2020 Scientific Research Poster Competition
Abstract Booklet
Experimental Research and Case Studies
Submitted by NSU KPCOM Students and CEME Interns, Residents and Fellows
Consortium for Excellence in Medical Education (CEME)

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Dear CEME Residents, Fellows, & NSU-KPCOM Students,

On behalf of the Consortium for Excellence in Medical Education - CEME, we would like to thank you for your participation in the 11th Annual CEME Poster Competition.

Scholarly activity is essential to the pursuit of excellence in clinical and academic medicine. Sharing with your colleagues interesting findings, unusual presentations of common disease, therapeutic options, or the results of various research activities, contributes to the body of medical knowledge and ultimately to the benefit of patient care.

We commend you for your commitment to research and life-long learning. Best wishes!

Sincerely,

Anthony N. Ottaviani, DO, MPH  
President  
Consortium for Excellence in Medical Education  
Dr. Kiran C. Patel College of Osteopathic Medicine

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Dear CEME Residents, Fellows, Interns, & NSU-KPCOM Students,

Let me take this opportunity to personally thank and commend each of you for your submission to CEME’s Annual Student/Intern/Resident/Fellow Research Competition.

Your work demonstrates the commitment that you have made to excellence as a clinician, scholar, and educator. While we had planned to see each of you present your research at the poster competition on April 17, 2020, COVID19 had other plans for us. Please let this Abstract Book bring you great pride - in yourselves and your institutions - as you have gone above and beyond expectations by completing the scholarly activity that you had anticipated displaying and presenting.

I hope this is not the end of your research endeavors but just one mark along your pathway to increasing the body of knowledge of your chosen profession. I wish to challenge all of you to continue your research efforts as you move forward in your career.

On behalf of all the faculty and administration of CEME & NSU-KPCOM, we wish you all success in achieving your personal and professional goals!

Sincerely,

Janet Hamstra, Ed.D.  
Executive Director, CEME-OPTI  
Assistant Dean, Graduate Medical Education  
Associate Professor, Internal Medicine  
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine
# TABLE OF CONTENTS

## EXPERIMENTAL RESEARCH ABSTRACTS – NSU FORT LAUDERDALE MAIN CAMPUS

### A Modifiable Risk Factor for Cardiovascular Disease: Exploratory Study of Urinary Metal Levels After Repeated Edetate Disodium Infusions
- Zenith Haq Alam, DO, PGY3; Francisco Ujueta, MD, PGY2; Ivan Arenas, MD, PhD; Gervasio A. Lamas, MD
- Mount Sinai Medical Center, Internal Medicine Residency Program

### Preventing the Development of Resistance to Radiation and Chemotherapy in Adrogen-Independent DU-145 Prostate Cancer Cells in Vitro
- Rida Altaf, OMS1; James Kumi-Diaka, PhD
- Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

### (+)MDM-2 Gene and Magnetic Resonance Imaging of Atypical Lipomas Literature Review
- Jose Alvarado, OMS1; Monica Cabrera, OMS2; Tim Niedzielak, DO
- Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

### Comparative Analysis on the Effects of Sarcopenia Following Primary Total Knee Arthroplasty: A Retrospective Matched-Control Analysis
- Andrew Ardeljan, OMS1, Joseph Palmer, DO; Rushabh M. Vakhraria, MD; Martin W. Roche, MD
- Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

### Impact of Discharge Status and Presence of Anti-Craving Medications on Readmission Rates for People with Alcohol Use Disorder
- Jordan Calabrese, DO, PGY2; Young Jo, MD, PGY2; Jonathan Brown, OMS3; Samuel Neuhut, MD
- Aventura Hospital and Medical Center, Psychiatry Residency Program

### The Incidence of Respiratory Failure (RF) after Hurricane Irma and Michael
- Zeeshan Chauhan, MD, PGY5; Armando Cabrera, MD, PGY6; Hector Vazquez Saad, MD; Gustavo Ferrer, MD
- Aventura Hospital and Medical Center, Pulmonary and Critical Care Medicine Fellowship Program

### Pain and Functional Outcome Comparison of Prolotherapy and Platelet-Rich Plasma Injection Effects on the Sacroiliac Joint: A Descriptive Review
- David M. Civitarese, OMS3; Keshav Godha, OMS3; Joshua B. Rothenberg, DO
- Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

### Dwindling Effects of Cytosolic and Nuclear Methionine Pools on Prostate, Ovarian and Pancreatic Cancer Cell Metabolism
- Marcos Clavijo, OMS2; Alexander Ting, OMS1; K.V. Venkatachalam, Ph.D
- Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

### A Review of Common Bone Substitutes in Depressed Tibial Plateau Fractures
- Charles De La Rosa, OMS1; Michael Downing, OMS2; Nick Lampasona, OMS2; Joshua Berko, OMS2, Alexander Ting, OMS1, Scott Polansky, DO, PGY4; Timothy Niedzielak, DO, PGY3
- Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

### Variations in Opioid Use Following Radical Prostatectomy
- Timothy Demus, OMS3; Diana M. Lopategui, MD, PGY2; Alan Nieder, MD
- Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

### Hemostatic Agents in Orthopedic Surgery
- Craig Dent, OMS1; Joshua Stephens, OMS1; Colleen Gorman, OMS1; Minh Chung, OMS1; Christopher Aguirre, OMS2; Timothy Niedzielak, DO, PGY3
- Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

### Anatomical Variations in Sacral Dysmorphism and Their Implications in Iliosacral Screw Placement – A Review of the Literature and Evaluation of the Need for Comprehensive Guidelines
- Samuel Eaddy, OMS1; Andrew Ardeljan, OMS1; David Tuyin, OMS1; Jose Alvarado, OMS1; Timothy Niedzielak, DO, PGY3; Edward Perez, MD
- Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

### Improving Patient Care by Building Self-Sustaining Communities
- Giselle Falconi, MD, PGY1; Diana Khalil, MD, PGY4; Debra Perrin-Davis, MJ, BSN; Daniel High, MD, PGY2; Nasim Alavi, PhD; Miriam Zylbergart-Lisigurski, MD; Christopher Ochner, PhD, MBA; Sanaz Kashan, MD
- Aventura Hospital Medical Center, Clinical Research Fellowship Program

### Home Health Care After Acute Myocardial Infarction - Asset or Liability
- Christopher Foth, DO, PGY3; Michael Girard, DO, PGY2; Mokhtar Radwan, DO, PGY2; Anais Cortes, MD
- Palmetto General Hospital, Internal Medicine Residency Program
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caregiver Trainings: A Useful Tool to Strengthen the Geriatric Workforce</td>
<td>36</td>
</tr>
<tr>
<td>Leena Owen, OMS4; Naushira Pandya, MD; Sweta Tewary, PhD, MSW, MMS</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
<tr>
<td>Dry Eye Syndrome and Near Work: A Closer Look at Subjective Symptoms and Patient Education</td>
<td>37</td>
</tr>
<tr>
<td>Veshesh Patel, OMS2; Jush Patel, BS; Divy Mehra, OMS3</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
<tr>
<td>In the Spotlight: Celebrity Influence and Caretaker Immunization Decision-Making</td>
<td>37</td>
</tr>
<tr>
<td>Aline M. Pereira, MBA, OMS4; Alexander Hardy, OMS4; George Ettel, OMS4; Andres D. Rodriguez, DO</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
<tr>
<td>Assessing the Awareness of Cardiovascular Disease Risk Factors Among Asian Indian Americans in Southern Florida</td>
<td>38</td>
</tr>
<tr>
<td>Rashmi Prasad, OMS2; Shivanie Ramdin, MPH, OMS2; Prachi Singh, OMS2; Nicole Cook, PhD, MPA</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
<tr>
<td>Continuous 24-Hour Contact Lens Sensor as a Commercial Device for IOP Related Changes: Patient Tolerability and Clinical Experience</td>
<td>38</td>
</tr>
<tr>
<td>Oshin Rai, OMS2; Ariel Chaves, MD; Renata Prota Hussein, MD; Syril Dorairaj, MD</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
<tr>
<td>A Case for More Than 30 Minutes: Evaluating Students’ Knowledge of Elective Pregnancy Termination Before and After an Educational Intervention</td>
<td>39</td>
</tr>
<tr>
<td>Nicholas Schenck-Smith, OMS2; Ashley Bisnow, OMS3; Taura Khorraramshahi, OMS2; Elizabeth Weirich, OMS4</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
<tr>
<td>Syphilis and Contraception in American Adolescents</td>
<td>40</td>
</tr>
<tr>
<td>Jasmin Shahrestani, OMS3; Logan Burstiner, OMS4; Ilana Gilderman, DO</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
<tr>
<td>Biologic Options in Orthopedic Trauma Surgery: A Systematic Review</td>
<td>40</td>
</tr>
<tr>
<td>Josh Sharan, OMS2; Tito Santos, OMS2; Gregory Kunis, OMS2; Jesse Blogg, OMS1; Ariel Kidron, OMS1; Jerry Ennolikara, OMS1; Tim Niedzielak, DO, PGY3; Brian Cross, DO; Edward Perez, MD</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
<tr>
<td>The Effects of Methionine Deprivation on mTORC1 and Proliferation of Cancer Cells</td>
<td>41</td>
</tr>
<tr>
<td>Orlando M. Telleria, OMS1; K.V. Venkatachalam, PhD</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
<tr>
<td>Analysis of Quality Improvement Initiative in Increasing Access to Colorectal Cancer Screening for the Uninsured in a Community Health Setting Using Initial FIT Testing</td>
<td>41</td>
</tr>
<tr>
<td>Evelina Todd, MD, PGY2; Diego I. Shmuels, MPH, MSN, CHCQM1; Joseph Durandis, MD; Sandra Roca, MPH, RN</td>
<td></td>
</tr>
<tr>
<td>Borinquen Health Care Centers, Family Medicine Residency Program</td>
<td></td>
</tr>
<tr>
<td>Targeted Therapy Against ATM with Radiation Increases Survival in ATRX-Mutated Pediatric Glioblastoma</td>
<td>41</td>
</tr>
<tr>
<td>Dustin Tran, OMS3; Vivekanand Yadav, PhD; Brendan Mullen, OMS1; Carl Koschmann, MD</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
<tr>
<td>How Your Chugs Affect Your Bugs: Effect of Various Beverages on the Salivary Microbiome</td>
<td>42</td>
</tr>
<tr>
<td>Ashley Ryan Vidad, OMS2; Camilo Rodriguez, OMS2; Samiksha Prasad, PhD; Algevis Wrench, PhD</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
<tr>
<td>Efficacy of Stimulants to Reduce Readmissions Secondary to Aggression for Children with ADHD and Autism</td>
<td>42</td>
</tr>
<tr>
<td>Angela Vittori, MD, PGY2; Young Jo, MD, PGY2; Jonathan Brown, OMS4; Samuel Neuhut, MD</td>
<td></td>
</tr>
<tr>
<td>Aventura Hospital and Medical Center, Psychiatry Residency Program</td>
<td></td>
</tr>
<tr>
<td>Tissue Dielectric Constant as an Assessment of Localized Skin Water: Estimating the Minimum Change Detectible by the Method</td>
<td>43</td>
</tr>
<tr>
<td>Don Woody, MBS, OMS2; Alexander T. Mikulka, MBS, OMS2, Harvey N. Mayrovitz, PhD</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
<tr>
<td>The Relationship Between Mold Toxin Exposure and Chronic Fatigue Syndrome</td>
<td>43</td>
</tr>
<tr>
<td>Ting Yu Wu, OMS1; Betsy Rodriguez, OMS3; Taura Khorraramshahi, OMS2; Irna Rey, MD</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
</tbody>
</table>
An Analysis on the Incidence of Dengue in Sri Lanka Based on Rainfall Patterns, Temperature, and Population (Urban and Total) ................................................................. 46
Nadia Ahamed, OMS1; Madhuri Prayaga, OMS1; Cyril Blavo, DO, TM & MPH
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Rab8a Role in αSynucleinopathy Disorders .............................................................. 46
Kaitlyn Alessi, OMS1; Mayur Parmar, PhD; Nikolaus McFarland, MD, PhD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Lifestyle Choices and Contraction of Sexually Transmitted Diseases Among U.S. Adults ................................................................................. 47
Ifat Anwar, OMS1; Deepesh Khanna, MD, PhD, MPH
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Depression and Its Symptoms in Patients with Inadequate Nutrition Habits ................................................................. 47
Nathan Badillo, OMS1; Deepesh Khanna, MD, PhD, MPH
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Homeless Needs Assessment in Hillsborough County: A Pilot Study ................................................................................. 48
Richard L. Bates III, OMS1; Umeir A. Syed, OMS1; Joel T. Davis, OMS1
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Prevalence of Sleep Disorders in a Population Aged 16 and Older ................................................................................. 48
Nada Belal, OMS1; Deepesh Khanna, MD, PhD, MPH
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Effect of Rab 35 on Tau Aggregation ................................................................... 49
Gina Bertelli, OMS1; Nikolaus McFarland, MD, PhD; Mayur Parmar, PhD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Neuroprotective Effects of Piceid Against Dopamine-Mediated Neurotoxicity ................................................................. 49
Taylor Butts, OMS1; Sneha Potdar, PhD; Jane E. Cavanaugh, PhD; Mayur S. Parmar, PhD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Health Issues Related to Tobacco Usage Among Veterans and Non-Service Members ................................................................................. 50
Owen Drozd, OMS1; Deepesh Khanna, MD, PhD, MPH
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Relationship Between E-Cigarette Use and Traditional Cigarette Use Among Florida Teens ................................................................................. 50
Brandon Friedman, OMS1; Cyril Blavo, DO, MPH
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Mental Health in Relation to Unhealthy Behaviors and Health-Related Issues ................................................................................. 51
Mohammed Khatib, OMS1; Deepesh Khanna, MD, PhD, MPH
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Prostate Radiation and Rate of Rectal Bleed ................................................................. 51
Scott Kramer, OMS3; Bansi Savla, MD, PGY1; Nick Mason, PhD; Eric Rost, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Prevalence of Chronic Disease Among Individuals of Different Weight Groups ................................................................................. 52
Sheldon Lord, OMS1; Deepesh Khanna, MD, PhD, MPH
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Perception of Weight Status in Relationship to Self-Reported BMI ................................................................................. 52
Cody M. Mutter, OMS1; Deepesh Khanna, MD, PhD, MPH
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

DNSP-11 as a Therapeutic Agent for Dopaminergic Cell Survival: Role of Caspase-3/7 and ERK Signaling ................................................................................. 53
Shreya Narain, OMS1; Sneha Potdar, PhD; Jane E. Cavanaugh, PhD; Mayur S. Parmar, PhD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

The Causal Relationship Between the Gut Microbiota and Neurodegenerative Disorders ................................................................................. 53
Shuchi Patel, OMS1; Eliyah Pollak, OMS1; Mayur Parmar, PhD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program
STK11 (LKB1) Loss of Function Promotes Non-canonical Polyamine Metabolism: A Potential Mechanism Contributing to Poor Response to Immunotherapy and Survival in Non-Small Cell Lung Cancer Patients

Trent Percy, OMS1; Tiana Dodd, OMS3
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

The Influence of Periodontal Health on Neurodegenerative Disease

Eliyah Pollak, OMS1; Shuchi Patel, OMS1; Mayur Parmar, PhD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Weight Status and Prevalence of Chronic Diseases in the U.S. Adult Population

Brian Slayyeh, OMS1; Deepesh Khanna, MD, PhD, MPH
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

CASE ABSTRACTS – NSU FORT LAUDERDALE MAIN CAMPUS

A Case of Colonic Adenocarcinoma Despite Strict Adherence to Current Colon Cancer Screening Guideline Recommendations

Crystal Acosta, OMS1; Ivonne Durand, OMS3; Jegan E. Gabbidon, DO, PGY1; Judith P. Schaffer, DO
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Stepping into a Landmine: A Case of Multi-Vessel Fusiform Aneurysms

John D. Adame, DO, PGY2; Giselle Falconi, MD, PGY1; Seneca Harberger, MD; Jennifer Dorce-Medard, DO
Lakeside Medical Center, Family Medicine Residency Program

A Bittersweet Dilemma: Amiodarone Versus Eliquis, Which Medication Caused This Patient's Sweet Syndrome?

Toni Adams, MD, PGY2; Deevee Sanchez, DO, PGY2
Floyd Medical Hospital, Family Medicine Residency Program

Eye Opener, A Case Report Of Bilateral Ptosis After Facial Botulinum Toxin Injection

Paul Agtarap, MD, PGY2; Mouriel Boucher, DO, PGY2; Remuka Tolani, OMS4
Palmetto General Hospital, Internal Medicine Residency Program

Uncontrolled Hypothyroidism Leading to Massive Pericardial Effusion with Early Tamponade

Ionut Albu, DO, PGY1; Balarama Krishna Surapaneni, MD, PGY2; Louis Betina, MD; Shaun Smithson, MD
Aventura Hospital and Medical Center, Internal Medicine Residency Program

Supernumerary Left Renal Vein and an Implication of Secondary Renal Hypertension

Brooke Alexander, OMS2; Nicholas Lampasona, OMS2; Michael Downing, OMS2, Taylor Mazzei, OMS2; Nicholas Lufti, MD, DPM
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

A Rare Case of a Pulmonary Granular Cell Tumor in a Patient Presenting with Empyema and Pleural Effusion

Andrea Alvarez, OMS3; Benjamin Baldridge, OMS3; Dayna Mastronardi, OMS3; Susana Ferra, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Comparative Analysis on the Effects of Sarcopenia Following Primary Total Knee Arthroplasty: A Retrospective Matched-Control Analysis

Andrew Ardeljan, OMS1; Joseph Palmer, PGY2; Rushabh Vakharia, MD; Martin W. Roche, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Implantation of Leadless LV Endocardial Pacing as an Alternative to Conventional CRT

Jonathan Arnedo, MD, PGY4; Ronald Pachon, MD, PGY5; Claudia Monge, DO, PGY4; Ahmed Osman, MD
Broward Health Medical Center, Cardiology Fellowship Program

The One That Almost Got Away: A Rare Case of Sarcomatoid Tumor in the Lungs

Maria Elena Arrate, OMS3; Yalini Pathmakumar, OMS3; Sushmita Mittal, OMS3; Sangita Gogate, DO
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

A Cyclic Heart - A Rare Case of Menstruation Induced Neurocardiogenic Syncope

Jilla R. Azarbal, MD, PGY3; Gustavo A. Vargas, MD, PGY3; James Davenport, MD, FACC
Kendall Regional Medical Center, Internal Medicine Residency Program

A Rare Case of Thrombotic Thrombocytopenic Purpura Presenting as a Code Neuro in a Patient Initially Presenting with Radiculopathy Pain: A Case Report of NSAID Induced TTP

Nabir M. Babbar, DO, PGY5; Loan Le, DO, PGY2; Mouriel Boucher, DO, PGY2; Christopher King, DO
Palmetto General Hospital, Critical Care Fellowship Program
A Mesenteric Desmoid Tumor Causing Recurrent Intermittent Bowel Obstruction ................................................................. 63
Nicholas Baltera, OMS3; Alexandra Monteverde, DO, PGY4; Harrison Colfer, DO, PGY5; Richard Ricca, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine

Point-of-Care Ultrasound Identification of Tension Hydrothorax ......................................................................................... 64
Leeran Baraness, MD, PGY1; Guarav Patel, MD; Vu Huy Tran, MD
Aventura Hospital and Medical Center, Emergency Medicine Residency Program

Successful Surgical Treatment of Pigmented Villonodular Synovitis in the Distal Radial Ulnar Joint with Sauvé-Kapandji Procedure: A Case Report .................................................................................................................. 64
Joshua Berko, OMS2; Andrew Ardeljan, OMS1; Gregory Kunis, OMS2; Joseph Palmer, DO, PGY-2; Michael O. Madden, DO;
Jacob Landes, DO
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Urinary Retention in a 3-Year-Old Male Secondary to Eosinophilic Cystitis ........................................................................ 65
Katheryn Birch, DO, PGY3
Palms West Hospital, Pediatric Residency Program

The Many Consequences of an Undiagnosed Case of Plasmodium Vivax ........................................................................ 65
Ashley Bisnow OMS3; Asma Ghafoor, OMS3
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Asenapine and the Nonadherent Patient: A Case Report ....................................................................................................... 66
Brian Blum, DO, PGY1; Kristy Fisher, MD, PGY1; Samuel Neuhut, MD
Aventura Hospital and Medical Center, Psychiatry Residency Program

A Case of Bacterial Endocarditis Related to Dental Caries ..................................................................................................... 66
Jamie Bolduc, DO, PGY2.
Community Health of South Florida Inc., Family Medicine Residency Program

A Rare Case of Fahr's Syndrome with Symptomatic Improvement .......................................................................................... 67
Ashish Bosakonda, MD, PGY3; Kira Fenton, DO; Cristina Savu, DO.
Broward Health, Internal Medicine Residency Program

Large Volume Central Clot Burden in a Patient with a Biventricular Pacemaker ...................................................................... 67
Otto Boutin, DO, PGY5; Ilan Razdkowolsky-Raoli, MD; Alex Morizio, MD
Palmetto General Hospital, Critical Care Fellowship Program

A Case of Eruption of Multiple Fibrous Nodules Isolated on the Scapula of a Middle-Aged Man .................................................. 68
Brett Brazen, OMS3; Christopher White, DO, PGY3; Richard Miller, DO
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Marcus Gunn Jaw Winking Ptosis: High Clinical Suspicion for Early Diagnosis and Treatment .................................................. 68
Kayla Brown, OMS3; Tyler Bean, OMS3; Akash Trivedi, OMS3; Jennifer Rich, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

New Onset Type 2 Diabetes in a Patient with a 3-Month History of Debilitating Gastrointestinal and Neurologic Symptoms .............. 68
Zachary Burns, OMS3
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

A Rare Case of Adult Intussusception ....................................................................................................................................... 69
Marianna Caballero, OMS3; Jasmin Shahrestani, OMS3; Jennifer Palacio, PGY1; Michael Dolberg, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Case Report: Adenocarcinoma of the Descending Colon in a 43-Year-Old Female .................................................................... 69
Rachael Candela, OMS3; Philip Cook, OMS3; Julia Ladna, DO, PGY1; Tan Duong, MD, PGY1
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Coccidioides Concoction: Fungal Meningitis in an Immunocompetent Patient ............................................................................. 70
Edward Cay, OMS4; Zahava Alshaev, OMS4; Larry Bush, MD, FACP; Maria Vazquez-Pertejo MD, FCAP
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Acute Thigh Compartment Syndrome as a Result of Blunt Trauma While Sleepwalking .......................................................... 70
Alexandra Chitty, DO, PGY3; Dennis Cardrice, MD; Diane Krutzler, MD; Jason Morris, DO
St. Lucie Medical Center, Emergency Medicine Residency Program

Sweet Sepsis: An Atypical Presentation of Myroides Bacteremia ............................................................................................... 71
Nicole Cohen, MD, PGY4; Carlos Bustamante, MD; Daniel Kaswan, MD; Paola Solari, MD
Aventura Hospital and Medical Center, Infectious Disease Fellowship Program
Case Report: Allopurinol Induced DRESS Syndrome in an Immunocompromised Patient ................................................................. 71
Philip Cook, OMS3; David Civitarese, OMS3; Julia Ladna, DO, PGY1; Tan Duong, MD, PGY1
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

An Interesting Case of EBV Infection ......................................................................................................................................................... 72
Amanda Costa, MD, PGY2; Estefania Niewialkouski, DO, PGY2; Karla Dixon, MD, PGY2
Broward Health Medical Center, Pediatric Residency Program

Multifocal Acute Ischemic Stroke Due to Air Embolism Secondary to Atrial-Esophageal Fistula as a Complication of Radiofrequency Catheter Ablation in a Patient with Refractory Atrial Fibrillation ................................................................................ 72
Susana Creagh, PGY2; Stephanie Prater, MD, PGY2; Roberto Fourzali, MD,
Aventura Hospital & Medical Center, Radiology Residency Program

The Importance of Recognizing Early Progression of Cerebral Vascular Accident ............................................................................. 73
Andrea Dager, DO, PGY2; Rajeswari Murugan, DO, PGY3; Saulin Quan, DO, PGY 2; Lissette Perez Lazo, DO
Palmetto General Hospital, Family Medicine Residency Program

A Masquerading Case of a Lumpy Bumpy Face: A Rare Clinical Case Report of Birt Hogg Dubé Syndrome ........................................... 73
Robert Daze, DO, PGY2; Lisa Fronek, DO, PGY2; Summer Moon, DO; Marheera Farsi, DO
Largo Medical Center, Dermatology Residency Program

An Atypical Cause of Rapidly Progressive Hearing Loss and Uveitis in a Pediatric Patient ........................................................................ 74
Evelina Dedic, OMS3; Marjorie Kragel, MS3; Alexander Small, MS3; Robin Chaize, DO
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Dilated Cardiomyopathy in the Setting of Euthyroid Sick Syndrome .................................................................................................. 74
Whitney De Oliveira, OMS3; Michael Girard, MD, PGY2; Xavier Ramos, MD, PGY3
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Unexpected Migration of Pacemaker Lead ............................................................................................................................................... 75
Eduardo Diaz, OMS3; Mark Vinicky, OMS3; Roger Carrillo MD, MBA
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Unilateral Internuclear Ophthalmoplegia as a Manifestation of Small Cell Lung Cancer Metastasis: A Rare Etiology of Acute-Onset Double Vision .................................................................................................................. 75
Yanet Diaz-Martell, MD, PGY1; Divy Mehra, OMS3; Javier Alvarado, MD, PGY2; Lino Saavedra, MD, PGY1
Kendall Regional Medical Center, Internal Medicine Residency Program

Recognition of Peripartum Cardiomyopathy .......................................................................................................................................... 75
Anthony Dieguez, DO, PGY1; Alberto Villareal, DO, PGY1; Talar Kachechian, PGY2; Peter Cohen, DO
Palmetto General Hospital, Family Medicine Residency Program

A Rare Combination of Tetralogy of Fallot with Situs Inversus Totalis .................................................................................................... 76
Alejandro Dominguez DO, PGY1; Lian Jelenszky, DO, PGY1; Victor Pazos, MD
Palmetto General Hospital, Internal Medicine Residency Program

The Use of OMT in Whiplash Induced Cervicalgia ............................................................................................................................... 76
Michael Downing, OMS3; Alessandra Posey, DO
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

The Dogma of Bicarbonate Therapy in Pediatric Diabetic Ketoacidosis ............................................................................................. 77
Michael Drechsler, DO, PGY2; Jeanette Roberts, DO
PBCGME- St. Lucie Medical Center, Emergency Medicine Program

Outside The Bowel: Venous Complications of Inflammatory Bowel Disease ...................................................................................... 77
Natasha Duggal, OMS3; Milad Heydari-Kemjani, OMS3; Anita Singh, DO; Maykel Trotter, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

An Unfortunate Case of Complex Regional Pain Syndrome After Transradial Cardiac Catheterization: A Case Report ................... 78
Ivonne Durand, OMS3; Dailys Rios, DO, PGY2
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

1.2 Million Creatinine Kinase Caused by Rare Fatty Acid Oxidation Disorder .................................................................................... 78
Michelle Dzung, DO, PGY1; Ashish Bosukonda, MD, PGY3; Peach Supupramai, OMS4; Param Eftekhari, DO.
Broward Health Medical Center, Family Medicine Residency Program
When Detoxing Can Turn Toxic  
Sundeep Gidugu, OMS3; Zaleikha Muzaffar, DO, PGY1  
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

See You Later Alligator Hallucinations: A Unique Case of Hallucigen Persisting Perception Disorder  
Kamalveer Grewal, DO, PGY2; Manonmani Murugappan, OMS3; Eric Robbins, MD  
University Hospital and Medical Center, Psychiatry Residency Program

Avoiding Tunnel Vision: Polyvalgia Rheumatica Presenting as Carpal Tunnel Syndrome  
Joel Haines, OMS3; Jackleen Goddener, OMS3; Vincent Guida, MD; Elizabeth Hames, DO  
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Posterior Reversible Encephalopathy Syndrome in an Elderly Female with Newly Diagnosed Drug Induced Systemic Lupus Erythematosus  
Samuel Harris, DO, PGY3; Amit Jangam, DO, PGY2; Jose Paz, DO  
Palmetto General Hospital, Internal Medicine Residency Program

Autoimmune Pancreatitis, Another Great Imitator  
Sandhya Haryani, OMS3; Shivani Palakodaty, OMS3; Jenny Maldonado, OMS3; Sangita Gogate, DO  
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Case Report on Osteopathic Manipulative Treatment in Mast Cell Activation Syndrome, Ehler-Danlos Syndrome, and Postural Orthostatic Tachycardia Syndrome  
Tahreem Hashmi, OMS2; Noareen Sheikh, OMS2; Manell Aboutaleb, OMS2; Patrick Barry, DO; Nancy Klimas, MD; Irina Rozenfeld, MHSH, MSN, APRN, CCRP  
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Pneumatosis Intestinalis with Portal Venous Gas Without Bowel Infarction  
Faroq Hassan, OMS3; Grant Myres, OMS3; James M. Doty, MD  
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Antiphospholipid Syndrome: An Inherited Coagulopathy Deserving of a Spot on the Differential  
Dean Helseth, OMS3; Katherine Fu, OMS3; Israel Ugalde, DO  
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

A Delayed Presentation of Foreign Body Induced Corneal Ulcer  
Chase Hemphill, DO, PGY1; Jeanette Roberts, DO; Victor Sasson, MD  
Saint Lucie Medical Center, Emergency Medicine Residency Program

An Uncommon Cause of Erythema Multiforme  
Jenny Impemba, OMS3; Mark Peicher, OMS3; Keri Mason, DO  
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Gluteal Abscess Following Potential Testosterone Injection in a Seronegative Patient - Is Testosterone Dangerously Overused?  
Sarin Itty, OMS1; Iman Squires, OMS1; Peter Cohen, DO; Judith Schaffer, DO  
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

A Case of Amyloid Cardiomyopathy  
Anmmarie Jaghab, OMS3; Taylor Kolb, OMS3; Sunny Hussain, MD, PGY3; Julia Ladna, DO, PGY1  
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Point-of-Care Ultrasound Diagnosis of Fournier's Gangrene  
Dennis James, MD, PGY1; Gaurav Patel, MD; Vu Huy Tran, MD  
Aventura Hospital and Medical Center, Emergency Medicine Residency Program

Third Case of Malignancy in a Patient with Morquio Syndrome  
Geethu James, OMS3  
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

A Curious Case of Lymphadenopathy: An Extra-Pulmonary Presentation of Tuberculosis  
Amit Jangam, DO; Shane Williams, DO; Katherine Fu, OMS3; Shivani Trivedi, OMS3  
Palmetto General Hospital, Family Medicine Residency Program

When the Mosquito is Gone but Families Have to Go on Establishing a Medical Home for the Pediatric Patient Diagnosed with Congenital Zika Syndrome  
Jessica Jean-Baptiste, OMS3; Gabriela Lins, OMS4; Lisa Gwynn, DO  
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program
Always Something Different: Another Variation of Presentation of Hodgkin Lymphoma
Marie Jean-Baptiste, DO, PGY2; Evan Layton, DO, PGY3
Palm West Hospital, Pediatric Residency Program

Infection of Urachal Cyst
Morgan Jensen, DO, PGY1; Kristen Hanrahan, DO
St. Lucie Medical Center, Emergency Medicine Residency Program

Gastric Extramedullary Plasmacytoma Presenting as a Solitary Gastric Mass
Dieula John, MD, PGY1; Balarama Krishna Surapaneni, MD, PGY2; Tony Cantave, MD, PGY5; Steven Kaplan, MD
Aventura Hospital and Medical Center, Internal Medicine Residency Program

Morvan's Syndrome: A Needle in a Haystack of Autoimmune Diseases
Kevin John, OMS3; Sandhya Haryani, OMS3; Mihir Nakrani, OMS3; Neville Mathews, OMS3
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

A Case of Ovarian Metastasis from a Primary Colorectal Mucinous Adenocarcinoma
Jaquelin Johnson, OMS3; Andrea Dager, DO, PGY2; Juan De La Ossa, DO, PGY2; Hugo Ferrara, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Heralding Lesion Gives Way to Diagnoses of Pityriasis Rosea
Talar Kachechian, DO, PGY2; Amit Jangam, DO, PGY2; Lailah Issac, DO
Palmetto General Hospital, Family Medicine Residency Program

A Rare Full Pentad: Recurrent Thrombotic Thrombocytopenic Purpura in Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
Anuj Khanna, OMS4; Niral Patel, DO, PGY2; Alexander Patel, DO, PGY2; Archana Maini, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Clinical Presentation and Treatment of Novel Dermatofibrosarcoma Protuberans
Ariel Kidron, OMS1; Daniel Fischer, PGY2; Hiep Nguyen, OMS1; Tianyi Liu, OMS1; Jack Bayer, MS1
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Newly Diagnosed HIV in a 15-Year-Old Male with Persistent Necrotizing Fasciitis and Subsequent Fulminant Course
Hoon Kim, DO, PGY2; Anthony Pearson-Shaver, MD
Palms West Hospital, Pediatric Residency Program

Unique Case of Reactivated Disseminated Varicella Zoster Virus and Herpetic Esophagitis in a Patient With Lupus Nephritis on Mycophenolate Mofetil and High-Dose Glucocorticoid Therapy: A Case Report
Sarah E. Kim, OMS3; Mohid Mirza, DO, PGY1; Robert L. DiGiovanni, DO; Rubaiya Mallay, DO
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Rare Presentation of Anti-NMDA Encephalitis
Adam Koller, OMS3; Tariq Jaber, MD, PGY3; Zahava Alishaev, OMS4; Rajiv Chokshi, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

An Incidental Finding of an Aortic Dissection in a Negative D-Dimer Patient
Khaled Kudsi, OMS3; Geidel Zambra, DO, PGY1; Jose Paz, DO; Marc M. Kesselman, DO
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Diagnosis and Treatment of Segmental Artery Mediolysis
James Kuhn, MD, PGY2; Yi Yang, MD, MPH, PGY3; Brian Baigorri, MD
Aventura Hospital and Medical Center, Radiology Residency Program

Novel Combination of Chemotherapy: The New Hope in the Treatment of Metastatic Colorectal Carcinoma
Maria J. Labra, MPH, OMS3; Jorge Hurtado-Cordovi, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

An Incidence of Duplicated Princeps Pollicis and Radialis Indicus Arteries
Nicholas Lampasona, OMS2; Brandon Laporte, OMS2; Taylor Mazzei, OMS2; Arthur Speziale, OMS2 Gary Schwartz, MD; Nicholas Lutfi, MD, DPM
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Who Deserves the Liver? Nonalcoholic Fatty Liver Disease: A Case Report
Kara Lappin, DO, PGY3; Anais Cortes, MD, MBA; Jose Paz, DO
Palmetto General Hospital, Internal Medicine Residency Program
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A Focus of Strategies to Approach Sixth Cranial Nerve Palsies with Incomplete Recovery and Incomitance</strong></td>
<td>101</td>
</tr>
<tr>
<td>Jillian Leibowitz, OMS2; Jorge Malouf, DO; Matthew Kay, MD; Austin Bach, DO, MPH</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
<tr>
<td><strong>A Case of Mucormycosis Presenting as an Acute Otitis Media</strong></td>
<td>102</td>
</tr>
<tr>
<td>Randy M. Leibowitz, OMS4; Samuel Rapaka, MD, PGY2; Jillian Leibowitz, OMS2; Cynthia Rivera, MD</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
<tr>
<td><strong>Taking a Radiological Look at Vape Associated Lung Injury (VALI) in a 26-Year-Old Patient</strong></td>
<td>102</td>
</tr>
<tr>
<td>Gabriela Lins, OMS4; Mariam Viquar, DO, PGY3</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
<tr>
<td><strong>Chronic Emesis and Hyperpigmentation in a 9-Year-Old Boy</strong></td>
<td>103</td>
</tr>
<tr>
<td>Stephanie Lombardi, DO, PGY3; Shivani Patel, DO, PGY1; Anthony Pearson-Shaver, MD; Joseph A. Sykes, MD</td>
<td></td>
</tr>
<tr>
<td>Palms West Hospital, Pediatric Residency Program</td>
<td></td>
</tr>
<tr>
<td><strong>A Curious Case of Rectal Pain - Neuroendocrine Tumors</strong></td>
<td>103</td>
</tr>
<tr>
<td>Cynthia Lopez, MD, PGY1; Neville Mathews, OMS3; Anirudh Gajjala, DO, PGY1; Hemang Thakor, DO, PGY3</td>
<td></td>
</tr>
<tr>
<td>Palmetto General Hospital, Internal Medicine Residency Program</td>
<td></td>
</tr>
<tr>
<td><strong>A Rare Case of Intrahepatic Stones</strong></td>
<td>104</td>
</tr>
<tr>
<td>Amro Mahmoud, DO, PGY3; Patrick Hartman, DO, PGY1; Patrick McLendon, DO, PGY3; Rajiv Chokshi, MD</td>
<td></td>
</tr>
<tr>
<td>Broward Health Medical Center, Internal Medicine Residency Program</td>
<td></td>
</tr>
<tr>
<td><strong>Acute HIV Detection During Window Phase in Young Male</strong></td>
<td>104</td>
</tr>
<tr>
<td>Christina Mangiaracina, DO, PGY1; Amy Goodner, DO, PGY1; Evan Altman, DO, PGY3</td>
<td></td>
</tr>
<tr>
<td>Broward Health Medical Center, Family Medicine Residency Program</td>
<td></td>
</tr>
<tr>
<td><strong>Preventing Plagiocephaly - A Hands-On Approach</strong></td>
<td>105</td>
</tr>
<tr>
<td>Kevin Marfiak, OMS3; Nathan Widboom, DO</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
<tr>
<td><strong>Massive Pulmonary Embolism as a Cause of Cardiac Arrest: Survival by VA-ECMO</strong></td>
<td>105</td>
</tr>
<tr>
<td>Robin Mata, OMS3; Gabrielle McDermott, OMS3; Joaquin Crespo-Mejia, MD</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
<tr>
<td><strong>Arteriovenous Malformation of the Jejunum in a Lower GI Bleed</strong></td>
<td>106</td>
</tr>
<tr>
<td>Neville Mathews, OMS3; Reena Patel, OMS3; Sundeep Gidugu, OMS3; Akash Patel, OMS3</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
<tr>
<td><strong>The Boy Who Cried Wolf: An Atypical Case Study of Pediatric Lupus</strong></td>
<td>107</td>
</tr>
<tr>
<td>Gabrielle McDermott, OMS3; Christine Adams, OMS3; Stanley Szybinski, MD, PGY2</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
<tr>
<td><strong>Rare Case of T1 Hyperintense Liver Masses: Diagnosing Metastatic Melanoma</strong></td>
<td>107</td>
</tr>
<tr>
<td>Jacob William McPhee, PGY3; Adam Shir, OMS2; James Banks, MD</td>
<td></td>
</tr>
<tr>
<td>Aventura Hospital and Medical Center, Radiology Residency Program</td>
<td></td>
</tr>
<tr>
<td><strong>Idiopathic Juxtafoveal Telangiectasia (Macular Telangiectasia Type II) in a Man with Rheumatoid Arthritis</strong></td>
<td>108</td>
</tr>
<tr>
<td>Divy Mehra, OMS3; Jeffrey Greiff, MD</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
<tr>
<td><strong>The De Garengeot Hernia: A Classic Case of a Rare Hernia Captured on Imaging</strong></td>
<td>108</td>
</tr>
<tr>
<td>Edward E. Missinne, MD, PGY3; Brett McKeon, MD</td>
<td></td>
</tr>
<tr>
<td>Aventura Hospital and Medical Center, Diagnostic Radiology Residency Program</td>
<td></td>
</tr>
<tr>
<td><strong>Something an Airport Body Scanner Will Not Miss: A Rare Case of Dermatofibrosarcoma Protopuberans</strong></td>
<td>108</td>
</tr>
<tr>
<td>Susmitha Mittal, OMS3; Lorena Rodriguez, OMS3; Asma Ghafoor, OMS3; Sangita Gogate, DO</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
<tr>
<td><strong>Diagnosis and Management of Malignant Pleural Effusion in the Setting of Stage IV Lung Adenocarcinoma</strong></td>
<td>109</td>
</tr>
<tr>
<td>Elizabeth Morin, OMS3; Alexander Fong, OMS3; Niral Patel, DO, PGY2</td>
<td></td>
</tr>
<tr>
<td>Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program</td>
<td></td>
</tr>
</tbody>
</table>
Determining Influence of Cannabis Use on Impulsivity in a Susceptible Patient Population .................................................. 109
Chris Morris, OMS3
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Myxedema Coma and Sequela .............................................................................................................................. 110
Oliver Morris, DO, PGY3; Jason Morris, DO
St. Lucie Medical Center, Emergency Medicine Residency Program

A Multidisciplinary Approach to Chronic Pancreatitis .......................................................................................... 110
Zuleikha Muzaffar, PGY1; Joel Haines, DO, OMS3
Mount Sinai Medical Center, Internal Medicine Residency Program

Myxedema Coma and Sequela .............................................................................................................................. 110
Oliver Morris, DO, PGY3; Jason Morris, DO
St. Lucie Medical Center, Emergency Medicine Residency Program

A Multidisciplinary Approach to Chronic Pancreatitis .......................................................................................... 110
Zuleikha Muzaffar, PGY1; Joel Haines, DO, OMS3
Mount Sinai Medical Center, Internal Medicine Residency Program

7-Year-Old with Perforated Appendicitis and Abscess Formation ............................................................................. 111
Grant Myres, OMS3; Devin Haney, OMS3; Farooq Hassan, OMS3; Allegra Meacham, DO
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

A Lifetime of Fistulas: A Cautionary Case of Surgery in Crohn’s Disease ....................................................... 111
Mihir Nakrani, OMS3; Rajeev Herekar, OMS3; Ram Hirpara, OMS1; Ronald Moore, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Left Atrial High-Grade Sarcoma with Focal Osteosarcomatous Differentiation .............................................. 112
Jessica Napuri, DO, PGY3; Jose Paz, DO; Pedro Valdes, DO
Palmetto General Hospital, Internal Medicine Residency Program

Serotonin Syndrome Secondary to Atypical Antipsychotic and Lithium Use .............................................. 113
David Nguyen, DO, PGY1; Jennifer Collins, DO
St. Lucie Medical Center, Emergency Medicine Residency Program

Immunodeficiency or Malignancy: A Masked Diagnosis .................................................................................. 113
Estefania Niewialkouski, DO, PGY2; Alyson Trillo, DO, PGY3; Anisha Mohandas, MD, PGY2
Broward Health Medical Center, Pediatric Residency Program

Non-Fluent Transcortical Motor Aphasia Syndrome in an HIV Patient Secondary to Immune Reconstitutive Inflammatory Syndrome/ Immune Reconstitutive Disease (Iris/Ird): A Case Report .... 114
Allen Machado Nunez, MD, PGY1; Jose A. Perez-Tirse, MD; Jose A. Gascon, MD; Sean M. Kauffman, MD
Kendall Regional Medical Center, Transitional Year Program

Point-of-Care Ultrasound Evaluation of Pulmonary Embolism in Pregnancy with Cardiac Arrest ............... 114
Manuel Obando, MD, PGY2; Benjamin Pirotte, MD, PGY1; Gaurav Patel, MD; Vu Huy Tran, MD
Aventura Hospital and Medical Center, Emergency Medicine Residency Program

Shingles Presenting with Acute Pancreatitis ......................................................................................................... 115
Adriana Ochoa, OMS3; Thanaporn (Jessica) Sae Tang, OMS3; Pallavi Aneja, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Acute Appendicitis: A Tenacious Diagnostic Challenge for Physicians .......................................................... 115
Ricardo Jaime Orozco, OMS3
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Autoimmune Polyendocrinopathy-Candidiasis-Ectodermal Dystrophy (APECED): Phenotypic Differences of AIRE Gene Mutations in Monozygotic Twins .......................................................... 116
Jack O'Sullivan, OMS3; Maria Elena Arrate, OMS3; Jennifer Rich, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Thinking Outside of the Box: A Case of Extra-Pulmonary Gastric Small Cell Carcinoma .................... 116
Shirvani Palakodaty, OMS3; Sandhya Haryani, OMS3; Noushad Mamun, OMS4; Jose J. Contreras, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Standardizing the Unknown: Work-Up and Management of Cancer of Unknown Primary Site .............. 117
Akash Patel, OMS3; Stephanie Pontillo, OMS3; Dinh Pham, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

When Immunoglobulins Attack: A Case of Evans Syndrome ................................................................. 117
Jay B. Patel, OMS3; Nisarg P. Shah, OMS3; Krunal S. Patel, OMS3; Walter J. Kay, DO
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

15 | P a g e
Pulmonary Artery Aneurysm in Setting of Chronic Thromboembolic Pulmonary Hypertension .......................................................... 118
Parth Patel, MD, PGY1; Chase Labiste, OMS3; Jacob Miller, MD; Robert Beecham, MD; James Banks, MD
Aventura Hospital and Medical Center, Transitional Rotating Internship Program

Trigeminal Neuralgia Misdiagnosed as Otitis Media in a Patient with Acromegaly .......................................................... 118
Rahul Patel, OMS4; Matthew Maggio, DO, PGY1; Tito Suero, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

An Ironic Presentation: Psychotic Features of a Psychiatrist .......................................................... 119
Shivani D. Patel, OMS4; Jonathan Hirschauer, PGY2
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Thymoma Type 2B Associated with Myasthenia Gravis .......................................................... 119
Yalini Pathmakumar, OMS3; Sundeep Gidugu, OMS3; Reena Patel, OMS3; Daniel Campbell, DO, PGY1
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

A Rare Case of Congenital Morgagni Hernia Masquerading as Longstanding Dyspnea on Exertion .......................................................... 120
Jason Petusevsky, OMS3; Ariel Rodriguez, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

The Mysterious Mediastinal Mass: Exploring the 5 T’s of the Anterior Mediastinum and Other Differentials .......................................................... 120
Nicholas Pigg, DO, MPH, PGY3; Zachary Carroll, OMS2.
Aventura Hospital and Medical Center, Diagnostic Radiology Residency Program

A Change of Heart: Transcatheter Aortic Valve Replacement for Aortic Stenosis in a Patient with Dextrocardia/Situs Inversus .......................................................... 121
Stephanie Prater, MD, PGY2; Robert Beecham, MD
Aventura Hospital and Medical Center, Diagnostic Radiology Residency Program

Shedding Light on Cryopreserved Aortic Allograft Management of an Infected Native Aorta .......................................................... 121
Austin Price, OMS4; Simonette Padron, OMS4
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Incarcerated Meckel’s Diverticulum Leading to Small Bowel Obstruction .......................................................... 122
Shane Quo, OMS3; Alexa Ragusa, OMS3; Ronald Moore, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Mycoplasma Pneumoniae Rash and Mucositis - Pediatrics .......................................................... 122
Alochana Ragula, MBBS, PGY3; Shane Quo, OMS3; Judith Cornely, DO
Broward Health Medical Center, Pediatrics Residency Program

A Rare Case of a Venolymphatic Malformation (VLM) in an Adolescent .......................................................... 122
Alexa Ragusa, OMS3; Katiana Garagozlo, MD, PGY3
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Septic Arthritis and Septic Emboli Secondary to Intraarticular Steroid Shoulder Injections and Potential Improper Intraarticular Injection Hygiene .......................................................... 123
Janelle Ramcharan, OMS3
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Neurogenic Stunned Myocardium in Subarachnoid Hemorrhage .......................................................... 123
Xavier Ramos, MD, PGY3; Julio Gonzalez, MD, PGY1; Michael Girard, MD, PGY2
Palmetto General Hospital, Internal Medicine Residency Program

Uterine Prolapse in Pregnancy .......................................................... 124
Matthew Darius Razavian, OMS3; Cari Graber, DO
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Xanthogranulomatous Pyelonephritis: A Case of the Great Mimicker .......................................................... 125
Jennifer Reyes, DO, PGY3; Leean Baraness, MD, PGY1; Hieu Duong, MD, PGY2; Erin Marra, MD
Aventura Hospital and Medical Center, Emergency Medicine Residency Program

Parathyroid Adenoma: A Thinking Inside the Box Presentation .......................................................... 125
Ansa Riaz, OMS3; Sushmita Mittal, OMS3; Ashrita Hanniah, OMS3; Roberto D. Comperatore, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program
Acute STEMI and Ischemic Limb in the Emergency Department

Kevin Summers, DO, PGY3; Jason Morris, DO
St. Lucie Medical Center, Emergency Medicine Residency Program

Subclavian Steal Syndrome

Huma Tahir, OMS4; Anthony Morris, OMS4; Divya Pandya, OMS4; Tariq Jaber, MD, PGY3
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Benefits of a Laparoscopic Robotic Approach in Discovering Multiple Hernias

Thanaporn Sae Tang, OMS3; Quynh-Nhu Tran, OMS3; Brian Weinstein, MD, FACS
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Spontaneous Pneumomediastinum: An Unusual Presentation of Mycoplasma Infection

Elena V. Tellez, DO, PGY1; Cesar Bertolotti, MD
Palmetto General Hospital, Internal Medicine Residency Program

Concurrent Pulmonary Embolism, Hypertensive Emergency and Flash Pulmonary Edema in Systemic Lupus Erythematosus

Lam Tran, DO, PGY1; Jeannette Roberts, DO
St Lucie Medical Center, Emergency Medicine Residency Program

A Leather Bottle Stomach with Diffuse Type Signet-Ring Cell Gastric Carcinoma

Quynh-Nhu Tran, OMS3; Thanaporn Sae Tang, OMS3; James Doty, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Bosma Arhinia Microphthalmia and Cardiac Abnormalities: A Case Report

Aakash Trivedi, OMS3; Tyler Bean, OMS3; Kayla Brown, OMS3; Carolyn Cain, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Therapeutic Challenge in Treatment of Hemochromatosis with Concurrent Hepatitis C and Alcoholic Cirrhosis

Shivani Trivedi, OMS3; Ashwani Sethi, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Unique Presentation of Hypercalcemia in the Geriatric Population: A Case Report of an Elderly Female

Kelly Tyson, OMS3; Mihir Nakrani, OMS3; Jason Ghasemloian, OMS3; Naushira Pandya, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Primary Spinal Glioblastoma Multiforme with Secondary Cerebral Metastasis: A Case Report and Comprehensive Review of the Literature

Jason D. Vadhan, OMS3; Daniel G. Eichberg, MD; Michael E. Ivan, MD; Ricardo J. Komotar, MD.
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

A Heart Within a Heart - A Case of an Occipital Infarct Unmasking the Diagnosis of a Sinus of Valsalva Aneurysm

Gustavo A. Vargas, MD, PGY3; Jilla R. Azarbal, MD, MPH, MBA, PGY3; Marco A. Mejia, MD, FACC; Marcos Valerio, MD
Kendall Regional Medical Center, Internal Medicine Residency Program

The Effect of Osteopathic Manipulative Treatment on Stiff Person Syndrome

Adithi Vemuri, OMS2; Michael Downing, OMS2; Patrick E. Barry, DO
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A Rare and Often Preventable Twisted Future: Twiddler Syndrome

Mark Vinycky, OMS3; Eduardo Diaz, OMS3; Krunal Patel, OMS3; Roger Carrillo MD, MBA
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Considering Cowden Syndrome in a Patient with Recently Diagnosed Melanoma

Jade Walter, OMS3; Frank Cirisano, MD
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Giant Chondrosarcoma of the Pelvis: A Case Report

Alexander Wilson, OMS3; Cassandra Weaver, OMS3; Deepika Sharad, OMS4; Ralph Guarneri, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

The Effect of Osteopathic Manipulative Treatment on Thoracic Outlet Syndrome

Eric Xu, OMS3
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program
Not Just a Pain in the Butt, A Review in Pediatric Joint Pain .......................................................... 141
Kuan Ting Yang, OMS3; Javier Guad-Vargas, MD, PGY1; Anisha Mohandas, MD, PGY2
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Unusual Case of Intussusception in a Teenager .......................................................... 141
Glenda Zamora, PGY2; Elizabeth Gantan, PGY3; Anthony Pearson-Shaver, MD
Palms West Hospital, Pediatric Residency Program

Re-Expansion Pulmonary Edema After Large-Volume Thoracentesis in a Patient with Primary Lingular Pulmonary Adenocarcinoma .................................................. 142
Lance Zimmerman, MD, PGY2; Muhammad Awan, OMS3; Kristina Antuna, OMS3; James Banks, MD
Aventura Hospital and Medical Center, Radiology Residency Program

CASE ABSTRACTS – NSU TAMPA BAY REGIONAL CAMPUS

Thinking Outside the Box in Liver Tox .......................................................... 144
Kimberly Brizell, DO, PGY5; Geoffrey Goldsberry, DO, PGY2
Largo Medical Center, Gastroenterology Fellowship Program

New Onset Psychosis Secondary to Neurosyphilis .......................................................... 144
Lauren DeMarco, DO, PGY2
Largo Medical Center, Psychiatry Residency Program

A Rare Case of Trichilemmal Carcinoma: Histology and Management .......................................................... 145
Lisa Fronek, DO, PGY2; Allyson Brabs, OMS4; Maheera Farsi, DO; Richard Miller, DO
Largo Medical Center, Dermatology Residency Program

Addressing Health Care Outcomes Utilizing a Model Case: Low Socioeconomic Status (SES) and Health Disparities in Pinellas and Hillsborough Counties, Florida .......................................................... 145
Oleksandra Gerus, OMS1; Bryan Adams, OMS1; Paige Webeler, OMS1; Tonni Bacoat-Jones, DO
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Osteopathic Manipulation to Correct Upper Crossed Syndrome Leads to a Decrease in Lower Back Pain .......................................................... 146
Alyssa Goldenhart, OMS3, Michael Hadley, DO
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Greither's Syndrome: A Novel Mutation .......................................................... 146
Taylor Gray, DO, PGY2; Christopher White, DO, PGY3; Maheera Farsi, MD; Richard Miller, MD
Largo Medical Center, Dermatology Residency Program

A Case of Malignant Granular Cell Tumor in a Patient with Segmental Neurofibromatosis .......................................................... 146
Victoria Griffith, OMS1; Michael T. Borenstein, MD, PhD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Atypical Presentation of Axial Spondyloarthritis .......................................................... 147
Melodie Keshani, OMS3; Anthony Safadi, OMS3; Robert Williams, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Two for One: A Case of a Toddler with Traveler's Diarrhea .......................................................... 147
Taylor Kolb, OMS3; Rogerio Faillace, MD; Noel Alonso, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Tumid Lupus Erythematosus - A Rare and Distinctive Variant of Cutaneous Lupus Erythematosus Masquerading as Urticarial Vasculitis .......................................................... 148
Evan Liu, OMS3; Robert Daze, DO, PGY2; Summer Moon, DO
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Cri du Chat Syndrome and Autism Spectrum Disorder: A Case Report .......................................................... 148
Krunal S. Patel, OMS3; Mark Vinicky, OMS3; Vivek Rajasekhar, PGY3; Christina Stamoolis, MD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

The Causal Relationship Between the Gut and Vaginal Microbiota and Neurodegenerative Disorders .......................................................... 149
Shuchi Patel, OMS1; Eliyah Pollak, OMS1; Mayur Parmar, PhD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program
Therapeutic Potential of MEK Inhibitor Monotherapy for Langerhans Cell Histiocytosis: A Case Study
Alexander Prouty, OMS1; Robert A. Baiocchi, MD, PhD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Painless Gallstone Pancreatitis in a 3-Year-Old: Case Report
Chad Richards, OMS3; Shawn Moore, MD, PGY1; Jeffery Pender, DO
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Unique Manifestation of Walker-Warburg Syndrome
Anthony Safadi, OMS3; Melodie Keshani, OMS3; Jessica Jean-Baptiste, OMS3; Mark Gabay, DO
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Significant Overlap in Clinical Presentation, Pathology and Lab Values Complicates Early Diagnosis and Treatment of ANCA-Associated Vasculitis
Dino Salkic, OMS3; Nisarg Shah, OMS3; Laxmichaya Sawant, PGY2
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

A Case of Multiple Bladder Stones: An Association with Benign Prostatic Hyperplasia
Trevor Smith, OMS1; Cody Mutter, OMS1
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Superficial Clear Cell Sarcoma (Melanoma of Soft Parts) of the Large Toe in an 80-Year-Old Female with Rare Cytogenetic Translocation
Regina Zambrano, OMS3; John Moesch, DO, PGY4; Michael Heaphy, Jr., MD, FAAD; Richard Miller, DO, FAOCD
Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Urinary Symptoms as a Result of an Ovarian Cyst
Amal Frances Ayoub, DO, PGY1; Raymond Chua, DO, PGY1; Andrea Horbey, DO
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A Rare Case of New Onset IgA Vasculitis in a Young Adult
Adolfo Alvarez, DO, PGY1; Barbara Pociurko, MD, PGY3; Omar Viqar, MD, PGY1; Ruben Delgado, MD, PGY1; Allison Hales, DO
Mount Sinai Medical Center, Internal Medicine Residency Program
EXPERIMENTAL RESEARCH ABSTRACTS

NOVA SOUTHEASTERN UNIVERSITY
FORT LAUDERDALE MAIN CAMPUS
Title: A Modifiable Risk Factor for Cardiovascular Disease: Exploratory Study of Urinary Metal Levels After Repeated Edetate Disodium Infusions
Authors: Zenith Haq Alam, DO, PGY3; Francisco Ujueta, MD, PGY2; Ivan Arenas, MD, PhD; Gervasio A. Lamas, MD
Program: Mt. Sinai Medical Center, Internal Medicine Residency Program

**Background:** Epidemiologic studies show that environmentally acquired lead and cadmium are associated with increased cardiovascular disease (CVD) risk. In the Trial to Assess Chelation Therapy (TACT), up to 40 infusions with edetate disodium (EDTA) over one-year lowered CVD risk in patients with a prior myocardial infarction. Post-EDTA urine lead and pre-EDTA urine cadmium inform on total body burden of these toxic metals. The effect of repetitive treatments of EDTA chelation on lead and cadmium body burden, however, is unknown.

**Objective:** Determine whether a reduction in surrogate measures of total body lead and cadmium could be detected after repeated EDTA-based infusions compared to baseline.

**Methods:** This is an exploratory retrospective study of 14 patients with coronary artery disease (CAD) without occupational exposure to toxic metals. Eligible patients participated in prior studies of EDTA infusions for vascular disease or received it based on clinical indications. Retrospective chart review was conducted for these analyses after approval from the Mount Sinai Institutional Review Board. The infusion regimen mirrored that of TACT. All patients were at least 50 years of age and had a creatinine 2.0 mg/mL or less at baseline. EDTA was administered intravenously. Urine was collected pre- and post-infusion in metal-free containers, assayed with inductively coupled plasma-mass spectrometry (ICP-MS; Doctor’s Data, St. Charles, IL), and controlled for urine concentration by expressing results as µg metal per gram of creatinine. We reported toxic metals associated with atherosclerosis that were measured as part of the laboratory panel. Urine metals pre and post edetate infusion at the time of the first infusion were compared to urine levels pre and post final infusion by a paired T-test.

**Results:** Patients’ mean (SD) age was 74 (11) years and serum creatinine was 0.9 (0.3) mg/dL. 71% of the patients were male, and 50% had a smoking history. All patients had a history of CAD, 86% a history of diabetes, and 86% a history of peripheral artery disease. The mean (SD) baseline MDRD GFR was 78 mL/min/1.73m. Patients received a maximum of 3 grams of edetate disodium over 3 hours per infusion, and a median of 51 infusions (range 22-61). After the initial infusion, post-edetate urine lead and cadmium increased by 3581% and 802%, respectively. Comparing the final infusion to baseline, post-edetate lead decreased by 36% (p=0.0004). Pre-edetate lead decreased by 60% (p=0.003). A reduction in post-edetate urine lead was observed in 84% of the patients after the final treatment. Moreover, spontaneous, pre-edetate lead excretion became undetectable in nearly 40% of participants.

**Conclusion:** This study suggests that in patients without clinical evidence of lead intoxication or exposure, EDTA-based infusions may decrease total body burden of lead. Our data, however, suggest no reduction in cadmium body burden. Ongoing trials (TACT 2 and TACT3a) will further assess the effect of repeated chelation with EDTA on toxic metal burden and its role in CVD.

Title: Preventing the Development of Resistance to Radiation and Chemotherapy in Androgen-independent DU-145 Prostate Cancer Cells in Vitro
Authors: Rida Altaf, OMS1; James Kumi-Diaka, PhD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** Prostate cancer (PCa) is still the most common non-skin cancer among men in the United States. The American Cancer Society has estimated 174,650 new cases and 31,620 deaths from prostate cancer for 2019. The standard treatment modalities (surgery, radio-chemotherapy, hormonal therapy) have been effective in improving the lifestyle of patients. Although the locally confined disease is treatable, treatment of the metastasized prostate cancer is still incurable with mostly guarded prognosis. The development of resistance to both radiation and chemotherapy has limited the efficacy of current therapeutic interventions for PCa. This has necessitated the search for novel and safer alternative therapeutic regimens.

**Objective:** Our hypothesis was that the use of very low dose radiation (VLDR) in combination with genistein isoflavone (Gn) will inhibit treatment-induced resistance and induce apoptotic cell death in DU-145 PCa cells at a faster rate and with significantly lower cytotoxicity.

**Methods:** We utilized DU-145 prostate cancers and exposed the to VLDR for 20 minutes before treatment with various doses of (Gn). MTT assay, inverted microscopy and fluorescence microscopy were used to assess the efficacy of mono vs. combination treatment.

**Results:** Our data revealed that exposing DU-145 cells to VLDR for 20 minutes before treatment with (Gn), significantly increased the therapeutic efficiency of genistein (Gn); the combination treatment (VLDR-Gn) caused significantly more apoptotic cell death in DU-145 cells. Results were statistically significant with p<0.05.

**Conclusions:** Our study demonstrated that hormone-independent DU-145 cells became more sensitive to genistein when primed with VLDR for 20 min prior to treatment in a dose-dependent manner than when treated with (Gn) alone. Preliminary data from limited studies in our lab revealed that (VLDR-Gn) combination inhibited treatment-induced resistance to apoptosis in the prostate cancer cells. If this observation can be demonstrated in in vivo studies, the outcome will be clinically significant.
Title: (+)MDM-2 Gene and Magnetic Resonance Imaging of Atypical Lipomas Literature Review
Authors: Jose Alvarado, OMS1; Monica Cabrera, OMS2; Tim Niedzielak, DO
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Background: Lipomas are slow growing mesenchymal neoplasms composed of adipose cells and varying levels of connective tissue. While lipomas are often benign, there is incidence of diagnostic misidentification of a characteristically analogous form of soft tissue neoplasm, atypical liposarcoma (ALT) which is also known as well-differentiated liposarcoma. The body of literature regarding lipoma to liposarcoma transformation has identified (+)MDM-2, a tumor suppressor gene inhibitor targeted at p53, as the main component behind the oncogenesis. Thus, increased MDM-2 gene expression has served as a genetic hallmark identifier in sarcoma diagnostic practice.

Objective: The objective of this review is to identify the concordance of (+)MDM-2 gene with a preoperative working diagnosis of ALT by criteria-based magnetic resonance imaging.

Methods: A systematic literature review was performed using keywords to identify articles pertinent to our objective. Inclusion criteria included articles examining lipoma/liposarcoma phenotypic morphology, ALT vs. lipoma differentiation via imaging, MDM-2 gene prevalence in relation to soft tissue oncogenesis, and imaging accuracy of fatty tissue masses. An emphasis was placed on literature over the last 30 years as there is a relative paucity of studies on this topic.

Results: Both lipoma and liposarcoma demonstrated thin septa and regions of increased signal intensity on fluid-sensitive MR images. However, imaging features favoring a diagnosis of liposarcoma included lesion larger than 10 cm, presence of thickened septa, presence of globular and/or nodular nonadipose areas or masses, and lesion less than 75% fat. In addition, the presence of contrast enhancement in a lipomatous tumor significantly increased the likelihood of ALT. ALTs have also been found to be more vascular than lipomas. Moreover, lipomas were most likely to be located intramuscularly, but may also be located subcutaneously or intermuscularly. In contrast, ALTs were more likely to be located intermuscularly, and none were located subcutaneously. The distribution of race and gender did not differ between patients with lipomas and patients with ALTs. However, as compared to patients with lipomas, patients with ALTs were older, and were more likely to have the tumor located on an extremity.

Conclusion: Although identifiable variation in presentation exist between ALT and lipomas, distinguishing clinical features do not prove sufficient for consistently establishing diagnosis. This literature review found many imaging features that favor a diagnosis of ALT over lipomas. However, questions were raised regarding the ability of professionals to accurately distinguish between the two diagnoses based solely on imaging features. This systematic review serves as a basis for future planned studies from our group. The main question raised from this study is whether these established advanced imaging criteria for ALT show concordance with the more accepted diagnostic criteria of a (+)MDM2 gene.

Title: Comparative Analysis on the Effects of Sarcopenia Following Primary Total Knee Arthroplasty: A Retrospective Matched-Control Analysis
Authors: Andrew Ardeljan, OMS1, Joseph Palmer, DO; Rushabh M. Vakharia, MD; Martin W. Roche, MD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Background: Sarcopenia is a musculoskeletal condition characterized by age related muscle tissue loss. The implications of sarcopenia on patients undergoing general surgical procedures is well documented, yet there is paucity in the current literature regarding the impact of sarcopenia on orthopedic outcomes. Considering the nature of orthopedic surgery, and importance of muscle strength in surgical outcomes, these implications could likely be magnified in orthopedic patients.

Objective: The objective of this study is to determine if patients with sarcopenia undergoing primary total knee arthroplasty are at greater odds of: (1) 90-day medical complications; and (2) 2-year implant related complications, costs and length of stay.

