model.** Elizabeth J. Aronstam, David T. Overton
9. **Efficacy of Complementary and Alternative Therapy in Cerebral Palsy.** Jacqueline A. Harrison, Lindsey E. Hough, Dilip R. Patel
10. **Young Breast Cancer Survivors: Fear of Recurrence and Impact on Screening Behaviors.** Kelley H. Pattison
11. **Decrease in Inpatient Mortality for Acute Myeloid Leukemia Patients - an Analysis of 317,017 Hospital Visits From 1993-2012.** Abhishek Seth, Karthik Kannegolla, Rakshita Chandrashekhar, Sreenivas Chandana
12. **30-day Readmission Rate for Patients Discharged with Sickle Cell Crisis: an Analysis of 369,103 Admissions.** Abhishek Seth, Karthik Kannegolla, Sumaiya Ansari, Mark Schauer
13. **Old Disease, New Location: A Case of Iatrogenic Eustachian Valve Endocarditis.** Abhishek Seth, Karthik Kannegolla, Sumaiya Ansari, Mark Schauer
14. **Demographic Factors Associated with a High 30-day Readmission Rate after Bone Marrow Transplant.** Abhishek Seth, Karthik Kannegolla, Sreenivas Chandana
15. **Acquired Hemophilia: Patient with Factor VIII Antibodies, Presenting with Bilateral Upper Extremity Compartment Syndrome.** Abhishek Seth, Steve Stone, Karthik Kannegolla, Sreenivas Chandana
16. **Coexistent Xanthogranulomatous Pyelonephritis and Renal Cell Carcinoma.** Amir Koldorf, Andrea Landon, Aaron Roberts, Mark Schauer
17. **Adding to the Differential Diagnosis for Painless Jaundice.** Andrew J. Whipple, Christopher M. Begley, Akshay Amaraneni
18. **An Unknown Cause of Acute Disseminated Encephalomyelitis.** Anju Patel, Alexandra Melonakos, Aaron Lane-Davies
19. **Mycophenolate-Induced Posterior Reversible Encephalopathy Syndrome in the Setting of Lupus Nephritis: A Case Report and Review of Literature.** Bhavik Khajuria, Yashwant Agrawal, Amir Koldorf, Joanne Baker
20. **Sexsomnia: A Case Presentation of a New DSM 5 Diagnosis.** Brandon G. Moore
21. **Foot/Ankle Fracture in War Conditions.** Christian W. Ertl, Brian Cheung, Nicole Carpp

22. **Homeless in a Graveyard: Diagnosing a Book by its Cover.** Carmen D. Garcia, Mark Kanzawa
23. **Groin Injury in a Collegiate Football Athlete.** Charlotte M. H. Moriarty, Robert J. Baker
24. **Comparing Hospitalization Charges of Teaching vs Non-Teaching Hospitals: Analysis of the Leading 30 Admission Diagnoses.** Mark Loehrke, Andrew Whipple, Christopher M. Begley
25. **Not All Valve Vegetations are Endocarditis.** Christopher M. Begley, Akshay Amaraneni, Andrew Whipple, Ethan Ebner
26. **Animal Bacterium in the Human Heart – A Case of Native Valve Endocarditis Caused by Staphylococcus Simulans in an Immunocompetent Patient.** Christopher M. Begley, Akshay Amaraneni, Andrew J. Whipple
27. **Man’s Best Friend? A Case of Human Pulmonary Dirofilariasis.** Devin Malik, Akshay Amaraneni, Sukhpreet Singh
28. **The Association of Asymptomatic Bacteriuria and Behavioral Deterioration in Dementia.** Elmira Yessengaliyeva, Anusuiya Nagar, Perry Westerman, Susanne Haas
29. **Recurrent Suppurative Thyroiditis with Underlying Pyriform Sinus Fistula.** Geneva A. Sagun, Aaron L. Lane-Davies
30. **Viral Myocarditis Presenting as ALTE (Apparent Life-Threatening Event) in an Infant.** Geneva A. Sagun, Matthew T. Siuba, Bryan A. Corpus
31. **Are Firearms a Problem in Southwest Michigan?** Scott B. Davidson, Sheri L. VandenBerg
32. **Complete Nephrectomy and Splenectomy - The End Result of a Staghorn Calculus.** Ibad U. Farooqui, Kanika Jaggi, Steven Pollens
33. **Heat Exhaustion in a Pediatric Patient with Anhidrosis.** Jason Lam, Sapna Sadarangani, Tom Melgar
34. **Collegiate Football Movement Disorder.** Jedediah L. Jensen, James T. VanHuysen, Michelle L. Crooks
35. **Diagnosis and Management of Esophageal Adenocarcinoma: A Case Report and Literature Review.** Julia J. Ng, Earl Norman
36. **Rare Cause of Headache in a Child.** Kanika Jaggi, Ibad U. Farooqui
37. **Rare Cause of Failure to Thrive in an Infant.** Kanika Jaggi, Sneha Patel, Kristi Vanderkolk
38. **Rare Case of Renal Cell Carcinoma Metastasis to Parotid Gland and External Jugular Vein 15 Years Later Resection.** Karthik Kannegolla, Rakshita Chandrasekar, Abhishek Seth, Juraj Zahatansky, Sree Chandana
39. **Cryptococcus Neoformans Meningitis in an Immunocompetent Host – Rare but Becoming Less Uncommon.** Karthik Kannegolla, Rakshita Chandrasekar, Abhishek Seth, Monoj Kondra
40. **Historical Advances in Infectious Diseases Management as a Spring Board for General Medicine.** Kevin Cates, Larry Lutwick
41. **Lady Windermere Syndrome Due to Mycobacterium Abscessus.** Ann-Marie Edwards, Larry Lutwick
42. **Adult Brain Abscess Following Esophageal Dilation: An Uncommon Association.** Andrew Whipple, Larry Lutwick
43. **Paraphytonosis: Rhizobium Radiobacter, A Plant Pathogen Causing Human Disease.** Andrew Whipple, Larry Lutwick
44. **Left Ventricular Pseudoaneurysm Presenting as To-and-Fro Murmur Following Mitral Valve Repair.** Matthew T. Siuba
45. **Disseminated Visceral Varicella Zoster (DV-VZV) Masquerading as Gastrointestinal Ischemia.** Matthew T. Siuba, Richard Card II

- 46. Finger Amputation after Injection with Lidocaine and Epinephrine.** Todd Ruiter, Nicholas Miladore, Thomas Harter, Alice Neafus, Michael Kasdan
- 47. Extensor Carpi Radialis Longus and Brevis Rupture in a Boxer.** Nicholas Miladore, Timothy Mundell, Todd Ruiter
- 48. A Case Report of Bartonella Henselae Osteomyelitis in a Pediatric Patient.** Paul J. Danielsky, Karen M. Bovid
- 49. Distal Radius Fracture in a Surgeon's Dominant Wrist.** Eric D. Gallagher, Peter J. Howard, Todd Ruiter, Larry Walton
- 50. Cryptococcus Neoformans Pericarditis in an Immunocompromised Patient.** Kristin N. Harjer, Akshay Amaraneni, Thomas Flynn
- 51. WMed: Work on Medication Error Discrepancies.** Tracey L. Mersfelder, Kevin J. Kavanaugh, T. Kurtis Schubert, Richard D. Card II, John S. Fleming, Ryan F. Halas, Abhishek Seth, Carleigh Zahn
- 52. Application of a Modified Habit Reversal Treatment Protocol for Skin Picking.** Roberto Flachier
- 53. Rapid Visual Loss in the Setting of Recent Cognitive and Personality Change: A Case of Creutzfeldt Jakob Disease.** Sadia Shaukat, Perry Westerman
- 54. Pulmonary Tumor Embolism: An Uncommon Diagnosis with a Common Presentation.** William Fangman, Daniel Votava, Scott Gibson, Nigel Bramwell
- 55. Analysis of Tuberculosis Demographics and Survey of Ten Year Trend of 84,000 Patients in United States.** Rakshita Chandrashekar, Karthik Kannegolla, Mark Loehrke
- 56. The Missing Piece of the Puzzle: A Rare Case of Postsplenectomy Sepsis from GAS.** Rakshita Chandrashekar, Pimpawan Boapimp, Larry Lutwick
- 57. Metastatic Follicular Thyroid Carcinoma Presenting as Primary Renal Tumor.** Rakshita Chandrashekar, Lee A. Bricker
- 58. Complete Dihydropyrimidine Dehydrogenase Deficiency: A Rare Phenomenon.** Rakshita Chandrashekar, Karthik Kannegolla, Sreenivasa Chandana
- 59. Heart Bleeds into the Chest: Pseudoaneurysm Dissection into Anterior Chest Wall.** Rakshita Chandrashekar; Jagadeesh Kalavakunta; Monoj Konda; Karthik Kannegolla; Vishal Gupta
- 60. Peripartum Cardiomyopathy: Demographics and Trends.** Rakshita Chandrashekar; Jagadeesh Kalavakunta; Sourabh Aggarwal; Karthik Kannegolla; Christopher Rogers
- 61. Allopurinol for Primary and Secondary Prevention of Cardiovascular Disease.** Rakshita Chandrashekar, Karthik Kannegolla, Ben Dormitorio, Luis Toledo
- 62. Henoch Schonlein Purpura in an Adult Patient.** Sandeep Patri, Shannon McCormack, Akshay Amaraneni
- 63. A Mysterious Case of Drug Induced Delirium.** Sarah F. Raiyn, BK Ramesh, Michael R. Liepman
- 64. A Case of Neurocysticercosis in Western Michigan.** Imran Shafqat, Rakshita Chandrashkar, Hugh Wong
- 65. New Onset Adolescent Pulmonary Sarcoidosis.** Thomas Pott, Aditya Dewoolkar, Ifeoluwapo Eleyinafe, Mary Moore
- 66. Challenges in Recognizing Synthetic Cannabis-Induced Psychosis.** Thomas Pott, Ryan Jones, Larry Mann, Bryan Corpus
- 67. Saphenous Venous Graft Aneurysm with Right Atrial Fistulous Formation.** Yashwant Agrawal, Pavan Poturu, Jagadessh Kalavakunta, Vishal Gupta

ACCIDENTS WITH BIOLOGICAL MATERIAL AMONG HOSPITAL HOUSEKEEPERS IN BRAZIL

Priscilla S. F. Ream, Anaclara F. V. Tipple, Thais A. Salgado, Adenicia C. S. Souza, Sandra M. B. Souza, Helio Galdino-Junior, Sergiane B. Alves

Federal University of Goiás School of Nursing, Post-Graduate Program of Nursing Sciences, Portage, MI

INTRODUCTION: While hospital housekeepers themselves do not provide patient care, accidents with biological material are still a present risk, due to the handling of medical waste.

RATIONALE: Multiple factors affect the risk of accidents with biological material among hospital housekeepers, not the least of which being marginalization of cleaning staff on the part of health services, predicating inadequate resources for performing their jobs, lack of on-the-job training, and especially the improper segregation and disposal of sharps waste by the medical professionals who generate it. The high frequency and severity of these accidents among hospital housekeepers underscores the importance of this study, the objective of which is to identify the frequency and profile of accidents that occur in this population, classify conduct pre-and-post exposure, and compare the profile of the first and last accident among workers with more than one occurrence.

MATERIAL & METHODS: Retrospective epidemiological study involving records of accidents with biological material occurring among hospital housekeepers in the State of Goiás, in Midwestern Brazil, between 1989 and June 2012. We used two sources of information to generate the database: records of all professionals who suffered accidents with biological material treated at the service for accidents with biological material in a referral hospital in Goiás and the state database for notifications of these occupational injuries. We used LinkPlus for probabilistic linkage of these databases. After selecting records of interest, those related to hospital housekeepers, the data were analyzed using SPSS with descriptive and inferential statistics. (Approvals in Ethics Committees: 033/2010 and 414 258/2013).

RESULTS: Of 8,568 records of accidents with biological material, 996 (11.6%) occurred among hospital housekeepers. Multiple occurrences were identified in 57 (6.1%) workers, for a total of 938 affected individuals. Accidents were mostly percutaneous, (981/ 98.5%), involved blood (852/ 85.6%), were caused by hypodermic needles (749/ 75.2%), were due to improper sharps disposal (705/ 70.8%) and involved an unknown source patient (855/ 85.9%). In 480 (48.2%) cases, the hospital housekeeper reported having completed the vaccine series against Hepatitis B and among these, 392 (81.7%) presented immunity; 390 (39.1%) records indicated no vaccination. The difference between the number of hospital housekeepers completing this vaccination series between the first and last accident was statistically significant, although 14 (24.5%) were not vaccinated at the time of either accident. The majority of cases did not result in recommendations for post-exposure prophylaxis against HIV (679/ 68.2%) or immunoprophylaxis against HBV (725/ 72.8%). In 861 (86.4%) records, clinical and laboratory follow-up was either not indicated or was abandoned by the worker.

CONCLUSIONS: The risk of accidents with biological material is particularly serious when the accident is percutaneous and involves blood from an unknown source. Accountability on the part of the healthcare team in the management of biological risk to hospital housekeepers is essential, including establishing the immunization status of workers prior to any incidents, as well as proactive clinical and laboratory follow-up post-exposure. Implementation of continuing education programs on waste management for the entire healthcare team is also indicated.

DIFFERENT PATHWAYS TO POSTPARTUM DEPRESSION: EARLY ONSET VERSUS LATE-ONSET DEPRESSION

Catherine L. Kothari, Amy B. Curtis, R. Shama Tareen, Michael Liepman

WMed, Biomedical Sciences Dept, Kalamazoo, MI

INTRODUCTION: Up to 15% of new mothers experience postpartum depression; an incidence that has been well-documented within the first three months after delivery (Cox, Holden, & Sagovsky, 1987; Gaynes et al., 2005). Less well-documented, but just as severe is late-onset depression, occurring six to eighteen months postpartum (Kothari, 2014). Regardless of when depression occurs, its consequences may reach far into the future, with adverse effects upon both mother and infant; for mother, the risk that depression will develop into a chronic condition and, for infant, the detrimental cognitive and behavioral effects of early neglect that can accompany maternal depression (Felitti et al., 1998; S. H. Goodman & Gotlib, 1999; Turney & Carlson, 2011).

RATIONALE: Little is known about the late-onset group; an important gap given that the existing risk profile for postpartum depression is based upon the early-onset group, a risk profile that may or may not apply to women experiencing depression months later. The study goal was to compare the demographic, psychosocial and depression characteristics between early-depression-onset and late-depression onset women.

MATERIAL & METHODS: This was a prospective longitudinal telephone survey of 249 postpartum women, conducted at two weeks, two months, six months and eighteen months after delivery. Depression was measured using the Edinburgh Postnatal Depression Scale (EPDS), and onset was defined by the first survey screening depressed (EPDS score of 12+ in the first two surveys=early-onset, in the last two surveys=late-onset). Multivariate analysis of EPDS item-specific changes over time, by each onset-group, were assessed using generalized estimating equation (GEE) regression using an ordinal logistic model. Maternal demographic and psychosocial information was collected through survey responses and medical record abstraction. Two-tailed statistical analyses with significance levels set at $p < .05$ were conducted using Pearson Chi Square and ANOVA with Bonferroni correction to compare no-PPD-onset, early-PPD-onset and late-PPD-onset women.

RESULTS: Multivariate GEE analysis reveal symptomatic differences between the two depression groups, with the early onset group ($n=22$) scoring higher on sadness and self-blame, while the late-onset group ($n=15$) screened higher on anxiety. Equally high numbers of early and late women reported 'Things have been getting on top of me'.yes, most of the time, albeit at different time points (14.3% early and 15.4% late). Compared to the no-PPD-onset group ($n=212$), both early-PPD-onset ($n=22$) and late-PPD-onset ($n=15$) women were more likely to be minority race, single, have prior history of depression, history of adult trauma, prenatal smoking and other substance use. Additionally, the early-PPD-onset group was more likely to have low socioeconomic-status (45.5% vs.20.8%), have housing problems (27.3% vs.2.4%), be adolescent (18.2% vs.3.3%), have 'not very/not at all helpful' family/friends (18.2% vs.1.0%) and enter prenatal care late (27.3% vs.8.5%) compared to the no-PPD-onset group. In contrast, the late-PPD-onset group was uniquely different from the no-PPD-onset group on a single characteristic, having delivered a low birth weight infant (13.3% vs.1.9%).

DISCUSSION: The significant main effects in the multivariate regression for the 'miserable', 'unhappy' and 'self-blame' items illustrate the stability and acuteness of the early-onset group's depression relative to the late-onset group over an extended postpartum period. Furthermore, it may be that anxiety plays a greater role in the depression of the late-onset group. Alongside variations in the course of their depressive episodes, the two onset groups had differential risk profiles, with the late-onset group having fewer of the risk factors traditionally associated with depression in general, and postpartum depression in particular (D. Hasin, Goodwin, Stinson, & Grant, 2005). The late-onset group was more likely than the early-onset group to be adults rather than adolescents, they had higher socioeconomic status (as indicated by insurance and housing stability), were less likely to have a partner in their lives but more likely to have a strong support network of family and friends, and they had better prenatal care, in terms of initiating care early and consistently. Perhaps these features play a protective role, responsible for the delay in depression onset.

CONCLUSION: The late-onset group shared characteristics with non-depressed women (higher socioeconomic status, family/friend support, healthcare access) that may reveal factors that are protective against depression, as well as factors that present risk; those shared with early-onset depressed women (minority, lack of supportive partner, history of depression, prenatal smoking and drug use).

MENTAL HEALTH NEEDS LOOM LARGE FOR VICTIMS OF PARTNER VIOLENCE

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INTRODUCTION: The purpose of this study was to explore and describe the health status and health care access of adult female victims and survivors of intimate partner (IPV) and sexual violence (SV) in the Kalamazoo area. In addition, we sought to assess the participants' receptivity to various healthcare delivery options. Researchers have demonstrated a strong correlation between a history of intimate partner and sexual violence and poor health outcomes, behaviors, and health care access. However, prior to this study, we had very little data on the health status of intimate partner and sexual victims and survivors in Kalamazoo.

RATIONALE: Intimate partner and sexual violence against women is common and associated with significant poor health outcomes. Sexual violence affects up to 20% (Centers for Disease Control, 2010) of women in their lifetimes. IPV affects approximately 25% of women in their lifetimes (Black, Basile, Breiding, Smith, Walters, Merrick, Chen, & Stevens, 2011). Poor health outcomes associated with IPV and SV are far reaching, ranging from death, chronic health problems to unplanned pregnancies and sexually transmitted infections. The evidence supports a significant relationship between IPSV and difficulty obtaining care (Champion et al., 2001; Plichta & Falik, 2001; Robohm & Buttenheim, 1996). Difficulty obtaining care encompassed access and other factors that affected the quality of care received such as difficulty talking to a doctor, dissatisfaction with care, and changes in care providers (Plichta & Falik, 2001). Women who were sexually assaulted by an intimate partner as compared with assault by a non-intimate were almost twice as likely to recall a time when they were too embarrassed to talk to a doctor about a medical problem (13.0%, 6.9%, respectively; Plichta & Falik, 2001). Other significant findings included the barriers of economics or logistics e.g., (finding a babysitter, transportation to clinic), and necessity (e.g., remission of symptoms, getting medication from friends; Champion et al., 2001).

MATERIAL & METHODS: A cross-sectional survey with a convenience sample of 58 adult female (18+) current or prior utilizers of the YWCA Domestic Assault Program (YWCA-DAP) or Sexual Assault Program (YWCA-SAP) (shelter, legal advocacy, counseling, SANE). Participants completed anonymous written surveys. The HITS instrument assessed current IPV.

RESULTS: Respondent demographics reflected the YWCA-DAP and SAP population: 62.1% identified as Black, 27.6% as White, 94.8% had children, 70.7% were single and 48.6% were employed. More than a third (39.6%) rated their health status as 'very good' or 'excellent' (5-point Likert scale); 32.8% indicating that abuse affected their health 'a lot.' Mental health was the most common unmet need for participants and their children (39.7% versus 19.0% for unmet physical needs). Most women (75.9%) had health insurance and reported no difficulties obtaining medical care (63.8%). Lack of reliable transportation (32.8%) and the cost of obtaining healthcare (22.8%) were the biggest barriers to obtaining health care for these participants. While 70.7% of the participants think that health care providers should ask about IPV and SV, more than a majority (60.3%) had never been asked about IPV or SA by their health care providers. Most women indicated that they think health care providers should give resources and information to their patients (67.2%) Based on the HITS, 87.9% of participants met criteria for current IPV. Women were most likely to utilize case management (60.3% 'very likely'). Half (50.0%) were 'very likely' to use a health clinic located at the YWCA. Women were almost equally inclined to use a mobile clinic in their neighborhood (41.4% 'very likely') or a healthcare provider specially trained to work with abused women (39.7%)

DISCUSSION: While abused women report multiple health needs, their mental health needs remain the largest unmet need. Although most participants think that health care providers should ask their patients about IPV and SV, most participants had never been asked about abuse by their health care providers. Women endorsed several healthcare delivery styles, with their greatest preference for care coordination and an on-site clinic.

CONCLUSION: This study is the beginning step in assessing the unique health needs of women in Kalamazoo who have experienced intimate partner and sexual violence. Health care providers in Kalamazoo need to improve screening for IPV and SV.

WHO'S PERINATAL PERIODS OF RISK ANALYSIS: MAPPING KALAMAZOO'S INFANT MORTALITY DISPARITIES TO COMMUNITY ACTION

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INTRODUCTION: Infant mortality is considered an important marker of how well a community or a nation is caring for the health and well-being of its most vulnerable citizens. Within Kalamazoo, Black infants die at 4.5 times the rates of White infants, and poor infants at 2.9 times the rate of infants living in higher-income families.

RATIONALE: Despite overall gains in IMR throughout the last decade in Kalamazoo County, racial and socioeconomic disparities have actually increased during this same period. As a first step in focusing preventive medical and public health action, a PPOR analysis (developed by WHO) can provide critically useful guidance, particularly targeting areas contributing toward the disparities.

MATERIAL & METHODS: Using aggregated counts provided by the Michigan Department of Community Health (MDCH), the PPOR analysis maps age at death (fetal, neonatal and postneonatal) by birthweight (500-1499 grams, 1500 grams). It then categorizes these into four groupings that have been shown to share underlying health risk profiles: (1) Maternal Health/Prematurity, (2) Maternal Care, (3) Newborn care, and (4) Infant Health. The current PPOR analysis was conducted for two periods of time (1997-2006, 2003-2012) for both risk groups (Black women/infants, poor women/infants). Race was operationalized based upon mother's reporting on the infant birth certificate, and poverty was defined as a Medicaid-paid birth. Cause of death data was anonymous, summarized from infant death files provided by MDCH. This is a public health surveillance study; as such is considered IRB-exempt.

RESULTS: A PPOR comparing Black women/infants in Kalamazoo County with a gold standard reference group (White, non-Hispanic women, aged 20+ years, with 13+ years of education) revealed substantial excess mortality in the area of Maternal Health, excess at the equivalent of 7.3 deaths per 1,000 births. This points to underlying ill-health/disease conditions that precede pregnancy, and may be complicated by unhealthy behaviors such as smoking. This excess has increased by 50% from the prior period, in a trend similar to that of disparities as whole. The Black excess in Maternal Health was partially but not completely accounted for by poverty; as subtracting the Poverty PPOR from the Black PPOR still left an excess 3.8 Black deaths per 1,000 births in this category for Black women/infants. The other category revealing excess deaths for both the Black and the poor populations was in the area of Infant Health, with excesses of 2.1/1,000 and 1.6/1,000 respectively. This excess had decreased by about 25% from the prior period for both groups. The next step in the analysis illustrated that it was largely associated with being poor rather than being Black. Further analysis shows that unsafe sleep-related conditions (co-sleeping, unsafe surface and unsafe position) are responsible for many of these deaths.

DISCUSSION: Decades of research into health disparities within developed countries have concluded that they are the cumulative result of structured social disadvantage; disadvantage that limits access to socio-economic resources and fragments social networks (Braun, 2002; Feldman, 2003; Long, 2009). At the same time, being black and being poor are both associated with lower sociopolitical status, which induces chronic stress through disempowerment and discrimination (Link & Phelan, 1995; Williams 2010; Smedley 2003). These conditions are directly expressed in morbidity and mortality across the lifespan, but most particularly in infancy (Shariff-Marco, 2010; Krieger, 2003). The prematurity and low birthweight constituting the infant death in Kalamazoo's Maternal Health category speak to pre-existing maternal ill health, to lack of choices and deficits in health literacy and to unhealthy coping behaviors (smoking, diet, substance abuse) (Acevedo-Garcia, 2000, 2001; Jackson, 2012; Sawyer, 2012; Sabin, 2012; Borrell, 2007). Further, while progress has been made reducing Infant Health deaths, there are still far too many preventable, sleep-related deaths among poor families in Kalamazoo.

CONCLUSION: To reduce the inordinately high rate of deaths among Black and poor infants in Kalamazoo falling within the Maternal Health category, community action should target: reducing the particular stressors experienced by Black and poor women in our community, expanding the medical, educational and social options that are available, and linking them to resources that support healthy behaviors. To continue the downward trend in deaths within the Infant Health category, increase the breadth and depth of Safe Sleep campaigns, particularly for poor families.

A CASE OF NIACIN DEFICIENCY IN AN ALCOHOLIC

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INTRODUCTION: ABSTRACT: 53 year old male in this case report had a classic case of pellagra (vitamin B3/Niacin deficiency). The patient is chronic alcoholic, HIV+ male whom was admitted for acute hypertensive emergency, headache, back pain, diarrhea, dermatitis, and alcohol withdrawal. Patient is a poor historian and diagnosed with hydrocephalus and PRES Syndrome. Headache and encephalopathy resolved with extra-ventricular drain placement, eventually diagnosed outpatient clinically with severe malnutrition leading to pellagra. After initiation of appropriate treatment, decrease alcohol intake, patient's rash and diarrhea resolved and his mental status gradually improved

CASE REPORT: A 53 year old male was admitted on May 2014 acute headaches, hydrocephalus, and requiring extra-ventricular drain placement, cerebral edema consistent with posterior reversible encephalopathy syndrome. Patient is a poor historian and didn't provide meaningful history. Upon discharge from the hospital he had persistent memory loss, skin lesions and diarrhea. At outpatient follow up patient found to have persistent poor memory, loose stool, and symmetric hyper pigmented rash, similar in color to sun burn over the posterior neck and multiple 3 mm-10 mm slightly raised with brownish hyperpigmentation scabbed off stuck on appearance lesions over the distal forearms bilaterally as shown in the pictures. According to patient's sisters his skin lesions have been present for several years, dementia has worsened over the years and his diarrhea gets worse as he starts to drink more. Patient continued to drink outpatient 1-2 alcohol drinks daily, which had significantly decreased from previous. His appetite had improved, given Niacin for 1 month, which resolved his skin hyperpigmentation over the posterior neck and skin lesions over the distal forearms b/l except 2-3 lesions. There was also significant improvement in his memory and gait, strength, improvement in his mood with resolution of malnutrition and niacin replacement for 1 month.

DISCUSSION: Pellagra (meaning "raw skin"): It is characterized by a photosensitive pigmented dermatitis (typically located in sun-exposed areas), diarrhea, and dementia. Other common neuropsychiatric symptoms include peripheral neuropathy, decreased muscle strength, depression, and hallucinations and delusions. Nicotinic acid is synthesized from the amino acid tryptophan, so niacin deficiency can directly influence the synthesis of enzymes and indirectly influence the synthesis of serotonin. The latter changes can cause dysfunctional neural transmission and, thus, give rise to neurological and psychiatric symptoms. Pellagra is common in Africa, Indonesia, North Korea, and China. In affluent societies like the US, a majority of patients with clinical pellagra are poor, homeless, alcohol-dependent, or psychiatric patients who refuse food. It is uncommon for patients to simultaneously present with all of the three cardinal symptoms so they may seek treatment in different medical departments. Patients may go to gastroenterology departments for diarrhea, to dermatology departments for desquamation, or to neurology or psychiatry departments for neuropsychiatric symptoms. If untreated, pellagra can kill within four or five years. Treatment is with nicotinamide.

CONCLUSION: Physicians should be aware of such cases and should consider treating patients with unexplained skin, neuro-psychiatric changes or gastrointestinal complaints with safe, inexpensive doses of niacin.



HEAD DROP EPISODES IN A TODDLER: A CASE REPORT ON TUBEROUS SCLEROSIS WITH POLYCYSTIC KIDNEY DISEASE

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INTRODUCTION: Tuberous sclerosis complex (TSC) is an autosomal dominant neurocutaneous disorder characterized by development of hamartomas in the brain, skin, kidneys, lungs, and heart. These benign tumors rarely progress to malignancy but can lead to organ dysfunction. Two tumor suppressor genes have been implicated in the pathogenesis of TSC. The TSC1 gene, found on chromosome 9q34, codes for the protein hamartin, while the TSC2 gene, found on chromosome 16p13, codes for tuberin. Common renal manifestations of TSC include angiomyolipomas (85.4%), renal cysts (44.8%), and renal cell carcinomas (4.2%). Less than 2% of patients with TSC have cysts suggestive of autosomal dominant polycystic kidney disease (ADPKD). ADPKD is due to mutations in PKD1 (chromosome 16p13.3 coding for polycystin 1) and PKD2 (chromosome 4q21-23 coding for polycystin 2). Patients with TSC and ADPKD are known to have a contiguous gene syndrome since TSC2 is immediately adjacent to PKD1. Patients with TSC2/ADPKD1 contiguous gene syndrome are at risk for early-onset renal failure and malignancy at an early age.

CASE REPORT: We describe the case of a 17-month-old girl who presented with a one-month history of "head dropping attacks" associated with jaw clenching and brief periods of decreased responsiveness. An incidental finding of a left-sided abdominal mass was noted at her pediatrician's office, and she was admitted to the hospital for further evaluation. Past medical history was unremarkable, and there was no family history of renal, cardiac, or neurologic disease. Upon presentation, she was found to be hypertensive (systolic blood pressures 155-170 and diastolic blood pressures >120). Her abdomen was markedly distended with a 5x6 cm firm, nontender mass palpable in the left flank and extending to the left lower quadrant. No rash or abnormal skin markings were noted, and the rest of her physical examination findings were normal. Initial laboratory studies revealed a normal complete blood count and complete metabolic profile with the exception of bicarbonate 18 mmol/L and anion gap 22 mmol/L. Abdominal ultrasound showed bilateral nephromegaly (14-15 cm in length) with multiple non-communicating cysts, with the largest cysts measuring 7-8 cm. She received labetalol IV and captopril PO initially but eventually required a nicardipine drip to adequately control blood pressures. Magnetic resonance imaging (MRI) to further evaluate the cysts was performed, confirming massively enlarged multicystic kidneys, an appearance suggestive of autosomal dominant polycystic kidney disease. However, this diagnosis was felt to be very atypical given her age of presentation. Electrocardiogram showed left ventricular hypertrophy with subsequent 2D transthoracic echocardiography exhibiting a mass in the left ventricle consistent with cardiac rhabdomyoma. MRI of the brain showed several cortical and subcortical tubers, subependymal nodules in the lateral ventricles, and a white matter cyst-like lesion in the frontal lobe. These findings confirmed the diagnosis of tuberous sclerosis complex.

DISCUSSION: The concurrence of TSC and ADPKD is extremely rare with minimal cases reported in the literature. The diagnoses of both TSC and ADPKD are primarily clinical. The presence of two major features or one major feature plus two or more minor features are needed for a definitive diagnosis of TSC. One major feature or two or more minor features suggests a possible diagnosis. Our patient met the diagnostic criteria for TSC with 3 major features (cortical dysplasias, subependymal nodules, and cardiac rhabdomyoma) and one minor feature (multiple renal cysts). ADPKD was diagnosed in our case with both ultrasound and CT of the abdomen/pelvis showing multiple large bilateral renal cysts. Although tuberous sclerosis is known to present with neurological symptoms, there have been no reports in the literature of head drop episodes as the initial presentation for TSC/ADPKD. Current therapy is focused on symptom management and prevention of future complications.

CONCLUSION: This case illustrates the importance of considering TSC in the differential diagnosis of children who present with hypertension secondary to polycystic kidneys. A delay in diagnosis and treatment may lead to serious complications. Clinicians should also be aware of the ways in which TSC may affect multiple organ systems and carefully monitor for the development of serious sequelae.

POSITIVE TROPONIN IN THE ABSENCE OF MYOCARDIAL INJURY IN A PEDIATRIC PATIENT: A CASE REPORT

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INTRODUCTION: Analysis of cardiac troponins is an invaluable tool in the workup for acute coronary syndrome (ACS). Many non-ACS causes of elevated troponins exist, and can range from sepsis and pulmonary embolism to tachycardia and strenuous exercise. Complicating the clinical use of troponin assays is the phenomenon of endogenous autoantibodies that interfere with these assays, leading to false-positive results. Such false-positive results are commonly described for troponin I assays, and rarely for troponin T assays. We describe the case of an 8 year old male who had laboratory evidence of elevated troponin T levels. Investigation revealed that he possesses an extremely rare heterophilic antibody responsible for repeated false-positive assays. This case demonstrates an important clinical entity in the context of elevated troponin without evidence for cardiac myocyte injury or ACS. Knowledge of such antibodies can dissuade unnecessary invasive workup and assuage concern for patients and families.

CASE REPORT: An 8 year old male presented to the ED with dyspnea and back pain following a head-on go-kart collision. At the time of impact, the patient was traveling about 25 mph and wearing a seatbelt. His back pain started following the accident however, his dyspnea began two and a half hours later. The patient had experienced a runny nose and congestion for a few days prior. Physical exam was significant for minimal bibasilar crackles. Laboratory and radiologic investigations (CK-MB, acute phase reactants, CBC, CMP, chest X-ray, EKG) were within normal limits except for a troponin T (cTnT) of 0.19 ng/mL and ProBNP of 152 pg/mL. An ELECSYS® TnT STAT reagent (Roche, Basel, Switzerland) was used for testing the patient's cTnT on a Cobas® e 602 analyzer (Roche, Basel, Switzerland). He was admitted for suspected myocardial contusion versus myositis. During admission of 2 days, the patient underwent a transthoracic echocardiography (TTE) which was normal however his cTnT levels remained elevated on two subsequent tests (0.19 ng/mL). Following discharge, the patient was evaluated several times over the course of four weeks at our outpatient pediatric cardiology clinic where serial troponin T levels, a repeat TTE, exercise stress test, and a CT angiography of the chest were performed. All tests were normal except for cTnT which remained elevated (range: 0.14-0.15 ng/mL). A troponin I was obtained and was normal. A strong suspicion for heterophilic antibodies causing false elevations in troponin levels was suspected. The patient's blood samples were sent to Roche Laboratories in Germany for further testing. The samples were fractionated by size exclusion chromatography (SEC). The interference was caused by a high molecular weight compound, presumably IgG. An interference caused by anti-idiotypic antibodies was deemed likely.

DISCUSSION: Cardiac troponin I (cTnI) and T (cTnT) are highly sensitive and specific biochemical markers for myocardial necrosis and are generally not elevated in cases other than acute myocardial infarction (AMI) and acute coronary syndrome (ACS) other than conditions such as heart failure, end stage renal disease, sepsis, and pericarditis to name a few. There have been reports of cases where false positive results are present where interfering substances, such as heterophilic antibodies in serum affecting assays are present. The majority of reports have been associated with cTnI with only a handful being related to cTnT. Sources report the prevalence of human IgG reactive with cTnT in healthy blood donors is close to 10%. Clinical correlation in regard to elevated troponin levels is warranted due to these findings. In this case, due to age, the patient was not subjected to further invasive testing as he may have if he was an adult. This patient is at risk for misclassification of cardiovascular disease for undergoing unnecessary testing and procedures that may have negative implications. A false positive troponin result is a reminder that although troponin plays an important role in the diagnosis of AMI and ACS, it should not be the only criterion for establishing these diagnoses. Due to the rarity of the interference presented in this case and the risks associated with having false-positive troponin levels, it is important for clinicians to be aware and to remember that it is always the patient, not the test that is reliable.

PERSISTENTLY PATENT DUCTUS ARTERIOSUS: WHAT HAPPENS AFTER NICU DISCHARGE?

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INTRODUCTION: Patent Ductus Arteriosus (PDA) is a common problem in pre-term infants and is responsible for significant morbidity and mortality in the growing infant. Despite years of experience and a growing knowledge base, there are no consensus guidelines on management of PDAs. There are many publications focusing on whether to treat and method of treatment. There is less written about incidence of PDA related CHF and long term follow-up of infants with persistent PDA after NICU discharge.

RATIONALE: Medical therapy with COX inhibition and/or surgical ligation is often used in preterm neonates to close a PDA. Management has swung back and forth between routine medical and/or surgical treatment to no treatment/close clinical observation. When PDAs persist, infants may develop CHF and surgical closure may then be needed. If infant risk for CHF can be more clearly understood, this knowledge may impact decisions regarding PDA treatment. A better understanding of the outpatient clinical course of infants with persistent PDA is needed.

MATERIAL & METHODS: We performed a retrospective chart review on infants cared for in the Bronson Methodist Hospital Neonatal Intensive Care Unit (NICU) from Jan 1, 2010 to Dec 31, 2012. Search criteria included neonates discharged from NICU with diagnosis of persistent PDA with confirmed follow-up in the Bronson Pediatric Cardiology office. Records were excluded if patients were diagnosed with complex congenital heart disease, genetic syndromes/associations, or multiple congenital anomalies. Inpatient clinical variables were compared to ultimate outpatient PDA outcome, spontaneous closure (SC) versus catheter occlusion (CO). Variables were analyzed for statistical significance using two tailed t-tests and Fisher's exact testing as appropriate.

RESULTS: There were 57 neonates identified as having PDA at the time of discharge, of whom 20 were confirmed to have cardiology follow-up. Catheter occlusion was required in 35% (7) infants. This occurred at a mean age of 5 months. There was spontaneous PDA closure in 65% (13) of infants. This occurred at a mean age of 9 months. There was a statistically significant difference in time to closure between CO and SC, $p = 0.043$. There was no significant difference in treatment with COX inhibition therapy between treatment groups, 43% (3) in CO vs. 31% (4) in SC group, $p = 0.65$. There was a trend toward statistically significant difference in average days requiring mechanical ventilation, 12 (CO) vs 4 days (SC) ($p = 0.072$). A statistically significant difference was observed in terms of diuretic therapy at the time of cardiology follow-up; 71% (5) (CO) vs. 8% (1) (SC), $p = 0.043$.

DISCUSSION: Based on our data collection, 65% of neonates with discharge diagnosis of PDA demonstrated spontaneous closure. There was no significant difference in COX inhibition therapy between this population and those requiring catheter occlusion. Infants who went on to require PDA catheter occlusion were significantly more likely to require diuretic therapy, likely due to combination of BPD and CHF symptoms. Infants who required PDA occlusion were identified, on average, about 4 months sooner than those who spontaneously closed.

CONCLUSION: This data shows that the majority of infants discharged from our NICU with the diagnosis of persistent PDA achieve spontaneous closure irrespective of COX inhibition exposure. Aside from requiring diuretic therapy it is unclear which other characteristics are predictive of requiring percutaneous intervention for PDA closure. If our sample size were larger, days on mechanical ventilation might have also reached statistical significance. Future studies using this data set will evaluate echocardiographic characteristics of persistent PDA and evaluate for significance related to outcome (SC vs. CO).

INCIDENTAL FINDING OF AN ARACHNOID CYST STATUS POST MILD TRAUMATIC BRAIN INJURY

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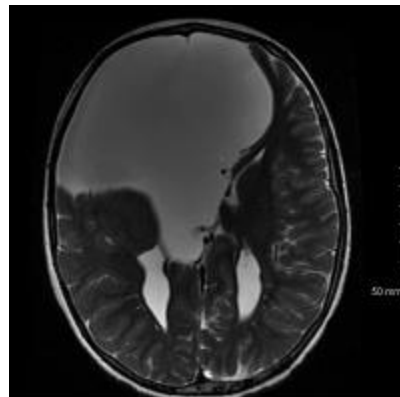
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INTRODUCTION: Arachnoid cysts are collections of CSF within the arachnoid membrane of the brain. These cysts can be an incidental finding in neuroimaging of pediatric patients. They do not always require surgery, though close monitoring and follow-up is necessary. The clinical presentation of arachnoid cysts vary greatly based on size, location and duration of the cyst. This case represents the impact that a large space occupying arachnoid cysts has on the cognitive and behavior development of a pediatric patient.

CASE REPORT: 9yo male admitted to the pediatric intensive care unit status post collision with a tree while outside running and playing. He suffered minor facial abrasions, but no loss of consciousness or altered mental status was initially noted. He developed confusion as the day progressed. His symptoms at the time of presentation included frequent emesis and pain out of portion to his injury. CT imaging of his head was completed revealing a chronic, expanding, right frontal arachnoid cyst. This cyst was an incidental finding which was unknown prior to his head CT. The large arachnoid cyst measured 12 cm x 11 cm x 9 cm, with midline shift was further evaluated with MRI (Image 1). Further review of his past history revealed evaluation for episodes of continuous vomiting, frequent headaches, developmental delay onset at 2 years old, behavior concerns and an abnormal gait in which he only swing his right arm. Following identification of the arachnoid cyst, he underwent endoscopic cyst fenestration with placement of Omayia reservoir. Post-operative he improve in terms of his symptoms, although he continued to have problems related to his behavior and anxiety.

DISCUSSION: Arachnoid cysts can be an incidental findings in neuroimaging of children. These cysts do not always require surgical invention, but their growth and new symptomatology must be followed closely. Arachnoid cysts within the pediatric population are more commonly found in males than females. Cysts that develop later in life are less often associated with enlargement or new symptoms and are less likely to require surgical intervention. It is essential to diagnose symptomatic cysts as early as possible to initiate surgical intervention and possibly prevent future symptoms and irreversible changes in both behavior and development. It was shown that arachnoid cysts can cause neurocognitive and psychological impairments, and when present in the frontal aspect of the brain are often associated with anxiety. Testing has shown that patients with arachnoid cysts have impairment in both basic and executive functions, with some amount of reversibility following cyst decompression. This case illustrates the importance of diagnosis and treatment of symptomatic arachnoid cysts

CONCLUSION: Cysts of the arachnoid membrane can be an incidental finding when performing diagnostic imaging of a child's head for alternative reasons. It is important to recognize the wide spectrum of clinical presentations associated with arachnoid cysts. Early intervention and monitoring provides a child with the best opportunity to avoid potentially irreversible changes to both behavioral and cognitive development.



NON-AXIAL OSTEOMYELITIS: A RARE MANIFESTATION OF CAT-SCRATCH DISEASE

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INTRODUCTION: Cat-scratch disease (CSD) commonly occurs in children and is characterized by self-limited regional lymphadenopathy. *Bartonella henselae*, the causative agent, is an aerobic gram-negative bacillus transmitted by the cat flea. It is transmitted to humans via cat saliva or from the scratch of an infected cat. This illness is known to cause a number of clinical symptoms with varying severity. Bone involvement occurs in 0.17% to 0.27% of known cases of CSD.

CASE REPORT: A 5-year-old unimmunized Amish boy presented with a five-week history of low-grade fevers and right leg pain without antecedent trauma. He initially presented as non-weight bearing three weeks earlier and was found to have a right femur mass. He was transferred to an outlying facility for further workup. MRI findings were initially consistent with osteoid osteoma. Pain was managed with Tylenol and appeared to be improving. Parents, however, noticed development of an enlarged right axillary lymph node, which was confirmed by ultrasound. Subsequently, computerized tomography was performed, demonstrating an increasing size of the original lesion found on his right proximal femur. There was no history of night sweats, pallor, or weight loss, and past medical history was unremarkable. Examination was notable for tenderness to palpation of his right femur without decreased range of motion. Inflammatory markers were mildly elevated, and bone biopsy revealed osteomyelitis with necrotizing granulomatous inflammation. Patient was started on intravenous ceftriaxone and clindamycin. Final cultures, however, were negative, and antibiotics were discontinued. A more extensive workup revealed the final diagnosis. Serologic testing for *Bartonella henselae* antibodies showed evidence of an acute infection. Titers were significantly elevated – IgM $\geq 1:20$, IgG $\geq 1:1024$, leading to the diagnosis of osteomyelitis from cat-scratch disease. Further history revealed the child had been playing with several kittens. He clinically improved on a four-week course of trimethoprim-sulfamethoxazole and rifampin.

DISCUSSION: Bone involvement in CSD is a rare phenomenon and should be considered in the differential diagnosis of osteomyelitis if there is history of contact with cats. Atypical manifestations occur in 5% to 25% of cases. The most common atypical manifestations of CSD include hepatosplenic abscesses, endocarditis, osteomyelitis, and Parinaud oculoglandular syndrome. Osteomyelitis resulting from *B. henselae* is usually subacute and more likely to involve bones of the axial skeleton with or without adjacent soft tissue inflammation. Femur, ileum, acetabulum, metatarsal, metacarpal, and distal humerus involvement have also been infrequently reported. Single focus or multifocal osteomyelitis can occur. Though lymphadenopathy is usually the main finding, osteomyelitis may develop several weeks after the initial presentation. Spread of infection to the bone is thought to be via the lymphatic route with regional involvement or hematogenously in disseminated cases. Diagnosis in the majority of the cases was made based on clinical features, positive CSD-skin tests, serology for *B. henselae*, and histopathology showing granulomatous lesions or multinucleated giant cells. The skin test is now considered obsolete due to variable sensitivity. Serological confirmation has become the cornerstone of CSD diagnosis. An IgG titer greater than 512 or a four-fold increase in IgG titer over 2-4 weeks has been proposed as diagnostic of acute CSD. On MRI, bone findings manifest as lytic lesions associated with sclerosis and periosteal reaction. Because it is so uncommon, there are no evidence-based guidelines for treatment of disseminated CSD, particularly when there is bone involvement. One study compared the outcome of 202 patients treated with 18 antimicrobial agents and concluded that only four agents appear effective: rifampin, ciprofloxacin, trimethoprim-sulfamethoxazole, and parenteral gentamicin. Another study showed that azithromycin was highly effective in vitro against *B. henselae*. All patients had a favorable prognosis irrespective of treatment, and four patients who received neither antibiotic therapy nor surgery went on to complete recovery.

CONCLUSION: This case demonstrates the importance of considering CSD in the differential diagnosis of children who present with fever of unknown origin and bone pain. Although usually a self-limited illness, osteomyelitis can occur in a small percentage of immunocompetent patients. Since recent studies show that 20% to 25% of cases come to medical attention for reasons other than lymphadenopathy, clinicians should be aware of atypical presentations of CSD.

EFFECT OF REAL-TIME FEEDBACK ON SCREW PLACEMENT INTO SYNTHETIC CANCELLOUS BONE

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INTRODUCTION: It has been demonstrated that surgeon dependence on conventional tactile feedback results in poor perception of screw torque insertion and may lead to screw stripping in cancellous bone.

RATIONALE: The objective of this study is to evaluate whether real time torque feedback may reduce the frequency of stripping when inserting screws through fracture plating into simulated cancellous bone.

MATERIALS & METHODS: Five attending orthopaedic surgeons and five senior level orthopedic residents each inserted non-locking screws through fracture plates into synthetic cancellous bone. Eight screws were inserted without feedback simulating conventional techniques. Then eight screws were driven with visual torque feedback. Finally, eight screws were again inserted with conventional techniques. Comparison of these three screw groupings with respect to screw insertion torque, subject rank, and perception of screw stripping, was used to establish the effects of feedback.

RESULTS: Seventy-three of 239 screws were stripped. During the first phase, no feedback was provided and the overall strip rate was 41.8%; this decreased to 15% with visual feedback ($p < 0.001$) and returned to 35% when repeated without feedback. With feedback, a lower average torque was applied over a narrower torque distribution. Residents stripped 40.8% of screws compared to 20.2% for attending surgeons. Subjects were poor at perceiving whether they stripped screws.

DISCUSSION: The main finding of this study was that real-time feedback in the form of a torque-vs-twist curve obtained via a custom screwdriver decreased the rate of screw stripping in this osteoporotic bone model. In spite of improved performance with real-time feedback, the data suggest that these effects may be transient and may not be sustained after removal of the feedback. In addition to a lower strip rate with feedback, there is a tighter clustering of applied torque. This decreased median torque and decreased scatter likely account for the reduction in strip rate from greater than 40% in Phase I to only 15% in Phase II. In contrast to previous investigations it was found that residents had poorer performance compared to attending surgeons. The concept of real-time feedback may be a valuable educational tool during resident training.

CONCLUSION: Prevention and identification of screw stripping is limited by surgeon perception of tactile sensation alone and is significantly improved with utilization of real-time visual feedback of a torque versus twist curve. This concept of real-time feedback appears beneficial toward performance in this cancellous bone surrogate and may lead to improved fixation in cancellous bone in a surgical setting.

ARTHROSCOPIC TREATMENT OF SUBJECTIVE HIP INSTABILITY IN PATIENTS WITH CAM DEFORMITY AND NON-OPERATIVELY TREATED POSTERIOR WALL FRACTURE AND DISLOCATION

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INTRODUCTION: Fractures of the posterior wall account for an estimated 25% of acetabular fractures. Nonsurgical treatment is appropriate if the remaining intact acetabulum is sufficient to maintain stability and congruity of the hip joint. Recurrent dislocation is certainly a catastrophic complication of failed treatment of posterior wall fractures; however, lesser degrees of dynamic instability may be problematic as well. Femoroacetabular impingement (FAI) has been described with increased frequency in the literature. To our knowledge, this entity has not yet been described in the setting of nonsurgically treated posterior wall fractures. Three patients with subjective dynamic hip instability following nonsurgical treatment of radiographically stable posterior wall fractures are presented. Surgical treatment for the cam deformity with hip arthroscopy and femoral neck osteoplasty is reviewed.

CASE REPORT: Approval for this work was obtained from Borgess Institutional Review Board. All three patients had a history of hip dislocation and posterior wall fractures treated with closed reduction and nonsurgical management. From seven months to nine years after injury, they presented with hip pain and symptoms of subjective hip instability. Radiographs revealed femoral neck cam deformities. Physical examination findings were consistent with hip impingement. All three patients underwent hip arthroscopy to address their hip pathology due to disability from their symptoms. A femoral neck osteoplasty was performed, with care taken to avoid excessive resection. If labral repair or acetabuloplasty was indicated these procedures were also performed. It was noted once this was performed there was no signs of hip instability intraoperatively. All patients did well and had relief of their symptoms of pain and instability.

DISCUSSION: The most important finding of the present study was that the subjective symptoms of instability after posterior wall acetabular fracture in patients with a cam lesion (alpha angle greater than 65 degrees in this case series) were successfully treated by arthroscopic femoral neck osteoplasty. It is suspected that this bony morphology combined with altered posterior wall anatomy resulted in abnormal mechanics in which the femoral head either levered out of the acetabulum during symptomatic hip positions or led to increased contact pressures due to altered joint congruency. Whether micromotion or actual subluxation led to the patients' symptoms is not able to be determined from our results. The treatment of femoral neck osteoplasty was found to alleviate these patients' symptoms and resulted in minimal patient morbidity. It is important to note that the diagnosis was, and still is, difficult. The clinician should be thorough in evaluating these patients through history, physical examination, and interpretation of imaging studies. Close observation is indicated for posterior wall acetabular fractures that meet nonsurgical treatment criteria in patients with concomitant cam lesions. This combination may lead to subjective instability and pain and could lead to altered joint loading and contact mechanics. In our series, femoral neck osteoplasty was successful at addressing the patients' symptoms.

CONCLUSION: Femoral neck osteoplasty of symptomatic cam lesions in this select patient population with nonsurgically treated posterior wall acetabular fractures resulted in symptom resolution. To our knowledge, this specific combined pathology has not yet been previously discussed. Arthroscopic treatment of the cam lesion has less surgical morbidity than open reduction internal fixation of a posterior wall acetabular fracture and consideration should be given to this treatment approach.

THE INFLUENCE OF SCREW PLACEMENT IN SUBTALAR JOINT ARTHRODESIS

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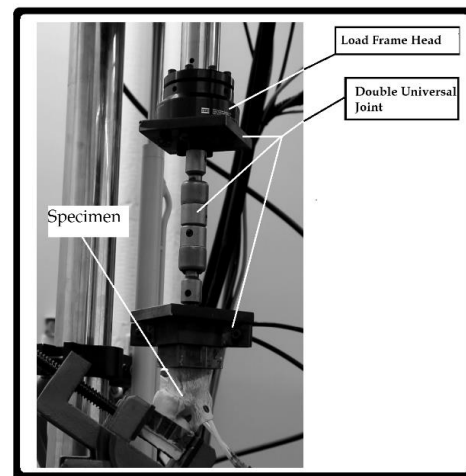
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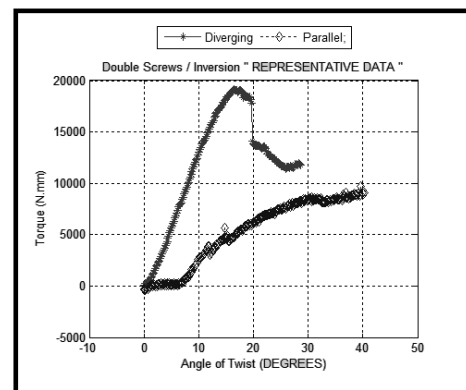
INTRODUCTION: Subtalar joint arthritis is a painful condition that is surgically treated with subtalar arthrodesis. Subtalar arthrodesis has a reported nonunion rate of 10% which carries a high morbidity and often results in revision surgery. There is no consensus on the optimal internal fixation for the arthrodesis with regard to the number of screws or the orientation of the screws. Additionally, there has been no anatomic study on the placement of subtalar arthrodesis screws and related key anatomic structures.

RATIONALE: The purpose of this study is to compare three fusion constructs in synthetic bone while varying screw configuration to determine which provides optimal rigidity under a physiologic load. Additionally, we sought to quantify the risk to anatomic structures by the placement of a divergent screw orientation. Our hypothesis is that two divergent screws would be superior to a single screw or to two parallel screws.

MATERIAL & METHODS: Three different screw configurations were utilized: two divergent screws, two parallel screws, and a single screw whose orientation was the same as the parallel screw group. The divergent configuration has one screw parallel to the screws in the other groups and one screw oriented perpendicular to the other screws. Ten synthetic subtalar joint fusions were constructed. These specimens were subjected to an applied inversion torque about the subtalar joint axis on a servo-hydraulic load frame. Torsional stiffness of the construct (i.e., the slope of the torque versus angle of twist curve) and the failure torque for each screws configuration was measured. Additionally, an



configuration was measured. Additionally, an



RESULTS: In laboratory experiments, the double diverging screw configuration was found to have higher torsional stiffness than double parallel under inversion load (1232.8 vs 326.1 Nmm/degree). The single screw configuration had a lower stiffness (457.8 Nmm/degree) than the double screw diverging but was unexpectedly stiffer than the double screw parallel configuration.. Additional laboratory testing is planned to refine values for stiffness and to establish the statistical significance of these outcomes. The mean distance from key structures to the divergent screw included the sural nerve (13mm), peroneus brevis tendon (18mm), tibialis anterior tendon (8mm) and posterior tibial tendon (21mm).

CONCLUSIONS: For the placement of divergent screws for subtalar arthrodesis, the minimum distance from key anatomical structures was 13mm which we believe allows this construct to be an alternative in clinical practice. The biomechanical laboratory experiments suggest that the double diverging screw configuration are superior two alternatives which are currently used more frequently. Additional tests is planned. In conclusion, based on this work, we believe surgeons should consider the double diverging screw configuration for subtalar arthrodesis.

SURGICAL TREATMENT OF DEGENERATIVE SCOLIOSIS

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INTRODUCTION: Degenerative scoliosis is becoming increasingly more common secondary to the aging population. Crucial to understanding this diagnosis is the intricate anatomy of the spine as well as a good understanding of the disease presentation. Physical examination is of utmost importance to identify any neurological abnormalities, muscular weakness, or spinal imbalance. Imaging modalities help define the deformity and have become an invaluable tool in diagnosis and preoperative planning. Nonoperative treatment is an integral part in the management of patients with smaller degree curves. For patients with larger deformities or neurologic deficits, operative treatment is the standard of care. Many different approaches and constructs can be used as part of the treatment.

RATIONALE: Degenerative scoliosis is a deformity of the spinal column in three different planes due to degenerative disc disease. In the recent past, the main focus was on rotation and coronal imbalance. However, recent studies suggest that restoring sagittal balance correlates with better patient outcomes.

METHODS: PubMed was utilized as the primary search tool. The first search phrase attempted "surgical treatment of degenerative scoliosis" yielded 410 results. The search was refined to "surgical treatment of adult degenerative scoliosis" which yielded 325 results. Two results matched the search completely, a 2014 publication from Asian Spine Journal and a 2013 publication in the European Spine Journal. The remainder of the articles were then systematically reviewed to identify clinically relevant articles. Twenty-four were deemed appropriate for use. The dates of publication ranged from 1988 to 2014. Types of articles included review articles (3), meta-analysis (1), randomized controlled trials (1), prospective studies (10), basic science publications (2), clinical practice guidelines (1), case series (1), retrospective reviews (3), and data base studies (2).

DISCUSSION: In review of the literature, it is clear that adult degenerative scoliosis is a frequently discussed topic. Information obtained includes classification of deformity, pathoanatomy, history and physical, imaging studies, nonoperative management, preoperative planning, and operative management. Operative management is complex and deserves special attention as the literature is evolving. Anesthesia is transitioning to total intravenous anesthesia (TIVA) and neuromonitoring of the patient is becoming standard of care. New surgical techniques are trending towards less invasive methods to obtain coronal and sagittal correction. Deformity correction through a posterior approach alone or in combination with a lateral transposas approach prevents the need for an access surgeon and can make positioning more convenient. A posterior or transforaminal lumbar interbody fusion (PLIF, TLIF) can both be performed through the same incision as the posterior fusion and is an appealing way to correct deformities. These procedures can be beneficial in terms of decreased operative time and patient morbidity. The extreme lateral interbody fusion technique has become increasingly popular as well. The anterior longitudinal ligament (ALL) can be manipulated, allowing for greater degrees of spinal balance correction. Compared to posterior procedures, this approach allows for increased visualization for discectomy, less morbidity, and increased surface area for graft placement. Physicians should be comfortable with different bone grafting options as creating a solid fusion is important to establish stability and decrease mechanical stress on the construct.

CONCLUSION: Surgical treatment of adult generative scoliosis is an important topic with an abundance of new literature. This likely stems from the increasing prevalence secondary to an aging population. It is important to not only understand the evaluation of these patients but the nonoperative and operative management. Operative management is complex and ranges from determining fusion levels to determining the type of approach to best correct the sagittal and coronal balance. Newer techniques described can aid in the management of disease.

A SYSTEMATIC REVIEW OF THE SURGICAL TREATMENT AND OUTCOMES OF POSTEROLATERAL CORNER KNEE INJURIES: PART II, CHRONIC INJURIES

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INTRODUCTION: There are a variety of surgical techniques reporting outcomes of chronic grade-III posterolateral corner (PLC) knee injuries. It is unknown if outcomes differ among the various surgical treatments.

RATIONALE: A systematic review of the literature to compare clinical outcomes of treatment for chronic grade-III PLC injuries will improve the surgeon's ability to manage these complex injuries.

MATERIALS & METHODS: A systematic review of the literature including Cochrane, PubMed, Medline, and Embase was performed. The following search terms were used: posterolateral corner knee, posterolateral knee, posterolateral instability, multiligament knee, and knee dislocation. Inclusion criteria were outcome studies of chronic PLC knee injuries with a minimum 2-year follow-up, subjective outcomes, objective outcomes including varus stability, and subgroup data on PLC injuries. Two investigators independently reviewed all abstracts. Accepted definitions of varus stability on exam or stress radiographs, and need for revision surgery, were used to categorically define success and failure.

RESULTS: Nineteen studies with a total of 627 patients were included in this study. The 19 studies included 7 level III and 12 level IV studies. The average age of the patients in each study ranged from 25.2 years to 40 years of age. For the included studies, the reported average time to surgery ranged from 5.5-52.8 months. The average follow-up duration ranged from 2 years to 16.3 years. Average postoperative Lysholm scores ranged from 65.5-91.8. Average postoperative IKDC scores ranged from 62.6-81.3. A variety of surgical techniques were reported.

DISCUSSION: The most important finding of this systematic review was that surgical management of chronic PLC injuries had an 82% success rate and an 18% failure rate in 19 studies reporting minimum 2-year subjective and objective outcomes. Of the 627 patients included in the 19 studies, 67% had combined posterior cruciate ligament (PCL) injuries, while only 17% had combined anterior cruciate ligament (ACL) injuries, 4% had combined ACL and PCL injuries, and 12% had isolated PLC injuries. Also, because of the wide variability of the reporting of objective postoperative outcomes, it is recommended that future clinical studies obtain bilateral comparison varus stress radiographs preoperatively and postoperatively to allow quantitative clinical evaluation and objective reporting of results.

CONCLUSION: Surgical management of chronic PLC injuries had an 82% success rate according to the authors' objective assessment of outcomes. Reported subjective outcomes scores varied across the 19 studies, with the Lysholm score reported in 15 of 19 studies. Surgical techniques included variations of fibular slings, capsular shifts, and two tunnel techniques (fibular tunnel and tibial tunnel). Further research is needed to determine the optimal surgical technique for treating chronic grade-III PLC injuries.

FACTORS ASSOCIATED WITH HOSPITAL READMISSION AFTER COMMON SURGICAL PROCEDURES

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INTRODUCTION: Surgical outcomes, complications, and readmission are increasingly tracked by programs such as the National Surgical Quality Improvement Program (NSQIP). In addition to improving patient care, the reduction of hospital readmissions is imperative to financial success due to the reimbursement deductions that are levied to hospitals with high rates of readmission. Identification of patients who are at a higher risk of readmission post-operatively, therefore, has multiple benefits.

RATIONALE: We conducted this study to examine the factors associated with hospital readmissions within 30 days of patients who underwent appendectomy, cholecystectomy, or herniorrhaphy.

MATERIAL & METHODS: We completed a retrospective chart review of patients who underwent appendectomy, cholecystectomy, or herniorrhaphy at two teaching hospitals, between 2011 and 2012, and were subsequently readmitted within 30 days. Demographic characteristics, comorbidities, medication use, intraoperative events, and length of hospital stay; as well as the main readmission symptoms and readmission diagnosis, were collected. Readmission reasons were categorized as procedure-related (e.g. wound infection, abscess, bleeding, injury to organ/structure), non-procedure-related (e.g. inadequate pain control, ileus, constipation) and reasons related to other causes, such as comorbidities.

RESULTS: Of 2,634 patients who underwent appendectomy, cholecystectomy, or herniorrhaphy within 2 years, 180 patients (6.8%) were readmitted within 30 days. Two patients were excluded due to incomplete data. Chi-square and Fisher's exact tests were used to analyze the data from the remaining 178 patients in order to determine the association between the type of procedure and reasons for readmission. Overall 57 patients (32 %) were readmitted for non-procedure-related reasons; 51 patients (28.65%) for procedure-related reasons; and 70 patients (39.32%) for other reasons. There was statistically-significant evidence of an association between the type of procedure and the reasons for readmission ($p=0.0042$). Patients who underwent appendectomy made up the highest proportion (60.9%) of those readmitted for non-procedure-related reasons (e.g. inadequate pain control, ileus). Those who underwent cholecystectomy made up the highest proportion (30.7%) of those readmitted for procedure-related reasons (e.g. bile leak, retained common bile duct stone, or wound problems); and patients who underwent herniorrhaphy comprised the highest proportion (56.1%) of those readmitted for other reasons (e.g., symptoms due to comorbid condition as diabetes-related, cardiac-related). There was no statistically-significant evidence of association between overall reasons for readmission and comorbidities.

DISCUSSION: In this cohort of readmitted patients, we observed significant evidence in the reasons for readmission based on the type of procedure. Cholecystectomies resulted in the greatest proportion of readmissions due to procedure-related causes, appendectomy readmissions due to non-procedure-related causes, and herniorrhaphy readmissions due to other causes.

CONCLUSION: Vigilant perioperative care as well as careful postoperative management of existing medical comorbidities could potentially reduce the readmissions after these common procedures.

SINGLE INCISION LAPAROSCOPIC GASTROSTOMY BUTTON PLACEMENT: A SIMPLE, EFFECTIVE, AND INEXPENSIVE TECHNIQUE

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INTRODUCTION/RATIONALE : Gastrostomy tube (G-tube) placement is a common procedure used to facilitate enteral feedings in children who cannot obtain adequate calories orally. The procedure has evolved from an open operation to one that is commonly done using minimally invasive techniques. Since it was first described in 1996, the ‘U-stitch’ laparoscopic primary placement of a gastrostomy button (G-button) has become a popular technique. More recently, Ponsky described single incision laparoscopic surgery (SILS) G-button placement utilizing an operative hysteroscope. We present a new SILS procedure that is based on this technique, but with several modifications that simplify the operation. This study is a retrospective review of our first 12 patients to undergo SILS G-button placement with these modifications.

MATERIAL AND METHODS: We retrospectively evaluated the first 12 patients (August, 2013 to October, 2014) to undergo SILS G-button placement with our modifications. Data regarding operative time, hospital cost of disposable equipment, and complications were collected.

PROCEDURE: A 5 mm incision is made in the left upper quadrant. A combination of blunt and sharp dissection is used to enter the peritoneal cavity. A 5 mm operative hysteroscope (Richard Wolf, Vernon Hills IL) is placed without the use of a trocar. Insufflation is achieved via a side channel of the scope. The mid-portion of the greater curvature is grasped using the flexible cup biopsy forceps inserted via the working channel of the hysteroscope. This segment is brought out through the incision as the hysteroscope is removed. A gastrostomy is made sharply, and 3-0 Vicryl (Ethicon, Cincinnati OH) suture is used on four points to secure the gastrostomy in an open position. The G-button is then inserted, and its balloon inflated with water. Thirty milliliters of air is injected into the stomach via an orogastric red rubber catheter. The air is withdrawn from the G-button confirming correct placement. This technique does not utilize a trocar, through-and-through abdominal wall sutures, electrocautery, or a dilator kit. There is no wound to close, and no need for a dressing.

RESULTS: The mean age of this cohort was 25 months (0.5-95 months) with an average weight of 9.2 kg (2.9 -20 kg). The mean operative time was 18.6 minutes (12-36 min). There was a learning curve. The mean operative time for the first four cases was 20.3 minutes, compared to 12.8 minutes for the last four cases (p-value: 0.03). There was no need to add additional trocars, nor were there conversions to an open approach. To date, there have been no complications. At our institution, the total cost of the disposable equipment needed to perform our SILS G-button placement was \$16.75, compared to \$158.63 for that of our previously employed ‘U-stitch’ laparoscopic technique.

DISCUSSION: With any new technique, there are concerns regarding increased equipment costs and operative time. Our SILS gastrostomy procedure can be done quickly. Previous reviews of laparoscopic G-tube placement demonstrate a mean operative time of 51 and 54 minutes compared with our 18.6-minute average. Very little equipment is needed. This, along with decrease OR time, minimizes costs. Our technique is safe. The entire procedure is done under direct visualization minimizing risk of injury to adjacent organs. The gastrostomy is sutured to the fascia in an open position. Thus, if early button dislodgment occurs, it can be easily replaced with much less concern for extraluminal placement or separation of the stomach from the abdominal wall. Only minor complications were seen and occurrence rates were comparable to the 60% rate of maintenance complications seen in a large retrospective review comparing laparoscopic and percutaneous techniques.

CONCLUSION: Our SILS G-button technique is inexpensive, fast, and safe. The disposable equipment needed was less expensive than that used for the ‘U-stitch’ laparoscopic G-button procedure. The operative time was short and decreased with experience. There were no complications.

A CASE OF FALSE GASEOUS GANGRENE AND NEAR AMPUTATION: A CAUTIONARY TALE

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INTRODUCTION: Chronic application of an iodine containing solution to dry gangrene was found to imitate gaseous gangrene on radiography. This unusual mimicker of gaseous gangrene was discovered after thorough history and physical examination. Bilateral above the knee amputation (AKA) was thus avoided and a much simpler treatment of gentle bedside debridement was applied.

CASE REPORT: A 64 year old bed bound male with immobile lower extremities and poor hygiene presented to the ER because of inability to care for himself and increasing foot pain for the past 2 months. He had a longstanding history of melorheostosis of the knees and was diagnosed with stable dry gangrene of the lower extremities eight months prior. He was given oral antibiotics and told to apply betadine to his feet daily in anticipation of auto-amputation. The skin of the bilateral distal feet and all phalanges was hard, flaky, thickened, necrotic, malodorous, and orange-brown in coloration from betadine application. A 0.25cm erythematous border surrounded the affected tissue. Foot X-rays demonstrated severe osteopenia, bone destruction, and soft tissue gas consistent with gaseous gangrene. A single blood culture revealed gram positive cocci in chains and clusters, but the patient remained afebrile without leukocytosis. As a result of high clinical suspicion, complete immobility of bileratal legs, and the potential for clinical deterioration, urgent bilateral AKA was recommended. The patient did not want to proceed with amputation. Upon detailed discussion, he admitted that he had not washed his feet during the eight months he had been applying the betadine. The combination of hyperkeratosis and repeated betadine applications resulted in a hard painful shell over both feet which mimicked gaseous gangrene on exam and radiography. Gentle debridement revealed the underlying skin to be well perfused and viable.

DISCUSSION: Rapidly progressive clostridial gangrene, necrotizing fasciitis, or septic gas gangrene calls for emergeny surgical debridement, or in this case AKA due to immobility and knee contractures. However the patient's indolent course and lack of overt sepsis on presentation complicated the diagnosis. A single positive blood culture with gram positive cocci likely represented a contaminant. The wound margins were also stable. Yet the X-ray's showed changes classic for gas gangrene. This patient also had comorbidities which made interpretation of the physical exam and imaging difficult. Melorheostosis, a rare genetic developmental bone dysplasia, leads to pain, physical deformity, contractures, and skin and vascular abnormalities in one or more limb. Were the X-ray changes due to melorheostosis, gaseous gangrene, or dry gangrene in a hyperkerototic iodized shell? A trial of bedside debridement seemed reasonable to discover the answer.

CONCLUSION: This case is a cautionary tale. This patient could have been taken to the OR for bilateral AKA. A thorough history and a trial of a less aggressive therapy showed that the entire clinical picture must be taken into account when making life changing surgical decisions.

OBTURATOR BYPASS IN MANAGEMENT OF INFECTED AORTOBIFEMORAL GRAFT

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INTRODUCTION: Aortoiliac occlusive disease is a chronic obliterative atherosclerotic process that affects the distal aorta and iliac vessels. Patients who have aortoiliac occlusive disease often have more distal occlusive disease in the femoral, popliteal, or infrapopliteal regions thus accounting for a wide variety of presenting symptoms from buttock claudication to ischemic rest pain or tissue loss in the distal extremities. Given the negative impact on quality of life as well as life expectancy in patients with critical limb ischemia, revascularization is advocated. While endovascular treatment options have become the first line therapy for treatment of aortoiliac occlusive disease, some patients ultimately require open repair. Aortobifemoral bypass grafting is currently the procedure of choice for open repairs given its long term patency rates. While this procedure can provide relief of symptoms, one feared complication is development of graft infection and subsequent anastomotic breakdown leading to pseudoaneurysm and frank hemorrhage. When these complications arise, obturator bypass is a rare but effective operation to provide life and limb salvage.

CASE REPORT: A 74-year-old male with history of peripheral artery disease, hypertension, and diabetes mellitus presented with lifestyle limiting claudication and was diagnosed with aortoiliac occlusive disease on computed tomography imaging. He underwent aortobifemoral bypass which was complicated by development of lymphocele of the right groin incision in the post-operative period. He underwent ligation of lymphatic tissue in the right groin. He presented 2 months later with a pulsatile mass in his right groin consistent with pseudoaneurysm formation, likely secondary to infected prosthetic material, and *Staphylococcus aureus* bacteremia. He was taken to the operating room for bypass of the right limb of his aortobifemoral bypass graft via an obturator bypass as well as excision of the graft in his right groin with ligation of the native vessels and gracilis muscle flap placement.

DISCUSSION: Aortobifemoral bypass grafts have high patency rates of nearly 90% at 5 years and 75% at 10 years after operation making them the primary procedure of choice for open revascularization procedure in aortoiliac occlusive disease. The post-operative period, however, can be complicated by early groin incisional complications. Rates of lymph fistulas or lymphoceles have been reported in up to 6.4% of patients undergoing this procedure which places patients at risk for wound infections, graft infections, and ultimately vascular anastomotic dehiscence. When dehiscence does occur prompt diagnosis and treatment is of paramount importance to prevent a contained leak or pseudoaneurysm of the graft from developing into a free rupture. Obturator bypass involves identification of proper inflow vessel from common iliac or external iliac arteries, or in this case the right branch of the aortobifemoral prosthetic graft. The distal target is usually the distal superficial femoral artery or popliteal artery, the latter which was used in this case. The tunneling device is passed from inferior to superior between the adductor longus and adductor magnus through the obturator foramen along its anteromedial aspect to avoid the obturator vessels that travel on the posterolateral aspect of the foramen. The obturator bypass graft is then passed and anastomoses created between the previously identified inflow and distal target.

CONCLUSION: Obturator bypass in the setting of an infected femoral pseudoaneurysm is a method of extra-anatomic bypass that allows for reperfusion of the limb as well as excision and debridement of infected tissue. The bypass is outside the infected field which decreases risk of recurrent infection. This type of bypass, although rarely performed and technically intricate, is a viable option for treatment of patients with infected femoral pseudoaneurysms.

NONUNION TIBIAL FRACTURE FIXATION WITH INTERMEDULLARY NAILING

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INTRODUCTION: We are presenting a case of Surgical Implant Generation Network (a.k.a. SIGN) utilization in a war environment with limited resources. A 34 year old male sustained fractures to the right tibia and fibula from a gunshot wound, initial local treatment was with external fixation for 8 months, until he could be brought to the Afghan National Police Hospital for definitive treatment. The entire procedure follows the published standards for SIGN implantation, and was done entirely without imaging and limited power tools. While this IM nail was originally designed for use in third-world environments with no access to imaging or power, the same conditions exist in many local national systems during war-time, particularly in Afghanistan. These patients benefit from early ambulation, with assistance, within 1-2 days of surgery and discharged within 1 week.

CASE REPORT: This is a 34 y.o. Afghan National Policeman who sustained a through and through GSW to the right tibia over 1 year ago. Initially the fracture was treated by external fixation for 8 months, and after fixator was removed, a nonunion fracture of the tibia was noted. Ultimately, the patient was brought into the Afghan National Police Hospital for consultation. Crepitus and bony instability were palpable over the shafts of the tibia and fibula. X-rays confirm a non-union, and prior drill holes from external fixator. Procedure: Bony fragments are identified and mobilized. Occasionally, due to the age of the fracture, a significant amount of sharp dissection was necessary to remove adhesions. All viable bone was used and never discarded. Bony sections were realigned and held into position manually. The patellar tendon was incised to allow for reaming into the tibia. Care was taken to avoid entering the bursa sac itself. Manual reaming was conducted while maintaining alignment of the bony fragments. Reaming is performed along the entire length of the tibia to ensure proper alignment. The system is designed to be performed this without power or imaging of any kind. Target arm is then assembled and locked onto IM nail. Screw size should be checked as best as possible, preoperatively. Nail with target arm is then inserted and manually guided across the fx site. Once positioned, the nail can be rotated to ensure the proper alignment. Distal screws should always be attached first. Successive sizes of drill guide cannulas are used to carefully place the interlocking screws and a simple depth gauge is then inserted to select the correct length screw. 4:33: For reference, we are showing the placement of the nail with the target arm. Before the distal interlock screws are applied, ensure proper reduction and neutral position is maintained. This case had power tools available, otherwise hand drilling is often necessary using the same T piece as was used for reaming. Screws are inserted and tightened, with the process repeated for the second interlock screw. After the distal interlock screws are applied, next the proximal screws are measured. These are applied with reduction and traction applied manually, and the process is repeated with the succession of cannulas and sizers. Also, if the fracture has been distracted too much, the converse is true and compression can be applied using the nail. Once screws are applied, the target arm is removed and disassembled from the nail. Alignment is reasonable with bone on bone noted. There was no graft material available to cover up large cortical defects. However, in this case, soft tissue flap mobilized and used to cover the rod. Irrigation was performed to remove residual bony fragments prior to primary closure.

DISCUSSION: These patients are ambulated within 1-2 days of surgery. IF the family is able to attain a crutch or cane to assist, otherwise they typically utilize a family member or assistant to walk. Most pt's are discharged within 1 week from the surgical date. The SIGN system was originally developed for low-energy civilian trauma, and has not been widely described for war (high-energy) injuries.

CONCLUSION: Certainly, war injuries are an appropriate use of this as well, even in a developing nation. The SIGN SYSTEM In other less adaptive environments patients are treated with external fixation only and time to healing or definitive therapy can vary widely from weeks to 1-2 years. The SIGN operation provides an additional option to the surgeons in an environment with limited resources. This case demonstrates adaptive, unconventional surgical decision making in a charged environment with limited resources leading to limb salvage and expedited return to functional status.

A COMPARISON OF ON-SCENE TIMES FOR OUT-OF-HOSPITAL PEDIATRIC CARDIAC ARREST PATIENTS IN A STATEWIDE EMS INFORMATION SYSTEM

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PURPOSE: Compare on-scene times of transported out-of-hospital non-traumatic cardiac arrest (CA) pediatric versus adult patients using a statewide EMS information system (EMSIS).

METHODS: A statewide EMSIS was used to conduct this retrospective, observational study. The study period was from 1/1/2010 to 12/31/2013. Data were filtered from EMSIS based on criteria previously found to maximally identify CA cases (e.g., impression of CA, CPR procedure, etc.). Pediatric cases were considered those <13 years old. Only patients transported to hospitals were selected. Scene time was calculated by subtracting the scene departure from the scene arrival time. Further comparisons were made of public locations, initial shockable rhythm, and return of spontaneous circulation (ROSC) reported upon ED arrival. Cases were excluded for trauma, CA at healthcare facilities, or those missing initial EKG, scene time, or ROSC data. Standard statistical analysis was performed.

RESULTS: There were a total of 5,060,339 records in the EMSIS, with 33,080 meeting initial criteria for CA. After exclusions, there were 10,240 cases remaining for final analysis, 266 (2.6%) pediatric and 9,974 (97.4%) adult. The median age for pediatric and adult patients was 8.4 months (IQR:2.4, 36.0) and 64.0 years (IQR:52.0, 77.0), respectively. There were 12.8% of pediatric versus 22.0% of adult arrests reported in public venues ($p=0.0005$). Eight (3.0%) pediatric arrests were reported with an initial shockable rhythm versus 2,020 (20.3%) of adults ($p<0.0001$). The median time on scene for pediatric and adults were 12.0 minutes (IQR:5.3, 21.8) and 23.0 minutes (IQR:16.0, 33.7), respectively ($p<0.0001$). The number of pediatric and adult arrests reported to have ROSC upon ED arrival were 30 (11.3%) and 2,473 (24.8%), respectively ($p<0.0001$).

CONCLUSION: This study demonstrates significantly shorter on-scene times of pediatric versus adult cardiac arrest patients. Adults were much more likely to have an arrest in a public location, have an initial shockable rhythm, and have ROSC upon ED arrival. Further studies are needed to assess any causal relationship between scene time duration and outcomes. Important limitations in this study include exclusive reliance on unverified data from a statewide EMSIS, large numbers of excluded cases including non-transported patients, and lack of hospital outcome data.

PRIMARY CLEAR CELL LUNG CANCER WITH EPIDERMAL GROWTH FACTOR RECEPTOR (EGFR) MUTATION: THE FIRST REPORTED CASE

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INTRODUCTION: Clear cell carcinoma of the lung is a rare histologic type of lung cancer classified as either an adenocarcinoma or large cell carcinoma by the World Health Organization. The majority of clear cell lung cancers in the literature are metastases from renal or ovarian cancers or a benign clear cell tumor of the lung. We present a case of a metastatic clear cell lung cancer with peritoneal and omental carcinomatosis.

CASE REPORT: An 80-year-old Caucasian man presented to his primary care physician after a computed tomography (CT) scan for abdominal pain showed an extra-luminal sigmoid mass and ascites. Diagnostic paracentesis revealed atypical cells suspicious for adenocarcinoma. Colonoscopy was attempted but deferred due to inability to pass the sigmoid mass. Another CT scan showed peritoneal and omental implants as well as pleural effusions. No kidney mass was seen. Patient underwent exploratory laparotomy with sigmoid resection due to a near obstructing extra-luminal mass. Pathology showed adenocarcinoma with clear cell features. Immunohistochemical stains were positive for CK7, TTF-1, napsin, CAM 5.2, vimentin, focally positive for CD 10 and CEA and negative for CK 20 and PAX-8. Renal cell antigen was also positive which can be seen in 20-25% of lung adenocarcinomas. Given the positivity of CK7, TTF-1, napsin and CEA, none of which are seen in clear cell carcinoma of kidney and without a renal mass present, a diagnosis of lung primary was made. Molecular testing revealed EGFR mutation, with KRAS and ALK gene negative. Patient was initially started on cisplatin and paclitaxel with erlotinib added once EGFR mutation was discovered.