Methods: Patients who underwent primary TKA were identified using International Classification of Disease, ninth revision (ICD-9) procedural code 81.54. The database was then queried for patients with a diagnosis of sarcopenia using ICD-9 diagnosis code 728.2. The inclusion criteria for the study group consisted of patients undergoing primary TKA with a 90-day history of sarcopenia prior to the index procedure. Patients who underwent primary TKA without a history of sarcopenia served as controls. Study group patients were randomly matched to controls in a 1:5 ratio by age, BMI (body mass index), chronic obstructive pulmonary disease (COPD), diabetes mellitus, hyperlipidemia, hypertension, and tobacco use. Logistic regression was used to calculate odds ratios (OR) and 95% confidence intervals (95%CI). A p-value of less than 0.05 was considered statistically significant.

Results: The query yielded 15,073 patients with sarcopenia, and 75,365 patients without sarcopenia, all of which had undergone primary TKA. TKA had greater incidence and odds of: 90-day medical complications (3.24% vs. 1.22%; OR: 2.71, p<0.0001), 2-year implant related complications (4.29% vs. 2.42%; OR: 1.80, p<0.0001). Study group patients were also found to have greater in-hospital LOS (3.31 vs. 3.47, p<0.0001), day of surgery ($48,248.24 vs. $52,900.47, p<0.0001) and 90-day ($57,671.08 vs $68,303.37) costs.

Conclusion: Our findings suggest that sarcopenia may be a risk factor for medical and implant related complications in patients undergoing primary TKA. Further, prospective research should be performed to better assess risks and help determine whether these risks change with varying degrees of sarcopenic muscle loss. Additionally, patients and surgeons alike should be aware of these possible risks, in order to develop protocols to improve surgical outcomes.
Title: Impact of Discharge Status and Presence of Anti-Craving Medications on Readmission Rates for People with Alcohol Use Disorder
Authors: Jordan Calabrese, DO, PGY2; Young Jo, MD, PGY2; Jonathan Brown, OMS3; Samuel Neuhut, MD
Program: Aventura Hospital and Medical Center, Psychiatry Residency Program

Background: Alcohol use disorder (AUD) is the most prevalent substance use disorder in the United States, and it often results in hospital readmissions. Yet opportunities to treat AUD are often missed despite literature showing efficacy of medication assisted treatment (MAT) for alcohol cravings. Discharge disposition is also an issue as only a small number of patients are discharged to AUD treatment facilities.

Objective: This study evaluates the presence of MAT on home medication as well as discharge disposition to decrease 30, 60, and 90-day readmissions for people with AUD.

Methods: The retrospective study reviews all encounters made within HCA hospitals across the US from 2016 to 2018. All patients, 18 and older, given ICD diagnosis code for AUD (ICD 10 code F10) on admission were selected for analysis. Information regarding existing home anti-craving medication (defined as acamprosate or naltrexone) was obtained. After descriptive analytics were complete, logistic regression was performed to determine if discharge status (rehab facility vs. all others), initial EtOH levels, presence of home medication was associated with changes in the likelihood of 30, 60, and 90 day readmission. Generalized linear models procedure was run to see whether discharge status, initial EtOH levels, and presence of home medication was linked with changes in BAH levels on 30 day readmission. All data was analyzed by SAS 9.4.

Results: 14691 patients met the criteria and were selected for analysis. 3448 of whom were readmitted within 30 days. Patients who did not have designated MAT as part of their home medications on admission are 1.186 times more likely to be readmitted within 30 days. Patients not discharged to a rehab facility are 0.637 times as likely to be readmitted within 30 days; however, these patients are expected to have blood alcohol level (BAC) of 26.74 units higher than patients discharged to rehab. Insured patients are 1.168 times more likely to be readmitted within 30 days compared to uninsured patients; however, insured patients are expected to have an ALC level 34 points lower than uninsured patients.

Discussion: Alcohol use is very prevalent and complicates numerous hospitalizations. MAT to reduce alcohol craving is associated with decreasing rates of readmission. Although discharge to substance rehab facility is associated with increased rates of readmission, these patients are found to have decreased BAC level upon readmission, implying better treated AUD. Discharge disposition needs to be further examined in relation to treatment of alcohol use disorder as well as initiation of anti-craving medications.

Title: The Incidence of Respiratory Failure (RF) after Hurricane Irma and Michael
Authors: Zeeshan Chauhan, MD, PGY5; Armando Cabrera, MD, PGY6; Hector Vazquez Saad, MD; Gustavo Ferrer, MD
Program: Aventura Hospital and Medical Center, Pulmonary and Critical Care Medicine Fellowship Program

Background: Hurricanes and the storm surge causes interruptions of electricity that can lead to malfunction of respiratory support equipment. There has been a significant increase in diabetes-related and respiratory complaints, especially asthma, reported after the hurricane. Hurricane Irma and Michael caused major impact on Florida in September 2017 and October 2018 respectively. It is important to analyze the impact of hurricanes on hospital’s resource utilization with increased risk for hospitalization with respiratory failure (RF) especially in elderly population.

Objective: The objective of study was to assess the effect of hurricane Irma and Michael on the number of respiratory failure related hospitalizations.

Methods: We conducted a case-control analysis of hospital admissions, age ≥66 years, with diagnosis of respiratory failure (RF) in HCA hospitals after the impact of hurricane Irma (September 10, 2017 to October 1, 2017) and Hurricane Michael (October 10, 2018 to November 1, 2018) in the affected parts of south and panhandle Florida respectively. RF-related Hospital admissions, in the same facilities, during the same time of prior year were also obtained as control group. Statistical analysis was done with Chi-Square tests.

Results: Analysis from hurricane Irma revealed a statistically significant increase in the number of RF-hospital admissions .1599 out of 37567 admissions during the control period increased to 2035 out of 38978 admissions following the hurricane. (OR 1.23 ,CI 1.15-1.32, p<0.001). Similarly, results from hurricane Michael also showed significant increase in the RF-hospital admissions from 152 out of 6860 during the control period to 243 out of 6686 after the hurricane. (OR 1.66,CI 1.35-2.04, p<0.001).

Conclusion: The increase in RF-related hospitalizations following the hurricanes Irma and Michael suggests the need for suitable hospital resource dedication and preparedness during the hurricane season. More research is needed to elucidate the effect of hurricanes on RF-related hospitalizations and appropriate resource dedication.

Title: Pain and Functional Outcome Comparison of Prolotherapy and Platelet-Rich Plasma Injection Effects on the Sacroiliac Joint: A Descriptive Review
Authors: David M. Civitarese, OMS3; Keshav Godha, OMS3; Joshua B. Rothenberg, DO
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Background: The sacroiliac joint (SIJ) is the largest axial joint in the human body with a surface area of 17.5 cm². The main function of the SIJ is stability, which includes transmission of upper trunk forces to the lower extremities. The etiologies of SIJ related pain include trauma, pelvic ligamentous laxity, biomechanical dysfunction, degeneration, and neuromotor abnormalities. PRP and prolotherapy have a longstanding and extensive use in
orthopedic injury; however, there are few studies which focus on primary SI joint dysfunction, with a majority of studies focused on degenerative intervertebral discs. Consequently, there are barriers for coverage from private insurance companies and Medicare. As such, our study supports the need for further research with long term, objective outcome measures as a foundation to evaluate efficacy and justification for coverage in the future.

**Objective:** The purpose of this project is to review the current status of literature regarding efficacy of regenerative strategies in the treatment of sacroiliac joint dysfunction.

**Methods:** A review of the literature regarding the existence evidence of prolotherapy and/or platelet-rich plasma interventions on the sacroiliac joint or ligaments was performed using PubMed, SCOPUS, EMBASE, COCHRANE, and CINAHL. These findings were cataloged through the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The main outcome measures utilized were the visual analog scale (VAS), numerical rating scale (NRS), Oswestry disability index (ODI), and modified Oswestry disability questionnaire (MODQ).

**Results:** Fifteen studies (six prolotherapy and nine PRP) evaluated the effects of regenerative treatments on the intraarticular SI joint or periligamentous SI structures. Five of the six controlled studies favored their respective regenerative treatments when compared to the control group. However, low numbers of patients were included in these studies and statistical significance was only noted at particular time intervals by two of these studies. A single Level I study was reviewed and considered to be the highest quality as a prospective, randomized, controlled trial with a consistent intervention achieving statistically significant outcomes favoring prolotherapy.

**Conclusions:** This review revealed the need for adequately powered well-designed, standardized, double-blinded randomized clinical trials in order to determine the effectiveness of PRP and prolotherapy in SIJ-mediated pain. Platelet-rich plasma and prolotherapy are regenerative strategies often studied in musculoskeletal injuries. The existing literature on this topic suggests there may be favorable pain and functional primary outcomes with limited adverse events. However, standardization of these outcome measures in future studies would offer more consistent and comparable data to further evaluate treatment effectiveness.

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**Title:** Dwindling Effects of Cytosolic and Nuclear Methionine Pools on Prostate, Ovarian and Pancreatic Cancer Cell Metabolism  
**Authors:** Marcos Clavijo, OMS2; Alexander Ting, OMS1; K.V. Venkatachalam, Ph.D  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Objective:** The effects of methionine gamma lyase-deaminase (MgLd) on cancer cells.

**Background:** Methionine is a key nutrient required for various metabolic processes. In cytoplasm, methionine is often the first residue that is incorporated into proteins during synthesis. In cytosol, methionine is also activated into S-adenosylmethionine (SAM). SAM is the universal methyl group donor. There are many compounds that are either N or O methylated. Thus, altering the cytosolic methionine pool would result in various consequences that is expected to alter the cancer cells. In the nucleus, methylation of DNA promoter CpG islands suppresses the gene expression. Likewise, histone protein methylation results in heterochromatin formation causing gene suppression. Poor hnRNA-5'G-cap methylation results in destabilized RNA that are prone to degradation. In bacteria, free methionine is degraded by Mgld into methylthiol and the deaminated product α-ketobutyrate (α-KB), α-KB is a key nutrient that is metabolized by bacteria for energy purposes. Mgld is absent in humans. Therefore, methionine cannot be used for energy purposes in humans.

**Methods:** In our lab, methionine levels are made lower in cells by transfecting plasmid vector that expresses the bacterial Mgld gene either in the cytosol or nucleus. The effects of cytosolic Mgld and nuclear Mgld were assessed and compared with the control non-transfected cell.

**Result:** Our results show that there are differences in cancer cell metabolism due to either cytosolic or nuclear methionine deprivation.

**Conclusion:** Methionine deprivation induced cytosolic and nuclear metabolism of prostate, ovarian and pancreatic cancer cells are different, and the comparative analysis will be discussed. **Grants.** Supported by NSU HPD.

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**Title:** A Review of Common Bone Substitutes in Depressed Tibial Plateau Fractures  
**Authors:** Charles De La Rosa, OMS1; Michael Downing, OMS2; Nick Lampasona, OMS2; Joshua Berko, OMS2, Alexander Ting, OMS1, Scott Polansky, DO, PGY4; Timothy Niedzielak, DO, PGY3  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** Tibial plateau fractures with intra-articular depression as described by the Schatzker classification can lead to premature osteoarthritis due to involvement of the meniscus and articular surface. Demineralized bone matrix (DBM) and autologous bone grafts hold commonplace in open repair of fractures, however, there are many differences between the two types of products with a paucity of literature establishing a gold standard for their use in depressed tibial plateau fractures.

**Objective:** This study aims to review the uses and efficacy of different demineralized bone matrix products as a bone graft substitute in the treatment of intra-articular tibial plateau fractures with a focus on understanding the manufacturing, delivery, utilization and efficacy of demineralized bone matrix.

**Methods:** A systematic literature review was performed using PubMed and eMendeley with the intent to understand current treatment standards and outcomes of patients with depressed tibial plateau fractures undergoing treatment with bone graft substitutes. Inclusion criteria for the study included all available literature on tibial plateau fractures, autografts, and allografts, specifically DBM. Keywords utilized in our search included “DBM”, “tibial
plateau fractures”, “autografts”, “autograft complications.” Articles were selected from the 2000-2020 to reflect the progression that DBM has made in the treatment of tibial plateau fractures since its discovery in 1965.

**Results:** Harvesting autologous bone grafts can cause donor site pain, donor site infection, increased blood loss and increased operative time. In addition, autologous bone grafts are limited by volume, as the donor source is scarce. Autologous bone grafting is recognized as the gold standard among the types of bone grafting, however, demineralized bone matrix (DBM) has been also used as an allogeneic alternative to autologous bone grafting as it avoids many of the secondary complications from autologous bone grafts. DBM’s bone morphogenic proteins promote its osteoinductive ability on the surrounding mineral components. Compared to autologous bone grafting, DBM has the advantage of low risk of complication of donor site pain and infection, shortens the operative time, and is not limited to graft amount. DBM is also cost efficient, as it has comparatively equal cost to autogenous bone grafts taken from the iliac crest. Few studies have been done comparing efficacy amongst DBM outcomes despite a wide array of available products. One study however compared two DBM products, Orthoblast and Grafton. Orthoblast was shown to have better treatment outcomes (P = 0.035). The difference in outcomes could be due to the variability in formulation and preparation of the different DBM products currently on the market.

**Conclusion:** There is a paucity of literature in comparison of DBM products as well as a lack of standardization for DBM products due to variabilities between manufacturers. Compared to many of the synthetic bone grafting alternatives, DBM may currently be at the forefront of significant tibial plateau fracture treatment outcomes but requires allograft bone as a delivery vehicle. Nevertheless, further research is necessary to establish the efficacy, safety, consistency and reliability of its use in comparison to other bone graft options.

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**Title:** Variations in Opioid Use Following Radical Prostatectomy  
**Authors:** Timothy Demus, OMS3; Diana M. Lopategui, MD, PGY2; Alan Nieder, MD  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** The opioid epidemic in the United States is a significant problem. The President has issued a state of emergency due to rising mortality from opioid overdose. In particular, South Florida is a hotspot for opioid abuse, dependency and subsequent death. In 2017, the counties of Palm Beach, Broward and Miami-Dade accounted for 29% of Florida’s opioid related deaths. Medical professionals are taught to practice evidence-based medicine. It is critical to conduct research to guide physicians on proper prescription of opioids in an effort to combat this nationwide epidemic. For this purpose, we have developed a questionnaire that investigates opioid use following radical prostatectomy. The results will serve to help establish recommendations for opioid prescribing practices following urologic surgery.

**Objective:** The goal of this project is to collect and report data on opioid prescription and use following radical prostatectomy.

**Methods:** We developed a questionnaire that will be administered to patients following their robotic assisted radical prostatectomy surgery (RALP). Patients must be over the age of 18 and undergoing a RALP. Exclusion criteria include length of hospital stay exceeding 2 nights, and postsurgical complications classified as Clavien-Dindo Grade 2 or above. Thus, patients receiving blood transfusions or total parenteral nutrition; undergoing surgical, endoscopic or radiological intervention; or experiencing any life-threatening complications requiring ICU management will be excluded. Additional exclusion criteria include a post-operative wound infection or abscess requiring incision and drainage. Medical management requiring antiemetics, antipyretics, diuretics and electrolytes will not exclude patients from the study. Data will be compiled and stored in REDCap.

**Results:** Our questionnaire provides panel data for pain and opioid use on postoperative days 1, 3, and 5. We will analyze our data using STATA statistical software. It is expected that greater than 80% of patients in this study will not consume their opioid medication. We also hypothesize that reported pain severity will not predict the amount of opioid consumed.

**Conclusion:** Urologists face the difficulty of ensuring that their patient's pain is adequately managed while not overprescribing opioid medications. In the few prior studies on this topic, the amount of opioids prescribed by urologists exceeds the amount consumed (Fuji et.al., 2018; Theisen et. al., 2018; Woldu et. al., 2014; Bates et. al., 2011). More studies are needed to better guide urologists towards an optimal postoperative medication regimen for their patients; one that adequately manages pain without prescribing in excess.

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**Title:** Hemostatic Agents in Orthopedic Surgery  
**Authors:** Craig Dent, OMS1; Joshua Stephens, OMS1; Colleen Gorman, OMS1; Minh Chung, OMS1 Christopher Aguirre, OMS2; Timothy Niedzielak, DO, PGY3  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** Failure to achieve prompt and adequate hemostasis impacts patient outcomes in both the peri- and postoperative phases. There are many hemostatic agents in current use in orthopedic trauma surgery.

**Objective:** The purpose of this paper was to identify the most frequently used agents to examine efficacy and patient outcomes while analyzing patient safety.

**Methods:** A systematic literature review was performed using PubMed, Medline, and EBSCO article databases. Only recent studies published between 2010-2020 were queried. After initial search, 65 abstracts were examined for inclusion criteria. Of these, 19 studies met inclusion criteria.

**Results:** All studies that mentioned Floseal indicated that Floseal was successful in local hemostasis. One study found that it was equal or superior to electrocautery in total blood loss; it can also be used in patients with contraindication to electrocautery. Floseal was shown to reduce the amount of blood
transfusions. Intravenous tranexamic acid (TXA) has been demonstrated to reduce all-cause mortality versus placebo in trauma settings. A meta-analysis indicated that multiple oral doses of TXA were shown to be superior versus single dose oral in Hb drop, total blood loss, and transfusion rate in primary THA. However, IV administration and oral administration have been shown to have similar patient outcomes. A meta-analysis demonstrated that aminocaproic acid (ACA) use in total knee arthroplasty (TKA) and total hip arthroplasty (THA) reduced total blood loss, need for transfusion, Hb drop, and perioperative drainage. Furthermore, it was shown that ACA is an acceptable alternative to TXA for systemic hemostasis in the setting of TXA allergy. There were no significant differences in regard to blood loss, transfusion requirements or complication rates between ACA and TXA; while ACA is available at lower cost to the hospital. Arista, another local agent, microporous polysaccharide hemostatic (MPH), was compared against a standard control (no MPH) in patients undergoing TKA. This study demonstrated significantly lower blood loss in the MPH group.

**Conclusions:** This review demonstrates the current data on hemostatic agents and their use in orthopedic trauma surgery. When comparing the currently available hemostatic agents, some have shown to be superior than traditional methods in specific anatomical locations. Reduced surgery time, surgical complications, and hospital costs were among the benefits seen. The use of hemostatic agents in orthopedic trauma surgery has also shown to be superior to traditional methods of suture ligation and electrocautery. Overall, there is a variety of suitable, efficacious, and safe hemostatic agents available that demonstrate promising results for patients undergoing orthopedic surgery, in both the elective and trauma settings.

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**Title:** Anatomical Variations in Sacral Dysmorphism and Their Implications in Iliosacral Screw Placement – A Review of the Literature and Evaluation of the Need for Comprehensive Guidelines

**Authors:** Samuel Eaddy, OMS1; Andrew Ardeljan, OMS1; David Tuyn, OMS1; Jose Alvarado, OMS1; Timothy Niedziela, DO, PGY3; Edward Perez, MD

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** Sacral dysmorphia is a congenital anomaly found in up to 41% of the general population. The condition includes a substantial variety of anatomical differences within the lumbosacral joint and its surrounding structures. Such variability presents a cause for concern in the surgical repair of posterior pelvic ring injuries. Iliosacral screw fixation is a widely accepted technique for stabilization of sacral fractures and posterior pelvic ring instability, and thus, consideration of anatomical differences is essential for surgical planning.

**Objectives:** The primary objective of this study was to review the most significant anatomical variations associated with sacral dysmorphia and their implications in iliosacral screw fixation of posterior pelvic ring injuries. The secondary objective was to evaluate the need for a more comprehensive classification system to better guide surgical approach in sacral dysmorphia.

**Methods:** A systematic literature review was performed summarizing the existing knowledge regarding implications of sacral dysmorphia in surgical fixation of posterior pelvic ring injuries with an iliosacral screw. Variables analyzed included morphological variations, radiological modalities, surgical approaches, and complication rates. A total of 36 studies were reviewed after initial query; 8 of these studies met inclusion criteria and were thus analyzed for this study.

**Results:** The primary objective of the review was aimed at iliosacral joint fixation. However, the majority of existing literature focuses on other surgical procedures and were included due to their surgical relevance regarding sacral dysmorphia. Critical surgical variables in dysmorphic sacra include: presence of mammillary bodies, “downsloping” sacral ala, residual upper sacral disc space, and colinearity of the L5 - S1 disc with the iliac crest. Sacral dysmorphisms, as described by these variables, have been shown to correlate with differences in surgical safe zones at each sacral segment, consequently altering perioperative planning.

**Conclusion:** Many studies classify varying dysmorphic criteria and attempt to guide surgical management. Nevertheless, a true classification system should guide management, and this has yet to be effectively established. This type of classification is essential in developing a surgical plan so as to avoid complications of iliosacral screws in posterior pelvic ring fixation. This study has identified consistent features of a sacral dysmorph: presence of mammillary bodies, “downsloping” sacral ala, residual upper sacral disc space, and colinearity of the L5 - S1 disc with the iliac crest. Some complications include: L5 palsy, spinal canal and neuroforaminal penetration, and malreduction to name a few. Further research is needed to examine the effects of these dysmorphic features on clinical outcomes and complication rates in the patient population undergoing iliosacral screw fixation for unstable pelvic ring injuries. This systematic review aims to serve as a protocol to examine these effects in the Broward County patient population.

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**Title:** Improving Patient Care by Building Self-Sustaining Communities

**Authors:** Giselle Falconi, MD, PGY1; Diana Khalil, MD, PGY4; Debra Perrin-Davis, MJ, BSN; Daniel High, MD, PGY2; Nasim Alavi, PhD; Miriam Zylberglait-Lisigurski, MD; Christopher Ochner, PhD, MBA; Sanaz Kashan, MD

**Program:** Aventura Hospital and Medical Center, Clinical Research Fellowship Program

**Background:** Practice-based learning and improvement (PBLI) and system-based practice (SBP) are two of the six core competencies residents are expected to attain per ACGME guidelines. Medical education research has noted several aspects of the “hidden curriculum” to be highly influential in terms of facilitating professional development and promoting social responsibility. Efforts should be made in areas that align with our academic requirements and where we can affect change immediately. Physicians respond to measurable and realistic goals. This project will give residents the opportunity to develop a longitudinal interprofessional palliative care curriculum alongside other members of the PC team. Creating an interdisciplinary team will encourage a learning culture in which our resident physicians will interact with other patient stakeholders over six months. This project will cover 2 domains: Interprofessional education (IPE), and palliative care education. Team leaders will define collective learning objectives, use validated
educational assessments, and measure improvement via continuous PDSA cycles. The resulting interdisciplinary health care teams will provide high-quality palliative care, raise awareness of existing hospital resources, decrease referral aversion, and offer optimal support to families.

**Objective:** Create and implement an interdisciplinary palliative care education curriculum for nursing, residents, social work students, and chaplains.

**Methods:** 8 domains for PC identified by the National Consensus Project for Quality Palliative Care will be covered using Kern’s 6 step model for curriculum development. Needs assessments of all stakeholders will be elucidated, interdisciplinary objectives will be developed following clinical guidelines and competencies for the various disciplines using the ABCD method and Bloom’s Taxonomy of measurable verbs. The teaching methods used will range from in-person workshops, written reflections and small group online discussion.

**Validated Educational Assessments:** Interprofessional Education/Collaboration: Team Development Measure (TDM) to assess team development and measure the success of the team to work together. Palliative Care Education: Palliative care quiz for nursing (PCQN) to measure nurse’s knowledge after intervention. Pre/Post Test for internal medicine residents using Bloom’s taxonomy of measurable verbs.

**Progress to date:** Currently, there are a total of 4 workshops in the making with the palliative care fellow leading the organization and pre-approved content structure of the blueprints. Internal medicine resident on the team will coordinate with an adult education specialist regarding methodologies, training needs and scheduling for implementing the workshops. Final training scheduling will be presented to the IM program director and the program coordinator for approval. After completion and implementation begins, team leaders will meet on a monthly basis completing a Plan-Do-Study-Act (PDSA) to ensure linear headway of the project and address new emerging ideas and/or criticisms of the curriculum.

**Conclusions:** Institutional support has been obtained. This activity has been designated for Category 2 CME credits. Nursing team members will secure CE from sponsoring institution. This will be the first time that the internationally validated PCQN will be used as part of an IPE curriculum with permission of the author’s designee.

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**Title:** Home Health Care After Acute Myocardial Infarction - Asset or Liability  
**Authors:** Christopher Foth, DO, PGY3; Michael Girard, DO, PGY2; Mokhtar Radwan, DO, PGY2; Anais Cortes, MD  
**Program:** Palmetto General Hospital, Internal Medicine Residency Program

**Background:** Nearly 1 in 5 patients with acute myocardial infarction are readmitted within 30 days of discharge. Home health care has been proposed as an effective means of reducing readmission rates.

**Objective:** Compare readmission rates and characteristics between different discharge dispositions for patients who initially presented with an acute myocardial infarction.

**Methods:** Data from 30-day readmissions in a predominantly Cuban-American population during a 1-year period at a community hospital was analyzed.

**Results:** At our institution the overall 30-day readmission rate for acute myocardial infarction was 10.8% during 2018. Heart failure and recurrent chest pain accounted for 50% of our hospitals readmissions for patients that initially presented with an acute myocardial infarction (AMI). Patients who were discharged home with home health care were 27.8% more likely to be readmitted than those discharged home without home health care or to an inpatient rehabilitation center. Those patients who also returned fewer days after discharge with an average out of hospital length of 9.4 days versus 13.5 days for the composite of home without home health care and inpatient rehab. Younger patients that initially presented with a STEMI were more likely to be readmitted with chest pain. Older patients and those who suffered an NSTEMI were more likely to be readmitted with heart failure symptoms.

**Conclusion:** In our hospital, home health care was associated with increased readmission rates and a shorter amount of time between discharge and readmission. This is in opposition of the current wisdom of home health care leading to reduced readmission rates by providing periodically monitored care in a home setting.

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**Title:** Leg-to-Arm Tissue Dielectric Constant Ratios to Aid Assessment of Leg Lymphedema  
**Authors:** Ted Frederic, OMS1; Isaac Ichoa, OMS1; Ram Hirpara, OMS1; Harvey Mayrovitz, PhD  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** Quantitative assessment of leg edema or lymphedema is useful to determine effectiveness of treatment and early detect and track lymphedema in patients who have undergone gynecological and other surgeries. Clinical assessment of lower extremity edema or lymphedema is largely visual and tactile. A puffy and swollen limb in which the architecture of the skin is smoothed with the visual absence of surface veins provides some descriptive evidence. The tactile detection part relies on skin pressing usually with non-standard pressures for usually non-standard times and observing either indentation depth or how long skin indentation remains after release of the pressure. Based on a combination of visual and tactile assessments it is usual to characterize the level of the edema present as 1°, 2°, 3° or 4° with the numerical assignment mainly subjective and largely dependent on the evaluator’s skill and experience. There is thus a need for less subjective measures that can be easily implemented.

**Objective:** There were two objectives; 1) to introduce a new measurement procedure that would be less subjective and 2) to provide a normal reference range of parameter values.

**Methods:** Because of the sensitivity of skin tissue dielectric constant (TDC) values to tissue water, its measurement was the primary assessment tool. TDC was measured at the foot, calf and forearm and foot/arm and calf/arm ratios calculated. The logic of using these ratios was that for most lower
extremity edematous conditions, there is little or no effect on arm water. Thus, the ratios provide self-contained assessment parameters independent of possible variations in absolute TDC values among patients. These ratios were measured in 44 young and 64 mature persons equally divided by gender to test for age-related differences.

**Results:** Foot/arm ratios of mature vs. young (mean ± SD) were 0.997 ± 0.112 and 1.041 ± 0.184 and did not statistically differ (p = 0.157). Calf/Arm ratios were 1.050 ± 0.168 vs. 1.085 ± 0.197 and did not significantly differ (p = 0.320). Including both age groups (n = 108) to get combined ratios yielded 1.015 ± 0.146 for foot/arm and 1.013 ± 0.160 for calf/arm. Potential lymphedema threshold ratios, calculated as the mean ratio plus 2SD, were for foot/forearm and calf/forearm 1.307 and 1.333 respectively.

**Conclusions:** Based on the present findings, it is proposed that a conservative estimate of lower extremity lymphedema presence could be based on a foot/arm or calf/arm TDC ratio exceeding 1.35. Changes in these ratios should be useable to track temporal changes and therapy related improvements. The test of these conclusions requires future research in which these intra-side TDC ratios and thresholds are evaluated in patients with lower extremity lymphedema and/or venous-related edema. The present work provides the reference values for such comparisons to be systematically done.

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**Title:** The Relationship Between Stress and Salivary Microbiome in the Medical Student Population

**Authors:** Jasmin Ghasemloian, OMS3; Janelle Torres, OMS1; Noelle Dorgham, OMS1; Maryanne Vaca, OMS1; Samiksha Prasad, PhD; Algevis Wrench, PhD

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** Stress has been defined as the, “wear and tear,” the body undergoes in response to psychological or physical stimuli. Long-term exposure to stressful stimuli has been linked to depression, anxiety, and various somatic complaints, putting the body in an immunosuppressive state. The hypothalamic-pituitary-adrenal axis is stimulated in response to stress and releases cortisol into the bloodstream, which in turn alters the gene expression of bacteria. However, the relationship between stress and the salivary microbiome has not been thoroughly investigated in the human population. This study aims to evaluate the relationships of the salivary microbiome of medical students, with various levels of perceived stress, as well as examine the co-occurrence networks of the different bacteria.

**Objective:** To determine the composition and co-occurrence networks of bacterial species in the salivary microbiomes of medical students affected by stress.

**Methods:** This is a cross-sectional study of saliva samples collected from 100 first-year and 100 second-year medical students at NSU-KPCOM and NSU-MD medical school programs, where each program will contribute 50 students to each group.1 Saliva will be collected on the university campus in a controlled setting at the same time of the day, with inclusion criteria in place: 1) First-year or second-year medical student at KPCOM and NSU MD; 2) Between the ages of 20 to 35 years; 3) No food or beverage one hour prior to collection. The participants demographics and perceived stress will be collected using questionnaires in the REDCap research platform. Students will be categorized into low stress, intermediate stress, and high stress based on their responses. 2 mL of saliva will be collected from each participant into a GeneFix™ Saliva Microbiome DNA Collector tube (Isohelix), and the pH of the collected saliva samples will be measured and recorded. Bacterial DNA from the samples will be extracted and checked for quality and sent for Illumina 16S rRNA sequencing. The constitution of the salivary microbiome will be subsequently determined after bioinformatics analysis.

**Results:** This study will examine 100 saliva samples. This sample size was selected based on the statistical concept of z-score, to obtain a confidence level of 90% with a 5.3% margin of error. One of the expected outcomes of this study is that medical students with higher stress levels than others on the Perceived Stress Scale (PSS) will exhibit a similar salivary microbial diversity or co-occurrence networks in their salivary microbiome than the medical students with lower PSS score.

**Conclusion:** In this study, we intend to demonstrate the influence of stress on the salivary microbiome. It is expected that scoring high on the PSS will pertain to similar microbial networks in the salivary microbiome of medical students. The observed similarities and dissimilarities can further develop our understanding of the salivary health, immune responses, and disease. A better understanding of the effect of stress on the salivary microbiome may be useful in preventative efforts to improve medical students’ wellbeing. This can be further explored in future research by including other healthcare-related programs.

1This research study was approved by the institutional review board (IRB) on Nov 14th, 2019 and is funded by the Health Professions Division Research Grant by Nova Southeastern University.

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**Title:** Prealbumin and Platelet-Lymphocyte Ratio Predict Outcomes in Trauma Patients

**Authors:** Rajeev Herekar, OMS3; Jacob Peacock, OMS3; Erica Pieper, OMS1; Ernesto Joubran, OMS1; Brian Cross, MD; Tim Niedzielak, DO

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** The use of reliable biomarkers in assessing the condition of trauma patients can be a valuable tool in predicting patient outcomes. Prealbumin (PAB) is an acute phase protein essential for wound healing under conditions of inflammation, infection, trauma, and surgery. The role of PAB as a biomarker for changes in nutritional status should be considered, given that malnourishment is linked to decreased immune function and adverse outcomes. Platelet-to-lymphocyte ratio (PLR) can also be assessed to determine the presence of systemic inflammation, as an increase in this ratio has been correlated with an increase in infection rates, longer hospital stays, and mortality. However, the use of prealbumin and PLR as prognostic tools in poly-trauma patients has not yet been thoroughly explored.
**Objective:** The objective of this study is to determine if prealbumin and PLR can be used as effective biomarkers in predicting clinical outcomes among trauma patients.

**Methods:** This is a retrospective review data in polytrauma patients (fractures of more than one long bone, each requiring surgery) treated between January 2018-January 2020. Patients were assigned based on their admission prealbumin. Those with a PAB under 19 mg/dL were assigned to the malnourished (MNC) cohort, whereas those with a PAB greater than or equal to 19 mg/dL were assigned to the control arm (CC). Patient age, initial admission prealbumin, PLR ratios, initial C-reactive protein (CRP), mortality rate, hospital length of stay (LOS), and dependence on ventilator were examined and recorded. The associations between levels of biomarkers and outcomes were analyzed using ANOVA, two sample T-tests, and linear regression models.

**Results:** Five patients were in each cohort. The average age of the MNC was 38.6 years and 45.4 years in the CC. The average PAB in the MNC was 15.4 mg/dL (+/-2.4) and 23.2 mg/dL (+/-3.77) in the CC and statistically different (p<0.05). The average PLR for the MNC was 0.023 and 0.007 for the CC. This difference in means was not statistically significant (p=0.22). There was a higher mean LOS of 18.34 days in the MNC cohort, whereas the CC had a mean LOS of 9.88 days; the MNC group also had a higher mean PLR of 0.023. When examining a correlation between PLR and length of hospital stay amongst all patients, there was no statistical significance (r=0.21; p=0.57).

**Discussion:** Routine measurement of prealbumin and PLR as biomarkers in trauma patients should be considered to predict outcomes and lengths of stay. Although our study failed to show a statistically significant correlation between PLR and length of stay, a trend was observed. Furthermore, malnourished patients with a PAB <19 mg/dL were shown to have a higher average PLR and concordant length of stay than their well-nourished counterparts which is consistent with current literature. Malnourished patients should be closely monitored as they may have worse outcomes and longer hospital stays than well-nourished patients. Ultimately, further research and larger cohorts are needed to establish these criteria.
investigated career burnout vis-à-vis clinical uncertainty and individual resilience in primary care providers (PCPs).

Objective: Clarify how KP35 evades innate immune clearance, specifically looking at whether KP35 inhibits the oxidative burst and how KP35 induces AM death.

Methods: Macrophage-induced THP-1 cells were infected with either KP35, KPPR1, or USA 300 (S. Aureus; the control). qRT-PCR analyses were performed for relative expression of NOX2/gp91phox – the catalytic core of phagolysosomal membrane associated NADPH oxidase. Flow cytometry analyses for both mitochondrial and intracellular reactive oxygen species (mROS and iROS respectively) were performed. Immunoblots for phosphorylated MLKL (p-MLKL) were performed to investigate the induction of necroptosis.

Results: qRT-PCR analyses for relative expression of NOX2/gp91phox indicated that KP35 did not upregulate oxidative burst at the level of transcription. Flow cytometry analyses for both mROS and iROS were inconclusive regarding the oxidative burst as they were confounded by the induction of significant cell death. Interestingly, two populations of dead cells emerged during flow cytometry: the first, positive for mROS; the second, negative for mROS. Immunoblots were negative for p-MLKL suggesting necroptosis did not occur.

Conclusion: It remains unclear how KP35 affects oxidative burst. KP35 does not upregulate NOX2 transcription, but activation of the oxidative burst has not been ruled out. Regarding cell death, flow cytometry suggested KP35 induces two forms of cell death: apoptosis and a non-ROS dependent form of cell death, such as necroptosis or pyroptosis. Although necroptosis was ruled out via immunoblot, other studies confirmed the occurrence of necroptosis by blocking the phosphorylation of MLKL and observing the consequences. It is unclear why these results are contradictory. What is clear: KP35 leads to the rapid demise of host macrophages, with or without ROS. More investigation is required.

Title: A Retrospective Analysis: 30-Day Readmission Rate for Patient Living with HIV/AIDS and Major Depression Disorder
Authors: Sindhura Kompella, MD, PGY2; Tom Joshua Wy, DO, PGY2; Clara Alvarez, MD
Program: Aventura Hospital and Medical Center, Psychiatry Residency Program

Background: Major depression disorder (MDD) is the most common psychiatric comorbidity in patients living with HIV (PLWHIV). The prevalence rate of MDD is higher in PLWHIV in comparison to general population. As PLWHIV are living for longer duration, the risk of developing depression also increases. Additionally, MDD has been associated with other comorbidities such as cardiovascular, ulcerative colitis, etc. Therefore, it is important to assess the correlation of MDD with PLWHIV. In our study, we focus specifically on the 30-day readmission rate of PLWHIV and severe MDD.

Methods: HCA Databank was used to conduct a retrospective study on PLWHIV and severe MDD. Keywords such as HIV, severe MDD, CD4, Viral load were used to identify the data. 30-day readmission rate is studied in PLWHIV (N=6200 with mean age=60) and severe MDD. Variables such as age, sex, gender, adherence to antiretroviral medications and comorbidities such as HTN were also studied in this population. PLWHIV were quantified using CD4 and viral load. DSM V criteria was used to diagnose MDD in PLWHIV. Antiretroviral medication list was used to analyze adherence in this population group. Geographical locations were identified using Urbanization codes. These codes include metro cities, principal urban centers, rural, semirural, suburban periphery and urban periphery. Logistic regression Analysis was used to analyze the data.

Results: Logistic regression analysis for 30-day readmission rate in PLWHIV with MDD was found to be higher in older age group (p<0.01). Additionally, Caucasian population (p<0.01) were more likely to be readmitted within 30 days of discharge if they had both HIV and MDD. Importantly, rural areas were found to have greater readmission rates within 30 days in comparison to suburban locations (p<0.01). Other variables such as gender, HTN or adherence to antiretroviral medication were not found to be significant for 30-day readmission rate in PLWHIV and severe MDD (P<0.05).

Discussion: As more patients live longer with HIV/AIDS, it gives rise to illnesses such as anxiety, depression and cognitive impairment. This study is interesting since it specifically looks into patients with severe MDD which is most prevalent in PLWHIV, per literature review. Patients in rural areas and older age groups are more likely to have higher 30-day readmission rates due to poor access to mental healthcare, limited resources, low socioeconomic status or lack of knowledge. Caucasians were more likely to be readmitted within 30 days in PLWHIV and MDD in comparison to other ethnic groups possibly due to non-suppression of viral load after treatment, sequela to the illness or nondisclosure of illness from other ethnic groups. Age, race and geographic regions are some of the factors that clinicians should be vigilant for in PLWHIV and MDD in order to decrease hospitalizations, morbidity/mortality and the financial burden associated with 30-day readmission rate.

Title: Clinical Uncertainty, Individual Resilience, and Burnout in a Sample of Primary Care Physicians
Authors: Michelle Lanspa, OMS1; Robin J. Jacobs, PhD, MSW, MS, MPH; Elizabeth U. Tran, MD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Background: Career burnout is a syndrome characterized by a loss of enthusiasm for one’s work, feelings of cynicism, and a low sense of personal accomplishment. Typical contributing factors to career burnout often revolve around aspects of clinical uncertainty. In primary care medical practice, clinical uncertainty is inevitable and considered an innate feature of medicine. Low levels of individual resilience, combined clinical uncertainty may increase physicians’ stress, lead to physician burnout, and may be a potential threat to patients’ safety. These physician burnout factors may also be influenced by gender and number of years post-training. Few studies have investigated career burnout vis-à-vis clinical uncertainty and individual resilience in primary care providers (PCPs).
**Objective:** This purpose of this study was to characterize the levels of clinical uncertainty, resilience, and career burnout among primary care physicians (PCPs). Additionally, it sought to examine the relation between clinical uncertainty, burnout, years of post-residency training, and gender.

**Methods:** This cross-sectional, descriptive study used an online survey administered to PCPs in outpatient primary care clinics. The 31-item survey contained validated scales asking about psychosocial variables (physicians’ reactions to clinical uncertainty, individual resilience), behaviors (physician strategies of resilience), and demographic characteristics. Also included was a 1-item measure of physicians’ perceptions of burnout. Characteristics of the participants were also collected, such as sex, age, and years out of training. Descriptive statistics of scales and individual items were conducted. Chi square, independent samples t-tests, and correlational analyses were analyzed using SPSS v.25 software to examine relations between clinical uncertainty, burnout, years out of training, and gender.

**Results:** Of the sample, 51.4% (n=18) were women. The mean age was 42.1 (SD=10.2; range 29-66 years). The majority worked mainly in outpatient settings. Clinical uncertainty and individual resilience were found to be strongly correlated, r(128)=.89, p < .01. There was a significant difference in the mean scores for uncertainty in women (M=36.7, SD=7.18) and men (M=29.4, SD=8.5); t(33)=2.75, p=.01; women scored higher scores on the clinical uncertainty scale. No differences were found between women and men on resilience scores. The relationship between career burnout and gender was also significant; participants with higher levels of burnout were more likely to be women (73.3% vs. 26.7%), χ²(1, N=176) 5.5, p < 0.05. There was no statistical significance between career burnout and years out of training.

**Conclusion:** These preliminary findings offer insight into the idea that there may be a relationship between clinical uncertainty and resilience, and gender may play a role in these psychosocial constructs, possible leading to burnout. Due to the limitations of this small sample size and narrow inclusion criteria (i.e., PCPs in Texas), more research is warranted to explore PCP characteristics that may be factors in or predictors of burnout among PCPs.

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**Title:** Comparison of Outcomes Between Static Spacers Versus Articulating Spacers in the Setting of Revision Periprosthetic Knee Infections

**Authors:** Justin Limtong, DO, PGY3; Ji Young Chung, OMS2

**Program:** Broward Medical Center, Orthopedic Surgery Residency Program

**Background:** One of the most serious complications after total knee arthroplasty (TKA) is periprosthetic joint infection (PJI). Despite tremendous advances in the prevention, diagnosis, and treatment of PJI, it remains the most commonly reported cause of early failure in TKA, resulting in the need for subsequent revision. The gold standard for periprosthetic joint infections is a two-stage revision with implantation of antibiotic loaded cement in order to eradicate the infection prior to reimplantation of the prosthesis. Traditional static spacers are blocks of cement inserted within the joint space that maintain the length of the extremity while preventing contraction of the surrounding soft tissues during the interim. Alternatively, articulating spacers are antibiotic loaded cement along with a polyethylene liner that prevent soft tissue contraction while allowing range of motion during the interim.

**Objective:** The objective of this study is to compare and contrast the outcomes of traditional static spacers and articulating spacers used for periprosthetic joint infection.

**Methods:** This study was designed as a retrospective cohort study using data collected by various investigators. The patients were identified as having PJI with the use of the criteria developed by the Musculoskeletal Infection Society (MSIS). Various outcome data points were collected and analyzed of patients who received either static spacers or articulating spacers.

**Results:** There were 881 static spacers and had a mean follow-up of 41.3 months (mean range, 40 to 58 months), while there was 1128 articulating study group had a mean follow-up of 58 months (mean range, 24 to 144 months). The mean range-of-motion during the final follow up for the static and articulating spacer groups was 93° (range, 85° to 100°) and 100° (range, 79° to 115°), respectively. The mean percentage of re-infections that lead to re-operation in the static spacer group was found to be 13% (mean range, 6% to 33.3%), while articulating spacer group was found to be 8.7% (mean range, 0% to 28.6%). The highest percentage of complications occurred in patients who had static spacers. The incidence of complications seen for static spacers ranged from 0% to 11.2%, and 0% to 29% in the articulating spacers, although several studies did not include the complication rate. The most common complication observed was delay in wound healing and deep venous thrombosis.

**Conclusion:** This study suggests that a greater final range-of-motion was observed in patients who had articulating spacers for staged revision compared to static spacers, but re-infection rates, complication rates, and re-operation rates were similar. In the setting of adequate bone stock, ligamentous stability, and adequate soft tissue envelope, an articulating spacer may be the optimal spacer of choice as this provides the patient with a more functional extremity during the interim as well as better outcomes in the end.

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**Title:** Can a Static Magnetic Field of a Concentric Multipole Magnet Alleviate Dysmenorrhea?

**Authors:** Marisa Mastropasqua, OMS2; Brittany Milo, OMS2; Brooke Alexander, OMS2; Yashaswani Moparthi, OMS2; Harvey Mayrovitx, PhD

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** Magnetic therapy has been used to reduce or eliminate pain based on the effect of static magnetic fields (SMF) from magnets of an array of designs, materials and intensities. Pain related targets have been extensive including chronic pelvic pain. The processes at work may impact blood flow which have been reported to increase, decrease or remain unchanged. Impacts on inflammatory processes and alterations in pain thresholds have...
been suggested. The use of concentric multipole magnets has been suggested to provide an efficacious design but systematic application of such an approach to the rapid amelioration of dysmenorrhea pain has not been systematically studied.

**Objective:** Our objective was to evaluate the effectiveness of a concentric multipole magnet regarding its impact on dysmenorrhea pain (Menstrual or Period Pain).

**Methods:** This was a double-blind study involving the use of a sham and actual concentric magnet (study was approved by the Nova Southeastern University’s IRB). Participants were recruited from the general community. Women with consistent period pain self-rated as ≥6 on the Numeric Pain Rating Scale (with 0 being no pain and 10 being the worst pain) and no history of secondary dysmenorrhea or implanted devices participated. Thirty-one women participated in total, with 17 in the magnet group and 14 in the sham group. After rating their entry pain, a magnet or sham was secured to an abdominal site close to the largest source of pain for 40 minutes. The magnet is of a concentric design with a surface field at its center of 500mT and an intensity of 60 mT at 4.5 mm. The magnet (25.4 mm wide, 3.5 mm thick and 14.5 g) is visually indistinguishable from the sham. After placement, subjects were free to go about their business but restricted from exercising or taking any medication. Upon returning, pain was again rated. Subject and experimenter were “blind” to whether a magnet or sham was used. Outcomes were determined by chi square analysis of the number of subjects in whom pain was or was not reduced. Subjects with NPRS ratings reduced by ≥35% were scored as having reduced pain; reductions < 35% were scored as no change.

**Results:** As of this writing 31 females have been evaluated, 17 with a magnet and 14 with a sham. Of the 17 with magnet, 10 had pain reduction and 7 did not. Of the 11 with sham, 3 had pain reduction and 8 did not. The difference between magnet and sham treatment was statistically significant via chi square analysis with p = 0.036. Entry pain levels (mean ± SD) for the groups were similar, with magnet and sham groups being respectively 7.06 ± 0.77 vs. 6.72 ± 1.14 and post-treatment scores of 4.56 ± 2.24 vs. 5.14 ± 1.41. Pain reduction was 37.1% ± 29.4% for magnet treated vs. 23.4% ± 17.5%, P<0.05 for sham treated. All subjects reported no negative effects associated with wearing the magnet.

**Conclusions:** The fact that, as of now, 59% of subjects who wore the magnet had a meaningful pain reduction whereas only 27% of subjects who wore the sham received a pain reduction, suggests a potentially favorable effect of the active magnet. If this finding maintains with increased number of subjects (planned for 30 in each group), the SMF from this magnet type may be considered a possible alternative to traditional pain management such as pharmaceutical medication. The magnet could be especially useful in women who are unable or unwilling to take medication or as a non-side effect substitute. In addition, this study provides a framework and background for further research into menstrual pain and its treatment.

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**Title:** Modernizing Dual Antiplatelet Therapy Protocol Surrounding Peripheral Endovascular Interventions  
**Authors:** Brad Money, OMS3; Daniel Rubin, DO, PGY1; Michael Patel, MD, PGY3; Francisco Ujueta, MD, PGY2  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** Patients undergoing endovascular stenting for symptomatic peripheral artery disease (PAD) and critical limb ischemia (CLI) and are commonly managed on dual antiplatelet therapy (DAPT) in addition to anticoagulation to prevent post-interventional thrombotic occlusions. DAPT consists of both aspirin and a P2Y12 inhibitor and while its algorithmic utilization in coronary artery disease (CAD) interventions has shown great promise, its algorithm is customarily extrapolated for use in preventing peripheral stent thrombosis in vascular/interventional radiology.

**Objectives:** The primary objective is to review the efficacy of DAPT in peripheral artery interventions and the optimal length of its use stratified by patient clotting risk. This work also plans to reinforce the need for a separate DAPT algorithm for proper periprocedural antiplatelet management in PAD/CLI interventions by exploring the pathohistological differences of plaques observed in PAD versus CAD.

**Methods:** A systematic review of existing literature as well as the Society of Interventional Radiology (SIR) Consensus Guidelines for antiplatelet therapy was utilized to explore current algorithms and clinical outcomes of DAPT used in CAD and PAD/CLI interventions.

**Results:** The efficacy of DAPT in peripheral artery interventions as well as the optimal length of DAPT for patients stratified by clotting risk is demonstrated. In adherence with the 2019 SIR Consensus Guidelines requiring patients’ to seek proper DAPT management with their peripheral vascular interventionist, this work also discusses the DAPT protocol used by vascular/ interventional radiologists at Mount Sinai Medical Center (MSMC) that ensure long-term patency and decrease risk of clotting complications associated with stent placement.

**Conclusion:** DAPT utilization in preventing thrombosis of peripheral stents is common amongst a majority of vascular specialists, yet the optimal treatment plan design for this subset of patients is not universally established in the current SIR Consensus Guidelines. We lay out DAPT protocol used by MSMC vascular/interventional radiologists known to treat hundreds of PAD/CLI patients annually.

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**Title:** Viral Load Suppression After Same-Day ART Initiation in HIV Patients at a Federally Qualified Health Center (FQHC) in Miami Dade County  
**Authors:** Magdeley Mordan, MD, PGY1; Joseph Durandis, MD; Diego I. Shmuels, MPH, MSN, CHCQM1; Sandra Roca, MD  
**Program:** Borinquen Health Care Centers, Family Medicine Residency Program

**Background:** Approximately 1.1 million people are living with HIV in the United States of America, in which the South region has the highest incidence of newly diagnosed cases with 52%. In Miami Dade County, the FDH reported that the PLWHIV increased to 28,345 (an increase of 1.0%) in 2018. Community Health Care Centers play an essential role in the delivery of testing and engaging patients of lower socioeconomic status to care in order to stop this growing health care epidemic.
**Objective:** To determine the viral load suppression after ART therapy initiation within the same day in patients with HIV in an FQHC Center in Miami Dade County.

**Methods:** This study was designed as retrospective and descriptive chart review of 154 patients diagnosed with HIV in FQHC from 11/01/2017 to 09/30/2019 in which demographics, laboratory results, and time to ART were recorded, summarized, and analyzed. The data used in this study were selected using the following characteristics: 1) Patients must have had a new diagnosis of HIV 2) ART initiation within the same day of diagnosis 3) Patients must have had a follow-up appointment two weeks after initial diagnosis and subsequent appointments.

**Results:** Using the data gathered, we identified that 73% of patients achieved a viral load of < 200 copies/mL in patients initiated on same day ART. The predominant age group was between 30-39 years old, respectively, from 2018 - 2019, a prevalence of males (60 %) was observed is consistent with the CDC Surveillance report from 2017 in which 73% of patients were identified as males. We noticed a significant increase in the Hispanic population (45 %) and the African American population (44%) identified as HIV positive patients. A total of 154 patients met these characteristics, and information was gathered using a Patient Navigator System.

**Conclusion:** The results of this study suggest that the implementation of same-day ART initiation is crucial for viral load suppression and engagement in the continuum of care to HIV patients. This study reaffirms and demonstrates that immediate ART initiation can effectively be implemented in FQHC to target underserved populations where the HIV rate is high.

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**Title:** The Enhancement of Osteopathic Rib Principles and Treatment Through 3D Printing

**Authors:** Kevin Moriles, OMS3; Amanda Ramnot, OMS3; Michael Lai, OMS3; Yasmin Qureshi, EdD, DPT, MHS

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** With the advent of accessible 3D-printing, the ability to rapidly prototype precision models have greatly improved. In osteopathic medicine, the diagnosing and treating of somatic rib dysfunctions can be enhanced with a tangible visualization of rib movement. A novel rib model designed specifically to display osteopathic techniques can thus enrich learning. Currently there are no osteopathic models that can display these concepts to students.

**Objective:** The purpose of this experiment is to assess the effectiveness of 3D printing models in enhancing the understanding of rib osteopathic principles. Statistical survey data will be used to determine potential knowledge acquisition and satisfaction in student learning. The design will then be compared to traditional rib models in order to evaluate cost-effectiveness.

**Methods:** Six 3D printed plastic ribcage models will be designed and prototyped for the purpose of the study. The design will incorporate a novel hinge at each rib to allow for free movement. Each completed unit was created through the Makerbot and Lulzbot 3D printers using 145.3 grams of PLA filament per rib model. 1st year osteopathic medical students would be divided into a comparison group that would receive a lecture with a traditional rib model and an experimental group that would receive the same lecture with the prototyped 3D rib model. Each student would have an opportunity to instruct with the 3-D rib model chose the correct answer to one knowledge question of three sta

**Results:** After several trials to optimize production and stability of model, 829.31 grams of PLA filament was used in the production of all six models for the experiment. Students instructed with 3-D models reported higher scores $(M = 9.55, SD = .978)$ on whether or not the model accurately depicted the material presented than did those who were instructed with the standard teaching model $(M = 9.06, SD = 1.33)$, $t(235) = 3.253, p < .01$. Students instructed with the 3-D rib model chose the correct answer to one knowledge question of three statistically significantly more than the students in the comparison group with the standard rib model (while both groups scored similarly on this item during the pre-test), $X^2 (1, N = 257) = 5.97, p < .05$ (52.9% vs 47.1%). On a scale of 1-10 on how helpful the rib models were to rib education the total sample size (N =234) reported $(M = 9.08, SD = 1.397)$.

**Conclusions:** Our study shows that 3D printed osteopathic rib model can enhance the understanding of rib somatic dysfunction, improve student learning satisfaction in learning the rib concepts, and provide a cost-effective alternative to traditional models.

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**Title:** Subtle, yet Significant and Noticeable Effects of Multifocal Contact Lenses Measured with New and Standard Visual Function Tests

**Authors:** Manommani Murugappan, OMS3; Andrea M. Janoff, OD; Luis Lesmes, PhD; Emma Flor, OD3

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** The recent applications of active learning algorithms to testing visual acuity (VA) and contrast sensitivity function (CSF) – quantitative VA (qVA) and quantitative CSF (qCSF) – reflect an attempt to develop tools with higher stimulus resolution, better test precision, and improved detection of vision changes related to intervention or ocular disease progression.

**Objective:** To compare measurements with new visual acuity (VA) and contrast sensitivity (CS) tests versus standard letter charts for detecting the effects of add power, pupil size in dim illumination, and contact lens (CL) brand on visual degradation with multifocal (MF) versus distance-only correction.
**Methods:** ETDRS VA, Pelli-Robson CS, and computerized active learning adaptive tests of VA (quantitative VA or qVA) and CS function (quantitative CSF or qCSF for area under the logCSF) were repeated at two visits in 64 eyes of 32 normally-sighted, pre-presbyopic adults without eye disease. Subjects were masked when performing the tests at 3-4m while wearing 1-Day Acuvue® Moist or Alcon Dailies Total 1® CLs with distance-only and MF correction in randomized order, and each subject had mid and high add powers randomized to each eye.

**Results:** All except two subjects (6%) were accurately able to identify which CL was the MF, based on subjective visual disturbances. With the MF, subjects with larger pupils were more adversely affected by glare from the trans-illuminated ETDRS chart as they had a significantly greater 0.03 logMAR reduction for every 1mm pupil size increase (p=0.016 high add; p=0.05 mid add), which did not occur with the qVA screen (p=0.23 high add; p=0.14 mid add), after adjusting for CL brand, which was not significantly associated with reduced VA with the MF (p>0.05). There was no significant difference in subjects’ pupil sizes (p=0.09) when comparing between CL brands. The qCSF measured a significantly greater CS reduction with the 1-Day Acuvue® Moist MF than the Alcon Dailies Total 1® MF (0.16 logCS; p=0.002 high add;0.14 logCS; p=0.008 mid add), after adjusting for pupil size. The Pelli-Robson chart measured a smaller, yet significant greater CS reduction with the 1-Day Acuvue® Moist MF than the Alcon Dailies Total 1® MF (-0.08 logCS; p=0.009) but only for the high add, as the Pelli-Robson found no difference between CL brands (-0.007 logCS; p=0.80) for the mid add, after adjusting for pupil size. The effects of mid versus high add were similar when evaluated by the ETDRS chart (mean difference 0.008 logMAR; p=0.58), whereas the qVA detected a significantly greater visual degradation of 0.05 logMAR on average with the high versus mid add (p=0.002). Similarly, the qCSF measured a -0.055 logCS mean difference between the high versus mid add (p=0.06), whereas the Pelli-Robson chart measured only a -0.027 logCS mean difference between add powers (p=0.12).

**Conclusions:** New computerized VA and CS tests measured larger visual degradations with MF CLs than standard letter charts, whereas the ETDRS chart was sensitive to glare effects for larger pupils. Distance visual function was worse with the high add and CS was more reduced with the 1-Day Acuvue® Moist MF; however, its pupil optimized design is not tailored to our young subjects with large pupils.

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**Title:** Prophylactic Hardware is Not Necessary After Curretting and Reconstruction of Giant Cell Tumors About the Knee

**Authors:** Timothy R. Niedzielak, DO, PGY3; Joseph Palmer, DO, PGY2; Andrew Ardeljan, OMS1; H. Thomas Temple, MD

**Program:** Broward Health Medical Center, Orthopaedic Surgery Residency Program

**Introduction:** Giant cell tumor (GCT) of bone is a relatively common tumor encountered by orthopedic oncologists. These lesions are typically found in a metaphyseal region of bone, occur eccentrically, and appear as a lytic lesion with geographic margins. Surgery is the cornerstone of management and commonly includes extensive intralesional curettage and bone grafting or cementing with (CBGC) with reconstruction (with or without internal fixation) plus adjuvant treatment for lesions that are well-contained. Recurrence rates have been cited in the range of 25-50%, which can be minimized by the use of adjuvants. Historically, after CBGC, patients are managed with protected weight bearing or with internal fixation to prevent catastrophic failure around the lesion. To our knowledge, there is a paucity of literature to suggest whether or not fixation with internal hardware is truly required. This study intends to examine fracture rates among patients with GCT of the knee and to determine if added hardware is required to protect the reconstructed area.

**Methods:** This study was designed as a retrospective cohort study. Patients with a diagnosis of giant cell tumor of the distal femur or proximal tibia treated with surgery between 2005 and 2018 were identified from our database. Patients were divided into three cohorts: those treated with curettage and bone grafting or cementing (CBGC) alone (Group A), those treated with CBGC and prophylactic internal fixation (Group B), and those treated with en bloc wide resection and endoprosthetic reconstruction (Group C). Each of these groups were compared for clinical outcomes, fracture rates, and complications.

**Results:** A total of 47 patients were identified in our database. 31 patients were Group A, 10 patients were in Group B, and 6 patients in Group C. Within Group A, 77% of the patients had the tumor defect packed with micronized bone graft, whereas 23% were filled with PMMA cement. 80% of the patients’ defects in Group B were filled with micronized bone graft, whereas 20% were filled with PMMA cement. Group C inherently did not require defect packing. In regard to adjuvant therapy after curettage of the lesion: 45% of Group A patients’ lesions were burred, 39% received intralesional phenol/nitrogen, and in 13% of cases, the argon laser was used. In Group B patients, only once was adjuvant therapy used with the use of the argon laser. Only one complication was noted amongst the 47 patients; one patient in Group C was diagnosed with a deep infection of implants. There were no postoperative fractures seen amongst any of the 47 patients treated in this study.

**Discussion:** A common fear exists amongst surgeons to leave defects of weight-bearing areas of the lower extremity, especially around the knee, unprotected without prophylactic hardware fixation. To this regard, the literature has shown satisfactory results when using freeze-dried particulate bone to fill defects following resection of benign and low-grade osseous lesions. Numerous studies have examined the ideal particle size and compressive strength of bone graft material, but none have related these findings specifically to the high compressive forces experienced about the knee, whether at the distal femur or proximal tibia. It is unknown whether these tibial plateau fractures or osseous defects after tumor resection can withstand the biomechanical forces of the knee with bone graft alone or if supplemental plate fixation is required. The goal of this paper was to make a recommendation for or against the use of such prophylactic fixation, in order to prevent postoperative fracture, when surgically resecting GCT of the knee. Our study shows that it is possible to have satisfactory and safe results when filling these reconstructable GCT defects of the knee with micronized bone graft alone, without the use of prophylactic hardware.

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**Title:** Dietary Added Sugar Intake and Risk for Depression in Individuals Receiving Interventions to Improve Health Literacy

**Authors:** Rebecca Nosal, OMS4; Mano Murugappan, OMS3; Amarilis Acevedo, PhD; Dreonna Waldrop-Valverde, PhD; Raymond Ownby, PhD

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program
**Objective:** The study was conducted to determine the relationship between added-sugar consumption and risk for experiencing symptoms of depression in individuals with low baseline levels of health literacy participating in the FLIGHT/VIDAS II clinical trial.

**Background:** Health literacy is critical to understanding one’s general health, chronic disease management, and influencing lifestyle preferences. It is demonstrated in the literature that there is a relationship between dietary quality and health literacy, but this relationship has not been well explored. Recent studies have begun to evaluate the association between dietary intake, specifically dietary added sugars (DAS) and added sugar from sugar sweetened beverages (SSB), and mood symptoms in both adult and adolescent populations. One cross-sectional study noted that there was a positive association when comparing intake of sweet foods and beverages with depressive symptoms. Men with the highest amount of sugar intake had a 23% increased chance of having a common mental disorder after 5 years. This analysis was independent of other health behaviors, sociodemographic factors, adiposity and other diseases. In addition, depression among adolescents is a major public health concern in the U.S. Approximately 30% of adolescents have reported feelings of depression, and a recent study noted an association between an increased intake of sugary drinks and depression among adolescents.

**Methods:** Results from the National Health and Nutrition Examination Survey (NHANES) 24-hour Dietary Screener Questionnaire for 165 participants were collected at baseline. Algorithms defined by the National Cancer Institute were used to calculate DAS and SSB in daily teaspoons of added sugar. Algorithms accounted for portion size variation based on age and gender. DAS accounted for a variety of food products including cereals, cakes, candy, and sodas; while SSB accounted for fruitades/sports drinks, sugar in coffee, and sodas. The Center for Epidemiologic Studies Depression Scale (CES-D) was administered, and scores over 16 were considered at risk for depressive symptoms, while scores below 16 were considered to have no clinical significance. A multivariate analysis was conducted using CES-D scores above threshold (≥16), Gender (Male/Female), and DAS and SSB as dependent variables. Baseline level of health literacy was accounted for as a covariate.

**Results:** Characteristics of the sample populations above and below threshold are described in Table 1. There were statistically significant interactions between CES-D scores above threshold and gender on the combined dependent variables DAS and SSB where F(6,318), p <0.05, Wilks' Λ = 0.851. The mean DAS and SSB for men and women above and below threshold are described in Figure 2.

**Conclusion:** Preliminary evidence from baseline assessments demonstrates a relationship between intake of DAS and SSB and risk for experiencing depressive symptoms, in individuals identified with having a low baseline level of health literacy. This study, along with previous studies, suggests that DAS can be linked to poorer psychological health, including depression. Major depression has been predicted to become the leading cause of disability in first world countries by 2030(2). Further studies may consider the effects of interventions aimed at improving health literacy on dietary quality and the intake of DAS and SSB. Limitations to the study include self-reported information, and small sample size in the group with CES-D scores below threshold.

**Grants:** This study was supported by grants R01HL096578, R56HL096578 and R01MD010368 (Ownby, PI) from the National Heart, Lung, and Blood Institute and the National Institute on Minority Health and Health Disparities.

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**Title:** Is Hand Dominance a Factor in Inter-Arm Systolic Blood Pressure (IASBP) Differences?

**Authors:** Ovshay S. Ovshayev, OMS2; Aneil Tawakalzada, OMS1; Harvey N. Mayrovitz, PhD

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** Previous report suggest that an IASBP difference of 5 mmHg may be an optimal threshold to predict future cardiovascular events. Data showed that in 11% of patients, left arm SBP exceeded right arm by at least 5 mmHg but in 16% of patients right arm SBP exceeded left arm by at least 5 mmHg. Others have indicated that an IASBP difference ≥ 10 mmHg is useful diagnostically. IASBP has been assessed in many cardiovascular conditions but has not been well studied in healthy populations systematically and separately considering the role of handedness. It may be that the imbalance in numbers of right and left handers in the general population have obscured a possible handedness-dependency with respect to IASBP.

**Objective:** To determine if hand dominance affects IASBP in young healthy adults.

**Methods:** This study used simultaneously determined bilateral SBP measurements done in triplicate in 90 subjects (45 female, 45 male). Average age (mean ± SD) was 29.4 ± 10.4 years with 38% (17/45) of each gender left-handed. Subjects were recruited mainly from medical students and faculty. All participants were non-smokers.

**Results:** Results show that the absolute IASBP difference in left-handers was 4.4 ± 3.8 mmHg and was 5.0 ± 4.2 mmHg for right-handers (P = 0.362). There was no statistically significant difference among 1st, 2nd and 3rd measured blood pressures during the simultaneous sequential triplicate measurements for either right or left-handers. Interestingly, nearly 15% of the total group demonstrated an IASBP difference ≥ 10 mmHg.

**Conclusion:** Results show no evidence of a higher systolic blood pressure in a participant’s dominant hand whether that person was left or right-handed. This finding clarifies the hand-dominance issue as a factor not generally needing to be considered in clinical assessments. A potentially useful secondary outcome was the finding that 14.8% of this group had at least one measured IASBP DIFF ≥ 10 mmHg, a fact that may have future relevance and was an unexpected finding in the relatively young and self-declared healthy group herein studied.