DISCUSSION: Clear cell adenocarcinoma of the lungs is an extremely rare type of lung cancer with only a handful of reported cases in the literature that have been confirmed by immunohistochemistry. Gene mutations, such as EGFR, occur in up to 10% of non-small-cell lung cancers (NSCLC.) There are 4 mutations checked with EGFR testing: exons 18, 19, 20 and 21. Mutations in exon 19 and 21 make up 90% of all detectable mutations. In our patient, the EGFR mutation detected was an exon 21 L858R point mutation. EGFR belongs to the family of receptor tyrosine kinases, and these mutations increase the kinase activity of downstream pro-survival signaling pathways.

CONCLUSION: EGFR mutation is an important prognostic factor as use of tyrosine kinase inhibitors can increase survival. To our knowledge this is the first reported case of an EGFR mutation in a primary lung clear cell adenocarcinoma.

NECROTIZING SARCOID GRANULOMATOSIS- A RARE FORM OF GRANULOMATOUS LUNG DISEASE

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INTRODUCTION: Necrotizing Sarcoid Granulomatosis (NSG) is a rare entity and was first introduced by Liebow in 1973. It is characterized by the presence of sarcoid-like granulomas and granulomatous vasculitis with varying degrees of necrosis associated with nodular and infiltrative parenchymal disease. It remains an enigma and continues to draw controversy concerning its proper taxonomical position more than 40 years after its introduction. In the clinical setting however, the more pressing task seems to be the exclusion of other differentials when considering this diagnosis.

CASE REPORT: A previously healthy 43-year-old African-American woman presented with several months history of worsening pleuritic chest-pain, exertional dyspnea, cough, night-sweats and fatigue. History of environmental and occupational exposures was negative. Physical examination was completely normal. Except for an elevated D-dimer, all other investigations including EKG and cardiac enzymes were normal. CT-chest angiography was negative for pulmonary embolism but revealed mediastinal and hilar lymphadenopathy with ground glass infiltrates and nodularities; resulting in a tentative diagnosis of sarcoid. Antibiotics were started for presumed pneumonia with planned pulmonology followup. 1 week later, symptoms were unchanged with rising inflammatory markers. PPD, ANCA, ANA and serum ACE were unremarkable. Endobronchial biopsy of lymph-nodes and BAL showed necrotizing granulomas. Because such impressive necrosis was atypical for sarcoid, exclusion of tuberculosis, malignancy and other infection was paramount. Mediastinal lymph-node, bone marrow and video assisted thoracoscopic lung biopsies were undertaken. Mycobacterial and fungal tests were negative. Evidence supporting malignancy was lacking. Lymph node and lung biopsy histology showed necrotizing granulomatous inflammation, suggesting the rare entity: necrotizing sarcoid granulomatosis (NSG). Intravenous glucocorticoid therapy was commenced. The patient was later discharged on oral steroids and Pneumocystis jiroveci prophylaxis. Pulmonology followup 2 weeks later, noted remarkable symptom improvement. CT-scan of the chest and pulmonary function tests are scheduled for her upcoming 6 week review.

DISCUSSION: NSG is largely considered a variant of sarcoidosis however the relationship between the two is still under debate. Major differences on histology are the presence of marked necrosis and prominent vasculitis. It commonly affects women in their fifth decade. The important clinical exercise here was to ensure the exclusion of any infectious process; particularly mycobacterial, fungal or bacterial; as well as a vasculitic or neoplastic process such as Wegener's granulomatosis or lymphoma respectively. This is because these other diagnoses tend to follow an aggressive course compared to NSG and often require a totally different treatment approach.

CONCLUSION: This case illustrates the rare disease NSG, of which little is known about its etiopathogenesis. Current evidence supports steroid responsiveness and an overall favorable prognosis. Nonetheless, close follow up is vital in order to identify relapse, adverse effects of therapy and ensure exclusion of other differential diagnoses.

A HOT CLOT- SEPTIC PELVIC THROMBOPHLEBITIS

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INTRODUCTION: Septic Pelvic Thrombophlebitis (SPT) is an uncommon condition that is most likely to occur in the setting of pelvic infection (e.g. puerperal infection such as endometritis and chorioamnionitis or PID). SPT may masquerade as several different conditions, highlighting the importance of a high index of suspicion to make the diagnosis.

CASE REPORT: A 37 year-old-woman presented to the emergency department (ED) with a two week history of right groin, thigh and low back pain with intermittent fever. Two weeks prior to presentation, she had vaginal delivery of a stillborn at 23 weeks 5 days gestation. The pregnancy had been complicated by cervical shortening on second trimester imaging, with subsequent PPROM 72 hours prior to delivery. She required admission 48 hours after delivery for fever up to 104F, chills and sweats. A diagnosis of post-partum endometritis was made. All investigations (i.e. blood and urine microbiology and pelvic ultrasound imaging studies) were negative. She received intravenous antibiotics (gentamycin, ampicillin and clindamycin) and was discharged on oral antibiotics after 48 hours without fever. In follow up with her PCP 3 days after hospital discharge, her symptoms were unchanged, at which point she was advised to complete oral antibiotics. At this current presentation to the ED, physical examination was remarkable only for fever of 103.7F, with sinus tachycardia of 140/minute. Abdominal and pelvic physical examinations were completely normal. CBC showed leukocytosis of 16.9 with left shift, but no anemia; UA was suggestive of UTI. Pelvic ultrasound was negative for retained products of conception and lower extremity ultrasound for DVT was negative. CT scan of the abdomen and pelvis renal stone protocol was negative, however degenerating uterine fibroids were noted. Because the patient had epidural anesthesia during delivery, MRI of the lumbosacral spine was done to rule out epidural hematoma or abscess. This was also negative. She was re-admitted with a working diagnosis of pyelonephritis and started on empiric antibiotics (cefoxitin and levofloxacin). Over the ensuing 48 hours, her symptoms remained unchanged and in addition developed chills and drenching night sweats. Antibiotic coverage was broadened to include piperacillin/ tazobactam. Blood culture from admission grew *Bacteroides fragilis*. Four days into her hospitalization an MRI venogram revealed a right ovarian vein thrombosis. Patient was started on intravenous heparin with bridging to warfarin. In spite of the above treatment, patient continued to spike fevers and demonstrate leukocytosis with a left shift, but was clinically stable. Patient defervesced on day 11 of hospitalization. This was associated with resolution of leukocytosis and pain. She was discharged home on antibiotics (piperacillin/tazobactam: total duration of 4 weeks and oral metronidazole total 3 weeks) with oral anticoagulation for 6 weeks. Repeat MRV of pelvis and abdomen at the end of therapy demonstrated no evidence of thrombus.

DISCUSSION: Since its first description in the late 1800s by von Recklinhausen, when the only means of diagnosis and treatment was by surgical approach with its associated high mortality, there has been a profound evolution in the understanding of the pathogenesis and treatment of this disease accompanied by a marked reduction in mortality. This is obviously as a result of advances in modern medicine particularly in the field of antimicrobial therapy and the development of advanced diagnostic imaging tools such as ultrasonography, computed tomography(CT) and magnetic resonance imaging (MRI) coupled with a shift towards a more conservative medical approach to treatment. Of particular interest is the disease's predilection for the right ovarian vein, which is hypothesized to be attributable to compression of the longer right ovarian vein at the pelvic brim by the gravid uterus and a retrograde flow of blood in the left ovarian vein that protects it against ascending infection.

CONCLUSION: This case illustrates the importance of a high index of suspicion for SPT, in the right clinical setting, when spiking fever patterns fail to respond to standard broad spectrum antibiotic therapy. This seems to be the natural course of the disease and does not necessarily suggest treatment failure or incorrect antimicrobial choice. The question as to whether anticoagulation should be part of standard therapy is yet to be answered pending further studies. CT and MRI remain the preferred imaging modalities over ultrasound.

DESCENDING NECROTIZING MEDIASTITIS: A CLASSICAL, RARELY SEEN ENTITY

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INTRODUCTION: Focal infections of the head and neck, especially in the retropharyngeal space and mostly odontogenic, can descend into the mediastinum causing a necrotizing infection with substantial morbidity and mortality. Although frequently discussed as a life-threatening infection, it is quite unusual in clinical infectious disease practice. We report such a case with a favorable outcome related to aggressive combined medical and surgical interventions.

CASE REPORT: A hepatitis C positive, HIV negative 27 year old man was admitted to a Kalamazoo hospital intensive care unit upon transfer from an outside facility. He had had dental-associated masticator and retropharyngeal space abscess drainage and treatment with clindamycin. After initial improvement, he developed chest and abdominal pain, fever and tachycardia, precipitating the transfer. He was found to have bilateral pleural effusions and drainage cultures revealed *Eikenella corrodens*, MRSA, non-group A or B beta-hemolytic streptococci, *Haemophilus* species and *Prevotella*. Followup chest imaging revealed pneumomediastinum and the presence of an infrapectoralis muscle abscess on the left and thoracic surgical intervention occurred with the evacuation of purulent material in the mediastinum, the pleural fissures and left infrapectoralis space and decortication. Cultures produced some of the same bacteria as well as *Pseudomonas aeruginosa*. Multiple drainage tubes and multiple washout and debridement procedures together with antimicrobials for coverage of the bacteria eventually resulted in his fever resolving over several weeks. He was also found to have an ischemic but not necrotic esophagus. After a 6 week stay in the ICU, off antimicrobials and with a decannulated tracheostomy, he was able to be transferred to a general medical floor.

DISCUSSION: The retropharyngeal space lies between the pharynx and the cervical spine and contains the so-called danger space between the alar and prevertebral fascia extending from the base of the skull through the posterior mediastinum to the diaphragm. Infections entering this space can descend into the mediastinum causing a fulminant, necrotizing infection that can also invade, as here, the pleural spaces. The microbiology of the process relates to mouth flora primarily but other bacteria as seen here can also be involved. Aggressive medical and surgical interventions are necessary to produce a reasonable outcome.

CONCLUSION: An odontogenic case of descending necrotizing mediastinitis is presented that with combined medical and surgical therapy produced a good outcome. Early recognition and intervention are vitally necessary in the treatment of this classic but rarely seen entity.

STANFORD TYPE B AORTIC DISSECTION IN LOEYS-DIETZ SYNDROME WITH A REPAIRED STANFORD TYPE A AORTIC DISSECTION.

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INTRODUCTION: Loeys-Dietz syndrome (LDS) is a rare genetic disease with autosomal dominant mode of inheritance. It is caused by mutations in transforming growth factor beta receptor (TGFBR) genes. This rare entity is associated with increased risk of aortic wall abnormalities with multiple aneurysms throughout the vasculature. We discuss a case of a patient with Stanford type B aortic dissection who was treated surgically. He has a history of Stanford type A aortic dissection with multiple surgeries and aneurysms.

CASE REPORT: Patient is a 19 year old male who presented in February 2015 to the emergency department with sudden onset of right shoulder pain. Physical examination was pertinent for mechanical click consistent with prosthetic aortic valve. His medical history was significant for Loeys-Dietz syndrome (LDS). His labs were unremarkable. A computed tomography (CT) angiography of chest, abdomen and pelvis was performed. It revealed a Stanford type B aortic dissection extending from left subclavian artery to proximal right common iliac artery. Patient was started on labetalol drip for systolic blood pressure maintenance between 110-120 mm Hg. Heparin drip was started to maintain INR between 2.0-3.0 for prosthetic aortic valve. Cardiothoracic surgery was consulted and they recommended patient be transferred to higher facility. Patient had thoracic aorta endovascular repair at University of Michigan. Patient's past medical records revealed involvement of TGFBR1 gene consistent with LDS. Patient had undergone multiple surgeries including Bentall procedure and ascending aortic replacement for his Stanford type A aortic dissection. He also underwent complete aortic arch replacement, bypass to the innominate artery bifurcation including separate bypasses to the right carotid and subclavian arteries. This was done as there was progressive enlargement of aortic aneurysm and complete occlusion of innominate artery with vertebrobasilar steal syndrome. Biopsy of the aorta showed mural myxoid degeneration with medial elastin fiber disorganization consistent with history of LDS.

DISCUSSION: LDS is associated with genetic mutations in TGFBR genes leading to increased TGF-beta activity. The causality of this process is disorganized elastin fibers and collagen overproduction. This leads to vessel wall instability instigating aneurysms, dilatations and dissections with rupture. Primarily two types of LDS have been described, Type 1 with and Type 2 without craniofacial abnormalities. LDS is a fatal genetic disease with mean survival of 26 years of age. The average age for the first cardiovascular event and procedure was about 16.6 years in type 1 and 27 years in type 2. In our patient, the first event and surgery was performed at age of 17. Moreover, since then he has had multiple vascular surgeries. Such aggressive pathology is mostly seen in type 1 LDS, however our patient did not have features consistent with it. Yearly screening with echocardiogram for ascending aorta anatomy has been proposed for LDS patients. After obtaining a basal magnetic resonance angiogram and CT angiogram of head to pelvis, at least a biennial visualization of each vasculature structure is proposed in these patients. These recommendations are flexible, where patients might require more frequent imaging as per their phenotype. The thoracic aortogram performed in December 2014 did not reveal new dissection or aneurysm in the descending aorta.

CONCLUSION: This case represents the unpredictable and aggressive nature of LDS where frequent surveillance can also leave more surveillance desired.

PERIODIC FEVER SYNDROME: A CASE OF TRAPS

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INTRODUCTION: Periodic fever syndromes represent a wide group of autoinflammatory diseases characterized by recurrent flares of systemic inflammation, presenting with sudden fever episodes and a number of other clinical symptoms. Tumor Necrosis Factor Receptor-Associated Periodic Syndrome (TRAPS), originally known as Familial Hiberian Fever, is one such periodic fever syndrome. It is an autosomal dominant, multisystemic, autoinflammatory disorder caused by mutations in the TNFRSF1A gene. The pathogenesis of TRAPS remains ambiguous. Here we describe a case of a young child who presented with recurrent febrile illnesses.

CASE REPORT: A 3-year-old boy presented with a two-year history of monthly febrile illnesses associated with abdominal pain, myalgias, and arthralgias. The episodes increased in frequency to approximately every two weeks over the last year with episodes lasting between four to seven days. His attacks classically were preceded by a one to two day prodrome of sneezing, abdominal pain, and leg pain followed by onset of fever. After several trips to local emergency rooms, he was admitted at an outlying facility and diagnosed with periodic fever syndrome. He was started on prednisolone as an abortive medication and experienced significant shortening in the duration of his episodes. Upon presentation, he was not currently having an episode. Laboratory evaluation, including a complete blood count and comprehensive metabolic panel, were within normal limits. C-reactive protein was mildly elevated. Genetic testing was performed in order to identify the specific periodic fever syndrome, and he was diagnosed with Tumor Necrosis Factor Receptor-Associated Periodic Syndrome based on R92Q mutation of the TNFRSF1A gene. He was tried on colchicine and then methotrexate and folic acid – both regimens without any improvement. Treatment with etanercept was suggested, but mother was reluctant due to conflicting studies and potential adverse effects, including immunosuppression.

DISCUSSION: Given our patient's history, physical examination, and supporting laboratory findings, he was diagnosed with TRAPS as evidenced by his typical fever pattern and positive genetic testing. Fortunately, his abnormal gene mutation was not considered high-risk for the development of amyloidosis. TRAPS is characterized by recurrent prolonged fever attacks associated with diffuse abdominal pain, appendicitis-like findings, chest pain, migrating rash and myalgia, arthralgia, periorbital edema, ocular pain, conjunctivitis, and the risk of long-term amyloidosis. The most frequent associated symptom is abdominal pain, which has led to unnecessary surgical procedures (appendectomy, laparotomy, and even gynecological interventions) in 33% of cases per one review of 120 patients. The prevalence of TRAPS has not been well established. However, one study found the incidence among German children to be 5.6 per 10,000,000 person/year. Although seemingly more prevalent in patients of northern European descent, TRAPS is now known to affect ethnic groups worldwide. The average age of onset is around three years; however, adult onset up to the sixth decade has been reported. The number, duration, and intensity of attacks vary greatly. In the majority of patients, typical fever attacks occur every 4-6 weeks with a mean duration of 14 days. Episodes can occur either spontaneously or after triggers such as injury, minor infections, and physical exertion. An increase in acute-phase reactants, such as C-reactive protein, erythrocyte sedimentation rate, fibrinogen, and haptoglobin, is seen during attacks and usually drop to normal levels during symptom-free periods. Identification of a mutation in the TNFRSF1A gene is needed for a definite diagnosis of TRAPS. Corticosteroids are useful during inflammatory attacks, but patients often require escalating doses with subsequent side effects. They also do not prevent amyloidosis and relapses are frequent after withdrawal. Etanercept has been shown to be effective in a subset of patients to prevent disease flares and reduce corticosteroid use; however, conflicting data has been published on the long-term efficacy. Anti-IL-1 agents are now being studied and are proving to be a reasonable option to prevent relapses in both the short-term and long-term.

CONCLUSION: Diagnosis of TRAPS and other periodic fever syndromes is often delayed because signs and symptoms are nonspecific and vary considerably amongst patients. Thus, it is important for clinicians to be aware of the presentation and potential complications of this disorder. Timely diagnosis and treatment may prevent development of amyloidosis and reduce unnecessary surgical interventions.

GENITAL ULCERATION AND PERIORBITAL EDEMA AS ATYPICAL PRESENTATIONS OF EPSTEIN-BARR VIRUS IN ADOLESCENT FEMALES.

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INTRODUCTION: Genital ulcerations and periorbital edema have been identified in the medical literature as rare presenting symptoms of acute Epstein-Barr Virus (EBV) infection, commonly known as infectious mononucleosis. Approximately 40 cases have been reported describing acute genital ulceration in non-sexually active young women in association with EBV. These symptoms may precede or occur in the absence of the typical prodromal signs and symptoms of EBV infection. Genital ulcerative lesions of EBV are commonly mistaken for Herpes (HSV) infection delaying correct diagnosis and contributing to patient anxiety.

CASE REPORT: An 18 year old female college student presented to the clinic with painful vulvar lesions and fever. Five days prior she had noted itchy, red eyes and flu-like symptoms (headache, malaise and fatigue). The following day she noted 'vaginal soreness' without itching, burning, or lesions for which she was diagnosed and treated for bacterial vaginosis. Fevers and facial puffiness persisted and vulvar pain worsened, eventually progressing to open, bleeding sores of the vulva. Two days prior to presentation the patient was evaluated in the Emergency Department and treated for suspected HSV. HSV cultures of the lesion were obtained and Acyclovir was prescribed. Evaluation in the clinic revealed 2 approximately 1cm ulcerated lesions on the mid-anterior right labia and one smaller non-ulcerated lesion on the posterior aspect of the left labia. Also, the hymeneal ring was swollen with a necrotic appearance. Exam under anesthesia and surgical debridement of the friable, necrotic tissue was considered. No cervical or inguinal lymphadenopathy was present. The patient denied all sexual activity. This patient was admitted to the hospital for pain control and dysuria. Initial laboratory results on admission showed the patient was neutropenic, lymphopenic, and thrombocytopenic without elevated alkaline phosphatase, liver enzymes or bilirubin. Testing for HSV, Chlamydia, Gonorrhea, and Trichomonas were negative. Further testing including CMV, RPR, HIV, Enterovirus and ESR was also negative. The only positive result was for Epstein-Barr Virus via Mono-screen and PCR. Throughout her hospitalization high fevers persisted and by day 5 liver enzymes were markedly elevated. Patient was treated supportively with IV Morphine and Topical Xylocaine gel for pain management. She was discharged 6 days after admission with definitive diagnosis of EBV infection with highly atypical presentation.

DISCUSSION: EBV is a ubiquitous herpes virus that, when symptomatic, most commonly presents with a syndrome of fever, fatigue, malaise, pharyngitis and lymphadenopathy. In rare cases, however, it may present as acute genital ulceration, primarily in non-sexually active adolescent females. Acute genital ulceration in combination with the prodromal symptoms of EBV infection was first recognized in 1913 by an Austrian dermatologist Benjamin Lipschutz and is sometimes referred to as Lipschutz ulcers or *ulcus vulvae acutum*. EBV wasn't recognized as the causative agent in these cases until 1977. Patients typically present with prodromal symptoms of headache, fatigue, and anorexia and progress to typical symptoms of EBV mononucleosis (high fever, pharyngitis, lymphadenopathy, periorbital edema) prior to the appearance of genital lesions. The ulcerations are described as exquisitely painful, deep, bilateral lesions in a 'kissing' pattern, and are often necrotic or hemorrhagic. In some cases, genital ulceration or periorbital edema preceded the typical symptoms of EBV infection further delaying diagnosis. EBV genital ulcers are most frequently mistaken for HSV and usually treated empirically with Acyclovir before cultures and serology are obtained. Lesions tend to resolve spontaneously with supportive treatment in approximately 2 weeks; however, unlike HSV lesions, EBV genital ulcers have not been known to recur. Definitive diagnosis of EBV as the etiology of genital ulceration requires the exclusion of more likely etiologies (infectious, autoimmune, drug reactions). Acute EBV infection is confirmed with the presence of (+)IgM to EBV viral capsid antigen or (+)PCR for EBV DNA (serum or tissue biopsy).

CONCLUSION: Although rare, the astute physician should consider EBV as the potential cause of painful genital ulceration in prepubescent girls and non-sexually active young women.

DE NOVO CHROMOSOMAL 19 PARTIAL DELETION OF 19P13.11-P13.12

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INTRODUCTION: Rearrangements, specifically deletions, of chromosome 19 constitute a rare constellation of clinical findings. A number of patients with deletions of a few regions of chromosome 19 have been reported in the literature, but it remains a rare chromosomal anomaly. Carriers of 19p13.12-p13.13 micro-deletions have been shown to have features including intellectual disability, speech and motor delay, hearing impairment, brachycephaly, and external ear anomalies. This case represents the systemic abnormalities of a newborn female with de novo chromosome 19p13.11-p13.12 deletion, spanning 53 genes.

CASE REPORT: Newborn Indian female born via cesarean section at 37 0/7 weeks (by dates) to a 32 year old G3P1011 mom with a history of Polycystic Ovarian Syndrome, previous spontaneous abortion and unremarkable maternal serology. Pre-natal ultrasound demonstrated bilateral talipes, possible Dandy Walker malformation and a ventricular septal defect (VSD). Multiple repeat fetal ultrasounds demonstrated significant growth lag with normal biophysical profile and amniotic fluid volume. Patient was delivered via C-section due to intrauterine growth restriction and multiple congenital anomalies. On delivery, the patient remained cyanotic, requiring oxygen in the neonatal intensive care unit (NICU), but was weaned from supplemental oxygen on day 3 of life. Echocardiogram demonstrated a patent foramen ovale, a small mid muscular VSD and a dilated aortic root. Cranial ultrasound and brain MRI demonstrated aplasia of the cerebellar vermis, paucity of cerebral white matter, periventricular cysts, diminished size of right peduncle with delayed myelination for age as well as overall immaturity of the brain. Genetic studies (micro-array) resulted in a loss of 53 genes on chromosome 19, specifically a deletion of 19p13.11 to 19p13.12. Parental FISH studies were noted to be normal, suggesting de novo mutation. Initial laboratory analysis demonstrated thrombocytopenia with a normal initial newborn screen. Repeat newborn screen demonstrated evidence of severe combined immunodeficiency (SCID); however, flow cytometry ruled out SCID but demonstrated a form of T cell leukopenia. At 1 month of age, a gastrostomy tube was placed secondary to concern for dysphagia and silent aspiration with thin liquids. The patient was discharged home with close follow-up. She was scheduled for subspecialty appointments with cardiology, neurology, as well as orthopedic and general surgery for continued care that had been initiated during her NICU admission.

DISCUSSION: Isolated deletions of chromosome 19p13 are uncommon. Such rare chromosomal deletions provide both a diagnostic and anticipatory challenge for newborns and their families. The etiology of a de novo chromosome 19p13 deletion remains unknown and appears to be multifactorial in nature. It has been associated in some cases with consanguinity. Researchers have hypothesized that it results from a multi-gene effect, based on the deletion of particular genes that result in specific phenotypic traits. By continuing to describe the phenotype of patients with unusual deletions of chromosome 19p13, we remain hopeful that diagnosis and prognosis will improve for future patients who are found to have findings similar to our patient.

CONCLUSION: Chromosomal 19p13.11-p13.12 micro-deletions can have a diffuse systemic effect on growth, development and cognitive function. The systemic involvement, wide variety of manifestations and unknown prognostic factors makes caring for children with chromosomal anomalies challenging, requiring a carefully planned multidisciplinary approach. Early identification of fetal developmental anomalies allows for the parents and health care team to be better prepared to address the future needs of these pediatric patients.

DEVELOPMENT OF A VALIDATED FINITE ELEMENT MODEL FOR FRACTURE PLATING

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INTRODUCTION: Internal fixation with plates and screws is a common method of stabilizing fractured bones in orthopaedic trauma. Optimal fracture plating is key to minimizing morbidity and to provide bone healing and return of function. Though bench level experimental work has been conducted to identify comparative performance amongst construct types, computational models of these constructs remains in their relative infancy. The complexity and variability of human tissue means that many fundamental questions cannot be answered on the bench. Validated computational models explore a broader space and can lead to fundamental discoveries in orthopaedic basic science.

RATIONALE: The purpose of this study is to develop validated computational modeling techniques for discerning the biomechanics governing orthopaedic fracture plating. This serves as a tool to bridge laboratory bench studies to clinical practice which is necessary because of the difficulty in accurately modeling human tissue. The hypothesis of this study is that improved computational models of the hardware-tissue interfaces will lead to improved devices and surgical techniques. The current report presents ongoing technique development and validation against existing experimental results.

MATERIAL & METHODS: A detailed finite element model was constructed allowing variation of multiple parameters associated with fracture plating. Latin hypercube sampling was used to create a design of computational experiments; the outcome is an analytical response surface. The parameters varied include: cortical strength (100-130 Mpa), cortical modulus (13-22.5 GPA), trabecular strength (0.56-22.9MPa), trabecular modulus (44-1531 Mpa), cortical thickness (0.25 – 4mm), number of screws (2 or 3), and type of screws (locking vs conventional). Applied loads included pure bending moment (1 Nm 4 pt-bend), axial (50 N), and torsional (1 Nm). Stress, strain, contact pressure, and other measures of bony failure are used for comparison of constructs. Correlations to Bottlang et al (2009) establish validation of the FEA model.

RESULTS: An analytical response surface is developed quantifying the likelihood of construct failure depending on the bony anatomy and bone quality, and the associated plate configuration. One example of clinical relevance is in the effect of the number of screws, where one additional screw decreases the stress in the cortical bone at the screw tip from 66.3 MPa to 37.7 MPa at a given load.

CONCLUSIONS: High fidelity computational models of fracture plating provide a foundation for substantive clinical guidance. Fundamental mechanisms can be identified that are predictive of fracture behavior. This study provides a foundation for model-guided personalized treatment of orthopaedic trauma.

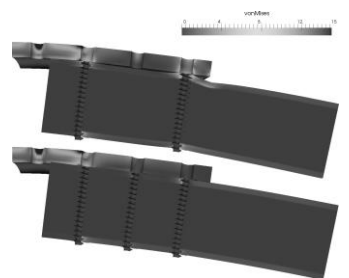


Figure 1: Current finite element model showing 2 vs 3 screws subjected to 4 point bending load

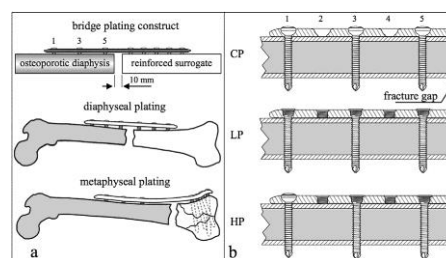


Figure 2: Bottlang et al experiment used for validation

MUSCULOSKELETAL EDUCATION DURING MEDICAL SCHOOL: A SURVEY OF ALLOPATHIC AND OSTEOPATHIC MEDICAL STUDENTS

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INTRODUCTION: Musculoskeletal (MSK) conditions are one of the most common causes of disability, ER visits, and physician visits in the United States. There is considerable anecdotal evidence suggesting that medical students are ill-prepared or do not feel properly educated to sufficiently treat these conditions but no study has explicitly investigated student perceptions of MSK education.

RATIONALE: This study aimed to assess current MSK education and medical students' perception of their education at two medical schools (allopathic and osteopathic) in Michigan.

MATERIAL & METHODS: Data was obtained through an anonymous survey of students in medical school GY-2,3,4 at Michigan State University College of Human Medicine (CHM, allopathic) and College of Osteopathic Medicine (COM, osteopathic). Questions were structured into 3 main categories: demographic information, content of current MSK curriculum, and opinions regarding importance, instruction and assessment of MSK education. Excel 2007 was used for summary statistics and computations were done using SAS 9.3 software.

RESULTS: Data was collected on the 247 responders. A majority of the course material was taught in the 2nd year in both allopathic and osteopathic schools, with osteopathic schools spending two more weeks on MSK education than their allopathic counterparts. Overall, 54% of students thought that their MSK education was adequate and 29.6% thought their education was inadequate with a greater portion of osteopathic students (57.1%) compared to allopathic students (26.8%) believing that their MSK curriculum is adequate. This had implications on board exam comfort. We also found that there was a variable perception of importance of MSK material with regard to specialty of interest.

DISCUSSION: There were distinct differences in the way allopathic and osteopathic medical students responded to the survey. The two schools also had several notable differences with regard to curriculum. At COM teaching of MSK reportedly occurred during both the first and second years, while at CHM MSK was taught almost exclusively during the second year. In addition MSK medicine was taught primarily via lecture, osteopathic manipulative medicine, and cadaver lab at the osteopathic school; while lecture was the primary reported teaching modality at the allopathic school. While these differences in opinion noted in the survey do not necessarily reflect differences in quality of education, they may give some insight to the most effective teaching modalities as well as timing of MSK education. Standardization of the curriculum to align with board examinations and clinical related MSK topics may help improve mastery of MSK skills.

CONCLUSION: There is an appreciable gap between the prevalence of MSK disease and dedicated MSK education at the medical school level. Implementation and standardization of more thorough and focused MSK curriculum, along with a nationally standardized curriculum may improve medical student ability to understand and treat MSK conditions.

INJURY TO THE PROFUNDA FEMORAL VEIN: A RARE BUT DEVASTATING RESULT OF A DISPLACED LESSER TROCHANTER FRACTURE

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INTRODUCTION: A high index of suspicion is required to appropriately diagnose and treat vascular injuries of the proximal femur as generally no further workup for hip fractures is initiated beyond plain radiographs. Furthermore, vascular injury presents with non-specific symptoms of pain and swelling and whereas arterial damage may be associated with a pulsatile mass, venous trauma has a far more indolent course. We present a case of a 55 year-old man who sustained a low energy petrochanteric femur fracture with subsequent injury to the profunda femoral vein from the displaced lesser trochanter fragment. The resulting thrombus and abductor hemorrhage went unnoticed and caused massive pulmonary embolus and cardiac collapse after positioning on the fracture table.

CASE REPORT: A 54 year-old man presented to our institution with a right-sided comminuted reverse obliquity subtrochanteric femur fracture with a significantly displaced lesser trochanter fragment. The patient was brought to the operating suite approximately 17 hours after his injury. General anesthesia was induced without incident and he was transferred to the fracture table, where he was positioned with the operative extremity in the standard position of adduction and internal rotation. Traction was applied through the leg to reduce the fracture. Less than five minutes after performing this maneuver, his blood pressure dropped to 40/20 and oxygen saturation dipped to 88% with end-tidal CO₂ of 25. Emergent CT scan of the chest showed an acute pulmonary embolism in the central pulmonary artery system with compensatory right heart strain and a left atrial filling defect. CT angiogram of the abdomen and pelvis showed marked narrowing of the profunda femoral vein immediately adjacent to the displaced lesser trochanter fracture. A linear filling defect consistent with thrombus extended proximally and distally from the area of compression. A transesophageal echocardiogram revealed a large, mobile thrombus in the left atrium extending through a patent foramen ovale to the right atrium. The right heart was dilated and hypocontractile. An emergent embolectomy of the right and left pulmonary arteries was performed, as well as extraction of atrial clots with closure of the atrial septal defect. The patient eventually underwent open reduction with cephalomedullary nailing of his femur fracture on post-injury day twelve. He sustained an anoxic brain injury from cerebral hypoperfusion, likely at the time of his initial event, and was only able to follow simple commands by the time of his discharge to an inpatient rehabilitation facility on post-injury day 29. At approximately 18 months after his original injury the patient had made almost a full recovery.

DISCUSSION: Due to the highly vascularized nature of the proximal femur, it is not uncommon for patients to experience significant blood loss, both before and after operative management. In addition, approximately one quarter of unstable intertrochanteric femur fractures present with a displaced lesser trochanter fragment, which is displaced superiorly by the pull of the iliopsoas. As a result, the fragment is drawn into even closer proximity to the major vessels of the thigh, leading to laceration of the superficial femoral artery and vein and the profunda femoral artery. Operative positioning intensifies the relationship between the fracture and the vessels. It is likely that our patient sustained his venous injury as the time of his fall, and his emboli were secondary to operative positioning; however, even after he became hypotensive in the operating room, the rarity of this clinical scenario led us to a more common diagnosis of fat embolism. By the time the thrombus was diagnosed, our patient had developed not only a saddle embolus, but also a paradoxical embolus.

CONCLUSION: Surgeons should consider vascular injury when confronted with markedly displaced lesser trochanter fractures. Patients should be monitored very carefully during positioning, as the standard reduction position of adduction-internal rotation places the vessels in close proximity to the fracture fragment. In addition, patients should be examined postoperatively for signs of pseudoaneurysms or thrombus, and their pain should be closely monitored. A high index of suspicion is necessary for making the diagnosis of vascular injury, but the consequences of overlooking an injury should not be underestimated.

IMPROVING THE QUALITY OF PRENATAL CARE PROVIDED AT THE WMED FAMILY MEDICINE CLINIC

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INTRODUCTION: Western Michigan University Homer Stryker MD Family Medicine Residency Clinic (WMed) is housed in a federally qualified health center (FQHC) providing access to care for over 40,000 uninsured and underinsured patients in Kalamazoo County. WMed residents currently deliver approximately 70 newborns annually from the FQHC and that number is continuing to grow. Challenges have been encountered in providing high quality care to the obstetrical patients in part due to high no-show rates and poor continuity of care in the resident clinic (Team Oakland).

RATIONALE: This quality improvement project aims to implement a standardized check list for obstetrical care reflective of the current standards of care endorsed by the AAFP, CDC and ACOG, and analyze resident compliance with these guidelines. Multiple recent studies have demonstrated that the risk of prematurity, stillbirth, neonatal and infant death increases in the setting of inadequate prenatal care. By analyzing our current practice habits, we hope to identify target areas for improvement and improve the care we are providing our patients.

MATERIAL & METHODS: This study was a retrospective chart review, in which the adherence to the current obstetrical standards of care was considered. Our study involved developing a standardized check list for prenatal screening and education based on current ACOG, AAFP and CDC guidelines. We then completed chart reviews of OB patients who received care between July 1, 2012 and December 31, 2014 who were current Team Oakland patients or delivered with Team Oakland. Data was collected based on completion of the various elements of OB screening and patient education by trimester (including up to last completed trimester and accounting for GA when prenatal care was begun). Summary statics were then compiled of our current practice habits. 174 patients met our inclusion criteria.

RESULTS: Data shown below in table 1 exhibit compliance rates for the targeted areas of prenatal screening and education.

DISCUSSION: Primary target areas to improve include patient education, depression screening and repeat chlamydia and HIV testing in third trimester for high-risk patients. Phase two of our study began January 1, 2015 implementing the checklist into our resident clinic and educating residents about current obstetrical standards of care. We plan to compare data before and after our intervention, over the next year. Our aim is to increase adherence to these guidelines in our resident clinic by both standardizing care and providing quarterly feedback to physicians.

CONCLUSION: While there are many barriers to providing high quality care at a FQHC, we were surprised that on average our patients complete at least 80% of their expected visits. We have many areas in which to improve. Our target goal is an 80% compliance rate for all areas of prenatal care identified above.

Average GA at entry to care	Average % of expected visits completed	PHQ9 Screening (1 st visit)	OB Panel (1 st visit)	Gonorrhea and Chlamydia Testing (1 st visit)	Test of cure for chlamydia	Offered HIV Screening (1 st visit)	PAP Screening if indicated (1 st visit)
15.57wks	80.14%	0%	99.4%	84%	56.3%	90.6%	85.8%
Urine Culture (1 st visit or 12-16 wks)	Offered QUAD screening (15-20 wks)	Offered anatomy ultrasound (18-21 wks)	Repeat Hg/Hct (24-28 wks)	1hr Glucose tolerance test (24-28wks)	3hr Glucose tolerance test if needed	Rhogam between 27-29 wks	Repeat Antibody screen prior to Rhogam
72.2%	73.9%	70.2%	55.7%	68.1%	81.8%	66.7%	33.3%
Repeat Chlamydia 3 rd trimester (high risk)	Repeat HIV 3 rd trimester (high risk)	GBS Screening (35-37wks)	Complete 1 st trimester education	Complete 2 nd trimester education	Complete 3 rd trimester education	TDap Vaccine (27-36wks)	Flu vaccine (If pregnant Oct - March)
63.9%	0%	69.8%	40.3%	23.8%	12.5%	54.8%	55.4%

Table 1. Compliance rates for the targeted areas of prenatal screening and education.

THREE DIMENSIONAL (3D) PRINTING AND VIRTUAL SURGERY FOR PREOPERATIVE PLANNING OF DEFORMITY CORRECTION IN ORTHOPAEDIC SURGERY

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INTRODUCTION: The creation of a physical model from a computer generated data, a manufacturing concept called rapid prototyping, can be accomplished with a 3D printer. Additionally, software can be used to simulate a virtual change in the data set (simulated surgery). This process is widely used in the automotive industry and in aircraft design to predict the outcome of a proposed design change. It is particularly useful when complex three dimensional spatial relationships are important.

RATIONALE: The application of this concept within medicine is in its infancy but in recent years the cost of 3D printing has decreased significantly while open source software solutions have increased significantly. The purpose of this project is to report and describe the methods for application of 3D printing and virtual surgery within orthopaedic surgery and deformity correction.

MATERIAL & METHODS: Patient CT scans were obtained. A 3D surface model and compatible file were created and printed utilizing a commercially available 3D printing service. A preoperative plan was developed to perform a corrective Z-shaped osteotomy. The symptomatic side surface models were converted into 3D solid models. Subsequently, a corrective osteotomy was simulated utilizing Boolean operations as well as translation and rotation of the distal bony fragment with a freely available software.

RESULTS: A 46 year old male patient presented with chronic pain and post traumatic ankle deformity. CT scans were obtained of his affected as well as his normal, contralateral ankle which provided a control for the proposed deformity correction. 3D prints were created and virtual surgery was performed prior to the actual corrective surgery. It was noted that the deformity magnitude was 7 degrees of external rotation, 6mm of loss of fibular length, and 5mm of posterior translation. It was determined that 7 degrees of internal rotation could be achieved with a posteriorly based 3mm wide iliac crest bone wedge. The deformity was operatively corrected as planned and the patient was followed clinically. At final follow-up, his pain resolved and he returned to recreational running activities.

DISCUSSION: We report a method to create virtual and physical 3D models of CT data sets using open source software, open data formats, and a commercially available printing source for use in orthopaedic surgery. We feel these types of models are invaluable for preoperative planning of difficult deformities as well as for patient education. In addition to the case example above, we provide several other clinical examples of this technology within orthopaedic surgery.

CONCLUSION: In conclusion we believe that this translational research is useful for the preoperative planning of surgical deformity correction. We also believe that this technology is becoming easier to use and that low cost and cloud based 3D printing has made this technology widely available.

THE HIGH COST OF CRIME VICTIMIZATION EXPERIENCED BY MENTAL HEALTH CONSUMERS

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INTRODUCTION: There has been a wealth of research focusing upon the violence and criminality of individuals with mental illness (Volavka, 2012; Swanson, 1990; Fazel, 2009; Elbogen & Johnson, 2009; Van Dorn, 2012). There has been significantly less focus, either within popular media or among researchers, upon the victimization of these same individuals (New, 2000; Kessler, 1997; Oram, 2013).

RATIONALE: The goal of the current study is to address this gap by assessing criminal victimization among a mental health service consumer population. A secondary goal was to assess the medical service utilization associated with victimization.