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**Title:** Caregiver Trainings: A Useful Tool to Strengthen the Geriatric Workforce

**Authors:** Leena Owen, OMS4; Naushira Pandya, MD; Sweta Tewary, PhD, MSW, MMIS

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program
**Background:** By 2040, the geriatric population of South Florida is expected to rise over 50%. Diabetes and Alzheimer’s Disease and Related Disease are both very prevalent in this population. As it stands, the South Florida health care workforce is not adequately prepared to meet the demands of its older adult population. In fact, 1,364 additional Geriatricians would be needed to meet Florida’s projected need, a feat that cannot be accomplished with current training rates. Given this, it is crucial to develop effective training of other health professionals to meet these needs. Through the Geriatric Workforce Enhancement program, we have conducted three such caregiver trainings on Effective Communication Strategies in Dementia Care, Diabetic Management, Sleep and Dementia and Alzheimer Disease and Related Disease in the elderly population.

**Objectives:** The purpose of this study is to evaluate the quality of caregiver trainings on Effective Communication Strategies in Dementia Care, Diabetic Management and Sleep and Dementia and Alzheimer Disease and Related Disease in the elderly population and identify areas for future improvement.

**Methods:** This is an IRB exempt cross-sectional survey study evaluating feedback from three separate trainings on Effective Communication Strategies in Dementia Care, Diabetic Management, Sleep and Dementia and Alzheimer Disease and Related Disease given to caregivers for elderly patients. Outcomes measured via post-training survey were “Attending the training was a good use of my time as a caregiver?”, “How much knowledge do you feel you gained from the training today?”, “Do you think you will be able to apply what you learned today in your role as a caregiver?”, “How will you apply what you learned today?”, “In future trainings, what would you like to know more about?” and “Do you have any suggestions on improving this training for future caregivers?” Survey results were analyzed by finding the average and median response for the first three questions and identifying common response themes of the last three questions.

**Results:** For all trainings, the majority of caregivers strongly agreed that the training was a good use of their time, they gained a lot of knowledge and yes, they will be able to apply what they learned in their role as a caregiver. The majority of respondents replied they would apply what they learned through use or sharing the information. When asked what they would like to know more about for future trainings, the majority of respondents suggested topics within “neurocognitive disorders and treatment” and “mental and behavioral health”. The most common suggestions for improvement were more frequent training and making the presentation available for reference after the training.

**Conclusion:** The results of this study suggest that lecture-based caregiver trainings are a useful educational tool to teach the geriatric workforce and should continue to be used. In the future, it would be beneficial to increase the frequency of trainings, make the presentation available for reference and to create additional trainings on neurocognitive disorders and treatment and mental and behavioral health.
Background: Cardiovascular disease (CVD) is the leading cause of death in India and affects Asian Indians more than any other ethnic population in the world. However, CVD presents atypically in Asian Indians, as obesity and hypertension are not reliable predictors for CVD as they are in the general population, leading to less screenings and late stage CVD diagnoses for Asian Indians. This disease presentation combined with cultural and traditional practices that involve a lifestyle with little physical activity and a diet high in fats puts Asian Indians at a higher risk for developing CVD than other populations. Westernization and immigration to Western countries further contribute to the rising prevalence rates of CVD among Asian Indians. However, little research has been done to assess the awareness levels and knowledge gaps among this population, resulting in a lack of effective interventions to reduce CVD rates in the Asian Indian community.

Objective: The objectives of this study were to assess the awareness of CVD risk factors and identify CVD knowledge gaps to be addressed through intervention in the Asian Indian population.

Methods: The Heart Disease Fact Questionnaire (HDFQ), a validated, cross-sectional, and anonymous survey was distributed to 71 Asian Indian adults at Nova Southeastern University and the South Florida Hindu Temple between October 2019 and January 2020. The HDFQ was administered in English and contained 25 true or false items to test awareness of CVD risk factors as well as 4 demographic questions that included gender, age, country of origin, and ethnicity.

Results: Only 44% (n=40) of respondents knew that people with diabetes typically have low HDL, while 92% (n=65) knew that people with diabetes typically have high LDL. Furthermore, 93% (n=66) of responders knew that high LDL increases the risk for CVD, while only 82% (n=58) knew that high HDL does not increase the risk for CVD. Another major finding was that 62% (n=44) of respondents did not know that women with diabetes have a greater chance than men to develop CVD. Additionally, females were less likely than males to know that high blood sugar levels can raise blood cholesterol levels and increase one’s risk for CVD (p=0.021), and respondents born in India were less likely than those born in the United States to know that diabetes is a risk factor for developing CVD (p<0.035). Responders over the age of 35 were less likely than those 35 years and under to know that a person with diabetes can reduce their risk of CVD if they keep their blood sugar levels under control (p=0.017) or that a person with diabetes can decrease their risk of CVD if they keep their weight under control (p=0.044).

Conclusion: Overall, there is a lack in understanding the differences between LDL and HDL, as well as how blood sugar, cholesterol, blood pressure, and weight interact to contribute to CVD. Furthermore, women, adults over the age of 35, and individuals born in India were more likely to have decreased understanding of CVD risk factors than males, adults 35 years and younger, and individuals born in the United States, respectively. Therefore, an intervention that provides education targeting these knowledge gaps should be provided to the Asian Indian community in southern Florida to improve CVD screenings rates and health outcomes.

Title: Assessing the Awareness of Cardiovascular Disease Risk Factors Among Asian Indian Americans in Southern Florida
Authors: Rashmi Prasad, OMS2; Shivanie Ramdin, OMS2; Prachi Singh, OMS2; Nicole Cook, PhD, MPA
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program
Background: Elevated intraocular pressure is one of the leading risk factors for the glaucoma progression, in which the optic neuropathy leads to damaging and irreversible vision loss. The disease is the leading cause of blindness but can be prevented with early detection and intervention of its progression. The only modifiable risk factor with evidence-based treatment in preventing glaucoma progression resides in lowering the intraocular pressure (IOP), to prevent optic nerve damage. Many studies have also shown that IOP fluctuates throughout the day, and therefore discrete, sporadic office measurements are not representative of true patient IOP. Even though diurnal and nocturnal variation in IOP is clinically recognized, glaucoma management decisions are made after considering IOP measurements in the office. The Contact Lens Sensor allows for continuous 24-hour monitoring but the safety and tolerability in patients’ needs to be accessed before establishing its role in glaucoma management.

Objective: To examine patient compliance, wear, tolerability and symptoms for Telemetri Contact Lens Sensor (CLS) wear over a 24-hour measuring period.

Methods: In this retrospective study, 51 patients from Mayo Clinic Jacksonville were considered candidates for the device, with two patients excluded. The CLS was clinically used for glaucoma patients upon discussion with the physician, therefore there was no exclusion criteria if the device was suited for the patient. The study group was observed from February to November of 2018. The device is worn as a contact lens, sitting directly on the cornea with a Bluetooth recording device designed to indirectly measure intraocular pressure (IOP). Over the 24 hours it collects about 300 data points, for 30-seconds during a 5-minute interval, that is sent to the Bluetooth sensor and recorded in mV equivalents. The 24-hour CLS required a fitting and removal appointment. Patients were provided a daily journal to log their activities, symptoms and medications used.

Results: The average age was 62.56 ± 11.44 years and 33 participants were female (67.30%). Out of 49 patients, 4.08% exclusively experienced pain, restless sleep, facial redness, woke up with eyes glued shut, tearing, headache, or light sensitivity. Redness was experienced by 4.08%. Only 6.12% of patients experienced itchiness. Most commonly, 55.11% of patients used artificial tears, an average of 3.45 times, and a median of 3 times. Additionally, 6.12% of patients experienced more than one symptom, however 73.46% of patients did not experience any symptoms. There were no reports of blurred vision, and no corneal abrasions were noticed upon slit lamp examination under fluorescein stain

Conclusion: This CLS proves to be a device that is well tolerated by patients and hosts minimal side effects or discomforts. The CLS can provide more data on daily IOP patterns and progression unavailable before. Although the CLS serves to be a promising device, more prospective research needs to be conducted to assess how the 24-hour IOP data collected by this safe device can influence and benefit both the clinician and patient in the management of glaucoma care.

Title: A Case for More Than 30 Minutes: Evaluating Student’s Knowledge of Elective Pregnancy Termination Before and After an Educational Intervention
Authors: Nicholas Schenck-Smith, OMS2; Ashley Bisnow, OMS3; Taura Khorramshahi, OMS2; Elizabeth Weirich, OMS4
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Background: Association of Professors of Gynecology and Obstetrics (APGO) guidelines recommend that students be competent in four reproductive health objectives including “providing non-directive counseling to patients surrounding pregnancy including unintended pregnancy.” Most medical schools do not incorporate thorough reproductive health education, but when they do the topics of non-directive pregnancy counseling and elective termination were left out or only allowed 30 minutes of discussion time. Induced pregnancy termination (IPT) is one of the most common procedures women in the U.S. undergo each year. However, access to IPTs has been declining over the past decade. Physicians hold a key spot in advocating for IPT access.

Objective: This study’s objective is to evaluate improvement in students’ knowledge of elective pregnancy termination before and after an educational intervention of APGO’s four objectives.

Methods: This was a randomized, controlled study where first-and second-year osteopathic medical students willing to complete a minimum of two surveys were assigned to an intervention group (n=6) or non-intervention group (n=8). Both groups were given preliminary, post-intervention, and follow-up surveys that assessed their knowledge of elective pregnancy termination. The intervention group was given a 20-minute presentation reviewing relevant objectives as well as a chance to practice interviewing skills with student actors followed by a debriefing. The surveys for both groups were uniform in their wording and included six multiple choice questions and one Likert style question. The primary study outcome was the number of content questions answered correctly while the secondary outcome was assessing students’ comfort with providing non-directive pregnancy counseling. The data was analyzed using two sample T tests via Microsoft Excel.

Results: While both groups started out with similar scores on the preliminary survey, there was significant improvement between the intervention group’s pre- and post-surveys compared to no significant change amongst the non-intervention group. The test group also had a higher average on the Likert scale question than the control group.

Conclusion: The results of this study suggest that teaching students about pregnancy counseling increased both their content knowledge of IPT and their comfort with non-directive pregnancy counseling. The intervention group’s knowledge of the objectives increased significantly immediately after the educational event and was retained four weeks after. This study highlights an area where medical schools can incorporate better reproductive health education. The study will be improved upon by repeating with a greater sample size of participants as well as refining educational presentations and standardized patient scripts.
**Title:** Syphilis and Contraception in American Adolescents  
**Authors:** Jasmin Shahrestani, OMS3; Logan Burstiner, OMS4; Ilana Gilderman, DO  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** Syphilis, caused by the spirochete, *Treponema pallidum*, is a sexually transmitted infection (STI) that has undergone a resurgence in the United States since the early 2000s. It can cause devastating neurologic and vascular consequences if left untreated, as well as causing death if contracted congenitally. This sudden rise has been particularly dramatic among adolescents. From 2003-2018, rates of primary and secondary (P&S) syphilis in those aged 15-19 have more than quadrupled (from 1.6 to 7.7 cases per 100,000). This increase appears to be accelerating, with rates nearly doubling in just the last five years of that period. Many factors including high-risk behaviors, lack of education, and multiple barriers to quality prevention services have been explored and likely all contribute to this issue.

**Objective:** The objective of this study is to explore the relationship between contraceptive behavior and the increased rates of syphilis in adolescents.

**Methods:** This study compared data from the Youth Risk Behavior Survey (YRBS) and the National Notifiable Diseases Surveillance System. The YRBS biennially surveys a nationally representative sample of 9th to 12th graders about a variety of topics, including sexual health. We analyzed student responses to two questions: 1. Self-reported condom use, 2. Self-reported or partner-reported use of hormonal contraception (pill, IUD, shot). We compared trends in these responses against each other and against trends in rates of P&S syphilis among those aged 15-19. Though syphilis rates are published annually, we selected only the years with corresponding YRBS data available.

**Results:** For the first question of interest, using the available data from 2003-2017, we calculated a correlation coefficient of -0.93, indicating a strong inverse relationship between condom use and the incidence of P&S syphilis. The second question of interest was only included in the YRBS from 2013-2017. We calculated a correlation coefficient of 0.99, indicating a strong positive relationship between hormonal contraception use and the incidence of P&S syphilis. We also calculated a correlation coefficient of -0.99 between hormonal contraception use and condom use among survey respondents.

**Conclusion:** In recent years, among adolescents, both rates of P&S syphilis and hormonal contraception use has increased while barrier contraception use has significantly decreased. These results suggest that these recent changes in contraceptive behavior may be related to the dramatic rise of P&S syphilis in this age group. Education or new screening guidelines may be warranted to combat this worsening health crisis.

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**Title:** Biologic Options in Orthopedic Trauma Surgery: A Systematic Review  
**Authors:** Josh Sharan, OMS2; Tito Santos, OMS2; Gregory Kunis, OMS2; Jesse Blogg, OMS1; Ariel Kidron, OMS1; Jerry Ennolikara, OMS1, Tim Niedzielak, DO, PGY3; Brian Cross, DO; Edward Perez, MD  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** Of the three main categories of biologics (auto-, allo-, and synthetic grafts), autografts display the highest compatibility and highest array of desired properties within orthopedics, including optimal osteoconductivity, osteoinductivity, and osteogenicity. Autografts also include the least cost burden, but at a greater risk of morbidity for the patient. Allografts demonstrate slightly less osteoconductive properties, less potential osteoinductive properties, and no osteogenic potential. However, allografts spare the patient of donor site morbidity associated with autograft harvesting. Nevertheless, there is a large propensity for infection transmission and host rejection due to a lack of histocompatibility. Allograft costs vary widely yet stay relatively comparable to structural synthetics. Structural synthetics provide some osteoconductive and osteoinductive properties but pose greater risk of resorption.

**Conclusion:** Effective bone healing rests upon the judicious usage of bone grafts, bone substitutes, and synthetic factors. The determination is based on the ability to foster osteogenesis, osteoconductivity, and osteoinduction while considering the associated costs and complications. Autograft remains the “gold standard” in regard to histocompatibility and osteointegration properties albeit posing donor site morbidity. To mediate these health risks, allografts and structural synthetics have been utilized. However, the reduced osteogenic and osteoinductive potentials in combination with the relative higher costs and risk of infectious transmissions and resorption has rendered them a case by case modality. The development of different bone graft modalities has nuanced the management possibilities available to surgeons and may spearhead rapid bone healing with increasing clinical effectiveness, safety, and narrower indications for maximized treatment success.
Title: The Effects of Methionine Deprivation on mTORC1 and Proliferation of Cancer Cells

Authors: Orlando M. Telleria, OMS1; K.V. Venkatachalam, PhD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Methionine is one of the essential amino acids required for cell growth and development. Methionine is used as the first residue for protein translation, it is converted to S-adenosylmethionine (SAM) which can further participate in methylation of CpG islands and histone lysine residues and thus contribute to epigenetic inheritance. In addition, methionine indirectly feeds into the regeneration of glutathione, an important redox agent for cells. Methionine deprivation promotes the association of the intracellular SAMTOR-GATOR1 complex, which in turn inhibits the activity of the mammalian target of rapamycin complex 1 (mTORC1), a serine/threonine protein kinase which regulates cellular growth and proliferation. Deprivation of methionine could hamper many metabolic processes crucial to cell progression. Therefore, inducing methionine starvation in cancer cell lines using the enzyme methionine gamma-lyase-deaminase (MGLD, extracted from bacteria and not present in mammals) could be a significant chemotherapeutic target.

Objective: The objective of this study is to determine how methionine deprivation affects cancer cells proliferation with an emphasis on the SAMTOR-GATOR1 control of the mTORC1 pathways.

Methods: DNA containing MGLD gene from Porphyromonas gingivalis was transfected into various cancer cell lines including PC3, DU-145, and Panc-1, using the mammalian expression vector pEGFP-C3. The effects of methionine starvation induced by MGLD were assessed using the MTT cell viability assay. The results were compared to those of existing chemotherapeutic agents such as methotrexate (MTX), AraC and Azacitidine.

Results: Methionine starvation through MGLD transfection resulted in moderate (>10%) cell death. When compared to existing chemotherapeutic agents such as MTX (~15% cell death) and AraC (<10% cell death), the effects of MGLD on cancer cell viability showed to be significant. Addition of propargylglycine (an MGLD inhibitor) to media containing MGLD restored nearly all cell survival.

Conclusion: The results of this study suggest that methionine depletion can ultimately have a significant effect on cancer cell metabolism. The lack of methionine and thereof its conversion to S-adenosylmethionine (SAM) increases the binding affinity and activation of the SAMTOR-GATOR1 complex which in its active form is able to inhibit mTORC1 and halt major pathways of cell proliferation.

Title: Analysis of Quality Improvement Initiative in Increasing Access to Colorectal Cancer Screening for the Uninsured in a Community Health Setting Using Initial FIT Testing

Authors: Evelina Todd, MD, PGY2; Diego I. Shmuels, MPH, MSN, CHCQM1; Joseph Durandis, MD; Sandra Roca, MPH, RN
Program: Borinquen Health Care Centers, Family Medicine Residency Program

Background: Colorectal cancer is the third most commonly diagnosed cancer and the second leading cause of cancer death in the U.S and CRC screening rates remain low, especially among low income and racial/ethnic minority groups. BHCC serve a diverse patient population: 99% of our patients are under 200% of the federal poverty level, 97% of patients are racial or ethnic minorities, and 66% of patients are uninsured. The University of Miami, Florida, reported Miami-Dade with the highest rate among all Florida counties for late-stage cancer diagnoses – 61% and the highest rate of CRC mortality for Blacks and Hispanics. Our medical center is the leading FQHC provider for three zip codes in the county with the highest incidence of late-stage CRC (over 70% late-stage diagnosis in each zip code).

Objectives: The objective of this retrospective study is to evaluate the effectiveness of quality improvement initiatives in increasing CRC screening rates by using initial FIT testing among underserved patient populations in the age group of 50-75 years, from January 2018 to January 2019.

Methods: We used the logic model to identify the shared relationships among the resources, activities, outputs, and outcomes that impact the CRC screening rate. We performed a root cause analysis that helped us to determine the patient, system, and clinical staff related barriers to getting FIT or colonoscopy. We created an action plan with mechanisms of interventions to implement changes such as: increase reminder systems and education of clinical staff by providing regular interactive workshops, tracking FIT completion by using a patient navigator; improving the health literacy of our clients through shared appointments with FM residents, and reducing the patient cost for CRC by ordering initial FIT testing. The outcome measure comprised the CRC screening rate (with FIT or colonoscopy). For the process measure, we used the numbers of FIT orders placed in Athena and their completion rate. We analyzed data by using statistical process control and run charts.

Results: We found CRC completion rate is higher in age group of 50-60 years - 59%, in females 57%, in whites 56%. The lowest CRC screening rate - 36% among African American. The FIT order rate was 72%, that improved by 23 % compared with the last year. The colonoscopy rate improved to 58% from 42% compared to last year. CRC screening rate with either FIT or colonoscopy in the run chart was 54% in 2018, compared with 62% in 2019. The FIT positive rate was 3.5 % with following colonoscopy in 2019.

Conclusions: BHCC has put several practices in place to sustain success in CRC screening. In coordination with American Cancer Society we established an operation access where we mobilized the network of gastroenterologists from South Florida group, Baptist Health to provide underserved population access to donated screening and surgical procedures. We implemented continuous health insurance enrollment throughout the year, standardized a client reminder system, and provider a navigator to avoid provider and client fatigue syndrome.

Title: Targeted Therapy Against ATM with Radiation Increases Survival in ATRX-Mutated Pediatric Glioblastoma

Authors: Dustin Tran, OMS3; Vivekanand Yadav, PhD; Brendan Mullen, OMS1; Carl Koschmann, MD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program
**Background:** ATRX chromatin remodeler (ATRX) gene encodes for a histone chaperone protein that loads histones onto telomeres and maintains heterochromatin environments and has implications in pediatric glioblastoma multiforme (GBM). GBM is a devastating brain tumor with a median survival of less than two years after multimodal cancer therapy. Recent work in genome sequencing of GBM tumors showed ATRX is recurrently mutated in 31% of pediatric primary glioblastomas. Mutant ATRX proteins have been shown to be able to maintain telomere extension through homologous recombination in glioma cells resulting in cell immortality. It has been shown that irradiated ATRX-deficient cells exhibit increased activation of ATM serine/threonine kinase (ATM), a protein responsible for DNA-damage repair. This finding opens new therapeutic options for treating GBM.

**Objective:** The objective of this study is to determine the therapeutic effect of targeted ATM inhibitor therapy in conjunction with irradiation in mice with ATRX-deficient GBM.

**Methods:** This study was designed as a randomized control trial. ATRX-deficient mouse GBM neurospheres that mimic the aggressiveness and architecture of human glioblastoma cells were implanted into the cortex of adult mice. Mice were divided into 3 groups: ATM inhibitor with irradiation, placebo with irradiation, and control. Mice designated for ATM inhibitor administration received either 10mg/kg AZD0156 or 20 mg/kg AZD1390. Mice designated for placebo received DMSO vehicle. Mice designated for irradiation received 4 Gy whole-brain irradiation twice weekly for two weeks for a total of four treatments. Survival time was recorded for each mouse.

**Results:** Mice that were treated with ATM inhibition and irradiation had a median survival of 100 days. Mice that were treated with placebo and irradiation had a median survival of 36 days. Untreated control mice had a median survival of 26 days (P ≤ 0.01).

**Conclusion:** Our study shows that ATRX mutant cells are uniquely sensitive to ATM inhibition. We hypothesize that these cells are inherently sensitive to irradiation because of their ATRX deficiency but can avoid mitotic catastrophe through increased ATM activation. By inhibiting ATM, cells are no longer able to avoid dysfunctional cell cycling and apoptotic cell death. Current phase 1 trial NCT03423628 using ATM inhibitor AZD1390 in adult GBM may miss this patient population as adult GBM rarely carry ATRX mutations. In summary, this study shows that ATRX-deficient glioma demonstrates a novel sensitivity to ATM inhibition via epigenetic dysregulation of cell cycle checkpoints. Current treatments for ATRX-deficient glioma (31% of all primary pediatric GBM) remain non-targeted and ineffective. Our epigenetic phenotypic results have opened a new window for therapies targeting unique features of ATRX-deficient glioma.

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**Title:** How Your Chugs Affect Your Bugs: Effect of Various Beverages on the Salivary Microbiome

**Authors:** Ashley Ryan Vidad, OMS2; Camilo Rodriguez, OMS2; Samiksha Prasad, PhD; Algevis Wrench, PhD

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** The human microbiome consists of billions of microorganisms that normally inhabit various organ systems, primarily the digestive tract. Different bacteria have varying susceptibility and immunity to specific substances thus, consumption of beverages can possibly alter a person’s microbiota and immune status. The relationship between chronic consumption of different beverages and the salivary microbiome has not been investigated in the human population. Given that these beverages are habitual in healthcare profession students, this study provides an insight to the possible outcomes of the consumption of these beverages.

**Objective:** This study aims to evaluate associations between drink types and salivary microbiome, specifically tracking the relative densities of different bacteria with varying frequencies and consumption amount in the medical student population while also investigating and comparing phylogenetic profiles of co-occurring species of bacteria.

**Methods:** This is a cross-sectional study of saliva samples collected from 100 first-year and 100 second-year medical students at NSU-KPCOM and NSU-MD medical school programs. The participants’ demographics and beverage consumption will be assessed using questionnaires in the REDCap research platform, which includes the amount and frequency of the consumption of coffee, tea, alcohol, low calorie beverages, or soda. In a controlled setting, saliva samples will be collected from the same group and bioinformatics analysis will be performed to obtain the composition, co-occurrence and relative densities of their salivary microbiomes. This research study was approved by the institutional review board (IRB) on Nov 14th, 2020 and is funded by the Health Professions Division Research Grant by Nova Southeastern University.

**Results:** This study will examine 100 saliva samples. This sample size was selected based on the statistical concept of z-score, to obtain a confidence level of 90% with a 5.3% margin of error. A few of the expected outcomes of this study are that consuming coffee or tea may increase the prevalence of many specific bacterial species which may outcompete or eliminate several others. Beverages such as soda which contain artificial sweeteners were shown to induce increased levels of Proteobacteria and E.coli and can have an effect on individuals who have Crohn’s disease. Alcohol consumption in heavy drinkers is expected to show an increase in amounts of Neisseria which could possibly predispose individuals to digestive tract cancers.

**Conclusion:** Imbalances in the composition of the salivary microbiome caused by chronic consumption of various beverages can affect the diversity of flora in the distal parts of the digestive tract. Thus, disruptions in the salivary microbiota can change the overall health status of an individual. A better understanding of the effects of these beverages on the salivary microbiome may be useful in preventative efforts to improve medical students’ wellbeing.

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**Title:** Efficacy of Stimulants to Reduce Readmissions Secondary to Aggression for Children with ADHD and Autism

**Authors:** Angela Vittori, MD, PGY2; Young Jo, MD, PGY2; Jonathan Brown, OMS4; Samuel Neuhut, MD

**Program:** Aventura Hospital and Medical Center, Psychiatry Residency Program
**Background:** Treatment of aggressive behavior in patients with Attention Deficit Hyperactivity Disorder (ADHD) and Autism Spectrum disorder (ASD) can be challenging. Agitation and aggressive behaviors are some of the most common presenting problems requiring admission to pediatric behavioral units. Stimulant medications have been shown to suppress agitation and aggressive behaviors for patients with ADHD.

**Objective:** Our study evaluates whether stimulants are linked with reduction of readmission secondary to aggression or agitation among children with ADHD and ASD.

**Method:** This is a retrospective study examining existing declassified data from inpatient encounters made across HCA Healthcare facilities. Cohort inclusion is for children aged between 4 and 17 with presence of ADHD or ASD as per ICD 10. Exposure is defined as presence of listed stimulant medications during hospitalization. Outcomes were defined as readmission secondary to aggressive behavior within 30, 45, and 90 days as well as length of stay of the hospitalization. Regression analysis was performed to calculate adjusted odds ratio as well as to model impact of stimulants on length of stay. Controlled variables include age, gender, and ethnicity.

**Results:** Children with ADHD and ASD who did not receive stimulants are 5 times as likely to be readmitted within 30 days, 4.74 times more likely to be readmitted within 45 days, and 3.89 times more likely to be readmitted within 90 days for a diagnosis of aggressive behavior compared to those who did receive stimulants. Stimulants are associated with increasing length of stay by 8 days. Only age had statistically significant association between stimulant use readmission.

**Discussion:** Stimulants are associated with decreased rates of readmission secondary to aggression in children with ADHD and ASD. Decreasing repeated hospitalization may improve formation of secure parent-child and other social relationships and improve long-term outcomes, especially for at-risk families. Prevention of frequent hospitalization can also decrease healthcare costs. Future research can study the association of stimulants to improve mortality and morbidity.

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**Title:** Tissue Dielectric Constant as an Assessment of Localized Skin Water: Estimating the Minimum Change Detectible by the Method

**Authors:** Don Woody, MBS, OMS2; Alexander T. Mikulka, MBS, OMS2; Harvey N. Mayrovitz, PhD

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** Tissue dielectric constant (TDC) values when used to assess skin strongly depends on the localized water content. The method is used to help assess edema and lymphedema features, detect its presence, and assess and track treatment related changes. Although the underlying physics of this technology has been well described in the literature, the method’s in vivo reliability aspects are not well known. To further complicate this issue there are now two types of probes in use: one is a more research designed device called the moisture meter D (MMD) and another that is a more compact in design referred to as the moisture meter compact (MMC) A central important question is the minimal detectable change (MDC) that may be ascribed to such measurements when either of these devices is used to assess TDC values.

**Objective:** The objective was to determine the MDC of both device types using test-retest measurements from which intraclass correlation coefficients (ICC) could be estimated.

**Methods:** This study was approved by the NSU institutional review board. All measurements were done in a dedicated research room on the NSU campus. Forty volunteer subjects (20 females and 20 males) aged 19 – 61 years with body mass indices of 14.7 – 47.0 kg/m2 and body fat percentages of 12.0% – 48.9% participated. Two measurers (M1 and M2) used each of the TDC devices to measure TDC in triplicate sequentially and bilaterally at three locations; anterior forearm, hand palmar mid-thenar eminence, and dorsum mid-web. These measurements were made by each measurer twice constituting test-retest values (T1 and T2). From these measurements ICC2,1 and MDC at 95% confidence were determined for each site and probe for both absolute TDC values and for inter-side TDC ratios.

**Results:** For both measurers and both measuring devices, differences in TDC values were statistically significant among anatomical sites (p<0.001). Differences in TDC values recorded by the compact probe (MMC) were statistically different from the MMD at all sites and for both measurers. There was an overall statistically significant difference (p<0.001) in TDC values between M1 and M2 at each site. MDC values for absolute TDC values ranged from 2 to 9 TDC units, and for inter-side ratios ranged from 5.3% to 8.0% depending on anatomical site and the specific TDC probe that was used. Values obtained for the ICC2,1 ranged from 0.765 to 0.982.

**Conclusion:** The MDC values obtained provides useful estimates of the MDC that reliably represents a real difference or change when measuring TDC in a research or clinical situation. Without this specification and clarification, not available prior to this study, confidence levels in interpreting measured changes in TDC were open to question. This applies to the measurement of absolute TDC values or their inter-side ratios that are often used for lymphedema assessment and tracking purposes.

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**Title:** The Relationship Between Mold Toxin Exposure and Chronic Fatigue Syndrome

**Authors:** Ting Yu Wu, OMS1; Betsy Rodriguez, OMS3; Taura Khorramshahi, OMS2; Irma Rey, MD

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** Chronic fatigue syndrome (also known as Myalgic Encephalomyelitis) is an illness with an unknown etiology. Presently, it is defined by the CDC as a chronic condition affecting multiple organ, accompanied by disabling musculoskeletal pain and characterized by post exertional malaise (PEM) with severe fatigue greater than 6 months that does improve by rest. It is prevalent among women and patients between the ages of 40-60 years...
old. Historically, this illness has been treated with multiple drugs, including psychiatric medications, but with little effect, leaving patients poorly managed. Other studies have found that the majority of patients with CFS also reported a history of living in water-damaged buildings that subjected them to long-term mold exposure. Mold toxins are widely known to be carcinogenic and immunotoxic in the body. Thus, the link between chronic mold exposure and the role it plays in CFS development demands further investigation.

**Objective:** The aim of this study is to establish the prevalence of mold toxin exposure among CFS patients with a history of having lived or worked in mold-infested, water-damaged buildings.

**Methods:** In a prospective IRB-approved cohort study, a total of 209 CFS patients were recruited for urine analysis of mold exposure. Mold types of Ochratoxin (OTA), Aflatoxin (AF), and Gliotoxin (Gli) were chosen because they were the standard of measurement for mold infections in urinalysis. Patients recruited for this study were selected using the following criteria: patients with medical insurance coverage, a concurrent diagnosis of Chronic Fatigue Syndrome and a history of living or working in water-damaged buildings.

**Results:** Using the data compiled, the overall prevalence among CFS patients with at least 1 mycotoxin exposure (OTA, AF, Gli) among a sampled population of 209 patients was calculated 91.8%. On average, prevalence for female patients with at least one exposure to a mold type comparable to male patients. In both gender groups, OTA had the highest prevalence of exposure, while AF had the least. The similarity in prevalence between gender groups was likely due to large differences, however, in the sampling sizes of female vs male patients.

**Conclusion:** Although the etiology of CFS remains unknown, recent research has shown that the majority of patients living with CFS also lived with chronic infections that they never fully recovered from. The relationship between mold exposure and chronic fatigue reveals a possible explanation of how multi-system immune disorders like CFS develop over time. CFS is a complex disorder with a disproportionately high, unexplained prevalence among female patients. In this present study, establishing the prevalence of mycotoxin exposure opens doors for future epidemiological work to explore the relative risk of chronic mold toxin exposure and its predisposition for the development of CFS.
**Title:** An Analysis on the Incidence of Dengue in Sri Lanka Based on Rainfall Patterns, Temperature, and Population (Urban and Total)

**Authors:** Nadia Ahamed, OMS1; Madhuri Prayaga, OMS1; Cyril Blavo, DO, TM & MPH

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** Dengue is a mosquito-borne disease that is prevalent in tropical and subtropical areas such as Sri Lanka. Dengue has quickly become a major public health problem around the world with an estimated 390 million infections each year. Since Dengue is a mosquito-borne disease, its transmission is correlated to the number of mosquito breeding grounds present in an area. Some key factors that have been found to contribute significantly to the spread of Dengue by the increase in mosquito breeding grounds are rainfall patterns, temperature, total population, and urban population. Dengue is a major public health problem in Sri Lanka, where the number of reported cases increased more than 2-fold between 2018 to 2019.

**Objective:** The objective of this study is to investigate the prevalence of Dengue in the Colombo district of Sri Lanka in correlation with rainfall patterns, temperature, and population (total and urban). The aim of the study is to determine if a correlation exists between the prevalence of Dengue and rainfall patterns, environmental temperature, and/or population.

**Methods:** This research is a secondary data analysis utilizing data from mixed research methods with a longitudinal trend study focus. A retrospective review from 2012 - 2019 was performed using the Weekly Epidemiological Reports from the Sri Lankan Ministry of Health, Epidemiological unit. The secondary analysis was conducted using SPSS- Spearman's test- in order to illustrate the trends in Dengue vs Rainfall patterns, Temperature, or Population density.

**Results:** The Spearman’s Rank Correlation did not show any significant relationship between average monthly rainfall and the monthly reported dengue cases, with a correlation coefficient of 0.176 (p = 0.085). There was a significant negative relationship between average monthly and max temperature with monthly dengue cases, with a correlation coefficient of -0.21 (p = 0.033) and -0.280 (p = 0.006) respectively. In terms of population, neither total population nor urban population was found to have a significant relationship with annual reported dengue cases with a correlation coefficient of 0.357 (p = 0.432) and 0.464 (p = 0.294), respectively.

**Conclusion:** There appears to be no significant relationship between population, urban population or rainfall with reported dengue cases. However, while there was a significant relationship between average monthly temperature and maximum monthly temperature and dengue cases, the correlation was weak in comparison to comparable studies done in other countries. Further research may be necessary to look at other factors specific to Sri Lanka that may have led to an increase in the number of dengue cases over the recent years, such as increase in construction sites.

**Discussion:** With the burden of the dengue epidemic on its healthcare system, Sri Lanka’s Ministry of Health has begun focusing on vector control to manage the spread of dengue in the country. Integrating educational awareness on Dengue in school curricula, controlling mosquito breeding grounds in schools, implementing an online notification system (DenSys), and removing potential breeding sites from construction areas, are significant methods that the Sri Lankan Ministry of Health has undertaken to decrease the prevalence of Dengue cases in the country. The common serotypes of Dengue present in Sri Lanka are DENV1, 2, 3 and 5, with the two most common vectors being Aedes aegypti and Ae. Albopictus mosquitoes. By targeting the aquatic phase of the Aedes mosquito, the government hopes to reduce the number of Dengue cases in the country.

**Title:** Raba Role in Synucleinopathy Disorders

**Authors:** Kaitlyn Alessi, OMS1; Mayur Parmar, PhD; Nikolaus McFarland, MD, PhD

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Objective:** To elucidate the role of Rab8a GTPase protein in αSynucleinopathy disorders.

**Background:** Alpha-Synucleinopathies are a group of disorders characterized by the accumulation of αSynuclein (αSyn) inclusion in various brain cell types in different brain structures. Parkinson's disease (PD), Lewy body dementia (LBD), and multiple system atrophy (MSA) are three major αSynucleinopathies. In PD, the pathological features are the progressive degeneration of dopaminergic neurons and axonal projections in the Substantia Nigra due to misfolding and accumulation of αSyn aggregates, called Lewy bodies. While in MSA, the underlying αSyn pathology occurs in oligodendroglia. These patients have some overlapping symptoms but different clinical manifestations, which are the basis for differential diagnosis. The etiology underlying the development of these diseases remains elusive. Recent evidence suggests an association between dysregulation of vesicle trafficking and PD pathogenesis. Rab GTPases are important for intracellular vesicular trafficking, endocytosis, and exocytosis/secretion and there are more than 60 distinct Rab proteins in humans. In the animal models, overexpression of Rab GTPases has shown to rescue dopaminergic cell death and αSyn aggregation. Rab protein has shown to co-localize with αSyn aggregates and have been a direct target of LRRK2 and PINK1. However, little is known about the role of Rab GTPases in human αSynucleinopathies. This study focused on elucidating the role of specific Rab GTPases, called Rab8a, in human αSynucleinopathies. Rab8a has diverse intracellular function and is known to interact with αSyn protein and reduce αSyn-mediated toxicity in the rodent model.

**Methods:** We examined the Rab8a protein expression levels in postmortem human brain samples from multiple αSynucleinopathy disorders (PD, LBD, MSA), and healthy matched controls. Tissues from select brain regions including frontal and temporal cortex, striatum, cerebellum, and white matter were analyzed. Frozen brain samples were homogenized in the high salt buffer and analyzed by Western blot with specific Rab8a antibody. To understand Rab8a's effects on αSyn expression and aggregation, a follow up in vitro experiment were conducted. Human neuroglioma H4 cells were cultured and co-transfected with wildtype (WT) αSyn and Rab8a plasmid (and other Rab8a mutants). After 36 hours, the cell lysate was collected, and in vitro experiment were conducted. Human neuroglioma H4 cells were cultured and co-transfected with wildtype (WT) αSyn and Rab8a plasmid (and other Rab8a mutants). After 36 hours, the cell lysate was collected, and western blot analysis was performed to study the effect of Rab8a on αSyn. To study the effect of Rab8a on αSyn aggregation, immunocytochemistry (ICC) was performed on stable αSyn H4 which are prone to form αSyn aggregates when seeded with pre-formed αSyn fibrils (PFF). These cells were...
transfected with either control EGFP or Rab8a. After 36 hours of seeding, the cells were fixed, stained for aggregates and fluorescence microscopy was performed.

**Results:** Analysis of the data reveals a statistically significant decrease in Rab8a protein expression in MSA postmortem tissue compared to healthy control. No changes in Rab8a expression were observed in PD or LBD. In H4 cells, the WT and constitutively active form (Q67L) of Rab8a had a significant effect on αSyn expression and aggregation. The nonfunctional mutants (T22N) did not show any effect on αsyn expression and aggregation.

**Conclusions:** These data provide the first evidence that Rab8a may play an important role in human αSynucleinopathy disorders. The findings from these studies provide preliminary data for larger studies examining the role of Rab GTPases in αSyn pathology and their potential for therapeutic modulation.

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**Title:** Depression and its Symptoms in Patients with Inadequate Nutrition Habits  
**Authors:** Nathan Badillo, OMS1; Deepesh Khanna, MD, PhD, MPH  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** Depression and its related symptoms becoming more apparent among the patient population in the United States. It is important to start recognizing the etiologies associated with depression. According to the CDC, from 1999-2000 through 2017-2018, the prevalence of obesity has increased from 30.5% to 42.4%, which can be due partly due to unhealthy eating habits. Inadequate nutrition can be an important factor in finding the root cause of a patient's depression due to body image perception and lack of energy that can result from poor eating habits.

**Objective:** The objective of this study was to evaluate the relationship between poor appetite habits and the presence of depression or depression-like symptoms.

**Methods:** This survey-based study was conducted in 2015-2016 by the Center for Disease Control. Questions were asked by trained interviewers, using the computer-assisted personal interview system. This review looked at several variables, which are responses from a nine-item depression screening instrument. This includes measuring gender and responding "nearly every day" to the question "are you bothered by poor appetite or overeating" versus responding "nearly every day" to "having trouble sleeping," "feeling down, depressed, or hopeless," "feeling tired or having little energy," "feeling bad about yourself," and "thought you would be better off dead." Data was analyzed by using descriptive analysis. The level of significance was set at 0.05.
**Title:** Homeless Needs Assessment in Hillsborough County: A Pilot Study  
**Authors:** Richard L. Bates III, OMS1; Umeir A. Syed, OMS1; Joel T. Davis, OMS1  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** As of January 2019, it was estimated that there were over 550,000 homeless individuals across the United States. 10% of U.S. States had a homeless population of greater than 20,000 individuals. Of that 10%, Florida ranks third highest only falling behind California and New York. According to the U.S. Interagency Council on Homelessness, Florida currently has 28,328 homeless individuals spread across 67 counties. In Hillsborough County, there are 1,650 homeless individuals, accounting for 5.8% of Florida’s homeless population. With such a large portion of Florida’s Homeless Population residing in Hillsborough County, not many studies have directly interviewed the homeless to determine their needs and determined the feasibility of conducting such research.

**Objectives:** Our aim was to determine the feasibility of using a Likert-style survey tool to perform a Needs Assessment of homeless adults in Hillsborough County.

**Methods:** To assess the viability of our survey tool with the homeless population in Hillsborough County, we conducted a pilot study in collaboration with Project Downtown. We surveyed 10 adult homeless individuals, in which our survey consisted of five Likert-style questions assessing how important food, clothing, shelter and level of support from local municipalities were to participants. The data were collected through Project Downtown in order to analyze the effectiveness of our methodology.

**Results:** Using the data and feedback from the participants we assessed our survey on 1) participation, 2) completion and 3) verbal criticism. We obtained full participation and completion from all 10 individuals who participated in the survey through Project Downtown. Verbal criticism consisted of individuals commenting on the language, time, and clarity of the survey. Participants said that they thought the survey was concise, easy to understand, and the survey was short enough to keep them engaged.

**Conclusion:** Based on our results, we determined that our survey tool is viable. Furthermore, we recommend a full assessment with IRB approval, either funded or non-funded, be conducted in Hillsborough County or adjacent counties using our methodology.

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**Title:** Prevalence of Sleep Disorders in a Population Aged 16 and Older  
**Authors:** Nada Belal, OMS1, Deepesh Khanna, MD, PhD, MPH  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** Snoring and other sleep issues affect many individuals in our society, whether they know it or not. Having an interrupted night’s sleep can potentially lead to a decrease in productivity as well as a potential for health issues. It is thus important to understand exactly how prevalent sleep disorders are in our society in order to potentially develop ways in which to resolve this issue.

**Objective:** The objective of this study is to evaluate the presence of sleep disorders in a population aged 16 and older.

**Methods:** This survey-based study was conducted in 2015-2016 by the CDC. Questions were asked at the respondent’s home by trained interviewers using the Computer-Assisted Personal Interview (CAPI) system. This review looks at four variables: frequency of snoring, frequency of snorting or stopping breathing, trouble sleeping, and feeling sleepy during the day. Responses were elicited through four questions for each variable, respectively: “in the past 12 months, how often did you snore while you were sleeping?,” “in the past 12 months, how often did you snort, gasp, or stop breathing while you were asleep?,” “have you ever told a doctor or other health professional that you have trouble sleeping?,” and “in the past month, how often did you feel excessively or overly sleepy during the day?” The association between reported frequency of snoring, frequency of snorting or stopping breathing, trouble sleeping, and feeling sleepy during the day was assessed with Chi-Square tests for males and females. Level of significance was set at 0.05.

**Results:** Data are presented as a percentage. A total of 6327 subjects participated in this study: 3048 males and 3279 females. Statistical analysis showed that 28.3% of males snore frequently (5 or more nights a week), 17.8% of males snore occasionally (3-4 nights a week), and 22.7% of males snore rarely (1-2 nights a week). On the other hand, 19.9% of females snore frequently, 16% snore occasionally, and 23.9% snore rarely ($\chi^2=89.152$, $p=0.000$). Out of the total males, 5.7% snore or stop breathing frequently, 6.9% snore occasionally, and 14.2% snore rarely. On the other hand, 3.4% of females snore frequently, 4.3% stop breathing occasionally, and 10.3% snore rarely ($\chi^2=78.394$, $p=0.000$). Furthermore, 22.3% of males and 28.9% of females told yes to the doctor that they had trouble sleeping ($\chi^2=35.652$, $p=0.000$). Out of the total males, 6.7% almost always feels overly sleepy during the day (16-30
Conclusions: Results show that males snore more frequently than do females. Both males and females were found to have a high response of rarely snoring; however, of the category that did snore or stop breathing frequently, a greater percentage of the males were affected. Both males and females had a high response for sometimes feeling overly sleepy; however, a greater percentage of females were affected. The results of this study suggest that there may be a stronger prevalence of sleep issues and disorders in males than females.

**Title:** Effect of Rab 35 on Tau Aggregation  
**Authors:** Gina Bertelli, OMS1; Nikolaus McFarland, MD, PhD; Mayur Parmar, PhD  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** Alzheimer’s disease is the world’s most common neurodegenerative disease and the leading cause of dementia in the United States. The pathologic features of Alzheimer’s disease include amyloid-beta plaques and neurofibrillary (tau) tangles. Tau protein is normally found within the neurons of the brain and functions to hold microtubules together. Tangles develop when the protein is misfolded, causing the microtubules to collapse and the misfolded proteins to aggregate. Rab GTPase proteins play an important role in membrane trafficking and have been shown to be involved in neurodegenerative diseases. In Alzheimer’s disease, normal functioning of specific Rab proteins have shown to be disrupted early. Further, Rab GTPase has been shown to contribute to abnormal tau accumulation and neurofibrillary tangle formation. However, the effect to Rab35 on tau accumulation and aggregation has been not studied.

**Objective:** The objective of this study is to determine the effect of Rab35 on tau aggregation.

**Method:** Available proteomics dataset (Ping et al., 2018) from quantitative TMT-labelled human brain extracts derived from AD were analyzed. Tissues from select brain regions including frontal and temporal cortex, striatum, and white matter were analyzed. Frozen brain samples were homogenized in the high salt buffer and analyzed by Western blot. To test the hypothesis that overexpression of Rab35 can rescue human tau accumulation and aggregation, human neuroglioma H4 cells were co-transfected with 4R0N WT or self-aggregating 2X Tau (double mutant P301L/S320F) with WT Rab35 and dominant negative (DN) Rab35 S22N.

**Results:** Analysis of a proteomics dataset demonstrates a significant reduction of Rab35 levels in diseased affected regions, such as the frontal cortex and anterior cingulate gyrus. Rab35 protein expression was significantly decreased in the striatum tissues of all tauopathies and in the CBD white matter tissue. Rab35 protein expression was also lower in the frontal cortex tissues. In H4 in vitro experiments, Rab35 overexpression resulted in a marked reduction of both total and phospho-soluble and insoluble Tau. In addition, Rab35 overexpression resulted in a reduction in ThioS positive tau inclusions in vitro.

**Conclusion:** This data provides the first evidence that Rab35 may play an important role in human tauopathy disorders. The findings from these studies provide preliminary data for larger studies examining the impact of Rab proteins in tauopathy and their potential for therapeutic modulation.

**Title:** Neuroprotective Effects of Piceid Against Dopamine-Mediated Neurotoxicity  
**Authors:** Taylor Butts, OMS1; Sneha Potdar, PhD; Jane E. Cavanaugh, PhD; Mayur S. Parmar, PhD  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** Dopaminergic (DA) neuronal density and sensitivity have been shown to decrease over time through aging and, more rapidly, through neurodegenerative diseases such as Parkinson’s disease (PD). One proposed mechanism of this DA neuronal degradation is through oxidative stress, leading to cell death/apoptosis through DA auto-oxidation metabolic pathways. Resveratrol, a commercially available antioxidant and anti-inflammatory molecule found in red wine, grapes, and other foods, has been shown to reduce this oxidative stress in vivo and in vitro. However, resveratrol has low oral bioavailability due to enzymatic activity. Piceid (RV8) is an analog of resveratrol that is more resistant to this enzymatic breakdown, thus warranting further investigation into piceid’s potential DA neuroprotection.

**Objective:** The purpose of this study is to evaluate the potential neuroprotective properties of piceid against dopamine-mediated oxidative stress.

**Method:** Several experiments were conducted to evaluate piceid’s neuroprotective properties and potential mechanisms for protection. Human dopaminergic-like cell lines (SH-SY5Y) were used throughout these experiments to mimic human dopaminergic cells. Dopamine was introduced to these cell lines to induce dopamine-autoxidation toxicity so piceid’s protective properties could be evaluated. Cell culture, phytochemical and inhibitor treatments, and Western Blot analysis were used throughout these experiments to assess results.

**Results:** This study showed that RV8 protects SH-SY5Y cell lines from DA-mediated oxidative stress. RV8 treatment resulted in activation of ERK1/2 and ERK5. To elucidate the role of ERK1/2 and ERK5 in RV8-mediated protection, the MAP kinases were inhibited using U0126 and XMD-92. Blocking of ERKs activation resulted in loss of RV8-mediated protection. It also resulted in loss of RV8-mediated reduction in oxidative stress. DA-mediated apoptosis was also shown to be inhibited by RV8 through an upregulation of Bcl-2 and a decrease in caspase-3/7 activity in SH-SY5Y cell lines.
**Conclusion:** Through this study’s findings, it can be suggested that piceid provides neuroprotective properties via ERK1/2 and ERK5 activation and inhibition of pro-apoptotic pathways caused by oxidative stress.

**Title:** Health Issues Related to Tobacco Usage Among Veterans and Non-Service Members  
**Authors:** Owen Drozd, OMS1; Deepesh Khanna, MD, PhD, MPH  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Tobacco usage has been linked to several pathologies including cancer, heart disease, stroke, and chronic obstructive pulmonary disease. Due to its pro-tobacco culture, prior membership in the U.S. Active Duty Armed Forces may increase or potentially lessen the detrimental health symptoms related to tobacco.

**Objective:** The objective of this study was to assess the precedence of health-related issues between former U.S. Active Duty soldiers and non-service members with current or prior use of tobacco products.

**Methods:** A face to face in-home, validated survey was conducted on participants aged 17 years and older. Trained interviewers conducted the Sample Person Questionnaire using the Computer-Assisted Personal Interview (CAPI) system to gather data on multiple topics related to veteran status, cigarette usage greater than 100 cigarettes, at least 1 use of a cigar, smokeless tobacco usage in the last 5 days, episodes of severe chest pain for longer than half an hour, and the experience of shortness of breath on stairs or inclines. Statistical analysis was completed using Chi-Square tests for veterans and non-service members. The level of significance was 0.05.

**Results:** Data are presented as a percentage. A total of 9971 people participated in the survey. Statistical analysis showed that out of the number of people who served in the U.S. Active Duty Armed Forces and smoked at least 100 cigarettes in their lifetime, 23.8% experienced severe chest pain for longer than half an hour. Of the non-service members who have smoked 100 cigarettes in their lifetime, 29.5% encountered severe chest pain for longer than half an hour (χ² = 0.979, p=0.322). Out of the prior service members who have smoked a cigar at least once in life, 36.6% had shortness of breath on stairs or inclines (χ² =1.700, p=0.427). Out of the prior service members who have smoked a cigar at least once in life, 38.9% reported having severe chest pain for longer than half an hour (χ² =0.847, p=0.357). Out of the nonservice members who used smokeless tobacco in the last 5 days, 10% participants experienced severe chest. The analysis also showed that out of the number of people who served in the U.S. Active Duty Armed Forces and smoked at least 100 cigarettes in their lifetime, 27.8% experienced shortness of breath on stairs or inclines. Of the non-service members who have smoked 100 cigarettes in their lifetime, 39.9% encountered shortness of breath on stairs or inclines (χ² =1.700, p=0.427). Out of the prior service members who have smoked a cigar at least once in life, 31% reported having shortness of breath on stairs or inclines. Among the nonservice members who smoked a cigar at least once in life, 36.6% had shortness of breath on stairs or inclines (χ² =0.737, p=0.692). Out of the veterans who have used smokeless tobacco in the last 5 days, 12.5% reported having shortness of breath on stairs or inclines. Among the nonservice members who used smokeless tobacco in the last 5 days, 36.4% had shortness of breath on stairs or inclines (χ² =1.896, p=0.388).

**Conclusions:** The results of this study show that there is no statistically significant difference between the nonservice members and veterans who have used various forms of tobacco and have encountered severe chest pain for longer than half an hour. Although the prevalence of experiencing respiratory difficulties are higher in non-service members versus veterans who have or currently use tobacco products, the results from this study show there is no significance between these values. Further studies can be conducted to examine the level of physical activity among veterans and nonservice members who have used tobacco products and experienced chest pain or respiratory difficulties. The results of these studies may provide further insight into the positive or detrimental long-term health effects associated with service in the U.S. Armed Forces combined with tobacco usage.

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**Title:** Relationship Between E-Cigarette Use and Traditional Cigarette Use Among Florida Teens  
**Authors:** Brandon Friedman, OMS1; Cyril Blavo, DO, MPH, TM, FACOP  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** In the present-day, it is widely accepted that cigarette use can lead to a myriad of illnesses such as lung cancer, but this link was not always so clearly established. Today we are facing a similar dilemma in establishing whether e-cigarettes pose the same risks as traditional cigarettes. While some may argue that since e-cigarettes lack tobacco, they are “safer”; they still contain nicotine which is a potent stimulant that has shown negative impacts amongst youth in the areas of brain development and cardiovascular performance. With new flavors (such as bubble gum and mango), and the less conspicuous nature of e-cigarettes, it is easier than ever for teenagers to obtain them and “vape” without being caught by authority figures. This availability raises the question of whether e-cigarette use has a gateway effect that could lead youth to traditional cigarette use. Nevertheless, the relationship between e-cigarette use and traditional cigarette use has not been fully established.

**Objectives:** The objective of this study is to determine the extent to which the increased usage of e-cigarettes amongst Florida teens correlates on traditional cigarette use.

**Methods:** The study was designed as a secondary data analysis of de-identified data using data previously gathered from the Florida Youth Tobacco Survey (FYTS) collected by the Florida Health Department. The data was selected from the FYTS using the following criteria: a) The subject must be between the ages 11-17. b) The subjects must be located in the State of Florida. Microsoft Excel software was used to store and analyze the data. A total of 28,051 middle school youth and 30,021 high school youth were sampled representing 67 different counties of Florida. Current cigarette and e-cigarette usage of different age groups were collected through the years 2012 to 2019.
Results: The data demonstrates that there has been a decline in cigarette use and a notable increase in e-cigarette use each year in Florida between 2012 and 2019, with a calculated p-value of 0.00648. This suggests a strong relationship between increased e-cigarette use and the declining usage of traditional cigarettes among Floridian teenagers.

Conclusion: The results of this study suggests that increased availability of e-cigarettes to adolescents has led to increased usage of e-cigarettes and is associated with a decreased traditional cigarette usage among Florida teenagers. E-cigarettes continue to appeal to teenagers more than traditional cigarettes, with their flavors and ability to be used discreetly. The literature suggests adverse effects of e-cigarettes and these results highlight the importance of proper governmental policies that should be in place to prevent future nicotine addiction and concomitant health issues among vulnerable individuals. A new federal law passed in 2020 bans the sale of e-cigarettes to those less than 21 years old. Future studies are recommended to determine if this law will be effective in lowering e-cigarette use in teens and what the long term consequences of early e-cigarette use is on this population’s health.

Title: Mental Health in Relation to Unhealthy Behaviors and Health-Related Issues
Authors: Mohammed Khatib, OMS1; Deepesh Khanna, MD, PhD, MPH
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Feeling down, depressed, or hopeless may provide a comprehensive measure for physicians to utilize, allowing them to quickly assess patient’s propensity to engage in unhealthy behaviors and be at greater risk for health-related issues.

Objective: The objective of this study was to assess unhealthy behaviors and health-related issues in relation to feelings of depression.

Methods: A face-to-face, an in-home, validated survey was conducted on participants aged 16 and older. Trained interviewers administered the questionnaire through Computer-Assisted Personal Interview (CAPI) system. Through this measure, such as feelings of depression, poor appetite, high cholesterol, high blood pressure, diabetes, BMI, and waist circumference were recorded.

Results: Data are presented as a mean ± SD and percentage. A total of 9971 people participated in the survey. Statistical analysis showed that out of the participants that have reported feeling down, depressed, or hopeless and poor appetite or overeating almost every day; 54.5% had a doctor tell them they have diabetes (χ²=151.607, p=0.000), 35.4% with high cholesterol level (χ²=292.130, p=0.000), and 41.3% with high blood pressure (χ²=353.334, p=0.000). Of this group, the mean BMI was 27.4811 ± 8.59535 (F=1.642, p=0.161), with a waist circumference of 90.2680 ± 22.48763 (F=1.642, p=0.161). This is compared to individuals who reported feelings of depression and poor appetite on more than half of the days, with 29.2% of individuals being told they have diabetes, 21.0% with high cholesterol, and 28.8% with high blood pressure. Of this group, the mean BMI was 24.7063 ± 6.01996, with a waist circumference of 86.3226 ± 23.26536. Individuals reporting feelings of depressions and poor appetite over several days had 40% with diabetes, 31.2% with high cholesterol, and 28.8% with high blood pressure. Of this group, the mean BMI was 25.3344 ± 7.49352, with a waist circumference of 88.7980 ± 21.51381.

Conclusion: The results of this study indicate that the assessment of feeling down, depressed, or hopeless is related to poor appetite and health-related issues. Individuals who have reported feeling depressed and poor appetite every day had more individuals reporting diabetes, high cholesterol, and high blood pressure. The results of this study can indicate the self-reported measure of feelings of depression can be useful in the clinical setting to assess a patient’s propensity for health risks and unhealthy behaviors. Further research can be conducted to assess how this measure is related to issues of weight loss, addiction, and self-discipline behaviors.

Title: Prostate Radiation and Rate of Rectal Bleed
Authors: Scott Kramer, OMS3; Bansi Savla, MD, PGY1; Nick Mason, PhD; Eric Rost, MD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Background: Radiation proctitis can occur when the rectum receives large doses of radiation therapy. Newer technologies allow for reduced incidence of these toxicities.

Objective(s): In this retrospective review, we sought to describe and analyze the presenting clinical features in our cohort and evaluate possible predictors of severity and chronicity in men with radiation proctitis after treatment with intensity-modulated radiation therapy (IMRT) for prostate cancer.

Methods: A retrospective cohort study of 383 patients treated with IMRT for prostate cancer between 1/1/2009-11/31/2019 was conducted. Descriptive and multivariate regression analyses were conducted.

Results: Three-hundred eighty-three patients were included in our study with a median follow up of 17.6 months (range 0.3 – 124.4 months). The rate of gastrointestinal comorbidities in all patients including diverticulosis, diverticulitis, hemorrhoids, colon cancer, ulcerative colitis, IBD, was 18.8% (72 patients). Seven percent (27 patients) had anticoagulant therapy and 36% (139 patients) had aspirin therapy during or after radiation therapy. The overall rate of radiation proctitis confirmed by colonoscopy was 9.1% (35 patients). The rate of grade ≥3 radiation proctitis was 8.6% (33 patients). Of those with grade ≥3 radiation proctitis, 51% (17 patients) had rectal bleeding directly from radiation proctitis. Eighty-one percent (27 patients) with grade ≥3 radiation proctitis had some other gastrointestinal comorbidity, 55% (18 patients) were on antplatelet therapy, and 15% (5 patients) were on an...
anticoagulant. Median months to first episode of rectal bleed leading to colonoscopy after completion of RT was 13.4 months (range 0.4-84.5 months). On multivariate analysis, only presence of gastrointestinal comorbidity in cases of radiation proctitis was considered statistically significant ($p <0.01$).

**Conclusion:** In this series, IMRT to the prostate was well tolerated with low rates of ≥ Grade 3 radiation proctitis. The concurrent incidence of other gastrointestinal comorbidities may be associated with reaching a diagnosis of radiation proctitis but is not known to be causative. Prospective evaluation and long term follow up to determine how to better predict and mitigate radiation proctitis is warranted to improve symptom burden and quality of life outcomes in patients receiving radiation therapy for prostate cancer.

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**Title:** Perception of Weight Status in Relationship to Self-Reported BMI  
**Authors:** Cody M. Mutter, OMS1; Deepesh Khanna, MD, PhD, MPH  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program  

**Background:** Correct perception of weight status is an important motivational factor for engaging in healthy behaviors, such as physical activity and making acceptable nutritional choices, to transition to a more favorable BMI. However, misperception is common in the population.

**Objective:** The objective of this study is to assess perceptions of weight status in relation to self-reported height and weight (BMI) among individuals ages 16 years and older.

**Methods:** A face-to-face, in-home, validated survey was conducted on participants ages 16 years and older. Trained interviewers conducted the Sample Person Questionnaire using the Computer-Assisted Personal Interview (CAPI) system to gather data on several topics related to body weight, including self-perception of weight, self-reported weight over the participant’s lifetime, attempted weight loss during the past 12 months, and methods used to try to lose weight and to keep from gaining weight. Analysis was completed using Descriptive and Chi-Square tests, level of significance was 0.05.

**Results:** Data are presented as a percentage. A total of 5964 people participated in the survey. Statistical analysis showed that out of the total males who self-reported normal BMI, 18% considered themselves underweight and 77.6% considered the right weight. Out of the total males who self-reported overweight BMI, 58.3% considered themselves right weight and 22.2% considered underweight ($\chi^2=1276.285, p=0.000$). On the other hand, females who self-reported normal weight, 7.8% considered themselves underweight and 76.2% considered the right weight. Out of the total females who self-reported overweight, 31.5% considered the right weight and 18.8% considered underweight ($\chi^2=1612.828, p=0.000$). On the other hand, females who self-reported overweight, 39.1% wants to stay at the same weight and 7.8% wants to gain weight ($\chi^2=1169.259, p=0.000$). On the other hand, females who self-reported overweight, 19.9% want to stay at the same weight and 8.4% want to gain weight ($\chi^2=1162.907, p=0.000$).
**Conclusion:** The results of this study show that when self-reported BMI is normal, males and females share similar perceptions on considering themselves the right weight, with the caveat that more males self-reporting normal BMI consider themselves underweight compared to females. When self-reported BMI was higher (overweight) perceptions varied between males and females. Significantly more males considered themselves to be the right weight compared to females in the overweight category. Furthermore, in the overweight range, males report wanting to remain the same weight significantly more than females in the same BMI range. Perceptions on current weight status are motivational factors for individuals regarding their attitudes in transitioning to a healthier lifestyle to attain a lower BMI.

**Title:** DNSP-11 as a Therapeutic Agent for Dopaminergic Cell Survival: Role of Caspase-3/7 and ERK Signaling

**Authors:** Shreya Narain, OMS1; Sneha Potdar, PhD; Jane E. Cavanaugh, PhD; Mayur S. Parmar, PhD

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** Glial cell-line derived neurotrophic factor (GDNF) has demonstrated neuroprotective and neurorestorative properties that can serve as a therapeutic molecule in the treatment of Parkinson’s disease. Despite its therapeutic value, GDNF has poor biodistribution. Therefore, Dopamine neuron stimulating peptide-11 (DNSP-11) was synthesized from the human pro-GDNF domain and exhibits potent neurotrophic action similar to GDNF. 6-hydroxydopamine (6-OHDA) is a neurotoxin widely used in vitro and in vivo to mimic toxicity observed in Parkinson’s disease. It has been shown to selectively induce cell death in dopaminergic cells.

**Objective:** The objective of this study is to test DNSP-11’s therapeutic effects on SH-5YSY cells exposed to 6-OHDA induced toxicity.

**Methods:** This study utilized in vitro tests to observe the effects of GDNF and DNSP-11 on the survivability of SH-5YSY cells exposed to 6-OHDA. Additionally, it included in vivo tests in adult rats by intrastriatal DNSP-11 injection.

**Results:** Using the data gathered, there were five main observations made: 1) Pretreatment with GDNF or DNSP-11 does not protect SH-5YSY cells against 6-OHDA mediated cell-death at 24 hours; 2) 6-ODHA treatment increases caspase-3/7 activity in SH-5YSY cells; 3) GDNF or DNSP-11 pretreatment decreases 6-OHDA-induced caspase-3/7 activity in SH-5YSY cells; 4) GDNF and DNSP-11 activate ERK1/2 and ERK5 cellular signaling; and 5) Intrastriatal infusion of DNSP-11 modulates ERK signaling pathways in the striatum (STR) and substantia nigra (SN).

**Conclusion:** The results of this study suggest that DNSP-11 can be considered as a therapeutic agent to prevent dopaminergic cell death, thereby having a beneficial effect in Parkinson’s disease. This research suggests that DNSP-11 is a novel agent that needs to be further clinically studied.

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**Title:** The Causal Relationship Between the Gut Microbiota and Neurodegenerative Disorders

**Authors:** Shuchai Patel, OMS1; Eliyah Pollak, OMS1; Mayur Parmar, PhD

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** Neurological disorders are the second-leading cause of mortality around the world. These disorders are devastating, often debilitating diseases that consist of a complex network of primary and secondary injury processes. The secondary injury processes are centered mainly on inflammation and directly contribute to the severity of neurologic dysfunction and inversely to recovery. In recent studies, research has shown the causal relationship between specific gut bacteria and inflammatory responses leading to neurodegeneration. The purpose of this study is to emphasize the prominent gut bacteria that are linked with neurological disorders and the underlying mechanisms of the innate immune system due to which these disorders occur.

**Objectives:** The current study will focus on understanding the role of the gut microbiota and its implication in neurodegenerative diseases

**Methods:** The following search was first conducted in PubMed to determine which neurodegenerative diseases were associated with gut bacteria through all fields containing search words such as “neurodegenerative” AND “gut bacteria”, “neural disorders” AND “gut microbes”, “neural disorders” AND “gut” AND “bacteria”, “neural disorder” AND “gastrointestinal” AND “bacteria”, “neurodegenerative” AND “gastrointestinal” AND “bacteria”. This search exhibited the basis for potential diseases linked to gastrointestinal microbiota, thereby narrowing the preliminary search. The possible diseases included Alzheimer’s disease, Parkinson’s disease, amyotrophic lateral sclerosis (ALS), Huntington’s disease (HD), and multiple sclerosis (MS).

With the presented results, connections between specific neurodegenerative disorders and bacteria were outlined with a search similar to the statement above. These search words included the following: “Parkinson’s disease” AND “gut bacteria”, “Parkinson’s disease” AND “gut microbes” and “Parkinson’s disease” AND “gastrointestinal” AND “bacteria.” To further narrow the search, additional studies that showed a recurrent association between a bacteria and neural disease were selected. For example: “Firmicutes” AND “Parkinson’s disease”. Searches were done on an identical basis for all five diseases with the following bacteria: Firmicutes, Bacteroidetes, Actinobacteria, Cyanobacteria, Fusobacteria, Proteobacteria, Spirochaetes, and Verrucomicrobia. There were no limitations regarding the publication date, as all possible articles were considered.

**Results:** Firmicutes were found to be associated with MS, AD, ALS, PD, and HD. Cyanobacteria have been found in correlation to ALS, AD, and PD. Fusobacteria were found in patients with MS. Bacteroidetes is associated with ALS, MS, and HD. Proteobacteria was found in patients with ALS and MS. Lactobacillus was seen in high levels in MS and found in PD. Actinobacteria is associated with patients with AD and MS. Verrucomicrobia was found in PD and AD. Spirochaetes have been found in patients with AD.
**Conclusion:** This research literature review presents an overarching summary of altering levels of specific gastrointestinal microbes that have been found to be associated with neurodegenerative diseases. A better understanding of these specific gut microbes and their underlying roles will aid in future studies generating better therapies for neurodegenerative diseases.

**Title:** STK11 (LKB1) Loss of Function Promotes Non-canonical Polyamine Metabolism: A Potential Mechanism Contributing to Poor Response to Immunotherapy and Survival in Non-Small Cell Lung Cancer Patients

**Authors:** Trent Percy, OMS1; Tiana Dodd, OMS3

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** STK11 (LKB1) is a tumor suppressor gene mutated in approximately 15% of non-small cell lung cancers making it the fourth most frequent mutation behind TP53, KRAS, and EGFR. Typically, STK11 protein becomes activated at times of metabolic stress and phosphorylates to activate AMP-activated protein kinase (AMPK). Patients harboring these mutations respond poorly to immunotherapy and are associated with poor survival for reasons yet to be defined. In this study, we aim to provide evidence for a non-canonical metabolic pathway involving arginine catabolism regulated by STK11 in which drives carcinogenesis and potentially contributes to the immune negative landscape exhibited by these tumors. With a nontoxic and FDA approved drug, we can target this mechanism in hopes to slow cancer progression and potentially restore immune surveillance leading to remission.

**Methods:** Moffitt Cancer Center constructed a patient sample bank consisting of 442 tumor samples (SPORE442), performed RNA expression analysis via microarray on these, and untargeted metabolomics via LC/MS on the remainder of the samples (123) that were of optimal quality (MLOS). Through computational analysis of these data, we took a discovery approach to determine up and downregulated genes and metabolites in response to STK11 mutations that may contribute to the immune evasive phenotype displayed by these tumors. Additionally, in order to confirm our findings, we constructed paired cell lines overexpressing our genes of interest.

**Results:** SPORE442 revealed that STK11 mutant tumors upregulated genes responsible for non-canonical arginine/polyamine metabolism including but not limited to ODC1, SAT1, MAOA, SSADH, CPS1, and SLCTA2. STK11 mutant samples processed via LC/MS had high levels of putrescine, y-amino butyric acid (GABA), and the TCA cycle intermediate succinic acid and conversely lower levels of intracellular arginine and ornithine in comparison to the STK11 wild-type (WT) samples. Regression analysis shows positive correlation between putrescine vs. GABA, putrescine vs. succinic acid, GABA vs. succinic acid, and a negative correlation between arginine and the downstream metabolites. When WT STK11 was reintroduced into the STK11 mutant A549 cell line via viral transduction, the expression of enzymes responsible for this non-canonical polyamine metabolism decreased. Additionally, arginine uptake measured by assay in the culture medium slowed upon STK11 overexpression. Interestingly, overexpression of ODC1 in A549 cells with and without WT STK11 increased the expression of the arginine catabolism related enzymes hypothetically through a feedforward mechanism.

**Conclusion:** We hope to translate our findings towards advancing cancer care of STK11 mutant non-small cell lung cancer patients. Through adjuvant therapy consisting of immunotherapy plus ODC1 inhibitor (DFMO) in STK11 mutant patients we hope to restore extracellular arginine in which T cells are dependent, ultimately reinstate immune surveillance, and block the non-canonical polyamine metabolism potentially driving energy production of these cells. Moving forward experimentally, we plan to track labelled-ornithine’s incorporation into GABA and succinic acid, evaluate the effects of ODC1 inhibition on metabolic output via seahorse assay, and define how the metabolic landscape of cells lacking STK11 and overexpressing ODC1 in return affect immune cell attraction.

**Title:** The Influence of Periodontal Health on Neurodegenerative Disease

**Authors:** Eliyah Pollak, OMS1; Shuchi Patel, OMS1; Mayur Parmar, PhD

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Background:** The adaptive immune response has been shown to decline with age. As a result, the functions of the innate immune system tend to be amplified, thereby producing an exaggerated inflammatory response when an individual is exposed to antigens. Recent studies have examined the connection between the extent to which certain oral bacteria promote the activation of inflammatory cytokines, thereby influencing the development of neurodegenerative disease. This research literature review will highlight the prominent oral bacteria that are associated with brain disorders while also examining the possible mechanisms underlying the pathophysiology.

**Objective:** The objective is to investigate the available research literature about the role of various oral bacteria in neurodegenerative diseases.

**Methods:** The following search was first conducted in PubMed to determine which neurodegenerative diseases were associated with oral bacteria through search words such as “neurodegenerative disease(s)” AND “periodontal disease”, “neurodegenerative disease(s)” AND “oral bacteria”, “neurodegenerative disease(s)” AND “gingivitis”, “neurodegenerative disease(s)” AND “oral health”. This search provided the foundation for possible diseases linked to oral bacteria, thereby serving as a brief overview to base the succeeding searches. The diseases include Alzheimer’s Disease (AD), Parkinson’s Disease (PD), Amyotrophic Lateral Sclerosis (ALS), and stroke (hemorrhagic and ischemic cerebrovascular disease). Once associations were made between specific neurodegenerative diseases with an outline of their corresponding bacteria, an identical search was conducted as stated above that was specific to each neurodegenerative disease. These search words included the following: “Alzheimer’s disease” AND “periodontal disease”, “Alzheimer’s disease” AND “oral bacteria”, “Alzheimer’s disease” AND “gingivitis”, and “Alzheimer’s disease” AND “oral health”. This search provided the bacteria which were associated with each disease. Again, this method was performed for all four diseases previously mentioned. Additional articles which showed a frequent association between a bacterium and the neurodegenerative disease were selected. For example: “Aggregatibacter actinomycetemcomitans” AND “Alzheimer’s disease”. Therefore, this search method was repeated across all four diseases for the
following bacteria: Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis, Fusobacterium nucleatum, and Treponema denticola. There was no limitation regarding the publication date, as all possible articles were considered.

**Results:** Porphyromonas gingivalis was found to be associated with Alzheimer’s disease, Parkinson’s disease, Amyotrophic Lateral Sclerosis, and stroke (hemorrhagic and ischemic cerebrovascular disease). Additionally, Fusobacterium nucleatum and Aggregatibacter actinomycetemcomitans were associated with both Alzheimer’s disease and stroke. Finally, Treponema denticola was only associated with Alzheimer’s disease.

**Conclusion:** This research literature review provides a summary of the bacteria which are common among various neurodegenerative diseases. Knowledge of these bacteria will allow for a better understanding of disease pathophysiology by identifying possible risk factors.

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**Title:** Weight Status and Prevalence of Chronic Diseases in the U.S. Adult Population

**Authors:** Brian Slayyeh, OMS1; Deepesh Khanna, MD, PhD, MPH

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Chronic disease within the U.S. Adult population has been on the rise. Indicating at-risk populations is an important first step in decreasing its prevalence.

**Objective:** The objective of this study is to assess weight status in conjunction with age and gender in differing chronic diseases within the U.S. Adult population

**Methods:** A validated survey was conducted within different demographics of the U.S. adult population. This involved conducting an in-person sample questionnaire using the Computer-Assisted Personal Interview (CAPI) system to gather data on several topics related to self-reported BMI and chronic diseases such as obesity, hypertension, hypercholesterolemia, Hepatitis B and Hepatitis C. Statistical analysis, at the level of significance of 0.05, was completed using Chi-Square tests on race and gender.

**Results:** A total of 9971 people participated in the survey. Statistical analysis showed that out of the total number of participants surveyed, 26.6% of the Mexican American males and 24.9% of the Mexican American females were obese (χ² = 9.163, p-value = 0.027). Additionally, 25.8% of other Hispanic males and 25.2% of other Hispanic females were also reported to be obese (χ² = 0.076, p-value = 0.995). Furthermore, Non-Hispanic white males constituted 27.5% of individuals surveyed while 29.2% of Non-Hispanic white females surveyed were classified as obese (χ² = 6.837, p-value = 0.77). There were reports of obesity within 30.3% of Non-Hispanic Black males and 24.7% of Non-Hispanic Black females. (χ² = 12.351, p-value = 0.006). Non-Hispanic Asian males made up 25.1% of obese respondents; similar to the 25.2% of non-Hispanic Asian females who reported being obese (χ² = 0.263, p-value 0.0967). Obesity was seen in 25.1% of multi-racial males as opposed to 25.2% of multi-racial females (χ² = 0.967). Furthermore, 8% of Mexican American males and 8.8% of Mexican American females were shown to be diagnosed with diabetes (χ² = 6.068, p-value 0.738). Other Hispanic males and females reported being diagnosed with diabetes, 9.4% and 8.3%, respectively (χ² = 0.608, p-value = 0.738). Non-Hispanic white males and females had 9.6% and 8.9% of diabetes prevalence respectively (χ² = 0.499, p-value = 0.919). On the other hand, Non-Hispanic Black males and females had 8.7% and 8.5% of diabetes prevalence respectively (χ² = 1.153, p-value = 0.764). Male Non-Hispanic Asians had a diagnosis of diabetes at 10.5% and 9.8% for their Non-Hispanic Asian female counterpart (χ² = 1.561, p-value = 0.608). Other races including multi-racial male participants who were diagnosed with diabetes made up 8.9% and 8.4% of female participants (χ² = 1.157, p-value = 0.561). Among Mexican American males, 34% diagnosed with high blood pressure, while 33.3% of Mexican American females had similar diagnoses (χ² = 1.215, p-value = 0.545). Comparatively, there were 35.4% of other Hispanic males who were diagnosed with high blood pressure, while 31.8% of other Hispanic females surveyed similar diagnoses (χ² = 1.211, p-value = 0.271). Non-Hispanic White males had a 33.2% diagnosis of high blood pressure, similar to that of the 33.3% of Non-Hispanic White females being diagnosed (χ² = 2.249, p-value = 0.325). Additionally, 31.7% of Non-Hispanic Black males and 31.8% of Non-Hispanic Black females were diagnosed with high blood pressure (χ² = 0.894, p-value = 0.639). The number of Non-Hispanic Asian males who were diagnosed with high blood pressure constituted 37.8% of people surveyed, whereas the Non-Hispanic Asian females who were diagnosed amounted to make up 29.7% (χ² = 5.787, p-value = 0.055). Other races including multi-racial males and females were diagnosed with high blood pressure, 26.5% and 37.7%, respectively (χ² = 5.299, p-value = 0.071). Mexican American males had 31.3% diagnosis of high cholesterol levels, almost exact to the 31.2% of Mexican American females who shared a similar diagnosis (χ² = 0.177, p-value = 0.915). Other Hispanic males had 29.2% incidence of high cholesterol, while other Hispanic females had a 29.9% case of high cholesterol (χ² = 0.837, p-value = 0.658). Males who are Non-Hispanic had 31.3% of having high cholesterol and Non-Hispanic white females had 32.6% diagnosis of high cholesterol levels (χ² = 0.780, p-value = 0.677). Among non-Hispanic black males and females, 30.9% and 31.5% were diagnosed with high cholesterol respectively (χ² = 0.074, p-value = 0.964). Additionally, 30.2% of Non-Hispanic Asian males had an increased cholesterol level, whereas 29.1% of Non-Hispanic Asian females had seen a similar increase in cholesterol (χ² = 0.876, p-value = 0.645). Multi-racial males included 26.3% of increased cholesterol levels, while multi-racial females had 32.5% increased cholesterol levels (χ² = 1.354, p-value = 0.508). Hepatitis B diagnosis in Mexican American males included 1.1% of the individuals surveyed and 1.0% of Mexican American females (χ² = 1.344, p-value = 0.511). Other Hispanic males diagnosed with Hepatitis B constituted 1.2%, while females only made up 0.8% (χ² = 0.496, p-value = 0.780). Non-Hispanic white males surveyed at 0.7% of Hepatitis B diagnosis, whereas Non-Hispanic white females surveyed at 1.0% (χ² = 0.599, p-value = 0.741). Additionally, 1.5% of Non-Hispanic Black males surveyed were diagnosed with Hepatitis B and 1.7% of Non-Hispanic Black females stated of the same diagnosis (χ² = 1.204, p-value 0.752). Non-Hispanic Asian males and females diagnosed with Hepatitis B both made up 1.1% and 0.5% of the survey, respectively (χ² = 3.145, p-value = 0.208). Both multi-racial male and females made up 1.4% of individuals surveyed related to the diagnosis of Hepatitis B (χ² = 0.326, p-value = 0.849). On the other hand, Mexican American males who made 8.8% of surveyors and female participants, who made 1.1%, stated of being diagnosed with Hepatitis C (χ² = 0.810, p-value 0.667). Other male Hispanics made 1.0% of individuals surveyed while 0.8% of other Hispanic females stated of being diagnosed with Hepatitis C (χ² = 0.144, p-value = 0.930). Non-Hispanic white males and females both had 0.8% diagnosis of Hepatitis C (χ² = 1.013, p-value = 0.603). However, Non-Hispanic Black males were seen to have a 1.1% diagnosis, while 1.3% of Non-Hispanic Black females were diagnosed with Hepatitis C (χ² = 1.768, p-value = 0.413). Non-Hispanic Asian males surveyed had 0.9% diagnosis of Hepatitis C, whereas their female counterpart had 0.5% diagnosis (χ² = 0.969, p-value = 0.616). Other races including multi-racial males diagnosed with hepatitis C included 1.4% of the individuals surveyed and the representation of female diagnosis of Hepatitis C constituted 0.5% of individuals surveyed (χ² = 3.00, p-value = 0.223).
**Conclusion:** The results of this study indicate that similar rates of obesity between Mexican American males and Mexican American females have been observed. However, Non-Hispanic black males and females showed a significant rate of obesity compared to other demographics. When diagnosed with diabetes, Mexican American males and females showed similar rates compared to other Non-Hispanic males and females. Additionally, Non-Hispanic Black males and females also showed similar rates of diagnosis of diabetes. Furthermore, Mexican American males and females showed similar diagnosis rates for high blood pressure compared to other Non-Hispanic males and females. However, it was shown that there was a significantly higher rate of diagnosis between Non-Hispanic Asian males and females with high blood pressure. Similar rates of high cholesterol levels were found between Mexican American males and females compared to other Hispanic males and females. Furthermore, Non-Hispanic White males and females also showed similar rates of high cholesterol levels compared to Non-Hispanic black males and females. Similar rates of diagnosis of Hepatitis B and C were found across all demographics.
CASE ABSTRACTS

NOVA SOUTHEASTERN UNIVERSITY
FORT LAUDERDALE MAIN CAMPUS
Title: A Case of Colonic Adenocarcinoma Despite Strict Adherence to Current Colon Cancer Screening Guideline Recommendations
Authors: Crystal Acosta, OMS3; Ivonne Durand, OMS3; Jegan E. Gabbidon, DO, PGY1; Judith P. Schaffer, DO
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Colorectal Cancer (CRC) remains a prevalent cause of worldwide mortality despite decreasing rates of incidence over the past 20 years. Approximately, 101,000 new cases of colon cancer are diagnosed annually in the United States, half of those individuals are expected to die from CRC annually. According to the World Health Organization (WHO) Colorectal cancer is the third most common cause of cancer related death in women, and the second leading cause in men. Current United States Preventative Task Force (USPTF) guidelines recommend CRC screening using colonoscopy beginning at age 40 every 5 years until age 75 for individuals with a family history significant for previously diagnosed CRC. In this report we explore a case where these guidelines fail to direct care providing positive outcomes.

Case Description: An 85-year-old male with a past medical history of celiac disease presents to the ED with abdominal pain for 3 weeks duration. Symptoms localized to the LLQ and gradually worsened causing patient to seek medical intervention. Severity scaled at a 9/10 and constant in nature. The day prior to admission patient experienced severe nausea and one episode of non-bilious, non-bloody vomiting. Patient denies having a bowel movement within the past 24 hours however, he reported having normal bowel movements in the weeks leading up to presentation. At the time of examination patient was unable to tolerate a solid food diet. Patient endorsed abdominal pain, weakess, nausea, and vomiting. He denied fever, hematochezia, melena, hemoptysis, diarrhea, chest pain, or dizziness. The patient has a PMH of NIDDM, CAD, celiac disease, HTN, CVA, and seizure disorder. Patient had a colonoscopy 3 years prior to admission, the results were negative for polyps or malignancy. He is a former 40 pack year smoker and denies use of alcohol and illicit drugs. Family history positive for a brother with malignant lymphoma, and both parents diagnosed with colon cancer. Upon arrival to the ED, CT of the abdomen and pelvis revealed an apple core lesion in the proximal transverse colon with associated mucosal wall thickening. Also visualized was a 2.5 cm hypodense mass at the dome of the liver. Findings were concerning for colonic stricture and neoplasm with likely metastasis to the liver. Patient was hypertensive and tachypneic during initial presentation. Laboratory data revealed normocytic anemia and was otherwise unremarkable. General surgery was consulted and a right hemicolectomy with tissue biopsy was performed. Pathology reports confirmed the presence of Adenocarcinoma of the colon with positive tumor markers MLH1, PMS2, MSH2, MSH6.

Discussion: Current guidelines recommend that patients with risk factors predisposing them to CRC undergo screening colonoscopy every 5 years. Despite strict adherence to this recommendation this patient still developed a life-threatening malignancy. In addition, the metastatic liver lesion suggests this neoplasm has been insidious for quite a lengthy time. We are extremely interested in investigating whether current guidelines are stringent enough to catch the majority of brewing colonic malignancies. Perhaps, it’s about time to revise the current USPTF guidelines regarding colon cancer screening.

Title: Stepping into a Landmine: A Case of Multi-Vessel Fusiform Aneurysms
Authors: John D. Adame, DO, PGY2; Giselle Falconi, MD, PGY1; Seneca Harberger, MD; Jennifer Dorce-Medard, DO
Program: Lakeside Medical Center, Family Medicine Residency Program

Introduction: Fusiform aneurysms differ significantly from saccular aneurysms in terms of pathology, anatomical distribution, progression, and management. Screening for abdominal aortic aneurysms (AAA’s) reduces mortality, but in cases of multiple aneurysms in individuals beyond the age of screening guidelines, life expectancy and quality of life play a crucial role in patient centered decision-making (PCDM).

Case Description: An otherwise healthy appearing octogenarian male presented to a rural outpatient clinic for evaluation of moderate left lower extremity pain of 1-week duration secondary to rolling ankle. Past medical history significant for radical prostatectomy and lifetime nicotine dependence.
- Regarding preventative care, patient had not been seen by a physician in over 20 years. On physical exam, limited range of motion of left lower extremity specifically in the ankle to dorsi- and plantar flexion noted in addition to non-palpable bilateral lower extremity pulses.
- Patient was sent for arterial duplex of bilateral lower extremities which revealed bilateral aneurysms of distal femoral arteries extending into the popliteal region and thrombosis of left popliteal artery aneurysm. He was admitted directly to the ED for further evaluation where CTA showed a 4.8cm infrarenal AAA, bilateral common and internal iliac artery fusiform aneurysms and bilateral popliteal aneurysms of 3.5cm on the right and 2.5cm on the left. Patient was transferred to a tertiary center for higher level of care.

Specialist care and Follow-up: Patient was then again transferred to a more specialized facility where he ultimately underwent a left femoral-to-posterior tibial artery bypass for severe rest pain after discovery of the thrombosed left popliteal artery aneurysm. He was sent to a skilled nursing facility for rehab and recovery. Follow up doppler interrogation of left ankle showed good signal indicating adequate blood flow. Minor complications occurred during the recovery phase but were addressed without complication and rest pain completely resolved. Follow up ABIs and a graft scan to come and if all heals well, plans per vascular surgery include repair of right leg popliteal artery aneurysm.

Discussion: New era of family physicians are immersing themselves in additional training for in office procedures/diagnostics and are equipped to handle screenings which may otherwise never happen or be lost to follow up and delay intervention. This will greatly enhance compliance of patients by minimizing referral loops and decreasing the burden of additional appointments/travel by performing select screenings in clinic.
**Title:** A Bittersweet Dilemma: Amiodarone Versus Eliquis, Which Medication Caused This Patient's Sweet Syndrome?

**Authors:** Toni Adams, MD, PGY2; Deevee Sanchez, DO, PGY2

**Program:** Floyd Medical Hospital, Family Medicine Residency Program

**Introduction:** Sweet Syndrome, also known as acute febrile neutrophilic dermatosis, is an uncommon inflammatory disorder characterized by fever, neutrophilia, and painful erythematous cutaneous lesions. The pathogenesis is multifactorial and not well understood. It presents as malignancy-associated, drug-induced, and a classic form. There have only been several hundreds of cases published to date, with the first documented drug-induced form in 1986. Drug-induced sweet syndrome appears within two weeks after drug exposure. Symptoms typically resolve after drug discontinuation and administration of systemic corticosteroids. Various drug classes can cause Drug-Induced Sweet Syndrome including antibiotics and anti-epileptics with granulocyte colony stimulating factor (GCS-F) being the most widely reported medication.

**Case Description:** We present a case of a 65-year-old Caucasian female who was recently diagnosed with atrial fibrillation and started on Eliquis and Amiodarone. She presented to the ER with an acute onset of painful skin bullae and oral lesions that appeared 8 days after one dose of each medication. On admission, she was afebrile, with a leukocytosis of 14.7, an ESR of 140, and a CRP of 24.8. Physical exam revealed oral lesions on the tongue, palate, and cheeks; a ruptured 15 cm bullae on her left arm draining serosanguinous fluid; and various erythematous bullae on her upper and lower extremities. Wound and blood cultures were negative after 5 days. ANA was positive but a subsequent lupus panel was negative. A punch biopsy was performed, and it revealed focal epidermal necrosis with diffuse neutrophilic dermal inflammation. The patient met major criteria for Drug-Induced Sweet Syndrome, including an abrupt onset of erythematous bullae after drug exposure and histopathologic evidence of dense neutrophilic infiltrate without evidence of leukocytoclastic vasculitis. She also met the following minor criteria: elevated ESR, and leukocytosis with greater than 70% neutrophils. After lengthy discussion, the patient decided against anticoagulation for her paroxysmal atrial fibrillation and both Amiodarone and Eliquis were discontinued. The patient was started on prednisone and had improvement of her skin and oral lesions within one week.

**Discussion:** Our case study is a novel presentation of drug induced Sweet Syndrome with Amiodarone and/or Eliquis. It is difficult to identify which of the two medications was the inciting factor, however, the patient had adequate response to treatment. In addition to increasing awareness of iatrogenic causes of Sweet Syndrome, the case highlighted the importance of shared decision-making in patient care.

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**Title:** Eye Opener, a Case Report of Bilateral Ptosis After Facial Botulinum Toxin Injection

**Authors:** Paul Agtarap, MD, PGY2; Mouriel Boucher, DO, PGY2; Renuka Tolani, OMS4

**Program:** Palmetto General Hospital, Internal Medicine Residency Program

**Introduction:** Botulinum toxin is an injectable neuromodulator derived from neurotoxins produced by Clostridium botulinum; it weakens or paralyzes skeletal muscle. Botox injection has now become one of the most requested procedures in facial rejuvenation. Thorough knowledge of muscular anatomy and function is crucial for the effective and safe administration of botulinum toxin, since improper administration can result in cosmetic disfigurement and functional deficits that persists for months. Ptosis can occur when botulinum toxin inadvertently migrates through the orbital septum and exerts a neuromuscular blockade on the levator palpebrae superiors muscle. Given similar mechanism and clinical feature, patients who have an exaggerated response to Botox injection should also prompt investigation for the possibility of existing Myasthenia Gravis (MG). We present a case of a 48-year old female who was unable to open her eyes 1 week after facial forehead and orbicularis injection of botulinum toxin.

**Case Description:** The patient has a medical history of CAD, chronic migraines, mood disorder, breast reduction, gastric bypass and abdominoplasty who presented to the ED complaining of difficulty opening her bilateral eyes 1 week after having Botox injected to the face in Dominican Republic. Patient reported associated symptom of burning sensation on the left side of the face with no report of dyspnea, dysphagia or any other neurological deficit. She reported slight facial swelling and numbness in the face after the procedure. On arrival to ED, CXR and CT of head were unremarkable. On examination, patient was found to be in no acute distress; both eyes were nearly closed, and she was unable to open them on her own or lift her eyebrows. AChR (Acetylcholine Receptor Antibodies) was requested in the ER. She was started on pyridostigmine 30 mg every 6 hours on admission. The following day patient reported significant improvement opening her eyes. Day 2 of admission the Pyridostigmine dose was increased to 60 mg tid. Day 3 of admission patient was able to open her eyes, but still unable to move her forehead. She was discharged and advised to follow up in their clinic the following day. Results of AChR antibodies were negative. Patient received an unspecified dose of botulinum toxin from Dominican Republic, but it was unclear if it was for headache or for cosmetic reasons. She presented with bilateral Ptosis and responded with Pyridostigmine treatment. AChR antibodies were negative but MG cannot be totally ruled out in this case. After further discussion with neurology team she was discharged in stable condition; pyridostigmine was continued post-discharge. She had her follow up with neurology as outpatient.

**Discussion:** The American Society of Plastic Surgeons reported 7,437,378 Botox injections for the year 2018. The FDA reported 5,127 cases of Botox side effects in 2018 and 4,511 in 2019. A 2004 meta-analysis of randomized trials (n=1425) found no reports of serious adverse effects in patients treated with onabotulinumtoxinA injection for medical or cosmetic purposes. Serious adverse effects reported to the FDA have also been low in number; between 1989-2003, only 36 serious adverse effects associated with cosmetic use were reported. Examples of documented adverse effects included injection site reactions, headache, focal facial paralysis, muscle weakness, flu-like symptoms, dysphagia, respiratory compromise, cardiac arrhythmia, seizure, ocular abnormalities, and allergic reactions. Although the risk of serious adverse effects is low with cosmetic use, side effects such as aspiration, dysphagia, pneumonia, anaphylaxis, botulism, and death have been reported in association with the use of botulinum toxin.
**Introduction:** Hypothyroidism, one of the most prevalent endocrine disorders worldwide, has a broad spectrum of clinical manifestations, from an asymptomatic condition to myxedema coma. Amongst these manifestations is pericardial effusion. Hypothyroidism can cause increased permeability of the pericardial capillaries to albumin. This, in addition to decreased drainage of albumin into the lymphatic system, leads to increased colloid pressure within the pericardium. This culminates in the accumulation of fluid in the pericardial space [1,2]. Incidence of pericardial effusion is 3-6% in mild cases of hypothyroidism and 80% in severe hypothyroidism [3]. Large to massive pericardial effusion is infrequent with rare cases of tamponade [4]. We present a rare case of uncontrolled hypothyroidism leading to massive pericardial effusion with early tamponade.

**Case Description:** A 62 y/o female with history of total thyroidectomy presented with a chief complaint of SOB worsened by exertion and lying flat, which onset 1 week ago. She denies CP, palpitations, LE swelling, dizziness, HA, cough, fever, recent infection and chest trauma. She stated that 2 days prior, during hemodialysis, the dialysis nurse recommended she come to the ER because her blood pressure was low during her session. She was started on thyroid hormone supplementation with Levothyroxine 100mcg PO daily after her total thyroidectomy 6 years ago but stopped taking the medication 2 months prior to arrival. Physical Examination is notable for uncontrolled blood pressure of 190/88 mmHg, bradycardia at 59 bpm and distant heart sounds. Labs were notable for normocytic normochromic anemia of chronic inflammation, elevated Creatinine to 6.3 and BUN to 44, pro BNP elevated to 7K, TSH was >100.00. Free T4 was noted to be 0.08 (nl 0.7-1.8). Autoimmune panel (RF, ANA, Cyclic Citrullinated Peptide, Scl-70 Ab, dsDNA, Anti-centromere Ab) were negative. The Hepatitis Panel was negative. CXR was notable for a large left lung opacity involving the mid and lower lung zones likely secondary to pleural fluid, an area of consolidation with infiltrates at the right lung base and mediastinal shift towards the right (Fig. 1). CT chest was notable for a large left pericardial effusion and a small right pleural effusion (Fig. 2). A TTE was performed and confirmed a large pericardial effusion (Fig. 3). She subsequently underwent urgent pericardiocentesis with removal of 1700 cc of serosanguinous fluid without complication (Fig. 4). The patient’s SOB improved immediately following the procedure. She was started on LT4 at 50mcg IV. A pericardial fluid analysis was then conducted and revealed yellow, hazy appearance with RBC 666 cells/µL, Total Nucleated Cells 119 cells/µL, and Total Protein 4.8 g/dl. Microbial cultures of pericardial fluid were negative for growth. Pathology revealed numerous histiocytes, rare mesothelial cells and scant mixed leukocytes. A TTF-1 stain was negative. Pericardial drain was in place for several days with a total output of 700cc. The etiology of the pericardial effusion was consistent with hypothyroidism and patient was transitioned to PO LT4. She remained asymptomatic and was scheduled to have a repeat TTE outpatient.

**Discussion:** This case illustrates the prompt diagnosis of Pericardial Effusion secondary to severe hypothyroidism with a successful outcome following early intervention.

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**Title:** Supernumerary Left Renal Vein and an Implication of Secondary Renal Hypertension  
**Authors:** Brooke Alexander, OMS2; Nicholas Lampasona, OMS2; Michael Downing, OMS2, Taylor Mazzei, OMS2; Nicholas Lufti, MD, DPM  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** This case study aims to draw conclusions about the physiology of an additional renal vein and the impact it might have on this cadaver’s medical history of hypertension and cerebrovascular accident. To our knowledge, here has not been extensive investigation into the contributory mechanisms of a supernumerary renal vein and its associations with hypertension.

**Case Description:** Through dissection, this 96-year-old female cadaver was found to have a supernumerary left renal vein. The patient’s medical history and cause of death included hypertension as well as a cerebrovascular accident. The patient had no other identifying factors that could be associated with persistent hypertension. We propose that the cause of this cadaver’s hypertension may be partly due to a longstanding, undiscovered supernumerary left renal vein based on physiologic principles.

**Discussion:** Due to an additional renal vein in parallel and a lower venous resistance, there is an increased flow to the kidney. Thus, the arterioles of the kidney will vasoconstrict through autoregulation, leading to an increase in arteriole resistance. The result is a left renal system with a higher arteriolar resistance and lower venous resistance. However, a higher ratio of arterial resistance to venous resistance, and a decrease in capillary pressure, results in the activation of the Renin-Angiotensin-Aldosterone System, possibly causing secondary renal hypertension. Thus, it can be suggested that the cause of this cadaver’s hypertension may be partly due to the presence of a supernumerary left renal vein centered around the physiologic principles described above. Being aware of renal vasculature anomalies may help guide physicians towards individualized patient treatment rather than routine pharmaceutical management of hypertension. Identifying such anomalies could also help guide retroperitoneal surgical planning.

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**Title:** A Rare Case of a Pulmonary Granular Cell Tumor in a Patient Presenting with Empyema and Pleural Effusion  
**Authors:** Andrea Alvarez, MBS, OMS3; Benjamin Baldrige, OMS3; Dayna Mastromardi, OMS3; Susana Ferra, MD  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Granular cell tumors (GCTs) are rare benign neoplasms that are believed to originate from Schwann cells. GCTs can arise at essentially any body site, but is most commonly found in soft tissue, breast, oral cavity, and digestive tract. The majority of GCTs are considered benign, although malignant GCTs have been reported in less than 2% of cases. It is less frequently found in the respiratory tract comprising of 6-10% of all GCTs. Microscopically the tumor cells are polygonal or ovoid, with abundant eosinophilic and granular cytoplasm. Immunostaining is classically positive for S-100 protein, CD68, neuron specific enolase (NSE), and vimentin. These tumors are typically found incidentally either by radiograph or bronchoscopy.

**Case Description:** Patient is a 59-year-old African American male with significant history of tobacco abuse (70 pack year history), alcoholism, and poorly controlled hypertension that presented to the emergency department with productive cough with brown-tinted sputum, shortness of breath, and left-sided chest pain while visiting from New Jersey. The patient reported recent weight loss, a worsening cough, and generally not feeling well for the last couple of months. Initial CXR showed left lower lobe opacities, suggesting pneumonia. Upon admission, patient met sepsis criteria,
and was started on azithromycin, ceftriaxone, and levofloxacin. Patients symptoms continued to worsen so antibiotic coverage was extended to Zosyn and Vancomycin, later followed by Meropenem. CT scan of the chest revealed a multiloculated left pleural effusion with compressive atelectasis and infiltrate suggesting empyema vs malignancy. Patient underwent left lung laparoscopic decortication with pleurectomy and chest tube placement for empyema. Two days later the patient underwent left thoracotomy due to large hemithorax, and during the intubation the anesthesiologist discovered a mass at the takeoff of the right upper bronchus incidentally. The endobronchial mass was later evaluated via bronchoscopy and multiple biopsies were taken. Pathology confirmed the diagnosis of granular cell tumor that was morphologically benign. This was confirmed by immunostaining which was positive for S-100, CD68, CD56 and focal weak calretinin while negative for TTF-1 and pan-keratin.

Discussion: This case presents a patient with a complicated hospital stay that was ultimately diagnosed through an incidental finding with a rare pulmonary tumor. It is unlikely that the complicated one-month hospital stay was related to the tumor, as the tumor was on the right side and most of his presenting symptoms originated from the left lung. The patient completed 5 days of Levofloxacin and 21 days of Meropenem via Groshong catheter and was deemed well enough for discharge with instructions to follow up with his primary care doctor for referral to a Pulmonologist upon return to New Jersey.

Title: Comparative Analysis on the Effects of Sarcopenia Following Primary Total Knee Arthroplasty: A Retrospective Matched-Control Analysis
Authors: Andrew Ardeljan, OMS1; Joseph Palmer, PGY2; Rushabh Vakharia, MD; Martin W. Roche, MD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Acute onset of IgA mediated vasculitis is a rare presentation in adults. There is an estimated annual incidence of 1.3 per 100,000, Gonzalez-Gay et al, to 5 per 100,000, Hocevar et al, with a mean age of 50 at presentation in adults. IgA vasculitis is an immune-mediated vasculitis, which is associated with IgA deposition in the organs, most predominantly demonstrating an increased role in kidney insufficiency, and end stage renal disease in adults. The pathophysiology is for the most part unknown; however, there is reason to believe that infectious along with chemical triggers are possible factors that play a role. Roughly 50 percent of cases are reported after URI, especially if caused by streptococcus. The characteristic finding in biopsy is leukocytoclastic vasculitis, demonstrating IgA immune complex deposition within the specific organs that are affected. The predominant cell types seen in the inflammatory infiltrate are neutrophils and monocytes.

Case Description: We present a case of a 26-year-old Hispanic female with a PMH of HTN, cigarette smoking and GERD presenting with a chief complaint of a burning bilateral rash. The patient stated the rash first began as small red dots on the back of her legs, progressing to increase in number, coalesce, and continue upward towards her abdomen. She admitted to associated pruritus, and arthralgia, but denied any fever, chills, oral ulcers, hematuria, nausea, vomiting, chest pain, abdominal pain, cough, SOB, diarhhea. One-week prior she went canoeing in Oleta Park and was bit on her right ankle by an ant, however, she continued to swim/canoe in the water. In addition, the patient reported that she was sick with a sore throat, congestion, and cough about one month ago. Her boyfriend was diagnosed with strep throat around the same time period.

Vitals on admission revealed a temperature of 98.3 degrees, BP 134/86, HR 90, RR 17, O2 sat 97%. Pertinent aspects of the physical exam were tenderness to palpation and mildly edematous bilateral ankles, along with non-blanching coalesced, palpable erythematous maculopapular lesions on bilateral lower extremities, with small areas noticed in the abdomen. Initial laboratory revealed leukocytosis of 14.31, neutrophil predominant, BMP unremarkable, UA with small amounts of blood, elevated CRP of 18, and ESR of 30. Subsequent labs including ANA, Anti-DsDNA, hepatitis panel, Sjrojen antibodies, cryoglobulin, and ASO were ordered. A skin biopsy was obtained, and specimen was sent to pathology to be analyzed. Initial pathology report revealed early leukocytoclastic vasculitis, and specimen was sent out for immunofluorescence. Specimen returned positive for findings consistent with IgA vasculitis.

Discussion: IgA vasculitis can present with skin, joint, gastrointestinal, and renal involvement. In adults, renal involvement is seen in a significantly higher rate than in pediatrics within 4 months of presentation. It is known a smoking history associated with IgA vasculitis increases the chances of nephrotic renal disease as patients continue to increase in age. Gastrointestinal symptoms are only seen 24.1% of the time before the onset of rash, Zhang et al. Upon follow up with patient, she still reported hematuria one-month post onset of rash.

Title: Implantation of Leadless LV Endocardial Pacing as an Alternative to Conventional CRT
Authors: Jonathan Arnedo, MD, PGY4; Ronald Pachon, MD, PGY5; Claudia Monge, DO, PGY4; Ahmed Osman, MD
Program: Broward Health Medical Center, Cardiology Fellowship Program

Introduction: Cardiac resynchronization therapy (CRT) is used in patients with severe LV systolic dysfunction and dysynchronous ventricular activation. It provides simultaneous or nearly simultaneous electrical activation of the LV and RV. Up to 5% of candidates cannot have CRT implanted due to anatomic limitations, 10% develop coronary sinus (CS) lead complications, and close to 30% of patients are not clinically improved by “conventional” CRT. Leadless left ventricular endocardial pacing offers an alternative to “traditional” epicardial CS lead CRT and a potential solution to these limitations. We present a case of successful leadless left ventricular endocardial device placement as a solution to severe symptomatic diaphragmatic stimulation from conventional CRT.

Case Description: Our patient is a 72-year-old male with history of severe dilated cardiomyopathy, class III congestive heart failure, status post remote CRT-ICD insertion and on maximal optimal medical therapy. The patient has a history of permanent atrial fibrillation and is chronically RV paced. The patient had multiple encounters with severe symptomatic diaphragmatic stimulation because of the proximity of his LV lead to the phrenic nerve, which had required termination of LV pacing via this lead. The patient was deemed high risk for surgical intervention, particularly given his significant pacing dependence. Given poor coronary sinus anatomy and lack of any suitable alternatives for left ventricular pacing, he agreed to proceed with insertion of a
Title: A Cyclical Heart - A Rare Case of Menstruation Induced Neurocardiogenic Syncope
Authors: Jilla R. Azarbal, MD, PGY3; Gustavo A. Vargas, MD, PGY3; James Davenport, MD, FACC
Program: Kendall Regional Medical Center, Internal Medicine Residency Program

Introduction: Arrhythmias in women may be affected by phases of the menstrual cycle (1), which can have implications for cardiac autonomic function (2). This concept was well studied by Dr. Robert Myerburg of the University of Miami. Dr. Myerburg and his team studied a population of women with spontaneous premenstrual clustering of supraventricular tachycardias and noted that there was greater inducibility of arrhythmia during the premenstrual phase (3). Specifically, they tested the theory that women with paroxysmal SVT have a difference in probability of induction during higher estrogen states (i.e. midcycle or with estrogen replacement therapy) versus at lower estrogen states (i.e. perimenstrual or without estrogen replacement). Similarly, studies of vasovagal syncope during the menstrual cycle found that patients reported the greatest episodes during menses, and the least during the follicular phase (4). These findings are significant because they suggest that in this population of women, electrophysiologic procedures should ideally be scheduled at times of low estrogen levels in order to facilitate the chances of a successful procedure (1).

Case Description: 37 YO female, with a PMH significant for dysmenorrhea, and syncope, presented to the ED after a witnessed syncopal episode lasting 1-3 minutes, with positive head trauma. Patient refers multiple syncopal episodes since onset at 17 years old, every 1-2 years, only occurring during the first day of her menstrual cycle. At the time of the exam, patient is on the first day of her menstruation. The EMS reported HR in the 30s improved to 50s with 0.5 mg atropine once. The patient reported chest pain during and after the episode. On admission, the EKG showed normal sinus rhythm, and brain imaging was negative for acute findings. The patient denied any other complaints. Electrophysiology took the patient for a tilt table test, and after 11 minutes she flat lined for approximately 4 seconds. The patient was turned to recumbence and quickly awoke. EPS confirmed a positive tilt table test for neurocardiogenic syncope, and recommended the patient begin birth control pills, encouraged to increase her fluid and salt intake, and wear compression stockings.
**Discussion:** While there are a few case reports of female patients reporting an association between their arrhythmias and their menstrual period, little is known about such an association (4). This is worth exploring further due to the implications that such testing can have on the female population with arrhythmias, which has been understudied when compared to men with respect to cardiac electrophysiology and arrhythmias. Physicians should be aware that the menstrual cycle can induce arrhythmias during electrophysiological testing. Going further, clinicians should also be aware that the arrhythmia and the result of clinical trials examining arrhythmia treatment may have different implications in women than in men (5).

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**Title:** A Rare Case of Thrombotic Thrombocytopenic Purpura Presenting as a Code Neuro in a Patient Initially Presenting with Radiulopathy Pain: A Case Report of NSAID Induced TTP

**Authors:** Nabir M. Babbar, DO, PGY5; Loan Le, DO, PGY2; Mouriel Boucher, DO, PGY2; Christopher King, DO

**Program:** Palmetto General Hospital, Critical Care Fellowship Program

**Introduction:** Thrombotic thrombocytopenic purpura (TTP) is a rare but serious blood disorder that causes thrombotic microangiopathy. The incidence is very rare, as low as 3 cases in one million adults per year. The classic patient presentation includes a pentad of fever, thrombocytopenia, microangiopathic hemolytic anemia, renal failure, and neurological symptoms. The hematologic abnormalities are the most commonly seen aspects of the pentad, while fever and renal failure are the least common. TTP is a medical emergency and can be fatal if not treated promptly. TTP can be inherited or acquired, and results from dysfunctional or diminished activity of the von Willebrand factor-cleaving protease ADAMTS13. This case provides support for an uncommon cause of TTP: ibuprofen and NSAIDs.

**Case Description:** 59-year-old male with past medical history significant for chronic back pain with associated lumbar herniation and diabetes mellitus who presented initially with complaints of worsening lumbar back pain refractory to over the counter NSAID use. Due to the intractable nature of his back pain, the patient followed up in the emergency department for further evaluation. In the ED, the patient had a CT scan of the lumbar region that showed findings concerning for mild spinal stenosis and bilateral foraminal narrowing from diffuse disc bulging in the L4-S1 levels. Right-sided avascular necrosis of the hip was also noted, a finding that the patient was not previously aware of. The patient was subsequently admitted for evaluation by neurosurgical services. Upon admission, the patient was neurologically intact with complaints significant only for lumbar radiculopathy and neuropathic pain which was chronic in nature. The patient was admitted and subsequently had an acute change in mental status during transfer. Evaluation by the ICU team found the patient to be aphasic, with slurring of words, and confused without focal motor neurological deficits. CT head, CT perfusion scan, and CTA of head and neck were all negative for acute findings of ischemic stroke, intracranial bleeding, or vascular occlusion. The patient was then transferred to the ICU due to persistent change in neurological status, becoming increasingly lethargic and beginning to show oxygen desaturations. Given the significant degree of desaturations, the patient required intubation for airway protection and hypoxia. Repeat labs showed acute drop in hemoglobin from 9.3 to 4.8, and platelet count from 97 to 71. The platelet count continued to drop the following day to 57. Renal function worsened with BUN increasing from 20 to 48, and creatinine from 1.3 to 3.1. The patient also had worsening LFTs. The patient was given packed red blood cells and platelet transfusions between day 1 and day 2. After transfusion, labs revealed platelet count worsened to 37. The patient exhibited findings significant for the pentad of TTP including fluctuation in neuro status, new onset fever, non-immune microangiopathic hemolytic anemia, low platelet count, and a new worsening renal failure with a subjective rash. Laboratory studies including peripheral smear with schistocytes and low level of ADAMTS13 activity eventually confirmed the diagnosis of TTP. The patient also had elevated reticulocyte count, total bilirubin and indirect bilirubin, and LDH that was trending upwards. The patient was immediately treated with multiple cycles of plasmapheresis, and rituximab. After the second cycle of plasmapheresis mental status improved remarkably and the patient was extubated successfully to high flow nasal cannula. Overall, the patient underwent 9 cycles of plasmapheresis and 1 cycle of rituximab. Repeat ADAMTS 13 assay showed an improving percentage of activity. After 9 cycles, central venous catheter was removed, and plasma exchange was discontinued. Patient underwent aggressive physical therapy and was subsequently discharged to a skilled nursing facility for daily lab draws. Patient was also instructed to avoid the use of NSAID containing products during the subacute process.

**Discussion:** This case illustrates an additional case report finding an unusual cause of TTP in which ibuprofen and NSAIDs can induce antibodies against this integrin and metalloproteinase with thrombospondin type 1 motif member 13. NSAIDs have become increasingly witnessed as causes of TTP. At this time, very few case reports are available and mostly associated with diclofenac. This patient exhibited chronic lumbar back pain secondary to herniations in the lumbosacral region. As such, the patient was taking a relatively moderate amount of NSAIDs approximately 2 to 3 800mg tablets per day for the past 2 weeks prior to admission. Previous case literature reports shown TTP from large ingestion NSAIDs and previous suicide like attempts. This case illustrates that even smaller reduction in doses of NSAID can exacerbate a TTP exacerbation.

Currently, only one case control study shows a correlation between NSAID use and documented presentation of TTP. This report did not necessarily favor the association and had limitations including confounding variables with other drugs, as well as an underpowered study with poor P-values. Anecdotally, few case reports are currently published via Pubmed search of NSAID use identified as the primary culprit for TTP exacerbations. And of those with TTP exacerbations, only 1 of the case reports described encephalopathy and seizure-like activity as the neurological presentation for TTP. Thus, this case shows the very rarity of this condition and the abnormal initial presentation for early onset of TTP diagnosed in the hospital setting as a Code Neuro.

This case also describes an unusual presentation of TTP from a neurological perspective in which the patient initially presented with dysarthria and aphasia. Up to 60% of patients with TTP may not show any neurological sequelae of the disease. Thus, as a practicing clinician, TTP and other hemolytic emergencies should always be considered on the differential for altered mental status.

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**Title:** A Mesenteric Desmoid Tumor Causing Recurrent Intermittent Bowel Obstruction

**Authors:** Nicholas Baltera, OMS3; Alexandra Monteverde, DO, PGY4; Harrison Cotler, DO, PGY5; Richard Ricca, MD

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine
Introduction: Desmoid tumors are rare, monoclonal, fibroblastic proliferations that arise in deep soft tissue. These tumors are benign with no metastatic potential; however, they are locally invasive with high recurrence rates. Desmoid tumors are driven by alterations of the Wnt/β-catenin pathway. Sporadic desmoids tumors comprise the majority, 85-90%, and are associated with somatic mutations of CTNNB1. Approximately 10-15% are associated with germline APC mutations in the familial adenomatous polyposis (FAP) syndrome. These tumors make up <3% of soft tissue sarcomas and about 0.03% of all malignancies. Desmoid tumors can arise in any anatomic location, but tend to arise in the extremities, joints, and abdomen. Clinical symptoms vary depending on the location. The treatment of desmoid tumors requires an individualized approach.

Case Presentation: We present a case of a 64-year-old male who was experiencing intermittent mid-abdominal pain. The pain was described as crampy gas pains. He experienced this pain 3 days prior which resolved spontaneously and was similar to a previous episode he had 5 years ago. The patient was hospitalized at that time and was found to have a mesenteric mass on CT. He deferred diagnostic laparoscopy then and was discharged when symptoms improved. This hospital course consisted of a CT Abdomen/Pelvis which revealed a partial small bowel obstruction, as well as a slight increase in size of the mesenteric mass now measuring 3.0 x 2.8 cm. The patient was managed conservatively, and he was discharged after he had a return of normal bowel function. He agreed to follow up outpatient with general surgery. Outpatient NM/PET scan showed no significant hypermetabolic activity associated with the mesenteric mass, and the chronicity of the lesion could suggest a low-grade malignancy. Intra-abdominal biopsy of the mass was deferred due to the location and potential for complications. A diagnostic laparoscopy was planned and was converted intraoperatively to an exploratory laparotomy. A mass of small bowel was identified which was wrapped around its mesentery. Within the mesentery, a small circular mass could be felt. The small bowel mass and mesenteric mass were resected, and a subsequent small bowel anastomosis was completed. Pathology findings revealed a densely collagenous hypocellular tumor consistent with a desmoid tumor. The post-op course was uneventful, and the patient was discharged on post-op day 4.

Discussion: This case exemplifies the difficulty in diagnosis and treatment of desmoid tumors, specifically those that are intra-abdominal. Diagnostic steps should include a histologic confirmation if it’s safe to conduct. When it comes to treatment, there is consensus on a “watch and wait strategy” for newly diagnosed patients with non-life threatening symptoms. When deciding between an active or definitive treatment; the initial tumor size, growth rate, location of the tumor, its risk to organs or nerves or worsening of function, should be weighed. Surgical resection is the recommended treatment for operable intra-abdominal desmoid tumors.

Title: Point-of-Care Ultrasound Identification of Tension Hydrothorax
Authors: Leeran Baraness, MD, PGY1; Guarav Patel, MD; Vu Huy Tran, MD
Program: Aventura Hospital and Medical Center, Emergency Medicine Residency Program

Introduction: Pleural effusion is a pathological condition which involves a collection of fluid between the parietal and visceral layers of the lung pleura. Lung ultrasonography has been increasingly utilized over the past several decades to aid in the diagnosis of pleural effusion, as well as to guide thoracentesis. We present a case of a hemodynamically stable patient with a large left pleural effusion causing structural shift of the mediastinal structures. We will discuss how the diagnosis was made initially and rapidly at bedside using point-of-care ultrasonography (POCUS) and how it led to definitive management.

Case Description: 55-year-old Chinese male presented to the emergency department (ED) with cough for 2 weeks, SOB for 5 days, and associated left sided pleuritic chest pain. The patient denied wheezing, fever, night sweats, mucous production in cough, recent weight loss, ill contacts, recent travel, history of smoking, alcohol or drug use. Vital Signs on arrival: HR 89, BP 148/83, RR 18, O2 sat 98, Temp 37.0. The patient was awake, alert, and non-toxic appearing. His had diminished breath sounds on the left associated with mild tachypnea. He was noted to have dullness to percussion of the left thorax. Cardiac exam revealed normal heart sounds and no jugular venous distention.

His chest x-ray revealed complete opacification of the left hemithorax with left to right mediastinal shift. A bedside echo revealed absence of cardiovascular structures in the parasternal long axis view. Instead pulmonary parenchyma was seen floating within a large pleural effusion. A chest CT confirmed the diagnosis of massive left pleural effusion causing rightward mediastinal shift and resulting in complete left lung collapse. Nonspecific heterogeneous enhancement within the lingula and posterior basal segments. The patient underwent thoracentesis with 3.8L of fluid removed. Analysis demonstrated an exudative effusion causing inflammation of the intraparenchymal membranes. Pathology report demonstrated evidence of malignancy, with cell markers specific for adenocarcinoma, consistent with metastatic involvement by a lung as the primary source.

Discussion: This case demonstrates how early application of POCUS was able to rapidly identify massive pleural effusion with total lung collapse and mediastinal shift in a stable patient. POCUS has been shown to be a very useful diagnostic tool for pleural effusion and can detect as little as 100ml. Pleural fluid is characterized by an anechoic space between the parietal and visceral pleura. Ultrasound can also help distinguish between exudative and transudate effusion. Exudative effusions generally exhibit more heterogeneous and complex anechoic patterns than transudative effusions. This patient case exhibited classic and expected ultrasound findings of an exudative pleural effusion. Importantly, since the effusion accumulated in an indolent fashion, he did not demonstrate hemodynamic changes secondary to mediastinal shift. POCUS was able to quickly diagnose this condition and guide further management.

Title: Successful Surgical Treatment of Pigmented Villonodular Synovitis in the Distal Radial Ulnar Joint with Sauvé-Kapandji Procedure: A Case Report
Authors: Joshua Berko, OMS2; Andrew Ardeljan, OMS1; Gregory Kunis, OMS2; Joseph Palmer, DO, PGY-2; Michael O. Madden, DO; Jacob Landes, DO
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program
Introduction: Pigmented villonodular synovitis (PVNS) is described as a rare, benign condition seldomly affecting the wrist, elbow, or hand. Although current literature does not describe a standardized treatment for PVNS, surgical intervention, usually total or subtotal synovectomy, is commonly used to treat the disease. This case is one of the first in evaluating the efficacy of the Sauvé-Kapandji procedure as a treatment modality for PVNS of the wrist.

Case Description: A 58-year-old, Hispanic male presented with right wrist pain, worsening for several months and reported an unspecified injury to the wrist approximately 1 year prior. Patient was informed about the procedure and elected to proceed. The procedure went without immediate complications. One-month post-operative visit revealed decreased pain and swelling. Four-month visit, the patient experienced no residual paresthesia, brisk capillary refill, and 2/4 peripheral pulses. Passive motion of the wrist: 65° extension, 55° flexion, 45° supination, 80° pronation. Supination markedly limited by heterotopic bone formation confirmed with radiograph. Patient elected for follow up procedure to remove the heterotopic bone formation and has been without complication to date.

Discussion: Estimated annual incidence of PVNS in the United States is approximately 1.8 cases per million patients and less commonly affects smaller joints such as the wrist, which make up about 2.53% of all cases. Likely due to the rarity of the disease, there is no standardized treatment for PVNS. In this case, the decision was made to employ the Sauvé-Kapandji procedure with partial extensor tenosynovectomy. The Sauvé-Kapandji procedure is a form of arthrodesis for the distal radioulnar joint (DRUJ) and is used to treat a myriad of conditions including various DRUJ instabilities and early synovitis in rheumatoid patients. It was elected for this case because of its increased reliability and durability in treating joint disorders. Although PVNS of the wrist is a relatively rare condition with no current standardized treatment, implementation of the Sauvé-Kapandji procedure can lead to favorable patient outcomes.

Title: Urinary Retention in a 3-Year-Old Male Secondary to Eosinophilic Cystitis
Author: Katheryn Birch, DO, PGY3
Program: Palms West Hospital, Pediatric Residency Program

Introduction: Eosinophilic cystitis is a rare diagnosis, especially in pediatrics. The typical presentation includes abdominal pain, hematuria and dysuria. In pediatrics it is more common in males, however usually at age 6. Our patient is a three-year-old male that presented with difficulty voiding. He was initially misdiagnosed as having a UTI, however upon return to the ED, they did blood work and imaging. Blood showed a significant eosinophilia. Bladder ultrasound showed a large bladder mass. The patient was admitted for the unknown bladder mass.

Case Description: Patient is a 3-year-old male with no past medical history who presented to the Emergency room with a complaint of decreased urination and abdominal pain. He was initially diagnosed with a urinary tract infection and was sent home on an antibiotic. Patient continued to have decreased urine output. Mother brought him back to the emergency department. During his second assessment, renal bladder US read as obstructive uropathy, left hydronephrosis and left hydroureter. Abd CT showed 2.9 x 2.3 x 3.3cm bladder mass on posterior wall with bilateral hydronephrosis and bilateral hydroureter. CBC showed a WBC 12.3, hgb 11.9, hct 34.2, plt 252, neut 33.4, lymph 45.1, mono 10.1, eos 10.6, baso 0.8. Urology was consulted and the patient was admitted to the pediatric floor. Upon admission he had a VCUG read as a posterior bladder wall mass. Patient continued to have difficulty urinating. The following day he had a cystoscopy with biopsy performed. He had a Foley placed. Pelvic MRI read as isolated posterior wall urinary bladder mass, 1.2 x 3.1 x 3.7cm, no enlarged pelvic lymph nodes. Chest CT bilateral atelectasis no pulmonary metastasis. After the Foley was taken out two days later he was unable to urinate. Patient subsequently went into acute renal failure secondary to obstruction. Urology placed nephrostomy tubes. The biopsy resulted in eosinophilic cystitis. Patient was started on steroids, ditropan and zyrtec. The tubes were able to be able clamped successfully. Renal/bladder US, no hydronephrosis, resolving posterior wall bladder mass. Upon follow up abdominal CT bladder had nonspecific wall thickening posteriorly. Patient was weaned off of nephrostomy tubes. One month after bladder cystoscopy with bladder wall with no edema or obstruction.

Discussion: Urinary retention in a child that is fully “potty trained” should require further investigation. This patient is unique in his presentation because of his age. Pediatricians need to have a high index of suspicion of an abnormality for urinary retention. This is a rare diagnosis and should not be at the top of the list, however obstructive uropathy has many different causes and further investigation is warranted.

Title: The Many Consequences of an Undiagnosed Case of Plasmodium Vivax
Authors: Ashley Bisnow, OMS3; Asma Ghafoor, OMS3
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Malaria should be considered for any patient who returns from a malaria-endemic region with flu-like symptoms and fever. Although fever is the main presenting symptom, it can present with a variety of non-specific symptoms ranging from diarrhea to chills. While the Plasmodium falciparum species is often considered most fatal, undiagnosed Plasmodium ovale can also be severe and even fatal in rare cases. Here, we report on a 53-year-old man who traveled extensively through the tropics and who was later diagnosed with P. ovale malaria in 2017 after experiencing multi-organ failure.

Case Description: We present a case of a 53-year-old African American male who presented in 2006 at the age of 39 with nausea, shortness of breath, loss of appetite, weight loss, and general flu-like symptoms that were occurring for approximately one week. The patient reports that before this hospitalization he had been in good health. He had recently returned from a trip to Haiti and Panama, and in addition, had an extensive and unclear travel history. Over the span of several weeks, his organs began to shut down and he was put into a medically induced coma. After being taken out of the coma he was believed to have an arrhythmia, and an implantable cardioverter defibrillator was placed but was subsequently turned off. Over the next several years, he developed chronic kidney disease and was started on dialysis in 2014. In 2017, after having recurrent spiking fevers at regular intervals, the patient was referred to an infectious disease specialist who officially diagnosed him with malaria and placed him on dual treatment with
hydroxychloroquine and primaquine. In 2019, he began showing signs of infection and was later diagnosed with Staphylococcus lugdunensis endocarditis due to infected defibrillator leads. He was placed on the kidney transplant list, but in order to receive the transplant, he was required to have the infected device removed. Due to poor wound care after removal of the defibrillator, involving retained gauze, he then developed bacteremia. He completed a course of antibiotics and is currently awaiting a kidney transplant.

**Discussion:** This case illustrates the importance of prompt diagnosis of malaria and the consequences of misdiagnosis.

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**A Case of Bacterial Endocarditis Related to Dental Caries**

**Title:** A Case of Bacterial Endocarditis Related to Dental Caries  
**Author:** Jamie Bolduc, DO, PGY2  
**Program:** Community Health of South Florida Inc., Family Medicine Residency Program

**Introduction:** Bacterial endocarditis is a rare disease, often difficult to diagnose due to varied definitions that exist amongst the medical community. Incidence of diagnosis has increased from 11% to 15% out of 100,000 patients from 2000 to 2011. One of the risk factors associated with bacterial endocarditis is poor dentition or dental infection with exposure of the oral flora (Strep Mutans) being the major factor. Universally accepted factors for diagnosis include clinical manifestations, such as fever, positive blood cultures, and a positive echocardiography. The Duke criteria is the major basis for diagnosis.

**Case Description:** A 58-year-old male with psychiatric history of schizoaffective disorder, bipolar type, presents involuntarily to the psychiatric inpatient unit for paranoid ideation, delusions, and psychotic behavior. Upon admission, Patient was previously treated with Divalproex ER and Olanzapine. During inpatient hospitalization, patient refused medication due to aversion to solid tablet medication. Patient insisted on liquid form for his medication. In order to enhance medication adherence, the patient was prescribed Asenapine, the first and only sublingual dissolving neuroleptic medication approved for acute mania associated with Bipolar Disorder/Schizoaffective disorder. Asenapine was selected due to its novel and unique administration as a sublingual dissolving tablet. Patient agreed to a trial 5 mg sublingual tablet twice daily and was titrated up to 10 mg dose twice daily over his hospital course with no reported or observed side effects. His mental status examination improved to the point where he was able to tolerate being a less restrictive environment as agreeable to continue to adhere to his medication regimen and receive psychiatric treatment as an outpatient. Patient has not had a psychiatric re-admission at our facility at the time of this publication.

**Discussion:** Navigating the complex dynamic of the patient’s prior adverse effects and experience of adverse side effects was a significant barrier to his adherence in this case. In conjunction with his organic disease process, the patient held fixed beliefs that solid tablet medication or any medication that was pink would result in similar side effects that he had previously experienced on a neuroleptic medication regimen (gynecomastia). Treatment of his long-term condition depended on a mutually agreed medication regimen with the patient and his psychiatric provider. Although not liquid medication as the patient requested, the novelty of a dissolving sublingual tablet that the patient did not have to swallow made Asenapine an agreeable option, until a new liquid neuroleptic is developed in the future. In this case we will discuss the utility and efficacy of novel sublingual dissolving antipsychotic Asenapine, particularly in unique patient scenarios geared towards optimizing medication adherence.

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**Asenapine and the Nonadherent Patient: A Case Report**

**Title:** Asenapine and the Nonadherent Patient: A Case Report  
**Authors:** Brian Blum, DO, PGY1; Kristy Fisher, MD, PGY1; Samuel Neuhut, MD  
**Program:** Aventura Hospital and Medical Center, Psychiatry Residency Program

**Introduction:** Patient adherence is the foundation of building a treatment plan within the model of collaborative care. Nonadherence to prescribed medication has been reported as a common phenomenon in the psychiatric setting, with deleterious effect on patient’s course. We believe that promoting patient adherence begins collaboration to develop the treatment plan in accordance with patient desires and concerns in conjunction with clinician judgement. We as clinicians must participate in process of removing barriers in patients’ willingness to adhere to their treatment plan. Effective medication can only be of utility if it is taken as prescribed.

**Case Description:** Mr. P is a 58-year-old male with psychiatric history of schizoaffective disorder, bipolar type, presents involuntarily to the psychiatric inpatient unit for paranoid ideation, delusions, and psychotic behavior. Upon admission, Patient was previously treated with Divalproex ER and Olanzapine. During inpatient hospitalization, patient refused medication due to aversion to solid tablet medication. Patient insisted on liquid form for his medication. In order to enhance medication adherence, the patient was prescribed Asenapine, the first and only sublingual dissolving neuroleptic medication approved for acute mania associated with Bipolar Disorder/Schizoaffective disorder. Asenapine was selected due to its novel and unique administration as a sublingual dissolving tablet. Patient agreed to a trial 5 mg sublingual tablet twice daily and was titrated up to 10 mg dose twice daily over his hospital course with no reported or observed side effects. His mental status examination improved to the point where he was able to tolerate being a less restrictive environment as agreeable to continue to adhere to his medication regimen and receive psychiatric treatment as an outpatient. Patient has not had a psychiatric re-admission at our facility at the time of this publication.

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Title: A Rare Case of Fahr's Syndrome with Symptomatic Improvement
Authors: Ashish Bosukonda, MD, PGY3; Kira Fenton, DO; Cristina Savu, DO
Program: Broward Health, Internal Medicine Residency Program

Introduction: Fahr’s disease is an autosomal dominant neurological disorder characterized by abnormal calcium deposition in the basal ganglia, thalamus, dentate nucleus, hippocampus, cerebral cortex, and cerebellar subcortical white matter. Prevalence is less than 1 in 1,000,000. Typically, between the fourth to sixth decade of life, patients present with extrapyramidal and neuropsychiatric symptoms, cerebellar dysfunction, dementia, and/or speech difficulty. Etiologies include endocrinopathies such as parathyroid dysfunction.

Case Description: We present a 61-year-old male with a known history of hypocalcemia nonadherent to supplemental therapy for 30 years, and alcohol use disorder, who presents with six months of dysarthria, disequilibrium, decreased grip strength, and bilateral hand paresthesia. Physical exam was significant for dysarthria, speech latency, dental caries, bradycardia, decreased grip strength bilaterally, diffuse hyporeflexia, Trousseau sign, Chvostek sign, dysmetria, dysdiadochokinesia, positive Romberg, and ataxic gait. CT and MRI of the brain without contrast showed symmetric calcification of the basal ganglia and cerebellum. Pertinent labs include a calcium of 5.3, ionized calcium of 2.5 mg/dL, phosphorus of 6.8 g/dL, and parathyroid hormone of less than 4 pg/ml. Patient was admitted for severe symptomatic hypocalcemia, and workup for secondary Fahr’s syndrome. Treatment consisted of aggressive calcium supplementation including calcitriol 0.5 mcg BID, calcium carbonate 120 mg TID, and an IV calcium replacement protocol consisting of 1 g of calcium gluconate every four hours for ionized calcium less than 3.5 mg/dL. Symptomatic relief followed normalization of ionized calcium above 4, starting with resolution of hand paresthesia and Trousseau/Chvostek signs. Grip strength improved, speech became less dysarthric, and ataxia lessened allowing the patient to ambulate with a walker.