MATERIAL & METHODS: This was a retrospective records review that integrated data from electronic administrative records from four sources: Kalamazoo Community Mental Health and Substance Abuse Services (KCMHSAS), Kalamazoo County Prosecuting Attorney's Office, Borgess Medical Center and Bronson Methodist Hospital. The sample was the 5,906 adult (age 21+) individuals receiving KCMHSAS services in 2009. Crime victimization was determined by being listed as a victim of a personal crime in a charging request submitted to the Kalamazoo County Prosecutor's Office in 2009. All emergency department visits to Borgess- or Bronson-affiliated emergency departments by KCMHSAS consumers during 2009 were identified by each hospital's Health Information Management departments and exported into datasets for the purposes of this study. Likewise, all hospital admissions by KCMHSAS consumers during 2009 were exported into study datasets. Hospitalizations included in-patient stays at Borgess Medical Center, Bronson Methodist Hospital and all psychiatric hospitalizations authorized by KCMHSAS. Comparisons were conducted between consumers and the general population, as well as between consumers who were victimized and their consumer peers who were not. Two-tailed statistical analyses were conducted using Pearson Chi Square.

RESULTS: KCMHSAS consumers were victimized at more than twice the rate of the population at large: a rate ratio of 2.1 : 1. In a single year, the 5,906 consumers were victims in 211 crimes: a crime rate of 3585 per 100,000 individuals. This compares to a crime rate of 1720 per 100,000 individuals in the county population that same year. Just as in the general population, consumer victims were disproportionately female and disproportionately of Black race ($p < .001$). Consumers' victimization was more violent and more likely to be by multiple perpetrators than the general populations ($p < .001$). Finally, consumer-victims were more likely to have complicated criminal justice histories, as more of them had also committed crimes: 39.3% of consumer victims had also been defendants in a crime compared to 24.7% of non-consumer victims ($p < .001$). Fewer of their cases result in conviction, with drop-offs at each step in adjudication. Crime victimization brings substantial health burden to consumers; with higher emergency department visits, greater psychiatric hospitalizations and more medical hospitalizations. Compared to their consumer peers who have not been victimized, consumer-victims have three times higher emergency department visits the year of their victimization ($p < .001$). Consumer-victims were twice as likely to have a psychiatric hospitalization as their non-victimized peers during the year they experienced the crime (20.5% of consumer victims hospitalized compared to 9.9% of consumer-non-victims, $p < .001$). Finally, consumer-victims were 1.7 times as likely to have a medical hospitalization compared to their non-victimized peers (21.6% and 11.3%, respectively, $p < .001$), and these hospitalizations were more likely to be for poisoning, substance abuse or injury ($p < .001$).

DISCUSSION: This study documented that consumer victimization was significant in amount and in severity. Yet they were not well-served by the criminal justice system, likely due to a combination of factors including their own criminality and their credibility as witnesses. Other research has documented that mentally ill victims experience a cycle of trauma that produces accumulated risk (Kilpatrick, 1997). This risk often has its roots in childhood adversity, which leads to psychological distress and substance abuse, and together create vulnerability to victimization, which in turn generates even more distress, and the cycle continues (Goodman, 2001). The poor health outcomes of victims compared to their peers, as evidenced by more emergency department visits and hospitalizations, is a testament to the cost of this cycle.

CONCLUSION: Given the degree of victimization experienced by mental health consumers, the cumulative damage incurred, and the inability of the criminal justice system to address it, the importance of clinical and community interventions (screen for violence, providing safety training, treating trauma and addiction) is clear.

A SURVEY OF WILDERNESS MEDICINE CURRICULAR CONTENT IN EMERGENCY MEDICINE RESIDENCY PROGRAMS.

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INTRODUCTION: Interest in the field of wilderness medicine has increased in recent years. Wilderness medicine involves handling medical emergencies in austere environments with limited access to sophisticated medical technology. There are now twelve established wilderness medicine fellowships and many elective opportunities for residents. While activity and interest in pursuing this sub-specialty is continuing to grow, it is not clear to what degree residency programs incorporate wilderness medicine education into their curriculum.

RATIONALE: While interest in wilderness education has increased in recent years, the extent to which it has been incorporated into formal emergency medicine residency programs is unclear. Accordingly, the objective of this study was to determine the prevalence and scope of wilderness medicine training in graduate emergency medical education.

MATERIAL & METHODS: A Survey Monkey survey was e-mailed to emergency medicine residency program directors or program coordinators. The list of all 187 accredited programs was obtained from the Society for Academic Emergency Medicine online residency directory. The survey consisted of five multiple-choice questions, along with a section for free text entry. The survey was emailed in April 2014, with follow up e-mails to non-responding programs in May and June. The study was submitted to the IRB and deemed exempt.

RESULTS: The response rate was 56% (104/187). Of these responders, 44% reported having wilderness medicine in their required curriculum, while 75% reported providing optional wilderness medicine opportunities. Of the programs with required wilderness medicine education, 33% have had the wilderness medicine curriculum for more than ten years, while 40% have had a wilderness medicine curriculum for less than five years. Of the programs with required wilderness medicine education, 96% have lectures on wilderness medicine, 36% have wilderness medicine simulations, and 36% have a dedicated wilderness medicine conference day. Of the 78 programs with optional wilderness medicine opportunities, 36% offer an elective sponsored by their home institution, 58% offer elective opportunities sponsored by another institution, and 35% offer a wilderness medicine specialty 'track' or 'interest focus'. The optional wilderness medicine opportunities described in the text entry portion of the survey are listed in the table below.

DISCUSSION: Limitations of this study include the fact that the data were self-reported and not validated by an external source. There also may have been a selection bias in that directors of programs that offer wilderness medicine activities may have been more likely to complete the survey. On the other hand, programs may have underestimated the availability of wilderness medicine optional activities to residents. Several institutions have wilderness medicine electives open to residents of any program. If an institution allows residents to participate in away electives, they would automatically have such optional wilderness medicine experience available to them.

CONCLUSION: Wilderness medicine training is now available in most emergency medicine residency programs: 44% of emergency medicine residency programs incorporate required wilderness medicine content while 75% of programs offer optional wilderness medicine activities. The range of optional wilderness medicine activities is extensive.

Responses for OPTIONAL Wilderness Medicine Activities
WM activities as an "ice breaker" during intern orientation
Weekend retreats
WM interest group
Additional conference attendance
Attend activities of home institution's WM fellowship
Unrestricted electives
Unrestricted Lecture Topics
Participate with a WM rotation for medical students
Participation in events by National Park Service
WM incorporated into military curriculum
Attendance at city-wide symposium on WM
Participation in "Med WAR"- Wilderness Adventure Race
Specialty track designed to meet FAWM (Fellowship of the Academy of WM) requirements

BIOMECHANICAL CONSEQUENCES OF LATERAL MENISCAL POSTERIOR ROOT AVULSIONS: INFLUENCE OF THE MENISCOFEMORAL LIGAMENTS AND ANTERIOR CRUCIATE LIGAMENT ON TIBIOFEMORAL CONTACT MECHANICS

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INTRODUCTION: Lateral meniscal posterior root avulsions are commonly found with anterior cruciate ligament (ACL) tears. The biomechanical consequences of this injury pattern on tibiofemoral contact mechanics have not yet been reported. Improved understanding will provide guidance to surgeons treating these complex injuries.

RATIONALE: The purpose of this study was to investigate the biomechanical effects of lateral meniscal posterior root avulsions with and without intact meniscofemoral ligaments (MFLs), and with concurrent ACL tears, on lateral compartment contact mechanics. We hypothesized that the meniscofemoral ligaments share load with the lateral meniscal posterior root and that disruption of both structures would affect contact mechanics whereas ACL integrity would not significantly affect contact mechanics. Also, we hypothesized that a root repair would restore contact mechanics to normal.

MATERIALS & METHODS: A controlled laboratory study was performed using ten nonpaired fresh-frozen cadaveric knees. Tekscan sensors were used to simultaneously measure contact area and pressure (Figure) in the lateral and medial compartments. Specimens were tested with 6 conditions (1: Intact; 2: Lateral meniscal posterior root avulsion; 3: Root avulsion and torn MFL; 4: Condition 3 with ACL tear; 5: Condition 4 with ACL reconstruction; 6: ACL reconstruction with root repair) at 5 flexion angles (0, 30, 45, 60, and 90 degrees), under a 1000 N axial load.

RESULTS: Compared to the intact state, condition 2 did not significantly alter lateral compartment contact area or pressure ($p < 0.05$). A significant decrease in contact area and increase in mean contact pressure occurred in condition 3. Conditions 4 and 5 (ACL tear and reconstruction of the ACL, respectively, both with deficient MFLs and lateral meniscal posterior root avulsion) also resulted in significantly lower contact areas than the intact condition ($p < 0.05$), and were not substantially different than Condition 3 (Figure). Changes in contact mechanics tended to be greater at increased flexion angles; for condition 3 at 0 and 90 degrees, contact area decreased 37% and 52% (95% CI [21,53] and [39,66], respectively) and mean contact pressure increased 55% and 87% (95% CI [33,76] and [59,114], respectively). Condition 6 (root repair with ACL reconstruction) was not significantly different from the intact state ($p < 0.05$).

DISCUSSION: The meniscofemoral ligaments protect the lateral compartment from changes in contact mechanics in the setting of a lateral meniscal posterior root avulsion, whereas combined lateral meniscal root avulsion and deficient meniscofemoral ligaments leads to substantial changes. ACL state did not substantially affect contact mechanics in this laboratory model with axial loading.

CONCLUSION: Concurrent ACL reconstruction and root repair restores contact area and mean contact pressure to the intact state.

FIGURE: Quantitative contact pressure maps from the Tekscan pressure sensors for a single specimen are shown for Conditions 1-6 at each flexion angle. Lateral meniscal posterior root avulsion alone (condition 2) was not significantly different from the intact state (condition 1), whereas root avulsion with torn meniscofemoral ligaments (condition 3) resulted in a substantial decrease in contact area and increase in contact pressure. Concomitant ACL tear and reconstruction (conditions 4 and 5, respectively) did not substantially differ from condition 3. Near restoration of contact mechanics after root repair and concurrent ACL reconstruction (condition 6).

THE HISTORICAL EVOLUTION OF ENDOSCOPY

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INTRODUCTION: INTRODUCTION: Minimally invasive surgery is on the rise and is becoming more common. Its advantage over traditional open surgery is a quicker recovery time and minimized risk of infection along with an aesthetically more pleasing smaller scar. Although many different scopes and instruments perform minimally invasive techniques, all minimally invasive instruments evolved from endoscopy. It wasn't until the 20th century that they began to diverge to separate studies. Therefore endoscopy is considered in regards to instrument evolution. History is full of twists and turns as different pieces of the scope progressed so its advancement has been separated into the principle obstacles, visibility and accessibility. These in turn are analyzed more deeply in discussion of lens technology, illumination, and the camera, along with trocars, insufflation, and flexible tubing.

RATIONALE: RATIONALE: The intent of this research is to provide a broad history of the evolution of modern endoscopic instruments. It is important to understand the history of these instruments to appreciate the advancements of modern technology and understand the basics of how they perform internally. An understanding of the medical, mechanical, and surgical advances of this technology will help the student comprehend the complexities that are common to modern instrument development.

REVIEW OF LITERATURE: REVIEW OF THE LITERATURE: One of the principle sources included in this study was Nezhat's History of Endoscopy from the Society of Laparoendoscopic Surgeons website. Other websites like General Surgery News and Corning helped provide information on more modern advancements. Many textbooks, encyclopedias, and atlases were found out in Western Michigan University's Waldo Library and the private library at Bronson Hospital. Numerous other articles were obtained through interlibrary loan at WMU, among these are articles coming from Millikin University ILL, University of Missouri-Kansas City, and Wayne State University. Furthermore, personal recollections of endoscopy's advancements were collected from Dr. Richard S. York and Simon Pang, principle engineer of R&D at Stryker Endoscopy.

ANALYSIS OF RESULTS: ANALYSIS OF RESULTS: The concept of minimal invasion to diagnose and cure internal diseases has been around since 1700BC noted in the medical treaty Edwin Smith Papyrus and possibly as far back as circa 2640BC. Hippocrates is most often given credit for his minimally invasive approach to medicine and was one of the first to have written description of viewing the internal body with a speculum to diagnose hemorrhoids found in The Art of Medicine circa 400BC. From this concept modern endoscopy was to evolve in two main categories, visibility and accessibility. Visibility was achieved as each of the following components were discovered and improved throughout history. The advent of lens technology created the first mode of visualization in 1683 with scientist Antony van Leeuwenhoek. Later various methods of illumination increased visibility from natural sunlight, candlelight, to Edison's light bulb, and finally the modern invention of fiber optics in 1970 by Drs. Maurer, Schultz, and Keck. The modern camera is the current mode of vision for surgeons. Accessibility was allowed as new entrances into the body were explored beginning with the humble orifice and advancing to incisions implementing the use of trocars as early as 25BC by surgeon Aulus Celsus, and later advanced to prevent insufflation gas leaks in 1920 by Ordnoff. Later, the introduction of insufflation, most importantly artificial insufflation developed by Kelling in the 1910s allowed for more room to access necessary organs. Furthermore, the advancement from rigid to flexible tubing provided the necessary movement to access nearly all parts of the body. All of these components and more went on to create the many branches of minimally invasive surgery that we know today such as laparoscopy.

CONCLUSION: CONCLUSION: Modern endoscopy should be viewed in awe as a modern marvel. It took man many years to advance simple technologies such as lenses and candlelight to cameras and fiber optics. The evolution of this technology is not only one with ancient and humble beginnings, but also one with a current special interest.

TRENDS IN THE HOSPITAL STAY FOR MULTIPLE MYELOMA PATIENTS AS PER THE HEALTHCARE COST AND UTILISATION PROJECT- NATIONWIDE INPATIENT SAMPLE DATABASE.

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INTRODUCTION: Multiple myeloma is characterized by the neoplastic proliferation of a single clone of plasma cells producing monoclonal immunoglobulins, resulting in extensive skeletal destructions with osteolytic lesions, osteopenia and pathologic fractures. Multiple myeloma accounts for 1 percent of all cancers and slightly more than 10 percent of all hematologic malignancies in the US. The annual incidence in the US is approximately 4 to 5 per 100,000. MM occurs in all races and all geographic locations. The incidence varies by ethnicity being two to three times more common in whites as compared to whites.

RATIONALE: The incidence of myeloma has been stable over time, with one database from Olmsted County, Minnesota showing a stable incidence from the 1940s to the early 21st century. In this study, we tend to determine the trends in inpatient hospital stays for multiple myeloma and the trends related to their discharge and in-house mortality.

MATERIAL & METHODS: Nationwide Inpatient Sample data was used to extract the data of patient's discharged with Multiple Myeloma for the years 1993-2012 using the clinical classification software (CCS) and ICD 9 code (203.00). Patient's diagnosed with multiple myeloma were identified and disease was trended on the basis of total number of discharges, rate of discharges per 100,000 persons, length of stay, mean charges, the number of admissions from the ER, the inpatient mortality rate and the percentage of patient's discharged on a routine basis.

RESULTS: We identified a total of 317,017 inpatient stays for AML from the year 1993 - 2012 and did not observe a significant increase in inpatient stays and the rate of inpatient stays per 100,000 people stayed stable. There was a slight decrease in the length of hospital stay per visit, with a mean length of stay being 21.25 days in 1993 and 17.88 days in 2012. There was a significant increase in the cost per hospital stay, with an average stay being worth 60,152 dollars in 1993 and 175,075 dollars in 2012. There was an increase in the number of patients being admitted from the ED, with 24.62% admissions to the hospital being from the ED in 1993, which increased to 39.20% in 2006. We observed a significant decrease in inpatient mortality from 24.91% in 1993 to 15.60% in 2012. The number of routine discharges declined 52.34% of all discharges in 1993 to 43.64% in 2012, but there was an increase in the number of patients, who were sent to a nursing home/rehab, with 1.13% patients being sent to these in 1993, which increased to 10.94% in 2012

DISCUSSION: From the Nationwide Inpatient Sample database, it becomes clear that the number of inpatient stays has remained fairly consistent from 1993- 2012, corresponding to a relatively stable incidence of the disease. The remarkable finding was the decrease in the inpatient mortality due to the disease as well as the remarkable increase in admissions from the ED to the hospital. There was a huge increase in the mean cost incurred with every stay rising from about 20,000 dollars in 1993 to 97,000 dollars, while the mean length of the stay remained constant. If the increase in cost, was to be calculated per the average inflation rate for the last 20 years, the average cost of stay today, would have been around 35,000 dollars.

CONCLUSION: Despite a consistent number of admissions due to multiple myeloma, the overall inpatient mortality due to the disease has decreased over the last 20 years.

PROPERTIES OF A SINGLE GLOBAL QUESTION IN FACULTY EVALUATION OF PSYCHIATRY RESIDENCY GRADUATES

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INTRODUCTION: Psychiatric resident evaluation involves a complex array of measures of knowledge, interpersonal and professional behavior, documentation, clinical decision-making, efficiency, scholarly activity, etc. Our program director devised a single global question that was used in addition to all of the above to evaluate our program success. We evaluated its psychometric properties.

MATERIAL & METHODS: 7-13 doctoral level faculty members evaluated 19 recently graduated residents from five consecutive graduating classes. Faculty had taught and mentored each resident for several years, and had ready access to all departmental evaluation information on each graduate. The single question rated each faculty member's impression on a 5-point scale: 5='Excellent: Highly competent in all domains with some exceptional strengths. Would readily refer a family member or close friend to him/her.' 4='Good: Competent in all domains with only minor deficiencies. Would probably refer a family member or close friend to him/her.' 3='Satisfactory: Safe and overall competent, but I would probably not refer a family member or close friend to him/her.' 2='Fair: Safe, competent in most areas, but some areas of concern. Would not refer a family member or close friend to him/her.' 1='Poor: Significant deficiencies. Don't feel good about him/her taking care of patients.' Data analysis: Inter-rater reliability was determined using extent of exact matches among faculty members of responses (1-5) relative to the same graduate. A secondary analysis collapsed the responses into a dichotomous variable with 1-3 ('would not refer') and 4-5 ('would refer'). Convergent construct validity was assessed through predictive ability of two commonly accepted performance standards, part 1 of the psychiatric board exam on the first attempt and the psychiatric portion of the Psychiatry Resident in Training Exam (PRITE). A simple logistic regression was used to assess if average faculty rating was predictive of whether the graduate passed (n=13), or failed/did not attempt (n=6) the psychiatric board exam. A linear regression was used to assess if average faculty rating was predictive of the graduate's last national (PGY-level standardized) percentile PRITE score,(could have been taken in 3rd or 4th year).

RESULTS: Using the 5-point scale, faculty raters were in exact agreement 37% of the time (95% CI: 31%, 42%). When responses were dichotomized, inter-rater agreement occurred, on average, 69% of the time (95% CI: 59%, 78%). There was not statistically significant evidence that average faculty rating was predictive of board exam performance on the first attempt (p=.2823), nor PRITE psychiatric score (p=.2005). These analyses suggest the current 5-point scale has low inter-rater reliability, and construct validity is questionable as there is no evidence of predictive ability. Moderate inter-rater agreement is achieved, however, when responses are dichotomized.

DISCUSSION: This single global question attempts to assess overall clinical competency of recently graduated psychiatrists. The ratings are by faculty who have observed these residents caring for patients during their 2-4 years of training in our program. The inter-rater agreement between faculty members was moderate using the dichotomous strategy, but was weak using the full range of 5 ratings in the original design. Neither PRITE performance, nor first try board passage, were predicted by the mean rating earned by the graduate. However, neither of these are direct measures of patient care skill, instead measuring knowledge and clinical decision-making. It has been difficult to find a metric for patient care skills as a 'gold standard' against which to compare this measure. The small number of graduates being studied may have adversely affected significance levels.

CONCLUSION: Further study is indicated, including deciding what to do with the 5-point versus dichotomous approach. This approach might also be applied to residents at annual review, as well as clinical trainees in other disciplines and specialties.

VISCERAL HETEROTAXY SYNDROME WITH ISOLATED LEVOCARDIA, INTERRUPTED IVC, AND JEJUNAL ATRESIA

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INTRODUCTION: Fetal Heterotaxy Syndrome is a congenital condition in which the major visceral organs, in the thorax or abdomen, are reversed from their normal position. While there have been discrepancies regarding nomenclature, the syndrome has historically been sub-classified into categories associated with asplenia or polysplenia. Those with polysplenic syndrome tend to present with bilateral two-lobed lungs, interruption of IVC with azygous or hemizygous continuation, and complex congenital cardiac defects. The asplenic variant has been associated with a bridging liver and left sided inferior vena cava. In this case report, we present an infant who was diagnosed in utero with isolated levocardia associated with abdominal situs inversus. This is a rare form of Fetal Heterotaxy Syndrome with a reported incidence of 1:22,000 patients. The condition may involve other organ abnormalities including gastrointestinal, immune, genitourinary, respiratory, and ciliary dysfunction. Prompt diagnosis is important as it allows for early medical and surgical intervention.

CASE REPORT: A 22-year-old G3P1 female was referred to our obstetric unit as her ultrasound at 26 weeks gestation was consistent with situs inversus incompletus with reversal of abdominal organs and levocardia. Repeat ultrasound at 28 weeks gestation showed the same findings, although it was positive for dilated bowel and oligohydramnios. Fetal echocardiogram showed levocardia with no intra-cardiac defects and an interrupted inferior vena cava with continuation into the azygous vein. The remainder of the pregnancy was uncomplicated and the infant was delivered by scheduled cesarean section at 39 weeks gestation due to persistent breech presentation. The infant had a birth weight of 3650 grams and Apgar scores of 3 and 9, at 1 and 5 minutes respectively. Immediately after birth, approximately 125 ml of yellow-green fluid was suctioned from an oro-gastric tube. The delivery was complicated by meconium stained amniotic fluid, and the patient became mildly hypoxic for which she briefly required oxygen via nasal cannula. Abdominal X-ray was positive for a single air filled loop of bowel with paucity of bowel gas in the lower abdomen. Abdominal ultrasound was significant for abnormal positioning of the liver, which was located predominantly in the left upper quadrant and abnormal position of a single spleen, located in the right upper quadrant. Echocardiogram demonstrated an interrupted IVC with azygous return, and hepatic veins draining directly into the right atrium, with the absence of intra-cardiac disease. Due to abnormal findings on imaging and persistent bilious gastric output, the patient had an upper GI with a small bowel follow through consistent with a jejunal atresia. She was taken to the operating room for a type II jejunal atresia repair. She tolerated the procedure and remained well post-op.

CONCLUSION: While true incidence of Heterotaxy syndrome is unknown, sources have estimated it to be close to 1 per 8,000-25,000 live births. Heterotaxy cases with IVC interruption/azygous continuation most commonly are associated with complex congenital heart disease. The infant we are describing had heterotaxy, isolated levocardia, an interrupted IVC with azygous continuation, and no intra-cardiac disease identified. She also had type II jejunal atresia, and a normal spleen located in right upper quadrant. While a few cases have been described with varying anatomic presentation, we could not find a case with this specific constellation of anomalies described in the literature. The incidence of Heterotaxy Syndrome with the findings seen in the infant we cared for is unknown although, thought to be extremely rare. It is possible that patients with Heterotaxy Syndrome without gastrointestinal obstruction go unrecognized for years. Knowledge of various associated anatomic abnormalities may help guide catheterization or surgical technique in patients where Heterotaxy Syndrome is identified. Therefore, it is important for practitioners to be aware of Heterotaxy Syndrome and its variants.

MANAGEMENT OF THE PEDIATRIC PATIENT AT RISK FOR TYPE 1 DIABETES

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INTRODUCTION: The American Diabetes Association (ADA) recently placed recommendations in the Standards of Medical Care in Diabetes - 2014 regarding screening of first-degree relatives of patients with type 1 diabetes mellitus. Recommendations include having relatives of patients with type 1 diabetes informed of the opportunity to be screened for the risk of development of type 1 diabetes, as early diagnosis may limit acute complications. This study was conducted to review and assess the evidence that specifically screening for antibody seroconversion will identify and benefit individuals prior to development of type 1 diabetes.

RESEARCH METHODS: This was a literature review and meta-analysis focused on autoantibody screening. The search was done in PubMed in November 2014 with keywords 'diabetes mellitus, type 1' AND 'screening' AND 'antibodies'. The search was focused on type 1 diabetes, antibody screening and prevention of diabetic ketoacidosis. Although over 300 articles were initially found, eventually 28 met the selection criteria for this study by providing data on: seroconversion rates, prevention and risk factors of diabetic ketoacidosis (DKA), comparison of DKA in patients followed for seroconversion.

RESULTS: The review and meta-analysis of published studies reviewed show that majority of children who develop multiple autoantibodies progress to develop type 1 diabetes in fifteen years, with seventy percent in ten years. New onset disease has the potential to present as DKA in up to seventy percent of the pediatric population with the risk being very high in children under two years of age. There are prevention trials in which relatives of patients with type 1 diabetes are followed for seroconversion. Once seroconversion occurs, these individuals are followed closely with routine blood glucose levels, glycosylated hemoglobin (HbA1c) levels and oral glucose tolerance tests. It is determined that at onset of diabetes, children who had been followed for seroconversion have a lower prevalence of DKA, with a milder disease when compared to affected individuals who have not been involved in prevention trials.

CONCLUSION: By reducing the prevalence of DKA in the population, we can reduce significant morbidity and mortality. The evidence from the literature indicates that following high-risk individuals for seroconversion may lead to a reduced prevalence of DKA or milder onset of disease. High-risk patients who are encountered in health care settings should be informed of this opportunity and referred for screening if they choose to be, and followed closely if seroconversion occurs. During this time the physician should focus on the education of diabetes and close monitoring for signs and symptoms of DKA as they may develop

MANAGEMENT AFFECTING LONG TERM SURVIVAL IN TRISOMY 13

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INTRODUCTION: Trisomy 13 occurs in approximately 1 in 10,000 live births, with 5-10% of infants reaching twelve months of age. In the past, there was generally a plan of ‘non-intervention’ and palliative care, as the diagnosis has been considered non-survivable. Literature has shown that there are several long-term survivors with Trisomy 13. We present a case report on a 20-year-old male with Trisomy 13, with a literature review discussing the recent shift in management of these patients from a ‘non-intervention’ and palliative care standpoint to appropriate medical and surgical intervention

CASE REPORT: A 20-year-old African-American male with Trisomy 13 initially presented to our multidisciplinary clinic at 6 months of age. His medical history is significant for pulmonary hypoplasia, bicuspid aorta, renal cyst, cleft lip and palate, visual and hearing deficits, and the development of type 1 diabetes at the age of seventeen. Surgical history includes a bilateral inguinal hernia repair, abdominal exploration for undescended testes, removal of postaxial digits, and cleft palate repair. At the age of twenty, he functions developmentally at 8 - 9 months of age. Relevant physical examination findings include microcephaly, large, sloping forehead, hypertelorism, narrow palpebral fissures, low set ears, narrow philtrum, mild retrognathia, moderate thoracolumbar scoliosis, micropenis, ulnar deviation of wrists, long tapering fingers and toes; surgically repaired polydactyly, hypertonicity with flexor contractures at hips, knees, elbows. His nutritional needs are met orally with pureed foods, and patient has never required a G-tube

DISCUSSION: Trisomy 13 is commonly associated with the following physical findings: abnormal auricular helices or low-set ears, cryptorchidism and abnormal scrotum in males, cleft lip and/or palate, polydactyly of hands and feet, microcephaly with sloping forehead, and microphthalmos. Common cardiac defects associated with Trisomy 13 include PDA, VSD, and ASD. A poor prognosis has been associated with the syndrome once a patient is diagnosed after birth. Despite this, 5-10% of infants live up to 12 months of age, and there are several long-term survivors documented in the literature, who live past twelve months of life. According to surveys given to parents of patients with Trisomy 13 or 18, ninety-eight percent of parents have reported their child was a positive effect on their life, despite the duration of the child’s life. Ninety-nine percent of parents of the long-term survivors have reported their child to be happy.

CONCLUSION: With the increasing number of long term survivors with trisomy 13, it is important in situations when the infant’s prognosis is ambiguous, the parents should be provided accurate information, as opposed to given an idea that their infant has a ‘lethal’ condition, in order to plan for appropriate medical and surgical intervention. Survival does not seem to be determined by extraordinary medical interventions, rather by lack of lethal abnormalities in the neonatal period. Parents of infants affected with Trisomy 13, have reported negative associations used by a physician to describe the condition, including a ‘life of suffering, meaningless life, and incompatible with life.’ Despite this, patients with Trisomy 13 have reportedly enriched their parents’ lives, including long term survivors. As there are documented cases of long-term survivors with Trisomy 13, and evidence that medical and surgical intervention may prolong life, management goals should be shifted from a palliative care and comfort care standpoint to appropriate medical and surgical intervention

EXCELLENCE IN ADOLESCENT IMMUNIZATIONS AT WESTERN MICHIGAN UNIVERSITY HOMER STRYKER MD SCHOOL OF MEDICINE

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INTRODUCTION: Western Michigan University Homer Stryker MD School of Medicine primary care clinics have been well recognized in recent years for their excellence in setting the standard in the state of Michigan for pediatric immunizations. Between June 2004 and November 2007, we raised our childhood vaccine rates from under 50% to over 90% in our family medicine clinic by initiating a nurse-driven protocol for vaccinations.

RATIONALE: With the recent trend of the anti-vaccine campaign adopted by many families, diseases such as measles and pertussis are re-emerging posing a significant health threat to the children in our community. Experts fear continued re-emergence of other vaccine-preventable illness. We recognized that this puts the adolescents in our community at a significant risk, in addition to the children, and saw the need to increase our adolescent immunization rates.

MATERIALS & METHODS: A program was developed to empower clinic staff to immunize anyone due for immunizations (“Immunize Now” program). Standing orders were developed to set the rules for immunizations and were then reviewed by the Clinic Management Team against current immunization standards and practices. They are reviewed annually by the Clinic Management Team and renewed by the Medical Directors. Nursing staff are expected to query the state database (MCIR) at every patient visit to assess the status of every patient’s immunizations. All immunizations are then expected to be given per protocol. Contra-indications and refusals are communicated to the physician seeing the patient at that encounter. The contra-indications are reviewed for accuracy and refusals lead to physician-patient discussion regarding the decision to refuse immunizations. Immunization rates continue to be a quality measure that is reviewed regularly at the Clinic Management Committee meeting. If any trends are noted regarding changes in rates, strategies are developed to address any barriers that are found. Beginning in 2010, we took this proven workflow for pediatric immunizations and focused our efforts on improving the care provided to adolescent patients in the area of immunizations.

RESULTS:

Month	Vaccination Rate
January 2010	49%
December 2010	60%
June 2012	91%
July 2012	40%
July 2013	64%
June 2014	74%

Table 1. Percentage of adolescents ages 13-15 who had completed the 3 dose HPV series (HPV 2 or 4 for females and HPV 4 for males). Note that in 2012, the ACIP recommendations changed and included a recommendation that boys age 11-12 receive the HPV series accounting for the drop in vaccination rates.

Month	Vaccination Rate
January 2010	91%
January 2011	95%
January 2013	97%
January 2014	99%
June 2014	99%

Table 2. Percentage of adolescents ages 13-15 who had received 3 IPV, 2 MMR, 3 Hep B, 2 Varicella and 1 Meningococcal vaccine

DISCUSSION: From 2010 to 2014, coverage for adolescents aged 13-15 years increased for all vaccinations routinely recommended. However, despite the availability of safe and effective HPV vaccines for adolescents, HPV immunization rates are still below the goal of 90%. In a 2012 National Immunization Survey for teens, parents reported their reasons for HPV vaccine refusal. Reasons cited included safety concerns, feeling their child did not need it because they were not sexually active and some felt that it was unnecessary altogether. Continued efforts are needed to educate parents about the HPV vaccine safety and effectiveness for both adolescent boys and girls.

CONCLUSION: The clinical staff at WMed Homer Stryker MD SOM Family Medicine Clinic in Kalamazoo has shown that with the right implementation, high rates of vaccinations can be achieved for children and adolescents.

THE CONTRIBUTIONS OF GALEN TO MODERN ANATOMY AND PHYSIOLOGY

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INTRODUCTION: Many were the contributions of Galen (129-199 AD) to the medicine of antiquity. In this regard, it was his knowledge of anatomy and physiology, more animal than human, that remained ahead of other disciplines. This work concentrates on defining the specific discoveries of Galen that advanced the development of anatomy and physiology.

RATIONALE: Galen perhaps more than any other medical figure of the past greatly advanced the knowledge of anatomy and physiology prior to the appearance of 'De Humani Corporis Fabrica' (Factory of the Human Body) introduced by Andreas Vesalius (1514-1564) in 1543.

HISTORICAL SOURCES: The classical book 'A Short History of Anatomy and Physiology from the Greeks to Harvey,' published in 1957 by the noted British historian Charles Singer (1876-1960), constituted the initial basis for this analysis. The published works of Galen, 'On Anatomical Procedures' in English and translated from the Greek by Charles Singer, represented the confirming sources for some of the verification of this review. In addition, the excellent monograph of George Sarton (1884-1956) on 'Galen of Pergamon', part of the Logan Clendening Lectures on the History and Philosophy of Medicine (1954), was very helpful in studying Galen the person, the physician and the scientist. In 2008, Cambridge University Press published an insightful source, 'The Cambridge Companion to Galen,' which permitted me to re-assess Galen's contributions to anatomy and physiology. Other works on the achievements of Galen were obtained mainly from the medical historical archives of the University of Minnesota and the Resource Sharing Center of Waldo Library at Western Michigan University.

CONTRIBUTIONS OF GALEN: Besides the organization of the anatomical structures and functions of animal and human bodies, Galen contributed the following specific anatomic findings, mostly obtained from his studies in animals like the Barbary ape : 1. He divided the bones into long and flat bones with and without a medullary canal; 2. He recognized and named apophyses and epiphyses; 3. He used the term trochanter; 4. He described 24 vertebrae ending in the coccyx and sacrum; 5. He gave accurate descriptions of the bones of the thoracic cavity and the limbs; 6. He described diarthrosis and synarthrosis; 7. His myology was particularly important, describing hundreds of muscles and naming several of them (e.g. masseter, cremaster, etc.); 8. He described seven of the twelve cranial nerves, although with some he combined two of them; 9. His angiology was less original, although he discovered that arteries carried blood and not air as initially proclaimed by his ancestors. The contributions of Galen to physiology were many and can be summarized as: 1. The voice originated from the recurrent laryngeal nerve and the larynx; 2. Urine was produced by the kidneys; 3. The spinal cord, severed at different levels, caused multiple responses ranging from death to various types of paralysis; 4. He described three pneumas or spirits, the natural spirit, the vital spirit and the animal spirit, all integrating the physiology of Galen; 5. The venous blood originated from the liver and the arterial blood-from the heart.

CONCLUSION: The contributions of Galen to modern anatomy and physiology were exceptional, not only in sheer volume but principally in their placement within the practical clinical context of his and our times. Galen, as Sarton would indicate, should be considered one of the masters of experimental physiology and, I would add, of anatomy as well.

ACGME MILESTONE ACHIEVEMENT THROUGH SIMULATION: DEVELOPMENT OF AN EXTENSOR TENDON REPAIR SIMULATION MODEL

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INTRODUCTION: Extensor tendon repair is an ACGME Emergency Medicine Milestone (Milestone 13, Wound Management, Level 5 Performs advanced wound repairs, such as tendon repairs). We sought to develop a simple and inexpensive extensor tendon repair simulation model for emergency medicine residents, designed to satisfy Level 5 of Milestone 13.

RATIONALE: Although extensor tendon repair is an ACGME milestone, emergency medicine residents may have limited opportunity to develop these skills. Previously described tendon repair simulation models designed for surgical trainees, have used models such as rubber worms, sheep forelimbs and cadavers. Our newly developed model uses pig tendons, in an effort to develop a more realistic and convenient practice model. Our educational objectives were to develop a simulation module to teach emergency medicine residents: 1) the relevant anatomy of the extensor tendons of the hand; 2) the indications and contraindications for emergency department extensor tendon repair and 3) the techniques of extensor tendon repair.

MATERIAL & METHODS: During their PGY-2 year, emergency medicine residents are provided an on-line educational module (via Moodle) which covers the following facets of emergency department extensor tendon repair: 1) the relevant anatomy; 2) the indications and contraindications; 3) the relevant physical exam findings; 4) the suture techniques; 5) aftercare and 6) a post-test. On a rotating basis, 2-3 residents receive this on-line educational module each month, several weeks prior to their scheduled lab session. This on-line module is to be completed ahead of time. During the subsequently scheduled lab session, each resident is supplied two pig feet. They dissect out the extensor tendons and perform tendon repairs using four different stitches: the modified Kessler, modified Bunnell, figure-of-eight and horizontal mattress.

RESULTS: Twenty-two PGY-2 emergency medicine residents have completed the module, to date. It has been very well-received. The lab takes approximately one hour to complete, and requires the presence of a single supervising faculty member.

DISCUSSION: Although it can be difficult to create real-life procedures in a simulated setting, simulation can be invaluable to gain experience with new procedures. Our educational module teaches residents the content relevant to emergency department extensor tendon repair, and allows them to practice the mechanics of tendon repair on an authentic tendon. Our model is more realistic than other models described in the literature (such as rubber worms), yet is more readily available and cost-effective than sheep forelimbs or cadavers. It is important for emergency physicians to recognize when it is appropriate to perform procedures in the emergency department and when these procedures need to be referred to a specialist. Accordingly, this educational model specifically outlines the indications and contraindications of extensor tendon repair in the emergency department setting.

CONCLUSION: This newly developed simulation model met our objectives well. It taught emergency medicine residents the relevant anatomy of the extensor tendons of the hand, the indications and contraindications for emergency department extensor tendon repair and the techniques of extensor tendon repair. Pig feet are readily available and inexpensive. Because the module is on-line and largely self-taught, the faculty time expenditure is limited to approximately one hour per month.

YOUNG BREAST CANCER SURVIVORS: FEAR OF RECURRENCE AND IMPACT ON SCREENING BEHAVIORS

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INTRODUCTION: Breast cancer survivors are often faced with the lingering fear that the cancer may reoccur. Fear of recurrence (FOR) has been defined as breast cancer coming back in the same breast or another area of the body, or a new breast cancer in either breast. Not knowing how to predict which of these women will suffer FOR leaves the healthcare team ill-prepared to safe guard against it.

RATIONALE: The purpose of this study was to investigate what factors predict FOR in young breast cancer survivors (under age 45 at time of diagnosis) and to determine who is at greatest risk of experiencing FOR. The goal of this study was to determine if FOR influences cancer surveillance behaviors, specifically mammograms and/or clinical breast exams. Three specific aims were addressed (1) to analyze the results of a random sample of 863 young breast cancer survivors recruited from a state cancer registry regarding their use of post diagnosis surveillance mammograms and clinical breast exams relative to their reported level of fear of cancer recurrence, (2) to determine the role of FOR in the young breast cancer survivors use of surveillance mammograms and clinical breast exam and (3) to correlate the participants' antecedent variables and reported FOR level.

MATERIAL & METHODS: This descriptive study was a secondary analysis of data from 863 young breast cancer survivors from the State of Michigan cancer registry. Participants completed questionnaires measuring quality of life, self-efficacy in using breast cancer screening services, perceived breast cancer risk, knowledge of breast cancer risk factors, perceived family support, and current breast cancer screening practices. Frequency statistics were used to determine distribution of scores for reported level of FOR. Pearson's Product Moment Correlations were used to examine association between variables. Multiple regression analyses explored the prediction of FOR and if FOR was a mediator for frequent clinical breast exam and mammogram.

RESULTS: Findings suggest predictors of FOR in young breast cancer survivors include race, level of education, belief that cancer development is by chance, level of anxiety, and delayed screening due to worry of finding cancer. A slight mediation effect was seen in the frequency of clinical breast exam.

DISCUSSION: Results of this study found younger age was associated with increased FOR. Black women reported more FOR than others in this study. Lower level of education was associated with FOR in this study population. Research has shown this result to be consistent. The results of this study found a diverging relationship between time from diagnosis and FOR. The less time from diagnosis the greater FOR reported. Women in this study reported both low levels of overall family support in general and low levels of family support in illness. Lack of family support may impact FOR for these women because without family support, family stressors increase and family QOL decreases. The results of this study found the greatest predictor of FOR in YBCS was the reported low degree of self-efficacy in managing breast cancer. BRCA1 status was found to be a variable which predicted FOR in this study sample. Participants who were negative for the BRCA1 mutation reported less FOR than their counterparts. Assessment of the woman's knowledge of breast cancer treatment regimen and goals needs to be done early and repeated often to be certain she understands the importance of surveillance. Education regarding breast cancer treatment, the importance of surveillance, and the risk of one developing a second cancer may increase self-efficacy in managing breast cancer and may decrease FOR.