Discussion: We present a unique case of primary sporadic idiopathic hypoparathyroidism leading to three decades of progressive calcification of the basal ganglia and cerebellar cortex. Reduction in parathyroid hormone regardless of the etiology, causes hyperphosphatemia and hypocalcemia, and can lead to progressive calcinosis. Our patient met numerous diagnostic criteria for Fahr’s syndrome including bilateral calcification of the basal ganglia demonstrated on CT and MRI, progressive neurological dysfunction, age of onset, diagnosed endocrinopathy with proven long standing metabolic disturbance, and absence of infection, trauma, toxins, and other biochemical abnormalities. Overall, Fahr’s syndrome is extremely rare, with limited cases reported. Moreover, in the English literature, there are no known reports of symptomatic improvement in an adult with Fahr’s syndrome secondary to hypoparathyroidism. Our case serves to support the notion that reversing the inciting metabolic defect, in this case hypocalcemia from long standing hypoparathyroidism, can abate calcinosis and reverse neurologic deficits.

Title: Large Volume Central Clot Burden in a Patient with a Biventricular Pacemaker
Authors: Otto Boutin, DO, PGY5; Ilan Razdkowolsky-Raoli, MD; Alex Morizio, MD
Program: Palmetto General Hospital, Critical Care Fellowship Program

Introduction: Venous thromboembolism is an uncommon but present risk for patients with implantable devices. In one paper published in 2017, the risk of thrombosis after AICD placement was 0.3% at 3 months and 1.9% at 5 years.[1] There has been little if any literature detailing the thrombosis risk in patients specifically with a biventricular pacemaker with AICD (BiV-AICD), and this risk may theoretically be higher than in patients with AICD alone given the lower ejection fraction and lack of ventricular synchronicity. That said, according to one study from 2010, the risk of subclavian vein obstruction of any cause in these patients is certainly not insignificant.[2]

Case Description: Patient is an 80-year-old male with a past medical history of heart failure with reduced ejection fraction (HFrEF) (ejection fraction <15%) s/p biventricular pacemaker with automated implantable cardioverter defibrillator (AICD) who presented to the hospital for shortness of breath and substernal chest pain. Electrocardiogram (EKG) and troponin were unremarkable. Patient was placed on nonrebreather mask and improved slightly. Computed tomography angiography (CTA) was performed which showed a thin saddle pulmonary embolus extending into a partially occlusive right lower lobe segmental artery; large mural-based triangular thrombus in the left atrium; significant clot burden in the right atrium and right ventricle; partial thrombosis of the right internal jugular, superior vena cava (SVC), and inferior vena cava (IVC); and completely occluded left brachiocephalic vein. There was no evidence of right heart strain. Bilateral lower extremity venous Duplex showed no obvious evidence of deep venous thrombosis (DVT). Case discussed with cardiovascular and thoracic surgery, not a candidate for surgical intervention. The case discussed with interventional radiology, patient not a candidate for thrombectomy due to lack of right heart strain. In addition, even if hypotension and right heart failure were to develop, patient would still not be a candidate for thrombectomy as performing this procedure would be likely to force more clot into the right heart and into the pulmonary system, leading to cardiovascular collapse. Therefore, the patient would only be a candidate for systemic thrombolysis if necessary. Patient was placed on a heparin drip and diuresis was started; the patient's symptoms improved greatly over the next few days. Echocardiogram showed findings consistent with dilated cardiomyopathy as well as thrombus noted in the left atrium. Supplemental oxygen was weaned down to 2 L by nasal canula, and the patient’s anticoagulation was transitioned to rivaroxaban. The patient was discharged home with supplemental oxygen and rivaroxaban.

Discussion: This case report details a complicated case of thromboembolism. The causes of this severe complication were likely the BiV-AICD in combination with the low flow state of HFrEF. Although the patient did not present with right heart strain, the patient could easily have developed a submassive or massive pulmonary embolism with mobilization of the clot. It was important to have clear communication between the intensivist and the interventional radiologist about what actions would be taken if the patient deteriorated. In addition, it was important to understand that central venous access catheters in the neck region as well as PICC lines could lead to the same complication. As the indications for these procedures continue to expand, this case underscores the importance of understanding the risks and benefits of these procedures (especially as it relates to underlying anatomical abnormalities and to the related pathology).
**Introduction:** First described by Crowe et al. in 1956, segmental neurofibromatosis (SNF) is a rare variant of neurofibromatosis that is localized to a single portion of the body. Also known as Type V neurofibromatosis, it has a reported prevalence of approximately 0.0014%-0.002%. [1] SNF may present with characteristics of either neurofibromatosis 1 (SNF1), neurofibromatosis 2 (SNF2), or a mixture of the two. Neurofibromatosis (NF) is an autosomal dominant, multisystem disorder.

**Case Description:** A 63-year-old Caucasian male was referred to the clinic for the evaluation and management of multiple skin tags that first presented in childhood. Certain lesions were easily irritated by clothing and the patient wanted them removed. Physical examination was relevant for a grouped collection of pedunculated skin-colored papules overlying the patient’s left scapula. Lesions were soft and non-tender to palpation. Though the patient initially denied any relevant personal or family history of dermatologic disease, specific questioning revealed his siblings had similar findings of varying degrees. Two shave biopsies were performed to confirm the diagnosis. A referral to a geneticist was offered but deferred by the patient, as he has no plans to conceive. Evaluation by ophthalmology was also recommended but declined, citing no active visual complaints. Histologically, all neurofibromas including those in SNF are mixed tumors consisting of cells of diverse lineages. The most common form, cutaneous neurofibromas, is composed of neoplastic Schwann cells and non-neoplastic elements including mast cells and fibroblasts. [3] Immunohistochemistry plays a large role in identifying the correct cell types as there are S100+ Schwann cells, CD34+ fibroblasts, and EMA+ perineural cells present the majority of the time. [3]

Typical histopathology shows characteristic well-circumscribed, non-encapsulated aggregations of spindle cells with wavy, “s-shaped” nuclei arranged in a whorled-pattern. Treatment options for SNF are currently quite limited, surgical excision is considered the gold-standard for cutaneous manifestations. Clinical trials with mTOR inhibitors and monoclonal antibodies are currently ongoing and may mark the future direction of treatment modalities for this disease.

**Discussion:** This case examines a rare variant of a hereditary disorder and takes a deep dive into the available treatment options including treatments that may be on the horizon or available in the near future. This case is different from others in literature as we relate our findings of SNF to those of typical neurofibromatosis and compare and contrast the similarities and differences between them.

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**Title:** Eruption of Multiple Fibrous Nodules Isolated on the Scapula of a Middle-Aged Man  
**Authors:** Brett Brazen, OMS3; Christopher White, DO, PGY3; Richard Miller, DO  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Marcus Gunn Jaw Winking Ptosis (MGJWP) is a unique and rare condition characterized by an “unusual congenital ptosis with peculiar associated movements of the affected lid” as first described by Marcus Gunn in 1883. With as few as 300 reported cases worldwide with this phenomenon, a deep understanding of the associated symptomatology and possible complications is not well defined. Severe progression of symptoms can present in infancy, though more often are not present until adolescence, often due to a lack of high clinical suspicion by healthcare professionals.

**Case Description:** A 4-month old female presented for a normal well child examination with an unusual repetitive and rhythmic unilateral right eye blinking and widening concurrent with sucking movements associated with bottle feedings. Ptosis was not present during bottle feeding nor while at rest in either eye.

**Discussion:** Surgical intervention for MGJWS is mostly considered for the moderate to severe cases. Those cases that are milder generally undergo observation in most instances, as the risks of surgeries are quite extensive and should be considered on a case by case basis. Associated abnormalities such as amblyopia and vertical strabismus should be dealt with before attempting surgical repair of jaw-winking ptosis. Implementing more critically detailed guidelines for the diagnosis and treatment of MGJWP may help pediatric generalists to provide improved care to their patients at an earlier stage of intervention with fewer long-term sequelae.

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**Title:** New Onset Type 2 Diabetes in a Patient with a 3-Month History of Debilitating Gastrointestinal and Neurologic Symptoms  
**Author:** Zachary Burns, OMS3  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Not all of the 1.5 million new cases of diabetes diagnosed annually in the United States present the same way. Given the incidence of this disease, clinicians must be versed in the disparate symptoms that can manifest.

**Case Description:** Mrs. J is a 50-year-old African-American female with a history of umbilical hernia repair and abdominoplasty. She presented to the NSU Family Medicine clinic on 1/28/20 after an emergency room visit on 1/22/20 for headache, palpitations, and bilious emesis. The ER chest and abdominal x-rays were negative, and blood work was unknown. She was discharged that day with an unspecified pain medication. 6 days later in the office, Mrs. J complained of continued headaches and nausea. She endorsed daily headaches and watery diarrhea for the past 3 months. On review of systems, she admitted to polyuria, blurred vision, and anxiety. She attributed the latter to a threatening ex-husband who was being followed by the police. On physical exam, the patient had stable vitals and a BMI of 42. She had no neurologic deficits, abdominal or suprapubic tenderness. Labs from 2018 showed impaired fasting glucose, but no follow up had been documented. Blood work today included a CBC, CMP, Hb A1C, lipid and thyroid panels.
On 2/5/20, Mrs. J returned and was diagnosed with type 2 diabetes. Her Hb A1C had been 10.3, with total cholesterol at 209 and LDL at 130. She was counseled at length on diet and exercise and started on 500 mg metformin BID and 35 mg pioglitazone QD. Atorvastatin 20 mg QD was also prescribed.

On 2/13, Mrs. J returned with the complaint of vomiting and worsening headaches after taking metformin as prescribed. During a headache, the patient endorsed nausea, tinnitus, photophobia, vertigo, and blurry vision. She denied numbness and tingling. On physical exam, neuro, HEENT, and abdominal exams were normal. Metformin was discontinued and pioglitazone was increased to 45 mg QD. Lisinopril was prescribed for migraine prophylaxis, with sumatriptan for abortive therapy. Meclizine was prescribed for vertigo and the patient was referred to ophthalmology.

On 2/6, Mrs. J returned for an ongoing cough. She reported improved headaches and vertigo. She admitted to continued diarrhea and polyuria, but reduced nausea. On physical exam, her BMI had decreased to 37.8 and HEENT exam was normal. She was prescribed loratidine for the cough.

**Discussion:** While it is improbable that each of Mrs. J’s symptoms resulted from uncontrolled diabetes, her case highlights the importance of less typical diabetes symptoms like diarrhea. Chronic elevation in glucose can cause enteropathy, bacterial overgrowth, and exocrine pancreatic insufficiency. The resultant diarrhea is watery and often worse at night. Hyperglycemia above 200 is also known to cause headaches. In our current health landscape, those with diarrhea or headaches—especially with class III obesity like Mrs. J—will benefit from having their glucose checked.

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**Title:** **A Rare Case of Adult Intussusception**

**Authors:** Marianna Caballero, OMS3; Jasmin Shahrenati, OMS3; Jennifer Palacio, PGY1; Michael Dolberg, MD

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** IgA vasculitis is an immune-complex mediated, small-vessel vasculitis. It is characterized by a tetrad of palpable purpura without thrombocytoopenia or coagulopathy, arthralgia/arthritis, abdominal pain, and renal disease. The annual incidence of IgA vasculitis in the United States is an estimated 3.267/100,000 for children and 0.8-1.8/100,000 for adults. Generally, initial treatment of intussusception is intraoperative laparoscopic reduction of the intussuscepted bowel. This is followed by resection when bowel cannot be reduced, or if ischemia or malignancy is suspected.

**Case Description:** A 52-year-old male presented to the Emergency Room with generalized, intermittent abdominal pain, nausea, anorexia and an erythematous, nonpruritic rash on his lower extremities that was noticed 2 days before. His past medical history was significant for recent stroke, hypertension, myocardial infarction, uncontrolled Type II Diabetes Mellitus with neuropathy, chronic kidney disease and gout. On initial examination, he had epigastric abdominal tenderness on palpation without rebound or guarding. Non-blanching purpura were noted on his lower extremities and per patient, the rash was spreading in the cephalad direction. Initial labs revealed an elevated blood urea nitrogen, hyperglycemia, anemia, mild leukocytosis, and positive antinuclear antibodies. Urinalysis revealed glucosuria, ketonuria, hematuria, and proteinuria. A CT arteriogram of the abdomen and pelvis revealed a non-obstructing ileoileal intussusception in the right lower quadrant of the abdomen, no evidence of bowel obstruction, pneumoperitoneum or ascites. The decision was made to take the patient to perform a diagnostic laparoscopy, with a plan to reduce the intussusception.

During the laparoscopic exploration, no intussusception was noted and there were no signs of obstruction. There were obvious abnormalities of erythema and edema throughout the small bowel without evidence of mass or obstruction. Bowel resection was deemed unnecessary at this time since the intussusception had resolved and all bowel was viable. Skin punch biopsies were obtained and demonstrated cuffing of small venules with an inflammatory infiltrate in the superficial dermis, which are consistent with an acute leukocytoclastic vasculitis. The patient was discharged and was to follow up with rheumatology for further management.

**Discussion:** Diagnosis of IgA Vasculitis is based on the patient’s clinical presentation and the presence of leukoclastic vasculitis with IgA deposit on tissue biopsy. According to the clinical presentation involving abdominal pain, renal involvement, purpura, as well as confirmed leukocytoclastic vasculitis, this patient meets the criteria for diagnosis with IgAV. We predict that the intussusception likely resolved after induction of general anesthesia, since no intussusception was noted during laparoscopy. Intussusception in adults is usually treated surgically by resection due to the elevated probability of malignancy being the cause. However, in cases where malignancy is ruled out, simple reduction of the intussuscepted bowel may be indicated.

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**Title:** **Case Report: Adenocarcinoma of the Descending Colon in a 43-Year-Old Female**

**Authors:** Rachael Candela, OMS3; Phillip Cook, OMS3, Julia Ladhna, DO, PGY1; Tan Duong, MD, PGY1

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Colorectal cancer is the third most common cancer in men and the second most common in women, with over 1.8 million new cases in 2018. Greater than 90% of colorectal cancer diagnoses are in patients over the age of 50; however, evidence suggests the yearly incidence of colorectal cancer has declined in populations over age 50 and increased in those younger than 50 since 1994. In May 2018, the American Cancer Society Guidelines for Colorectal Cancer Screening were updated to emphasize earlier testing beginning at age 45 for average risk individuals. The purpose of this vignette is to examine the course of a female smoker under the age of 45 with the diagnosis of descending colon adenocarcinoma.

**Case Description:** We present a 43-year-old Vietnamese female who came to the emergency department with a chief complaint of left lower quadrant abdominal pain for 2 months, recently diagnosed with colitis and prescribed metronidazole and ciprofloxacin. The pain was described as constant, dull, non-radiating, rated 5/10, exacerbated by eating and improved with recently prescribed antibiotics. She complained of an associated fever, constipation, heartburn, and weight loss over the past several weeks. She denied any family history of malignancy and her social history was significant for a 20-pack-year history of cigarette use and employment at a nail salon. On physical examination, a tender, firm mass was appreciated in the left lower quadrant. Her lab results revealed a macrocytic anemia. Contrast CT of the abdomen/pelvis revealed circumferential transmural bowel wall thickening involving
the descending colon with adjacent phlegmon or early omental abscess. Differential diagnosis included severe colitis versus neoplasm. CEA was within normal limits and fecal occult blood testing was positive. Colonoscopy was significant for abnormal nodularity with polyoid formation in the sigmoid colon and an obstructing, fungating mass near the distal descending colon/sigmoid colon junction. Histological examination of the mass demonstrated evidence of adenocarcinoma and a CT scan of the chest revealed sclerotic lesions in vertebral bodies of the thoracic spine including T7, T9 and T12. Bone scintigraphy, surgical intervention, and postoperative oncological care are pending.

Discussion: This case demonstrates the potential for consideration of colorectal cancer in younger patient populations with smoking as a risk factor. Cigarette smoking has been proven to increase the incidence and mortality of colon cancer in patients, yet earlier screening is not recommended. Although this patient’s age is not within the recommended screening range, her clinical presentation and risk factors, should increase the index of suspicion for malignancy. It is our view that the American Cancer Society should explore lowering the age of colon cancer screening in individuals with a substantial history of smoking tobacco. The trend towards earlier screening for colorectal cancer may prove to be beneficial for tobacco smokers at higher risk of malignancy and, in the case of our patient, would likely have been invaluable in the detection and treatment of adenocarcinoma of the descending colon.

**Title:** Coccidioides Concoction: Fungal Meningitis in an Immunocompetent Patient  
**Authors:** Edward Cay, OMS4; Zahava Alishaev, OMS4; Larry Bush, MD, FACP; Maria Vazquez-Pertejo, MD, FCAP  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Coccidioidomycosis, a dimorphic fungal infection known as ‘Valley Fever’, is endemic to certain desert regions of the Southwestern United States. Following acquisition via inhalation of arthroconidia found in desert soil, the majority of infected individuals either exhibit no clinical symptoms or a mild respiratory illness. Those with cell-mediated immune defects are at increased risk of a progressive pneumonia and hematogenous dissemination resulting in potentially serious complications. However, extrapulmonary spread of infection is found to occur in only an approximate 0.5% of infections in otherwise immunocompetent hosts, and when present, most commonly involve the skin, bones, and joints. Although documented in <0.1% of all coccidioidomycosis cases, coccidioidal meningitis, generally develops soon after disease acquisition and is the most serious form of infection. Untreated it is largely fatal within 2 years (1). Therefore, in patients being evaluated for meningitis, it is imperative to include a careful travel history looking for any particular epidemiologic clues, as well as any evidence of an undiagnosed pulmonary condition that may be related to potential coccidioides fungal exposure.

**Case Description:** We present a case of a 68-year-old previously healthy Caucasian female who presented to her primary care physician complaining of dry cough and mild shortness of breath after returning from a 5-day vacation to Arizona 3-weeks earlier. Her symptoms seem to resolve after empiric oral antibiotics. Over the next few months her symptoms relapsed prompting a chest CT scan showing right upper lobe nodular pulmonary infiltrates and mediastinal adenopathy, prompting her pulmonologist to perform a bronchoscopy with lung biopsy and culture. Histologic examination of the tissue demonstrated several granulomas as well as fungal yeast highlighted by GMS staining. Approximately 10-days following this procedure she presented to the hospital emergency department with signs and symptoms of meningitis. Cerebrospinal fluid (CSF) abnormalities included a lymphocytic and eosinophilic pleocytosis

**Discussion:** The indolent nature of the infection along with the lack of specificity of symptoms contribute to the lack of consideration and delay in diagnosis of disseminated coccidioidomycosis. This is especially true if the initial pulmonary infection has not been recognized and treated when appropriate. All epidemiologic information together with a patient’s travel history are essential components of a thorough history and physical examination and are indispensable when composing the differential diagnosis of a clinical syndrome.

**Title:** Acute Thigh Compartment Syndrome as a Result of Blunt Trauma While Sleepwalking  
**Authors:** Alexandra Chitty, DO, PGY3; Dennis Cardriche, MD; Diane Krutzler, MD; Jason Morris, DO  
**Program:** St. Lucie Medical Center, Emergency Medicine Residency Program

**Introduction:** Acute compartment syndrome (ACS) of an extremity is an emergent limb-threatening diagnosis requiring prompt recognition and treatment. It is most often secondary to trauma and is often associated with orthopedic fractures. However, injury to vascular structures or soft tissues without fracture can also cause ACS. Immediate fasciotomy is required to prevent irreversible ischemic damage. Initial injury, such as blunt trauma, leads to an increase in intracompartmental pressure (ICP) within a fascial compartment. Venous resultantly become compressed leading to hypertension at the level of the capillary beds. Increased hydrostatic force then results in further increase in ICP leading to compression of arterioles which ultimately results in ischemic injury of the muscles and nerves. The diagnosis of ACS is dependent on a high clinical suspicion, risk factors, and physical examination. The failure to recognize the diagnosis early can lead to permanent loss of function and potentially loss of limb. Measuring ICP can aid in the diagnosis of ACS. Normal resting intramuscular pressure is between 0-8mmHg. An ICP measurement of ≥ 30mmHg has often been thought to be the threshold for performance of fasciotomy. Another suggested way to diagnose compartment syndrome is by using the difference between the diastolic blood pressure and the ICP with a differential pressure between 10-30mmHg as the threshold for performing a fasciotomy.

**Case Description:** We present a case of a 69-year-old male who presented to the emergency department at a community hospital reporting severe right thigh pain. The patient reported a history of sleepwalking and stated he struck his right thigh against the edge of a table approximately eight hours prior to presentation while sleep walking. He reported progressively worsening pain in his right thigh which he stated was severe and restricted him from being able to bend his knee or bear weight. He reported taking 81mg aspirin daily but denied use of other blood thinners. The patient’s vital signs were as
follows: Temperature: 36.5°C, Pulse: 108bpm, Blood pressure: 190/100mmHg, Respiratory rate: 18, Pulse oxygenation: 98% on room air. Clinically, the patient was calm, but appeared to be in a significant amount of pain. On examination, there was significant swelling of the right thigh with a 5cm area of ecchymosis over the anterolateral aspect of the mid-proximal right thigh. The affected area was markedly tender and firm, and the patient exhibited pain out of proportion to injury. Sensation to light touch was diminished focally over the anterolateral aspect of the right thigh. The patient had equal, palpable dorsalis pedis pulses. The lower extremities were warm to palpation and there was no discoloration of the distal right lower extremity. Minimal flexion of the right knee exacerbated his pain. The ICP of the anterior compartment of the thigh was measured to be 122mmHg. The differential pressure between the ICP and the diastolic blood pressure was noted to be 22mmHg, confirming the suspected diagnosis. The general surgeon arrived promptly to the emergency department and emergent fasciotomy was performed. We believe this case is unique for several reasons, the first being the mechanism of injury and the second being that the orthopedic surgeon and an operating room were both unavailable resulting in bedside fasciotomy.

**Discussion:** This case illustrates the importance of early and prompt recognition and management of compartment syndrome leading to the preservation of limb function.

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**Title:** Sweet Sepsis: An Atypical Presentation of Myroides Bacteremia  
**Authors:** Nicole Cohen, MD, PGY4; Carlos Bustamante, MD; Daniel Kaswan, MD; Paola Solari, MD  
**Program:** Aventura Hospital and Medical Center, Infectious Disease Fellowship Program

**Introduction:** Myroides Sp., named after the Greek word “myron” for their aromatic scents, are a group of aerobic gram negative rods typically found in the environment. Despite their ubiquitous nature, these organisms are rarely a source of invasive infection. We present a case of severe sepsis secondary to Myroides bacteremia.

**Case Description:** The patient is a 74-year-old caucasian female with a past medical history significant for osteoporosis, COPD, hypothyroidism, and chronic lower extremity ulcers who was brought to the emergency room by emergency medical services for weakness. The patient stated she had been feeling malaise for close to 48 hours. Review of systems was pertinent for shortness of breath and wheezing. On physical examination, the patient was in mild distress, dyspneic, and had bilateral lower extremity ulcerations with erythema and edema. The patient was hypoxic on room air with an oxygen saturation of 87% and hypotensive with a blood pressure of 89/52 mmHg. Laboratory studies were pertinent for an elevated white blood cell count of 13 and acute kidney injury with a creatinine of 1.3 mg/dL. All other laboratory studies were unremarkable. Imaging studies of her lung fields failed to demonstrate acute pathology. Because the patient met criteria for severe sepsis, the patient was pan-cultured and empiric broad spectrum antibiotics (Vancomycin and Cefepime) were initiated. The patient clinically improved and final blood cultures grew Myroides species two out of two sets. Given her physical exam findings, the most likely entry point of the infection was her lower extremity ulcerations. In addition to aggressive wound care, patient persistence and de-escalation to ceftriaxone and discharged home on oral ciprofloxacin.

**Discussion:** Myroides is typically found in soil and water, however it is an infrequent source of infection. As of 2017, 48 cases of myroides infections have been documented. What raises concern is that despite the paucity of cases, the organism itself has developed multi-drug resistance to beta-lactams, aminoglycosides, and in some cases carbapenems. Patients who are immunocompromised are at risk for developing this infection, and a high index of suspicion is imperative in establishing treatment.

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**Title:** Case Report: Allopurinol Induced DRESS Syndrome in an Immunocompromised Patient  
**Authors:** Philip Cook, OMS3; David Civitarese, OMS3; Julia Ladna, DO, PGY1; Tan Duong, MD, PGY1  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Drug Reaction with Eosinophilia and Systemic Symptoms (DRESS) syndrome is a rare complication that can cause life threatening systemic damage through T-cell mediated reactions. DRESS syndrome presents with many clinical features that usually appear 2 to 8 weeks after starting the offending drug and carry a mortality rate of 5 to 10 percent. Literature suggests several links between a variety of medication categories and DRESS syndrome; we are examining a case of likely allopurinol-induced DRESS syndrome in a patient with newly diagnosed human immunodeficiency virus infection.

**Case Description:** The patient is a 26-year old Colombian man with history of newly diagnosed HIV/AIDS (admission CD4 count of 84) and bilateral bicep implants performed in Colombia, complicated by recurrent swelling and inflammation of his biceps. The patient exhibited a worsening pruritic, maculopapular rash which started 2 days after initiating Biktarvy (bictegravir/emtricitabine/tenofovir) therapy. The patient’s bicep swelling was successfully treated in Colombia with allopurinol. The patient also complained of pain when swallowing and oral thrush. He was admitted due to persistent fevers, hypotension, tachycardia and suspicion of an abscess near the bicep implants. Empiric antibiotics were initiated but were discontinued as the fevers persisted and imaging was negative. Micafungin was later added for candidiasis and other infectious causes were ruled out. The patient developed a worsening confluent morbilliform rash when allopurinol was continued.

Given the history of allopurinol exposure and the drug reaction, DRESS syndrome was most likely. Additionally, viral reactivation has been identified as a possible trigger for DRESS syndrome and with previous exposure to CMV and EBV, they may have contributed. Lab results revealed elevated liver function testing, eosinophilia, thrombocytopenia, and atypical lymphocytes. Skin biopsy revealed basal vacular change and multiple scattered apoptotic keratinocytes in the epidermis which supported the diagnosis of a drug eruption and DRESS syndrome. Treatment with a long steroid taper was initiated with an emphasis on protecting the liver, heart, and kidneys. The patient improved with steroids and was discharged with a taper.

**Discussion:** Ultimately, it was hypothesized that viral reactivation, in combination with allopurinol exposure, acted synergistically to cause DRESS syndrome in this patient. In the setting of a complicated clinical picture it is imperative that there is early recognition of the triggers and signs of DRESS syndrome.
syndrome so as to decrease the mortality rate of the disease. Furthermore, additional research is warranted to elicit the mechanism of severe adverse cutaneous rashes as a response to allopurinol use, and to establish a more definitive link between the use of particular drugs and DRESS syndrome.

**Title:** An Interesting Case of EBV Infection  
**Authors:** Amanda Costa, MD, PGY2; Estefania Niewialkowski, DO, PGY2; Karla Dixon, MD, PGY2  
**Program:** Broward Health Medical Center, Pediatric Residency Program

**Introduction:** Abnormal brain function distinguishes encephalitis from meningitis. Clinical features of encephalitis include altered mental status, decreased level of consciousness, lethargy, personality changes, unusual behavior, seizures, and/or focal neurologic signs. Encephalitis can be caused by different infectious etiologies with viruses being the most common pathogen. Research reports that Epstein-Barr virus (EBV) is found in 2-5% of all viral encephalitis and meningitis cases.

**Case Description:** 14-year-old female with no significant past medical history initially presented to CSMC ER with a one-day history of dizziness, lightheadedness, nausea, non-bloody emesis, and fever. Rapid strep, influenza, and UA were within normal limits. She was discharged on Zofran for a viral syndrome. Due to persistency of symptoms, she presented to University Hospital ER. CT abdomen showed mesenteric adenitis and bladder wall thickening. She was discharged on Nitrofurantoin and Motrin for an UTI. Blood culture performed later grew Achromobacter bacteria. Patient continued with high fevers and developed sore throat and right-sided neck swelling and returned to CSMC ER. CT of neck revealed cervical lymphadenitis. Labs showed mild anemia and elevated inflammatory markers with no leukocytosis. Physical exam was significant for a cervical mass, enlarged tonsils, and pharyngeal erythema without exudates. She was admitted to the pediatric floor for treatment of cervical lymphadenitis with IV antibiotics. She was subsequently transferred to the PICU for interval development of pancytopenia with bandemia in the setting of DIC. Patient was transferred to SFCH PICU for further evaluation by Hematology/Oncology team. She presented afebrile with stable vital signs. Physical exam was significant for a non-tender right submandibular mass. She developed headaches requiring Norco. Initial CT of head was normal. Patient then developed altered mental status with encephalopathy requiring intubation and sedation. MRI of brain showed extensive leptomeningeal enhancement throughout both cerebral hemispheres and cerebellum consistent with diffuse meningitis in the setting of meningoencephalitis. VEEG showed no epileptiform activity. Bone marrow biopsy was negative for malignancy. CSF PCR came back positive for EBV. Repeat MRI brain showed slight improvement on enhancement around the convexities in the posterior fossa. Patient completed empiric antibiotics course and was back to her baseline neurological status prior to discharge.

**Discussion:** Encephalitis is an acute, life-threatening emergency that is largely a clinical diagnosis. The pathogenesis of EBV encephalitis continues to be uncertain. Studies suggest that the virus can manifest by direct invasion of the brain parenchyma, infiltration of cytotoxic T-lymphocytes into the neural tissue, and antibody-antigen complex deposition in neural structures. While the specific treatment of EBV encephalitis is still debatable, some research suggests that drugs such as acyclovir and corticosteroids can be useful by decreasing viral replication and nasopharyngeal virus shedding. Supportive care still remains the mainstay treatment.

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**Title:** Multifocal Acute Ischemic Stroke Due to Air Embolism Secondary to Atrial- Esophageal Fistula as a Complication of Radiofrequency Catheter Ablation in a Patient with Refractory Atrial Fibrillation  
**Authors:** Susana Creagh, PGY2; Stephanie Prater, MD, PGY2; Roberto Fourzali, MD  
**Program:** Aventura Hospital and Medical Center, Radiology Residency Program

**Introduction:** Atrial fibrillation is the most common arrhythmia worldwide. Occasionally, this arrhythmia is caused by abnormal foci of cardiac pacemaker activity outside of the heart, most frequently within the pulmonary veins. Radiofrequency catheter ablation (RFCA) is widely recognized as an effective means of treating patients suffering from atrial fibrillation caused by these ectopic foci. The procedure utilizes the heat create by high frequency radio waves to destroy the abnormal cells and while it considered safe and effective, it is not without risk. Indirect injury to the esophagus secondary to elevated esophageal temperature has been reported to occur in nearly 50% of patients. However, only a small minority of esophageal lesions will form an atrial-esophageal fistula (AEF) and even fewer will lead to cerebral air embolism.

**Case Description:** A 40-year-old man with a PMH of diabetes, cardiomyopathy and Afib returned to the hospital with a complaint of fever, SOB and hematemesis 2 weeks following radiofrequency ablation of an ectopic focus of pacemaker activity in a pulmonary vein, the source of his Afib. Patient was admitted with a diagnosis of sepsis with gram positive bacteria. Contrast enhanced CT chest revealed esophageal perforation. In the next 24 hours, while the patient was being optimized, he became altered, developing seizure and acute respiratory distress. Emergent EGD showed deep mucosal esophageal tear. Cardiothoracic surgery was consulted, but surgical intervention was withheld given the patient unstable clinical status. Stat non-contrast CT of the brain revealed multiple foci of air as well as multiple hypodense foci consistent with acute ischemic infarction involving multiple vascular territories. Findings were confirmed on subsequent non-contrast MRI of the brain and the patient was diagnosed with multifocal stroke from air embolism secondary to AEF as a complication of the patient’s recent RFCA procedure. Patient’s cardiopulmonary and neurological status continued to deteriorate, and he expired during the next couple of days despite all medical resuscitative efforts.

**Discussion:** AEF is an extremely rare but fatal complication of left atrial ablation therapy that occurs as a result of the close anatomical relationship of the left atrium and pulmonary veins to the esophagus. Various factors that increase the risk of esophageal injury have been identified, including short atrium to esophagus distance (<2mm), left atrium enlargement, and general anesthesia. When present, AEF allows for the introduction of oral flora and air into systemic circulation, resulting in bacteremia and embolism/stroke, respectively. Prevention and early diagnosis of AEF is critical for reduction of morbidity and mortality. Reducing radiofrequency power as well as use of water-irrigated intraesophageal balloons for cooling and esophageal thermometers for temperature monitoring are some of the safety measures used to prevent this complication. If AEF occurs despite best preventative efforts, emergent surgical intervention should be undertaken to repair the AEF and prevent further complications such as the air embolism-induced stroke experienced by the patient.
**Title:** A Masquerading Case of a Lumpy Bumpy Face: A Rare Clinical Case Report of Birt Hogg Dubé Syndrome  
**Authors:** Robert Daze, DO, PGY2; Lisa Fronke, DO, PGY2; Summer Moon, DO; Marheera Farsi, DO  
**Program:** Largo Medical Center, Dermatology Residency Program

**Introduction:** Birt Hogg Dubé (BHD) syndrome is a rare genodermatosis with an autosomal dominant, inactivating mutation of the folliculin (FLCN) gene. Key cutaneous features of this syndrome include benign tumors inclusive of fibrofolliculomas, trichodiscomas, and acrochordons. Internal involvement is notable for lung cysts that predispose affected individuals to spontaneous pneumothoraces and an increased risk of malignant renal neoplasms, predominantly oncocyoma or chromophobe renal cell carcinoma. To date, 663 families have been identified through the Birt Hogg Dubé Foundation.

**Case Description:** We present a 54-year-old Caucasian male who presented to the dermatology clinic for evaluation of multiple, asymptomatic, flesh-colored papules distributed on his central forehead and malar cheeks. The papules developed over the course of 10 years and resulted in a prior work up and evaluation for tuberous sclerosis complex given the diffuse distribution. While the differential was ruled out by neurology, the patient’s progressive cutaneous symptomatology warranted further investigation. Two shave biopsies were performed and demonstrated trichodiscomas which prompted additional work up. Upon computed tomography (CT) evaluation of the abdomen and pelvis, there was significant evidence of scattered bullae within the bilateral lower lobes, right middle lobes, and lingula. Renal ultrasound revealed two anechoic masses on the right renal pole, consistent with renal cysts. Genetic testing identified a pathogenic, heterozygous, loss-of-function mutation in the FLCN gene. The above clinical and histopathological correlation confirmed the diagnosis of Birt Hogg Dubé syndrome. Per the current oncological surveillance guidelines, a renal magnetic resonance imaging (MRI) was performed to further evaluation of masses noted on ultrasound. No evidence of renal carcinoma was identified, and the patient is scheduled to have follow-up imaging in two years.

**Discussion:** Clinical management for patients with BHD depends on the history, presentation, and symptomatology. Initial clinical diagnostics should include a skin biopsy with histologic examination to rule out other syndromic diseases associated with multiple facial papules including Tuberous sclerosis complex, Muir-Torre syndrome, Cowden disease, and Brooke-Spiegler syndrome. With the phenotypic heterogeneity of BHD, not all patients will manifest the triad of fibrofolliculomas and trichodiscomas, pulmonary cysts and pneumothoraces, and renal carcinoma. Fibrofolliculomas and trichodiscomas are benign tumors that do not require any further management. A high-resolution CT scan should be performed to evaluate for pulmonary involvement. The mainstay management of patients with BHD syndrome is targeted towards early diagnosis and treatment of renal tumors. Therefore, lifelong oncologic surveillance with interval magnetic resonance imaging is recommended to detect for tumors given the 7-fold increased risk for developing renal neoplasia. Annual renal MRI’s are preferred, and if there is a negative family history and 2-3 negative annual screens, screening may be performed every 2 years. Tumors <3cm should be monitored with periodic scans. And for any tumor >3cm, nephron-sparing surgical intervention is recommended. Once the FLCN mutation has been identified in a proband, genetic testing should be offered to all relatives at risk.
**Title:** An Atypical Cause of Rapidly Progressive Hearing Loss and Uveitis in a Pediatric Patient  
**Authors:** Evelina Dedic, OMS3; Marjorie Kragel, MS3; Alexander Small, MS3; Robin Chaize, DO  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Cogan’s Syndrome (CS) is a rare autoimmune disease of unknown etiology with approximately 300 reported cases. It is characterized by inner ear manifestations that include vertigo, ataxia, tinnitus, and sensorineural hearing loss. The classic associated ocular condition is interstitial keratitis; other forms of ocular inflammation, such as uveitis and scleritis, can also occur. The pathogenesis of CS is presumed to be autoimmune. It most commonly presents in the third decade of life with studies showing an approximate median age of 29 years old. Pediatric cases such as this are exceedingly rare.

**Case Description:** We present a case of a 9-year-old female with past medical history of precocious puberty and diet-controlled type II diabetes mellitus. The patient’s initial symptom was bilateral eye erythema and pain that began in July 2019. She was diagnosed with conjunctivitis and had mild relief with tobramycin drops. She was also given glasses for impaired vision. In October 2019, the patient developed hearing impairment and failed an audiology exam. In December 2019, she was seen at the Joe DiMaggio ED for clumsy gait. A brain MRI suggested labyrinthitis and chronic sinusitis; the patient was discharged with outpatient follow-up. Outpatient otolaryngology diagnosed the patient with sensorineural hearing loss and recommended future cochlear implants. Outpatient optometry diagnosed her with bilateral panuveitis with optic disc swelling and prescribed atropine eye drops and oral prednisone.

Per the recommendation of her neurologist, the patient was admitted to Joe DiMaggio Children’s Hospital in February 2020 in an attempt to find a unifying cause for her symptoms. During her hospital stay, an extensive workup was performed, including a lumbar puncture, CTA of the brain, MRA of the chest, abdomen & pelvis, echocardiogram, and renal ultrasound. No infectious, autoimmune, or vascular anomalies were identified. In the absence of another cause for her constellation of symptoms, the patient was diagnosed with Cogan’s Syndrome and discharged with instructions to follow-up with outpatient rheumatology and neurology. She has since been started on methotrexate and infliximab by the pediatric rheumatologist.

**Discussion:** Diagnosis of CS can be difficult as there is no confirmatory test; rather, CS is a clinical diagnosis of exclusion. Lack of confirmatory studies coupled with the syndrome’s rarity often leads to delay in diagnosis, as exemplified by this patient’s clinical course. Based on the inflammatory nature of CS and suspected autoimmune pathogenesis, treatment largely involves immune suppression. Topical steroids have proven to relieve ocular inflammation, while systemic steroids treat related systemic vasculitis and inner ear disease. A short period of high-dose steroids has been shown to help restore hearing when initiated soon after symptom onset; early diagnosis with prompt treatment is therefore critical for these patients. This patient’s ocular symptoms have been well-managed by steroid treatment; however, it unfortunately may be too late for improvement in her hearing.

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**Title:** Dilated Cardiomyopathy in the Setting of Euthyroid Sick Syndrome  
**Authors:** Whitney De Oliveira, OMS3; Michael Girard, MD, PGY2; Xavier Ramos, MD, PGY3  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Caloric deprivation is thought to cause of Euthyroid Sick Syndrome, a thyroid disorder that presents with normal TSH in the presence of low total T3 and normal/low free T4. This is due to alteration of deiodinases, enzymes responsible for conversion of T4 into active T3.

Reduced caloric intake is also believed to play a role dilated cardiomyopathy. Specifically, selenium deficiencies have been implicated as secondary causes of dilated cardiomyopathy.

**Case Description:** A 24-year-old Hispanic female with PMHx of iron deficiency anemia, oligomenorrhea, and family history of hyperthyroidism presented to the hospital with general malaise. Patient endorsed palpitations without shortness of breath. Patient specifically endorsed viral upper respiratory infection symptoms 2 weeks prior, treated by outpatient with antibiotic amoxicillin.

On examination, the patient appeared thin, pale, and anxious. It was noted that the patient had lost a substantial amount of weight since her last admission 2 years prior, dropping her BMI from 24 to 18. Labs revealed pancytopenia. EKG revealed supraventricular tachycardia. D-Dimer was obtained which was elevated at 573µg/L. Subsequent CTA Chest with contrast was performed, which ruled out pulmonary embolism and interstitial lung disease; however, a dilated right atrium was revealed. Ultimately, Trans-thoracic Echocardiogram was performed, revealing a moderately dilated right ventricle with accompanying mild tricuspid regurgitation, and a severely dilated right atrium. In addition to this, Ejection Fraction was 60-65% with no decreased collapsibility of IVC, and normal PASP of 25mmHg. Trans-esophageal Echocardiogram showed no evidence of PFO after bubble study was performed. ESR and CRP were elevated (96mm/hr and 279.4mg/L, respectively), raising suspicion for viral myocarditis, which correlated with recent history of viral illness.

TSH was within normal limits (1.29mU/L), while total T3 and free T4 were markedly lowered (<52ng/dL and 1.50µg/dL, respectively); given patient’s endorsement of recent weight loss, SVT, tachycardia, and oligomenorrhea, Euthyroid Sick Syndrome was diagnosed, likely due to malnutrition. Psychiatry was consulted, and caution was taken when placing orders for nutrition to avoid potentiating Refeeding Syndrome. Given clinical picture, a differential diagnosis of viral myocarditis vs. Euthyroid Sick Syndrome was made. Close outpatient follow-up with cardiology, psychiatry, and endocrinology was recommended in order to monitor cardiac function and treat Euthyroid Sick Syndrome.

**Discussion:** Patients presenting with symptoms of dilated cardiomyopathy should be worked up for Euthyroid Sick Syndrome and malnourishment, as mineral deficiencies may contribute to cardiomyopathy, especially deficiencies in selenium, which can lead to oxidative damage to myocardial tissue, as well as to decrease formation of T3.
**Title:** Unilateral Internuclear Ophthalmoplegia as a Manifestation of Small Cell Lung Cancer Metastasis: A Rare Etiology of Acute-Onset Double Vision

**Authors:** Yanet Díaz-Martell, MD, PGY1; Divy Mehra, OMS3; Javier Alvarado, MD, PGY2; Lino Saavedra, MD, PGY1

**Program:** Kendall Regional Medical Center, Internal Medicine Residency Program

**Introduction:** Internuclear ophthalmoplegia (INO) is an ocular movement disorder characterized by impaired adduction of the ipsilateral eye with nystagmus of the contralateral eye. It is caused by functional damage to the medial longitudinal fasciculus (MLF) in the dorsomedial brainstem tegmentum of either the pons or the midbrain. Adduction deficit may be weak/slowed or may be completely impaired resulting in horizontal diplopia with possible symptoms of visual confusion, loss of depth perception, and notably normal convergence. Nearly 80% of INO cases are the result of multiple sclerosis (MS) flare-ups and cerebrovascular disease (CVD) in the form of ischemic stroke, with more rare occurrences due to infectious etiologies, trauma, mass effect, and others. The prevalence of brain masses causing INO has not been definitively established, and suspicion of this etiology should prompt magnetic resonance imaging (MRI) as a modality for evaluation. INO commonly resolves over several days or weeks with a worse prognosis associated with viable causative lesions of MRI. Treatment of acute-onset double vision is primarily management of the underlying condition. This case details the workup of headache and acute-onset double vision, ultimately resulting in a diagnosis of internuclear ophthalmoplegia due to metastatic small cell lung cancer; there are zero prior such cases documented in the literature.

**Case Description:** A 54-year-old man with a medical history significant for adrenal and parathyroid mass resections, chronic cigarette and cocaine use, and multiple ischemic brain stem strokes presented to the emergency department with a one-day history of acute onset headache and double vision, particularly in the right eye. The patient admitted to one episode of vomiting, denying fever, myalgias, or other focal neurologic deficits. The gentleman was hemodynamically normal with unremarkable vital signs or laboratory workup. On physical exam, there was significant ptosis of the right eye, conjunctival hyperemia, and lateral deviation of the right eye at rest. Adduction extraocular movement of the right eye was impaired and associated with nystagmus of the left eye on left lateral gaze, findings were consistent with internuclear ophthalmoplegia. This prompted several imaging tests – CT scan of the chest revealed a 6.1 x 4.8 x 6.8 cm solid mass in the right lower lung highly concerning for malignancy. CT scan of the brain revealed multiple bilateral cortical parenchymal lesions with vasogenic edema, and T2-weighted MRI exhibited bilateral supra- and infratentorial lesions interpreted as metastatic. Steroids were administered, leading to alleviation of headache and visual deficits in the following few days; the patient was promptly referred for necessary oncologic management.

**Discussion:** As exemplified in this case, there are multiple potential causes of unilateral INO in the acute setting, and prompt evaluation and treatment of the underlying condition can prevent long-term vision loss. In addition, this case highlights the importance of detecting serious systemic conditions using basic physical examination abilities and an understanding of visual anatomy, function, and pathophysiology.
stressors can lead to decompensated heart failure usually within the first three months of postpartum. Diagnostic criteria have been set by the European Society of Cardiology defining PPCM as an idiopathic cardiomyopathy with development of heart failure towards the end of pregnancy or within 5 months following delivery, absence of another identifiable cause for heart failure, and left ventricular systolic dysfunction with ejection fraction of <45 while the left ventricle itself may or may not be dilated. Multiple potential causes have been discussed to attempt to uncover the pathophysiology of PPCM. Angiogenic imbalance causes by VEGF inhibitors, secreted by the placenta and found in higher levels in preclampsia or those with multiple gestations, can damage vasculature. Another potential cause is due to abnormal immune response in which fetal cells circulated through the maternal system and get lodged in the cardiac tissue triggering a pathologic autoimmune response.

Case Description: We present a case of a 38-year-old female with past medical history of hypertension and an uncomplicated C-section deliver 5 day prior to her admission for chest pain and shortness of breath. She describes the pain as a constant pressure, non-radiating with worsening if she laid flat. CT scan of her chest showed bilateral pulmonary infiltrates and cardiomegaly but was negative for focal filling defects in the pulmonary arteries to suggest a pulmonary embolism. Cardiac workup was initiated with troponins being negative, EKG revealing sinus tachycardia, and BNP slightly elevated. Patient was placed on 50% venturi mask as well as IV Lasix. Cardiology performed an echocardiogram, which showed patient to have the left ventricle as moderately dilated, diastolic dysfunction grade III, moderate global hypokinesis of the left ventricle, moderate to severe mitral regurgitation, and an ejection fraction of 35-40%. She was counseled on her need of medical management with a low dose ace inhibitor and spironolactone preventing her from breastfeeding as well as ensuring that she would be discharge with a LifeVest and further evaluated in the next 3-6 months on chronic medical therapy vs the need for possible ICD placement. She will also need a cardiac CT to rule out the presence of ischemic cardiomyopathy.

Discussion: Peripartum cardiomyopathy (PPCM) is a rare cause of heart failure that affects women late in pregnancy or in the early puerperium, affecting thousands of women each year in the US. Although first described in 1849, it was not recognized as a clinical diagnosis until 1930 and yet its etiology is still unclear. Diagnosis is often delayed due to close resemblance of symptoms that mimic normal spectrum of pregnancy or postpartum state. However, misdiagnosis or a delay in recognition can cause fatal consequences. This case emphasizes the importance of considering PPCM as part of the differential of postpartum complications to provide accurate care and prevent mortality.

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**Title:** A Rare Combination of Tetralogy of Fallot with Situs Inversus Totalis  
**Authors:** Alejandro Dominguez, DO, PGY1; Lian Jelenszky, DO, PGY1; Victor Pazos, MD  
**Program:** Palmetto General Hospital, Internal Medicine Residency Program

**Introduction:** We present a case of a patient born with Tetralogy of Fallot (ToF) and Situs Inversus Totalis (SIT). We focus on the rarity of the comorbidities and highlight the sequelae these patients present to the hospital with as adults following surgical repair in infancy, a potential increase as surgical procedures and technology continue to advance.

**Case Description:** A 28-year-old male with a past medical history of Tetralogy of Fallot (ToF), Situs Inversus Totalis (SIT), Ischemic Stroke x2, Ventricular Tachycardia s/p Automatic Implantable Cardioverter Defibrillator (AICD) placement, and Provoked Pulmonary Embolism presents to the emergency department complaining of worsening right-sided chest pain that began earlier in the morning. The pain worsens with exertion and alleviates with rest. He has presented to multiple hospitals in the past complaining of similar symptoms with no source of his chest pain found. The patient has an extensive surgical history including Blalock-Taussig shunt and Ventricular Septal Defect (VSD) repair at birth, pulmonary valve repair at three years of age, pulmonary valve replacement at 26 years of age, and pulmonary artery stent placement at 26 years of age. On presentation to the hospital, he denies any shortness of breath, palpitations, syncopal events, cough, or lower extremity swelling. Physical exam reveals right-sided heart sounds and a 3/6 systolic murmur best heard at the right upper sternal border. Chest pain is non-reproducible, lung fields are clear to auscultation bilaterally, and there are no signs of right-sided heart failure. Chest x-ray reveals dextrocardia with proper AICD lead placement and no acute process. The first electrocardiogram reveals a pattern suggestive of improper lead placement. A second, right-sided electrocardiogram reveals normal sinus rhythm with no ST-segment or T-wave inversion. Pacemaker interrogation was not performed excessive unremarkable interrogations, per the pacemaker company.

**Discussion:** SIT has an estimated incidence of 1:8000 to 1:10,000 live births. Among those patients, there’s a 5 to 10% chance of comorbid congenital heart disease. Of the possible anomalies associated with SIT, ToF is the leading cause of morbidity and mortality seen in these patients. Currently, a complete single-stage repair is recommended at an early age of 3 to 6 months of age, or sooner if symptoms develop. Surgery is aimed at closing the VSD with a patch and relieving pulmonary flow obstruction by expanding the Right Ventricular Outflow Tract (RVOT). Surgical repair can be complicated by mirrored anatomy and has increased risk of sequelae such as arrhythmia and heart failure. These patients are also associated with an increased risk of developing hypoxemia, hypertensive crisis, infections, pulmonary embolism, stroke, or transient ischemic attack. Given the nature of extensive repairs, these patients can present later in life with symptoms of pulmonary regurgitation causing right ventricular (RV) enlargement, RV dysfunction, aortic valve insufficiency, atrial tachycardia, ventricular tachycardia, and sudden cardiac death.

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**Title:** The Use of OMT in Whiplash Induced Cervicalgia  
**Authors:** Michael Downing, OMS3; Alessandra Posey, DO  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Whiplash is the rapid, back-and-forth, movement of the head and neck, causing injury to the head, neck, and upper thoracic regions. More than one million Americans suffer injuries from whiplash each year. Fifty percent of those affected by whiplash have neck pain a year or more later.
**Case Description:** A 46 Y.O. female patient presents with constant, sharp neck pain radiating to the left upper-thoracic region and shoulder post-MVA two weeks prior. The pain is 2/10 and increases to 10/10 after prolonged inactivity. Numbness and tingling occur down the left arm that ends prior to the wrist. There’s decreased sensation to light touch of the left peri-scapular region. The patient experiences intermittent headaches 2x/day. The osteopathic structural exam revealed hypertonic paracervical and thoracic musculature and somatic dysfunction of the scapula. Counterstrain and Muscle-Energy techniques were performed to cervical/upper-thoracic muscle groups. The scapula was treated with Balanced Ligamentous Tension. After visiting the clinic, the patient has no pain at rest, and is occasionally a 3/10 after inactivity. Numbness and tingling of the left upper extremity were resolved. Sensation to light touch of the left peri-scapular region was improved. The patient has not had headaches since the final visit.

**Discussion:** Targeting the cervical and upper thoracic musculature with OMT relieved the patient’s pain and symptoms caused by whiplash. The use of OMT in patients with whiplash injuries should be moved to the forefront of treatment plans. Standard medical treatment has been suboptimal for such a prevalent issue. Further investigation should embark on the long-term benefits of OMT on whiplash vs. control, as compared to whiplash injuries not treated with OMT.

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**Title:** The Dogma of Bicarbonate Therapy in Pediatric Diabetic Ketoacidosis  
**Authors:** Michael Drechsler, DO, PGY2; Jeanette Roberts, DO  
**Program:** PBCGME- St. Lucie Medical Center, Emergency Medicine Program

**Introduction:** Diabetic ketoacidosis is the leading cause of morbidity and mortality in children with type 1 diabetes mellitus and occurs at the time of initial diagnosis in approximately 30% of children in the United States (1). The main principles of management are to resolve ketosis with insulin administration, correct dehydration with volume expansion, and correct electrolyte abnormalities. Bicarbonate remains a controversial therapy due to its inherent risks of administration and apparent lack of clinical benefit (2,3). There is a small subset of patient’s in which bicarbonate may be beneficial. Further insight into the administration of bicarbonate in diabetic ketoacidosis needs to be explored.

**Case Description:** The patient was a 21-month-old female born full term, no significant birth history or past medical history presented to the Emergency Department with her parents for rapid breathing of four days. For a few weeks prior she had a poor appetite, polydipsia and polyuria. Additionally, she had a mild cough, and a fever of 101°F that resolved. On exam the patient appeared lethargic and toxic. Her mucous membranes were dry and she had dry chapped lips. The patient had vomited twice in the morning and one time in the Emergency Department. Initial fingerstick blood glucose was 540. Initial VBG pH 6.885. Initiation of an IV was difficult and ultimately needed a femoral line for resuscitation. An initial NS bolus of 20mL/kg was administered followed by a 10mL/kg/hr insulin drip and maintenance fluids with supplemental potassium. Labs revealed large acetone, anion gap, ketonuria, and glucosuria. A repeat VBG after initiation of therapy was 6.86 and the patient still appeared lethargic and clinically did not appear to be improving. The patient was then started on a very slow weight-based bicarbonate drip. After continuation of the treatment, the patient became more arousable and interactive with her mother. Patient was transferred to a PICU at another facility and made a full recovery.

**Discussion:** The current dogma states bicarbonate administration is of limited clinical benefit in diabetic ketoacidosis and carries the risk of slowing the rate of resolution of ketosis, increases the development of cerebral injury, decreases the respiratory drive, and can induce a state of hypokalemia. This dogma was further cemented by a systematic review in 2018 by Chua et al (4). The International Society for Pediatric and Adolescent Diabetes states “Bicarbonate administration is not recommended except for treatment of life-threatening hyperkalemia or unusually severe acidosis (pH <6.9) with evidence of compromised cardiac contractility (C).” I challenge the prevailing dogma with a case of clinical improvement after bicarbonate administration in a patient with diabetic ketoacidosis.

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**Title:** Outside The Bowel: Venous Complications of Inflammatory Bowel Disease  
**Authors:** Natasha Duggal, OMS3; Milad Heydari-Kemjani, OMS3; Anita Singh, DO; Maykel Trotter, MD  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** The thrombotic mechanism in IBD patients is complex, multifactorial, and not completely understood. This case demonstrates that in the absence of a genetic predisposition and abnormal hypercoagulation, multiple risk factors such as the refusal of VTE prophylaxis, fluid depletion, prolonged immobilization, and steroid therapy may have collectively contributed to the development of VTE in our patient with newly diagnosed IBD. Early diagnosis of VTE in IBD patients is challenging as patients can present solely with abdominal pain. Therefore, careful consideration and discussion regarding anticoagulation should be included in the plan of patient care early in the hospital course to prevent such complications.

**Case Description:** A 19-year-old male presented to the ED with two-week history of worsening bloody diarrhea associated with persistent diffuse abdominal pain. Computed tomography (CT) of the abdomen showed diffuse thickening of the rectum and colon with inflammation and colonic air fluid levels in the ascending and transverse colon, suggestive of proctocolitis. Subsequent colonoscopy and biopsy revealed crypt abscesses and erosion confirming irritable bowel disease; thus, patient was started on high dose corticosteroids. The patient remained in the hospital for two weeks due to worsening of bloody stools which required multiple blood transfusions to treat severe anemia. A repeat CT of the abdomen was obtained to evaluate worsening abdominal pain revealing a portal vein thrombosis involving the posterior division of the right portal vein and anticoagulation therapy was initiated.

**Discussion:** VTE is a rare but fatal complication of IBD. Given its non-specific presentation, a high index of suspicion is required for early intervention. The use of prophylaxis anticoagulation therapy in the hospital outweigh its risks of bleeding in a hospital setting.
Title: An Unfortunate Case of Complex Regional Pain Syndrome after Transradial Cardiac Catheterization: A Case Report
Authors: Ivonne Durand, OMS3; Dailys Rios, DO, PGY2
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Complex regional pain syndrome (CRPS) can be described as a rare debilitating condition, of a neurological nature, affecting commonly the distal extremities bypassing pre-establish notions of dermatomal nerve distributions or areas delineated by a peripheral nerve map but rather affecting regional areas of no specific nerve or arteriovenous supply distribution. CRPS is characterized by pain out of proportion of the affected area with associated swelling and decreased range of motion as well as vasomotor involvement, decreased bone mineral density and skin involvement, muscle wasting, and contracture of extremity as consequence of the limited range of motion caused by allodynia. There is no defining pathogenesis describing CRPS, but several mechanisms have been attributed to contribute to the overall syndrome; if not leading to causation at least these mechanisms, individually or combined, can be considered descriptive of the disease process after its onset.

Case Description: This is the case of a 55-year-old female with past medical history of hypertension who underwent cardiac catheterization on 11/18/2019 due to symptoms of intermittent pressure like chest pain upon exertion radiating to the left arm, and a 1-week old positive stress test revealing ST depression on lateral leads at moderate physical activity. Six weeks status post (s/p) trans-radial cardiac catheterization, patient returned to the with gradual onset and progressive lateral shoulder and medial forearm pain, and hypersensitivity since completion of the procedure. On physical exam, there was tenderness over the right shoulder, limited ROM on shoulder abduction, elbow pronation, and hand dorsiflexion. There was contraction of second, third, and fourth digits on right hand and right ulnar. Pt experienced allodynia in right upper lateral shoulder and medial forearm. She had negative venous doppler US, wrist x-ray, and MRI of right shoulder unremarkable for nerve compression.

She was placed on pain management with Diclofenac 75 mg twice daily, gabapentin 300 mg 3 times a day, lidocaine patch, Percocet 5/325 mg tablet every 4 hours as needed for severe pain. Occupational Therapy was limited secondary to pain and a splint was recommended for intrinsic plus motion in order to prevent contracture, which was not well tolerated. A Stellate ganglion block was performed with no improvement of symptoms. Differential diagnosis proposed were osteoarthritis, radiculopathy, brachial plexopathy, deep vein thrombosis, all which were ruled out by imaging.

Discussion: Early intervention has been shown to improve the outcome and decrease disability. With only five reported cases of CRPS status s/p trans-radial cardiac catheterization as of 2019, early and accurate diagnosis is important for prompt management. At the time of admission, 6 weeks s/p trans-radial cardiac catheterization, the patient was presenting with extreme allodynia and skin hypersensitivity in the right extremity, followed by diminished range of motion and contracture of digits despite occupational therapy. As seen in this case, a six-week delay in medical intervention had a detrimental effect on the prognosis of the patient, likely resulting in long-term disability.

Title: 1.2 Million Creatinine Kinase Caused by Rare Fatty Acid Oxidation Disorder
Authors: Michelle Dzung, DO, PGY1; Ashish Bosukonda, MD, PGY3; Peach Supupramai, OMS4; Param Eftekhar, DO
Program: Broward Health Medical Center, Family Medicine Residency Program

Introduction: There are extremely rare hereditary myopathies that result in recurrent rhabdomyolysis and can lead to renal failure. These disorders stem from disruption in mitochondrial beta-oxidation or transportation of fatty acids via the carnitine pathway resulting in hypoketotic hypoglycemia, and deposition of fat causing liver steatosis, cardiomyopathy, altered mentation, and myopathy. Fatty acid oxidation disorders of interest include short chain acyl-coA dehydrogenase deficiency, carnitine palmitoyltransferase type 1 (CPT1D) and type 2 deficiency (CPT2D). Initial diagnosis is made based on symptoms, acylcarnitine elevations, urine organic acid quantification, and is confirmed via genetic testing. CPT1D specifically has an incidence of 1:1,000,000. Primary prevention includes avoidance of prolonged fasting and overexertion, a diet high in carbohydrates and low in fats, and surveillance liver function testing. Although fifty cases of CPT1D exist, only one presentation of rhabdomyolysis has been reported in the literature.

Case Description: We present a developmentally appropriate 18-year-old African American male with a history of five episodes of rhabdomyolysis starting from age 8, precipitated by viral infections including coxsackie B, adenovirus, influenza B, and parainfluenza-3, who presented to our institution with a peak creatinine kinase (CK) of 1.2 million. On this admission, the patient denied overexertion, viral prodrome, and trauma, but did endorse skipping meals. Workup revealed no urine ketones, negative toxicology, and positive myoglobinuria. Muscle biopsy demonstrated severe myopathy consistent with rhabdomyolysis. Quantitative plasma acylcarnitine studies showed elevated C2-C6 and C14 in the absence of carnitine supplementation. Urine organic acid quantification demonstrated elevated methylsuccinic acid. Although total carnitine levels were not reported, in 2016, both free and total carnitine levels were markedly elevated. Treatment course included hemodialysis for acute renal failure and instruction for specialized genetic testing upon discharge.

Discussion: This is a very unique case of rhabdomyolysis with a peak CK of 1.2 million. Our patient demonstrated elevated free and total carnitine levels, elevated C2-C5, relative hypoglycemia with urine organic acids devoid of ketones, and an elevated ratio of C0 to the sum of C16 and C18, all consistent with NIH diagnostic criteria for CPT1D. Although adult onset recurrent rhabdomyolysis is more commonly associated with CPT2D, lack of C16, C18, C18:1 make this less likely. Although elevated C4 and urine methylsuccinic acid is associated with short chain acyl-coA dehydrogenase, lack of ethylmalonic acid, methylmalonic acid, and high total carnitine, make this diagnosis less likely. In 2018, prior genetic testing revealed GAA intronic heterozygous mutation and whole exome sequencing revealed NEB heterozygous mutation suggesting Pomp’s and Nemaline Myopathy, respectively. However, these disorders are known to have multiple comorbidities not present in our patient. Moreover, muscle biopsy failed to report nemaline bodies on trichrome staining. In conclusion, we present the second case of late onset rhabdomyolysis due to presumed CPT1D. Recent studies have uncovered 3 subtypes of CPT1D including liver isoform (CPT1a), muscle isoform (CPT1b), and neuronal isoform (CPT1c). CPT1a deficiency are the only human cases reported. Patient was referred to Nicklaus Children’s Health System and pending results of specialized genetic testing. We may have discovered the first case of CPT1b deficiency. Until then, it remains unclear whether the lack of CPT1b cases is due to embryonic demise, as seen in CPT1b knockout mice found in other studies, or from extremely low incidence.
**Title:** A Rare Case of Diffuse Large B-Cell Lymphoma of the Pelvis  
**Authors:** Keresa V. Edwards, DO, PGY1; Ian D. Singer, DO, JD, PGY1; Natan Bastoky, DO, PGY3; Ashley Shanblatt, DO, PGY2; Rajiv Chokshi, MD; Tricia A. Kalwar, MD, MPH  
**Program:** Broward Health Medical Center, Family Medicine Residency Program

**Introduction:** Diffuse Large B-Cell Lymphoma (“DLBCL”) is one of the most common Non-Hodgkin Lymphoma subtypes worldwide. Patients diagnosed with DLBCL typically present with symptomatic nodal enlargement in the neck, mediastinum, or abdomen. Close to one-third of patients will also exhibit B-symptoms such as fever, weight loss, and night sweats while more than one-half of patients will have an elevated serum lactate dehydrogenase. DLBCL is also an AIDS-defining malignancy. Primary lymphomas of the bone are rare and represent <2% of lymphomas worldwide. Those with disease involving the bone have a median age of 56 years and present with a palpable mass, non-remitting bone pain, and the B-symptoms.

**Case Description:** We present a 48-year-old Jamaican male with no significant past medical history admitted to our hospital with a left pelvic tumor and possible surrounding organ infiltration. The patient presented with worsening left hip pain with radiation to the back for one year. He lost the ability to ambulate independently and developed groin and rectal numbness with concurrent constipation and urinary incontinence. He denied fever but endorsed intermittent night sweats and unintentional weight loss of 15 lbs. The patient underwent radiograph of the hip and pelvis, which revealed a large mixed lytic sclerotic lesion of the left hemipelvis. Follow up magnetic resonance imaging confirmed a left pelvic mass measuring 16.4 cm x 6.7 cm x 23 cm with invasion of the rectum, bladder, prostate, corpus cavernosum base, and sacrum. Subsequent computed tomography showed lytic destructive infiltration suspicious for sarcoma. HIV testing was negative. With the patient’s prognosis looking grim, the hospital’s palliative team was consulted for end-of-life care discussions with the patient. However, a pelvic mass biopsy unexpectedly came back as suspicious for DLBCL. This was a surprising yet highly encouraging finding for our comprehensive care team given the dramatically improved prognostic outlook. It should be noted this diagnosis could not be confirmed at the time due to the small number of cells observed. A port was nonetheless placed in anticipation of aggressive outpatient chemotherapy therapy for DLBCL. The patient subsequently underwent open biopsy which officially confirmed diagnosis of DLBCL and 2 rounds of chemotherapy including with R-EPOCH (rituximab, etoposide phosphate, prednisone, Oncovin, cyclophosphamide, and hydroxydaunorubicin). He has tolerated the treatments well and will continue to be followed in the outpatient setting.