CONCLUSION: Knowing what predicts young breast cancer survivors to experience FOR is important. When a woman is diagnosed with breast cancer her healthcare team can employ screening measures to determine if she may experience FOR. Future research should include assessing coping strategies and if FOR changes over the duration of time from diagnosis through survivorship. Future research should also determine if the observations of this study hold true in other samples of cancer survivors including young women, breast cancers survivors with different stages and types of cancer, and women for whom a second cancer has already been diagnosed.

DECREASE IN INPATIENT MORTALITY FOR ACUTE MYELOID LEUKEMIA PATIENTS - AN ANALYSIS OF 317,017 HOSPITAL VISITS FROM 1993-2012

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INTRODUCTION: Acute Myeloid Leukemias are a group of hematopoietic neoplasms involving precursor cells committed to myeloid line of cellular development. There is a clonal proliferation of myeloid precursors with a reduced capacity to differentiate into more mature cellular elements, as a result there is accumulation of leukemic cells in the bone marrow, peripheral blood and other tissues.

RATIONALE: Acute Myeloid Leukemia is the most common acute leukemia in adults. In the US and Europe, the incidence has been stable at 3 to 5 cases per 100,000 population. In adults, the median age at diagnosis is approximately 65 years. The incidence increases with age, with approximately 1.3 and 12.2 cases per 100,000 population for those under or over 65 years respectively. Male to female ratio is 5:3, with a similar incidence among people of different races. In this study, we trend to determine the trends in inpatient hospital stays for AML and the trend related to their discharge and in-house mortality.

MATERIAL & METHODS: Nationwide Inpatient Sample data was used to extract the data of patient's discharged with AML for the years 1993-2012 using the clinical classification software (CCS) and ICD 9 code (205.00). Patient's diagnosed with AML were identified and disease was trended on the basis of total number of discharges, rate of discharges per 100,000 persons, length of stay, mean charges, the number of admissions from the ER, the inpatient mortality rate and the percentage of patient's discharged on a routine basis.

RESULTS: We identified a total of 317,017 inpatient stays for AML from the year 1993 - 2012 and did not observe a significant increase in inpatient stays and the rate of inpatient stays per 100,000 people stayed stable. There was a slight decrease in the length of hospital stay per visit, with a mean length of stay being 21.25 days in 1993 and 17.88 days in 2012. There was a significant increase in the cost per hospital stay, with an average stay being worth 60,152 dollars in 1993 and 175,075 dollars in 2012. There was an increase in the number of patients being admitted from the ED, with 24.62% admissions to the hospital being from the ED in 1993, which increased to 39.20% in 2006. We observed a significant decrease in inpatient mortality from 24.91% in 1993 to 15.60% in 2012. The number of routine discharges declined 52.34% of all discharges in 1993 to 43.64% in 2012, but there was an increase in the number of patients, who were sent to a nursing home/rehab, with 1.13% patients being sent to these in 1993, which increased to 10.94% in 2012.

DISCUSSION: From the Nationwide Inpatient Sample database, it becomes clear that the number of inpatient stays has remained fairly consistent from 1993- 2012, corresponding to a relative stable incidence of the disease. The remarkable finding was the decrease in the inpatient mortality due to the disease as well as the increase in admissions from the ED to the hospital. There was a huge increase in the mean cost incurred with every stay, while the mean length of the stay decreased. If the increase in cost, was to be calculated per the average inflation rate for the last 20 years, the average cost of stay today, would have been around 101,796 dollars

CONCLUSION: Despite a consistent number of admissions due to AML, the overall inpatient mortality due to the disease has decreased over the last 20 years.

30-DAY READMISSION RATE FOR PATIENTS DISCHARGED WITH SICKLE CELL CRISIS: AN ANALYSIS OF 369,103 ADMISSIONS.

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INTRODUCTION: Sickle-cell crisis is used to describe several independent acute conditions occurring in patients with SCD. SCD results in anemia and crises that could be of many types including the vaso-occlusive crisis, aplastic crisis, sequestration crisis, hemolytic crisis, and others.

RATIONALE: Patient readmission within 30 days from discharge has been perceived to be an indicator of poor healthcare quality. In this study, we try to determine the demographic factors associated with a high readmission rate for sickle cell crisis.

MATERIAL & METHODS: Nationwide Inpatient Sample data was used to extract data of patients discharged with sickle cells crisis, for the years 2009-2011 using clinical classification software (CCS) and ICD 9 code (282.6). All the patients who were discharged with primary diagnosis of sickle cell crisis and readmitted within 30 days were identified. Statistical analysis was done using chi square test.

RESULTS: We identified a total of 369,103 admissions for sickle cell crisis nationwide during the study period from 2009-2012 with total 30-day readmission rate of 26.61% due to sickle cell crisis as primary cause and 31.57% due to sickle cell crisis as a secondary cause. Young patients (age 18-44), females, patients under Medicare, patients in low median income zip code and in metropolitan areas had a higher 30-day re-admission rate due to sickle cell crises.(P<0.001).

DISCUSSION: In comparison to COPD, where the readmission rate was 7.22% as a primary cause and 10.69% as a secondary cause (as per NIS data); sickle cell crises had a triple rate of readmission, with 26.61% as primary cause and 31.57% as a secondary cause, leading to a higher financial burden. Whereas COPD, CHF affect primarily the elderly (44-65 and >65 years), sickle cell anemia is primarily a disease of the young (18-44).

CONCLUSION: Strategies to reduce 30-day readmissions secondary to sickle cell crisis should be focused on more susceptible population including females, aged 18-44 years old, under Medicare, having low median income for zip code and staying in metropolitan areas.

OLD DISEASE, NEW LOCATION: A CASE OF IATROGENIC EUSTACHIAN VALVE ENDOCARDITIS

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INTRODUCTION: Right-sided endocarditis occurs predominantly in intravenous drug users, in patients with pacemaker or central venous lines and in patients with congenital heart disease. The vast majority of cases involve the tricuspid valve, but lesions affecting Eustachian valve are rare. In 1986, Edwards et al.[1] first described the entity of Eustachian valve endocarditis (EVE) in an autopsy study of a patient with overwhelming streptococcal sepsis. In the literature only few cases have been reported so far. Here in we describe a case of iatrogenic Eustachian Valve endocarditis

CASE REPORT: Case 50-year-old African-American female, with no past medical history presented with complains of acute onset, non-localized headache. She was found to be in hypertensive emergency with blood pressure of 210/96mmHg and acute kidney injury with serum creatinine of 4.6 mg/dL. Her work up in hospital was positive for anti-Smith antibodies and renal biopsy confirmed diagnosis of lupus nephritis. Central venous catheter was placed for hemodialysis and high dose steroids were started. During course of her hospitalization, she developed high grade fever (40.3 C), sinus tachycardia and tachypnea. Labs revealed neutrophilic predominant leucocytosis (WBC 25000/mm³). She was initially started on Vancomycin and Tazobactam/Piperacillin. Her urinalysis and chest X-ray were unremarkable. Blood cultures came back positive for Methicillin sensitive Staphylococcus aureus and she was switched to Nafcillin. Transthoracic echocardiogram was unremarkable, however transesophageal echocardiogram revealed a large 1.6x1.6 cm round mass with stalk attached to the Eustachian valve and opening of the IVC with echolucent areas within it. She was diagnosed with Eustachian valve endocarditis. Her blood cultures became sterile after 2 weeks of continuous antibiotic therapy. Nafcillin was continued and the patient's condition improved significantly during the hospital stay.

DISCUSSION: Eustachian valve is an embryological remnant of the sinus venosus, directing oxygenated fetal blood from inferior vena cava across foramen ovale, and into the left atrium. In the adult, the eustachian valve when present, directs the blood flow from inferior vena cava into the right atrium. Eustachian valve endocarditis is an uncommon disease with similar signs and symptoms of the tricuspid valve endocarditis. A series of only a few cases of eustachian valve endocarditis are reported in the literature. In the cases reported in the literature, IVDA was the most common risk factor for EVE. In all IVDA patients with EVE, staphylococcus aureus was the only pathogenetic organism isolated, while in the remaining cases different organisms were isolated.

CONCLUSION: In the majority of cases described in the literature, diagnosis of EVE was made by TEE. Transesophageal echocardiography is not indicated as initial examination in the diagnosis of native valve endocarditis. According to American College Cardiology/American Heart Association (ACC/AHA) guidelines for the clinical application of echocardiography when the valvular structure or pathology is well visualized by TTE, there is no indication to perform TEE. In cases where TTE results were normal, the indication to perform a TEE is derived from a strong clinical suspicion of bacterial endocarditis in the presence of a bacteremia. In our case TTE did not reveal any significant abnormalities and TEE when performed revealed a large 1.6x1.6 cm round mass with stalk attached to the Eustachian valve and opening of the IVC with echolucent areas within it.

DEMOGRAPHIC FACTORS ASSOCIATED WITH A HIGH 30 DAY READMISSION RATE AFTER BONE MARROW TRANSPLANT.

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INTRODUCTION: Hematopoietic stem cell transplantation (HSCT) is the transplantation of multipotent hematopoietic stem cells, usually derived from bone marrow. It is a medical procedure in the field of hematology, most often performed for patients with certain cancers of the blood or bone marrow, such as multiple myeloma or leukemia.

RATIONALE: Patient readmission within 30 days from discharge has been perceived to be an indicator of poor healthcare quality. Our study identifies the risk factors for 30-day readmission among recipients of bone marrow transplant.

MATERIAL & METHODS: Nationwide Inpatient Sample Database was used to extract the data for patients who were discharged after a Bone Marrow Transplant (both autologous and allogenic) for the years 2009-2012, using clinical classification software. We collected the data variables including age, gender, the type of insurance on all the patients, who were readmitted within 30 days after index hospitalization for bone marrow transplant.. Statistical analysis was done using SAS software. We used chi-square analysis to determine group differences.

RESULTS: We identified 65,699 index hospitalizations, with 30 day readmission rate of 24% . Readmission rate was highest among younger patient (less than 17 years) with a readmission rate of 45 % as compared to older s patients (18-44 yrs, 27.4%; 45-64 yrs, 19.8%, ≥65 yrs, 19.9%). Chii-square analysis was statistically significant ($P < 0.0001$). The readmission rate of female patients was higher than male patients (25.2% vs 23.3% $p < .0001$). Statistically significant difference was seen among patients with medicaid (32.6%) vs medicare (22%) vs private insurance (22.1%).

DISCUSSION: In this retrospective study involving 65,699 patients with bone marrow transplantation, we identified several risk factors, which could explain their 30 day readmission, of which age, sex and the type of insurance were most significant.

CONCLUSION: Strategies to reduce 30-day readmissions after bone marrow transplant should be focused on more susceptible population including females, age less than 17 years and with Medicaid insurance.

ACQUIRED HEMOPHILIA: PATIENT WITH FACTOR VIII ANTIBODIES, PRESENTING WITH BILATERAL UPPER EXTREMITY COMPARTMENT SYNDROME.

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INTRODUCTION: Acquired hemophilia or factor VIII (FVIII) deficiency, caused by FVIII antibodies, is a very rare condition that commonly results in severe hemorrhagic complications. We report a case of acquired hemophilia presenting with bilateral forearm compartment syndrome.

CASE REPORT: 54 year old African American male with presented to the local Emergency Department with bilaterally, painful, swollen forearms, with associated numbness and tingling in all ten digits. Bilateral upper extremity venous Doppler ultrasounds were negative but, the forearm compartment pressure was found to elevated by ultrasound (60mmHg). He had an emergent bilateral fasciotomy. The patient experienced excessive post-operative bleeding and the coagulation studies revealed an elevated partial thromboplastin time; 80.4 sec(45 sec). Mixing studies failed to show any improvement in the aPTT. Factor VIII activity was low and the antibodies against factor VIII were detected. A rheumatological work up was negative. The patient was given Aminocaproic acid, to achieve hemostasis. Patient was treated with recombinant factor VIIa and prednisone. He was discharged home with scheduled outpatient followup.

DISCUSSION: Acquired hemophilia, is rare and results in a more dramatic clinical picture than congenital hemophilia. The most common conditions associated with the development of acquired hemophilias are rheumatic diseases, the postpartum period, malignancy, and some drugs like hydralazine. If there is a low antibody titer against factor VIII, initial control of active bleeding is done using factor VIII concentrates. If the antibody titers are higher, treatment with recombinant factor VIIa and prednisone leads to a better outcome.

CONCLUSION: Isolated prolonged PTT, is a common laboratory abnormality which is often overlooked in clinical practice. Patient's presenting a with a new prolongation of PTT, may have antibodies against one or more clotting factors, representing development of acquired hemophilia. These patients should be evaluated carefully, as they can present with serious bleeding complications.

COEXISTENT XANTHOGRANULOMATOUS PYELONEPHRITIS AND RENAL CELL CARCINOMA

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INTRODUCTION: Xanthogranulomatous Pyelonephritis (XGP) is a rare inflammatory process in which renal parenchyma is replaced by lipid-laden macrophages (xanthoma cells). It is frequently mistaken for renal cell carcinoma (RCC) due to similarities in clinical presentation, laboratory results and radiological findings. Confirmatory diagnosis is based on histopathological examination. We present an interesting case of coexisting XGP and RCC.

CASE DESCRIPTION: DS, a 73-year-old woman, presented with three months of worsening, sharp, left-sided flank pain radiating throughout her abdomen associated with anorexia, nausea, constipation, a 10 pound weight loss, night sweats and a new abdominal mass. Laboratory investigations showed leukocytosis and a hemoglobin of 5.5. Urinalysis results were +1 proteins, +2 ketones, +3 leukocyte esterase, +1 hemoglobin, 48 RBCs, and >180 WBCs. CT abdomen/pelvis revealed several intraabdominal abscesses, an obstructing staghorn calculi in the left kidney, and a heterogeneously enhancing mass in the upper pole of the left kidney concerning for RCC. Multiple Jaxton-Pratt (JP) drains were placed and empiric antibiotics were started. Abscess fluid cultures grew *Proteus mirabilis*. One week later, she underwent a left radical nephrectomy with an abdominal washout after no significant improvement with medical management. She tolerated the surgery well and was discharged home a few days later. Final pathology showed clear cell RCC and granulomatous pyelonephritis.

DISCUSSION: XGP is a form of chronic pyelonephritis associated with chronic urinary tract obstruction and infection. It commonly presents diffusely, but focal infections are seen, as in this case. Patients are typically middle-aged women presenting with fever, flank pain, weight loss and urinary tract symptoms. The most common pathogens found on urine culture at diagnosis are *E. coli* and *P. mirabilis*. However, *Staphylococcus aureus*, *Klebsiella*, and *Pseudomonas* have also been reported in the literature. Most cases involve a single kidney and treatment involves antibiotics in combination with a partial or total nephrectomy. RCC, the seventh most common cancer in the United States, has a slight male predominance and most patients present in the sixth or seventh decade of life. Risk factors are smoking, obesity and hypertension. Prior to routine use of radiological imaging, patients typically presented with a triad of hematuria, flank pain and a palpable abdominal mass. As imaging frequency has increased, over half of all patients are now diagnosed incidentally. Prognosis is indirectly related to how early the patient is diagnosed.

CONCLUSION: To date, at least 10 case reports have shown coexisting XGP and RCC. Although it remains unknown whether one predisposes to the other, it is important to consider their coexistence and provide appropriate and timely treatment to ensure the best prognosis for the patient.

ADDING TO THE DIFFERENTIAL DIAGNOSIS FOR PAINLESS JAUNDICE

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INTRODUCTION: Bouveret's syndrome refers to gastroduodenal obstruction from gallstone impaction which occurs in the setting of a cholecystoduodenal fistula. Depending upon the exact location and size of the gallstone, a variety of clinical manifestations are possible. We describe a case of Bouveret's syndrome with the unique presenting symptom of painless jaundice.

CASE REPORT: A 62 year-old female presented with a 3 week history of increasing jaundice, fatigue, and nausea with an associated 15 pound weight loss. The patient denied abdominal pain and abdominal examination was unremarkable. Initial laboratory studies were significant for total bilirubin 9.3 mg/dl, alkaline phosphatase 477 U/L, aspartate aminotransferase 95 U/L, and alanine aminotransferase 111 U/L. Initial ultrasound revealed intrahepatic and extrahepatic biliary dilatation. Magnetic resonance cholangiopancreatography (MRCP) showed a suspected calculus located in the proximal portion of the duodenum with surrounding soft tissue thickening. Endoscopic gastroduodenoscopy (EGD) confirmed a large gallstone in the duodenal bulb which occupied the entire lumen and partially protruded through the pylorus. As this was unable to be removed endoscopically, the patient underwent gastrotomy and removal of a 3.3cm gallstone. No fistulous tract was appreciated intraoperatively and is considered to have closed spontaneously. Subsequently, the patient was treated supportively and discharged home on post-operative day 7 with resolution of her symptoms and normalization of her laboratory values.

DISCUSSION: Bouveret's syndrome was first reported in 1896 and remains an uncommon variant of gallstone ileus, for which it comprises only 1-3% of cases. While a wide variety of presenting symptoms have been reported, to our knowledge no case of Bouveret's syndrome has presented as painless jaundice, which in this case was a result of external CBD compression. The largest review was published in 2006 by Cappell and Davis where they describe 128 cases. The most common presenting symptoms were nausea, vomiting, abdominal pain, hematemesis, and weight loss. Less commonly, patients reported an absence of abdominal pain in 29% and Jaundice in less than 2% of cases. The mean age of patients at diagnosis was 74, and had a female predominance of nearly a 2:1 ratio. As in our case, EGD reveals gastric outlet obstruction in almost all cases; however the source of obstruction is only visualized 69% of the time. While EGD is useful diagnostically, endoscopic gallstone retrieval is usually not possible due to the size of the gallstone. Thus, treatment of the obstructive process most often requires gastrotomy or enterolithotomy and is 90% successful.

CONCLUSION: Although rare, Bouveret's syndrome is a clinically distinct form of gallstone ileus which can present in a variety of clinical manifestation, including painless jaundice.

AN UNKNOWN CAUSE OF ACUTE DISSEMINATED ENCEPHALOMYELITIS

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INTRODUCTION: ADEM is a monophasic demyelinating disease of the central nervous system, and can present with various multifocal neurological symptoms. These can include altered mental status, cerebellar ataxia, cranial nerve abnormalities, seizures, and speech impairment. The annual incidence is estimated to be 0.4-0.8 per 100,000. The exact pathogenesis is unknown, however theories have identified ADEM as an immune-mediated inflammatory process triggered by infection or immunization. Young children are predominately affected, some believe this is due to the higher frequency of immunizations and viral/bacterial infections in this age group. ADEM is a diagnosis of exclusion, it is a clinical diagnosis supported by MRI findings of demyelination.

CASE REPORT: A previously healthy 9 year old Caucasian female was admitted from outside ED for possible cerebellar ataxia, brain CT was negative for a bleed at that time. Patient's symptoms included progressive weakness, ataxia, altered speech and altered mentation that started 6 days ago. History revealed an ED visit 3 days prior to admission for imbalance and slurred speech resulting in acute otitis media diagnosis and prescribed azithromycin which she completed. Otherwise parents deny any prior illnesses, or recent immunizations. Also significant per history was constipation for past 6 days, and oligouria for past 24 hours. Speech disturbances, abnormal behavior, memory loss and some confusion were obvious on initial evaluation. Neurological exam was notable for diffuse weakness most significant in the lower extremities, truncal ataxia, increased sensitivity to touch, and mild clonus. No focal cranial nerve abnormalities were noted. Physical exam was unrevealing otherwise. Initial work up included an MRI of the brain and spine reporting abnormal areas of increased T2 and FLAIR signal within the brain along with a punctate focus of enhancement within the left temporal lobe and spinal cord. LP revealed CSF pleocytosis and was negative for oligoclonal bands. Bladder scans revealed large volume of urinary retention, requiring multiple straight catheterizations throughout her hospitalization. Patient was started on high dose IV solumedrol 20mg/kg daily for 5 days, otherwise her stay consisted of supportive care. She was discharged with oral steroid taper on day 5 of hospitalization. Patient was admitted to the PICU the following day with new onset seizures. Her family had not even had a chance to give her home dose of medication when she started seizing. EEG reported mild to moderate encephalopathy, with no seizures or interictal epileptiform activity recorded. Patient experienced periods of extreme emotional lability, screaming and crying, followed by long periods of sleep. She was started on high dose of IV steroids for 2 additional days, was transferred to the floor and then switched to oral steroids which she tolerated well with no additional symptoms or recurrent seizures. Repeat MRI of brain and spine showed previously identified areas as nearly resolving; new small areas of FLAIR signal change within the left frontal lobe, both parietal lobes and both cerebellar hemispheres. Eventually her urinary retention and encephalopathy improved and she was discharged home with neurology follow up.

DISCUSSION: Patient had additional neurological sequelae from ADEM causing readmission. Whether it was due to steroid dosing or not will remain unknown. Whether she should have received a longer course of IV steroids or started on IVIG remains a question. Additional information on treatment, course, and when to consider other therapies is necessary. The definitions of ADEM terms: relapsing, recurrent, continues to be controversial. Relapsing typically occurs while steroid dose is being tapered or shortly after steroid withdrawal. Our patient presented with a new neurologic sequelae (seizure) before she had even started her oral steroid taper. Several research studies classify ADEM as post infectious or following immunizations; 50-75% of all cases have identified those as preceding incidents. Our case is one of the approximately 26% with no known preceding incident. Literature on ADEM is limited and controversial, and lacking in differential etiologies. Further research on other possible causes of ADEM needs to be investigated.

CONCLUSION: This case offers great opportunity for learning and looking into other, less common, causes of ADEM. The case reminds pediatricians to include ADEM in their differential diagnosis despite an absence of recent illness or vaccination history.

MYCOPHENOLATE-INDUCED POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME IN THE SETTING OF LUPUS NEPHRITIS: A CASE REPORT AND REVIEW OF LITERATURE

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INTRODUCTION: Posterior reversible encephalopathy syndrome (PRES) is a rare clinical entity associated with malignant hypertension, autoimmune disease, and calcineurin inhibitors. Symptoms include seizure, headache, and altered mental status. The pathophysiology involves subcortical vasogenic edema secondary to hypertension and endothelial damage. As the name suggests, PRES is completely reversible with strict blood pressure control, discontinuation of the offending agent, and treating the underlying disease. We report a case of PRES caused by mycophenolate administration.

CASE REPORT: A 29 year old female presented with diffuse anasarca and shortness of breath. Workup revealed a creatinine of 3.3 and a GFR of 17. The patient was also found to be pancytopenic with evidence of hemolytic anemia. A renal biopsy showed evidence of Stage IV lupus nephritis with rapidly progressive glomerulonephritis (RPGN). Her lupus was further classified as ANA-negative and anti-dsDNA-positive. Mycophenolate and triweekly hemodialysis were started along with a steroid burst of methylprednisolone 1g for three days followed by prednisone 60mg daily. Four days following discharge the patient represented with a witnessed three-minute seizure involving bowel incontinence, altered mental status, and tongue biting. She was given 2mg IV lorazepam and loaded with 1000mg levetiracetam for seizure prophylaxis. MRI of the head revealed bilateral posterior hemispheric subcortical edema and the diagnosis of PRES was made. Mycophenolate was immediately discontinued and replaced with cyclophosphamide. Strict blood pressure control below 140/90 mmHg was maintained initially with IV nicardipine drip then transitioned to oral nifedipine, clonidine, losartan, and minoxidil. A repeat head MRI eight days later showed resolved subcortical edema consistent with the patient's improved mental status. No permanent neurologic sequelae were recorded as a result of this hospital episode.

DISCUSSION: Mycophenolate is an immunosuppressive medication commonly used for treatment of lupus nephritis. The temporal association of PRES with starting and stopping mycophenolate in our patient makes this medication the most likely cause. The patient was also receiving steroids throughout making her autoimmune disease an extremely unlikely cause of PRES. The Naranjo Adverse Drug Reaction Probability Scale rates our association of mycophenolate to PRES as 'probable'. To date, there has only been one other case report linking mycophenolate to PRES. This was in the setting of renal transplantation where mycophenolate was also discontinued resulting in resolution of symptoms.

CONCLUSION: The clinician must remain vigilant in screening newly initiated medications when presented with PRES. Early diagnosis with head imaging and treatment of blood pressure is crucial to recover and preserve neurologic function. Other immunosuppressive medications such as cyclophosphamide may be a better choice in patients with a history of PRES.

SEXSOMNIA: A CASE PRESENTATION OF A NEW DSM 5 DIAGNOSIS

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INTRODUCTION: Parasomnia involving sexual activity has been presented as a unique variant of parasomnia dating to the mid 1990's. The diagnosis of sexsomnia was officially introduced in The Diagnostic and Statistical Manual of Mental Disorders (DSM 5). The diagnosis appears for the first time in DSM 5 as a specifier within the category of Non-REM Sleep Disorders and specifically states parasomnia with sexual activity (sexsomnia).

BACKGROUND: The first mention of sexsomnia in a published scholarly article came in 2003 in the Canadian Journal of Psychiatry as a case report series. Questions arose over the next few years as to whether this was a viable defense. The Journal of Forensic and Legal Medicine addressed these questions in a 2007 article. In short, the article argued this was a valid defense based on automatism. The majority of cases that have been tried using sexsomnia as a defense have been successfully defended and the charged found not guilty of their alleged crimes.

CASE REPORT: This was a 44 year old married Caucasian male referred to outpatient psychiatry by neurology for management of sexsomnia. Patient and wife were increasingly concerned about sexual activity while asleep. This activity was increasingly becoming aggressive but abruptly stopped with introduction of clonazepam and the occurrence of a legal charge. There had been a long history of exposure to sexual material dating back to age 9 and by 17 he was compulsively seeking sexual gratification. Marriage counseling was also being sought by the couple outside of my care. I have continued to see this patient and his sexsomnia symptoms have been in almost complete remission for about one year.

CONCLUSION: This case illustrates a sensitive new diagnosis, which likely goes under addressed in both general and forensic psychiatry as well as in primary care and sleep medicine. Even in a rather liberal culture such that we live in in the United States, it is still often taboo to discuss topics of a sexual nature. There is also a great deal of shame around the diagnosis and behavior. The case also presents unique characteristics of addictive type behavior along with sexsomnia. My hope in bringing light to this new diagnosis is to encourage dialogue with patients and bring awareness to the diagnosis so that those who need help get what they so desperately need and deserve.

FOOT/ANKLE FRACTURE IN WAR CONDITIONS

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INTRODUCTION: Surgeries performed in war torn countries, such as Afghanistan, can differ drastically compared to procedures in resource-replete Western healthcare systems. These differences often arise because of the significant cost of security personnel, required to transport and maintain equipment and supplies. Issues of theft and the omnipresent danger and uncertainty in war zones further exacerbate these conditions. In turn, fewer trips are made to resupply hospitals in these areas, and all equipment and supplies become so valuable that they are almost irreplaceable. Therefore, surgeons must stretch what little resources that they have, and adapt when equipment, such as modern fixation systems, are not available. We present a case of surgical decision making in this unstable environment, where an ankle fusion was performed.

CASE REPORT: A 36-year old male Afghan policeman presents with multiple fractures to the right ankle, secondary to a ground based blast. The patient was placed in a cast and was made non-ambulatory for one month. Afterward, he was recasted with partial weight bearing for three months. The patient presented to the Afghan National Police Hospital with joint instability and persistent pain, particularly with plantarflexion of the right ankle. There is limited range of motion to dorsiflexion or plantarflexion at the ankle. There was flattening of the arch and loss of ankle mortise and height. The patient did not receive physical therapy or manual manipulation. A revision operation was decided upon to fit the patient with an orthotic post-op, to address the right leg length discrepancy and the patient's pes planus. The lateral malleolar area was exposed and tendonous attachments were mobilized off the joint, exposing the retinaculum. Due to the age of the injury, sharp dissection was required to mobilize the soft tissue. Once the tendons and insertion sites were removed, there was no identifiable joint or bursa. The wound was debrided, and partial osteotomy was performed to allow for 90 degree of dorsiflexion. It was determined that salvaging the ankle was not an option and would have to be fused. The distal tibia was also partially resected, and the residual bony alignment was checked. Irrigation was performed to remove any remaining fragments, and a hand drill was used to make a pilot hole for lag screws. The screws were then placed by hand.

DISCUSSION: Although, there is limited access to power equipment, it is unreliable given the current climate in Afghanistan. Ultimately, a fusion was performed utilizing some power equipment, but the operation was mostly performed by hand. Because of the limited materials for x-rays, no completion film was obtained. The typical follow up is clinical evaluation and pain control with a fitted cast. To do this, the patient would have to risk additional injuries due to mines and pay exorbitant bribes to get to the hospital. However, this is not an option for the patient given the tumultuous environment.

CONCLUSION: This is an example of surgical decision making in an austere and kinetic environment, without ready access to resources and materials. While we, in the United States, may have more options, the outcome for this patient is earlier discharge, and expedited return to provide for himself and his family.

HOMELESS IN A GRAVEYARD: DIAGNOSING A BOOK BY ITS COVER

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INTRODUCTION: African American subjects are almost three times more likely to be diagnosed with schizophrenia spectrum disorders than white subjects even though the same amount of affective symptoms are present. There is an ingrained perception among clinicians that schizophrenia is a mental illness with a downward drift in social and vocational functioning, so ascribing such a misdiagnosis to a patient may lead to low expectations in treatment outcome. This could close off the clinician from screening for mood symptoms. Uncontrolled mood symptoms can lead to a deterioration or shortening of one's vocational career and lifespan.

CASE REPORT: A divorced 62 year old African American male with a reported history of schizophrenia presented with agitation and hyperirritability. He was brought to the ER by police after reportedly spitting on people in a food court and threatening to kill everyone on the scene. He was living in a graveyard for the past 6 months. While in the ER, he was restrained and given an injection of Olanzapine for agitation. Once his sedation abated, grandiosity and hyperirritability re-emerged. He was sleeping only a couple of hours a night, moved about with high energy, and his speech was pressured with flight of ideas. We reviewed the patient's previous records, and discovered the patient had a previous hospital admission in 1999. At that time, he was found to be severely depressed with suicidal ideation and auditory and visual hallucinations and diagnosed with major depressive disorder with psychotic features. The patient's brother relayed a clinically useful family history describing his daughter as 'Very bipolar. When she goes off, she's just like him.' His grandfather was 'treated with Thorazine.' Our patient's presentation and past psychiatric history pointed to a diagnosis of bipolar I disorder. We treated our patient with Lithium 1200 mg/day and increased his usual Geodon from 40mg per day to 80 mg/day. His compliance with treatment improved and he was taking all of his medications as prescribed by day 5. The patient's agitation and hyperirritability softened. He started sleeping more and eventually slept through the night. His grandiosity and pressured speech resolved. But he remained suspicious of the psychiatrist's motives. He was ready for discharge on the 16th day of his hospitalization.

DISCUSSION: This case presented with characteristics that could have led the clinician to premature closure and misdiagnosis of schizophrenia. His outpatient team had diagnosed and treated him for schizophrenia. His homelessness and disorganized behavior is an obvious sign of poor social functioning which has been popularly ascribed to the schizophrenic lifestyle. With such disorganized behavior, classic signs of Bipolar Disorder can be overlooked. However, 15% of Cerimele's primary care population of bipolar patients were homeless. Our patient also mistrusted the psychiatrist's motives for treatment and remained antagonistic toward him through most of the hospitalization.

CONCLUSION: Investigating present and past history through collateral sources is sometimes essential to arrive at an accurate diagnosis. Reviewing old medical records and obtaining family history of mental illness can either direct the clinician to a working diagnosis or validate one. As clinicians we must be diligent in reading the appendices of a patient's history to gather pertinent information toward making an accurate diagnosis.

GROIN INJURY IN A COLLEGIATE FOOTBALL ATHLETE

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INTRODUCTION: General medical conditions, including infections and neoplasms, are an important part of the differential diagnosis in athletes presenting with pain or injury. A psoas abscess is a collection of pus in the iliopsoas muscle compartment and may have significant morbidity and mortality. Presenting symptoms are generally nonspecific and the onset may be subacute, developing over days to months. Clinical presentation may have features suggestive of other diagnoses, including septic hip arthritis, iliopsoas bursitis, and retrocecal appendicitis. Proper diagnosis and management is critical to prevent complications of septic shock, paralytic bowel ileus, and death.

BACKGROUND: Psoas or iliopsoas abscess is more common in males than females. It is a rare cause of hip, low back, or groin pain with an incidence reported in children and adolescents of 0.4 per 100,000. The most common etiology is a bacterial source. In a series of 124 cases in Spain, 42% of psoas abscesses were attributed to *Staphylococcus aureus*. Twenty percent progress to septic shock. Literature review found no specific cases of psoas abscess related to athletes with acute hip flexor strain.

CASE REPORT: A 19-year-old Division 1 Collegiate football player presented to the Emergency Department four days following injury to his right groin during football practice. He complained of severe right groin pain accompanied by increasing fatigue, fevers, nausea, and diarrhea over the past 24 hours. Laboratory workup revealed leukocytosis and isolated conjugated hyperbilirubinemia. A CT of the abdomen and pelvis showed a right iliopsoas muscle injury with soft tissue stranding suggestive of possible superinfection. He was admitted to the hospital for further management, including MRI with contrast to further evaluate psoas injury. On hospital day 1 he developed oliguria with acute kidney injury and rhabdomyolysis. Within hours he became febrile, tachypnic, tachycardic, and hypotensive and was transferred to the medical intensive care unit for management of sepsis and acute kidney injury. Despite broad spectrum antibiotic therapy, on hospital day 2 he developed septic shock with multisystem organ dysfunction and was intubated. A repeat CT scan revealed possible pyomyositis of the right psoas and he was taken to the operating room by general surgery for exploration of the right retroperitoneum. No frank purulence was noted in the retroperitoneal space and a wound vac was placed. On hospital day 3 the patient continued to decline, requiring pressor therapy and CVVHD. A stat MRI with gadolinium contrast showed a 14.2 x 5.7 x 5.3 cm abscess located in the right iliopsoas and distal myotendinous junction. He was taken back to the operating room with trauma surgery for anterior thigh incision and debridement of necrotic right iliopsoas muscle. Cultures grew methicillin-sensitive *S. aureus*. Antibiotic therapy was targeted and the patient eventually made a complete recovery, beginning rehabilitation 6 weeks post-injury and returning to collegiate football 4 months post-injury.

DISCUSSION: Our case was in a male football player with previous suspected groin strain. There is no epidemiologic data available regarding the risk of psoas abscess as a complication following hip flexor strain. In this particular case, infection was likely primary due to hematogenous spread. The source of the infection was *S. aureus*, the most common cause of psoas abscesses. This athlete had no known risk factors for hematoma, immune compromise, or gastrointestinal sources.

CONCLUSIONS: This case highlights the importance of maintaining a broad differential diagnosis in the setting of an athlete presenting with pain following injury. Making the diagnosis of a psoas abscess often requires a high degree of suspicion and timely acquisition of imaging studies. In this particular case, MRI was delayed secondary to the patient's declining kidney function, but was key to making a proper diagnosis and tailoring treatment to save his life.

COMPARING HOSPITALIZATION CHARGES OF TEACHING VS NON-TEACHING HOSPITALS: ANALYSIS OF THE LEADING 30 ADMISSION DIAGNOSES

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INTRODUCTION: Teaching hospitals have classically been regarded as inefficient and financially burdensome, although to our knowledge no study has specifically addressed individual diagnoses in their assessment of hospitalization charges. Since teaching hospitals are reimbursed by the Inpatient Prospective Payment Services (IPPS) at a higher rate than non-teaching institutions, hospital-related expenses should more accurately be represented by hospital charges than cost. Hospitalization charges undoubtedly rely upon a variety of factors including admission diagnosis, extent of testing, length of stay, and treatment decisions. Therefore, this study aims to identify which admission related diagnoses are associated with differences between teaching versus non-teaching hospitalization charges.

METHODOLOGY: Using the Healthcare Cost and Utilization Projects online query system, summary data was collected regarding mean total hospitalization charges for teaching vs. non-teaching urban hospitals in 2012 through the Nationwide Inpatient Sample (NIS). The NIS contains data on 5,557,703 discharge events among 4,324 U.S. hospitals in 44 states. Data was collected for discharges that had a non-neonatal, non-maternal primary admission diagnosis of one of the top 30 most common hospital admission diagnoses. For each of these diagnoses, a z-test was used to compare average hospitalization charges at urban teaching hospitals and urban non-teachings hospitals. To control for multiple testing, a Bonferroni correction was applied and a significance level of $\alpha = 0.05/30$ (0.0017) was used to determine statistical significance.

RESULTS: Of the 30 diagnoses tested, 12 resulted in statistical significance. Teaching hospitals, on average, had higher charges for: congestive heart failure (non-hypertensive) ($p < .0001$), mood disorders ($p < .0001$), cardiac dysrhythmias ($p < .0001$), complication of device/implant/graft ($p = .0010$), acute cerebrovascular disease ($p < .0001$), schizophrenia and other psychotic disorders ($p < .0001$), respiratory failure/insufficiency/arrest (adult) ($p = .0002$), and pancreatic disorders (not diabetes) ($p = .0007$). Non-teaching hospitals, on average, had higher charges for: skin and subcutaneous tissue infections ($p = .0010$), nonspecific chest pain ($p < .0001$), biliary tract disease ($p = .0009$), and asthma ($p < .0001$). Reliability and validity of these results are limited as the online query system provides only summary data which shows large differences between mean and median values and may indicate a skewing of the distribution of total charges.

CONCLUSION: There is statistically significant evidence that total charges differ for several of the most common diagnoses due to hospital teaching status. For 8 of the top 30 diagnoses, teaching hospitals had higher average charges while non-teaching hospitals had higher average charges on 4 of the top 30 diagnoses. There were no statistically significant differences in charges between teaching versus non-teaching hospitals for the remaining 18 diagnoses. This study is to serve as a pilot to open discussion regarding differences in charges due to teaching status. Subsequent analyses are needed to account for other various factors such as age, length of stay, gender, race, number of comorbidities, primary payer and primary procedure.

NOT ALL VALVE VEGETATIONS ARE ENDOCARDITIS

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INTRODUCTION: Primary tumors of the heart are a rare entity, with prevalence estimated to be less than 0.1%. Papillary fibroelastomas are the second most common primary cardiac tumor. Although they are considered to be benign, may result in serious complications including stroke, valvular dysfunction and sudden cardiac death.

CASE REPORT: A 56-year-old man was brought in to the hospital for a three-week history of intermittent confusion. According to family, his symptoms consisted of short-term memory impairment. No focal sensory or motor deficits were reported. Past medical history was significant for diabetes mellitus, hypertension and coronary artery disease. Physical exam, including vital signs and neurological exam, was unremarkable. Laboratory data showed no abnormalities other than mild hyperglycemia. Computed Tomography (CT) of the head revealed a small ischemic focus in the right pons, with recommended follow up Magnetic Resonance Imaging (MRI) for further characterization. MRI of the brain confirmed this finding and additionally showed small remote lacunar infarcts in right brainstem and left thalamus. On day one of hospitalization, a transthoracic echocardiography (TTE) was performed as a result of the radiographic findings, with an embolic source was suspected. A small to moderate sized mobile mass versus vegetation was visualized on the aortic valve, and transesophageal echocardiography (TEE) was recommended. TEE was performed on day two of hospitalization; findings revealed a pedunculated moderate sized mobile mass on the non-coronary cusp leaflet measuring 0.6 x 0.9 cm. The mass was thought to be suggestive of a cardiac papillary fibroelastoma. The patient underwent excision of the mass, which was attached to the free margin of the leaflet on a thin stalk, and thus 1 x 3 mm edge of leaflet tissue was removed. The patient tolerated the procedure well and was discharged after recovery from surgery. Pathology confirmed papillary fibroelastoma.

DISCUSSION: Papillary fibroelastomas are the second most common primary cardiac tumor behind myxomas. The mean age of patients who develop fibroelastomas is 60 years, with a male predominance. Prior to echocardiography, most of these tumors were diagnosed post-mortem. Despite the fact that many are found incidentally and are considered pathologically benign tumors, there is great potential for serious morbidity and mortality. Patients may present with stroke secondary to embolism, caused by the tumor itself or subsequent thrombus, valvular dysfunction and possibly sudden cardiac death. Surgery is indicated in patients who are thought to have embolic events related to mobility and for those greater than or equal to 1 cm in size. Grossly, papillary fibroelastomas have been described to have a sea anemone like appearance with multiple papillary fronds attached to the endocardium by a short stalk. The majority of resections do not require valvular repair or replacement. Recurrence following resection has not been reported.



ANIMAL BACTERIUM IN THE HUMAN HEART - A CASE OF NATIVE VALVE ENDOCARDITIS CAUSED BY STAPHYLOCOCCUS SIMULANS IN AN IMMUNOCOMPETENT PATIENT

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INTRODUCTION: Staphylococcus simulans is an infrequent colonizer of the human skin. It is a coagulase negative Staphylococcus that is rarely known to cause infection in the human host. Most cases of this bacterium causing infection are skin and soft tissue infections but rarely this can present as endocarditis. Risk factors for colonization are exposure to animals as this is typically colonized in sheep, cattle and domestic animals. We report a case of *S. simulans* endocarditis in a patient who did not report a history of exposure to animals.

CASE REPORT: A 73-year-old man presented to the emergency department with subjective fevers and malaise. Past medical history was significant for non-ischemic cardiomyopathy and a recently treated urinary tract infection (UTI). Vitals were stable. On physical exam, a 3/6 systolic murmur with radiation to the axilla was appreciated that was not reported previously. Initial laboratory data revealed no leukocytosis, but a urinalysis was suggestive of a urinary tract infection. Blood cultures were obtained, and the patient was initiated on oral antibiotics for presumed UTI and placed in observation. Within 12 hours, 2/2 sets of blood cultures were positive for gram-positive cocci in clusters and the patient was placed on intravenous Vancomycin. The patient underwent transesophageal echocardiography (TEE), which showed a partially flail posterior mitral leaflet, moderate to severe mitral regurgitation, a highly mobile mass consistent with a torn chordae tendon and a small mobile vegetation on the aortic valve measuring 0.88 cm. Final results on blood cultures were positive for *S. simulans* that was susceptible to Vancomycin. The patient was evaluated by cardiothoracic surgery, and due to the fact that he was well compensated and hemodynamically stable the decision was made to treat the patient with six weeks of intravenous vancomycin prior to evaluation for mitral valve repair.

DISCUSSION: *S. simulans* is an uncommon coagulase negative Staphylococcus and is typically found in animals with infrequent human involvement. It commonly causes mastitis in animals but can also lead to skin and soft tissue infections in humans. In our research, we were able to find four other cases of endocarditis caused by *S. simulans*. Typically, coagulase negative Staphylococci are considered to be contaminants of blood cultures. However, in the right clinical setting (positive urine cultures and multiple positive blood cultures) it should be taken seriously. This bacterium should be treated similar to any coagulase negative staphylococcal infection. We elected to continue the patient on Vancomycin following discharge to a rehab facility for six weeks. The importance of this case comes from the recognition of coagulase negative Staphylococcus as a cause of endocarditis and bacteremia and should be diagnosed and treated appropriately.

MAN'S BEST FRIEND? A CASE OF HUMAN PULMONARY DIROFILARIASIS

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INTRODUCTION: Heartworm (*Dirofilaria immitis*) is a roundworm parasite that is spread to dogs by mosquito bites, causing heart failure in the definitive host canine. Other hosts may include cat, wolf, fox and rarely humans. In the seldom chance a human does get infected, the nematode travels from the subcutaneous tissue into the vessels, and eventually the right ventricle. The human body is an unsuitable environment for heartworm and as the nematode dies, it embolizes the pulmonary vessels causing infarction and eventual nodule formation that can present as a solitary or multiple pulmonary nodule(s) which in the right clinical context is presumed to be neoplastic

CASE REPORT: We describe a 48 year-old gentleman with a 30 pack-year smoking history who was admitted for refractory hypoglycemia secondary to a suspected insulinoma. Biochemical work up proved positive warranting imaging studies with a computed tomography (CT) chest/abdomen/pelvis to look for an underlying insulin-secreting tumor. Imaging studies revealed multiple pulmonary nodules, the largest measuring 1.4x1.2cm in diameter. Further work up was negative for fungal and mycobacterial causes of pulmonary nodules. A CT guided core needle biopsy of the mass done to rule out neoplasm revealed a parasitic granuloma with remnants of *dirofilaria immitis* noted on microscopy. During the nodule work up, the patient was still experiencing repetitive, symptomatic episodes of hypoglycemia while on maximum medical therapy and was transferred to a quaternary care center for management of his biochemical insulinoma.

DISCUSSION: In the United States, heartworm infection in dogs and humans are endemic in the east and southeast regions. Patients infected with *D. immitis* are generally asymptomatic and present with a single pulmonary nodule that is incidentally found on chest radiograph. Occasionally there can be multiple pulmonary nodules mimicking metastatic disease or fungal or mycobacterial infection. Regardless of the number of nodules, these asymptomatic nodules are usually evaluated for possible underlying cancer prompting invasive procedures to obtain tissue. Diagnosis of dirofilariasis can be made if parasite fragments are seen on microscopy as in this case, but most require excisional biopsy for tissue confirmation. No serologic tests are available for dirofilariasis.

CONCLUSION: Human pulmonary dirofilariasis should be considered as a differential diagnosis in patients presenting with asymptomatic solitary or multiple pulmonary nodules in the appropriate epidemiologic and clinical setting.

THE ASSOCIATION OF ASYMPTOMATIC BACTERIURIA AND BEHAVIORAL DETERIORATION IN DEMENTIA.

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INTRODUCTION: The presence of bacteria in urine is not considered a normal state; however, in the older population colonization exists and is described as asymptomatic bacteriuria. The U.S. Preventive Task Force states that treatment of asymptomatic bacteriuria with antibiotics is not necessary. These guidance rules are related to population with intact cognitive reserves. In dementia, the diagnosis of UTI is often considered when a patient exhibits changes in behavior, often the only symptom of ongoing infection. The majority of geriatric psychiatrists treat UTI more aggressively than it is recommended by national standards, although there is inadequate literature supporting or disapproving this approach.

RATIONALE: To answer the question of whether the treatment of asymptomatic bacteriuria makes a difference in outcome, including disposition, length of stay or functional abilities of the patients

MATERIAL & METHODS: We performed a retrospective chart review of 100 gero-psychiatric inpatient females, aged 60 and over, who were diagnosed with any type of dementia with behavioral disturbances and had a documented urinalysis (UA). There were no restrictions on concurrent medications or number of medications and no restrictions on concurrent psychiatric and/or substance abuse diagnoses. We did exclude patients with indwelling catheters, patients transferred from the medical unit and patients with concurrent diagnosis of developmental delay.

RESULTS: Out of 100 patients, 94 had urine available, and 46 had culture results. Of those with dirty urine, 10/31 had culture >100,000. None of those patients had an elevation in temperature. The difference in length of stay was not statistically significant and changes in BP and admission MMSE also were not significant. Unfortunately, we were not able to answer the main question regarding the changes in functional status of patients with the treatment of UTI due to inconsistency of documentation and difficulties in data extraction. Interestingly, the average age showed statistical significance in the comparison of controls to patients with a dirty urine.

DISCUSSION: Asymptomatic bacteriuria is a common phenomenon in older adults, with the incidence increasing from 3.5% in the general population to 15-18% in women older than age 70. Demented individuals often cannot provide a clear history, making it difficult to determine whether the increase in behavioral disturbance is due to progression of the dementia or to superimposed delirium caused by infection. Making this distinction becomes especially complex when the diagnosis of UTI is uncertain based on an equivocal UA.

CONCLUSION: The lack of symptoms and signs of infection in the elderly population makes a diagnosis difficult, as the elderly do not show a robust response to infections as compared to younger people. When cognition is compromised, patient history becomes very unreliable, and the treatment decision has to be based on results of urine tests. Although treatment of asymptomatic bacteriuria in the institutionalized elderly population has not been clearly shown to be of benefit and could be harmful, it still remains a common practice. No studies have looked at benefits of treatment versus no treatment of demented hospitalized patients with dirty urines that measure changes in functional level as an outcome. For the dementia patient hospitalized for behavioral disturbances with dirty urine on admission, the ultimate question remains the same: To treat or not to treat?

RECURRENT SUPPURATIVE THYROIDITIS WITH UNDERLYING PYRIFORM SINUS FISTULA

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INTRODUCTION: Suppurative thyroiditis, an infection of the thyroid gland, also known as acute infectious thyroiditis, microbial inflammatory thyroiditis, pyrogenic thyroiditis, and bacterial thyroiditis, is very rare accounting for less than 1% of all thyroiditis. Its rarity is attributed to the thyroid gland's relative resilience to infections. Protective factors of the thyroid include its capsule, which isolates it from direct communication with neighboring structures, its high iodine concentration, and its ample supply of blood and lymphatics. Predisposing congenital anomalies, notably pyriform sinus fistulas, which result from failure of intrauterine obliteration of the third or fourth branchial pouch, and thyroglossal duct remnants, commonly exist in patients with suppurative thyroiditis. Additional reported causes in children include hematogenous spread, direct spread from adjacent site, or perforated esophagus. We present a case of recurrent suppurative thyroiditis in an adolescent discovered to have a pyriform sinus fistula.

CASE REPORT: A 14 year-old female with prior history of thyroiditis was admitted with sore throat, odynophagia, neck pain, left-sided neck swelling and chills concerning for recurrent thyroiditis. Eight months prior, she was admitted with fevers, left-sided thyroid swelling and pain, and sore throat with diagnosis of subacute thyroiditis thought to be of viral origin given recent Influenza A illness. She was, at that time, in the hyperthyroid phase with an elevated T4 and low TSH. During that admission, autoimmune workup, thyroid uptake scan and ultrasound of the neck were completed. Autoimmune workup was unremarkable. Thyroid uptake scan demonstrated low radioactive iodine uptake. Ultrasound of the neck revealed enlarged thyroid with large hypoechoic nodules within the isthmus and left thyroid lobe without obvious drainable fluid collection. With consideration of bacterial cause for thyroiditis, she was initially treated with clindamycin without expected clinical response; therefore, antibiotics were changed to vancomycin and ceftriaxone. With improvement in symptoms, she was discharged home with Bactrim to complete antibiotic therapy. Repeat thyroid uptake scan four months later revealed recovery of thyroiditis. She was doing well until current admission, during which presenting symptoms were concerning for recurrent thyroiditis. She was started on vancomycin and ceftriaxone given improvement on these antibiotics during previous admission. MRI of neck revealed inflammation centered within the left lobe of the thyroid gland and focal rim-enhancing fluid collection superior to left lobe concerning for abscess. Fine needle aspiration under ultrasound demonstrated a heterogeneous lesion of the left lobe with focal hypoechoic portion which yielded purulent material. Specimen was sent for culture but, due to logistics, was not processed. On clinical improvement, she was sent home with clindamycin and cefdinir to complete treatment. One month later, a barium esophogram was completed which revealed a blind-ending fistula tract extending inferiorly from the left pyriform sinus. Patient is expected to receive management for this congenital anomaly.

DISCUSSION: Patients with acute suppurative thyroiditis often present with symptoms of fevers, chills, sore throat, neck swelling, dysphagia, and dysphonia. Clinical exam may reveal a unilaterally or bilaterally tender and swollen thyroid gland. Diagnostic workup includes thyroid function tests, though often normal, assessment for leukocytosis and elevated inflammatory markers, and imaging. Initial imaging recommended is ultrasound of the neck, often revealing lobular swelling with or without abscess formation. When an abscess is present, cultures should be obtained. *Staphylococcus aureus* is the most common isolated bacteria in children, followed by *Streptococcus pyogenes*, *Streptococcus epidermidis*, and *Streptococcus pneumoniae*. If ultrasound fails to establish a diagnosis, neck CT and MRI may be warranted.

CONCLUSION: Children diagnosed with suppurative thyroiditis should undergo further testing to assess for a pyriform sinus fistula, usually left-sided, or a thyroglossal duct remnant. Careful evaluation with barium swallow study or direct laryngoscopy of the hypopharynx to assess for these congenital anomalies is important given, when either of these predisposing conditions exist, there is a high risk for recurrent infections. Management of these predisposing anomalies with transcervical excision, or endoscopic cauterization is often successful, with reported success rates of 93% and 100%, respectively, thereby leading to decreased recurrent episodes and decreased morbidity.

VIRAL MYOCARDITIS PRESENTING AS ALTE (APPARENT LIFE-THREATENING EVENT) IN AN INFANT

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INTRODUCTION: Myocarditis is a significant cause of morbidity and mortality with an estimated yearly incidence of one per 100,000. Though the cause of myocarditis may be either viral or non-viral in origin, most pediatric cases are viral in origin, most commonly enterovirus, adenovirus, parvovirus B19, EBV, CMV, and HHV-6. As presenting symptoms are often non-specific, myocarditis is often misdiagnosed, missed on first presentation in about 83% of cases.

CASE REPORT: A 10 month old female with history of ALTE and reflux was admitted with apneic episodes despite current outpatient treatment with amoxicillin for pneumonia. Prior ALTE workup included apnea monitoring for one month without recorded apneic events and unremarkable NM reflux scan and video swallow study. Admission CXR supported recent pneumonia diagnosis and patient was continued on antibiotic therapy. Patient was placed on apnea monitor without recorded events. EEG studies were unremarkable. On Day 2, patient continued to have poor oral intake and urinary output and was given successive fluid boluses, subsequently developing respiratory distress and hypoxia along with facial edema and pallor.

DISCUSSION: STAT CXR suggested pulmonary edema and cardiomegaly. With concern for developing myocarditis, troponin and EKG were checked. Troponin was elevated and EKG showed ST elevation in anterolateral leads (admit EKG significant for only sinus tachycardia). ECHO revealed biventricular dilation with LVEF of 27%. Viral PCR testing was positive for metapneumovirus, and rhinovirus/enterovirus. Patient was given IVIG over 24 hours, started on milrinone, furosemide, enalapril, and aspirin. On discharge, milrinone was discontinued and digoxin was started. Repeat echocardiography over the following months showed serial improvements in left ventricular size and function.

CONCLUSION: A high index of suspicion for viral myocarditis is warranted, when clinical decompensation in setting of respiratory illness occurs, as early intervention contributes to decreased morbidity and mortality. Moreover, though our patient tested positive for enterovirus, a virus commonly known to cause viral myocarditis, other viruses, such as metapneumovirus, must be considered as cause.

ARE FIREARMS A PROBLEM IN SOUTHWEST MICHIGAN?

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INTRODUCTION: Injuries from firearms are a significant problem in the United States, whether sustained as a result of violence, self-inflicted, or accidental discharge. The incidence of firearm related deaths in our nation is the highest among industrialized countries. Recent mass shootings and solitary firearm incidents continue to increase in frequency in our country and are almost a daily topic in the media, but are they a problem in our region? The incidence and circumstances surrounding firearm related injury and death in southwest Michigan has yet to be evaluated.

RATIONALE: The purpose of this study was to examine the impact of firearm related injuries and deaths in southwest Michigan. Equipped with this information, we can then identify appropriate and effective opportunities for education and injury prevention programs

MATERIAL & METHODS: Following Institutional Review Board approval, patients were identified by a query of our trauma registry for the International Classification of Diseases, 9th Edition (ICD-9) External Cause (E-Code): E922.0-.9, E955.0-.4, E965.0-.4, E970, E985.0-.4. Inpatients of all ages admitted to Bronson's Level I Trauma Center from January 2002 to May 2013 who met inclusion criteria were retrospectively reviewed and assigned to one of three mechanisms of injury: assault, self-inflicted, or accidental. Gender, age, mortality, and hospital charges were collected. Patient characteristics and related outcomes were summarized using descriptive statistics.

RESULTS: Overall, 268 patients met inclusion criteria; 246 males (92%) and 22 females (8%), with age range of 3-91 years, mean 30 ± 16 , mortality 23%. There were 176 patients in the assault category with 92% males, age range 3-58 years, mean 25 ± 21 , mortality 18%. The largest concentration of patients was in the male 20-29 year age group. There were 59 self-inflicted firearm injuries, predominately male (92%), age range 14-91 years, mean 46 ± 21 , mortality 49%, with the predominant age range being 20-29 year old males. Of the 33 accidental firearm related injuries there were 91% males; age range 5-78 years, mean 26 ± 16 , mortality 6%. The leading age group was the male 20-29 year olds. Total hospital charges for the entire cohort were \$11,134,597.00. Hospital charges tallied \$6,927,963.00 for assaults; \$3,377,178.00 for self-inflicted; and \$829,456.00 for accidental mechanisms.

DISCUSSION: Firearm injuries related to assaults occurred most frequently, had the second lowest mortality, and were the most costly. Young males in the 20-29 year old age group were the most involved. Self-inflicted injuries were both the second most common and costly, but carried the highest mortality. While the 20-29 year old males were the most frequent victims of self-inflicted injury, our data demonstrated that suicides continue to be a profound problem among all ages. Accidental firearm related injuries were the least frequent and least costly of the three mechanisms studied. Once again, the male 20-29 year olds remain the leading cohort. These data would suggest that interventions aimed at 20-29 year old males should be a priority. Multiple targeted interventions are necessary to address the three firearm related mechanisms involved. Collaboration between the medical, legal, and political entities in our community is paramount. Additionally, the victims of self-inflicted injury were spread across multiple age groups and addressing this complex issue will require greater mental health intervention.

CONCLUSION: Firearm related injuries and deaths in southwest Michigan are a reflection of the greater problem in our country. The cost to our community from both an economic and social perspective is immense. Further studies are warranted to fully comprehend the complexity of this issue in southwest Michigan.

COMPLETE NEPHRECTOMY AND SPLENECTOMY - THE END RESULT OF A STAGHORN CALCULUS

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INTRODUCTION: A subset of renal calculi, sometimes referred to as ‘infection stones’ form as a result of a bacterial infection, as opposed to metabolic disturbance. Struvite stones, which constitute 10 to 15% of all renal stones, remain difficult to diagnose due to non-specific symptoms. Furthermore, treatment and resolution is notoriously difficult due to their branching, invasive nature. A lower urinary tract infection by urease producing organisms instigates the process. As little as six weeks is enough for the stone to invade the entire renal pelvis and calyces. Despite these stones being visible on plain x-ray and CT scan, missed diagnosis is possible and can cause extensive morbidity. Here is a case of a patient with a complicated staghorn calculus that caused solitary kidney failure necessitating a unilateral nephrectomy with total splenectomy.

CASE REPORT: A 26-year-old female presented with a history of objective fever, chills and left flank pain for one day. She had a history of previous left sided pyelonephritis three years ago and multiple recent episodes of acute cystitis, all treated with oral antibiotics as outpatient. Given the history of repeat infections, a CT abdomen was done. This revealed a complicated left staghorn calculus, with signs of chronic obstruction in the left kidney. In addition, there was a complicated left perinephric abscess extending into the spleen. On hospital day one, a left nephrostomy tube and splenic drain were placed. Culture from these sources grew *Proteus mirabilis*. The urine culture was negative. A conservative approach was taken to treat with parenteral antibiotics to resolve the abscesses before any attempted stone excision. Re-imaging on day six showed a persistent abscess in the kidney and spleen. On day 11, a nuclear renogram with flow imaging demonstrated no appreciable function of the left kidney and mildly impaired function of the right kidney. Since patient’s left kidney had failed and would remain a nidus of infection without definitive treatment, it was decided to remove the kidney itself. The perinephric abscess extending into the spleen also failed conservative treatment, and a splenectomy was thus planned. On day 13, patient underwent an open left nephrectomy and splenectomy. Renal function remained normal and she was discharged after 18 days in the hospital.

DISCUSSION: Unlike other renal stones, staghorn calculi are often asymptomatic, without the typical renal colic symptoms. The diagnosis is frequently missed until complications that warrant imaging arise, such as suspicion of urosepsis in our patient. Urine culture is also unreliable in elucidating the causative organism. Up to 30% of the time, the organism growing in urine culture is discordant with the one causing calculus propagation, affecting appropriate antibiotic selection. The large obstruction also prevents infection from reaching the distal urinary tract, rendering a urine culture negative, as seen in this case. This can further lower suspicion of an infectious etiology of the stone. Given the advanced findings in this patient, the stone was likely chronic in nature. Thus, this case was too advanced to allow for renal preservation. With these non-specific symptoms, clinicians must rely heavily on evidence based guidelines and clinical suspicion for timely diagnosis. Recurrent infection with known urease producing organisms, such as *Proteus mirabilis*, of which 100% of isolates produce urease, should elicit further investigative imaging as per the Canadian Urologic Association (CUA). Another clue can be persistently basic urine and the characteristic magnesium ammonium phosphate crystals on urinalysis in the setting of infection. The CUA has listed criteria for when to obtain imaging for recurrent urinary tract infections. Of their listed criteria, our patient had one: recurrent pyelonephritis at time of presentation. Unfortunately, the damage to her Left kidney was by now irreversible.

CONCLUSION: Staghorn Calculi remain difficult to diagnose because of their vague symptoms. This case highlights the importance of knowing indications for imaging for recurrent urinary tract infections. Further, all physicians should maintain a high index of suspicion of this complication, which arises from a seemingly routine infection. As demonstrated here, a missed diagnosis can be devastating.

HEAT EXHAUSTION IN A PEDIATRIC PATIENT WITH ANHIDROSIS

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INTRODUCTION: Sweating is the primary thermo-regulatory mechanism by which the body lowers its internal temperature via evaporative heat loss. However, people with anhidrosis (acquired or congenital), have an impaired ability to produce sweats, and if unrecognized, especially in children, may become a medical emergency.

CASE REPORT: We describe a 4-year-old male with history of Eczema and Pityriasis Alba who presented with symptoms of heat exhaustion. Mother reports patient has never sweated in his life. He did not exhibit phenotypic features characteristic of ectodermal dysplasia. His sensation to pain was intact. Thyroid Function Test, Basic Metabolic Panel, and Alpha galactosidase assay were normal, making hypothyroidism and Fabry's disease unlikely. A quantitative sudomotor axon reflex test (Q-SART) only produced trace amount of sweats from forearm, proximal leg, and foot. Although there are no established normative data for Q-SART results below age 10, the results were consistent with anhidrosis. Evaluation by a Pediatric Dermatologist with expertise in anhidrosis at Northwestern University reached the same conclusion; no further testing (including skin biopsy) was advised because the diagnosis was clear and further testing would not change medical management. Expert opinions by physicians from other major medical institutions were also in agreement. Patient was advised to follow up in 10 years in hopes that genetic testing would be available then and possibly provide implications for patient's future offspring.

DISCUSSION: Anhidrosis is a rare disease where individuals are unable to produce sweats. It can be congenital or acquired. Causes include congenital dysplasia of sweat glands, metabolic disorders (such as Fabry's disease), connective tissue disease (such as Sjogren's), skin damage, conditions that cause nerve damage, or certain drugs. In this case, it appears to be isolated congenital anhidrosis. Anhidrosis, left unrecognized, especially in pediatric population who are unable to verbalize their symptoms or lack the means to cool themselves, may become a medical emergency, leading to hyperthermia, heat stroke, heat exhaustion, or death. All of these complications are easily preventable by raising caretaker's awareness of medical condition, maintaining adequate hydration, avoidance of hot environments, staying in cool environments, and having the means to cool the body readily available.

CONCLUSION: Anhidrosis is a rare disease that left unrecognized, especially in a pediatric patient, may become a medical emergency. Complications of the disease are easily preventable with readily available means.

COLLEGIATE FOOTBALL MOVEMENT DISORDER

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CASE HISTORY: An 18-year-old, right hand dominant, Asian-American male collegiate football player was witnessed by athletic training staff during a blocking drill to have uncontrollable, tonic movement involving right-side of body with associated facial grimace. Upon furthering inquiry, the athlete admitted to multiple similar episodes over the last year, becoming progressively more frequent, described as ‘freezes’. Episodes most commonly occur when he is inadequately warmed up, conducting explosive type movement. He states he feels them coming on occasionally, although he has no other associated symptoms such as headache, nausea/vomiting, aura, or change in mental status. The episodes result in paralysis of his right arm, feeling like deadweight, as well as paralysis of his right leg although not resulting in falls. Multiple players and even a coach had witnessed these episodes, stating his arm appeared contracted and he was forced to end a drill early due to symptoms. No previous history of seizures, concussion, loss of consciousness associated, or back/neck pain. No other significant neurological involvements or symptoms. A previous workup had been conducted approximately one year ago in August 2013. At that time he was seen for right-sided numbness, episodes lasting 5-10 seconds, described as ‘freezes’. Diagnosed with myoclonus, cleared without restriction for sports participation.

PHYSICAL EXAM: Immediately following a purposely induced ‘freeze’ episode which last 10 seconds, the athlete was examined. He was alert and oriented x3, cranial nerves II-XII fully intact, without focal deficits. Ambulation and stance normal. Romberg negative. No Dysidokinesia, finger-nose-finger testing normal. Heel-shin rub normal. No reproduction of dystonic movement of right upper extremity with blood pressure cuff inflated for 1 minute, hyperventilation, or attempted startle response. No graphesthesia bilat. Normal proprioception of upper and lower extremities bilateral. Intact sensation throughout upper and lower extremity bilateral.

DIFFERENTIAL DIAGNOSIS: Vascular anomaly, stroke, partial complex seizure, spinal stenosis, muscle cramps

TESTS AND RESULTS: CBC with differential and CMP normal, CPK elevated at 668, ANA Titer: 1:80, speckled pattern. EEG and an EMG of the right upper and lower extremities were normal. MRI brain and cervical spine normal. Video footage was obtained of the movement disorder after purposeful exacerbation with 40 yard sprint with athlete improperly warmed up.

CONCLUSION: Review of video evidence by neurologist Dr. Crooks indicated that athlete was experiencing sporadic, involuntary movements resembling dystonia, exacerbated by sudden explosive movements. These symptoms and their exacerbation were characteristic of paroxysmal kinesigenic dyskinesia. After obtaining baseline CBC with differential and hepatic panel, Athlete was started on carbamazepine 200mg PO once daily. One week following start of carbamazepime, the athlete underwent rigorous testing, repeating previously exacerbating exercises under inadequately warmed up conditions. No recurrence of symptoms resulted. Demonstrating resolution of dystonic movements with use of carbamazepime, the athlete was determined to be able to safely protect himself during contact drills. The athlete was slowly progressed back to full participation without restrictions, requiring CBC and hepatic enzyme monitoring every 6 months on medication therapy.

DIAGNOSIS AND MANAGEMENT OF ESOPHAGEAL ADENOCARCINOMA: A CASE REPORT AND LITERATURE REVIEW

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INTRODUCTION: Esophageal cancer accounts for about 1% of cancers and 1.8% of cancer deaths worldwide. While squamous cell carcinoma of the esophagus remains the most common histologic type of esophageal cancer worldwide, esophageal adenocarcinoma has become the predominant type in the United States since the 1970s, now accounting for 70% of new cases. The increasing trend of esophageal adenocarcinoma in the United States has been seen with increasing rates of gastroesophageal reflux (GERD) and its related factors of obesity and Barrett metaplasia. GERD initiates a sequence of intestinal metaplasia (Barrett esophagus) in the distal third of the esophagus that progresses to low grade dysplasia, high grade dysplasia, and eventually adenocarcinoma. For patients with symptoms of reflux, studies have shown an odds ratio of 7.7 for development of adenocarcinoma with recurrent symptoms compared to 43.5 increased odds ratio for those who defined their symptoms as severe. The annual risk of adenocarcinoma in Barrett esophagus is 0.5% per year. In pathologic analysis of patients with high grade dysplasia who underwent resection, 40% had evidence of invasive cancer making the early detection and treatment of Barrett metaplasia important. Obesity with body mass index (BMI) greater than 30 kg/m² has an odds ratio of 16.2 for developing adenocarcinoma compared to those with BMI less than 22 kg/m². It is an aggressive malignancy which results in less than half of patients eligible for resection at diagnosis. The overall 5 year survival rate is 17.3% with highest rates among those with local disease (38.7%) and the lowest among those with metastatic disease (3.5%).

CASE REPORT: A 63 year-old male presented to clinic with dysphagia and weight loss for 3 months. He had an esophagogastroduodenoscopy which demonstrated a mass in the lower esophagus, 2 centimeters above the gastroesophageal junction. He had an endoscopic ultrasound which demonstrated T2N1 disease. He then had positron emission tomography/computed tomography scan for distant metastatic work up which was negative. Given his staging he was referred for neoadjuvant therapy. Following completion of this he was restaged and deemed to be suitable for resection. He tolerated this well and was seen in follow up at 3 months.

DISCUSSION: The mainstay of treatment for Stage I tumors is surgical resection given the lower incidence of lymph node metastases and ability to obtain an R0 resection. The risk of lymph node metastases in T2 tumors and above approaches 80% which is why patients with these tumors should have multidisciplinary evaluation and neoadjuvant therapy. 15-30% of patients will have a pathologic complete response (pCR) to neoadjuvant chemoradiation therapy. Patients that have a pCR have a 50% survival rate at 3 years versus 27% for those without a pCR. Preoperative treatment with sole radiation therapy has not proven any survival benefit compared with surgery alone. Chemotherapy and combination chemoradiation therapy, however, have been shown to be beneficial. The MAGIC trial evaluated patients with Stage II disease with tumors located in the proximal stomach, esophagogastric junction, and distal esophagus. The survival rate for the group with neoadjuvant treatment was 36% and in the surgery only group it was 23%. Both groups had similar perioperative complication rates. The CROSS trial evaluated the use of preoperative chemotherapy with carboplatin and paclitaxel as well as radiation therapy. 29% of patients in this study had a pCR. 92% went on to have an R0 resection compared to 69% in the surgery alone group. Survival was 49 months versus 24 months for patients in the neoadjuvant therapy group.

CONCLUSION: In the past, surgical resection for early stage esophageal cancer was standard of care. With advances in chemotherapy and radiation therapy, new algorithms for the treatment of esophageal cancer have introduced neoadjuvant therapy. The ability to induce a pCR in patients undergoing neoadjuvant therapy prior to resection has been shown to have a survival benefit.

RARE CAUSE OF HEADACHE IN A CHILD

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INTRODUCTION: Headache is a common complaint in children presenting to the emergency department (ED). By age 18 years, more than 90 percent of children report having had a headache. These in children can be categorized as a primary syndrome (ie, migraines, tension headaches) or secondary to an underlying medical condition (ie, febrile illness, sinusitis, upper respiratory tract infection (URTI), intracranial mass, or central nervous system infections such as meningitis, abscess, or subdural empyema (SDE)). We present a rare case of SDE presenting with a headache, fever of 101.7 degree Fahrenheit, and an episode of seizure.

CASE REPORT: A 7-year-old male brought in to the ED by EMS after having a witnessed seizure at school. The patient was initially found to be postictal by EMS, however was alert, oriented, and talking during the ride to the ED. He had no recollection of the seizure or the events that took place thereafter. As per the parents, he had complained of an intermittent right-sided frontal headache for the past 2 weeks. The patient had 'flu-like' symptoms including low-grade fevers, sore throat, congestion, fatigue, nausea, and vomiting, which had resolved 2 weeks ago. On arrival to the ED, the patient was alert and oriented with an unremarkable physical exam. His vitals were significant for a temperature of 101.7 deg F. A CT Brain without contrast revealed a right frontal subcortical low-attenuation focus. The differential diagnoses for the findings were broad and therefore a MRI Brain with and without contrast was recommended. The MRI revealed a right anterior frontal lobe SDE with reactive cerebritis. He was started on Vancomycin, Metronidazole, and Ceftriaxone after consulting infectious disease. Neurosurgery recommended right frontal craniotomy with evacuation of the SDE. This was performed on hospital day 2 without any complications. Blood and subarachnoid tissue cultures showed no growth. Patient remained afebrile and had no seizures during the hospital stay. He was discharged home with a PICC line for a 30-day course of antibiotics.

DISCUSSION: Subdural empyema is an uncommon cause of secondary headaches in the pediatric population. It accounts for 15-20% of all intracranial infections. This is an intracranial focal collection of purulent matter between the dura and arachnoid matter. Before antibiotics, the mortality was 100%. Now, the mortality has decreased to 14-28%. SDE is more common in males and two thirds occur between the ages of 10 and 40 years. SDE is a known, but rare, complication of bacterial sinusitis. In our case, it was hypothesized that the patient may have had bacterial sinusitis after the resolution of his URTI, leading to direct extension or retrograde thrombophlebitis via the diploic veins into the subdural space. Infections are often polymicrobial with the most common organisms being aerobic and anaerobic streptococci, staphylococci, or Haemophilus influenzae. Patients often present with headache, nausea, vomiting, altered mental status, and new-onset seizures. The treatment includes prompt initiation of intravenous antibiotics and neurosurgical consult for craniotomy for evacuation of the empyema.

CONCLUSION: Majority of children who present to the ED for headaches are diagnosed with benign etiologies such as a viral illness or migraine headaches. SDE are neurosurgical emergencies that require prompt recognition and management to salvage a good functional neurologic outcome. These lesions progress rapidly and can lead to coma and death within 24 to 48 hours if untreated. Therefore, physicians should always have a low threshold for further testing if serious secondary causes of headache are suspected to reduce morbidity and mortality.

RARE CAUSE OF FAILURE TO THRIVE IN AN INFANT

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INTRODUCTION: Failure to thrive (FTT) is characterized by inability to gain weight appropriately as determined by the growth chart. One of the rare causes of failure to thrive is nutritional deficiency rickets, especially in children less than 2 years of age. According to CDC, 5 per 1,000,000 children between ages 6 months and 5 years have rickets, seen mainly in African American children and those who are exclusively breastfed. Although since it is not a reportable disease in the United States, 208 cases have been reported since 1985.

CASE REPORT: We report a case of a 9 month-old African-American male who presented to the ED from his primary care physician's office due to failure to thrive for the last four months. The mother reported that the patient had been more lethargic for the last two days. He was exclusively breastfed since birth without Vitamin D supplementation. He had normal amounts of wet diapers and stools per day. In the ED, his vital signs were normal. On examination, he had a cachectic appearance with muscle wasting. He was developmentally delayed for gross motor and speech skills. He had frontal bossing of his head, soft skull bones, and open anterior and posterior fontanelle. He had pectus excavatum and rachitic rosary of the anterior ribs. Knee X-ray showed fraying of the metaphyses of the knees bilaterally, which was consistent with rickets. Initial labs were significant for alkaline phosphatase of 3308 U/L, vitamin D level of 6 pg/mL, PTH of 508.5 pg/mL and corrected calcium of 7.8 mg/dL. He was admitted for FTT and initiating the treatment for vitamin D deficiency rickets. Patient's daily caloric intake was calculated for goal feeds. He was not breastfeeding well and did not use the bottle. Therefore, mom pumped breast milk for Nasogastric tube feeds and the rest was supplemented with formula to meet goals. A complete malnutrition work-up including celiac panel, TSH, lead level, Cystic fibrosis, fecal fat, IgG and IgA levels showed no abnormalities. Also, renal tubular acidosis was ruled out. Once patient received adequate Vitamin D supplementation along with calcium and phosphorus, his weight increased 1.5 kg over the course of the month. He was then discharged in a stable condition.

DISCUSSION: In this case, patient met the criteria for failure to thrive. Although FTT can be multifactorial, Vitamin D deficiency rickets was likely the main contributor. Initial serum alkaline phosphatase level of greater than 3000, low phosphorus and high PTH level is suggestive of calcipenic rickets. Low Vitamin D level confirmed the diagnosis of Vitamin D deficiency Rickets. Patient was followed closely for weight gain and monthly labs. Three months after the treatment was initiated, follow-up imaging of the knees and chest were done to assure proper healing of rachitic lesions. Vitamin D deficiency rickets is a rare but treatable cause of failure to thrive. With early diagnosis and treatment, long-term permanent consequences can be prevented.

RARE CASE OF RENAL CELL CARCINOMA METASTASIS TO PAROTID GLAND AND EXTERNAL JUGULAR VEIN 15 YEARS LATER RESECTION

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INTRODUCTION: Renal cell carcinoma(RCC) is the most common primary neoplasm of the kidney. Common metastasis sites include lungs, liver and brain. Late metastasis 10 years after the curative nephrectomy is very rare. Vascular invasion into the external jugular vein is also very rare with less than 20 cases reported in literature. We report a case of renal cell carcinoma metastasis in the parotid gland and external jugular vein, 15 years after radical nephrectomy in a 83 year old man.

CASE REPORT: 83 year old Caucasian man with past medical history of hypertension, hyperlipidemia, left RCC 15 years back status post left nephrectomy presented with a 2cm x 2cm painless left parotid swelling which gradually progressed over 4 months. Ultrasound revealed tumor thrombus in the left external jugular vein with extension in to other branches. CT soft tissue of neck revealed asymmetric contrast enhancement in the left masticator, retromandibular and external jugular vein. Fine needle aspiration cytology was consistent with metastatic RCC. He underwent partial left parotidectomy and excision of left external jugular vein with dissection of cranial nerve VII. Gross Pathology showed the 2.2x1.0x1.0cm mass extending into the lumen of the vein. Given his age and extent of tumor, he was treated also with radiation therapy. He was started on Pazopanib and switched to VOTRIENT. Patient is being followed at the cancer center regularly and has been doing well for 2 years.

DISCUSSION: Renal cell carcinoma, especially clear cell, gains access to the venous system as the initial route of extrarenal spread. Intravenous growth can involve extrarenal veins or renal veins but it is extremely rare to metastasize and involve the head and neck veins. Considering the fact that kidneys receive 25% of circulating blood volume, they are hypervascular tumours associated with multiple arteriovenous shunt, with a high expression of vascular endothelial growth factor(VEGF), the platelet-derived growth factor receptor and basic fibroblast growth factor(bFGF), good adaptive potential in a diverse array of microenvironments, RCC has a high hematogenous spreading potential. However, an alternative theory postulates that tumor emboli may spread through Batson's paraspinal venous plexus, bypassing pulmonary vascular filtration and reaching head and neck. There have been case reports of unusual sites of metastasis of RCC to main pancreatic duct, biliary thrombus, superior sagittal sinus. However, unusual metastatic sites like head and neck region with late metachronous metastases (>10 years) are extremely rare.

CONCLUSION: Hence metastasis from RCC must always be in the differential for any vascular presentation in a patient with a history of RCC.

CRYPTOCOCCUS NEOFORMANS MENINGITIS IN AN IMMUNOCOMPETENT HOST – RARE BUT BECOMING LESS UNCOMMON

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Introduction: *Cryptococcus neoformans* is one among the two common pathogens involved in cryptococcosis the other being *C.gattii*. Meningitis and meningoencephalitis are the most common forms of infection and portal of entry is respiratory tract and source of infection is droplet, most commonly pigeon droppings. Though it is most commonly seen in immunocompromised individuals it is becoming more common in general population as well which makes us think is it becoming more virulent? Here we present a case of Cryptococcal meningitis in a 67 year old man and discuss the latest mechanisms of pathogenesis.

Case description: A 67-year-old man with past medical history significant for coronary artery disease with stents, hypertension, atrial fibrillation admitted with complaints of intermittent episodes of confusion and headache. Initial blood tests and CT of brain were unremarkable. Lumbar puncture was obtained, CSF analysis showed 10 RBC, 303 WBC, 96 mononuclear cells, 4 Neutrophils, Glucose of 11 , Protein of 97, Cryptococcal antigen is positive and fungal culture grew *Cryptococcus neoformans*. All other bacterial and viral studies on CSF were negative. Patient was started on Liposomal Amphotericin B and 5-Fluorocytosine. Amphotericin was stopped secondary to acute kidney injury after a week. Patient was discharged on fluconazole to be continued for 12 months. Patient's symptoms improved significantly after the treatment but unfortunately two months later patient passed away secondary to septic shock and multi-organ dysfunction from hospital acquired pneumonia.

Discussion: Cryptococcal meningoencephalitis is mostly seen in immunosuppressed patients. However, rare case reports exist where it can affect immunocompetent hosts. The source of infection is through inhalation, disseminates hematogenously and has a propensity to localize to the central nervous system (CNS). Pathogenesis is believed to be due to production of mannitol, which contributes to brain edema, and inhibition of phagocyte function. More often case reports indicate *C. gattii* as the common source of infection for cryptococcal meningitis in immunocompetent hosts. One case review series of cryptococcal meningitis in Australia found that 35 of 118 cases occurred in immunocompetent patients. 25 percent were caused by *neoformans* species. Treatment includes combination therapy with Amphotericin B and 5-flucytosine should be administered for 6 weeks intravenously followed by a further 6–18 months of oral treatment with fluconazole

This case report emphasizes the broadening of the differential when previously healthy patient present with nonspecific CNS symptoms, fungal etiology should be considered with low glucose and high protein in CSF, as it has very high mortality rate.

HISTORICAL ADVANCES IN INFECTIOUS DISEASES MANAGEMENT AS A SPRING BOARD FOR GENERAL MEDICINE

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INTRODUCTION: In the pre-immunization, pre-antimicrobial eras, even in the Western World, the morbidity and mortality of infectious diseases impacted greatly on humanity. Specific advances made in the management of certain infectious diseases dramatically impacted the mortality of the infection and these modalities subsequently spilled over into the mainstream of disease management in many other fields of medicine.