**Discussion:** This case illustrates a potentially rare finding of DLBCL that originated in the bone and more specifically in the appendicular skeleton. It therefore reinforces the overarching theme of conducting a thorough work-up even when statistical evidence overwhelmingly points to other diagnoses. Doing so could drastically change patient management and considerably improve outcomes. As this relates to our patient, a diagnosis of DLBCL can yield a five-year survival rate of greater than 70% with multi-agent chemotherapy. In summary, but for the above-discussed comprehensive work-up, this vibrant patient with a young family to care for would have likely been dismissed as an untreatable patient.

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**Title:** The Efficacy of Oral and Rectal Ivermectin Therapy in Disseminated Strongyloides  
**Author:** Christopher Eierle, OMS3  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Disseminated Strongyloides infections are typically the result of severe immunodeficiency or sepsis. If untreated, mortality is nearly 100%. Ivermectin is first-line treatment for such cases and can be used as monotherapy or in combination with albendazole. Dosage and duration of therapy is individualized with no standard guidelines, but treatment is generally continued until the parasite is eliminated. Ivermectin is FDA-approved for oral use only, though rectal administration is sometimes used off-label when oral administration is ineffective or contraindicated. Intravenous ivermectin is not FDA-approved for use in human helminthic infections, despite veterinary applications. Only with case-by-case approval under the compassionate use clause of the FDA has intravenous ivermectin been used to treat disseminated Strongyloides in humans. The results are mixed.

**Case Description:** A 70-year-old Haitian female with a past medical history of COPD, small bowel obstruction, and chronic abdominal pain presented to the emergency department with complaints of abdominal pain and vomiting for 2 weeks. The patient had previously been admitted to the same hospital for similar symptoms and was discharged upon the resolution of her small bowel obstruction one week prior to admission. On primary survey, the patient was afebrile with a temperature of 98.1F, but tachycardic with a pulse of 118 bpm. Blood pressure was stable at 118/68 mmHg and oxygen saturation was measured at 94% on room air. Physical exam was unremarkable. Initial chest x-ray was normal. Subsequent chest x-rays displayed patchy nodular densities in the bilateral lung bases suggestive of scarring or neoplasms versus small infiltrates. Serologic screening revealed a chronic human T-cell lymphotrophic virus 1 infection that was confirmed by positive HTLV 1 antibodies. The patient suffered acute respiratory failure, leading to multi-organ failure and septic shock requiring vasopressor support. Multiple GI series suggested an obstructive pattern that was determined not to be due to paralytic ileus. An upper GI endoscopy with biopsy was also performed due to GI bleeding. This resulted in the discovery of a severe disseminated Strongyloides infection. The patient was treated with both oral and rectal ivermectin, which proved unsuccessful in achieving therapeutic levels due to poor absorption secondary to inflammation of the gastric mucosa and rectal edema. Transfer to two different facilities for compassionate use of IV ivermectin was attempted, but ultimately denied. Thereafter, the patient’s condition continued to deteriorate until she expired due to cardiac arrest.

**Discussion:** This case illustrates the shortcomings of oral and rectal ivermectin treatments in severe disseminated Strongyloides and the necessity of parenteral alternatives in the face of near-certain mortality. Though intravenous ivermectin does not guarantee recovery, when standard therapy fails to improve the patient’s condition, it may provide the only chance the patient has for survival, regardless of the potential complications and low success rate. Greater access to intravenous ivermectin for disseminated Strongyloides cases refractory to standard therapy would allow researchers to better define human dosing recommendations, guidelines, and indications, as well as provide the extensive data necessary to accurately quantify its therapeutic efficacy.
**Title:** Bilateral Pyelonephritis in a Postpartum Patient  
**Authors:** Taleb El-Masri, DO, PGY2; Amin Jamal, DO, PGY3; Neville Mathews, OMS3; Gianfranco Molfetto, OMS4  
**Program:** Palmetto General Hospital, Internal Medicine Residency Program

**Introduction:** Postpartum Pyelonephritis is an infection of kidney or upper urinary tract within 6 weeks of delivery, which occurs when bacteria ascend from the lower urinary tract to the kidney. It generally involves a single kidney. UTI tend to be more common in postpartum patients. Pelvic floor muscles keep the urethra closed so urine does not leak out. However, during pregnancy and labor these muscles tend to be stretched out and damaged leading to weaken pelvic floor muscles. This increases risk of urinary incontinence. Bladder tone tends to be lost during pregnancy due to hormonal fluctuations causing inability to completely empty bladder making urine more prone to flow up ureters, which increases risk of infection. Pyelonephritis is a complicated UTI that is most commonly caused by E. Coli. Other uropathogens include Klebsiella, Proteus, Pseudomonas, Enterococci, and Staphylococci. Pyelonephritis typically presents with flank pain, fever, chills, nausea, vomiting, and costovertebral angle tenderness.

**Case Description:** The patient is a 22-year-old with no known PMH who presented to the hospital with worsening right upper abdominal and right flank pain w/ a fever of 102 degrees F. Patient had given birth to a baby girl vaginally 3 weeks ago without complications. Patient was in septic shock. WBC count on admission was 40.2 and patient was placed on levophed due to hypotension unresponsive to normal saline resuscitation. Transvaginal Ultrasound was unremarkable. CT Abdomen w/ contrast was notable for severe, bilateral pyelonephritis with areas of bilateral lobar nephronia rather than true abscesses. Urinalysis was positive for WBC and leukocyte esterase. Urine culture was positive for E. coli. She was treated with zosyn with improved in symptoms. WBC improved to 13.8. No longer required levophed. Discharged home with midline catheter and to continue zosyn for 6 more days for a total of 14 days.

**Discussion:** Complications of pyelonephritis include renal corticomedullary abscess, perinephric abscess, emphysematous pyelonephritis, or papillary necrosis. Diabetes Mellitus and urinary tract obstruction are risk factors for these complications. If pyelonephritis is suspected, urinalysis and urine culture with sensitivities are performed. Imaging is generally not warranted unless patient is severely ill, symptoms persist despite 2 to 3 days of antibiotics, or are suspected of having infection from urinary tract. Ceftriaxone and piperacillin-tazobactam are suggested for hospitalized patients. Patient can be transitioned to oral medications once symptoms improve and can be further managed outpatient. Kegel exercises are recommended to pregnant patients to prevent urinary incontinence. Voiding should be encouraged every 2-3 hours in the immediate postpartum period to ensure emptying of bladder.

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**Title:** Severe Pneumonia in a Pediatric Patient During a Coronavirus Epidemic  
**Authors:** Alia Elñaji, OMS3; Monica Lee, MD; Fatma Levent, MD  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program  

**Introduction:** Pneumonia caused by Ebstein-Barr Virus (Human Herpes Virus 4) is a very rare presentation in young children. This virus is most commonly known to cause Infectious Mononucleosis in adolescents and adults. EBV has been linked to cause many other illnesses like viral meningitis, encephalitis, Burkitt’s Lymphoma, Hodgkin’s and Non-Hodgkin’s lymphoma. Although rare, connections to pneumonia and interstitial lung disease have been noted. EBV can be diagnosed via the Monospot test, although that test has been falling out of favor due to low sensitivity, compared to the Epstein-Barr capsid antibody test with a sensitivity of 91% and the specificity was 100%. The Epstein-Barr viral capsid antibody test is the most specific and sensitive. Mainstay treatment for EBV infection remains supportive management and effective prevention techniques including avoiding contact with infected individuals’ saliva, toothbrushes, drinks, etc. We present a patient travelling from China who was exhibiting viral respiratory symptoms with suspicion for novel coronavirus (COVID-19), related to an ongoing epidemic starting in China.

**Case Description:** Our patient is a seven-year-old male with no significant past medical history who presented with a 5-day history of fever, congestion and cough. The patient is from Beijing, China who arrived at the United States as a tourist 12 days prior to admission. He was evaluated at an outpatient clinic 3 days prior to the presentation where he was diagnosed with an upper respiratory infection. He was ultimately diagnosed with pneumonia at the emergency department (ED) the next day and prescribed amoxicillin. He presented to the ED 2 days later again having failed outpatient treatment. His work up revealed worsening right basilar pneumonia, leukopenia with neutrophilic predominance, as well as elevated liver enzymes and inflammatory markers. Blood cultures were obtained, and the Centers for Disease Control (CDC) was contacted given his origin of travels and current symptoms. He was placed on special airborne and contact precautions, testing for COVID-19 was performed and sent to the CDC. He remained with worsening respiratory status requiring nasal cannula oxygen. Initial Respiratory Viral Panel results were negative.

Patient was empirically started on azithromycin, clindamycin and resumed ceftriaxone empirically. Increasing transaminitis were noted and patient began to develop a generalized rash. Repeat chest x-ray revealed worsening pneumonia with small right pleural effusions. Cefpime was started for broad spectrum coverage. On day 7 of admission, the patient remained afebrile and rash was resolving. Serology confirmed acute EBV infection as the etiology of pneumonia and COVID-19 test was reported as negative. Patient remained on the triple antibiotic therapy and then switched to cefdinir and clindamycin by mouth upon discharge.

**Discussion:** Pneumonia is an infection of the lung pleura and surrounding structures by alveolar inflammation. The inflammation can lead to purulent accumulation leading to a cough with purulent phlegm. This is caused by an infectious etiology therefore causing fever, and chills. The most common etiologic agent of pneumonia in pediatric patients is Strepococcus pneumoniae. Another common atypical etiologic agent is Mycoplasma pneumoniae. Although EBV is not a common cause of pneumonia in pediatrics, EBV can be a primary, co-primary or secondary cause of pneumonia. It can be beneficial for clinicians to consider this as an etiological agent, when a pediatric patient presents with pneumonia that is not explained by the most common etiologies. The novel coronavirus strain from China, COVID-19, has caused a public health hysteria in the United States. Common, or even uncommon, etiologies can be missed when fear of an epidemic is confounding the medical care of a patient.
**Title:** Initial Presentation of Patient with Pseudohypoaldosteronism Type 2  
**Authors:** Adrien C. Ennis, DO, PGY2; Joseph A. Sykes, MD; Nasim Alavi, PhD  
**Program:** Palms West Hospital, Pediatric Residency Program

**Introduction:** Pseudohypoaldosteronism (PHA) is quite a rare condition that typically presents with hyperkalemia, hypertension, and cardiac arrhythmias. PHA presents in two types, type 1 being an autosomal dominant form that has low renin in addition to electrolyte abnormalities, and type 2 has no clear heritable pattern with a normal renin level. The pathophysiology in PHA is due to the kidney’s inability to detect aldosterone leading to a sodium loss through the urine and retention of potassium.

**Case Description:** The patient initially presented to at 6-days of life due to concern from the mother for the patient having decreased appetite for 1 day and onset of a cough on the morning of presentation. The mother reported that the cough was initially a mild, wet sounding cough that rapidly worsened to the point that the patient was having difficulty breathing. In the ED the patient was febrile with a temperature of 100.8F, hypertensive at 103/73, had a pulse of 131, and respirations of 32 with an O2 saturation of 95%. On examination the patient was lethargic and minimally responsive to painful stimuli. Her anterior fontanel was sunken, and pupils were sluggish. Lung sounds were coarse and crackly diffusely with minimal respiratory effort and air movement. Upon auscultation of heart sounds it was noted that the patient’s heart rate was becoming bradycardic with fewer than 90 beats per minute. A 12-lead EKG was immediately ordered along with a stat bedside BMP. The EKG demonstrated ventricular fibrillation, and the iStat showed hyponatremia of 126, hyperkalemia of 11.6, and acidosis with bicarbonate of 13. The patient was resuscitated with calcium chloride, an insulin bolus with a bolus of D10, and a dose of Kayexalate. The patient was intubated for respiratory support, and blood work was collected to screen for potential adrenal and renal causes for her condition. The patient continued to have fluctuating levels of hyperkalemia and hyponatremia until a scheduled regimen washout, and started the patient on phenelzine the very next day. The patient was observed for over two weeks. During that time, moderate sodium loss through the urine and retention of potassium.

**Discussion:** This case illustrates the prompt and accurate diagnosis of pseudohypoaldosteronism leading to optimal patient outcome.

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**Title:** Rapid Use of MAOI Antidepressant in a Geriatric Patient with Treatment Resistant Depression  
**Authors:** Kamron Fariba, DO, PGY1; Benjamin Adler, OMS4; Ethan B. Kass, DO  
**Program:** University Hospital and Medical Center, Psychiatry Residency Program

**Introduction:** Over forty percent of patients treated for depression fail to respond to the empiric algorithm of treatment modalities. This failure of response is known as treatment-resistant depression (TRD). When managing a patient with TRD over an extended period of time, clinicians start with many options that narrow after multiple failures. Too often clinicians spend months exchanging and augmenting one SSR or SNRI for another with modest success. The Landmark STAR*D study employed a protocol where multiple substitutions and augmentation strategies were employed before consideration of MAOI antidepressants. It is understandable MAOI Antidepressant therapy is not a first-line choice due to potentially very problematic side effects. The potential consequence of Hypertensive Crisis and Serotonin Syndrome, which can occur from drug-to-drug and drug-diet interactions has limited their use. Unfortunately, the trepidation associated with MAOI antidepressant use has led to very infrequent consideration in a case of severe TRD, especially in geriatric cases, where the use of multiple medications and medical co-morbidities is higher than in the general population. We present a case of successful, rapid, and safe use of an MAOI Antidepressant in a 68-year-old female hospitalized for severe TRD.

**Case Description:** A 68-year-old female patient with a past psychiatric history of TRD presented involuntarily to the hospital following decompensation in the PHP setting. The patient had already completed a trial of fourteen sessions of ECT with minimal improvement. The patient had been compliant with home medications, which included escitalopram and mirtazapine. The treatment team discontinued the escitalopram, declined the recommended 14-day washout, and started the patient on phenelzine the very next day. The patient was observed for over two weeks. During that time, moderate improvements in mood were observed. Of note, no signs or symptoms of hypertension or serotonergic hyperactivity were reported.

**Discussion:** Because of their feared hemodynamic and/or serotonergic consequences, clinicians have become averse to the utilization of MAO-I's. Even when a clinician finally considers switching to an MAO-I in the setting of TRD, most guidelines still recommend waiting two to four weeks for a washout period. This case report demonstrates that clinicians could consider turning to MAO-I’s more commonly in the setting of TRD.

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**Title:** Cutaneous Metastasis of Breast Carcinoma Presenting as Right Upper Arm Papules  
**Authors:** Emelia Farnsworth, OMS1; Dong-Lin Xie, MD; Robert A. Norman, DO  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Though relatively uncommon, the underlying primary malignancies of cutaneous metastases can include breast carcinoma, gastric carcinoma, prostate carcinoma and renal cell carcinoma. This case study is an example of cutaneous metastatic breast carcinoma. Immunohistochemical (IHC) studies are necessary to help to identify or confirm the primary site of the metastatic breast carcinoma. Obtaining the appropriate clinical context from the patient will help to select IHC studies and will result in fewer IHC stains being needed to reach the diagnosis. Skin metastases can mimic other dermatologic conditions, including dermatitis, cellulitis and cutaneous mucinosis. Clinical consideration of possible metastases depends on a thorough inquiry into the patient’s past medical history. More common than not, in these metastatic lesions, the patient presents with a skin rash of unknown origin. Usually the diagnosis of metastasis, such as in this case, is unexpected.

**Case Description:** This is a 65-year-old female with a history of multicentric invasive ductal breast carcinoma with lobular features and asthma who presented with a chief complaint of lesions on the right arm. During examination, mildly erythematous elevated papules were
visualized on the patient’s right axilla and right upper arm and shoulder areas. The patient had an additional lesion on the right forearm which had a scaly appearance. The patient noted no symptoms such as pruritus or bleeding associated with them. An 8 mm punch biopsy to the depth of 1.1 cm was obtained from the patient’s right upper arm and shoulder areas. A shave biopsy was obtained from the right forearm, which measured 0.5 x 0.4 x 0.1 cm. The first biopsy from the right upper arm and shoulder area revealed diffuse infiltrative tumor cells between collagen bundles through the entire reticular dermis at different magnifications. The tumor cells were clustered in small nests and single cell strands in an “Indian-file” pattern. The neoplasm cell stained positive with pan-cytokeratin, CK7, estrogen receptor, was focally positive with progesterone receptor and negative with S-100 stain. The IHC for Her2/Neu was negative in the tumor cells. The second biopsy revealed squamous carcinoma in situ in the background of hypertrophic actinic keratosis.

**Discussion:** Correlation with the original ductal breast carcinoma is important in making the determination of a possible metastatic lesion in the skin. Additionally, a strong physician-patient relationship can facilitate obtaining a relevant and detailed history. A good physical examination, inclusive of a thorough skin survey, is essential to the assessment of cutaneous metastasis. Appropriate diagnostic testing by credentialed physicians enhances the likelihood of making the correct diagnosis. Relative to treatment it must be noted that the IHC profile may change in the surviving metastatic tumor cells and impact treatment decisions.

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**Title:** Novel Surgical Technique for Sacroiliac Joint Fusion in Persistent Chronic Low Back Pain  
**Authors:** Alexander Fong, OMS3; John P Malloy, IV, DO  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Sacroiliac joint pain can be a source of debilitating low back pain and has been well documented to be a component of chronic low back pain with a prevalence of 15-30%. Moreover, it has been reported that 32-43% of patients with persistent or new-onset low back pain after receiving lumbar fusion surgery attribute the pain to the sacroiliac joint. Diagnosing sacroiliac joint pain can be done clinically. A complete history, a positive Fortin Finger Test, and a positive result to 3 out of 5 provocative tests (Distraction, Thigh Thrust/Shear, FABER, Compression, Gaenslen’s) are indicative of a positive diagnosis of sacroiliac joint pain. Historically, treatment has ranged anywhere from physical therapy, to injections, to operative management. As time has progressed, surgical techniques have greatly improved as well, from large open procedures to percutaneous pinning to the minimally invasive fusion techniques we use today.

**Case Description:** We present a 76-year-old Caucasian female with a history of chronic low back pain and several lumbar fusion procedures complaining of worsening low back/sacroiliac pain and left lower extremity pain. The patient underwent an extensive course of non-operative treatment that included activity modification, home exercise and physical therapy, and sacroiliac joint injections that have only provided minimal relief and have failed to last greater than 6 months. On physical exam, the patient demonstrated positive findings consistent with sacroiliac joint dysfunction including positive SI compression, shear, Gaenslen’s test, and positive Fortin Finger Test. CT Scan of the pelvis revealed advanced degenerative changes of the left sacroiliac joint. Surgical management was deemed to be the most beneficial management at this time. In the operating room, Intraoperative fluoroscopy was then used to localize the joint. The skin and subcutaneous tissues were anesthetized. A pin was placed in the right PSIS and the tracking array was secured to the pelvis for intraoperative navigation. CT guided navigation was utilized to assist in localization of the joint. Incision was then made posteriorly, and the posterior SI joint was decorticated. A guide pin was placed within the left SI joint; intraoperative navigation was used to confirm the position within the joint. Through a separate fascial incision, morselized iliac crest bone graft was obtained and packed intrarticularly within the joint. Next, an allograft bone dowel was then impacted into the SI joint under direct visualization. Attention was then turned to the left lateral transfemoral fixation. Using intraoperative navigation, 3 guidewires were inserted traversing the left SI joint. Once appropriate trajectory, length, and position were achieved, transiliac sacral fixation was inserted across the SI joint in a trajectory to allow for cortical fixation of the outer ilium in addition to fixation across the left SI joint and sacral ala.

**Discussion:** This case demonstrates a novel minimally invasive technique to sacroiliac fusion in the setting of persistent low back pain. The use of the bone dowel provides better fixation as well as a true fusion of the joint in comparison to simply percutaneous pinning. Post-operatively, our patient was neurovascularly intact and hemodynamically stable, with pain well controlled. Her recovery involved using a rolling walker for 3 weeks and she was able to return to full activity, with no restrictions, in only 6 weeks demonstrating improved patient outcomes relative to past techniques.

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**Title:** A Case of Prolia-Associated Hypocalcemia  
**Authors:** Dyanna Fountain, MD, PGY2; Justin Rushing, MD, PGY3  
**Program:** Floyd Medical Hospital, Family Medicine Residency Program

**Background:** Osteoporosis is a disease commonly encountered by primary care physicians requiring a good understanding of screening, diagnosis and management of the disease. RANKL inhibitors, such as Denosumab (tradename Prolia), are becoming increasingly more common as a treatment option for this condition, however a potential side effect of this drug is hypocalcemia, which is often asymptomatic. Severely low levels of serum calcium can be life-threatening and requires prompt diagnosis and treatment. We present a case in which a continuous calcium infusion was utilized in the treatment of a patient with symptomatic hypocalcemia secondary to denosumab. Our patient is a 62-year-old Caucasian female with a past medical history significant for osteoporosis, vitamin D deficiency and hypocalcemia. She presented to the ER with complaints of worsening numbness and tingling of her extremities. She also experienced muscle spasms, weakness, nausea, and diarrhea. Her symptoms began 6 days prior to presentation. She also endorsed confusion and anxiety. Of note, she received her first injection of denosumab approximately 3 months prior to presentation. The patient had no documented labs within 6 months of admission. Physical examination was notable for upper extremity fasciculations and positive Chvostek’s sign. Blood chemistries revealed corrected calcium of 5.7, potassium of 2.9, phosphorus of 1.1, and Vitamin D level of 21. The patient was initially given 1g of IV calcium...
gluconate with aggressive fluid resuscitation using normal saline, however, calcium checked four hours later was 5.2 and the patient remained symptomatic. We then initiated a continuous infusion of 1 mg/mL of elemental calcium via calcium gluconate in D5 water (890 mL) run at 50 mL/hr, which we ultimately increased to 100 mL/hr. Her response to therapy was assessed using BMP checks every 4 hours. In addition to calcium infusion, the patient was given a single dose of 2000 mg oral calcium carbonate as well as 1 g of IV magnesium sulfate, 60 mg oral potassium chloride and 1 g of oral potassium phosphate. We also continued fluid resuscitation throughout admission. By the morning after presentation her corrected calcium was 9.3 and she was completely asymptomatic. The calcium infusion was discontinued while serial BMPs were continued to assess control with oral therapy which included calcium carbonate 600 mg twice daily and 0.5 µg calcitriol twice daily. At the time of discharge her corrected calcium was 8.9.

Discussion: Although symptomatic hypocalcemia is often treated with oral replacement therapy, our case illustrates that in severe cases continuous IV infusion is a safe and viable treatment option for symptomatic patients requiring hospitalization.

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Title: A Rare Case of Trichilemmal Carcinoma: Histology and Management
Authors: Lisa Fronek, DO, PGY2; Allyson Brahs, OMS4; Maheera Farsi, DO; Richard Miller, DO
Program: Largo Medical Center, Dermatology Residency Program

Introduction: Trichilemmal carcinoma (TC) is a rare, malignant, adnexal neoplasm that is derived from the ORS of the hair follicle. These tumors predominantly occur in elderly patients on sun-exposed areas, specifically on the head and neck with the face defined as the most common location. The mean age of diagnosis is 70 years old with a slight male predominance. These lesions are commonly identified as a papular, nodular, and sometimes, exophytic tumor. They generally arise de-novo but may also derive from an underlying proliferating trichilemmal cyst with a loss of p53, a seborrheic keratosis, a nevus sebaceous, or a scar. They can be locally aggressive and may exhibit telangiectasias and ulceration due to local destruction.

Case Description: We present a case of a 66-year-old Caucasian male who presented to our clinic for a routine full body skin exam and was diagnosed with a biopsy proven TC. The patient had a history of actinic keratoses treated with topical 5-fluorouracil (5-FU) and BCCs status-post excision and MMS. On physical exam, there was a pink to erythematous, pearly plaque with arborizing telangiectasia and fine scale located on the right central anterior neck; no ulceration, discharge, or lipid deposits were noted. One tangential shave biopsy was taken from the right central neck and sent for processing and hematoxylin and cosin (H&E) staining. Histopathologic report revealed an adenexal neoplasm with trichilemmal differentiation, desmoplastic component and atypia with margins involved. Immunohistochemical staining (IHC) was positive for CD34, and tumor cells displayed uptake of the Ki-67 proliferation marker; staining for p53 was negative. The pathologist advised for complete removal of the lesion with further evaluation.

Discussion: TC is a rare adnexal tumor that grossly and microscopically mimics many entities. A biopsy is essential for diagnosis and often requires supplemental immunostaining. It should be distinguished from other tumors of follicular origin and from other cutaneous malignancies. Complete excision with tumor-free margins is the typical treatment modality, though, MMS has some advantages, including comprehensive visualization of the margins and a greater preservation of healthy tissue. The patient in this case deferred MMS in favor of WLE and was treated successfully with 3.0 mm margins. As we struggle for uniformity in treatment recommendations, the therapeutic modality and surgical margins should be decided on an individual basis considering the patient’s preference and the lesion’s clinicopathologic features. Further characterization of the true nature and behavior of TC would contribute to a standard treatment recommendation. Additionally, a study comparing MMS to WLE for the treatment of TC would be of great utility, yet, such an endeavor is limited by the rarity of the disease.

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Title: Atypical Chest Pain Makes a Sliding Come-Up into the Differentials
Authors: Katherine Fu, OMS3; Dean Helseth, OMS3; Israel Ugalde, DO
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: There are approximately 7.6 million annual visits for chest pain, making it the second highest cause for Emergency Department visits in the United States. A differential that is rarely considered yet possesses a high occurrence rate in the United States is hiatal hernia. Greater than 95% of hiatus hernias are Type I, sliding, while the prevalence of Type II, III, and IV, paraesophageal, hernias make up less than 5% of the cases.

Case Description: 79-year-old female presented to the emergency department (ED) with a chief complaint of acute, 8/10 sharp chest pain that radiated to the midthoracic spine for a few hours before presentation. Associated symptoms included progressive dyspnea over the past few months. Her medical history was remarkable for diabetes mellitus type 2 and peripheral vascular disease. In the ED, patient was afebrile, pulse 106 bpm, respiration rate 31 bpm, blood pressure of 166/95 mm Hg, and pulse oximetry of 96% on room air. Pulmonary computed tomography angiogram showed a large left hiatal hernia containing the stomach and portions of the transverse colon and fat. Esophagogastroduodenoscopy (EGD) was performed which confirmed a large paraesophageal hernia with more than 75% of the stomach herniated and volvulized with incarceration in the chest, along with first part of the colon. The patient underwent successful laparoscopic repair of the hernia with esophageal mediastinal mobilization and gastropexy.

Discussion: This case illustrates an unusual symptomatic manifestation of a paraesophageal hernia manifesting as acute chest pain. The majority of patients with hiatal hernias are asymptomatic and are found incidentally on imaging. The only method of confirming a diagnosis of a hiatal hernia is with upper endoscopy or barium swallow. The result of delayed diagnosis increases the risk of complications such as gastric volvulus, gastric distension, gastric bleeding, erosions, or gastritis within the herniated pouch. Respiratory complications via mechanical compression of the lungs from the hernia or other organs herniating upwards is also frequently seen in large hernias. The consideration for hiatal hernias should be especially heightened in the United States due to high rates of gastroesophageal reflux diseases (GERD) and obesity. Both GERD and obesity are risk factors that contribute to the development of a hiatal hernia. The greatest prevalence of GERD occurs in North America (18.1% to 27.8%), while the prevalence of obesity in adults was 39.8% in 2016. Studies show 50-94% of patients with GERD have a type I hiatal hernia as compared to 13-59% of...
normal. This case demonstrates chest pain as an uncommon chief complaint in patients with hiatal hernias and should be kept in the differential diagnosis of emergency and internal medicine physicians.

Title: An Unusual Etiology of Osteomyelitis
Authors: Daniel Gable, OMS3; Ryan Wright, DO, PGY1
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Osteomyelitis affecting the vertebrae is the most common presentation of osteomyelitis in adults and usually occurs via hematogenous spread. The rates in the United States have increased from 2.9 in 100,000 hospitalized patients in 1998 to 5.4 in 2013. It is most common in men over 50 years old and the risk increases with age, injection drug use, infective endocarditis, degenerative joint disease, and an immunocompromised state. The most common type of injection drug use is with psychoactive drugs, but another often overlooked category is androgenic steroids. Androgenic steroid use is becoming more common among recreational athletes and weightlifters, and it is currently estimated that 6.4 percent of men and 1.6 percent of women use them at some point in their lives.

Case Description: We present the case of a healthy appearing 36-year-old male who presented to the ED with severe pain in his lumbar spine, flank pain, and intermittent fever for one week after lifting a heavy object. He denied weakness, numbness, or tingling. His past medical history was significant for intravenous heroin use, but he hadn’t used in several years and his urine toxicology screen came back negative. Exam showed point tenderness at the level of L1-2 without accompanying erythema or edema and ROM was limited due to pain. Labs revealed leukocytosis of 13.8 and patient was febrile at 100.6 degrees Fahrenheit. MRI showed discitis and osteomyelitis at L1-2 with a small epidural abscess. A small multiloculated fluid collection was present in the right psoas and extended from L1-5. The patient was questioned further regarding a potential etiology and this revealed that although he was no longer using intravenous heroin, he was regularly injecting testosterone to increase his strength and lean body mass. Neurosurgery and infectious disease were consulted, and empiric intravenous antibiotics were started. Blood cultures revealed Methicillin Sensitive Staphylococcus Aureus (MSSA) and the patient underwent an L1-2 laminectomy and discectomy w/ T12-L2 fusion to remove the epidural abscess and infected vertebrae and disc. Subsequently the patient received intravenous MSSA sensitive antibiotics for six weeks and was discharged home.

Discussion: With the increasing use of anabolic steroids amongst amateur athletes and weightlifters it is important to keep it in mind as a potential etiology of osteomyelitis in patients who lack other risk factors.

Title: A Case of Immune Reconstitution Inflammatory Syndrome (IRIS) in a Patient with Newly-Diagnosed AIDS and 3 Concurrent AIDS-Defining Illnesses
Authors: Anirudh Gajjala, DO, PGY1; Monica George-Palop, MD, PGY2; Rajeswari Murugan, DO, PGY3
Program: Palmetto General Hospital, Family Medicine Residency Program

Introduction: Immune Reconstitution Inflammatory Syndrome (IRIS) is a fairly uncommon collection of inflammatory disorders that is associated with a paradoxical worsening of pre-existing infectious processes in HIV (+) individuals following the initiation of anti-retroviral therapy (ART). IRIS is estimated to occur in approximately 13% of HIV patients being treated with ART and has an estimated mortality rate of 20-30%.

Case Description: This patient is a 60-year-old male with no documented past medical history who presented to the hospital following a syncopal episode. The patient had very poor medical follow-up, stating he had not been seen by a doctor in 16 years. He elicited complaints of head trauma, loss of consciousness, dysphagia, two episodes of non-bloody non-bilious vomiting, recent weight loss of four pant sizes, and a prior history of syncopal episodes. History was unremarkable aside from a 30-pack-year smoking history, but the patient stated he had not smoked in 18 years. Physical exam was remarkable for oropharyngeal thrush, resting tremor of the right upper extremity, and necrotic tissue in the toes and heels of the bilateral feet. He was found to be anemic and leukopenic, but chemistry panel was within normal limits. CT of the abdomen without contrast and CT of the chest with contrast revealed abdominal lymphadenopathy and multiple diffuse spiculated nodules concerning for metastatic disease versus infectious impaction. HIV studies revealed the patient to be HIV-1 (+) with a CD4+ count of 30 cells/ul. and a Viral Load of 137,000 copies/mL. Other studies, including EKG, Chest X-ray, CT head, MRI brain and Ultrasound carotids were all unremarkable. Retroperitoneal lymph nodes biopsy revealed Acid-Fast Bacilli, likely Mycobacterium Avium Complex. Biopsy of the left foot revealed Kaposi’s Sarcoma, HHV-8 (+). Endoscopy with duodenal biopsy revealed CMV Duodenitis. Bronchoscopy with sputum culture and bronchial washings revealed Aspergillus. The patient also developed MSSA bacteremia during the admission. Patient was initiated on bicitrevir/emtricitabine/tenofovir, in addition to antibiotic medications. Ten days later, the patient began spiking fevers and tachycardia, with reported TMax 103.9°F and max. HR 130 bpm. He was subsequently administered IV methylprednisolone and recovered well.

Discussion: In patients with Category B and Category C defining illnesses per CDC Classification, IRIS has been shown to double the rate of all-cause mortality. Early recognition and appropriate management of IRIS is paramount to good outcomes in these patients.

Title: Bilateral Preseptal Pellulitis as a Possible Pomplication of Petrozole and Palbociclib Treatment for Breast Cancer
Authors: Armando Luis Garcia, MD, PGY1; Surapaneni Balarama Krishna, MD, PGY2; Kelli Coleman, MD, PGY1; Samragyni Madala, MD, PGY2
Program: Aventura Hospital and Medical Center, Transitional Rotating Internship Program
**Introduction:** Preseptal cellulitis is caused by an infection located anterior to the orbital septum, and typically involves the eyelids and superficial periocular tissues. The first case of bilateral preseptal cellulitis in literature was reported in 2013 in a child who underwent a combined adentonsilectomy and strabismus surgery. Herein we report the second case of bilateral preseptal cellulitis in a female patient on letrozole and palbociclib for stage IV breast cancer.

**Case Description:** A 77-year-old female with a past medical history of stage IV breast cancer status post radiation currently undergoing treatment with letrozole and palbociclib presented to the emergency department at Aventura Hospital and Medical Center with swelling and redness of her left eye. She states that her symptoms started off as two to three small erythematosus papules that she likely scratched because of pruritus. On clinical exam, her pupils were reactive to light, there was no restriction of eye movements, pain, or diplopia on clinical exam. Her history was remarkable for recurrent similar previous episodes that resolved with antibiotics. She was diagnosed with preseptal cellulitis and was discharged from the hospital with clindamycin. Three days later she returned with worsening bilateral erythema and edema of superficial periocular tissues (Fig. 1). Clinical exam findings remained consistent with preseptal cellulitis. A maxillofacial computerized tomography (CT) scan showed sparing of the orbit and globe (Fig. 2).

Because her infection did not resolve with outpatient antibiotics, she was admitted to the hospital and was started on vancomycin and cefepime for broader coverage. Supportive therapy with warm compresses and lubricating tears was provided. Antibiotic treatments were de-escalated to cefazolin secondary to clinical improvement. Blood cultures on this admission were negative. The patient was discharged and sent home with cephalexin. The patient returned to the emergency department approximately two weeks later with persistent erythema and edema of the left superficial periocular tissues. CT scan of the head and orbits indicated mild left preseptal and periorbital cellulitis. Repeat blood cultures and wound cultures were performed. The patient was started on vancomycin and ceftriaxone empirically to cover methicillin-resistant Staphylococcus aureus (MRSA), which was subsequently de-escalated to cefazolin because MRSA screening tests were negative. Wound cultures were positive for Candida parapsilosis, and fluconazole was added. The patient successfully achieved resolution of her symptoms and was discharged home.

**Discussion:** This is the first case ever described of recurrent bilateral preseptal cellulitis likely secondary to immunosuppression from concurrent treatment with letrozole and palbociclib.

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**Title:** A Case of Colocutaneous Fistula Formation as a Result of Biological Mesh Utilization in Abdominal Wall Reconstruction  
**Authors:** Toria Gargano, OMS3; Rajeev Herekar, OMS3; Ronald E. Moore, MD  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Traumatic disruption of the components of the abdominal wall, including its overlying skin, subcutaneous tissue, fascia, muscle, or peritoneum presents the surgery team with the opportunity to perform an abdominal wall reconstruction. The surgeon aims to provide pain relief, maintain function, and prevent strangulation or incarceration of intraabdominal tissues while utilizing methods to best avoid post-operative complications. There are several approaches to choose from, including direct tissue closure, prosthetic mesh, local advancement of regional flaps, distant flaps, or combined flap and mesh techniques. When opting to perform the reconstruction using a mesh implant, there is yet another decision to make: synthetic or biologic? Synthetic mesh is known to cause tight adherence to the abdominal wall and/or visceral organs due to buildup of fibrotic tissue secondary to an inflammatory foreign body response. Biologic meshes, on the other hand, are said to have fewer post-surgical complications, such as reduced foreign body response and increased resistance to infection. Although there has been a widespread acceptance of biological mesh over synthetic implants, multiple studies have found a lack of evidence supporting their routine use.

**Case Description:** Here we present the case of a 54 year old male with a past medical history of atrial fibrillation, hypertension, alcohol use disorder, polysubstance abuse disorder, and multiple mood disorders who underwent transabdominal wall reconstruction, closure of colocutaneous fistula, and repair of ventral hernia in November of 2019 following an exploratory laparotomy, abdominal washout, and wound closure due to a penetrating stab wound in April of 2018. The patient required the 2019 reconstruction due to a colocutaneous fistula that had formed in the area of a 10cm x 15cm Acell biologic mesh placed during his original wound closure operation, causing feces to extrude from the abdomen. A successful abdominal wall reconstruction and removal of fistula tract operation was performed, however the post-operative course was complicated by several psychosocial and medical issues, such as nicotine/alcohol withdrawal, self-removal of surgical drains, temporary elopement from the hospital premises, and general non-compliance. His post-operative struggles led to a prolonged hospital course and disallowed the proper healing of the incisions/reconstruction.

**Discussion:** This case elucidates the need to re-evaluate the role of biologic meshes and the side effects they are capable of inciting. Many practitioners believe that biologic meshes are lower/free of risk in developing immune reactions, fistulas, and other foreign body maladies. However, whether due to epithelialization, or similar immune reactions caused by synthetic meshes, complications still occur and should be monitored closely. It may be prudent to wait for acute inflammation to subside after substantial trauma before placing a mesh of any kind to avoid complications and the need for future revisions/operations. Additionally, it may be worthwhile to treat other causes of local or systemic inflammation, such as Crohn’s or Rheumatoid arthritis, prior to surgery in order to avoid similar problems.

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**Title:** Idiopathic True Brachial Artery Aneurysm  
**Authors:** Feargal Geraghty, PGY2; Youssef Shaban, DO, PGY4; Adel Elkbuli, MD, MPH, MBA; Jorge De La Portilla, MD  
**Program:** Kendall Regional Medical Center, General Surgery Residency Program

**Introduction:** Brachial artery aneurysm is rare pathology with potentially devastating complications if missed but can easily be diagnosed with a high index of suspicion coupled with a thorough history and physical examination. The vast majority are false or pseudoaneurysms compared to true aneurysms consisting of all 3 layers of the arterial wall. Compared to lower extremity aneurysms, upper extremity peripheral aneurysms much less common and account for 1% of all peripheral artery aneurysms with 0.5% involving the brachial artery and only 0.17% being true aneurysms. The etiology of true aneurysms encompasses atherosclerotic, genetic (Neurofibromatosis), vasculitides (Kawasaki’s syndrome, Buerger’s disease), previous
surgery (arteriovenous fistula), and idiopathic pathology. Patients with brachial artery aneurysms are typically symptomatic and present with a palpable mass, pain or paresthesia, or acute limb ischemia due to thromboembolic sequela. Initially asymptomatic lesions convert to be symptomatic in about 33% of cases.

**Case Description:** An 83-year-old gentleman presented to our emergency department with left upper extremity pain, erythema, and swelling for one week. He denied trauma to the area. Examination revealed a pulsatile mass at the volar aspect of antecubital fossa and decreased distal pulses. Imaging consisting of an ultrasound arterial Doppler and confirmed by a CT angiogram illustrated a 9mm aneurysm of the brachial artery with stenosis of the radial artery and non-enhancement of the origin of the ulnar artery. The patient underwent a left brachial artery aneurysm ligation and excision, embolectomy with a Fogarty catheter #3 of the left radial and ulnar arteries and clot recovery. Then he underwent a brachial artery to ulnar artery end-to-end bypass, and brachial to radial artery end-to-end anastomosis with reverse saphenous vein graft harvested from the left lower extremity.

The surgery was successful with good flow through the anastomosed vessels. Palpable pulses were appreciated in the radial and ulnar arteries as well as Doppler signals in the palmar arch. The hand was noted to be well perfused with adequate capillary refill. Histology demonstrated a true aneurysm where all three layers (intima, media, and adventitia) of the arterial wall seen with hyperplastic intimal layer and fragmentation of elastin fibers in the media. No evidence of vasculitis was observed. The patient’s postoperative course was uneventful, and he was discharged home on the second postoperative day. At follow-up 6 months later, the patient had normal left-hand function and adequate perfusion.

**Discussion:** We present a rare case of the oldest documented patient with a true brachial artery aneurysm with an idiopathic etiology. This case highlights the importance of maintaining a high index of suspicion injuries coupled with a thorough history and physical exam when encountering neurovascular complaints of the upper extremities. There are no randomized control trials available in the literature regarding treatment, however, the most widely accepted intervention based on retrospective data and expert opinion includes prompt diagnosis and operative resection of the aneurysm with interposition vein grafting as successfully demonstrated in this case.
**Case Description:** This patient is a 31-year-old African American homeless male with a past medical history of unspecified psychosis who presented involuntarily under Police Baker Act due to aimless wandering at a local Walmart while talking to himself, which included thoughts of killing himself. Patient admitted to ingesting LSD 2 weeks prior to the presentation. He admits to having constant visual hallucinations since ingestion. Patient reports seeking treatment at multiple hospitals over the past two weeks. However, those visits did not result in comprehensive psychiatric treatment as he was discharged from the ED and told he should “sleep it off.” He reports hallucinations of seeing tree roots walking out of the ground, alligators driving cars, and even chasing him. Patient believed his life was in danger because the aforementioned alligators wanted to eat him at Walmart, so he wanted to kill himself before the alligators did.

**Discussion:** This case illustrates the difference in duration of HPPD compared to other cases of drug intoxication. Specifically, there has been a reported case of another man in his late forties who had visual perceptual disturbances up to 25 years after LSD ingestion. Misdiagnoses are one of the concerns as it led to delay of care for this patient despite series of attempts to seek treatment. It is also important to discuss the social stigma among both the homeless population and drug users so that they are not inappropriately dismissed by healthcare providers.

**Title:** Avoiding Tunnel Vision: Polymyalgia Rheumatica Presenting as Carpal Tunnel Syndrome  
**Authors:** Joel Haines, OMS3; Jackleen Glodener, OMS3; Vincent Guida, MD; Elizabeth Hames, DO  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Polymyalgia rheumatica is a relatively common disease, causing proximal myalgias in the elderly. The typical presentation includes bilateral shoulder or hip pain and morning stiffness lasting at least 30 minutes in adults over 50 years of age, especially women. Giant cell arteritis is an important association because of its feared complication of blindness. However, Isolated symptoms in the distal joints of the upper extremity are atypical. In a study of 177 patients with polymyalgia rheumatica, 14% of the patients presented with carpal tunnel syndrome during their disease course and only 31% of these presentations occurred without shoulder and hip involvement. In this case, we will elucidate an unusual disease presentation in the hopes that physicians can avoid the misdiagnosis of polymyalgia rheumatica.

**Case Description:** A 90-year-old female presented to the clinic with edema and 10/10 pain in the right wrist that had been present for 3 days. The patient believed that the wrist pain was incited by repetitive wrist motions due to her new knitting hobby. The physical exam was positive for Tinel's sign, Phalen's sign, and the Prayer Test. Pertinent negative findings include no changes in sensation or pulses. Despite severe pain while testing active and passive motion, the wrist maintained full range of motion. The patient was prescribed 200 mg ibuprofen, given a carpal tunnel brace, and referred to orthopedics. Two weeks later, the patient returned to the clinic. The orthopedist agreed with the initial assessment of carpal tunnel syndrome and ordered nerve conduction study tests. The patient denied pain improvement and stated that the wrist pain was beginning to radiate to her elbow.

The patient followed up with orthopedics where she received a cortisone injection in the wrist. EMG testing returned negative. However, the patient’s pain worsened, and she went to the ER with severe pain now radiating to her shoulder. In the ER, bilateral shoulder x-rays revealed arthritic changes and a cervical CT scan showed cervical spondylosis; neither diagnosis explained the patient’s pain. In clinic, an autoimmune panel revealed an elevated CRP and ESR, but was negative for ANA, RF, dsDNA, SCL-70, RNP, SS-A, SS-B, CCP, and Jo-1 antibodies. Labs showed hypercalcemia, and further screening for multiple myeloma was negative.

Four weeks later, the patient’s pain and weakness had spread to her hips and she was having difficulty getting out of bed. Repeat blood work had shown elevated ESR and CRP, and a 5-day course of oral prednisone was trialed which provided rapid pain relief within 48 hours. The elevated acute phase reactants and rapid response to steroids supported the diagnosis of polymyalgia rheumatica, despite the unusual pattern of joint involvement.

**Discussion:** This case highlights the role of maintaining a high index of suspicion in establishing early diagnosis and following long-term care of patients with an unusual presentation of polymyalgia rheumatica. Proper diagnosis of polymyalgia rheumatica is important because clinicians need to consider the risk for blindness in association with giant cell arteritis.

**Title:** Posterior Reversible Encephalopathy Syndrome in an Elderly Female with Newly Diagnosed Drug Induced Systemic Lupus Erythematosus  
**Authors:** Samuel Harris, DO, PGY3; Amit Jangam, DO, PGY2; Jose Paz, DO  
**Program:** Palmetto General Hospital, Internal Medicine Residency Program

**Introduction:** Posterior reversible encephalopathy (PRES) is a disorder characterized by a clinical syndrome of headache, confusion or decreased level of consciousness, visual changes, and seizures, associated with specific radiological findings consistent with posterior cerebral white matter edema1,2. Its exact mechanism is unknown, but it is believed to be associated with dysregulation of blood pressure and endothelial dysfunction1,3. Most commonly, 75% of patients with PRES have uncontrolled fluctuations in blood pressure and present with malignant hypertension. One disease associated with endothelial dysfunction that has been related to PRES is Systemic Lupus Erythematosus (SLE). The exact occurrence is not currently known, but it is estimated that 50% of patients with PRES have an autoimmune disease3. About 91% of cases associated with SLE also present with hypertensive emergency and 90% with nephritis5,12. Most cases of previously reported PRES in the setting of SLE have been reported in young patients, and few cases of PRES in elderly patients with drug induced SLE have been reported.

**Case Description:** We present an 82-year-old female, presenting to the emergency room from her PCP with shortness of breath and concern for pneumonia. She had been having difficulty with blood pressure control due to several drug allergies and was recently started on Hydralazine by her primary physician. At admission she was found to be confused and hypertensive with a BP of 235/96 mmHg. She underwent a CT of the head revealing edema of the left parietal occipital lobe. An MRI was performed demonstrating worsened chronic small vessel ischemic changes in the left occipital
periventricular involving both the white matter and gray matter since prior MRI from 10 year prior and increased T2 and FLAIR signal abnormality in the periventricular white matter slightly more prominent in the left occipital periventricular deep white matter gray matter. It was also noted that the patient had a discoid rash on her left leg and severe proteinuria, prompting concern for SLE, which was confirmed with a positive ANA, dsDNA antibody, and anti-histone antibody. The patient’s symptoms improved and her encephalopathy resolved, with blood pressure controlled on nicardipine drip and discontinuation of hydralazine, a likely cause of her lupus flare. The patient was then started on prednisone, mycophenolate, hydroxychloroquine as an outpatient with overall improvement of quality of life.

**Discussion:** In most cases of PRES in the setting of SLE, patients are young and have a previous diagnosis of SLE. This case demonstrates an unusual presentation of PRES in the setting of newly diagnosed drug induced SLE in an elderly patient.

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**Title:** Case Report on Osteopathic Manipulative Treatment in Mast Cell Activation Syndrome, Ehler-Danlos Syndrome, and Postural Orthostatic Tachycardia Syndrome

**Authors:** Tahreem Hashmi, OMS2; Noareen Sheikh, OMS2; Manell Aboutaleb, OMS2; Patrick Barry, DO; Nancy Klimas, MD; Irina Rozenfeld, MHS, MSN, APRN, CCRP

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Recent observation shows a co-occurrence of Mast Cell Activation Syndrome (MCAS), hypermobile Ehler-Danlos Syndrome (hEDS), and Postural Orthostatic Tachycardia Syndrome (POTS). MCAS is a newly described condition that presents as urticaria, angioedema, wheezing, potentially anaphylaxis and death. hEDS, a subtype of EDS, is a connective tissue disorder involving hypermobility of joints, hyperextensibility of skin, and fragility of tissues. POTS is a chronic orthostatic intolerance that presents with excessive orthostatic tachycardia, syncope, fatigue, and headache. These conditions are based on a diagnosis of exclusion and the pathophysiology is largely unknown, but it may involve sympathetic overactivation.

There is no standardized treatment protocol, but current management is through lifestyle modifications, symptomatic relief, and prevention of complications. This case study focuses on the therapeutic use of Osteopathic Manipulative Treatment (OMT) in a patient with MCAS, hEDS, and POTS. OMT is a set of hands-on techniques used to diagnose and treat somatic dysfunctions. It can serve as an adjunct by addressing the nervous, muscular, and skeletal components related to symptoms such as tachycardia, hypotension, and abdominal cramps.

**Case Description:** A 46-year-old female presented to the Institute for Neuro-Immune Medicine with chronic fatigue, musculoskeletal pain, itching, orthostatic intolerance, headache, and post-exertional malaise. Past medical history includes rheumatoid arthritis, parvovirus B19 and coxsackie B...
infections, hypothyroidism, fibromyalgia, POTS, hEDS, and MCAS. Pharmacotherapy, including opioids, monoclonal antibodies, and antihistamines, and lifestyle modifications, such as exercise and FODMAP diet, were prescribed for management.

Her musculoskeletal pain and fatigue were treated at the OMT clinic with balanced ligamentous tension, myofascial release, muscle energy, and articulatory techniques. She showed a 30% increase in quality of life using the Karnofsky Performance Scale. Her orthostatic hypotension improved from 115/90 mmHg (lying) and 110/70 mmHg (standing) before OMT to 121/80 mmHg (lying) and 119/93 mmHg (standing) after OMT. Patient reports subjective improvement in her fatigue and pain after three OMT sessions.

Discussion: Although MCAS, hEDS, and POTS seem to co-occur, there is inadequate evidence to establish a relationship. A multidisciplinary approach including OMT may be effective in alleviating symptoms of sympathetic overactivation shared in this triad. Further research is necessary to link these conditions and investigate the role of OMT as an adjunct in current management of complex chronic illnesses.

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**Title:** Pneumatosis Intestinalis With Portal Venous Gas Without Bowel Infarction  
**Authors:** Farooq Hassan, OMS3; Grant Myres, OMS3; James M. Doty, MD  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Pneumatosis intestinalis is an ominous finding on a CT scan of the abdomen that indicates a complex management scenario. It is defined as the presence of gas between layers of the bowel wall, more commonly the mucosa and submucosa1. One theory on the pathogenesis of PI is that disruption of the mucosal barrier due to ischemic necrosis of the bowel wall. An additional ominous finding with PI is portal venous gas, where the gas is absorbed into the venous blood stream and into the portal venous system. The combination of PI and portal venous gas usually denotes bowel infarction with a high morbidity and mortality rate. The management of bowel infarction with the aforementioned imaging findings is a resection of the ischemic portion of bowel with primary anastomosis.

**Case Description:** We present a 65 y/o female with history of T2DM, HTN, CKD, AIDS, ileocolic resection due to appendicitis 10 years ago with one day history of nausea, vomiting and diarrhea. Her emesis and diarrhea were dark without blood. VitalTs and labs showed an afebrile, hypotensive (70/50 mmHg) patient with a moderately elevated WBC count (11.4 x 10^9/L). Physical exam showed diffuse abdominal tenderness. CT abdomen and pelvis without contrast was done which showed distended loops of small intestine with air fluid levels suggesting pneumatosis intestinalis and gas present in the SMV and portal venous branches in the liver. This signified a potential infarction of the small bowel. The patient was given IV fluids to restore perfusion and was subsequently taken to the operating room. Upon gross examination of the intestines there were no ischemic changes. However, there were extensive adhesions from the mid-jejunum to the ileocolic anastomosis. The adhesions were lysed. The patient was admitted to the ICU and then the medical-surgical floor. She regained bowel function on post-operative day 5, was not febrile and was in a stable condition to be discharged home within 4 weeks. The repeat CT scan on post-operative day 20 showed resolved PI with no portal venous gas.

**Discussion:** Adhesions are the most common cause of bowel obstruction in the USA and are a sequelae of repair of an inflammatory insult to the bowel and can lead to incarceration and strangulation. Pneumatosis intestinalis with portal venous gas on CT scan of the abdomen and pelvis is an unfavorable finding in a patient, with specificities for bowel ischemia between 75-90%. Although adhesions generally do not lead to PI with portal venous gas, they are a common cause when it occurs. We present a case in a patient with multiple comorbidities and hypotension who had the aforementioned findings on CT scan, but had extensive adhesions from the mid-jejunum to her prior ileocolic anastomosis. The patient was treated with lysis of adhesions and regained bowel function on post-operative day 5. Therefore, the finding of pneumatosis intestinalis with portal venous gas may not always indicate bowel infarction, even though it must be taken with a high suspicion of such. Patients with clinical findings indicating bowel ischemia should be treated aggressively to prevent morbidity and mortality.

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**Title:** Antiphospholipid Syndrome: An Inherited Coagulopathy Deserving of a Spot on the Differential  
**Authors:** Dean Helseth, OMS3; Katherine Fu, OMS3; Israel Ugalde, DO  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Antiphospholipid Syndrome (APS) is a rare autoimmune disorder associated with an increase in thrombotic tendency. In 2019, an epidemiology study of APS in adult ages ≥ 18 years of age estimated an incidence of 2 persons per 100,000 population per year. Albeit rare, APS can initially present as a hemorrhagic syndrome via severe thrombocytopenia, acquired thrombocytopenia, acquired factor VIII inhibitor or prothrombin deficiency.

**Case Description:** 49-year-old female presented to the emergency department (ED) with a chief complaint of anxiety and multiple episodes of emesis. One week prior to admission, she had paresthesia, poor concentration, which progressed to left sided weakness, shuffling gait, and 10/10 headache. Her medical history was remarkable for hypothyroidism, oral contraceptive use, and lower extremity deep vein thrombosis. Upon admission to the ED, CT brain revealed a right frontal intraparenchymal hematoma with 4 mm midline deviation. MR venogram (MRV) showed thromboses in the superior sagittal sinus (SSS), transverse sinuses, sigmoid sinuses, and jugular bulb with hemorrhage. She underwent neuroendovascular thrombectomy. Hypercoagulable work up yielded a positive ANA and lupus anticoagulant. Patient was bridged to warfarin with INR goal of 2-3 and discharged. Despite thrombectomy and therapeutic INR, the patient returned two weeks later and repeat MRV showed new thrombosis within the SSS. She required a two stage thrombectomy with aspiration. The INR goal was increased to 3 to 3.5. During an outpatient follow up, she reported seizures and two episodes of transient left sided facial and upper extremity numbness. She was started on levetiracetam and lacosamide for seizure control. Repeat imaging did not show any new thrombosis.
**Discussion:** This case illustrates the unique characteristics of APS, a less prominent cause of recurrent thrombotic and bleeding events which requires prompt and accurate diagnosis for optimal patient outcome. In a cohort study of 1000 patients with APS, the most common manifestations were peripheral thrombosis (38.9%) and neurologic signs, such as migraine (20.2%) or stroke (19.8%). Hemorrhagic stroke, as seen in this patient, is a rarity amongst the clinical signs for APS. Therefore, it is important to keep APS in consideration in patients who present with history of hemorrhagic events in the presence of multiple clot formations.

Furthermore, this case sheds light on the insufficiency of current literature to provide adequate recommendations for the anticoagulation treatment of APS. Treatment options include warfarin, direct anti-Xa inhibitors and direct thrombin inhibitors. Current evidence supports long-term anticoagulation levels for APS with a target INR of 2-3. However, as shown in this case, patients with APS may exhibit insufficient anticoagulation while being maintained on INR levels of 2-3, thus challenging the broad application of utilizing the standard INR goal for APS patients who may require higher levels of anticoagulation.

**Case Description:** The patient was a 29-year-old male, non-contact lens wearer, who presented to the emergency department for a foreign body sensation in his right eye for four days. He noted that this started after he had brushed metal shavings out of his hair and felt a piece fall into his eye. He delayed care, instead trying to remove the foreign body. He presented to the emergency department after waking up with eye discharge and crusting. He reported decreased vision and pain in the right eye, with a foreign body sensation, and photophobia. He denied any medical history including glaucoma. Physical exam of the right eye was remarkable for clear discharge, diffuse conjunctival injection, and mild swelling of upper eyelid. Lid eversion revealed no evidence of retained foreign body. Extraocular motor function was intact bilaterally without pain, and he had no evidence of proptosis on exam. Pupils were equal in size and reactive to light bilaterally. Visual acuity was 20/30 on the left, his baseline, and 20/100 on the right. Slit lamp exam with fluorescein staining revealed a circular crater-like erosion area of uptake 1-2 mm in size, directly over the 12 o’clock position of the pupil. Within the ulceration, several dark foreign bodies with rust colored staining extending outward were noted at its center. There was no evidence of hyphema, hypopyon, or Seidel’s sign. The patient was given tetracaine drops for pain control, physical exam, and for foreign body removal attempts. With slit lamp guidance, extensive efforts were made by the emergency medicine resident and attending physician to remove the foreign bodies. Although several small pieces of metal fragments were successfully removed, the layer of cornea beneath the fragments was rust-stained with evidence of additional fragments embedded even deeper. With his current visual acuity and high risk of long-term complications, the patient was transferred to a nearby facility for evaluation by an ophthalmologist. Polytrim eye drops and a tetanus booster were administered prior to transfer.

**Discussion:** Our decision to transfer the patient was based on current ophthalmologic guidelines regarding patients with corneal foreign bodies. Foreign bodies which are not removed within 24 hours are at risk for becoming embedded within the corneal stroma, as was this case. Unlike inert foreign bodies, metallic foreign bodies are recommended to be removed regardless of their depth, as they will cause a rust ring. Some small rust rings can be managed with repeated corneal shavings. However, the central location of this ring warranted emergent removal due to the higher risk of long-term vision impact from scarring. Rust rings, if not removed promptly, also increase risk of developing a secondary iritis. Iritis can cause compounded pain and vision loss and pre-dispose for additional infections and keratitis. Current recommendations dictate that centrally located foreign bodies or retained rust rings should be seen immediately by an ophthalmologist. Our patient had both of the previously mentioned high risk findings and a delayed presentation greater than 24 hours. We removed as much foreign body material within our scope of practice, but ultimately this patient needed a higher level of care to have the best chance at preserving his vision.

**Title:** A Delayed Presentation of Foreign Body Induced Corneal Ulcer
**Authors:** Chase Hemphill, DO, PGY1; Jeannette Roberts, DO; Victor Sasson, MD
**Program:** Saint Lucie Medical Center, Emergency Medicine Residency Program

**Introduction:** This was a case in which a patient presented with a debilitating corneal ulceration secondary to metal fragments of which proper removal was beyond the scope of routine emergency medicine practice.

**Case Description:** The patient was a 29-year-old male, non-contact lens wearer, who presented to the emergency department for a foreign body sensation in his right eye for four days. He noted that this started after he had brushed metal shavings out of his hair and felt a piece fall into his eye. He delayed care, instead trying to remove the foreign body. He presented to the emergency department after waking up with eye discharge and crusting. He reported decreased vision and pain in the right eye, with a foreign body sensation, and photophobia. He denied any medical history including glaucoma. Physical exam of the right eye was remarkable for clear discharge, diffuse conjunctival injection, and mild swelling of upper eyelid. Lid eversion revealed no evidence of retained foreign body. Extraocular motor function was intact bilaterally without pain, and he had no evidence of proptosis on exam. Pupils were equal in size and reactive to light bilaterally. Visual acuity was 20/30 on the left, his baseline, and 20/100 on the right. Slit lamp exam with fluorescein staining revealed a circular crater-like erosion area of uptake 1-2 mm in size, directly over the 12 o’clock position of the pupil. Within the ulceration, several dark foreign bodies with rust colored staining extending outward were noted at its center. There was no evidence of hyphema, hypopyon, or Seidel’s sign. The patient was given tetracaine drops for pain control, physical exam, and for foreign body removal attempts. With slit lamp guidance, extensive efforts were made by the emergency medicine resident and attending physician to remove the foreign bodies. Although several small pieces of metal fragments were successfully removed, the layer of cornea beneath the fragments was rust-stained with evidence of additional fragments embedded even deeper. With his current visual acuity and high risk of long-term complications, the patient was transferred to a nearby facility for evaluation by an ophthalmologist. Polytrim eye drops and a tetanus booster were administered prior to transfer.

**Discussion:** Our decision to transfer the patient was based on current ophthalmologic guidelines regarding patients with corneal foreign bodies. Foreign bodies which are not removed within 24 hours are at risk for becoming embedded within the corneal stroma, as was this case. Unlike inert foreign bodies, metallic foreign bodies are recommended to be removed regardless of their depth, as they will cause a rust ring. Some small rust rings can be managed with repeated corneal shavings. However, the central location of this ring warranted emergent removal due to the higher risk of long-term vision impact from scarring. Rust rings, if not removed promptly, also increase risk of developing a secondary iritis. Iritis can cause compounded pain and vision loss and pre-dispose for additional infections and keratitis. Current recommendations dictate that centrally located foreign bodies or retained rust rings should be seen immediately by an ophthalmologist. Our patient had both of the previously mentioned high risk findings and a delayed presentation greater than 24 hours. We removed as much foreign body material within our scope of practice, but ultimately this patient needed a higher level of care to have the best chance at preserving his vision.

**Title:** An Uncommon Cause of Erythema Multiforme
**Authors:** Jenny Impemba, OMS3; Mark Peicher, OMS3; Keri Mason, DO
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Erythema multiforme (EM) is characterized by classic target lesions typically along the extremities, including palms and soles. The lesions have a dusky, central area or blister, with a dark red inflammatory zone surrounded by a pale ring of edema and an erythematous halo on the periphery. There are two subclasses: EM major, which has mucosal involvement and EM minor, which has mild or no mucosal involvement.1,2 Much of the pathogenesis has been studied on HSV infections (causes >90% of EM), therefore what is understood is thought to be due to an autoimmune delayed-type hypersensitivity reaction against viral antigens.3 Much of the other causes of EM are not well understood. There has been a vast spectrum of drugs that have been known to cause EM, commonly non-steroidal anti-inflammatory drugs, sulfonamides, and antiepileptics.4 A drug that has reported EM as a rare side effect is Tamiflu (oseltamivir).

**Case Description:** A 39-year-old Caucasian male presented with a red, itchy, and mildly painful rash for 3 days that started on his palms and progressively spread to his arms, back, scalp, and soles. He was seen at an urgent care two days prior to the onset of rash for fever and myalgias. Rapid influenza and strep screens were negative. Although influenza screening was negative, empiric Tamiflu was initiated. One day after beginning therapy, he was noted to have erythematous non-blanching maculopapular rash on his palms, arms, elbows, trunk, scalp, and soles with some representing target-like lesions. He also had mild tenderness to palpation of the lesions. There was no mucosal involvement. Of note, the patient is a landscaper and was recently in contact with soil. He had not been taking any other medications. His vital signs were stable. Labs were within normal limits. Respiratory viral panel was positive for rhinovirus (RE). HIV (human immunodeficiency virus) serology and RPR (rapid plasma reagin) were negative. Patient had a
skin biopsy x2 to the left upper extremity. Cultures were negative for bacteria, acid fast bacilli, and fungus. Pathology was consistent with interface dermatitis characterized by lymphocytes at the dermal epidermal junction with basal vacuolar changes and numerous apoptotic keratinocytes with central epidermal necrosis favoring erythema multiforme and Stevens-Johnson syndrome spectrum, which may be drug induced. Tamiflu was discontinued and treated with Benadryl. The rash was resolved at his 1 week follow up.

**Discussion:** Other possible causes of his EM could have been due to RE; however, it is not a known cause of EM. Therefore, this case leaves us with an opportunity for additional research to discover the pathogenesis of EM in a non-infectious presentation. This is just one example as to why empiric Tamiflu should not be recommended.

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**Title:** Gluteal Abscess Following Potential Testosterone Injection in a Seronegative Patient - Is Testosterone Dangerously Overused?

**Authors:** Sarin Itty, OMS1; Iman Squires, OMS1; Peter Cohen, DO; Judith Schaffer, DO

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** An abscess is a localized region of pus resulting from a bacterial infection, typically arising from an S. aureus infection. Abscesses, bacteremia, and generalized sepsis are medical complications that rarely occur after intramuscular injection of testosterone, often occurring in immunocompromised individuals. Testosterone is an anabolic steroid; it is also the primary male sex hormone. It should be administered by a licensed health professional. However, individuals are not deterred by the health risks associated with self-injection with the use of black market preparations of performance-enhancing injections like testosterone, used often for success in sports or for physical physique. Within the black market, injections are often provided without any surveillance or prior approval. In addition to this, testosterone is often used as a weight loss supplement, aide for gender conditions, and increases the risk for prostate cancer in males.

The patient is a Hispanic male in his early 50s who presented with a large abscess on his gluteal region, potentially exacerbated due to testosterone injections and suppression of the immune response. The patient is a competitive bodybuilder. On initial consult, the patient denied the use of steroids; however, testosterone injection was strongly suspected. The unique aspect of this particular case was that the patient was not immunocompromised in any manner (no HIV, chemotherapy, etc.). In addition to this, although the patient was treated with antibiotics empirically, his wound cultures were negative.

Following his initial visit, the patient was referred to a general surgeon given the large size of the abscess for I&D (incision and drainage). The drainage was described as voluminous and volcano-like. The patient had the abscess drained by a general surgeon and postoperatively followed up every day for the weeks following with North Miami NSU Clinic for wound packing and redressing as the infection healed. Although the wound cultures came back negative, testosterone may have exacerbated the infection and had a role in suppressing the function of the immune system in the fight against infection.