RATIONALE: To illustrate how advances in the management of certain infectious diseases, as examples poliomyelitis, diphtheria and cholera, have been widely applied outside of the discipline of infectious diseases into many other aspects of medical care.

REVIEW OF LITERATURE: Poliomyelitis and Artificial Respiration: Viral induced anterior horn cell neuron destruction related to the respiratory muscles caused respiratory failure and death during the polio outbreaks of the 20th century. In 1928' Drinker and Shaw developed the first "iron lung" which was improved upon in 1931 by Emerson. These negative pressure ventilators were the forerunners of the positive pressure respirators of today used in a spate of respiratory failure conditions. Diphtheria and Airway Management: Although tracheostomies have been used for centuries in the management of upper airway obstruction, in 1880 Macewen described a less invasive procedure passing an oral tube into the trachea. A few years later, O'Dwyer developed a metal tube that could be placed orally to treat upper airway obstruction caused by pseudo membrane formation and mucosa edema caused by diphtheria. Further adaption of the O'Dwyer tube has led to today's endotracheal tube used in a myriad of causes of respiratory failure Cholera and Fluid/Electrolyte Management: The cause of death in *Vibrio cholerae* infection is toxin-induced fluid and electrolyte loss. Watten developed the Watten cot to adequately divert the watery diarrhea so that it can be assessed both for volume and for electrolyte content. Replacement of the fluid and electrolytes by either intravenous or oral route prevented death and was the start of aggressive fluid and electrolyte management in many area of clinical medicine.

ANALYSIS OF RESULTS: Specific manipulations of care in the management of certain infectious diseases clearly have had utility in other fields of medicine

CONCLUSION: Although poliomyelitis, diphtheria and, to a lesser extent cholera, have been prevented by the use of safe and effective immunization programs, the advances made in the management of these infections have widely improved the management of other, non-infectious processes.

LADY WINDERMERE SYNDROME DUE TO MYCOBACTERIUM ABSCESSUS

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INTRODUCTION: Lady Windermere's Fan, A Play About a Good Woman is a four-act comedy by Oscar Wilde was first produced in 1892. The protagonist 's name has been adopted to describe a syndrome of nontuberculous mycobacterial pulmonary infection in elderly women. We present a case of Lady Windermere syndrome associated with a rapid growing mycobacterium, *Mycobacterium abscessus* who responded well to therapy until other medical conditions intervened.

CASE REPORT: An 83 year old Caucasian female without known immunocompromising illnesses, was evaluated in Infectious Diseases clinic for persistent weight loss thought to be related to chronic pulmonary infection with a nontuberculous mycobacterium. by history, she had had a similar illness 4 years before and was diagnosed with Lady Windermere Sydrome due to *Mycobacterium avium-intracellulare* and responded to ethambutol/rifampin/azithromycin. Her illness was associated with increasing lower lobe pulmonary infiltrates, minimal coughing and a weight loss necessitating the placement of a gastronomy tube for nutrition. Respiratory secretions now were positive for *Mycobacterium abscessus* and a change in antimicrobial therapy to ciprofloxacin/doxycycline/clarithromycin resulted in. A 2.4 kg weight gain, corresponding to an increase of 6.5% of body weight and obviating the need for the gastronomy. She tolerated the medications without incident but eventually required for therapy related to progressive dementia.

DISCUSSION: Reich and Johnson first used the term 'Lady Windermere syndrome' in 1992. They described 6 elderly women who were immunocompetent, had no significant smoking history or underlying pulmonary disease, and developed *Mycobacterium avium* complex (MAC) pulmonary infection limited to the right middle lobe or lingula. They hypothesized that these women could have had the habit of voluntary suppression of cough, responsible for the inability to clear the secretions from the right middle lobe and lingula. This habit results in a focus of inflammation in these areas, which in turn predisposes to MAC infection. They named this condition Lady Windermere Syndrome to suggest the fastidious behavior. Although our patient had previously been treated for this syndrome associated to MAC, she presented to our clinic and had only *Mycobacterium abscessus* isolated from several respiratory cultures. With antimicrobial therapy aimed more at *M. abscessus*, she began gaining weight and improved clinically, avoiding PEG placement until dementia intervened. Few cases of this entity are due to other mycobacteria. Rapid growing mycobacterium should be considered in the differential diagnosis.

CONCLUSION: Although MAC is reported to be the most common cause of Lady Windermere Syndrome, other mycobacterium may be causal as well, as in this case. Appropriate therapy postponed the need for a gastronomy until dementia intervened. Being aggressive in the treatment of this entity can be quite productive even with a difficult to treat organism. The most celebrated line in the play, "We are all in the gutter, but some of us are looking at the stars" illustrates that aiming at the stars can be useful in the therapy of difficult to treat illnesses.

ADULT BRAIN ABSCESS FOLLOWING ESOPHAGEAL DILATION: AN UNCOMMON ASSOCIATION

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INTRODUCTION: Pyogenic brain abscesses can be caused by contiguous spread from sinus infection, from trauma, or from a more remote focus related to bacteremia such as dental or pulmonary infection. We present a man with brain abscesses that developed after esophageal dilatation related to eosinophilic esophagitis.

CASE REPORT: A 41 year old man was admitted to the hospital in September 2014 with right upper and lower extremity weakness, expressive aphasia and slurred speech. A brain imaging study revealed 2 ring enhancing lesions in the left frontal lobe consistent with infection. A month prior to this presentation, he was evaluated for some dysphagia and found to have an esophageal stricture associated with eosinophilic esophagitis and balloon dilation was performed a week prior to the development of CNS symptoms. Stereotactic aspiration of the larger abscess revealed purulent material, Gram stain revealed many PMNs, many Gram negative bacilli and some Gram positive cocci in chains. Culture revealed *Streptococcus constellatus* aerobically and *Fusobacterium* anaerobically. He was treated with ceftriaxone and metronidazole and his neurological symptoms resolved. The patient received 28 days of intravenous antimicrobials and when seen in Infectious Diseases clinic at the end of therapy, he was asymptomatic and his followup CNS imaging study revealed resolution of the lesions.

DISCUSSION: Transient bacteremia during and after endoscopic procedures is a well-documented phenomenon but rarely result in serious bacterial infection, primarily endocarditis in individuals with underlying valvular pathology. Brain abscesses following esophageal dilatation are quite rare and when described have been in children with dilation for caustic strictures. This association in adults is quite rare. The alpha-hemolytic streptococcus *S. constellatus* is part of the *Streptococcus anginosus* (or *S. milleri*) group that are more invasive than other alpha-hemolytic streptococci, behaving more like their beta-hemolytic counterparts. This organism and *Fusobacterium* are part of the normal oral flora and have been associated with brain abscess frequently.

CONCLUSION: Pyogenic brain abscess should be considered as a potential complication of esophageal dilation in the adult as well as in children. A case related to *S. constellatus* and fusobacteria is described.

PARAPHYTONOSIS: RHIZOBIUM RADIOBACTER, A PLANT PATHOGEN CAUSING HUMAN DISEASE

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INTRODUCTION: Although certain animal pathogens can jump species barriers and infect humans (zoonoses) and many of the newly emerging pathogens fit into this grouping, much less is known about the ability of pathogen pathogens to infect humans, either through direct contact or otherwise. We present a case of a human vascular device infection with the plant pathogen *Rhizobium radiobacter* and review the literature.

CASE REPORT: A 59 year old man was admitted to a hospital in September 2014 for fever and mild neutropenia. He had been diagnosed as having adenocarcinoma of the lung shortly before this admission and had a port placed for chemotherapy and had received three cycles prior to this admission. The patient reported that within hours after the second and third treatments, he developed undifferentiated fever and rigors lasting no more than 12 hours. After admission, he remained afebrile except when the port was accessed and flushed to obtain blood for culture. His physical examination was unremarkable and the port site reviewed no tenderness, erythema or swelling. His initial WBC was 3.2K (94% PMNs) and his blood cultures (2 from the port) and 1 of 3 peripherally grew a nonlactose fermenting Gram negative bacillus identified as *Rhizobacterium radiobacter*. The port was explanted and the same organism was cultured from the catheter tip. He remained afebrile and completed a 14 day course of levofloxacin without recurrence. The patient denied any specific contact with soil or plants, including legumes.

DISCUSSION: The members of the bacterial family Rhizobiaceae have a unique ability to induce cortical hypertrophy on plants. The genera *Rhizobium* and *Bradyrhizobium* are well-known nitrogen-fixing bacteria associated with legumes. *Rhizobium* (formerly *Agrobacterium*) *radiobacter* has been recognized to infect humans rarely without first case reported in 1980. It has primarily been associated with infections of intravascular devices (as seen in this case) but has also been reported to cause endocarditis, pneumonia, empyema, peritonitis and endophthalmitis, primarily in otherwise debilitated individuals. No direct association with environmental exposure has been reported.

CONCLUSION: We have coined the term paraphytonosis to describe a human infection with a pathogen well recognized to infect plants. It has not been shown that there is a direct transmission from plant to man which is also the case for *Burkholderia cepacia*, the cause of onion root rot that causes pulmonary infections in man, especially in cystic fibrosis patients. More descriptive work is needed to better compare human and botanic isolates of such organisms.

LEFT VENTRICULAR PSEUDOANEURYSM PRESENTING AS TO-AND-FRO MURMUR FOLLOWING MITRAL VALVE REPAIR

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INTRODUCTION: Left ventricular pseudoaneurysm is a rare complication of both acute MI and cardiac surgery, with case reports scattered throughout the literature. The majority of cases present symptomatically with chest pain and dyspnea.

CASE REPORT: A 31 year old woman with past medical history significant for SLE with nephritis was 3 weeks post-op from mitral valve repair (MVR) [complicated by hemopericardium requiring repeat surgery] due to *granulicatella adiacens* endocarditis presented in routine follow-up to her cardiothoracic surgeon. She denied any symptoms but a new murmur was present, described as 3/6 holosystolic with accompanying 2/4 diastolic murmur, both best heard at the base, without significant radiation. The remainder of the exam was unremarkable. Due to concerns of valve dehiscence, urgent 2D echo was performed which revealed preserved EF and perhaps mild rocking of the MVR. On the lateral wall of the LV a large pseudoaneurysm with bidirectional flow was present. Further characterization with cardiac MRI demonstrated lateral wall midcavity 8 x 12 mm defect with 50 x 70 x 80 mm pseudoaneurysm (images to be included). She remained clinically stable throughout the evaluation but was quickly transferred to a quaternary center for definitive repair. Several months post-operatively she continues to be symptom-free with excellent functional status.

DISCUSSION AND CONCLUSION: A new asymptomatic murmur in a patient with recent cardiac surgery should prompt the clinician to consider pseudoaneurysm as a possible complication. As our patient had multiple comorbidities (and thus multiple subspecialists to see in follow-up), any of these physicians could have been the first to detect this finding. Early detection is paramount as 30-45% of pseudoaneurysms are prone to rupture with resultant high morbidity and mortality.

DISSEMINATED VISCERAL VARICELLA ZOSTER (DV-VZV) MASQUERADING AS GASTROINTESTINAL ISCHEMIA

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INTRODUCTION: DV-VZV is a rare but recognized clinical syndrome seen most often in immunocompromised patients manifesting as acute hepatitis or pneumonitis.

CASE REPORT: Here we present an 83 year old woman with history of indolent chronic lymphocytic leukemia (CLL), not on chemotherapy, in otherwise excellent health until an abrupt onset of severe epigastric abdominal pain lead to hospital presentation. On admission she was found to be in new-onset atrial fibrillation (AF) with pain out of proportion to physical findings, leading to presumptive diagnosis of non-occlusive gastrointestinal ischemia (celiac vs. mesenteric distribution). Acute kidney injury made confirmation with CT angiography untenable so conservative supportive management ensued. Over the next two days she developed transaminitis and elevated lipase prompting GI consultation and endoscopy which revealed distal esophageal ischemia not amenable to biopsy. Her renal function and hemodynamics progressively worsened and 48 hours later she was transferred to the medical ICU, intubated, and placed on vasopressor support. Evaluation at that time revealed mild lactic acidosis and a new macular non-blanching rash across the trunk which was promptly biopsied. Despite aggressive supportive care, her hemodynamics precipitously worsened, leading to worsening renal failure, development of anasarca, and finally death. Not until the day of death did the skin lesions reveal a more typical vesicular pattern of VZV. At autopsy, acute fulminant hepatitis and necrotizing adrenalitis were discovered in sections that stained positively for VZV by immunohistochemistry (photomicrographs to be included). Pancreatitis and viral cytopathic changes in the lung were also demonstrated.

DISCUSSION AND CONCLUSION: In an octogenarian presenting with abdominal pain and new-onset AF one may very reasonable expect gastrointestinal ischemia. However, in an immunocompromising condition (in this case, CLL even without active chemotherapy), clinicians must have a high index of suspicion for rare infectious processes. As demonstrated by this unfortunate case, rapid decompensation can occur if a prompt diagnosis is not made.

FINGER AMPUTATION AFTER INJECTION WITH LIDOCAINE AND EPINEPHRINE

Todd Ruiter, Nicholas Miladore, Thomas Harter, Alice Neafus, Michael Kasdan

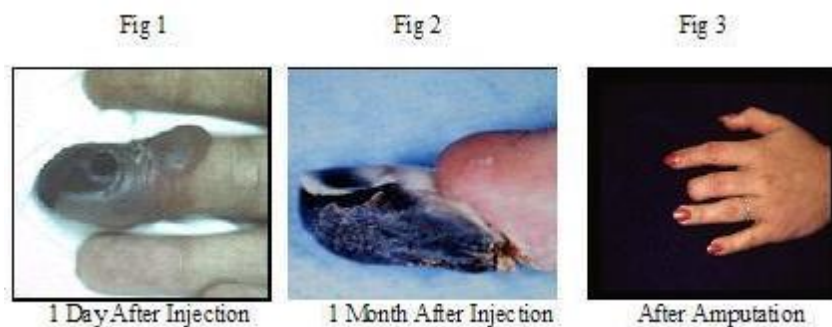
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INTRODUCTION: Hand surgeons routinely use lidocaine with epinephrine for digital anesthesia in elective and emergency hand surgical operations. We are unable to find another reported case of finger ischemia and amputation after injection of an epinephrine-containing local anesthetic. This case demonstrates digital ischemia after local anesthesia injection which has been thought to be of historic concern, owing to the previous use of procaine, which may deteriorate and result in a toxic drop in pH.

CASE REPORT: A 36-year-old previously well female, nonsmoker, without significant medical history, received an injection of lidocaine with epinephrine from her dermatologist, delivered in his office, to the radial and ulnar aspects of the middle phalanx of her long finger before having a skin lesion (wart) removed. No tourniquet was used. Eight hours later, the patient presented to the emergency department with acute pain of the involved long finger. Ischemic changes were noted on initial examination, and despite 1 week of intensive inpatient care, irreversible digital damage had occurred and the patient went on to develop necrosis of the distal phalanx requiring amputation (Fig 1-3).

DISCUSSION: When employed for digital anesthesia, epinephrine redistributes cutaneous blood and injected digits experience a low flow state, which is usually well tolerated. The temporary vasoconstriction allows for improved hemostasis, longer duration of analgesia, and decreases the need and risk of a tourniquet. The addition of epinephrine is known to potentiate and prolong the effect of analgesia, with four-fold greater duration being reported in the rat model. Epinephrine-induced vasoconstriction in the digit may be reversed through an alpha-blockade. Injecting phentolamine (1mg/1mL normal saline) directly into the compromised finger quickly reestablishes blood flow and decreases the likelihood of reperfusion pain or neuropraxia. Many reports of even high-dose epinephrine via auto injector (Epipen, Day Napa Calif) have been successfully managed without digital necrosis.

CONCLUSION: The authors are uncertain if the epinephrine containing local anesthetic caused this patient's finger necrosis. The patient had no known prior medical (eg, Raynaud's) or psychiatric history, did not smoke or use illicit drugs, and gave no history of previous hand injury. Yet, it is possible that other events such as immersion in hot water, even if denied by the patient, could have possibly occurred. Also, reversal via phentolamine was not attempted. Knowledge of phentolamine as a rescue agent is important and may have saved the finger in this case if the true cause was indeed epinephrine vasoconstriction. However, our practice is to avoid epinephrine containing local anesthesia for use in the digits. We prefer plain marcaine or lidocaine with a finger tourniquet as an alternative when anesthetizing fingers for surgery.



EXTENSOR CARPI RADIALIS LONGUS AND BREVIS RUPTURE IN A BOXER

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INTRODUCTION: There have been limited reports in the literature demonstrating avulsion injuries of both the extensor carpi radialis longus (ECRL) and the extensor carpi radialis brevis (ECRB) tendons. Three cases have reported traumatic avulsion of both ECRL and ECRB after high-energy injury and one case of isolated ECRB avulsion by boxing injury. The mechanism of injury in acute tendon rupture, secondary to their inherent viscoelastic properties, is thought to be abrupt acceleration/deceleration. Our case demonstrates a traumatic avulsion of both the ECRL and ECRB and repair with suture anchors.

CASE REPORT: A 34-year-old man experienced rupture of extensor carpi radialis longus (ECRL) and extensor carpi radialis brevis (ECRB) tendons after striking a heavy boxing bag. This rare event was diagnosed via magnetic resonance imaging which demonstrated an empty second extensor compartment and avulsion of the extensor tendons from their insertion sites. More proximally, extensor pollicis longus was seen crossing over an empty second dorsal compartment. Both tendons were explored and repaired to their respective insertion sites using mini-suture anchors.

DISCUSSION: Many studies describe the association of fluoroquinolone antibiotic use and tendon rupture, most commonly, the Achilles tendon. Patients taking fluoroquinolones, particularly ofloxacin, are at greatest risk of tendon rupture within the first month after taking the drug and are at increased risk of rupture if they are concomitantly taking a corticosteroid. Tendinitis is an independent risk factor associated with tendon rupture. There have been anecdotal reports of anabolic steroid use and creatine supplementation associated with tendon rupture, although the evidence is incomplete. One report of weight-lifters showed no difference in collagen fibril structure under electron microscopy between those who used anabolic steroids and those who did not, while another study discovered a difference. Although his body habitus was that of a body-builder, our patient has no documented history of fluoroquinolone, anabolic steroid, or supplement use. Suture anchors were used to approximate the ECRL and ECRB tendons to the base of the second and third metacarpals, respectively. Suture anchors have various pullout strengths based on manufacturer and location, with mini suture anchors having pullout strength in metaphyseal porcine femur between 13 and 151 pounds of force. In general, suture anchors, especially when used in the hand, exceed pullout strength when compared to commonly used suture material. Suture anchors provide more strength for tendon repair than suture material alone and are less likely to fail than other aspects of the repair. Suture anchors are strongest when inserted in the diaphysis (further from joint surfaces), when inserted in thick cortical bone, and when loading forces are applied parallel to the bone surface (i.e. suture anchor inserted perpendicular to bone with loading force applied perpendicular to suture anchor). The tissue interface between tendon and bone is known as an enthesis. Enteses consist of 4 tissue zones (tendon, fibrocartilage, calcified fibrocartilage, and bone) that create a strong interface between bone and tendon. In our patient, the enthesis was likely interrupted as the ECRL and ECRB were avulsed from the bone surface with little visible tendon attachment remaining on the bone surface. To facilitate effective healing, the tendons must be approximated closely to their bony insertions. The healing process is not clearly understood, but one study using sheep demonstrated formation of a fibrous bridge between the approximated tendon and bone, with histological differences from uninjured enthesis still present at 2 years.

CONCLUSION: Our case demonstrates a rare injury, pathognomonic imaging findings, and describes a technique for surgical repair. Suture anchors demonstrate higher pullout strength when compared to suture alone; however, more studies are needed to understand exactly how the enthesis interface heals and whether fixation method affects tendon healing. The authors believe the treating physician should educate the patient on possible contributing factors to tendon rupture, which vary from pharmacotherapy to over-the-counter supplements.

A CASE REPORT OF BARTONELLA HENSELAE OSTEOMYELITIS IN A PEDIATRIC PATIENT

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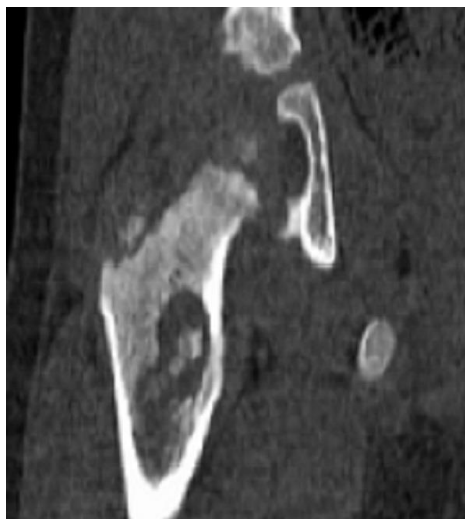
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INTRODUCTION: *Bartonella henselae* osteomyelitis is an unusual manifestation of Cat Scratch Disease, itself a rare clinical entity. Fever and regional lymphadenopathy are the predominant symptoms. However, in rare instances and in immunocompromised individuals, other disease manifestations include ocular involvement, encephalopathy, granulomatous hepatitis, endocarditis, and osteomyelitis. There is little evidence to guide treatment of disseminated disease.

CASE REPORT: A 5-year-old otherwise healthy unvaccinated male presented to the emergency room complaining of intermittent right hip pain for several weeks without antecedent trauma. His parents reported fevers to 102.5°F but denied other symptoms. His hip was not irritable. He did have an enlarged axillary lymph node. CRP and ESR were elevated. Radiographs did not demonstrate any bony lesion. MRI showed increased T2 signal in the right proximal femur and osteomyelitis was suspected, however, malignancy was also in the differential. Referral for pediatric orthopaedic oncology consultation was recommended. At the tertiary institution, the patient was felt to have a viral illness and a concomitant osteoid osteoma. He was treated with 2 days of antibiotics and was discharged with the recommendation for a follow-up CT. The patient continued to be symptomatic. CT demonstrated an evolving osteomyelitis with abscess. The patient was admitted to the hospital and underwent CT-guided biopsy of the femur. Purulent fluid was aspirated; cultures were negative. Biopsies had no evidence of malignancy. Surgical curettage of the lesion was then performed. Intraoperative cultures were negative and pathology was consistent with osteomyelitis with necrotizing granuloma. Warthin-Starry silver staining was negative for *Bartonella*. Subsequent workup was positive for *Bartonella* antibodies. The patient reported no known trauma from a cat, but he was exposed to kittens. Post-operatively, he was placed on trimethoprim-sulfamethoxazole and rifampin. At most recent follow up he had no pain, no signs of infection, and radiographs demonstrated bone healing at the curettage site.

DISCUSSION: *Bartonella henselae* osteomyelitis is rare and is difficult to diagnose. Most often, the vertebral column is affected, followed by the hip. When disease is suspected, diagnosis can be confirmed with cultures of lymph node aspirates and histological examination. However, the organism is difficult to culture, and immunoassays are more reliable. If serological testing is negative, PCR is another option. There are relatively few studies to guide antibiotic management of Cat Scratch Disease. Most reported patients had good outcomes; although a variety of different antibiotic regimens were used. Moreover, some patients were cured without antibiotics. Although studies have showed a role for antibiotic therapy, effective antibiotic regimens are not well defined.

CONCLUSION: Atypical osteomyelitis can be challenging to diagnose and treat. In this case of *Bartonella henselae* osteomyelitis, serological studies confirmed the diagnosis. It is unclear if antibiotics were required for a cure, but there were no adverse side effects. Health care providers should keep a broad differential diagnosis and be aware of serologic studies that can identify organisms difficult to isolate in culture in cases of atypical osteomyelitis. Figure 1. Coronal CT of the proximal right femur showing a complex lytic lesion, concerning for intraosseous abscess. Although less likely, neoplastic process could not be ruled out



DISTAL RADIUS FRACTURE IN A SURGEON'S DOMINANT WRIST

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INTRODUCTION: Among orthopedic injuries, distal radius fractures occur frequently. Therefore, the Orthopedic Surgeon must have extensive knowledge of all aspects of treatment. The surgeon needs to recognize which fractures require surgery and which can be adequately treated non-operatively. Once treatment decisions are made patient specific therapy must follow. Patient appropriate treatment can lead to excellent outcomes with few, if any, limitations.

CASE REPORT: A 33-year-old RHD Surgeon, fell sustaining a comminuted, dorsally displaced, intra-articular right distal radius fracture. Closed reduction was performed followed by ORIF utilizing a dorsal approach. On POD six ROM was begun followed by aggressive five day per week therapy. She returned to practice without restrictions after seven weeks.

DISCUSSION: Indications for ORIF of distal radius fractures involves many factors. Acceptable parameters for alignment are: greater than or equal to 15 degrees radial inclination, less than or equal to 5mm of shortening of radial length, less than 15 degrees dorsal or 20 degrees volar tilt, and less than 2mm of articular step off. Fractures that meet these parameters after reduction may be treated non-operatively. However, they may require operative intervention if reduction is not maintained. Fractures that do not meet these parameters after reduction should undergo ORIF if the patient is an acceptable candidate for surgery. Patients who have open fractures, compartment syndrome, acute carpal tunnel, bilateral distal radius fractures, or ipsilateral proximal or distal arm fractures are generally indications for surgery. The patient's age, functional demands, and lifestyle should always factor into decision making despite fracture parameters and other injuries. When operative intervention is indicated there are two main surgical approaches. The palmar modified Henry approach begins with an approximately 8 cm longitudinal incision directly over the flexor carpi radialis. The FCR is retracted ulnarly to protect the median nerve. The FCR sub-sheath is incised and blunt dissection is taken down to the level of the flexor pollicis longus and pronator quadratus. The FPL is retracted either radially or ulnarly. The pronator quadratus is incised at the lateral border of the radius and elevated off the radius leaving a cuff of pronator on the lateral aspect for repair if desired. The utilitarian dorsal approach begins with an incision just ulnar to Lister's tubercle, centered over the radial metaphysis. Incision length is based on necessary exposure for reduction and fixation; generally between 3-10cm. Skin flaps are raised at the level of the extensor retinaculum. The 3rd extensor compartment is incised and the extensor pollicis longus is retracted radially. The 4th compartment is then elevated sub-periostally to expose the distal radius. The 2nd compartment can be elevated for further exposure if needed. Both of these approaches are followed by fracture specific fixation. After fixation of distal radius fractures therapy for strength and motion is commonly performed. Early motion has been compared to delayed motion in the literature. There are conflicting outcomes on early motion of the wrist after fixation. Early motion in some studies improves functional scores by eight weeks but equivalent outcomes for early motion versus delayed motion are seen by three to six months. There is no agreement about whether formal hand therapy should be prescribed or independent exercises should be performed at the direction of the surgeon. Availability and costs to the patient should be considered as well when deciding between formal therapy and independent therapy. Independent exercises have been shown in prospective randomized controlled studies to have greater arc of motion and strength increases at three and six months when compared to formal supervised therapy. However, it is our bias to enroll young, active patients in early motion with aggressive therapy.

CONCLUSION: Distal radius fractures are very common injuries. It is important to understand indications, approaches, and techniques for treatment in order to guide the decision making process. As a surgeon injuring her dominant wrist, our patient's livelihood relied on a good functional outcome. After thorough discussion of the treatment options and expected outcomes, the patient elected to undergo operative treatment. ORIF and aggressive hand therapy helped her return to practice without restrictions during the 7th postoperative week.

CRYPTOCOCCUS NEOFORMANS PERICARDITIS IN AN IMMUNOCOMPROMISED PATIENT

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INTRODUCTION: Pericardial effusions are not an uncommon event, however fungal causes of pericardial effusions and pericarditis are very rare. *Cryptococcus neoformans* is an encapsulated fungus found in the excrement of birds that colonizes human lungs before causing meningitis or encephalitis. Disseminated infections are rare but very rarely involve the heart. We present a case of *C. neoformans* pericarditis in a patient with underlying Systemic Lupus Erythematosus (SLE).

CASE REPORT: A 57-year-old man presented with shortness of breath, back pain and drenching night sweats for two weeks. The patient was recently diagnosed with SLE and lupus nephritis. His current medications included Prednisone 40 mg/day, Mycophenolate 1000 mg/day, Hydroxychloroquine 200 mg/day, Furosemide, Metoprolol and Nifedipine. He was a lifelong non-smoker and denied recreational drug or alcohol use. On examination, patient was in mild respiratory distress and hypertensive. Physical exam was unremarkable except for bilateral lower extremity pitting edema. Initial investigations were significant for a hemoglobin of 10.7 mg/dL. Serum chemistry was notable for a BUN 28 mg/dL and creatine 1.1. His ESR was 126 mm/h. Chest x-ray showed an enlarged cardiac silhouette and calcified granulomas within the lung fields. Computed tomography (CT) angiogram of chest was positive for bilateral pulmonary embolism and large pericardial effusion. Electrocardiogram was normal. Lower extremity ultrasound showed sub-acute deep vein thrombosis within the left proximal femoral vein. A transthoracic echocardiogram showed large pericardial effusion with preserved ejection fraction, EF 65%. Pericardiocentesis was performed. Fluid cultures were positive for *C. neoformans*. A lumbar puncture was performed and *Cryptococcus meningitis* was ruled out. Treatment was initiated with fluconazole 400 mg daily to be taken for at least six months. An IVC filter was also placed for the DVT and the patient was started on rivaroxaban given the hemorrhagic pericardial effusion. The patient made a full recovery and was discharged on oral fluconazole.

DISCUSSION: *C. neoformans* pericarditis was first described in 1966 in a patient with underlying Hodgkin's disease following chemotherapy and radiation. Since then, there have only been two cases of this condition reported in the literature. There have been several cases of Cryptococcal heart disease but most cases have been endocarditis or myocarditis. Many of those infections were fatal, however Cryptococcal pericarditis has not caused any fatalities to date. A common underlying risk factor in these patients seems to be the presence of immunodeficiency, which is a known risk factor for Cryptococcal meningitis. It is not known if there are any particular precipitating factors in patients who develop cardiac disease.

CONCLUSION: Cryptococcal pericarditis has not been well described in the literature. It is important to recognize that a pericardial effusion in a patient with an underlying immunodeficiency may be the right situation for a pericardiocentesis. And a diagnosis of cryptococcal pericarditis is a treatable disease with a good prognosis.

WMED: WORK ON MEDICATION ERROR DISCREPANCIES

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INTRODUCTION: There has been a recent focus on medication reconciliations that was stimulated by a Joint Commission national patient safety goal. Accuracy rates have been noted to be low and are believed to be linked to increased medication errors. It is currently unknown the accuracy of the medication records at the outpatient medicine clinic.

RATIONALE/OBJECTIVE: To determine the rates of agreement between outpatient clinic medication records and outpatient pharmacy records with regards to medications and allergies/intolerances.

MATERIAL & METHODS: Patient names were obtained by comparing the medication fill records at a local pharmacy with academic medicine and medicine/pediatric outpatient clinic physician names. Patients were excluded if they did not have a follow-up appointment scheduled or were under the age of 18 years. Medication and allergy lists were collected from the respected sites and evaluated for agreement. The results were reported in percentages. The study was approved by the investigational review board and considered exempt.

RESULTS: One hundred forty patients were initially screened. Twenty-eight patients were excluded (two died, 17 were not clinic patients, and nine were less than 18 years of age). The remaining 112 patients were included for analysis. There was a 49% rate of agreement between the pharmacy and clinic with regards to medications. Only four patients had an identical medication list between the two providers. Allergy/intolerant accuracy was lower at a 25% rate of agreement between the pharmacy and clinic. Twenty-five patients had an identical allergy list.

DISCUSSION: Discrepancies between pharmacy records and medication histories upon hospital admission have been seen to be as high as 67-85%. A study evaluating pharmacy insurance claims and the medication records at a clinic had a 35% discrepancy rate. Our study reported a 51% discrepancy rate. None of these published studies evaluated the discrepancy rate of medication allergies/intolerances.

CONCLUSION: The medication and allergy records at the outpatient clinic involved in this study had a low rate of accuracy compared to the pharmacy records. An intervention will be performed to determine if the accuracy rate can be improved.

APPLICATION OF A MODIFIED HABIT REVERSAL TREATMENT PROTOCOL FOR SKIN PICKING

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INTRODUCTION: Excoriation or Skin Picking is defined in DSM-V as "recurrent skin picking resulting in skin lesions" and marked by "repeated attempts to decrease or stop" this behavior. This behavior is not related to the physiological effects of a substance. Pharmacological approaches have had limited or no long term effects. Therefore, the focus has been on developing behavioral treatment approaches, mainly Habit Reversal Training (HRT). Behavioral treatment methods have been established as the first line of treatment before medications are used, and the latter is recommended only for the most severe cases. In this case, the patient was a 9 yr old girl who had significant difficulties communicating due to distress. Thus assessment and treatment implementation had to be modified.

CASE REPORT: The patient was a 9 year old, Caucasian girl who presented with skin picking of the scalp, mainly in the part of her hair, but also in other parts of her body (e.g., supra-pubic area). Parents noticed sporadic skin picking for several years with intensification in the last year. She asked for help as this was very disturbing to her, causing daily distress, especially in social situations and school. HRT treatment protocols have been extensively researched and found to have varied levels of effectiveness. In this case, she found it significantly distressing to talk about her skin picking behaviors, causing much difficulty in assessment and treatment implementation. HRT usually follows a 4-phase process. Both parents and the patient were engaged in the assessment phase (including "Functional Analysis") and treatment phases. This process was very difficult and the parents were utilized to ask their daughter questions and report her answers. She cried and was tearful throughout this process, and she was clearly anxious. Nonetheless, she followed through on requests and recommendations. By the third session, she had completely stopped skin picking. Subsequent follow up communications at 2 months and 4 months confirmed treatment success.

DISCUSSION: One of the well researched factors in the effectiveness of HRT is the degree of collaboration between patient and therapist. In HRT, assessment and functional analysis is of utmost importance, because, from this process, idiographic or person centered treatment modalities are identified. Communication is also extremely important in implementing HRT components such as 'Awareness Training'. Because of her difficulties in verbal communication, creative forms of information gathering and communication about implementation of treatment modalities were initiated. For instance, it is crucial that all the components and topography of the behavior are specified, as this specificity is utilized in the necessary treatment process of "Awareness Training". Information gathered through parents was essential. Parents were active participants in all aspects of treatment and they performed various aspects of treatment in conjunction with the therapist.

CONCLUSION: By the third session, the modified HRT assessment and treatment implementation was successful in stopping skin picking behavior. When communication is a problem, the therapist needs to be very creative in assessment and treatment implementation. In this particular case, parents were utilized throughout the treatment process. It is important to note that by the third session, the patient did start to talk to the therapist with no reservations and with lack of anxiety.

RAPID VISUAL LOSS IN THE SETTING OF RECENT COGNITIVE AND PERSONALITY CHANGE: A CASE OF CREUTZFELDT JAKOB DISEASE

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INTRODUCTION: Cruetzfeldt Jakob disease (CJD) is a form of nervous and mental illness associated with progressive central nervous system degeneration, first described by Creutzfeldt and Jakob in the early 1920s. CJD principally affects the grey matter of cerebral cortex, brainstem and molecular layer of cerebellum. It is believed to be caused by histologically unconventional infectious agents called PRIONS. It is uniformly fatal and the annual incidence rate is 1-2 per million worldwide. For non-genetic cases, direct inoculation of the agent remains the only proven mechanism of transmission. We report a case of CJD with a complicated initial presentation which led to an initial possible diagnosis of Conversion disorder and psychiatric admission.

CASE REPORT: A 73 year old married woman was referred by her ophthalmologist to the Emergency department for further evaluation of poor vision and personality changes. Patient's initial symptoms began over a course of 4-5 months, starting in July 2014, where she was noted to be forgetful and 'clumsy', bumping into furniture while walking. Suspicion for a psychiatric etiology was heightened because she had a stressful relationship with her daughter, whom she did not see in years and a history of depression which was diagnosed in June 2006. She was being treated with Sertraline and intermittently with Alprazolam for panic attacks in the context of significant stresses with her step children. Prior to 2006 she had no history of panic attacks or conversion. By October 2014 her symptoms had progressed and now she was staring blankly into space and had occasional flinging movements of her arms and legs. These symptoms were dismissed as not pathologic by her family. She complained of vision disturbances and was referred to an ophthalmologist. She was seen by an ophthalmologist twice who documented progressive visual loss by perimetry testing. After a screening evaluation in the Emergency Department, which included a head CT, the patient was admitted under psychiatry service.. On mental status exam patient was oriented to person and time but not to situation or place. She appeared to be significantly depressed and would repeat, 'There is no point'. Physical exam showed poor visual acuity and bizarre choreoathetoid movements in upper extremity. She was given 2mg Lorazepam IM for possible conversion disorder but showed no effect. EEG was grossly abnormal and revealed periodic lateralizing epileptiform discharges (PLEDS). Pt was transferred to ICU for non-convulsive status epilepticus. CSF studies were unremarkable. Tentative diagnosis of encephalopathy was made, CSF was sent for 14-3-3 protein and NMDA receptor antibody. Her hospital course was rapidly downhill until her death in December 2014.

DISCUSSION: The challenge in making a diagnosis of an uncommon disease is to have an awareness of the potential presentations. CJD, though a neurodegenerative disease, can frequently present with psychiatric symptoms. Conversion disorder was the preliminary diagnosis for this patient, given how the family conceptualized her changes in motor movement and the fact that classically conversion disorder presents with an acute sensory or motor loss. The etiology of conversion disorder is not clear, but historically the roots of conversion go back to Freud and struggles within the unconscious and the failure of an individual's coping skills to bind the anxiety. It is unusual for conversion disorder to occur late in life, as our coping skills continue to develop as we age. All lives have stress. It is the psychiatrist role, in making the diagnosis of conversion disorder, to assess the level of an individual's stressors and the sufficiency of the individual's coping skills. When there is a mismatch in the magnitude of these two factors the diagnosis of conversion disorder should be questioned. The diagnostic intervention is to attempt to resolve the anxiety by use of a high dose of Lorazepam. The failure of response adds further weight to the need for further neurological evaluation, which in this case was a diagnostic EEG of PLEDS. We conclude that psychiatric symptoms are common in CJD and many times precede the onset of neurological deficits and raise the suspicion for a neurologic rather than a psychiatric etiology.

PULMONARY TUMOR EMBOLISM: AN UNCOMMON DIAGNOSIS WITH A COMMON PRESENTATION

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INTRODUCTION: Pulmonary tumor embolism (PTE), characterized by microscopic tumor emboli in the pulmonary arteries without parenchymal metastasis, is a well-documented yet underdiagnosed entity which has a high mortality rate among diagnosed and undiagnosed cancer patients. First described as early as 1874 (Andree), some degree of PTE has been found in 3-26% of cancer patients on autopsy. In this case report we recount a patient who presented with symptoms classic for PTE who followed a catastrophic clinical course.

CASE REPORT: Patient GR is a 51 year-old African-American female with a history of breast cancer who presented to our facility with dyspnea, right-sided chest pain, and fatigue for one week. Echocardiogram two weeks prior had shown an ejection fraction of 60% and mild concentric left ventricular hypertrophy. Medical history was remarkable for hypertension, adrenal adenoma, and high-grade ductal carcinoma in situ status-post mastectomy two years prior. The patient had mild tachycardia, hypoxemia, and right chest wall tenderness on physical examination. Electrocardiogram (EKG), complete blood count, metabolic panel, cardiac enzymes, and chest x-ray were unremarkable, and she was discharged home. She returned the next day with worsened tachycardia, tachypnea, and hypoxemia. EKG demonstrated T-wave inversions in the precordial leads. Troponin, myocardial creatine kinase, and B-type natriuretic peptide were elevated. Computed tomography (CT) of the chest, abdomen, and pelvis with contrast was negative for pulmonary embolism, but right ventricular enlargement was noted. The patient was admitted for cardiac catheterization, which showed no significant coronary lesions. Right heart catheterization was attempted, but the patient developed cardiac arrest. During cardiopulmonary resuscitation, bedside ultrasound demonstrated marked right ventricular dilatation. Return of spontaneous circulation could not be achieved, and resuscitation efforts were terminated. On autopsy, marked right ventricular and atrial dilatation was seen on gross examination with no patent foramen ovale or other structural abnormalities. Histology showed extensive tumor cell emboli to the microscopic pulmonary and cardiac vessels without evidence of metastases or intimal proliferation. Cause of death was therefore determined to be PTE from primary breast carcinoma resulting in fulminant cor pulmonale.