**Discussion:** Although mainstream advertisements propose for the use of testosterone in treating a variety of ailments, the reality is that testosterone is being used as a “snake oil.” While it may hold some therapeutic value, there is a deficit in knowledge about the long term or adverse effects of testosterone supplementation. Usage of testosterone without proper diagnostic and therapeutic evaluation can be very detrimental to the health status of patient, resulting in several unprecedented complications. Marketing for testosterone can be very aggressive and it is important that patients are aware of the risks associated with testosterone supplementation, which includes increased risk for infection, cardiac events, and prostate cancer.

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**Title:** A Case of Amyloid Cardiomyopathy

**Authors:** Anmmarie Jaghah, OMS3; Taylor Kolb, OMS3; Sunny Hussain, MD, PGY3; Julia Ladna, DO, PGY1

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Amyloid cardiomyopathy most commonly manifests as heart failure with symptoms of dyspnea and edema. Light-chain (AL) amyloidosis typically presents in patients over the age of 50. Presenting symptoms may be angina and syncope as well as decreased appetite and weight loss secondary to involvement of other organs. Low cardiac output may also contribute to renal dysfunction. A combination of heart failure along with heavy proteinuria, periorbital purpura, or hepatomegaly disproportionate to the degree of heart failure strongly suggests AL amyloidosis. Echocardiography is the initial noninvasive test of choice to diagnose cardiac amyloidosis. Increased left ventricular wall thickness with evidence of diastolic dysfunction is the earliest abnormality seen on echo. The diagnosis is confirmed by endomyocardial biopsy showing amorphous hyaline deposits composed of non-branching fibrils which bind Congo red and produce green birefringence under polarized light. Diagnosis may also be confirmed by histologic examination of a biopsy from the abdominal fat pad, rectum, or kidney. Subcutaneous aspiration biopsy of abdominal fat will stain positive for amyloidosis in >70 percent of patients with AL amyloidosis. Bone marrow biopsy should also be included in the workup of cardiac amyloidosis as plasma cell dyscrasia is present in >80% of patients and shows amyloid deposits in 60%.1

**Case Description:** A 47-year-old male with a PMHx of hyperthyroidism s/p radioactive iodine ablation, HTN, CAD, HFrEF secondary to ischemic cardiomyopathy, and newly diagnosed atrial fibrillation presented to the ED with a complaint of weakness. On arrival, a CT angiogram was performed which showed pleural effusions right greater than left with associated atelectasis. Troponins were slightly elevated at .4 in the setting of CAD followed by repeat troponins of .38, .46, and .39 respectively. He underwent an echo on 9/17/19 which showed increased myocardial thickness with apical sparing on strain analysis consistent with amyloidosis. A nuclear medicine scan was done which was negative. However, free kappa was 28 (reference range .33-
1.94 mg/dL), free lambda was 668 (reference .57-2.63 mg/dL) and the kappa/lambda free light chain ratio was .041 (reference .26-1.65). A fat pad biopsy was then done which showed minute foci of orange red coloration on congo red stain. Observation under polarized light was indeterminate for apple green birefringence secondary to a minute specimen. Hematology/Oncology was consulted for further workup of the elevated kappa and lambda light chains and a beta 2 microglobulin level was obtained and found to be elevated at 6.03. A flow cytometry was done which showed 2.3% lambda predominant plasma cells as well as a small subpopulation (.3%) expressing CD56. Bone marrow clot smears were significant for approximately 5% plasma cells by manual count. On the morning of 9/28/19 the patient went into PEA and a code blue was called and unfortunately after more than 30 minutes of resuscitation efforts the patient expired.

**Discussion:** This case illustrates the importance of maintaining a high index of suspicion for Cardiac Amyloidosis in those with an unclear myriad of cardiac symptoms.

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**Title:** Point-of-Care Ultrasound Diagnosis of Fournier's Gangrene

**Authors:** Dennis James, MD, PGY1; Gaurav Patel, MD; Vu Huy Tran, MD

**Program:** Aventura Hospital and Medical Center, Emergency Medicine Residency Program

**Introduction:** This is a case of a patient with a large right-sided deep tissue infection within the buttoc and perineal region causing septic shock and requiring emergent surgical debridement. We will discuss how the diagnosis was made rapidly at bedside using point-of-care ultrasonography (POCUS).

**Case Description:** 54M presents to the ED with complaints of right gluteal abscess. Patient states he's had this issue for 1 month associated with subjective fevers and diarrhea for 2 weeks. He was seen by an urgent care center and prescribed doxycycline without relief. The erythema, swelling, and pain worsened over one week, until the pain was unbearable. Patient denied other associated symptoms including bloody stool, abdominal pain, nausea, vomiting, or dysuria. He denies recent travel, IV drug use, or sexual intercourse.

Vital signs: Temp 101.8°F, HR 105 bpm, BP 89/61, RR: 18, SpO2: 99%. The patient was awake, alert, and non-toxic appearing. On exam, there was a large area of erythema and induration of the right gluteal region involving the base of the right sacrum to the right scrotum which was exquisitely tender. Fourniers gangrene was strongly suspected and a bedside ultrasound of the affected area was performed to evaluate for extent of presumed abscess. Bedside ultrasound revealed a subcutaneous fluid collection (hypoechoic collection with subcutaneous edema) as well as hyperechoic gas in the deep tissue. A sepsis alert was called and broad-spectrum antibiotics (cefepime, clindamycin, and vancomycin) and intravenous fluids started per protocol. A CT was performed to evaluate the extent of the collection. Labs: WBC 28.4, 87% PMNs, Hb 11.8, Hct 35.1, Lactic acid 2.9, Na 133, K 3.2, Cl- 95, HCO3- 24, BUN 25, Cr 1.10. The patient

**Discussion:** General surgery and urology were consulted and performed an emergent debridement with retroperitoneal abscess evacuation. Perineal analysis demonstrated gray, tan, and pink fibroadipose tissue with abscesses and necrosis. Scrotal pathology revealed 3+ Gram positive cocci in pairs, 3+ Gram negative rods, 2+ Gram positive rods with the primary and secondary organisms being Streptococcus constellatus and Bacteroides thetaiotaomicron, respectively. Blood culture showed B. thetaiotaomicron bacteremia causing hematogenous spread. Antibiotic regimen was switched to metronidazole and cefepime, as per sensitivities. Seven days post-surgery, he was transferred out of the ICU.

This case demonstrates how POCUS was able to rapidly identify necrotizing fasciitis and facilitate further management. Ultrasonography can be used to confirm the suspicion of necrotizing infections rapidly. Important sonographic findings include subcutaneous tissue thickening, fluid collections, fascial irregularity, and subcutaneous air.

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**Title:** Third Case of Malignancy in a Patient with Morquio Syndrome

**Author:** Geethu James, OMS3

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Morquio syndrome, or mucopolysaccharidosis IV, is an autosomal recessive lysosomal storage disorder. Incidence of the two variants of Morquio syndrome, A and B, are 0.22 and 0.14 per 100,000 births, respectively [6]. Improper degradation of glycosaminoglycans leads to improper cartilage and bone development. Classically, this presents as different combinations of musculoskeletal anomalies, including shortened trunk, pectus carinatum, short neck, muscular atrophy, thoracic kyphoscoliosis, and odontoid hypoplasia [3]. However, there are few documented associations of malignancy with Morquio syndrome. A review of literature only revealed two other cases of malignancy in Morquio syndrome patients: osteosarcoma in an 18-year-old male and metastatic gastric adenocarcinoma in a 30-year-old male, diagnosed at age 3 [4,5].

**Case Description:** We present the case of a 46-year-old Hispanic male with a history of Morquio syndrome, asthma, and hypertension who arrived at the emergency department complaining of abdominal pain, constipation, and shortness of breath. CT scan of his abdomen revealed air-fluid levels and severe distension of the colon and small bowel, providing suspicion for colonic obstruction. He became pulseless and cyanotic in the emergency department and was intubated and started on vasopressors, prior to admission to the intensive care unit. Flexible sigmoidoscopy conducted by Gastroenterology revealed an obstructive apple core lesion to the presumed proximal sigmoid colon preventing further advancement of the scope. The patient was emergently transported to the operating room for an exploratory laparotomy with descending and sigmoid colectomy and diverting colostomy creation. Surgical pathology of the resected colon demonstrated invasive colonic adenocarcinoma with invasion of the sub-serosal tissue, negative margins and twenty-six lymph nodes negative for malignancy. The patient's postoperative course was complicated by episodes of bronchospasm, transient cardiac arrest, right lower extremity deep vein thrombosis, angioedema, and bleeding from his colostomy. The patient repeatedly failed weaning trials from mechanical ventilation and thoracic surgery and otolaryngology surgery were consulted for possible tracheostomy. Due to the challenging anatomy of his shortened
neck, his baseline inability for cervical extension, and increased risk for airway stenosis, tracheostomy placement was not recommended. After discussion with the family at bedside, the patient was withdrawn from mechanical ventilation and provided comfort care until his expiration.

**Discussion:** This case serves to report a novel occurrence of malignancy in a rare lysosomal storage disorder. Despite prompt diagnosis and surgical resection, post-operative complications as well as the anatomical abnormalities associated with Morquio syndrome prevented a more successful outcome.

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**Title:** A Curious Case of Lymphadenopathy: An Extra-Pulmonary Presentation of Tuberculosis  
**Authors:** Amit Jangam, DO; Shane Williams, DO; Katherine Fu, OMS3; Shivani Trivedi, OMS3  
**Program:** Palmetto General Hospital, Family Medicine Residency Program

**Introduction:** Tuberculosis (TB) is still a significant epidemic worldwide. According to the World Health Organization (WHO), TB is still one of the top 10 causes of death worldwide and leading infectious cause of death. In 2018, there were an estimated 1.2 million deaths in HIV-negative people. Although TB most often infects the lungs, extrapulmonary TB can present in various forms, the most common of which is Tuberculosis Lymphadenitis, occurring in about 35-40% of patients with extrapulmonary TB in the United States. Risk factors include female gender, HIV infection, young age, and Asian or African origin. Cervical lymph nodes, especially supraclavicular, submandibular, posterior cervical, and jugular, are the main sites of infection. Ultimately, extrapulmonary TB is treated similarly to pulmonary TB.

**Case Description:** We present a case of a 21-year-old Haitian female without any significant past medical history who initially presented to the clinic to establish care after a post hospital discharge follow-up for cervical adenopathy. The patient had noted mild cervical adenopathy about 1 year prior to presentation. Per the patient, evaluation at that time by her primary care physician had suggested the lymph node was likely benign. However, she had noticed growth of her lymph nodes both in size and number before presenting to our clinic. The patient immigrated from Haiti to the U.S. in 2012. She had no known history of TB exposure, incarceration, homelessness, and did not work as a healthcare worker. The patient denied any unintentional weight loss, night sweats, or hemoptysis. Physical examination showed multiple, enlarged, mobile cervical lymph nodes, including anterior cervical, posterior cervical, and supraclavicular lymph nodes. Initial lab workup was negative for HIV and syphilis, and positive for EBV IgG but negative for EBV IgM. Soft Tissue Neck Ultrasound showed multiple bilateral cervical lymph nodes; largest lymph node on the right measured 2.1 cm with 1 supraclavicular lymph node measured 2.1 cm, and largest lymph node on the left measured 3.8 cm and 2 supraclavicular lymph nodes measuring 1.9 cm and 2 cm. Patient was referred to Oncology and ENT.

Initial suspicion leaned toward a lymphomatous process. PET/CT scan showed increased FDG concentration and uptake identified in bilateral-lateral neck, supraclavicular regions, right and left upper axillary lymph node, as well as right lower abdominal mesentry, all fulfilling quantitative criteria for viable neoplasm. Excisional biopsy of right supraclavicular lymph node showed necrotizing granulomatous lymphadenitis and positive Acid Fast Bacilli, but no diagnostic fungi, and no diagnostic malignancy. Patient was then referred to Infectious Disease. Wound culture, fungal culture, and Gram stain of the right supraclavicular lymph node were negative. However, Quantiferon Gold was positive. Overall, the patient’s clinical picture indicated granulomatous lymphadenitis likely secondary to Mycobacterium tuberculosis. The patient was then placed on Rifampin, Isoniazid, Pyrazinamide, and Ethambutol therapy. The AFB culture eventually came back positive and confirmed the presence of Mycobacterium Tuberculosis.

**Discussion:** This case illustrates the importance of considering atypical presentations of common diseases, as well as integrating a thorough clinical investigation in order to avoid missing other serious causes.

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**Title:** When the Mosquito is Gone, but Families Have to go on Establishing a Medical Home for the Pediatric Patient Diagnosed with Congenital Zika Syndrome  
**Authors:** Jessica Jean-Baptiste, OMS3; Gabriela Lins, OMS4; Lisa Gwynn, DO  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Congenital Zika syndrome occurs when the Zika virus (ZIKV) is vertically transmitted from mother to baby in utero. Rarely seen in the U.S., only ten congenital Zika syndrome cases have been identified in the state of Florida since 2016. ZIKV is a neurotropic virus that preferentially kills neuroprogenitor cells affecting brain development. Congenital Zika syndrome can present with the following complications: microcephaly, delayed brain development, feeding problems, hearing loss, seizures, vision abnormalities, and contractures. These manifestations can lead to severe disability and take a toll on the pediatric patient and their family. This case examines the clinical presentation of a 3-year-old male from El Salvador brought to a local pediatric mobile clinic for a well child visit.

**Case Description:** During this initial visit, the patient’s mother established that she was exposed to the Zika virus during her pregnancy. Furthermore, the family had only been living in the U.S. for the past three months and had not established medical care for their son due to lack of resources. The patient’s review of systems revealed that the patient does not speak or ambulate. His physical exam included anthropometric measurements including weight, height, head circumference, and BMI. The patient fell below the 1% for head circumference meeting criteria for microcephaly. His weight was under 1% diagnostic for failure to thrive. Further exam findings included a positive Hirschberg test, suscal dimpling, contractures of bilateral limbs, poor head control, and inability to ambulate or speak. His assessment included an eye strabismus, possible spinal bifida, and global developmental delay respectively based on physical exam findings.

The patient’s clinical findings coupled with his mother’s exposure to ZIKV during pregnancy were highly suggestive of congenital Zika syndrome. However, other differentials for microcephaly include: CMV, HIV, VZV, and Rubella. Differentiating features include rash and hepatomegaly, which have not been reported in congenital Zika syndrome. During this initial visit, the patient’s plan compromised of receiving vaccinations, anticipatory...
guidance and he was referred to multidisciplinary specialty care. On subsequent visits, the patient was referred to greater ancillary social and medical services such as WIC and monitoring at the Zika Exposure unit with the local affiliated hospital. This partnership further established a safety net for the patient and his family as well as it provided the family access to confirmatory testing through the FL Department of Health; the plaque reduction neutralization test (PRNT) was confirmed to be positive.

**Discussion:** This case established the fundamental role that the medical home plays in helping manage the complex care of the pediatric patient diagnosed with congenital Zika syndrome. Although the mosquitoes that carry ZIKV are no longer in our backyards, the children and families affected by them still are. In a global society, it is imperative that healthcare providers familiarize themselves with the clinical phenotype of congenital Zika syndrome, as well as proper management with the establishment of the medical home.

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**Title:** Always Something Different: Another Variation of Presentation of Hodgkin Lymphoma  
**Authors:** Marie Jean-Baptiste, DO, PGY2; Evan Layton, DO, PGY3  
**Program:** Palm West Hospital, Pediatric Residency Program

**Introduction:** Hodgkin Lymphoma (HL) is the most prevalent form of lymphoma in the developed world and the most prevalent neoplasm in patients aged 10-19. The typical presentation that often comes to mind is painless lymphadenopathy and a mediastinal mass on CXR or CT scan. B symptoms are fairly common, presenting in 40-60% of cases. Prognosis is partly dependent on the stage at which treatment is started. Given the fact that the typical early presentation of HL shares common symptoms in children with the common cold, pediatricians should have a low threshold to perform a reasonable workup and increase the chances of early detection with better prognosis.

**Case Description:** We present the case of a 14 y/o previously healthy female who presents with a c/o intractable upper back pain lasting for 3 weeks. Pain was located around her left scapula, radiating to the left axillary region and left anterior chest wall. Reported some unintended weight loss of about 25lbs over the previous 6 months and occasional night sweats. Denied fevers, difficulty breathing or shortness of breath. She was seen at the PCP 2 months prior to presentation for evaluation of a “right lump in her neck”, diagnosed with presumptive cat scratch disease, started on Zithromax that she sought out a second opinion. On initial evaluation, she was in obvious pain, afebrile and non-toxic appearing. Labs showed microcytic anemia, mild lymphocytosis, ESR >145, mildly elevated PT with normal INR; CMP, uric acid and LDH were wnl. CXR had a large lobular mass in the mediastinum with narrowing of the trachea, and a small opacity in the left lung with small left pleural effusion. CT showed several soft tissue masses in the anterior and superior mediastinum, narrowing of the trachea, 3.5cm left axillary mass, compression of the SVC, mild bilateral pleural effusion and atelectasis. Examination showed patent airway with decreased breath sounds at the left apex posteriorly but otherwise clear; a palpable anterior left chest protrusion and superior mediastinum, narrowing of the trachea, and a small opacity in the left lung with small left pleural effusion. CT showed several soft tissue masses in the anterior and superior mediastinum, narrowing of the trachea, 3.5cm left axillary mass, compression of the SVC, mild bilateral pleural effusion and atelectasis. Examination showed patent airway with decreased breath sounds at the left apex posteriorly but otherwise clear; a palpable anterior left chest protrusion and 5x2cm prominent right supraclavicular lymph node. After reviewing imaging, biopsy pathology and PET scan, her HL lymphoma was graded as grade III/ IV x with a poor prognosis.

**Discussion:** This case demonstrates an atypical presentation of HL. At the time of presentation there was already bone involvement (only present in about 6.5 % of cases). Usually the lymphadenopathy is painless, but our patient presented with a painful progressively enlarging cervical lymph node that was one sided on the opposite side of the mediastinal mass. She also presented with left sided anterior chest wall swelling. Another notable fact is that she appropriately sought treatment early in the disease process, with the presentation of the “neck mass” which was inappropriately followed, leading to a later diagnosis and a poorer prognosis.

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**Title:** Infection of Urachal Cyst  
**Authors:** Morgan Jensen, DO, PGY1; Kristen Hanrahan, DO  
**Program:** St Lucie Medical Center, Emergency Medicine Residency Program

**Introduction:** Abdominal pain is one of the most common chief complaints in the emergency room, with a broad differential diagnosis. However, a unique and rare cause of abdominal pain in the elderly population is an infection of a urachal cyst remnant. This is an infection where an understanding of embryology is pertinent to understanding the disease. Discussed in this case is the presentation of the disease process, initial work up and hospital course for infection of the urachal cyst.

**Case Description:** The patient presented to the emergency department with chief complaint of progressively worsening abdominal pain with distention. Patient reports the abdominal pain has been worsening over the past week with decreased bowel movements and intermittent chills. His abdomen was firm, severely distended with generalized tenderness to palpation, guarding and rebound present. He was also noted to have an umbilical hernia, easily reducible with mild overlying erythema. CT abdomen and pelvis revealed infection of the urachal cyst. Patient was admitted to the hospital for further surgical and medical evaluation. He was seen by the medical team, urology and infectious disease.

**Discussion:** Infection of the urachal cyst is a unique and rare cause of abdominal pain. Embryology must be remembered to understand the infectious process. A urachal cyst is a sinus remnant structure from the urachus, a structure that connects that bladder of the fetus and travels within the umbilical cord during fetal development. Normally used to drain the bladder during fetal development, it may remain patent in the early weeks of life and produce urine from the umbilicus. This remnant may become infected in the early weeks to months of life, rarely causing problems in adolescence or adulthood.
MFC. Patient was started on IVIG, plasmapheresis and steroidal treatment which improved her condition significantly and patient was discharged.

Autoimmune encephalitis. Lab results revealed positive antibodies to VGKC, which confirmed the diagnosis of limbic encephalitis as a symptom of hallucinations. Given the combination of progressive behavioral changes and cognitive decline, an autoantibody screening was done to test for seizures (FBDS) and catatonia, which had been present from the beginning, became more marked. She also presented with a new onset of audiovisual treated with two doses of cyproheptadine. Despite the treatments, the patient's condition continued to deteriorate. Symptoms of faciobrachial dystonic respiratory mechanical ventilation and was treated with physostigmine for possible anticholinergic delirium. However, there was no improvement in the cells extending to the mucosa. No lymphoepithelial lesions were present.

The informed consent for description of the case report was obtained from the patient.

Discussion: Plasmacytoma can be primary or secondary with secondary form more common. The most commonly involved sites are the liver, spleen, and lymph nodes. The prevalence of GI system involvement was found to be 0.9% in a recent systematic review done with 2,584 Multiple myeloma (MM) patients. This is associated with a poor survival of less than seven months from diagnosis. Favorable outcomes in cases of EMP have been linked to tumor size <4 cm, age <50 years, patients with head and neck EMP, and serum M protein negativity.

We have described a rare case of gastric plasmacytoma without symptoms of MM.

Title: Gastric Extramedullary Plasmacytoma Presenting as a Solitary Gastric Mass
Authors: Dieula John, MD, PGY1; Balarama Krishna Surapaneni, MD, PGY2; Tony Cantave, MD, PGY5; Steven Kaplan, MD
Program: Aventura Hospital and Medical Center, Internal Medicine Residency Program

Introduction: Extramedullary plasmacytomas (EMP) are a subcategory of plasma cell neoplasm that involves organs outside the bone marrow. We report a case of an aggressive extramedullary myeloma invading the stomach.

Case Description: An 84-year-old woman with a past medical history of type 2 diabetes mellitus, hypothyroidism, hypertension and gastroesophageal reflux disease presented to the emergency room with abdominal pain, nausea and vomiting for 2 days. Patient was found to be anemic with Hgb of 10.7 g/dL, hematocit 32.4%. Patient’s electrolytes and renal function tests were within normal limits. Imaging (US) of the abdomen showed gallbladder calculus with positive Murphy’s sign and no pericholecystic fluid. A CT scan of the abdomen and pelvis showed a large hiatal hernia with suspicion of choledolithiasis. A HIDA scan showed no evidence of cystic duct obstruction or distal biliary obstruction. After cholecystitis was ruled out GI was consulted and an EGD was planned for intractable abdominal pain with intermittent vomiting. During the EGD findings [Figure 1] were noted for a 3.5-4 cm nonbleeding, non-ulcerated mass on a very large stalk that appeared to be blocking the pylorus [Figure 2]. The pylorus was normal appearing once past the mass. The polyp was partially resected. A small polyp was resected but the larger polyp was not able to be removed due to getting stuck at the criopharyngeus so it remained in the stomach [Figure 3]. Biopsy findings were noted predominantly of well-differentiated plasma cells with some of the cells extending to the mucosa. No lymphoepithelial lesions were present.

The immunohistochemical stains were positive for CD138 [Figure 5] and showed a low Ki-67 proliferation index of <5%. The neoplastic cells were lambda light chain restricted. Rare plasma cells are positive for kappa. They were negative for PAX5, CD20, CD56, c-KIT, cyclin D1 and pankeratin. CD3 highlights background T-cells. Based on the findings a plasmacytoma or secondary involvement by multiple myeloma was favored. However, a B cell lymphoma with extensive plasmacytic differentiation could not be entirely excluded. Bone marrow biopsy was not done because the patient had refused the procedure.

The informed consent for description of the case report was obtained from the patient.

Discussion: Plasmacytoma can be primary or secondary with secondary form more common. The most commonly involved sites are the liver, spleen, and lymph nodes. The prevalence of GI system involvement was found to be 0.9% in a recent systematic review done with 2,584 Multiple myeloma (MM) patients. This is associated with a poor survival of less than seven months from diagnosis.

We have described a rare case of gastric plasmacytoma without symptoms of MM.

Title: Morvan's Syndrome: A Needle in a Haystack of Autoimmune Diseases
Authors: Kevin John, OMS3; Sandhya Haryani, OMS3; Mihir Nakrani, OMS3; Neville Mathews, OMS3
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Morvan Fibrillary Chorea (MFC) also known as Morvan's syndrome, is an extremely rare condition that presents with a constellation of neurological symptoms such as neuromyotonia, insomnia, diaphoresis, hallucinations, and encephalopathy. A significant proportion of this patient population tests positive for autoantibodies to the voltage-gated potassium channels (VGKC), which are believed to play an important role in the pathogenesis of this syndrome. An important complication MFC is limbic encephalitis, an abscute onset of disorientation, seizures, hallucinations, sleep disturbances and agitation. Limbic encephalitis is a paraneoplastic syndrome with a poor prognosis, therefore early recognition and treatment in these patients is important. However, the vague sensory complaints with fluctuating behavioral abnormality of this disorder often leads to misdiagnosis with psychiatry disorders and delayed treatment. Therefore, it is paramount to differentiate MFC from psychiatry disorders for proper and rapid treatment.

Case Description: A 40-year-old female with a past medical history of anxiety, depression and CVA presented with a three-day history of severe agitation, tachycardia, diaphoresis, acute seizures, insomnia, catatonia and urinary retention. According to the family, the patient was recently prescribed and taking benzodiazepine, fluvoxamine, bupropion and ipratropium. The initial computed tomography (CT) and magnetic resonance imaging (MRI) of the brain revealed no acute intracranial abnormality. Lab results including blood, urine and CSF cultures were unremarkable. On physical exam patient was found to have decreased breath sounds and rales bilaterally. Given the clinical and physical exam findings, the patient was put on respiratory mechanical ventilation and was treated with physostigmine for possible anticholinergic delirium. However, there was no improvement in clinical symptoms which led to further evaluation from psychiatry. The psychiatrist concluded possible serotonin syndrome for which the patient was treated with two doses of cyproheptadine. Despite the treatments, the patient’s condition continued to deteriorate. Symptoms of faciobrachial dystonic seizures (FBDS) and catatonia, which had been present from the beginning, became more marked. She also presented with a new onset of audiovisual hallucinations. Given the combination of progressive behavioral changes and cognitive decline, an autoantibody screening was done to test for autoimmune encephalitis. Lab results revealed positive antibodies to VGKC, which confirmed the diagnosis of limbic encephalitis as a symptom of MFC. Patient was started on IVIG, plasmapheresis and steroidal treatment which improved her condition significantly and patient was discharged.

Discussion: Morvan’s syndrome is a rare condition with a significantly low incident rate, almost exclusively seen in males. It is mainly a clinical diagnosis that presents with a combination of CNS, ANS and PNS symptoms that make it difficult to distinguish it from other psychiatric disorders. However, the treatment modalities for a psychiatric disorder is different than treatment for MFC. MFC requires a combination of plasmapheresis, IVIG and steroidal treatment. In this case, the patient was falsely diagnosed with anticholinergic delirium and serotonin syndrome which delayed the proper treatment and worsened her condition. Anti-VGKC antibodies and a careful history should be obtained for early diagnosis and treatment to prevent mortality associated with limbic encephalitis and morbidity associated with cerebral atrophy. In the future, MFC should be considered in a patient with atypical psychiatric symptoms.
Title: A Case of Ovarian Metastasis from a Primary Colorectal Mucinous Adenocarcinoma
Authors: Jaquelin Johnson, OMS3; Andrea Dager, DO, PGY2; Juan De La Ossa, DO, PGY2; Hugo Ferrara, MD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Colorectal cancer is a leading cause of cancer-related death worldwide, and the third leading cause of cancer-related death in the United States. Statistics show that 10-20% of colorectal carcinoma are mucinous adenocarcinoma, often diagnosed at an advanced stage in young female patients. Colorectal cancer has various sites of metastasis and at these sites, the ovaries are one of the more unusual locations. In fact, ovarian metastasis from colorectal cancer accounts for only 7-9% of cases.

Case Description: We present the case of a 45-year-old G1P1 female with a past medical history of hypertension, hyperlipidemia, and microcytic anemia who presented to the OB-GYN with the complaint of severe pelvic pain and irregular menses for four months. Her last menstrual period was 10/24/2019. The patient denied any history or tobacco or alcohol use. Upon physical examination, the patient had a palpable pelvic mass and an ultrasound was ordered. Results of the pelvic ultrasound were consistent with a 9.5 cm solid mass of unknown etiology. A previous pelvic scan in 2018 was unremarkable. A CA125 level was done and resulted above high normal (115) and ROMA was 3.63 (also above high normal). Subsequently, the patient was scheduled for a total hysterectomy with bilateral oophorectomy with possible BSO. Upon laparoscopic visualization, the patient was found to have an approximately 15 cm x 15 cm right adnexal multicystic mass with involvement of the left ovary with multicystic lesions. Numerous peritoneal implants were also visualized in the cul-de-sac bladder flap, diaphragm, and omentum. Surgical oncology was consulted and found an appendiceal mass with adhesion to the ileum. Surgical Oncology then performed a retroperitoneal dissection with right ureteral lysis, omentectomy, and right hemicolectomy. Pathology reports were consistent with mucinous adenocarcinoma of gastrointestinal origin, specifically the cecum. The patient was hospitalized for 5 days postoperatively. At time of discharge she was ambulating, advancing her diet, and had her pain well controlled. At follow up with OBGYN she reported she was slowly improving and following up with an oncologist for further evaluation with a PET-scan.

Discussion: This case illustrates the diagnosis of mucinous adenocarcinoma by visualization of metastatic lesions to the ovaries leading to further exploration and discovery of the primary tumor in the cecum.

Title: Heralding Lesion Gives Way to Diagnoses of Pityriasis Rosea
Authors: Talar Kachechian, DO, PGY2; Amit Jangam, DO, PGY2; Lailah Issac, DO
Program: Palmetto General Hospital, Family Medicine Residency Program

Introduction: Pityriasis rosea is an acute, self-limited, exanthematous skin disease characterized by the appearance of slightly inflammatory, oval, papulosquamous lesions on the trunk and proximal areas of the extremities. It typically affects young adults and children. Although the etiology is unclear, several factors indicate an infectious cause. First, outbreaks of the condition occur in clusters, suggesting an infectious agent is circulating. Next, recurrence outside the acute phase if rare which suggests that there is long-lasting immunity after the infection. The rash typically lasts about 5 to 8 weeks and resolved in more than 80% of patients. Treatment goals have been focused on controlling pruritus through zinc oxide, calamine lotion, topical steroids, oral antihistamines, and even oral steroids. Ultraviolet radiation has been recommended to decrease the duration of the rash and intensity of itching for patients. However, if the rash or pruritus lasts more than three months, physicians are encouraged to consider a biopsy to confirm the diagnosis.

Case Description: We present a case of a 23-year-old male patient with past medical history of childhood asthma, eczema, and ADHD who noticed a rash for two weeks which started on his anterior hips and spread to his back. The rash was described as very itchy. He denied fevers, chills, headaches, numbness or tingling in the areas, arthralgia, rhinorrhea, recent illness, cough, sore throat, nausea, vomiting, abdominal pain, or diarrhea. He did recall going to a new gym last months as well as changing his detergent over a month ago as well. Patient adds that he was not out camping, exposed to the sun or tested for any sexually transmitted diseases in the past. There were no lesions on his palms or soles nor genitourinary symptoms. The lesions first appearing on his anterior hip area were about 2 cm in diameter, ovoid, erythematous, and slightly raised with a collarette of scale at the margin, which is typical of a herald patch. When he came back to the clinic three weeks later, crops of smaller lesions 5-10mm in diameter developed in the bilateral anterior hip area which were more salmon colored and dry. The lesions on his back followed the typical cleavage lines or Langer’s lines and aligned in the Christmas tree pattern, transversely across the lower abdomen and back. We ordered STD screening labs, Lyme disease antibodies, as well as sent the patient to dermatology.

Discussion: This case emphasizes the importance of recognizing pityriasis rosea as this can be challenging. The diagnosis is unclear at the onset of symptoms and there are no noninvasive tests to confirm the condition. In at least one half of patients, the first symptoms are nonspecific and consistent with a viral upper respiratory infection.

Title: A Rare Full Pentad: Recurrent Thrombotic Thrombocytopenic Purpura in Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
Authors: Anuj Khanna, OMS4; Niral Patel, DO, PGY2; Alexander Patel, DO, PGY2; Archana Maini, MD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Thrombotic thrombocytopenic purpura (TTP) is caused by a hereditary or acquired severe ADAMTS13 deficiency. Von Willebrand protease activity is typically below 10%. A pentad of symptoms may exist including platelet consumption due to small vessel platelet rich thrombi...
resulting in thrombocytopenia, anemia, fever, renal dysfunction, and neurologic abnormalities. It is considered a medical emergency and needs treatment with plasma exchange therapy.

**Case Description:** A 48-year-old African American male with poorly controlled HIV/AIDS CD4 count of 142 and two previous episodes of TTP within the last year presented to the emergency department with high grade fever up to 102 degrees Fahrenheit, anemia with hemoglobin of 5.9, platelets of 14,000, renal dysfunction with creatinine of 2, and altered mental status. A peripheral blood smear demonstrated a microangiopathic process with schistocytes. Labs were also significant for an elevated lactate dehydrogenase of 2,000, haptoglobin less than 8, and VWF protease activity of less than 3%. His presentation and labs were highly consistent with thrombotic thrombocytopenic purpura and he had the full pentad. He was emergently transfused packed red blood cells and fresh frozen plasma. A trialysis catheter was placed for emergent plasma exchange. His hospital course was complicated by Pseudomonas aeruginosa bacteremia secondary to line sepsis and he was concurrently treated with antibiotics. His mental status slowly improved after multiple plasmapheresis treatments, transfusions, and even starting rituximab over his 2-month hospital stay.

**Discussion:** The full pentad of TTP is rarely seen and should be in the differential of a patient with HIV/AIDS. Prompt recognition is required as mortality is high and plasma exchange must not be delayed. This particular patient's gram-negative sepsis complicated matters as he developed recurrent TTP during his hospital stay despite 3,000 to 4,000 milliliter plasma exchanges. TTP can be the presenting findings in someone with HIV. It is important to diagnose this condition rapidly and once appropriately treated, provide education regarding compliance with anti-retroviral therapy and about regular follow up.

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**Title:** Clinical Presentation and Treatment of Novel Dermatofibrosarcoma Protuberans  
**Authors:** Ariel Kidron, OMS1; Daniel Fischer, PGY2; Hiep Nguyen, OMS1; Tianyi Liu, OMS1; Jack Bayer, MS1  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Dermatofibrosarcoma protuberans is a rare, locally aggressive, and seldom metastatic soft tissue tumor usually confined to the dermis and subcutaneous tissues. The first case of DFSP was described in 1924 and termed by Hoffman in 1925. It accounts for less than 0.1% of all malignant neoplasms and 1% of soft tissue sarcomas. DFSP typically appears on the trunk or extremities and less often on the head and neck with most lesions being less than 5 cm in diameter. Herein, we report a rare case of the clinical and histopathological presentation of DFSP tumor and the surgical modality that was adopted.

**Case Description:** A 35-year-old Caucasian man presented to the ED for 10/10 sharp, squeezing chest pain. Examination of the chest revealed a mass forming out of scar tissue that developed after a traumatic MVA. The mass grew exponentially over the two months prior to his hospitalization. During this time the mass became increasingly painful causing intermittent stabbing pain, radiating to the back, lasting about 20 seconds, and recurring 20+ times throughout the day. Physical exam was remarkable for large, multilobulated, highly vascular chest wall mass localized to the left sternal border measuring approximately 10x12 cm with well-demarcated margins. The lower portion of the mass was firm while the upper portion was soft. The mass was highly tender. A CT scan of the chest showed a left anterior chest wall mass (11.3x8.8x6.3 cm) in the subcutaneous tissue. An MRI of the chest revealed multiple well-circumscribed, grape-like hypervascular masses in the subcutaneous soft tissue of the left anterior chest wall. There was predominant vascular supply from the intercostal and internal mammary chain vascular structures. Ultrasound-guided core needle biopsy had cores that showed a relatively monotonous spindle cell proliferation with storiform architecture. The mitotic rate was 8/10 HPIs coupled with the immunohistochemistry showing positivity for CD34 and vimentin, and negative for S100, desmin, epithelial membrane antigen, and CD68. Ki67 index was brisk and a STAT-6, and factor XIII were negative. Interpretation was read as spindle cell neoplasm of intermediate grade favoring DFSP. The patient was successfully treated by Mohs micrographic surgery at a specialized surgical institute followed by six weeks of radiation therapy. On 16 months follow-up, no recurrence has been observed and the patient achieved complete remission.

**Discussion:** This is unique as the patient was symptomatic with pain at the site of the lesion. The painful nature and slow growth of the DFSP tumor could be misdiagnosed as benign. DFSP is idiopathic. Some studies suggest that t(17;22) may play a role. This is thought to cause an upregulation of the PDGF-B polypeptide leading to proliferation. With the possible diagnosis of a lipoma, the patient underwent excision with Mohs micrographic surgery. Local recurrence following excision is common with treatment, and the prognosis is excellent (10-year survival rate of 99.1%). The effects of the DFSP treatment marked by loss of muscle tissue and radiation damage have permanently altered the patient’s daily life. This emphasizes the importance of diagnosing and treating a DFSP tumor early. DFSP’s high rate of misdiagnosis and potential for delay in management can lead to poorer outcomes and more complex treatment. Physicians should pay close attention to patient history of prior DFSP and changing appearance of scar tissue in their clinical evaluation.

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**Title:** Newly Diagnosed HIV in a 15-Year-Old Male with Persistent Necrotizing Fasciitis and Subsequent Fulminant Course  
**Authors:** Hoon Kim, DO, PGY2; Anthony Pearson-Shaver, MD  
**Program:** Palms West Hospital, Pediatric Residency Program

**Introduction:** HIV is a rare cause of immunosuppression in a pediatric population. There were 170,000 newly diagnosed children in 2018, bringing the estimated total number of children with HIV to 2 million. In the absence of ART treatment, 50% develop AIDS by 1 year of life, and 50% die by 2 year of life. However, there is a rare (<5-10%) subset of HIV patients named non-progressors, who remain asymptomatic and maintain CD4 counts above 350-500 cells/mm3 without treatment for at least 8-10 years. Here we introduce a rare case of a non-responder whose HIV status was unknown previously.

**Case Description:** A 15-year-old male with past medical history of eczema, mutism, and ADHD presented with fever and right lower extremity cellulitis extending from foot to mid-thigh. He was seen 2 days prior at an outside facility and was started on Amoxicillin/Clavulanate, without much improvement.
improvement. He was febrile, tachycardic (HR 140), tachypneic (R 30), normotensive (BP 122/57), CBC showed WBC of 5.5 with bandemia (B 50) and thrombocytopenia (Plt 129). CMP showed hyponatremia (Na 133), acidosis (Bicarb 18), elevated BUN/Cr (39, 1.15), and elevated AST/ALT (122/65). CRP was elevated at 6.2. Lower extremity x-rays were negative. Physical examination showed warmth and soft tissue swelling of lower extremity with tenderness. Scab was unroofed and weeping serous fluid was cultured. He was admitted and was placed on Ceftriaxone and Clindamycin. Ultrasound showed inguinal lymphadenopathy. Further history revealed that the caretaker was not the patient's biological mother. MRI of the leg on day 4 showed circumferential soft tissue swelling, cellulitis, and myositis. Wound culture grew MSSA and Strep pyogenes. Based on sensitivities, antibiotics were eventually adjusted to Nafcillin, Meropenem, and Linezolid. He underwent 3 surgical incisions and drainages by Orthopedics on day 5, 8, and 11, which helped him defervesce. Biopsy was consistent with necrotizing fasciitis. Immunodeficiency workup revealed that he was HIV positive and that his CD4 count was 422. Viral load was 79148. Lumbar puncture was performed, which showed HIV RNA PCR 2470. He was started on antiretroviral therapy. On day 23, he developed abdominal distension and CT abdomen showed colitis. Metronidazole was added. On day 27, blood culture grew Candida albicans and on day 28, he developed hypertension and possible bilateral fungal balls on renal US. Micafungin was started, later to be changed to Fluconazole. On day 39, blood culture grew Klebsiella. Meropenem and Tobramycin were started and changed to Cephalosporin based on sensitivities. He finished 28 days of Fluconazole and 14 days of Cephalosporin. He was discharged on day 57. He was seen outpatient for a follow-up in 6 weeks and he demonstrated good CD4 count and decreased viral load.

**Discussion:** HIV is an important cause of an acquired immunosuppression. Even in the setting of normal CD4 count, HIV cannot be ruled out due to the presence of non-progressors.

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**Title:** Unique Case of Reactivated Disseminated Varicella Zoster Virus and Herpetic Esophagitis in a Patient with Lupus Nephritis on Mycophenolate Mofetil and High-Dose Glucocorticoid Therapy: A Case Report

**Authors:** Sarah E. Kim, OMS3; Mohid Mirza, DO, PGY1; Robert L. DiGiovanni, DO; Rubaiya Mallay, DO

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Systemic lupus erythematosus (SLE) is a systemic autoimmune disorder with a wide range of manifestations and multiple organ involvement. Approximately 50% of SLE patients will develop involvement of the kidneys known as Lupus Nephritis (LN), a major risk factor for overall morbidity and mortality in SLE. The treatment of LN consists of combination therapy with corticosteroids, immunosuppressive agents, and biologics. Patients on this immunosuppressive regimen is at higher risk of viral infections, most commonly from parvovirus B19, cytomegalovirus, Epstein-Barr virus, and human simplex virus; however, there have been only a few documented cases of disseminated varicella zoster virus (VZV) in SLE patients.

**Case Description:** We present the case of a 30-year old Colombian female with a past medical history significant for SLE and Class IV LN. She presented to Largo Medical Center for evaluation of diffuse abdominal pain, nausea, and vomiting of one-week duration. While in the emergency department, a computed tomography (CT) of the abdomen/pelvis revealed a complex low-density collection extending into the left perinephric space. Interventionsal radiology aspirated the collection and found it to be a residual hematoma from renal biopsy three months prior, from which she was diagnosed with Class IV LN and was started on prednisone 60 mg and mycophenolate mofetil 1500 mg twice daily. During the hospital admission, she developed a puritic rash with a vesicular and umbilicated pattern encompassing her entire body. Biopsy of the lesions revealing herpesvirus etiology, together with the positive serology for VZV immunoglobulin with patient’s history of chickenpox as a child, was consistent with the final diagnosis of disseminated herpes zoster infection. In addition, she developed painful mouth ulcers, white plaques on the gingiva, and worsening dysphagia and odynophagia. Esophagogastroduodenoscopy (EGD) was performed revealing biopsy-proven acute erosive herpetic esophagitis. Following initiation of acyclovir treatment, she developed moderate-to-severe angioedema of the face, including the periorbital area and lips. Both the rash and the angioedema improved significantly with the addition of diphenhydramine to her daily medications. She was discharged on acyclovir, decreased doses of prednisone and mycophenolate mofetil, and was recommended to follow up outpatient with rheumatology and nephrology. Unfortunately, the patient was lost to follow-up.

**Discussion:** Comprehensive literature review demonstrates that infectious complications caused by VZV in the setting of combination immunosuppressive agents in a patient with lupus nephritis is extremely rare. Disseminated VZV often manifests in atypical and varied presentation in immunocompromised patients, posing a diagnostic challenge. This case report emphasizes the need to lower the threshold for diagnosis of VZV in lupus nephritis patients on immunosuppressive therapy. Although the current guidelines for treatment and prophylaxis of herpes zoster in immunocompromised patients only includes solid organ and hematopoietic stem cell transplantations, the overlap of immunosuppressive agents in lupus nephritis and post-transplant patients may allow for the modification of the guidelines to include this unique patient population.

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**Title:** Rare Presentation of Anti-NMDA Encephalitis

**Authors:** Adam Koller, OMS3; Tariq Jaber, MD, PGY3; Zahava Alishaev, OMS4; Rajiv Chokshi, MD

**Institution:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Paraneoplastic neurologic syndromes - such as Anti-NDMA encephalitis - are a complex set of disorders caused by mechanisms that are not related to metastases, metabolic/nutritional deficits, infections, or effects of therapy. Manifestations result when an immune response targets antigens not only expressed by the nervous system but also expressed by tumors. Clinical features include changes in behavior, psychosis, seizures, memory and cognitive deficits, dysautonomia, and altered level of consciousness. Systemic manifestations are rare which separates it from psychosis secondary to other traditional medical conditions. Two general approaches to treatment include removal of the antigen source by treatment of the underlying tumors and suppression of the immune response. Here we present a case of catatonia with autonomic dysregulation originally thought to be Neuroleptic Malignant Syndrome but ultimately diagnosed as Anti-NDMA (N-methyl-D-aspartate)-Receptor Encephalitis (ANRE).
**Case Description:** 36-year-old female with no past psychiatric or medical history developed acute onset of psychosis, later became catatonic, and treated in an inpatient psychiatric facility. The resulting rhabdomyolysis led to renal failure and she was transferred to the ICU. She had a CT and ultrasound showing a fibroid alongside an ovarian cyst. Anti-NMDA-receptor antibody was positive in both serum and CSF. The patient had several plasmapheresis treatments, upon which patient seemed to stabilize and was discharged. She was later readmitted to an inpatient facility for altered mental status, psychosis, and was treated successfully with steroids and IVIG. A review of imaging strongly suggested the ovarian cyst of the follicular type and fibroids. Patient was medically optimized with treatment and discharged pending follow-up for cyst and fibroid removal.

**Discussion:** ANRE classically presents in women with dermoid cysts. Current hypothesis suggests the etiology is due to antibody production by plasma cells in the brain, along with the antibody effects on brain circuitry. Plasma cells, via stimulation of inflammatory cells and changes in brain architecture, produce antibodies to the NMDA-receptor as a result of cross-reactivity with NMDA-receptors in the ovarian teratomas or dermoid cysts. Our patient had positive serum and CSF markers for the anti-NMDA-receptor antibody with two benign ovarian masses—fibroids and a follicular cyst. This is unique because most patients with ANRE have ovarian masses that are dermoid cysts, which have not been reported to be associated with or have concurrent fibroids. In fact, we believe this is a unique variant of ARNE, and has only been discussed in the literature in less than three case reports. Therapy for this variant of ARNE includes glucocorticoids, plasma exchange, IVIG or rituximab which had positive results for our patient. Because this type of disorder is considered paraneoplastic, removal of the mass is the ultimate therapeutic modality. Unfortunately, ANRE is commonly misdiagnosed as psychosis, meningitis or even drug abuse. Greater cognizance of this spectrum of diseases and due diligence in coming up with a broad differential may prevent misdiagnosis, patient dismissal and unnecessary intervention.

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**Title:** An Incidental Finding of an Aortic Dissection in a Negative D-Dimer Patient

**Authors:** Khaled Kudi, OMS3; Geidel Zambr, DO, PGY1; Jose Paz, DO; Marc M. Kesselman, DO

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Aortic dissection (AD) is a relatively uncommon medical emergency that has variable presentations, requiring clinicians to have a high index of suspicion. Type A AD most commonly has an abrupt onset with a severe non-migratory chest pain. An electrocardiogram (ECG) is routinely performed on these patients acutely and it is abnormal in 60% of Type A ADs. It can sometimes delay the diagnosis since acute coronary artery occlusion is pursued as more of a primary diagnosis. The D-dimer, a fibrin degradation product that is commonly used to help rule out the presence of a serious blood clot, has emerged as a widely used serum marker for excluding AD. A negative D-dimer (<0.50μg/ml) has a sensitivity of 97% and a negative predictive value of 96% for AD. Nevertheless, Nazerian et al. demonstrated that 8 out of 1850 patients with negative D-dimers had an acute aortic syndrome (AAS). AAS is the modern term that includes AD, intramural hematoma, and aortic ulcer. Implementation of the aortic dissection detection risk score (ADD-RS), a clinical tool that measures the likelihood a patient may be experiencing an AD, may help to standardize diagnostic decisions that involve advanced imaging for AD.

**Case Description:** A 54-year-old Hispanic male with hypertension and hyperlipidemia presented with a sudden onset of severe chest pain associated with dyspnea and nausea that began 5 hours prior to presentation. He is a former 8 pack year smoker whose father passed away from a myocardial infarction at 79 years old. On initial presentation, the patient appeared pale, diaphoretic and in acute distress. He was bradycardic at 52 beats per minute and hypotensive with a systolic blood pressure in the low 70s. The patient was treated with IV fluids and placed in reverse Trendelenburg for hemodynamic support. On physical examination, the chest pain was not reproducing upon palpation and a 1/6 systolic murmur was noted at the apex. Chest x-ray was negative for widening of the mediastinum and the D-dimer was negative at <0.150μg/ml (normal is <0.5μg/ml). The initial troponin, a protein that is released from damaged cardiac muscle, was negative at 0.154ng/ml (normal is <0.4ng/ml). Serial ECGs revealed non-specific ST segment and T wave abnormalities but no signs of ischemia. The second and third troponin levels were positive at 3.033ng/ml and 5.876ng/ml respectively. The patient continued to have intermittent chest pain with pre-syncope. A decision was made to perform cardiac catheterization the day after admission and resulted in the finding of the AD that involved the ostium of the right coronary artery. The CT scan of the chest showed a centrally displaced calcified intima that involved the ascending aorta and the aortic arch. He was sent for an emergent aortic prosthetic reconstruction, an aortic valve replacement with a bioprosthetic valve and a double coronary artery bypass graft using the saphenous vein. Ultimately, the patient was hemodynamically stable and discharged from the hospital.

**Discussion:** Despite the high sensitivity of the D-dimer for AD, a study by Nazerian et al. found that 4% of patients who had a high pretest probability for AD (ADD-RS >1) and negative D-dimer were diagnosed with an AAS. Consequently, using the ADD-RS along with the D-dimer can be especially helpful in atypical cases such as the one presented here.

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**Title:** Diagnosis and Treatment of Segmental Artery Mediolysis

**Authors:** James Kuhn, MD, PGY2; Yi Yang, MD, MPH, PGY3; Brian Baigorri, MD

**Program:** Aventura Hospital and Medical Center, Radiology Residency Program

**Introduction:** Segmental artery mediolysis (SAM) is a rare idiopathic noninflammatory vascular disease that is characterized by vascular abnormalities of splanchnic arterial branches. It most commonly involves middle-sized branches of the superior mesenteric artery (SMA). Patients classically present with a spontaneous intra-abdominal hemorrhage of the mesentery, peritoneum, or bowel lumen. Imaging is essential for diagnosis, often demonstrating fusiform aneurysm, stenosis, dissections or occlusions. Treatment is centered around the coil embolization of symptomatic or at-risk patients.

**Case Description:** We present the case of a 61-year-old male from the Cayman Islands with a 2-year history of prostate cancer and osseous metastasis who presented with a one-day history of epigastric pain, vomiting, and generalized weakness. The patient originally came to the United States from the Cayman Islands to start radiotherapy treatment for his prostate cancer, receiving a radiation treatment one day prior to admission. The physical exam was notable for a cachectic appearing patient with sharp epigastric pain on palpation. Initial hemoglobin was 9.5 which down trended to 7.1 over a 3-hour period.
span after admission. Abdominal CT revealed a large hyperdense mass surrounding the third segment of the duodenum consistent with a mesenteric hematoma. Follow up abdominal CT Angiography (CTA) revealed a pseudoaneurysm in the previously identified mesenteric hematoma. The patient underwent an angiogram which demonstrated multiple pseudoaneurysms with active extravasation originating from the inferior pancreaticoduodenal branch. These were subsequently successfully treated with coil embolization. 1-2 weeks later, follow up abdominal CTA demonstrated a stable hematoma with no active extravasation and resolving hemoperitoneum.

**Discussion:** This case demonstrates the complexities associated with the diagnosis and treatment of SAM under the guise of significant comorbid conditions. It also serves to improve patients’ outcomes by elucidating findings that may be associated with SAM. SAM is a rare disease (Incidence 1:100,000 per year) that usually presents with distension, bowel ischemia, or abdominal pain. Although the pathophysiology is incompletely understood, it is thought to be caused by repeated vasoconstrictive responses in the splanchnic vascular bed. CT angiogram is the modality of choice commonly demonstrating fusiform aneurysms, hemorrhages, dissections, and occlusions in medium-sized branches of the superior mesenteric artery. Treatment is recommended for symptomatic patients or aneurysms greater than 1cm. Coil embolization is most commonly utilized, but if it is not available or contraindicated, surgical ligation and resection of affected bowel viscera can be considered. Steroids are ineffective as SAM is a noninflammatory vascular disease. When SAM is found incidentally and does not require treatment, follow up is required. There is no consensus, but most experts recommend continued surveillance, only treating when patients become symptomatic or the aneurysm enlarges greater than 1cm.

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**Title:** Novel Combination of Chemotherapy: The New Hope in the Treatment of Metastatic Colorectal Carcinoma  
**Authors:** Maria J. Labra, MPH, OMS3; Jorge Hurtado-Cordovi, MD  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** The last decade has seen promising progress in cancer research and prevention, but despite significant breakthroughs in the understanding and treatment of cancer The American Cancer Society still reports over 200,000 cases of colon cancer in the US per year with adenocarcinoma comprising the vast majority of colorectal cancers.

**Case Description:** The patient is a 67 y/o Caucasian female with a past medical history of essential hypertension presented to Broward General Hospital (BGH) for further evaluation after being diagnosed with a newly rectal adenocarcinoma. The patient reports she was in her usual state of health up until three months ago when she experienced an insidious onset of bowel habit changes, intermittent rectal bleeding, and significant unintentional weight loss, which prompted her visit to the primary doctor. Subsequently, she was referred to a gastroenterologist for further evaluation. The patient underwent a colonoscopy procedure that showed an ulcerated mass in the rectum going about half the circumference of the colon. Biopsy results were consistent with moderately differentiated adenocarcinoma of the rectum. At BGH, the patient went for initial staging MRI that demonstrated a 6 cm long, circumferential lobular polyoid mass in the inferior rectum extending into the anal canal. The mass extended to the sphincter complex, involving the left internal sphincter, possibly involving the left intersphincteric plane, invading the levator ani and puborectalis muscle, and the posterior wall of the vagina/cervix. Mesorectal fascia adenopathy and at least 2 left pelvic sidewall lymph nodes of 13 mm in size were also identified. The assessment at this point was cT4bN2aM1a Stage IV metastatic (lung) rectal adenocarcinoma of unknown molecular profile and it was recommended to start FOLFOXIRI (folinic acid, fluorouracil, oxaliplatin, and irinotecan).

After 4 cycles of FOLFOXIRI, Avastin was added considering her molecular profile revealed a Kras mutation precluding EGFR therapy. After 6 cycles a new rectal MRI was performed to restage the tumor and gather treatment response. Results of the MRI showed a cranio-caudal tumor of 3.5 cm with a maximum thickness of 9 mm that had previously registered as 6 cm length and 20 mm of maximum thickness. The previously noted tumor of the left levator ani and puborectalis muscle was no longer identified on this MRI and the mesorectal lymph node measured 3.5 mm in comparison to 8 mm seen on the previous test. The 3.2 cm extramesorectal lymph node/mass in the left iliac lymph node chain adjacent to the lateral cervical wall seen on the previous examination now measures 2 cm in diameter and demonstrates relatively homogenous decreased signal intensity. A new CT of the chest revealed a marked regression of the multiple pulmonary metastatic lesions, with complete resolution of most of them. MRI findings showed a downstage of the tumor from T4 to T3. As per RECIST criteria, there has been at least a 40% reduction in tumor size. Currently, the patient is being surgically evaluated to consider curative intents.

**Discussion:** This case demonstrates that the new combination of FOLFOXIRI plus molecular targeted therapies such as Avastin (bevacizumab), has shown to be effective as a first-line treatment in advanced metastatic colorectal cancer setting the stage for a hopeful future in scientific research and efforts to advance definitive cancer treatment.

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**Title:** An Incidence of Duplicated Princeps Pollicis and Radialis Indicis Arteries  
**Authors:** Nicholas Lampasona, OMS2; Brandon Laporte, OMS2; Taylor Mazzei, OMS2; Arthur Speziale, OMS2; Gary Schwartx, MD; Nicholas Lutfi, MD, DPM  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** The princeps pollicis artery (PPA) is typically a direct branch off the deep palmar arterial arch. Being aware of a possible second PPA and radialis indicis artery holds relevance in the realm of orthopedic surgery, plastic surgery and radiology. This case report details the importance of this anatomic anomaly for clinicians performing various clinical procedures and may affect patients' prognoses as well. Surgical procedures that require precise knowledge of the first web space include Dupuytren's contracture release, trigger thumb release, and syndactyly release at the first web space. Moreover, special attention must be directed to the PPA and blood supply to the thumb in the case of 1st CMC joint arthroplasty (trapeziectomy) and treatment of thumb amputations involving replants and/or transfers. Thorough preoperative evaluation can help elucidate such vascular abnormalities as described in this case study and prevent intraoperative complications.
**Case Description:** This case explores the first web space of a 90-year-old female cadaver in which the right hand has a duplicated princeps pollicis artery (PPA) and radialis indicis artery. These vessels originate from the superficial palmar arterial arch as variant vessels, as well as from the deep palmar arterial arch as anatomically noted. Dissection of the first web space follows these vessels to the distal thumb and confirms these findings. No other deformities or scars are noted to the right hand. The contralateral hand shows no such variation or any other obvious deformities.

**Discussion:** Clinical importance of a duplicate PPA can be shown through symptom presentation and subsequent complications and sequelae. Thrombotic occlusion of the PPA may lead to amputation of the thumb. In the incidence of duplicated PPA, occlusion may go unnoticed due to collateral circulation to the thumb through an additional PPA. Subsequent emboli may result in occlusion of smaller vessels distal to the original thrombosis sometime after. In this case, clinicians may struggle to determine the causative event depending on case presentation. In the event of total thumb amputation, total toe transfers are an option for reconstruction. The incidence of a duplicated PPA may offer an obstacle for matching vessel diameters to the transferred digit and managing vasospasm intraoperatively. In cases involving revascularization, thenar flap surgical care may have a better prognosis due to the increased blood supply to the volar palm in the incidence of a duplicated PPA and may decrease complications and patient costs. Hand surgeons may benefit from preoperative assessment of the volar hand using angiogram or doppler ultrasound studies for cases in the first web space and before closed reduction internal fixation with percutaneous pinning at the base of the first metacarpal, such as in the case of a Bennett fracture. Continued updates anatomical variations are crucial for surgeons planning surgery and may result in better outcomes for patients.

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**Title:** Who Deserves the Liver? Nonalcoholic Fatty Liver Disease: A Case Report

**Authors:** Kara Lappin, DO, PGY3; Anaïs Cortes, MD, MBA; Jose Paz, DO

**Program:** Palmetto General Hospital, Internal Medicine Residency Program

**Introduction:** Nonalcoholic Fatty Liver Disease (NAFLD) is a metabolic disorder that includes a range of diseases from the most benign, hepatic steatosis, progressing in severity to nonalcoholic steatohepatitis (NASH), fibrosis, and cirrhosis that carries a risk of hepatocellular carcinoma and/or end stage liver disease. The disease process is thought to be related to an inflammatory overdrive reaction secondary to hyperactive cytokines leading to excess fat and insulin resistance within the liver that leads to damaged liver cells. There is a positive association between obesity and development of NAFLD. Currently, approximately 40% of the US population is classified as obese, with an estimated 30% of American adults diagnosed with NAFLD and 5% diagnosed with NASH. Incidence of these disorders continues to increase along with increasing rates of obesity. NAFLD is predicted to become the leading indication for liver transplant in the near future, soon to surpass alcohol-related liver disease as the most common medical condition requiring liver transplant.

**Case Description:** We present a 37-year-old female with a complicated past medical history of insulin-dependent diabetes mellitus type 1, diabetic retinopathy with blindness, peripheral neuropathy, end-stage renal disease due to diabetic nephropathy status post right renal transplant, neurogenic bladder, prior treated hepatitis C, hypothyroidism, heart failure with preserved ejection fraction and hypertension who presented to the ER complaining of right upper quadrant abdominal pain associated with nausea and subjective fever. Patient presented with a BMI of 35, leukocytosis, low-grade fever and dysuria. Initial workup included abdominal CT which showed a very abnormal appearing liver with lobulated and patchy areas within the right and left lobe of the liver. The working differential at time of admission was chronic necrosis, atypical fatty liver, underlying vascular malformation, liver abscess or possible malignancy. Our patient underwent liver biopsy which showed diffuse macrovesicular steatosis involving >95% of the liver parenchyma without signs of fibrosis. Of note, the patient had an ultrasound of the abdomen in 2013 that was reported as normal and CT abdomen in 2011 where the liver was reported as normal. After the results of the liver biopsy were obtained and the patient’s abdominal pain resolved, the patient was discharged and instructed to follow up with her PCP, Nephrology, Endocrinology and GI.

**Discussion:** Increased awareness of NAFLD is imperative as 30% of the United States is already affected and primary care providers will be expected to be on the front lines preventing, diagnosing, and managing NAFLD. NAFLD is only recently being recognized as a public health emergency in the United States; as this disease process is associated with a high financial burden to the healthcare system and the risk for an adverse health outcome is increasing. The prediction that NAFLD will be the leading indication for liver transplant in the future raises several concerns. How will patients with NAFLD be ranked on the waiting list for a donor liver? It is widely accepted in the medical community that patients with alcoholic related liver disease are ineligible for a liver transplant until one is able to abstain from alcohol for an average of 6 months; will patients with NAFLD due to an unhealthy lifestyle be ineligible for a donor liver until one can alter their lifestyle? Guaranteeing a patient has a healthy diet and exercise habits prior to transplant may prevent recurrence of NAFLD. Further, how will the number of eligible transplant donors be affected when increasing proportions of the population in the United States diagnosed with NAFLD? NAFLD includes a broad range of disease processes that progress in severity to cirrhosis. What degree of NAFLD in a potential donor will be considered too diseased to transplant? Finally, our patient developed NAFLD within 7 years indicating an urgent need to establish guidelines for screening and monitoring once diagnosed.

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**Title:** A Focus of Strategies to Approach Sixth Cranial Nerve Palsies with Incomplete Recovery and Incomitance

**Authors:** Jillian Leibowitz, OMS2; Jorge Malouf, DO; Matthew Kay, MD; Austin Bach, DO, MPH

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Cranial nerve six originates in the abducens nucleus of the dorsal pons. The nerve courses to the ipsilateral lateral rectus muscle with partial innervation to the contralateral medial rectus muscle through the superior orbital fissure. Most commonly, a sixth cranial nerve palsy will occur due to either vasculopathies or trauma. With its long intracranial course from the pons, through the cavernous sinus, and into the orbit, it is the most common ocular motor nerve injured in adults. Vasculopathies causing sixth nerve palsy include diabetes, hypertension, inflammation, increased intracranial pressure, atherosclerosis, thrombosis, and malignancies. An insult to the abducens nerve causes an incomitant esotropia due to muscle imbalance. There are many approaches to treating incomplete sixth nerve palsies with a common challenge to make the patient orthotropic in all fields of gaze. Surgical techniques include unilateral recession and resection of the affected medial rectus muscle, unbalanced bilateral medial rectus recession,
and a variety of approaches including vertical rectus muscle transpositions with or without medial rectus resections. This case presents a newer approach to surgically treat a sixth nerve palsy with mostly full versions and an incomitant esotropia.

**Case Description:** A 56-year-old Caucasian female presented to a private practice ophthalmology office with a left sixth nerve palsy with stable measurements for one year. Outside the misalignment, the physical examination, vision, and intraocular pressure were within normal limits. The patient required 8 prism dipters of prism to fuse images in primary gaze. The surgical procedure consisted of a single muscle recession, and resection of the contralateral medial rectus muscle, with a re-insertion in a “hang-back” technique. After the postoperative adjustment, the muscle was resected a total of 2mm and hung back a total of 8mm. At two months postoperatively, the patient showed a -1 decrease in levoduction in both eyes and was orthophoric in all gazes with no diplopia.

**Discussion:** This modified technique with no intervention of the affected eye, operated completely by Herring’s law, was shown to be successful in an adult with incomplete sixth nerve palsy with a small angle esotropia. Currently, one of the more popular surgical approaches to correcting a non-comitant sixth nerve palsy is the Faden procedure. This procedure is performed by suturing the muscle belly of a yoke muscle directly to the posterior sclera making a new effective insertion point. This technique seeks to weaken the unaffected yoke muscle to cause comitance. A concern with this operation is the difficulty in accessing the posterior sclera and the inherent difficulty and danger in passing a needle on the posterior globe. With incomitant deviations, this method of surgical treatment with a large right medial rectus recession and a small resection can successfully treat a small inconitance. This alternative procedure reported in the case description has been shown to be safer than a Faden Procedure because of the re-attachment back to the original insertion site combined with effectively changing the insertion of the muscle.

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**Title:** A Case of Mucormycosis Presenting as an Acute Otitis Media  
**Authors:** Randy M. Leibowitz, OMS4; Samuel Rapaka, MD, PGY2; Jillian Leibowitz, OMS2; Cynthia Rivera, MD  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Mucormycosis is a rapidly fatal infection caused by ubiquitous broad, irregularly branched non-septate fungi of the Mucorales order. These organisms, which transmit via airborne conidia or traumatic implantation, typically carry low virulence in the immunocompetent. Mucorales infections carry a 50-85% mortality rate in the immunocompromised. In a review of 929 cases of confirmed mucormycosis, 39% had diabetes mellitus, 17% had a hematologic malignancy, and 12% had received either organ or hematopoietic stem cell transplant. Although mucorales infection has been described in a variety of organ systems, the most common presentation is rhino-orbital-cerebral mucormycosis (70% of overall cases). Once spores are deposited in the nasal cavities, the fungus spreads rapidly, crossing tissue planes and eventually fatally infecting the central nervous system.