DISCUSSION: Cancer patients most commonly die from infections, thromboembolism, massive effusions, restrictive lung disease, ARDS, and extensive metastasis. PTE presents with clinically unexplained acute or subacute dyspnea often in the setting of fatigue, non-productive cough, pleuritic chest pain, and unremarkable initial evaluation. Due to its non-specific presentation, the disease process is typically recognized on autopsy after eventually succumbing to right heart failure and often after patient has been ineffectively treated for alternate diagnoses. This is problematic because PTE is a significant factor in death of 8% of patients with a pathologically proven diagnosis. Early diagnosis hinges on a high index of suspicion, especially if the primary cancer began in the breasts, stomach, or lungs. Though definitive diagnosis requires a lung biopsy, several diagnostic tools are currently thought to be of value in evaluation for PTE. Many PTE case reports have found a VQ scan abnormality known as a 'segmental contour pattern' which represents multiple sub-segmental filling defects. Echocardiogram may reveal RVH, RV failure, or evidence of pressure overload without pulmonary embolism on CT. Pulmonary wedge aspiration cytology has also shown promise, but requires more evidence. Interestingly this patient showed evidence of tumor embolism in her coronary arteries. Systemic tumor embolization is usually the result of an atrial myxoma, bronchogenic carcinoma from invasion into pulmonary veins, or a patent foramen ovale. Disseminated tumor emboli has been reported, but we were unable to find any previous reports of breast cancer tumor embolization to the heart without a patent foramen ovale.

CONCLUSION: Pulmonary tumor embolism is an unusual condition with a deceptively common presentation. The non-specific symptoms and preponderance of alternate diagnoses makes timely recognition a rarity. Increased awareness of this condition as well as the development of a more defined diagnostic strategy and subsequent tailored management plan may result in improved outcomes and avoidance of unnecessary treatment of alternate diagnoses.

ANALYSIS OF TUBERCULOSIS DEMOGRAPHICS AND SURVEY OF TEN YEAR TREND OF 84,000 PATIENTS IN UNITED STATES

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INTRODUCTION: Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis*. People in the developing world contract tuberculosis because of a poor immune system due to high rates of HIV/AIDS. Most cases of TB in the United States are related to immigration. We assessed the demographics and 10 year trend of TB in USA using National Inpatient Sample (NIS) database.

MATERIAL & METHODS: NIS database is the largest all-payer inpatient care database and represents 20% of all the hospitalizations in USA. We used Diagnosis Related Group (DRG) to extract data for patients discharged with the primary diagnosis of TB in 2012. We were able to assess the demographics of patients and the trend of TB from 2002 to 2012.

RESULTS: We extracted data for 5160 patients discharged with primary diagnosis of TB in 2012 with mean length of stay of 14.7 days and in-hospital mortality rate of 3.39%. The mean charge per patient is \$85,154 and the national aggregate charge is 437 million dollars. Majority of patients were between age group of 18-44 years and 45-64 years constituting around 69% of the cases and 20% of the patients were in the age group of 65-84 years. Men were twice more commonly affected than women. Most of the patients were diagnosed in private, not for profit hospital (61.82%), in urban teaching hospitals (64.92%), hospitals with large bed size (63.08%), and were covered for by both Medicaid (26.55%) and Medicare (24.52%). 21% of cases were transferred to other short term hospitals or nursing homes or home health care. Most of the patients were diagnosed in southern part of USA (41.67%) with mean hospitalization cost of \$57,473 compared to west part of country where 26% of diagnoses were made with mean hospitalization cost of \$129,623 per patient. Overall, there have been 84,062 cases of TB in the last 10 years with maximum number of cases in 2002 (9,741 cases) and a minimum in 2012(5,160 cases). Though the mortality rate has decreased from 5.09% to 3.39%, the mean hospitalization charges per patient have doubled.

CONCLUSION: Our analysis reports that 20% of the subset of population affected by TB are still uninsured. 65% of TB cases are treated by urban teaching hospitals and greater than 40% cases are from the South. The mortality rate and number of cases have been trending down in the last 10 years due to better treatment. The reason for increased hospitalization charges in the western part of the country is unknown. Insurance coverage needs to be increased and further studies need to be done to identify the causes for these cost differences to reduce burden on healthcare economy.

THE MISSING PIECE OF THE PUZZLE: A RARE CASE OF POSTSPLENECTOMY SEPSIS FROM GAS

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INTRODUCTION: Group A streptococci (GAS) continue to be a major health problem, due to a worldwide increase in the incidence of severe invasive infections observed since mid-1980s¹⁵. Entry site is normally the throat or a minor occupational wound or mucosal lesion, not necessarily impressive on physical examination. Opportunistic Post Splenectomy Infection (OPSI) is characterized by sudden onset nausea and vomiting, confusion, coma and death within hours, despite appropriate antibiotic therapy. 1-2 The most common organisms causing OPSI, in order of frequency, are Streptococcus pneumoniae, Neisseria meningitidis, and Hemophilus influenzae. Other organisms less commonly causing this infection are streptococci, staphylococci, Escherichia coli, Klebsiella sp, Salmonella sp, and Pseudomonas aeruginosa. 3 There are numerous case reports and case series of OPSI caused by Group B streptococcus but very rare cases of GAS causing OPSI. We report an interesting case of OPSI caused by GAS.

CASE REPORT: A 54 year old diabetic woman with a history of lupus on steroids, pseudotumor cerebri with ventriculo-peritoneal shunt, a remote history of disseminated histoplasmosis, chronic kidney disease stage 3, who was surgically asplenic (cause unknown) was admitted to the hospital Intensive Care Unit with septic shock and adrenal crisis. She was managed with aggressive intravenous fluids, vasopressors, broad spectrum antimicrobials and steroid stress doses. Two sets of blood cultures were positive for GAS with unclear primary source of infection. Infectious Disease consultation was obtained and the antimicrobials were narrowed down to ceftriaxone and clindamycin for 2 weeks. Blood cultures were negative two days after the therapy was started. She responded well and was transferred to the floor. Post hospital discharge, she was seen in Infectious Disease clinic where she was asymptomatic.

DISCUSSION: Splenic dysfunction can be the result of either anatomic or functional hyposplenism. The commonest cause of the absence of splenic tissue is surgical splenectomy. Individuals with sickle cell disease undergo auto-splenectomy. Functionally, the spleen plays a fundamental role in bacterial clearance either by antibody response or macrophage bactericidal capacity. There is evidence that the spleen also contributes to bacterial detoxification. In a study of 538 splenectomized persons who were followed over 1,731 person-years, 38 developed bacteremia, and of these, 45% occurred during the first month after surgery. Beyond the early postoperative period, there was an 8-fold increase in the risk of bacteremia¹¹. Saslaw et al conducted studies by injecting splenectomized and non-splenectomized young pre-pubertal monkeys with T14 and S23 strains of Streptococcus hemolyticus, Group A, to ascertain whether differences in susceptibility could be detected following a shorter splenectomy interval, i.e 5,8 or 12 days postsplenectomy. It was found that T14 strain was somewhat more virulent and no significant differences were noted between splenectomized and normal monkeys in reference to fatal outcome after challenge 5-12 days after surgery. However, splenectomized monkeys challenged at the 5-day period either died earlier, or if they survived had longer periods of clinical illness, than their nonsplenectomized controls. The elderly and those with underlying medical conditions are at the greatest risk for invasive group A streptococcal disease, toxic shock, and necrotizing fasciitis. Invasive streptococcal infection is associated with a substantial risk of transmission in household and health care institutions⁹. Host factors are HIV infection, diabetes, malignancy, injecting drug use and cardiac disease.

CONCLUSION: PSS is a rapidly fulminating and often fatal infection due to certain encapsulated bacteria. Despite its common presence, GAS has only rarely been reported to cause this entity which has a case-fatality rate of 50-60%. Not all encapsulated organisms are equal in this regard, since GAS is such a common encapsulated bug but it is not seen much at all in the postsplenectomized patient. It is possible because of effective vaccines for the more common causes, other encapsulated bacteria like GAS and Klebsiella may become more frequently reported or there must be something about the pneumococcus and its capsule that makes the fulminant illness occur in the asplenic or hyposplenic host.

METASTATIC FOLLICULAR THYROID CARCINOMA PRESENTING AS PRIMARY RENAL TUMOR

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INTRODUCTION: Renal metastases of thyroid carcinomas occur rarely and represent about 3% of all metastases to the kidney, with only 23 single case study reports in the English language literature. Follicular thyroid carcinoma has a propensity for vascular invasion and hematogenous metastasis, most commonly to bone and lungs. However, they rarely spread to involve other organs such as liver, brain, kidneys, skin or even adrenals. We present a case of an 89 year old woman whose metastatic follicular thyroid cancer presented as a primary renal tumor 10 years earlier.

CASE REPORT: 79 year old woman presented with right sided flank pain for approximately 6 months. Abdominal computed tomography (CT) scan revealed 7.5cm mass (in its greatest dimension) present on the right upper pole of the kidney. It was considered as renal cell carcinoma based on imaging modality and admitted to the hospital for radical nephrectomy. On physical admission, patient was hemodynamically stable with no palpable enlarged lymph node on her cervical, axillary or inguinal area, and no palpable mass in her abdominal region. Laboratory data on admission showed microhematuria at urinalysis without protein, glucose or white blood cells. Blood cell counts and biochemical data were within normal limits. Chest X-ray revealed no lesion on the lung or heart. Right radical nephrectomy was performed on 02/12/2004. The right kidney measured 13x7.5x4.5cm. In the superior pole of the kidney, there was a 7.5 cm (in greatest diameter) white, firm mass with central 4.5cm cystic/necrotic area partly filled with blood clot. The mass was well circumscribed and also well demarcated from the surrounding kidney. Histologically, initially it was thought to be a collecting duct tumor but was later identified as metastatic follicular carcinoma of thyroid. A thyroid ultrasound revealed a mass measuring 2.6x2.2x2.8cm in the lower portion of the right lobe. The left lobe and isthmus were without any nodules. Histology revealed it to be follicular carcinoma. Chest and abdomen/pelvis computed tomography (CT) did not reveal any metastasis. Blood cell count, serum calcium and phosphate levels, thyroid function tests and thyroglobulin levels were all within normal limits. She then underwent total thyroidectomy and radio-iodine treatment and was started on levothyroxine. She was discharged on the ninth postoperative day. On follow-up, her thyroglobulin levels were elevated and she underwent three sessions of radio iodine treatment. Whole body scan was done and was negative. Further workup with a PET scan was not done as our patient refused to undergo further testing. At present she is clinically euthyroid on levothyroxine and doing well ten years later, albeit with known widespread metastatic disease to lungs

DISCUSSION: Only 18 cases of renal metastasis from thyroid carcinoma have been reported in the English language literature. Renal involvement from a thyroid primary is rare, being only about 4.5%– 5.9%, whereas out of all metastases to the kidneys, thyroid cancer constitutes only about 2.5%– 2.7%. There have been more than 30 cases of renal metastasis of thyroid carcinoma in the Japanese literature, which may indicate that the incidence of thyroid carcinoma is higher in Japan. Several reports have suggested that the results of radiographic imaging, such as with fluorodeoxyglucose positron emission tomography-computed tomography, magnetic resonance imaging and somatostatin receptor scintigraphy with single photon emission computed tomography (SPECT)-computed tomography, are helpful for the diagnosis of metastatic renal carcinoma of thyroid origin.

CONCLUSION: It is relatively rare for thyroid cancer to present with renal metastasis as described above but it ranks low on the list of dangerous cancers. Our patient underwent three sessions with radioactive iodine without complete resolution of metastatic lesions. More research is warranted in this area regarding the duration and the number of radioactive sessions prior to complete resolution.

COMPLETE DIHYDROPYRIMIDINE DEHYDROGENASE DEFICIENCY: A RARE PHENOMENON

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INTRODUCTION: 5-Fluorouracil (5-FU) is used in the treatment of most gastrointestinal cancers. Dihydropyrimidine dehydrogenase (DPD) is the rate-limiting enzyme for fluoropyrimidine catabolism and eliminates >80% of administered 5-FU. It is an autosomal codominantly inherited trait. In patients who are deficient in DPD, 5-FU can cause profound toxicity, such as myelosuppression, mucositis, neurotoxicity, hand-foot syndrome, and diarrhea. We present a case of a woman with rectal cancer who succumbed due to the side effects of 5-FU caused by complete DPD deficiency.

CASE REPORT: 60 year old Caucasian woman presented with rectal pain, bleeding and constipation associated with right groin lump. Colonoscopy showed distal rectal mass measuring 6cm in length, ulcerated and friable at 0.4cm from anal verge fixed to the posterior vaginal wall. Biopsy was positive for low-grade adenocarcinoma of the rectum. Computed Tomography and Positron Emission Tomography scans were positive for metastatic disease to the right inguinal lymph node, right perirectal nodules and right obturator lymph nodes. There was no evidence of lung or liver involvement. The tumor was staged at T4N2M0. As the tumor was locally advanced and unresectable, it was decided to treat her with combination chemotherapy with FOLFOX, chemoradiation, 5-FU infusion, and abdominoperineal resection. After the first dose of 5-FU, she developed a macular rash of the extremities extending to the chest and abdomen, ulcerations of the oral cavity and red beefy tongue. She developed neutropenic fever and respiratory distress and had to be admitted to the Intensive Care Unit. She was started on broad spectrum antibiotics, antifungals and antiviral medications. She received multiple red cell and platelets transfusions. Bronchoscopic cultures were negative for bacterial, viral and fungal infections. Attempts to wean her off the ventilator were futile. Family meetings were held, patient's poor prognosis was discussed and decided to make her comfort care. Patient was not tested for 5-FU toxicity prior to administration and the above clinical course was most likely due to complete DPD enzyme deficiency. Her three children were all heterozygous for IVS14+1 G>A mutation.

CONCLUSION: Several approaches have been utilized to detect DPD deficiency in an effort to identify individuals not suitable for treatment with 5-FU or capecitabine: genotyping, radioimmunoassays and measuring the concentration of uracil in serum, urine or exhaled air. As no single method is accurate, combining genetic testing and functional assays may provide better sensitivities to detect these deficiencies. When comparing the cost of care for an individual who develops severe 5-FU toxicity, pretesting may actually represent a more cost-effective and medically responsible option.

HEART BLEEDS INTO THE CHEST: PSEUDOANEURYSM DISSECTION INTO ANTERIOR CHEST WALL

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INTRODUCTION: Left ventricular pseudoaneurysm (LVPA) is a rare condition that occurs when a ventricular rupture is contained by pericardium, adherent thrombus or scar tissue. It is characterized by ventricular dilation without all the three layers of the ventricle and is associated with a high risk of rapid enlargement and rupture. They are rarely suspected at clinical presentation due to their non-specific symptoms. Rare as they are, there have been no cases reported about LVPA dissection into the chest wall. We present this rare and fascinating case of LVPA dissecting into the anterior chest.

CASE REPORT: 72 year old woman with a remote history of myocardial infarction, ischemic cardiomyopathy, status post coronary artery bypass surgery with repair of small left ventricular (LV) aneurysm with two layer pledged repair and epicardial LV lead implantation in 2009, presented to the Emergency department with sudden onset of severe left sided chest pain while watching television. Electrocardiogram showed no new acute changes. Physical examination was positive for pulsatile mass measuring at least 5cm over the mitral area. Patient was normotensive at 114/72 mm of Hg, heart rate at 102 beats/minute and saturating 94% on room air. Troponins were elevated at 0.21. Computed Tomography of the chest with contrast showed LVPA measuring 7.4x4.6x7.4 cm and dissecting through the anterior chest wall. She required intravenous morphine for pain control. Surgical treatment was discussed with the patient but she opted against surgery in favor of comfort care at home. Prior to her presentation, she had been followed up regularly with cardio-thoracic surgery and studies over the years had showed no pseudo aneurysm. She had a complicated hospital course due to diverticular abscess in 2013 and echocardiography (ECHO) done showed EF of 40-45% with evidence of apical LVPA measuring 4.8x2.4x7.1 cm on CT chest. Patient did not wish to pursue surgical intervention or anticoagulation then and had been doing well on medical therapy until the current presentation.

CONCLUSION: LVPA is a rare condition with fatal complications. Myocardial infarction and previous heart surgery constitute most common etiologies (close to 90%), followed by trauma (>5%) and infection (<5%). As symptoms are non-specific, clinical presentation is varied. The most dangerous is the risk of cardiac rupture (30%-45%) and is almost invariably fatal. ECHO is commonly used for diagnosis. Surgery is the definitive treatment of giant pseudo aneurysms, without which the prognosis is very poor. In our patient, as the prior ECHOs were normal, it was suspected that LVPA developed due to sepsis from diverticular abscess. She succumbed 5 days later from cardiac rupture.

PERIPARTUM CARDIOMYOPATHY: DEMOGRAPHICS AND TRENDS

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INTRODUCTION: Peripartum cardiomyopathy (PPCM) is an infrequent form of cardiomyopathy and is diagnosed in women without a history of heart disease 1 month before delivery or within 5 months postpartum. Risk factors include advanced maternal age, multiparity, African descent and long term tocolysis. We assessed the demographics and trend of PPCM using National Inpatient Sample (NIS) database.

MATERIAL & METHODS: NIS database is developed through Agency of Healthcare and Research quality through federal-state funded partnership and represents 20% of all the hospitalizations in USA. We used ICD 9 code (674.5) and clinical classification software (CCS) to extract data for patients discharged with the primary diagnosis of PPCM in 2012. We were able to assess the number of discharges, location and teaching status of hospitals, hospital regions, mean length of stays (LOS) in hospitals, mean hospital charges (in dollars), percentage of patients who were transferred to another hospital or received home health care, insurance payers and the trend of PPCM from 2003 to 2012.

DISCUSSION: We extracted data for 1445 patients discharged with primary diagnosis of PPCM in 2012 with mean length of stay of 4.2 days and in-hospital mortality rate of 0.17%. Majority of patients (96%) were between age group of 18-44 years. Most of the patients were diagnosed in private, not for profit hospital (77%), in urban teaching hospitals (61.25%), hospitals with large bed size (69.6%), and were covered for by Medicaid (49.8%) or private insurance (39.1%). 3.11% of cases were transferred to other short term hospitals mostly from urban teaching hospitals. Most of the patients were diagnosed in southern part of USA (41.5%) with mean hospitalization cost of \$36,821 compared to west part of country where 18% of diagnoses were made with mean hospitalization cost of \$104,016. Overall, there were 302 cases of PPCM in 2003 which reached the maximum numbers in 2010 (1720 cases).

CONCLUSION: Our study reports the demographic distribution that >60% of PPCM cases are treated by urban teaching hospitals. Greater than 40% cases are from the South due to unknown factors. LOS in hospitals has been decreasing due to early diagnosis and better treatment options. There has been close to 5 fold increase in the cases in 2012 when compared to 2003 most likely due to better modalities and guidelines for diagnosis. The mean cost of treating PPCM is 2.5 times more than the cost of treating heart failure in the elderly. This huge difference points towards unmet need to decrease cost of hospitalization and reduce burden on healthcare economy by PPCM. Further studies need to be done to identify the causes for these cost differences.

ALLOPURINOL FOR PRIMARY AND SECONDARY PREVENTION OF CARDIOVASCULAR DISEASE

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INTRODUCTION: Allopurinol is a xanthine oxidase inhibitor with anti-inflammatory properties and hence its key effects would include reducing superoxide anions and other free radicals which exert oxidative stress (OS); to increase tissue oxygen, and to increase hypoxanthine. This paper investigates the effect of allopurinol on cardiovascular events in patients with gout and hyperuricemia.

MATERIAL & METHODS: We conducted a retrospective, cross-sectional study of patients at Bronson Methodist Hospital in Kalamazoo, MI, who were diagnosed with gout according to International Classification of Diseases. The protocol was approved by the Institutional Review Board of the hospital. Test group were patients who have been on allopurinol (100-300mg per day) for at least 5 years and the control group with patients not on allopurinol. Demographics and cardiovascular comorbidities were collected by electronic medical record review. The primary outcome was a composite of hospital admissions for unstable angina, Myocardial Infarction and Congestive heart failure.

RESULTS: To assess the association between allopurinol use and number of admissions for cardiovascular events, a Poisson regression model was fit using data from 124 patients who were diagnosed with gout. Of these, 73 patients had been using allopurinol to manage gout for at least 5 years, while 51 patients who did not use allopurinol in gout management served as the control group. Both groups were controlled for diabetes mellitus, statin use, hypertension, and smoking status. It was found that allopurinol reduced hospital admission for cardiovascular events by nearly 50% ($p = 0.0003$). The mean incidence of cardiovascular admissions in the allopurinol group was estimated to be 0.55 per patient/year while that in the control group was 1.11 per patient/year. These findings provide statistically significant evidence that allopurinol use ($p=0.0003$) related to the incidence of cardiovascular admissions at the $\alpha = 0.05$ level when controlling for statin use ($p=0.0192$), hypertension ($p=0.3642$), smoking status ($p< 0.0001$), and diabetes mellitus ($p=0.7150$). The insignificance of hypertension and diabetes mellitus indicate these two factors do not add additional predictive ability to the model when allopurinol use, statin use, and smoking status are already present in the model.

CONCLUSION: In this study, patients with gout who did not take allopurinol had twice the incidence (50%) of hospital admissions for cardiovascular events and all-cause morbidity compared to those who took allopurinol. Allopurinol should be considered for primary and secondary prevention of cardiovascular events in patients who have been diagnosed with gout or hyperuricemia. The possible influence of confounding factors is being investigated.

HENOCH SCHONLEIN PURPURA IN AN ADULT PATIENT– AN OFTEN MISSED AND MISDIAGNOSED CONDITION IN ADULTS

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INTRODUCTION: Henoch Schonlein purpura (HSP) is a form of leukocytoclastic vasculitis characterized by deposition of IgA immune complexes in small vessels of skin, intestinal wall and renal mesangium. The classic presentation is a tetrad of palpable purpura, arthralgia/arthritis, abdominal pain and renal involvement. More than 90 % of patients are children younger than 10 years. It is only rarely seen in adults and is associated with a more complicated course compared to children.

CASE REPORT: A 22 year old male presented with a rash on both legs. He did not report any abdominal pain, arthralgia or associated prodrome. Prior to hospitalization, he was initially treated with antibiotics for presumed cellulitis and subsequently with short burst steroids with transient resolution of the rash. With cessation of steroids, the rash recurred and progressed rapidly. Physical examination revealed a blistering erythematous maculopapular rash most prominent in lower extremities, consistent with palpable purpura. Urinalysis and renal function were normal. Anti-Streptolysin O titre was elevated at 904 IU/ML suggesting a recent subclinical Streptococcal infection that might have triggered the rash. Serum IgA was elevated at 449 MG/DL. Skin biopsy was revealing for clastic vasculitis. Immunofluorescence showed vascular staining with IgA and the characteristic stippling pattern seen with HSP/IgA vasculitis. His rash responded well to steroid therapy. He was discharged on a prolonged taper and appropriate follow up.

DISCUSSION: The presentation of HSP in our patient was notable for many reasons. Apart from the rash, our patient did not have any other typical manifestations of HSP or the prodrome associated with it. This atypical presentation and the fact that HSP is rarely seen in adults may have contributed to the rash being initially treated as cellulitis. Additionally he did not have a typical upper respiratory infection preceding the rash which is seen in about 50% of the cases. Unlike children, adults have been reported to have atypical presentations, delayed renal complications, recurrence of the disease and an overall more complicated course. Fortunately our patient did not have any renal involvement.

CONCLUSION: It is essential to keep the diagnosis of HSP as a differential in an adult exhibiting palpable purpura. A skin biopsy should also be performed in adults to distinguish it from more severe forms of vasculitis like lupus, GPA and benign diseases like urticarial vasculitis. Follow up should include periodical urinalysis and blood pressure monitoring.



A MYSTERIOUS CASE OF DRUG INDUCED DELIRIUM

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INTRODUCTION: A psychiatric patient was admitted to hospital after she became increasingly confused, displaying behavior that could potentially lead to unintentional self-harm. She showed signs of motor and cognitive decline, including altered mental status and ataxia. The cause of her delirium is explored in this report. Gabapentin alone, or in combination with several other deliriogenic medications, could have been the etiology of her encephalopathy. Encephalopathy is a potential side effect of many antiepileptic medications. However, it is important to note that although gabapentin may have the potential to cause delirium, other drug interactions cannot be ignored, and may play a larger role than initially expected.

CASE REPORT: PK was a 53 year old Caucasian female with a past psychiatric history of schizoaffective disorder who was brought in by her roommate due to increasing confusion, unsteady gait, and appearing at risk to unintentionally harm herself. Her home medications included benzotropine 2mg BID, clozapine 125mg at bedtime, gabapentin 300mg TID, lamotrigine 200mg/day, haloperidol 5mg/day, albuterol, aspirin, cholecalciferol, docusate senna, ferrous sulfate, meloxicam, metformin, montelukast, pantoprazole, and pravastatin. Initially she was obtunded with slurred speech. EEG was consistent with delirium. A drug induced delirium was suspected, and gabapentin and haloperidol were discontinued on day one. Over the next 3 days, PK gradually became more arousable, steady, and less confused. Daily Folstein mini mental status examinations were documented starting from the first day she could cooperate, day 6 to 14, indicating gradual but consistent mental status improvement from a score of 9 to 21 out of a possible 30. After her delirium resolved somewhat, on day seven, we rechallenged with haloperidol which did not grossly alter her mental status. Haloperidol was discontinued on day twelve and benzotropine on day fourteen. Mental status and cognition remained intact thereafter. At nine weeks telephone follow-up, PK showed further improvement in mental status since discharge, and did not complain of any acute problems. She reported no further episodes of confusion or ataxia.

DISCUSSION: The EEG was consistent with drug-induced delirium. Discontinuing gabapentin and haloperidol resulted in gradual improvement in her mental status, supporting the drug-induced cause of her delirium. Rechallenging with haloperidol without mental status deterioration convinced us that her delirium was gabapentin-induced. Gabapentin is excreted unchanged in urine, with half-life of 5-7 hours. Since gabapentin has a short half-life, it is difficult to explain why it took two weeks for her mental status to recover. However, due to her extensive list of 16 home medications, we further examined the drug metabolism of each medication, along with drug interactions. Among the 16 medications that PK was taking, the combination of haloperidol, clozapine, benzotropine, and gabapentin all individually and in combination can lead to CNS depression and the first three to anticholinergic effects. In addition, several of her medications could have interfered with the catabolism of clozapine, possibly causing it to accumulate in her body. Any of these could have contributed to the drug-induced delirium.

CONCLUSION: When managing patients on multiple medications, it is valuable to check for drug interactions before introducing a new drug and genomic polymorphisms after adverse consequences arise from starting a new drug. Although initially gabapentin appeared to cause the delirium, after considering its short half-life and her protracted recovery, and further exploration of drug interactions amongst her home medications, her case appeared to be more complex. There was a combination of factors that could have played a potential role in her drug induced delirium.

A CASE OF NEUROCYSTICERCOSIS IN WESTERN MICHIGAN

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INTRODUCTION: 29 y/o farmer presents with chronic headache was found to have multiple brain lesions on imaging consistent with neurocysticercosis. Patient required craniotomy and neuro endoscopic removal of of cysts and subsequent was treated with steroids and albendazole. Neurocysticercosis disease is acquired by eating raw or undercooked pork. Ingested larva can develop into adult tapeworms in our intestines, these worms eventually shed egg bundles which can auto-inoculate in humans. Metastatic infectious foci can cause multitudes of pathology in our muscles, brain, eyes, and other tissues.

CASE REPORT: 29 y/o Hispanic male working in livestock farm for several years presented with intermittent cephalgia for 4 months which acutely got worse with nausea for 2 weeks without any neurologic deficits. CT head showed hydrocephalus and calcified lesions. A subsequent MRI of brain confirmed neurocysticercosis with total of 8 lesions: some in colloid and other in granular-nodular stage with a midline cyst obstructing the lateral ventricles and another large 4 cm cyst over posterior parietal cortex. Patient was started on decadron to prevent edema. Initial labs didn't reveal any eosinophilia. Neuro surgery was consulted and patient had a craniotomy and neuro-endoscopic removal of ventricle cyst. Decadron was continued and albendazole initiated at high dose of 800 mg TID. Headaches improved significantly after surgical treatment. Repeat CT indicated stable ventriculomegaly with continued numerous cysts and nodules. Patient was discharged home with tapering dose of steroid, Diamox and to complete 30 day course of albendazole. Subsequent CT head 3 months later showed continued progressive improvement in neurocysticercosis with no new brain lesions. Patient on follow-up continued to be headache free and was adequately treated with antiparasitics.

DISCUSSION: Cysticercosis infection originates in pigs as Tapeworm larvae (cysts) and is an infection which is a result of fecal-oral ingestion. Tapeworms cycle between human hosts and pigs. Humans ingest Tapeworm cysts in undercooked pork or unwashed vegetables. Larvae attach to human gut (via a hook-like head) and grow to adult Tapeworm. Adult Tapeworm sheds egg bundles which are excreted in feces which are ingested in Pigs to continue its life cycle. Cysts are initially asymptomatic for years as larvae in cysts are walled off from host response. When cysts degenerate they can cause severe inflammation. Host antigenic response can lead to edema (and in some cases, mass effect. Brain Parenchymal Neurocysticercosis are the most common in 90% of cases. Symptoms can range from Headache (most common), seizures (50-80% of symptomatic patients), Parkinsonism, encephalopathy (if numerous brain cysts), obstructive hydrocephalus (ventricles involved in 20-30% of symptomatic patients), Nerve palsy (mass effect with large cysts), Radiculopathy (if spinal cord involved - uncommon), Eye lesions (1-3% of cases). Recommended imaging modalities include CT Head or MRI Brain. Differential diagnosis includes Tuberculosis, Parasitic Brain Lesions (e.g. Toxoplasmosis), Brain Tumor, and Brain abscess. Management and treatment is individualized by multiple factors: Antiparasitic agents are not uniformly indicated: Albendazole with Systemic Corticosteroids is typically used when they are. In our patient Albendazole was held initially until removal of cyst as anti-parasitic medications can lead to cyst leakage and inflammatory reaction resulting in obstruction and worsening edema. You should consult infectious disease in nearly all cases. Consult neurology and neurosurgery in all CNS cases.

CONCLUSION: It is important to include parasitic infections in your differential diagnosis of brain lesions. Neurocysticercosis is a preventable disease. It is important to have proper hygiene in particular in handling of raw pork. Careful and frequent hand washing and fully cooking of meat is paramount to prevent spread of disease.

NEW ONSET ADOLESCENT PULMONARY SARCOIDOSIS

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INTRODUCTION: Sarcoidosis is a multisystem inflammatory granulomatous disease that affects adults more frequently than children and its presentation varies greatly between both populations. The variability of systemic manifestations makes sarcoidosis a diagnostic challenge. The purpose of this presentation is to emphasize the diagnostic difficulty associated with the diagnosis of new onset pulmonary sarcoidosis in an adolescent.

CASE REPORT: 14yo African American female with a history of obstructive sleep apnea and hypertension admitted with a 2-week history of an unproductive cough, chest pain, fever and shortness of breath. She had failed outpatient treatment with azithromycin, albuterol and Tylenol with codeine and had to stop her summer job (de-tasseling corn) because of pain and dyspnea. Patient was exposed to nursing home residents at church function 2-weeks prior, no other sick contacts. Other pertinent history was the death of the family parakeet around the same time her symptoms began. Initial laboratory analysis revealed a normal complete blood count (CBC), comprehensive metabolic panel (CMP), lactate dehydrogenase (LDH), elevated inflammatory markers (c-reactive protein and erythrocyte sedimentation rate). Chest radiograph revealed diffuse bilateral nodular opacities with a few small-scattered areas of patchy consolidation. CT chest completed showed diffuse multiple lung nodules less than 1 mm in size with upper lobe predominance. Infectious disease and rheumatology consultation was completed after she failed to improve with a prolonged course of azithromycin and ceftriaxone. She was started on amphotericin B, but it was discontinued after only two days of therapy because of a rising creatinine. Multiple infectious disease and rheumatological studies including respiratory culture, legionella, fungitell, histoplasma, mycoplasma, chlamydia, sputum cultures, human immunodeficiency virus (HIV), perinuclear antineutrophil cytoplasmic antibodies (p-ANCA), cytoplasmic antineutrophil cytoplasmic antibodies (c-ANCA), anti-nuclear antibody (ANA) 1:80 speckled and angiotensin converting enzyme (ACE) levels were normal. A wedge lung biopsy revealed extensive noncaseating granulomatous inflammation consistent with pulmonary sarcoidosis. She was started on prednisone 40mg daily and discharged home. She continued to improve from a pulmonary standpoint both clinical and radiological. Her follow-up pulmonary function test and chest x-ray were normal after her course of steroids.

DISCUSSION: The etiology of sarcoidosis is currently unclear, but hypothesized to be the end results of an immune response to various ubiquitous environmental triggers. The diagnostic challenge of pediatric sarcoidosis is based on the wide diversity of systemic manifestations of this chronic disease. Like adults, adolescents typically presents with a combination of lung, lymph node and eye involvement, while infants and young children present with skin, joint and eye involvement without the typical pulmonary findings. Diagnosis under age of 5yo is relatively uncommon with a prevalence of 0.06 per 100,000 in contrast to a climbing prevalence in the mid-teenage years (14-15yo) to 1 per 100,000. Our current knowledge of sarcoidosis in children is based largely on adult studies, which contributes to the diagnostic difficulties associate with pediatric sarcoidosis. The varied presentation between both adolescents and younger children add to the diagnostic challenges.

CONCLUSION: An extensive understanding of the systemic involvement of sarcoidosis can aid clinicians in keeping pediatric sarcoidosis on the differential. Furthermore, understanding the change in clinical presentation from infants and children to adolescents and adults will help clinician's in better understanding pediatric sarcoidosis.

CHALLENGES IN RECOGNIZING SYNTHETIC CANNABIS INDUCED PSYCHOSIS

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INTRODUCTION: Synthetic cannabinoids represent a new class of designer drugs that are gaining popularity with an alarming increase in use amongst adolescents. Synthetic cannabis or ‘spice mixtures’ are created by spraying synthetic cannabinoidomimics on dried plants, spices, and/or herbs. These chemicals interact with the endocannabinoid system receptors CB1 and CB2 to initiate cannabis-like effects with a binding affinity of 4-5 times that of THC. The purpose of this case presentation is to emphasize the diagnostic challenges associated with recognition of synthetic cannabis use and psychosis amongst adolescents.

CASE REPORT: 16yo female with a past medical history of asthma admitted with a 5 day history of altered mental status and acute psychosis accompanied by auditory and visual hallucinations. History suggested smoking a “joint” 5 days prior, but other substances or pharmaceuticals were denied. Increased agitation and periods of impulsive shouting of non-sensible phrases was reported. Her father believe she had smoked ‘spice’ or synthetic marijuana that had been purchased legally in neighboring Indiana. Physical exam revealed a hemodynamically stable, hyperactive female with psychomotor agitation, active auditory and visual hallucinations, without paranoia, homicidal, or suicidal ideations. Diagnostic workup included the following negative results: rapid strep, urine drug screen, urinalysis, urine phencyclidine (PCP), urine human chorionic gonadotropin (HCG), thyroid studies, electroencephalography, heavy metal testing (arsenic, lead, cadmium, mercury), human immunodeficiency virus, gonococcal/chlamydia screen, antinuclear antibodies (ANA), cerebrospinal studies (cerebrospinal fluid culture, cell count, protein, gram stain, meningoencephalitis panel). Synthetic cannabinoid urine metabolite screen and urine bath salt panel were sent, but not immediately available. CT and MRI of the brain were negative. Increasing agitation and aggression towards family and hospital staff, along with an immediate danger to herself prompted physical and pharmacological restraints. She receive both lorazepam and haloperidol to maintain her safety. Day three of hospitalization she was less agitated and her overall mental status improved. She no longer required pharmacological or physical restraints to augment her behavior. She was asymptomatic and discharged on hospital day 4.

DISCUSSION: This case emphasizes how synthetic cannabinoid use amongst adolescents is gaining popularity because of their availability and perceived lack of adverse effects. Dried plants, spices and herbs are coated with the synthetic compounds which are sold as meditation potpourri, air fresheners, perfumes and hygiene supplements at gas stations, ‘head shops’, convenience stores and on the internet. Chemically engineered cannabinoid drugs are snorted, smoked or ingested. Clinical presentation can include panic/anxiety, paranoia, breathing difficulties, diaphoresis, chest pain, visual hallucinations, aphasia, extreme agitation, auditory hallucinations, aggression and suicidality. The greater potency and longer half-lives make the clinical symptoms longer in duration and often more severe than natural cannabinoids (traditional marijuana). Synthetic drugs such as these are missed on laboratory studies, urine drug and synthetic metabolite screens due to an every changing chemical formulation and metabolite byproduct. This frequently changing chemical structure makes it challenging for the DEA to regulate.

CONCLUSION: This case reflects the importance of healthcare providers having a greater awareness and suspicion for the abuse of synthetic cannabinoids amongst adolescents. While state laws have helped to curb some abuse, many formulas still are not covered by legislation and new chemical formulations keep the market a step ahead. Lack of education and increasing use amongst adolescents has set a dangerous precedent for harm. The lack of readily available sensitive laboratory testing for synthetic cannabinoids also complicates the picture. Providers treating adolescents must be aware of these drugs and have appropriate conversations with their parents and patients regarding the adverse effects of these new designer drugs.

SAPHENOUS VEIN GRAFT ANEURYSM WITH RIGHT ATRIAL FISTULOUS FORMATION.

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INTRODUCTION: Saphenous vein graft (SVG) aneurysm is an extremely rare complication after aorto-coronary bypass with fatal outcomes. Fistulous communication between the SVG with a cardiac chamber is an even more unusual entity. We report a SVG aneurysm with right atrial fistula formation in a 56 year old male 16 years after coronary artery bypass grafting (CABG).

CASE REPORT: A 56 year old Caucasian male presented from an outlying facility 2 hours after acute onset of sub sternal chest pain at rest with diffuse ST segment depression and ST segment elevation in AVR. 16 years back the patient had a triple vessel CABG done with selective coronary and SVG angiographies done at 46 and 53 years age. At 53 years age patient had also received a left heart catheterization with stent placement and also a permanent pacemaker placement in the right ventricle. Upon initial presentation the patient's physical exam was unremarkable. EKG had shown diffuse ST segment depression and ST segment elevation in lead AVR. Emergent coronary artery and SVG angiography was performed which revealed a 6-8 cm aneurysm followed by another 12-15 cm aneurysm both in the SVG to the RCA. An aneurysm leak into the venous system was also appreciated. Left anterior descending artery was 100% occluded and proximal portion of the SVG had a stent with 70-80% in-graft restenosis was also noted. The patient was hemodynamically stable and no surgical intervention was performed. He was monitored in the cardiac unit and had further imaging studies for better visualization of the venous leak. A transthoracic echocardiogram showed aneurysms of the apical septum and of the mid anteroseptal myocardium. A poorly defined right atrial mass was also appreciated in the subcostal view. A transesophageal echocardiogram showed a cystic right atrial structure measuring 5.0 x 5.3 cm with Doppler flow within and extending from the structure into the right atrium. A CT chest with contrast revealed a partially thrombosed aneurysm measuring 2.8 x 3.0 cm about 3.4 cm distal to the RCA graft origin and a large pseudoaneurysm measuring 5.0 x 4.2 cm distal to the first aneurysm both in the SVG to the RCA. The pseudoaneurysm demonstrates a fistulous connection to the right atrium.

DISCUSSION: A very rare complication of CABG, 1 case series reported incidence of 0.07% from an estimated review of > 5,500 grafts at one institution 1. The etiology of SVG aneurysms is most likely cause would be degeneration of the graft from atherosclerotic changes causing graft dilatation 2, 3, 4. SVG aneurysms may be incidental findings (32.5%). However, patients most commonly present with chest pain/angina (46.4%), dyspnea (12.9%) and myocardial infarction (7.7%) 9. The incidence of these aneurysms has been reported in the RCA (38%), left anterior descending (25.3%), obtuse marginal (10.9%) and left circumflex (10.5%) arteries 5. Complications of SVG aneurysms include fistula formation (16 case reports up until 2012, of which 9 involved the right atrium), compression of various cardiac chambers and great vessels, aneurysm rupture, hemothorax, and cardiac tamponade. Management of SVG aneurysms has traditionally been surgical (58.4% of cases reported), with either aneurysmal resection or ligation, followed by bypass grafting in high risk patients. Conservative medical management with drug optimization is the second most common treatment option (20.1% of reported cases). In the past ten years, percutaneous intervention including coil embolization, Amplatzer vascular occlusion, and covered stent placement has been reported (15.8% of cases).

CONCLUSION: Despite the very rare nature of this entity, SVG aneurysm with fistula formation carries a high morbidity and mortality risk given the high likelihood of catastrophic complications. Physicians should maintain a high index of suspicion in post CABG patients who present with new radiographic or clinical findings.