**Case Description:** A 77-year-old Hispanic male with a past medical history of acute myelogenous leukemia (treatment with cytarabine/glasdegib). Type 2 diabetes mellitus and iron overload secondary to chronic anemia requiring multiple transfusions treated with deferoxamine, presented to the emergency department complaining of left ear pain and bloody aural discharge for 1 day. Over the past month prior to admission, the patient had complained of progressively worsening sinusitis with intermittent bloody mucoid nasal discharge. During the week prior to admission, the patient’s family reported an acute worsening of his hearing as well as progressive fullness and pain of the left ear and left jaw. On admission, the patient was afebrile, hemodynamically stable and maintaining adequate O2 saturation at 96%. Otolologic examination revealed injection of the tympanic membrane with hemotympanum. Physical exam also revealed tenderness to palpation over the left maxillary sinus and left mastoid process and left conjunctival injection. Initial laboratory evaluation was significant for normocytic anemia, leukocytosis of 13 10^3/ul and severe thrombocytopenia of 4 10^3/ul for which he received a total of 6 units of platelets and 2 units of pRBC throughout the admission. CMP was significant for an AKI with a BUN and creatinine of 40 mg/dl and 2.56 mg/dl respectively. Maxillofacial CT without contrast was performed revealing a left middle ear effusion with opacification of the left external auditory canal, opacification of mastoid air cells, anterior nasal septum thickening with air pockets and erosion of the nasal septum. The patient was given the preliminary diagnosis of acute otitis media and otitis externa, started on empiric antibiotics and both ENT and infectious disease were consulted. A nasal endoscopy revealed nasal crusting and necrotic debris. The clinical diagnosis of mucormycosis was made and the patient was started on Liposomal Amphotericin B. Twenty-four hours after treatment with Amphotericin B, the patient’s family opted for palliative care and hospice, anti-fungal therapy was stopped and surgical debridement was not performed. The patient passed away 72 hours later.

**Discussion:** Up to 2009, only 4 reported cases of mucormycosis presenting as an acute otitis media have been reported. Although biopsy and histologic evaluation was not performed, endoscopic findings, clinical presentation and patients risk factors were sufficient in achieving the diagnosis. Due to the high likelihood of damaging Mucorales in sample collection and microscopy preparation, mucormycosis remains a clinical diagnosis. Prompt recognition of symptoms and risk factors are essential to beginning anti-fungal therapy and surgical debridement which remains the only course of treatment.

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**Title:** Taking a Radiological Look at Vape Associated Lung Injury (VALI) in a 26-Year-Old Patient  
**Authors:** Gabriela Lins, OMS4; Mariam Viqar, DO, PGY3  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Initially recognized in the summer of 2019, vape associated lung injury (VALI) is an acute or sub-acute lung injury that can be severe and life threatening. A diagnosis of exclusion, it typically presents with respiratory symptoms as well as with subjective fevers and GI symptoms are commonly reported. Of the 2668 CDC reported cases, 2/3 are male and 80% are under 35 years of age. Exact pathogenesis is unknown; however, it is proposed that THC and Vitamin E acetate are the potential toxins. Mean duration of symptoms is 6 days and approximately 1/3 of patients progress to acute respiratory failure requiring intubation. As of February 18, 2020, there have been a total of 2807 hospitalizations associated to VALI reported to the CDC, with 68 deaths confirmed at this time. Given the high acuity of the condition, it is important that healthcare providers are informed of the clinical and radiological findings associated to VALI in order to screen for the condition.
**Case Description:** The patient is a 26-year-old male with past medical history of childhood asthma, depression, and thyroid disease who presented to the emergency department with intractable vomiting for 4 days, moderate in severity, with no provoking/alleviating factors. He also had intermittent shortness of breath and chills for the past day. Patient endorsed vaping marijuana for the past 8 years. In the emergency room, patient had the following signs and symptoms: fever of 102.8°F, tachycardia, tachypnea, SOB, dyspnea on exertion and rales on physical exam. The patient was ultimately admitted to the hospital for a week due to acute respiratory failure and was treated with empiric antibiotics and high dose steroids as well as bi-level positive airway pressure (BiPAP). During the patient’s stay in the hospital, radiological imaging was ordered including a chest X-ray as well as a CT angiogram with IV contrast. The findings on imaging and clinical presentation were suggestive of vape associated lung injury (VALI).

Differentials for this case include pneumothorax, hypersensitivity pneumonitis (HP), viral pneumonia, and alveolar sarcoidosis. However, given the patient’s history of vape use, his clinical hospital course, and the ground glass opacities, centrilobular nodules, mediastinal and bilateral hilar lymph nodes on imaging, his presentation was more suggestive of VALI. At the patient’s two week follow up appointment, he was clinically asymptomatic, was able to pass a 6 min walk test, had quit vaping and repeat chest X-ray showed resolution of radiological abnormalities.

**Discussion:** Vape associated lung injury (VALI) is a diagnosis of exclusion. It can present with constitutional symptoms, shortness of breath and GI symptoms. Ground glass opacities can be a nonspecific finding on imaging associated to multiple differential diagnoses. However, in the setting of SOB and vape use within past 90 days, it is important to consider vape associated lung injury as a differential. Proposed criteria for VALI include: vape use in the past 90 days, lung opacities on chest radiograph or computed tomography, exclusion of possible alternate diagnosis, and exclusion of lung infection based on (negative influenza, negative respiratory viral panel, negative HIV opportunistic infections, and negative blood, urine, and sputum cultures, if applicable. Suggested clinical workup includes respiratory pathogen panel, blood cultures, echocardiogram, CXR and CT scan. Given the acuteness of these cases, it is important for healthcare providers to screen for vape use as well as keep VALI on their differential.

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**Title:** Chronic Emesis and Hyperpigmentation in a 9-Year-Old Boy  
**Authors:** Stephanie Lombardi, DO, PGY3; Shivani Patel, DO, PGY1; Anthony Pearson-Shaver, MD; Joseph A. Sykes, MD  
**Program:** Palms West Hospital, Pediatric Residency Program

**Introduction:** Adrenal insufficiency is a rare disorder in children, with an incidence not completely known. Congenital adrenal hyperplasia accounts for 73% of cases, with an incidence of approximately 1 of 14,200 births. It is a life-threatening disease due to impaired secretion of adrenal hormones, potentially resulting in adrenal crisis. Early identification of classic signs including fatigue, hyperpigmentation, hyponatremia, hypoglycemia, hyperkalemia, salt craving, and vomiting is critical. These symptoms overlap multiple conditions, therefore having a high index of suspicion is important.

**Case Description:** We present a case of a 9-year-old male with recurrent emesis since the age of 2.5 years old. The emesis was nbnb, with worsening over the last year, now a daily occurrence. The patient had increasing fatigue, weakness, poor school performance, and the mother noted the patient to be putting large amounts of salt on his food. He had been diagnosed with cyclic vomiting syndrome and a hyper-reactive gag reflex in the past. No medications initiated or bloodwork completed at that time. The vomiting worsened with stress and concurrent illness. He was also diagnosed with worsening eczema, however denied the rash being pruritic.

Upon initial exam the patient was tachycardic at 111bpm with elevated BP at 139/75, alert, tired-appearing but not toxic, with no altered mental status. He was noted to have generalized macular papular hyperpigmentation on the flexor surfaces of his extremities, skin folds and oral mucosa. Abdomen was soft, non-distended, with no palpable masses, GU exam revealing an undescended right testicle. Labs revealed hyponatremia of 122, hypocloremia of 93, potassium at the high end of normal at 5.2, metabolic acidosis with a CO2 of 15, BUN/Cr elevated at 36, stable CBC, and a UA with >80 ketones. CT of the brain completed and negative. CT of the abdomen revealed no masses. The patient was given 2 normal saline boluses and admitted to the PICU with suspicion for adrenal crisis. Endocrinology was consulted, recommending rehydration, hydrocortisone and fludrocortisone, which was initiated. A random serum cortisol was collected, resulting low at 3.09. At 8am a cortisol level and aldosterone level resulted low at 3.36 and <1.0 respectively. An ACTH stimulation test was completed with the level elevated at >2000. Thyroid studies normal and 21-hydroxylase antibodies were negative. Findings were suggestive of primary adrenal insufficiency. Due to intolerance of a barium swallow study, an EGD was completed and ruled out achalasia. Maintenance hydrocortisone and fludrocortisone were initiated with resolution of the emesis and clinical presentation were suggestive of vape associated lung injury (VALI).  

**Discussion:** This case illustrates the necessity for clinicians to keep adrenal insufficiency within their index of suspicion for children with frequent vomiting, especially in the setting of hyperpigmentation and salt-craving. Prompt and accurate diagnosis of primary adrenal insufficiency is crucial for the quality of life of the patient and to help prevent the development of a life threatening adrenal crisis.

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**Title:** A Curious Case of Rectal Pain - Neuroendocrine Tumors  
**Authors:** Cynthia Lopez, MD, PGY1; Neville Mathews, OMS3; Anirudh Gajjala, DO, PGY1; Hemang Thakor, DO, PGY3  
**Program:** Palmetto General Hospital, Internal Medicine Residency Program

**Introduction:** Neuroendocrine tumors (NETs) are a group of rare and aggressive heterogeneous malignant tumors that have a low incidence rate of about 3-5 people per 100,000. These tumors primarily metastasize to the gastrointestinal system and pulmonary system but can also be found in the pancreas, breast, ovaries, thyroid, and other parts of the body. One of the hallmarks of NETs is their ability to produce and secrete neurotransmitters such as serotonin, causing symptoms such as flushing, diarrhea, nausea and vomiting. While these tumors develop very slowly, they may be challenging to diagnose and treat early. However, these tumors may be identified and labeled through the utilization of biomarkers, which are secreted by the tumor cells.
**Case Description:** This patient is a 54-year-old male with no documented past medical history who presented with 3 days of severe rectal pain and constipation. He had poor medical follow-up. History was unremarkable aside from a 30-pack-year smoking history. There was no associated bleed or abdominal pain. Bloodwork revealed elevated liver enzymes, amylase and lipase. CT scan showed possible metastatic liver disease and right suprahilar pulmonary nodule. Colonoscopy found a 1.5 cm rectal polyp that was excised 8 cm from the anal verge and subsequently found to be a benign adenomatous mucosal polyp. A biopsy of the liver nodules was taken, and pathology showed a G2 neuroendocrine tumor positive for Villin/CDX2/Chromogranin and Synaptophysin. CDX2 staining indicated a possible small intestine or proximal bowel origin. Due to metastasis of the tumor, resection was not an option and the patient was scheduled for outpatient PET scan with Gallium-68 DOTATATE. He is to be followed outpatient for somatostatin-analog treatment and possible chemotherapy.

**Discussion:** There are no screening guidelines for NETs unless a patient has a family history of multiple endocrine neoplasia (MEN), which has a strong association with NETs. However, it has been shown that 22.4% of patients with a carcinoid tumor had other associated neoplasms, with 29% of those associated with small bowel NETs. In this case, there was a finding of a rectal polyp in addition to the multiple NETs. It is theorized that the exogenous secretory products from the primary tumor can induce neoplastic transformation along with behavioral and environmental risk factors. It may be beneficial for patients with benign neoplasms to have further work-up done to rule out the presence of NETs—especially in those with a family history of cancer—to aide in earlier diagnosis and intervention.

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**Title:** Acute HIV Detection During Window Phase in Young Male  
**Authors:** Christina Mangiaracina, DO, PGY1; Amy Goodner, DO, PGY1; Evan Altman, DO, PGY3  
**Program:** Broward Health Medical Center, Family Medicine Residency Program

**Introduction:** Human immunodeficiency infection was first described as a “mononucleosis-like” illness in 1985 that attacks several cells within the body including dendritic cells, macrophages, and CD4+ T cells. The diagnostic algorithm recommended when physicians have a suspicion for acute HIV infection begins with screening patients by enzyme-linked immunoassay (ELIZA) fourth generation which targets IgM antibody, IgG antibody, and p24 antigen. If the screening test is positive, a confirmatory assay should be performed by Western blot which targets IgM and IgG antibodies for detection. HIV viral load test is a diagnostic test which targets HIV-1 RNA and is highly sensitive. Importantly, blood HIV viral load correlates with the risk of transmission of acute HIV infection.

**Case Description:** This patient is a 32-year-old Caucasian male without significant medical history who presented to the ED with fevers, chills, and rash for five days. The rash began on his left shoulder and spread across his chest and face. Patient developed a Tmax of 102 degrees Fahrenheit. Associated symptoms included an ongoing throbbing headache, dry cough, sore throat, weakness, fatigue, diarrhea, vomiting, and anorexia. Denied recent travel,
sick contacts, new piercings or tattoos, intravenous drug use, or homosexual partners. Patient was admitted under SIRS criteria and acute rhabdomyolysis with CK >7500. HIV preliminary screening for Ab/Ag was reactive, however confirmatory HIV ½ assay was negative. Two days later, HIV viral load was found to be 3,257,992 copies of HIV-1 RNA/ml. Patient was counseled and educated on acute HIV diagnosis and was stable for discharge home with family and prompt follow up outpatient with infectious disease.

Discussion: Patient was diagnosed with acute HIV infection in the window phase. The window phase of acute HIV infection is about a ten-day period between detection of HIV p24 antigen and prior to detection of antibodies in the blood stream. The fourth generation ELIZA test is a screening test that detects antibodies as well as p24 antigen. The approximate time to positivity for this test is between 15-20 days. The western blot is a confirmatory test which detects antibodies in the blood stream and the approximate time to positivity is 35-60 days. The time period between detection of p24 antigen and detection of antibodies is considered the window phase of acute HIV infection. During this window phase, the patient typically shows signs of an acute viral syndrome and is very contagious. Our patient had the classic signs of acute HIV infection such rash, fevers, headache, myalgia, sore throat, and diarrhea. During the acute window phase, HAART does not have to be immediately initiated. However, it is important to educate the patient on prompt follow up with infectious disease to monitor viral load and initiate HAART therapy once deemed appropriate. Outpatient initiation of treatment has been shown to decrease mortality in patients, decrease risk of transmission, and improve immune function.

Title: Preventing Plagiocephaly - A Hands-On Approach
Authors: Kevin Marfiak, OMS3; Nathan Widboom, DO
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: The newborn skull is designed to accommodate the forces of labor while minimizing trauma to the developing brain, with restoration of mobility once the stress of labor is over. This restoration of mobility is facilitated by the numerous malleable sutures of the newborn skull. It accommodates the forces of labor and passage through the birth canal by overlapping the bones of the cranial vault in a characteristic manner, involving the frontal bones underlying the parietal bones. It is known that the cranial bones make up not only the cranium and cranial vault, but also the cranial base – a central station for many important neurovascular elements. Thus, improper accommodation during the stress of labor may lead to restrictions of the internal base of the skull. Such restrictions may directly impinge upon and affect the neurovascular elements exiting through the restricted foramina, such as the jugular foramen containing cranial nerves 9, 10, and 11. By addressing restricted sutures, we can prevent problems in the neonatal period ranging from feeding patterns, to proper cranial bone development. This early intervention and osteopathic manipulative treatment (OMT) may also circumvent the need for helmet therapy to correct head shape, which is the current standard treatment for plagiocephaly at around 4-6 months of age. Emerging research has demonstrated at least mild neurodevelopmental symptoms among infants with plagiocephaly. This research, combined with the fact that early detection psychomotor interventions are highly successful in preventing and reducing the impact of these problems, supports the idea that early screening and OMT may also prevent these eventual problems in the newborn patient population.

Case Description: Our patient was a one-week old male brought in to the OMT clinic after ear height asymmetry was first noticed by his grandmother. Initial visit HPI findings included the patient’s mother describing a noticeable preference for head rotation to the left, as well as a weak suck, with short and painful latch times when breastfeeding. HEENT exam showed gross asymmetry in ear and eye heights, with the right side being lower. Osteopathic structural exam revealed the left parietal bone was underlining the frontal bone, left occipitomastoid suture compression, left temporal bone internally rotated and medial, left frontal bone externally rotated, and right sternocleidomastoid (SCM) hypertonicity. The treatments I employed during OMT sessions involved osteopathic cranial manipulative medicine techniques including: V-spread to release restricted sutures, frontal and parietal lift to address cranial bone somatic dysfunctions, as well as gentle suboccipital decompression to facilitate healthy autonomic tone. Indirect myofascial release was also utilized each session for the hypertonic right SCM muscle. At this point the patient is around 6-months old, and at each visit the patient’s mother and/or grandmother has observed continued improvement in head symmetry, improved and non-painful breastfeeding, as well as equal preference of head rotation to either side.

Discussion: These positive results provide evidence for the practical utility of early recognition of plagiocephaly, and osteopathic intervention to reduce cranial strain patterns in newborns. Future research considerations include evaluating the effect of early OMT on preventing progression and further neurodevelopmental symptoms of plagiocephaly, as well as preventing or limiting the amount of time an infant is subjected to helmet therapy.

Title: Massive Pulmonary Embolism as a Cause of Cardiac Arrest: Survival by VA-ECMO
Authors: Robin Mata, OMS3; Gabrielle McDermott, OMS3; Joaquin Crespo-Mejia, MD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Pulmonary Embolism (PE) is a common diagnosis with an associated mortality of 14.7%. More critical variants such as Massive PE, are characterized by severe hemodynamic instability and can potentially cause cardiac arrest. Though less than 5% of patients progress to cardiac arrest, mortality rises to 65-95%. VenoArterial Extracorporeal Membrane Oxygenation (VA-ECMO) is a unique form of cardiopulmonary bypass. It has existed since the 1970s but has become more widespread within the past decade as a bridge to medical therapy in instances of life-threatening cardiac and pulmonary failure. FDA-recommended treatment for Acute PE is continuous infusion of 100 mg of alteplase (tPA) over 2 hours. In cases of hemodynamic instability, bleeding risk and refractory clots there are no set guidelines and multiple treatment options must be explored.

Case Description: A 42-year-old male presented with progressive shortness of breath after a syncopal event. Patient was employed as a taxi driver and had no medical history, recent trauma or injuries. Work up evidenced an elevated d-dimer, significant right ventricle (RV) strain on transesophageal echocardiogram (TEE) and bilateral pulmonary artery and right ventricle emboli on Chest CT. The patient was placed on a heparin drip while the PE response team (PERT) was consulted. As the clot burden was significant and symptoms of tachypnea were not resolving, contraindications to tPA were
ruling out and continuous infusion was initiated. Within one hour the patient developed a headache, raising concern for intracranial hemorrhage. The infusion was stopped, and the patient was awaiting STAT CT of the head when he became hypotensive and bradycardic, leading to cardiac arrest. After multiple failed resuscitation attempts the decision was made to initiate VA-ECMO. Once hemodynamically stable, multiple therapy options were considered including repeat tPA, catheter directed thrombolysis, percutaneous thrombectomy and surgical embolectomy. Due to the suspected clot in transit from the RV this patient was not a candidate for catheter directed thrombolysis. Considering the patient’s failure of anticoagulation/tPA, clot burden, and bleeding risk with surgical embolectomy the decision was made to proceed with percutaneous mechanical thrombectomy. The patient incurred late complications of pericardial effusion, infarct CVA, and acute kidney injury but was able to recover and initiate rehab therapy.

**Discussion:** Although rare, cardiac arrest can occur within several hours of Massive PE presentation. Clinicians should maintain high suspicion for potential cardiac arrest in patients with significant clot burden to facilitate prompt referral and initiate early, aggressive treatments. VA-ECMO is useful in life-threatening cases as it can provide oxygenation, unload RV strain for recovery, and afford additional time to weigh risks/benefits of treatments. However, with increased diversification of VA-ECMO and interventional treatments comes a need for large scale randomized trials to evaluate their outcomes in high risk PE.

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**Title:** Side Effects of Immunotherapy: Sometimes the Answer is on the Surface

**Authors:** Mekha Mathew, OMS3; Subhiksha Aravind, MBBS; Megan Winter, DO, PGY3

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Immunotherapy against a tumor involves the complex interaction between different immune cell types in the innate and adaptive immune system. The anti-tumor response of nivolumab, a human IgG4 monoclonal antibody, impedes programmed cell death-1 (PD-1) activity by adhering to the PD-1 receptor to block the PDL1 and PDL2 (ligands) from binding. The well-known side effects of Nivolumab range from non-specific flu-like symptoms to immune-related events such as hepatitis, colitis, dermatitis, and endocrinopathies. Panniculitis, defined as the inflammation of subcutaneous fat, presents typically with inflammatory nodules and plaques and is considered a rare side effect associated with immunotherapy.

**Case Description:** A 74-year-old female with hypertension, hyperlipidemia, diabetes mellitus, and renal cancer on immunotherapy (nivolumab) presented to our emergency department with the complaint of bilateral lower extremity swelling for 3 weeks. She admitted to associated erythema of the legs as well as pain. Of note, she had presented to the ED with similar symptoms one-week prior and was sent home with 10 days of cephalexin to treat possible cellulitis after an ultrasound indicated no deep venous thrombosis was present. Her symptoms, however, had not improved.

In the emergency department, she was afebrile and normotensive with a physical exam notable for bilateral lower extremity erythema with trace pitting edema, tenderness to palpation, and warmth. Her initial evaluation in the ED was grossly unremarkable, so she was admitted to the hospital for further work-up with the differential diagnosis including cellulitis, nephrotic syndrome, IVC obstruction due to tumor burden, and cardiac cause.

During her hospital stay, thorough investigation including urine studies, echocardiogram IVC ultrasound, bone scan, and MRI of the lower extremity failed to reveal a cause for the symptoms. On her final day of admission, she had a skin biopsy taken from the right leg and was discharged home with wound care. Pathology returned a few days later revealing the underlying diagnosis of lobular panniculitis resulting from her treatment with immunotherapy.

**Discussion:** While immunotherapy is well known for its autoimmune side effects, panniculitis is rarely reported. Knowledge of its presence is important to prevent patients from enduring costly ED visits, hospital stays, lengthy work-up, and antibiotics that are not needed.

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**Title:** Arteriovenous Malformation of the Jejunum in a Lower GI Bleed

**Authors:** Neville Mathews, OMS3; Reena Patel, OMS3; Sundeep Gidugu, OMS3; Akash Patel, OMS3

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Gastrointestinal (GI) bleeding sends about 100,000 people in the United States to the hospital every year. This relatively common complaint has a wide range of etiologies, consisting of everything from infectious processes to malignancies. An arteriovenous malformation (AVM) is an abnormal tangle of blood vessels connecting arteries and veins, which can disrupt normal blood flow. AVM within the gastrointestinal tract is a rare cause of bleeding that can easily be forgotten during a gastrointestinal bleed workup. Unfortunately, AVMs can continue to bleed until addressed, leading to anemia among other uncomfortable symptoms. Current standard of care recommends super selective embolization as choice of treatment for lower GI bleeds from AVMs.1 Our case demonstrates the importance of considering, identifying, and treating AVMs during a gastrointestinal bleed workup.

**Case Description:** We present a case of a 78-year-old female, with a past medical history of hypertension, hyperlipidemia, squamous cell carcinoma of the left face and radiation induced heart thrombus, who presents to the clinic with complaints of chest tightness and shortness of breath. She was diagnosed with non-ST-elevation myocardial infarction (NSTEMI) and cardiogenic shock. She then underwent cardiac catheterization and was placed on dual antiplatelet therapy. After which, she complained of dark stool, which was later diagnosed as an arteriovenous malformation in the jejunum using CT angiogram. She was not a surgical candidate at this time, was transfused with two units of blood which stabilized her hemoglobin at 9.4 and was discharged. However, a few days later she returned to the ER complaining of repeat melena. Her hemoglobin was 5.6 on admission. She was transfused with 3 units of blood and underwent jejunal AVM onyx embolization. Patient was discharged after stabilization of her hemoglobin at 8.5. One month later, she returned with the same complaint and underwent repeat embolization. Patient’s hemoglobin stabilized at 10.3 and then discharged. One month after, she suffered from a third episode of melena which resulted in a third AVM embolization.
Discussion: Our case illustrates the need for further research with respect to the protocol for efficiently treating AVMs. While the current standard of care and guidelines were followed, the fact that this patient suffered from multiple recurrent bleeds from her jejunal AVM, causing her to return to the hospital on multiple occasions, is of concern. Although vasopressin is an alternative method of treatment, a study performed by Browder et. al. demonstrated that of an initial 91% success rate, stopping vasopressin led to a 50% rate of rebleed. Another consideration to better treat this patient’s AVM could have been to utilize the N-butyl cyanoacrylate (NBCA) embolization procedure instead of the Onyx procedure, as the NBCA procedure has a lower chance of recurrent bleeding at 15%. In addition, AVMs of the gastrointestinal tract are quite rare resulting in a high probability of not initially considering it as an etiology of lower gastrointestinal bleed. Thus, we believe this case showcases the importance of considering an uncommon presentation of a lower GI bleed. We also propose that further research should be conducted regarding the small but promising NBCA embolization study, along with other new possibilities that will reduce readmission for recurrent bleeding from AVMs.

Title: The Boy Who Cried Wolf: An Atypical Case Study of Pediatric Lupus
Authors: Gabrielle McDermott, OMS3; Christine Adams, OMS3; Stanley Szybinski, MD, PGY2
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Lupus is a chronic, autoimmune disease of unknown etiology that targets organ systems and cells throughout the body, most commonly the joints, skin, kidneys, cardiovascular system, hematologic system, and nervous system. Over ninety percent of patients are women of child-bearing age. However, the disease can target patients of any age, race, or gender, including pediatric patients. The American College of Rheumatology has 11 criteria for Lupus, with 4+ criteria considered as diagnostic; malar rash, skin rash, photosensitivity, mouth or nose ulcers, nonerosive arthritis (inflammation in two or more joints), cardio-pulmonary involvement, neurologic disorder (seizures and/or psychosis), kidney dysfunction (urine positive for protein and/or RBCs), blood disorder (anemia, low WBC, and/or low platelets), immunological disorder, and positive Antinuclear antibodies (ANA). Although no single test is considered diagnostic, anti-dsDNA and Sm antibodies are specific for lupus. Kidney biopsy can also be utilized in the diagnosis of lupus - and staging can be performed to aid in diagnosis and treatment.

Case Description: A 16-year-old African American male presented to the ED with complaints of cough, fever, and problems with balance. On physical exam, he had difficulty with the finger-to-nose, rapid alternating movements, and heel-to-shin test, as well as difficulty walking. The patient was admitted for observation and further testing. While in the hospital, the patient was noted to have abdominal ascites and a pleural effusion with hypoalbuminemia. He underwent kidney biopsy, which showed Class IV lupus nephritis, and laboratory testing showed positive ANA, ds-DNA, and Sm antibodies. Upon admission to the hospital, the patient had no past medical history, but was diagnosed with Nephrotic Syndrome by Neurology after admission. Family medical history is positive for his mother having rheumatoid arthritis and Nephrotic Syndrome.

Discussion: The patient’s neurological symptoms presented first and originally were consistent with cerebellar dysfunction. It was only after a urinalysis showed hypoalbuminemia, that nephrology was consulted, and the kidney biopsy was performed. Prior to the biopsy, the patient had a CT which showed abdominal ascites and bilateral pleural effusions. The original CT and MRI were within normal limits. The patient eventually responded to steroids, but developed multiple complications including respiratory failure and Guillian barre syndrome that required an ICU stay and months of inpatient rehabilitation. He is currently home and much improved. This case is unique, since the typical patient is female and child-bearing age, while pediatric cases are still being explored. Keeping SLE on the differential for patients with a multitude of symptoms that seemingly are not connected is vital for early diagnosis and treatment.

Title: Rare Case of T1 Hyperintense Liver Masses: Diagnosing Metastatic Melanoma
Authors: Jacob William McPhee, PGY3; Adam Shir, OMS2; James Banks, MD
Program: Aventura Hospital and Medical Center, Radiology Residency Program

Introduction: Due to its improved contrast resolution, magnetic resonance imaging (MRI) is an excellent tool for the evaluation and characterization of indeterminate liver lesions. T1 hyperintense lesions on MRI are an uncommon finding in general practice and support a narrow differential diagnosis. Included in the differential is metastatic melanoma, which is a rare neoplasm with a poor prognosis. As there are limited treatment options and poor clinical outcomes, timely and accurate diagnosis of metastatic melanoma is critical to allow for coordinated care by a multidisciplinary team.

Case Description: Our case is a 37-year-old female with a past medical history of obesity who presented to the emergency department with a history of back pain for 3 weeks duration. Computed tomography (CT) completed in the emergency room revealing an S1 sacral insufficiency fracture with an underlying lytic lesion, as well as multiple liver lesions. MRI of the abdomen demonstrated multiple T1 hyperintense lesions within the liver. The patient underwent CT guided core needle biopsy of these lesions which revealed darkly pigmented tissue samples. Histopathology confirmed the presence of metastatic melanoma.

Discussion: Lesions hyperintense to the liver on T1-weighted MRI form a special diagnostic category and include lesions that contain one of the 5 substances that shorten T1 relaxation times. These substances are fat, blood, protein, melanin, and gadolinium. With these 5 substances in mind, a narrow and accurate differential can be provided to allow for rapid diagnosis. Metastatic melanoma carries a extremely poor prognosis, with a mean survival rate of 6-9 months and a 5-year survival rate of 5-14%. Treatment options include surgical resection, chemo/therapy, immunotherapy, targeted therapies, and radiation. The location and extent of disease may dictate the treatment strategy, i.e. metastatic disease to the pelvis representing a challenge in limb salvage surgery due to the high rate of complications.
**Title:** Idiopathic Juxtafoveal Telangiectasia (Macular Telangiectasia Type II) in a Man with Rheumatoid Arthritis  
Authors: Divy Mehra, OMS3; Jeffrey Greiff, MD  
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program  

**Introduction:** Idiopathic juxtafoveal telangiectasia, also referred to as macular telangiectasia Type 2 or MacTel, is an uncommon retinal disease with a prevalence between 0.005% and 0.01% of the population. MacTel commonly manifests bilaterally with symptoms of central scotoma and metamorphopsia that may present asymmetrically. Macular telangiectasia type 2 has been found to have genetic preponderance, with studies pointing to an autosomal dominant inheritance with incomplete penetrance in both males and females. In an analysis conducted at the University of Sydney, three retinal autoantibodies were found in serum samples of individuals diagnosed with MacTel at a significantly greater prevalence than healthy controls (n=45, 69% vs. n=58, 16%, p<0.0001). While the etiology of MacTel is unknown, these findings suggest a possible autoimmune relationship. The following is a case of a man with history of rheumatoid arthritis diagnosed with idiopathic juxtafoveal telangiectasia through advanced ophthalmic imaging, first encountered in the outpatient family medicine setting.

**Case Description:** A 68-year-old man with a past medical history of rheumatoid arthritis, fluoroquinolone-induced biceps tendon rupture, and bilateral pseudopseudahia was referred to the clinic with difficulty reading and subjectively “crossed” images at a distance. Following a basic physical examination in the family medicine outpatient clinic, the patient was referred for further ophthalmic evaluation. External and slit lamp exams revealed no abnormalities. Fundus exam revealed pigment changes of the macula and faint telangiectatic vessels temporal to the fovea, OU. Ocular computed topography (OCT) revealed loss of the inner segment/outer segment (IS/OS) junction, pigment migration, cystic spaces, and internal limiting membrane draping bilaterally. Faint hyperautofluorescence was noted just temporal to the fovea, and fluorescein angiography (FA) revealed staining temporal to the fovea bilaterally with no signs of choroidal or retinal neovascularization. No exudative lesions were found on imaging. Imaging was consistent with macular telangiectasia type 2. The patient was recommended a diet rich in green leafy vegetables and daily vision monitoring.

**Discussion:** As exemplified in this case, macular telangiectasia type 2 is a possible cause of vision deficiencies in both near and far central vision. Definitive diagnosis must be made using advanced ophthalmic imaging, however, prompting referral to an ophthalmologist. Given strong genetic preponderance and possible autoimmune etiology, family history of macular vision problems should be taken. On imaging, fluorescein angiography (FA) may show temporal foveal telangiectatic vessels, right angled venules, and subretinal neovascularization in later stages; signs of macular hyperfluorescence or macular leakage remains the gold standard for diagnosis of MacTel. Several of these imaging characteristics were noted in this patient. This case emphasizes interdisciplinary care and highlights the importance of ophthalmologic referral from the outpatient setting in the suspicion of less common chronic causes of vision deterioration.

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**Title:** The De Garengeot Hernia: A Classic Case of a Rare Hernia Captured on Imaging  
Authors: Edward E. Missinne, MD, PGY2; Brett McKeon, MD  
Program: Aventura Hospital and Medical Center, Diagnostic Radiology Residency Program  

**Introduction:** Hernias can present with a variety of symptoms sometimes vague and sometimes classic and depending on the hernia type. The De Garengeot hernia is a rare type of femoral hernia which contains the appendix. It can be asymptomatic, can present as an inguinal mass with palpable tenderness, and even present as appendicitis. Often presenting with incarceration in the acute setting, the patient’s pain can be so severe and the diagnosis of a “femoral hernia” clear on physical exam, that the patient is sent to the operating room. The appendix is then discovered to be contained the hernia, and the diagnosis of a De Garengeot hernia is made incidentally. Thus, this entity is often diagnosed intra-operatively, without preprocedural imaging. We present a case of an incarcerated Dr Garengeot hernia which was diagnosed without the need for surgical intervention.

**Case Description:** We present a case of a 63-year old female who presented to the emergency department with acute onset of 9/10 crampy, dull, right lower quadrant abdominal pain. The patient denied alleviating or aggravating symptoms, as well as nausea, vomiting, fever, chills, or changes in bowel habits. She did notice, however, a new bulge in her right groin associated with the onset of her symptoms.

She was afebrile with a normal heart rate and blood pressure. On physical exam, a right inguinal palpable mass was discovered, measuring approximately 3 x 3cm, which was tender to palpation. The abdominal exam was negative for rebound, guarding, or abdominal distension. CBC and BNP laboratory studies were unrevealing. A CT of the abdomen and pelvis demonstrated a fat containing right femoral hernia, with fat stranding and a small amount of fluid, concerning for a strangulated versus incarcerated hernia. In addition, a nondilated appendix was identified within the hernia sac. The patient was admitted for possible surgical intervention after initial reduction maneuvers in the emergency department were unsuccessful. During her overnight inpatient stay, however, the hernia was successfully reduced with near resolution of the patient’s abdominal pain. A post-reduction CT of the abdomen and pelvis confirmed the result. The patient was discharged with outpatient follow up for elective hernia repair.

**Discussion:** This case details the radiologic findings of the rare De Garengeot hernia not often captured on imaging before being incidentally discovered during surgery.

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**Title:** Something an Airport Body Scanner Will Not Miss: A Rare Case of Dermatofibrosarcoma Protuberans  
Authors: Sushmita Mittal, OMS3; Lorena Rodriguez, OMS3; Asma Ghafoor, OMS3; Sangita Gogate, DO  
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program  

**Introduction:** Dermatofibrosarcoma protuberans (DFSP) is a rare, slow-growing tumor considered of low-grade aggressiveness but with high recurrence. It’s classified as a sarcoma of cutaneous origin and accounts for about 1% of all soft tissue sarcomas and less than 0.1% of all malignancies.
It commonly presents among 20 to 50-year-olds with female predominance however has equal frequency among all ethnic groups. Clinically, it often presents as a superficial cutaneous multinodular bluish mass on the trunk and proximal extremities with a benign aspect and less commonly on the head and neck regions. Patients who have recurrent DFSP can have additional surgery to remove the lesions, however, the chance of metastasis is increased in these patients.

**Case Description:** We report a case of a 30-year-old African American male patient who presented with a large protuberant mass located on the lateral side of the left hip. The patient denied any pain. On physical examination, a large, painless, soft tissue, multinodular mass was palpated on the left hip. Blood count results were Hb 13.1, WBC 7.4, platelets 320, neutrophils 70.5. Distant metastases of the tumor were dismissed by clinical examination and imaging studies.

With the possible diagnosis of a large benign mass of subcutaneous tissue, the patient underwent local excision of the mass. Upon histological examination, a well-circumscribed tumor measuring 15.3 x 9.8 x 2.2 cm was described with multiple nodular areas ranging from 0.4 to 5.8 cm in the greatest dimension. Cross-section revealed light gray and pink tan rubbery to firm and homogenous cut surfaces. Histology showed a spindle cell neoplasm, deeply invasive into the underlying dermis and adiase soft tissues. It showed moderate degree of cytologic atypia and 18 mitosis per 10 HPFs’, however, there was no evidence of atypical mitosis nor areas of necrosis or hemorrhage. There was no evidence of lymphovascular space invasion and surgical margins were free of malignancy. These histopathological examination results confirmed the diagnosis of dermatofibrosarcoma protuberans.

**Discussion:** This case illustrates the importance of early diagnosis and treatment options of a rare presentation of a soft tissue sarcoma. Although DFSP has low aggressiveness, it has a high recurrence rate which significantly increases risk of metastasis leading to further complications. Most reported patients with distant metastasis from DFSP died within the two-year mark, highlighting the significance of early intervention and careful monitoring post-operatively.

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**Title:** Diagnosis and Management of Malignant Pleural Effusion in the Setting of Stage IV Lung Adenocarcinoma  
**Authors:** Elizabeth Morn, OMS3; Alexander Fong, OMS3; Niral Patel, DO, PGY2  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Lung cancer is the leading cause of cancer-related deaths worldwide, with Non-Small Cell Lung Cancer comprising about 85% of cases. In about a quarter of cases, malignant pleural effusions can develop (4), defined as the accumulation of pleural exudate and malignant cells within the pleural space, pleural fluid, or parietal pleura (1). To diagnose a malignant pleural effusion, imaging is usually done first, such as a thoracic ultrasound and thoracic CT. This is usually followed by more diagnostic techniques such as thoracentesis, closed pleural biopsy, medical pleuroscopy, or video-assisted thoracoscopic surgery (3). Not only do malignant pleural effusions result in frequent hospitalizations and high medical costs for the patient, but they also are associated with a reduced survival time of 4-7 months. Given this prognosis, minimally invasive procedures, such as thoracentesis and the placement of pleural drainage catheters, are frequently used to better manage symptoms (2, 4). In addition, studies have shown that using ultrasound techniques to guide thoracentesis reduces the risk of procedure complications such as pneumothorax.

**Case Description:** We review a case of a 55 year-old, non-smoker, African American female with a past medical history of Stage IV Lung adenocarcinoma and malignant pleural effusion status-post left pleural catheter placement who presented with shortness of breath, productive cough with clear sputum and sanguineous discharge from the catheter. Vital signs were stable and physical exam was positive for shallow breaths, bilateral expiratory wheezing, decreased breath sounds on the left, and a left pleural drain intact with no surrounding erythema or discharge. An ultrasound of the thorax showed a small left pleural effusion and the pleural catheter within the fluid. A radiograph of the chest showed no pneumothorax and residual pleural fluid with the catheter in place on the left. A CT scan of the chest without contrast showed marked nodularity suspicious for metastatic disease in the right lung, complete collapse or consolidation of the left upper lobe with bronchial obstruction, numerous nodules in the left lower lobe, a small volume of fluid at the left lung base and periphery of left upper lobe, and multiple sclerotic foci in the upper lumbar spine. An MRI of the brain without contrast showed foci enhancing lesions with a small degree of vasogenic edema consistent with metastatic disease. CEA and CA-125 were markedly elevated. An ultrasound-guided thoracentesis of the left-sided pleural effusion extracted 700cc of dark brown, exudative fluid. Cytology of the fluid was positive for adenocarcinoma. The patient was discharged home and instructed to have the pleural catheter drained every 3-4 days and follow-up with hematology/oncology for further cancer treatment.

**Discussion:** This case details the steps taken to confirm the diagnosis of a malignant pleural effusion in the setting of stage IV lung adenocarcinoma and the proper management of the pleural effusion. With the interventions made and proper adherence to outpatient follow-up guidelines, symptoms arising from the malignant pleural effusion should be reduced. However, given the extent of the patient’s disease, the likelihood of rehospitalization is high.

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**Title:** Determining Influence of Cannabis Use on Impulsivity in a Susceptible Patient Population  
**Author:** Chris Morris, OMS3  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Both marijuana use and attention deficit hyperactivity disorder (ADHD) have been associated with changes in impulse control and hostility. Changes in impulsivity have been associated with increased risk for mental health issues, addiction disorders, and engagement in risk behaviors. Impulsivity in patients with conditions that alter or decrease impulsive control that use marijuana likely have a compounded effect that largely inhibits impulse control and may be responsible for dramatic changes in behavior or acts of aggression.
**Case Description:** I present a case of a 16-year-old male being treated in the inpatient setting with the primary diagnosis of Cannabis Use Disorder with comorbid Tourette's, ADHD, OCD, sleep disturbance and Cannabis Induced Disorder relating to anger outbursts. The patient was admitted for a recent arrest and drug charges. The patient had been expelled previously for drug possession and threatening peers. Leading up to these events, the patient was struggling with failing grades, involvement in gang activity, and was aggressive and noncompliant with his teachers. The patient was also arrested for trespassing and was belligerent to the responding police officer. The patient had an extensive history of drug use outside of marijuana, as well as a previous suicide attempt. The patient had also confessed that he had been involved in a stabbing and had also been shot in the arm. When asked about when this behavior started, the patient’s parents stated that they believed the change in behavior began after the patient started using marijuana. The patient was started on Guanfacine, Fluvoxamine and continued on Clonazepam from a previous psychiatrist. As the patient remained off of marijuana and continued treatment, the patient demonstrated remarkable improvement in insight, impulse and anger control.

**Discussion:** This case explores a suspected link between marijuana use and increased impulsive and aggressive behavior in a patient with comorbid attention deficit hyperactivity disorder. Studies in the past have demonstrated links between marijuana and aggression, as well as attention deficit hyperactivity disorder and aggression. Because the aggressive behavior ceased with abstinence from marijuana and more aggressive treatment of attention deficit hyperactivity disorder, it is unclear which, if not both aspects of the patient's history were more correlated to the patient's previous behavior. Improved management of patient’s neuropsychiatric conditions and removal of drug use will most likely continue to show significant improvement in the patient’s outcome.

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**Title:** Myxedema Coma and Sequela  
**Authors:** Oliver Morrs, DO, PGY3; Jason Morris, DO  
**Program:** St. Lucie Medical Center, Emergency Medicine Residency Program

**Introduction:** Myxedema coma is defined as severe hypothyroidism that leads to decreased mental status, hypothermia, and signs of slowing of other organs. This can manifest in decreased mental status and hypothermia, hypotension, bradycardia, hypoglycemia, and hypoventilation. This is an absolute endocrine emergency that has to be managed aggressively due to a high mortality rate, ranging from 30-50%. Many incidents of Myxedema coma occur in patients with severe, prolonged and uncontrolled hypothyroidism or induced by a stressful, acute event in poorly controlled hypothyroid patient. Often, infection, myocardial infarction or surgery can be the inciting stressors. With the mortality rate being so high it is a disease process that needs to be recognized early and treated aggressively.

**Case Description:** We present a case of a 56-year-old female with longstanding, uncontrolled hypothyroidism due to medical non-compliance, who was presenting for fatigue, facial swelling and shortness of breath. She was seen in the same hospital almost one-year prior with similar presentation and a TSH of 366 (normal range). She refused admission at that time and left AMA. She was unable to secure follow-up and had been living with these symptoms for approximately one year, before returning back to the hospital for help. On primary survey, airway was patent, respiratory rate of 14, pulse of 56, blood pressure of 151/94, and oral temperature of 36.3 (97.3F) oral. Patient appeared to have significant widespread facial swelling, severe truncal obesity, thinning hair and a goiter. Decreased breath sounds were also appreciated along with systolic ejection murmur and bradycardia. She appeared stable but was slow to answer questions and appeared fatigued. Additionally, she had complaints of paraesthesias of the distal fingertips of the first, second and third digits of the right hand. Patient was found to have no other neurologic deficits on completion of physical exam. Chest Xray showed stable cardiomegaly with mild vascular congestion (fig 1). This Xray was similar to previous Xray performed 11 months ago showing cardiomegaly. CT scan of the chest was ordered and revealed moderate to large pericardial effusion with bilateral upper lobe predominant ground glass opacities and interlobular septal thickening, suggestive of vascular congestion (fig 2). Lab work was performed which revealed an essentially normal CBC and CMP. NT-Pro-B Natriuretic Peptide of 14.1 (0-125 pg/mL) and a TSH of 102. She was then started on steroids (Hydrocortisone 100mg q8H), Levothyroxine 250mcg and liothyronine 25mcg. Patient was then admitted to the hospital for further evaluation. During her course in the hospital she had to be transferred to another facility for cardiothoracic surgery evaluation for drainage of the pericardial effusion. No surgery was performed, patient improved and was later discharged with medication and follow up.

**Discussion:** This case illustrates a case of Myxedema, an endocrine emergency, which requires immediate recognition in the Emergency Department as delay in treatment can result in significant mortality. Many of the symptoms and sequelae improve with medication and patients should be started on steroids and levothyroxine.

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**Title:** A Multidisciplinary Approach to Chronic Pancreatitis  
**Authors:** Zuleikha Muzaffar, PGY1; Joel Haines, DO, OMS3  
**Program:** Mount Sinai Medical Center, Internal Medicine Residency Program

**Introduction:** Chronic Pancreatitis is the seventh most common digestive disease diagnosis for hospitalization, with annual healthcare costs eclipsing three billion dollars. Pain management remains one of the largest challenges for clinicians servicing this population. Due to poor understanding of disease physiology, pain is often improperly managed leading to multiple hospital visits, and repetitive workups, which further contribute to this large healthcare burden. Surgical intervention has proven to be an effective method for establishing pain control in these patients, and numerous surgical techniques are available, despite not always being considered by the primary care team. Our case demonstrates a multidisciplinary approach to a patient with chronic pancreatitis.

**Case Description:** Our patient is a 33-year-old female who presented with epigastric pain associated with nausea, vomiting and diarrhea for three days. She had a history of alcohol induced chronic pancreatitis (diagnosed in 2012); her last drink was two years ago. She has had multiple hospitalizations with her last episode being two years ago. She denies ever having any surgery and manages her symptoms mainly by diet. Prior to this admission, she had multiple emergency department visits for increased abdominal pain. On each of these encounters, she received a computed-tomography (CT) scan
that showed chronic pancreatitis with no acute changes. In the emergency department, she presented with a mild leukocytosis of 12.1 along with a decreased lipase at 37; hepatic panel and serum chemistries were unremarkable. An abdominal ultrasound identified a dilated common bile duct of 14 mm (increased from 9 mm on prior CT). An MRCP revealed no choledocholithiasis and a 9 mm common bile duct with a dilated pancreatic duct of 6 mm, consistent with chronic pancreatitis. Two days after admission, pain management was consulted due to failure to control pain. General surgery was consulted and recommended that the patient would be a good candidate for a pancreaticojejunostomy. The patient underwent the procedure on hospital Day 4. Post-operatively the patient continued with surgical pain, but she progressed appropriately and was able to be advanced from clear liquids to a full and regular diet. The patient was eventually discharged on hospital Day 7 and followed up with pain management as an outpatient.

Discussion: Our case highlights the importance of utilizing a multidisciplinary approach to improve these patients’ quality of life. Multiple theories exist to why these patients have an altered response to pain. We believe our patient suffered from pancreatic neuropathy which lead to remodeling of pancreatic nerve innervation leading to altered nociception. Along with appropriate pain regimens, surgical techniques are available to improve both patient outcomes and their quality of life. The pancreaticojejunostomy (modified Puestow) is the most common procedure in this population, providing pain relief in approximately eighty percent of patients post-operatively, with fifty percent maintaining pain relief for five or more years after follow-up. Due to increased sensitization to pain and ultimate health care cost, the multi-modal approach should be on the forefront when considering pain control in this population.

Title: 7-Year-Old with Perforated Appendicitis and Abscess Formation
Authors: Grant Myres, OMS3; Devin Haney, OMS3; Farooq Hassan, OMS3; Allegra Meacham, DO
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Acute bouts of appendicitis are the most common surgical emergency; unaddressed, serious complications will occur. Appendicitis treatment in children specifically consists of intravenous rehydration, electrolyte abnormality correction, prophylactic antibiotics, and appendectomy within 24 hours of diagnosis. However, ruptured appendicitis requires antibiotics, drainage, and resolution of acute inflammation before surgical measures can be considered. This case will discuss the care for a ruptured appendicitis in a pediatric patient and how to properly diagnose appendicitis, thus preventing the untoward outcomes seen in this case.

Case Description: The patient is a 7-year-old female with no past medical history who presents to the emergency department with her parents for a 2 to 3-week history of fever, abdominal pain, and non-bloody diarrhea. 2-3 weeks prior to admission, patient developed cough, congestion, fever, and intermittent vomiting. Patient presented to the emergency department at that time and was diagnosed with the flu and promptly discharged home. At home, the abdominal pain waxed and waned but persisted. Pain was located periumbilically. Patient developed further fevers (Tmax 104.0 F), chills, and daily episodes of diarrhea (1-2/day). Patient became tired with little energy and appetite decreased. Patient presented to the ED again with these new long-standing symptoms. CT and US imaging were taken in the ED after initial treatment. Upon reviewing CT images, patient was diagnosed with advanced perforated appendicitis with abscess formation. Patient was admitted for non-operative treatment with IV antibiotics and CT-guided abscess drainage and was discharged 10 days after admission.

Discussion: No two patients will identically present even with the same illness; furthermore, confounding factors will blur the line between diagnoses. Careful consideration of the presentation, imaging, lab results, and the patients themselves can untangle two diagnoses with similar characteristics and lead to proper treatment. When the patient first reported to the emergency department, the initial presumptive diagnosis of exclusively influenza infection lead to deleterious outcomes in this patient, and a more comprehensive approach and assessment of the patient may have led to the correct diagnosis of appendicitis before it ruptured, causing sepsis and abscess formation.

Title: A Lifetime of Fistulas: A Cautionary Case of Surgery in Crohn’s Disease
Authors: Mihir Nakrani, OMS3; Rajeev Herekar, OMS3; Ram Hirpara, OMS1; Ronald Moore, MD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Crohn’s disease (CD), one of the most damaging pathologic processes of the gastrointestinal tract (GI), is characterized by transmural inflammation that affects segments of the GI tract anywhere from mouth to anus. In 2015, approximately 3 million US adults have been diagnosed with inflammatory bowel disease which includes Chron’s disease, an increase from 2 million adults in 1999. Consequently, this has led to an increase in research and development of treatments modalities to induce and maintain remission of the disease while limiting complications. Approximately 17-50% of CD patients can suffer from a harmful complication of fistula formation, with one third of these individuals forming recurrent fistulas. The predominant mechanism for fistula formation is due to distal obstruction and inflammation including causes such as foreign bodies, radiation, epithelialization, neoplasm, distal obstruction, and inflammation. In this case report, we present a patient that received inadequate medical therapy combined with premature surgical intervention resulting in fistula formation and extensive hospital courses.

Case Description: A 39-year-old female with a history of multiple hospital admissions and Crohn’s disease complicated by numerous enterocutaneous, enterovesical, and enterovaginal fistulas presented to Broward Health with diffuse, achy abdominal pain associated with nausea and vomiting for 2 days. Her most recent surgery was 2 months prior for lysis of adhesions. Physical exam revealed diffuse abdominal tenderness to palpation in all four quadrants and negative peritoneal signs. Initial CT scan of abdomen/pelvis revealed air fluid level on anterior abdominal wall representing an abscess or fistula. Air within the bladder was also noted indicating an enterovesicular fistula. CBC revealed elevated white count consistent her previous hospital admissions. She was admitted and given IV Carbapenem for intra-abdominal infection along with Mesalazine and Prednisone for Crohn’s flareup. The patient was discharged 2 days later, however, she returned to the hospital multiple times since the initial admission due to complications from fistulas. Most of the patient’s hospital courses had been complicated by fistula tracts, DVTs, arrhythmias, worsening pain, and
Case Description: A 75-year-old male with a past medical history of right breast cancer s/p mastectomy, hypothyroidism s/p thyroid removal, hypertension, hyperlipidemia and paroxysmal atrial fibrillation who presented to our hospital with a chief complain of shortness of breath and pinpointed left sided chest pain. On physical exam, the patient complained of some mild difficulty breathing without signs of respiratory distress. Lungs were clear to auscultation bilaterally (BL). Respiratory rate was 18 bpm. 3+ pitting edema to the mid-shin noted DL. EKG revealed normal sinus rhythm with occasional premature atrial contractions. Troponin was negative. Outpatient stress test from two weeks prior did not show any signs of ischemia. Chest CT showed a filling defect in the left atrium concerning for a mass versus thrombus. An immediate bedside contrast TTE was performed and confirmed a filling defect with a mass like lesion adherent to the posterior superior wall adjacent to that in the flow of the pulmonary vein. Given the above findings, the patient underwent a TEE the following morning which showed a 4cm multi-lobular echogenic mass with calcifications in the left atrium likely arising from the pulmonary vein which was suspicious for malignancy. Cardiovascular thoracic surgery (CVTS) requested CT chest/abdomen/pelvis which was negative for metastatic malignancy. Due to the patient’s comorbidities, CVTS recommended left heart catheterization in the event the patient needed CABG concurrently with the removal of the atrial mass. Catheterization reported no evidence of occlusive coronary artery disease. CVTS scheduled the patient for resection of the atrial mass via minimally invasive approach. The specimen was reported to be multi-lobular and was resected in several fragments of tan, fleshy, and somewhat gelatinous appearing tissue in aggregate. Histopathology showed spindle cell malignant neoplasm with small foci of bone and cartilaginous formation, suggestive of an osteosarcoma. Since these finding represented an extremely rare case, the pathology was sent out for expert consultation at John Hopkins which reported this to be a high-grade sarcoma with focal osteosarcomatous differentiation.

Discussion: Synovial sarcomas predominantly occur in para-articular soft tissues in the extremities of young adults and adolescents. Cardiac synovial sarcomas are less than 0.1% of all primary cardiac tumors reported in the literature. These are highly aggressive, proliferate quickly, and cause death rapidly. Cardiac synovial sarcomas are not extensively described in the medical literature due to their low incidence and prevalence which limits treatment data. Thus, it is important to report cases and follow outcomes. This case reports an extremely rare diagnosis that has been previously reported in less than 7 prior case reports. Much remains unknown due to its rarity.
Discussion: This case demonstrates the importance of early recognition of acute interstitial nephritis in a patient with recent beta lactam exposure. This patient had contrast exposure 48 hours prior to onset of acute kidney injury, which clouded the clinical presentation and led the acute kidney injury to be initially attributed to contrast associated nephropathy. Clinicians must remain cognizant of the development of peripheral eosinophilia when paired with rising creatinine, as this points towards acute interstitial nephritis. Although acute interstitial nephritis is a diagnosis that ultimately requires biopsy, the diagnosis is further supported by the presence of urine WBC casts and eosinophilia. In addition, the patient’s renal function and eosinophilia responded appropriately after administration of steroid therapy casting further doubt aside.

**Discussion:** This case illustrates the importance of having a high index of suspicion for SS, especially when multiple agents affecting serotonin levels are involved and symptoms consistent with Hunter’s Criteria are present. This case also emphasizes the overlap of symptomatology between SS and NMS, and the need to focus on details of the patient’s physical in order to differentiate between the two. Lastly this case highlights that lithium is another medication that can commonly cause SS, whereas atypical antipsychotics are much rarer in causing SS.

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Discussion: PNPD deficiency is very uncommon but death due to recurrent infections is common without treatment. It is imperative that any health care providers be aware of its presentation. Treatment includes supportive care, bone marrow transplant, and gene therapy currently undergoing research. With immunodeficiency, it’s important to be wary of the risk of lymphoproliferative disorders as well. EBV-associated lymphoproliferative disorders occur in immunocompromised hosts as the virus permits the unchecked proliferation of EBV-infected lymphocytes. Treatment includes restoring the immune response by reducing immunosuppression or targeting B cells. In this case, however, chemotherapy was given to an individual with an underlying immunodeficiency that placed them at increased risk for infection and ultimately contributed to his demise.

Title: Non-Fluent Transcortical Motor Aphasia Syndrome in an HIV Patient Secondary to Immune Reconstitutive Inflammatory Syndrome/ Inflammatory Reconstitutive Disease (IRIS/IRD): A Case Report
Author: Allen Machado Nunez, MD, PGY1; Jose A Perez-Tirse, MD; Jose A Gascon, MD; Sean M Kauffman, MD
Program: Kendall Regional Medical Center, Translational Year Program

Introduction: Inflammatory Reconstitute Disease as part of the Immune Reconstitute Inflammatory Syndrome are well described and defined entities, but poorly studied in patient current receiving HAART. They are very challenging in the diagnosis process; both altogether combine an identifiable infectious source with a collection of inflammatory disorders associated with endothelial inflammation or immune activation (IRD) following the initiation of antiretroviral therapy. Suppression of HIV replication by HAART therapy often restores intrinsic immune response that damage targets tissues and causes disease [immune restoration disease/syndrome (IRIS/IRD)]. Concomitant or subtle Infections are the most common causes and the most researched, with multiples infective pathogen identified (7.6-13% HIV cases). Epidemiological and pathophysiological data of IRD as a single entity is very poor and limited due to lack of recent studies, but it suggests that immune-inflammatory mechanisms play a pivotal role in the illness process.

Case Description: We present a 47 y/o male from Nicaragua came to the hospital with difficulty to speak and impaired word repetition, also with lack of equilibrium, symptoms developed 3 months ago, increased progressively over time. Patient has HIV diagnosed 8 years ago, but not following any treatment, no other signs/symptoms. On primary work up CD4 count 346, no other symptoms reported but neurology wise continue worsening, CT brain reported multifocal hypodense lesions, negative to brain edema, LP is recommended, follow up Brain MRI reported innumerable enhancing cortical/subcortical and white matter lesions bilateral cerebral hemispheres, involving the basal ganglia, bilateral thalami, splenium of the corpus callosum, brainstem and cerebellum. Brain Biopsy reported GMS positive organism well visualized on PAS slide with prominent lymphoplasmacytic infiltrate. PCR report negative to multiple pathogens. Final report pending for expert second opinion.

Discussion: IRIS/IRD is a syndrome reported in HIV patients after HAART treatment is started, involving an inflammatory, immunologic reaction after patient’s body regain capability to mount an appropriate immune response. IL-6 mediated hypersensitivity play an important role, this case is unique and challenging.

This is a preliminary report, but our question remains, what is causing this peculiar IRIS/IRD syndrome?

Title: Point-of-Care Ultrasound Evaluation of Pulmonary Embolism in Pregnancy with Cardiac Arrest
Authors: Manuel Obando, MD, PGY2; Benjamin Pirotte, MD, PGY1; Gaurav Patel, MD; Vu Huy Tran, MD
Program: Aventura Hospital and Medical Center, Emergency Medicine Residency Program

Introduction: We present a case of a young female who presented in cardiac arrest with signs of right heart strain on bedside echocardiography both during the resulting code and after return of spontaneous circulation (ROSC). Findings of right heart strain have been associated with pulmonary embolism and used to guide clinical decision making. We will discuss this specific point-of-care ultrasonography (POCUS) finding, how it guided clinical management, and analyze if this is appropriate use of POCUS.

Case Description: 22-year-old G1P0 female, approximately 7 weeks gestation presented to the emergency department (ED) in cardiac arrest with pulseless electrical activity (PEA) on initial rhythm. Prior to arrest, the patient complained of chest pain, acute dyspnea, and exhibited agonal respirations. Throughout her ED course, the patient was in extremis and hemodynamically unstable. Pulmonary embolism was highly suspected, but the patient was too unstable for CT angiogram of the chest to confirm the diagnosis. Bedside echo was performed which showed right atrial/ventricle enlargement and right ventricle akinesis with apical sparing (McConnell’s Sign), consistent with acute right ventricle strain. Based on presentation and echo, the decision was made to administer tissue plasminogen activator (tPA) for presumed massive pulmonary embolus. Ultimately the patient expired after a prolonged resuscitation. According to the autopsy report, the patient’s cause of death was determined to be secondary to bilateral massive pulmonary emboli.

Discussion: This case demonstrates the utility of early application of POCUS in a patient with cardiac arrest due to bilateral massive pulmonary emboli. We were able to rapidly identify signs of acute right heart strain in a patient in cardiac arrest and alter clinical management in real-time. Because of echo findings of right heart strain, tPA was administered empirically for suspected massive PE. TPA is not currently recommended for routine use in patients with undifferentiated cardiac arrest but may be considered in patients with confirmed pulmonary embolus and hemodynamic instability, or with severe RV dysfunction.

Recently, there has been discussion in the literature about the validity of using right dilation as a marker for pulmonary embolus in cardiac arrest. A porcine ultrasound study in 2017 demonstrated right ventricular dilation in pig models due to hypovolemia, hypokalemia and primary arrhythmia. These findings suggest that RV dilation in arrest may be an inherent result of cardiac arrest due to causes other than PE. Furthermore, this phenomenon was also described in several patient-based studies, confirming that right ventricular dysfunction was prevalent in patients who attain ROSC. Furthermore, post-arrest RV dilation was as prevalent as LV dysfunction, and predictive of worse outcomes. Another study published in 2019...
analyzed the use of POCUS in a post-cardiac arrest setting in the ICU. This study found that echo ultrasound studies within 60 minutes after ROSC were a useful adjunct in clinical diagnosis and decision making. In this analysis, the proportion of patients that were found to have PE as a cause of their cardiac arrest had echo findings of right ventricular dilation in addition to signs of pressure overload, as either a flattening of the intraventricular septum (“D-sign”) or McConnell’s sign.

Although the finding of RV strain in patients in cardiac arrest may not always be due to pulmonary embolus, this case suggests that PE should be considered with these findings in patients with high pre-test probability.

**Title:** Shingles Presenting with Acute Pancreatitis  
**Authors:** Adriana Ochoa, OMS3; Thanaporn (Jessica) Sae Tang, OMS3; Pallavi Aneja, MD  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Acute pancreatitis usually presents with abdominal pain and elevated pancreatic enzymes, with gallstones or alcohol abuse being the most common etiologies. Although Shingles is uncommonly associated with acute pancreatitis, it is an origin to consider and must promptly be treated with antiviral medication when other etiological factors are excluded.

**Case Description:** Our patient is a 71 year old male, with a significant past medical history of diverticulitis who presented to the ER with R flank/abdominal pain for the past 4 days which began as a scratchy skin sensation and developed into pain which worsens at night, is intermittent, and improves in the day. The patient denied associated symptoms of dysuria, hematuria, vomiting, or diarrhea. Patient also denies abdominal surgery. Home medications include paroxetine, baby aspirin, and atorvastatin. Patient reports he was taking augmentin a few days ago for an upper respiratory infection.

Patient quit drinking 3 years ago and is a former smoker. On initial presentation, his vitals were stable and afebrile with slightly elevated blood pressure 151/80. Physical exam was significant for right lower quadrant tenderness without rebound or guarding, and right flank pain. The skin was dry with no rashes. Initial labs demonstrated elevated total bilirubin at 1.6, unconjugated bilirubin at 1.3, amylase at 280, lipase of 1650, monocytes % of 11.4. Ultrasound of the abdomen showed a normal right upper quadrant examination with no gallstones. CT of the abdomen and pelvis with contrast showed diffuse colonic diverticulosis without evidence of acute diverticulitis. No acute bowel pathology or obstructive uropathy was seen. The appendix appeared normal, a urinary bladder diverticulum was described along with hepatic steatosis. Due to the extremely elevated lipase, the patient was admitted for further management for a GI consult and repeat labs. On admittance, the patient was made NPO and started on IV fluids with ketorolac and morphine pm for pain. On hospital day 1, repeat labs showed downward trend in amylase and lipase at 184 and 451 respectively. HIDA scan showed mild delay of gall bladder emptying otherwise negative for any obstruction or stone. Patient reported a new onset of right abdominal paresthesia and pain. On hospital day 2, AST was elevated at 69 and total bilirubin at 2.2. Physical exam revealed a new onset of vesicles on the skin concluded to be from shingles. The patient was started on valacyclovir and recommended MRCP and outpatient tumor marker labs.

**Discussion:** Shingles, a reactivation of the varicella zoster virus, is common among older adults, like our patient, for its extremely vicious and painful vesicular lesions outlined in a dermatomal distribution usually along thoracic or lumbar dermatomes. What is unique about this case, is that our patient presented with his bout of acute pancreatitis prior to both the eruption of vesicular lesions and awareness of neuritic pain. Due to the exclusion of common etiologies for acute pancreatitis such as the patient's alcohol cessation for the past 3 years, absence of gallstones on ultrasound, negative CT scan for diverticulitis, lack of bowel pathology or obstructive uropathy, the cause of this patient’s presentation became unclear. A better clinical picture became apparent upon the patient’s second day of admittance when physical exam revealed new onset vesicles across the epigastic region that extended to the right upper quadrant, right along where the pancreas sits on the body. Once the patient was started on valacyclovir to treat the rash, the acute signs and symptoms of the pancreatitis subsided effectively.

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**Title:** Acute Appendicitis: A Tenacious Diagnostic Challenge for Physicians  
**Author:** Ricardo Jaime Orozco, OMS3  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Appendicitis is a condition in which the appendix is inflamed, filled with pus causing pain. Etiology of appendicitis remains uncertain, but a popular theory notes that luminal obstruction blocks mucosal secretions leading to increase pressure. The increased pressure precipitates engorgement and stasis that can lead to necrosis and eventually perforation. Causes of luminal obstruction include faecoliths, foreign bodies, malignancy, and lymphoid hyperplasia.

Diagnosing appendicitis requires a full work up with patient presentation, labs, and imaging required to make a definitive diagnosis. Despite the various history and modalities involved, acute appendicitis still manages to be missed. 20-40% of patients with proven appendicitis being misdiagnosed and discharged by physicians before the correct diagnosis is made. These high cases of missed appendicitis appear to be rooted in the lack of continuity amongst patients. It appears that only about half of patients with acute appendicitis will display the typical clinical features of abdominal pain, central pain migrating to the right iliac fossa, nausea, vomiting, and anorexia.

**Case Description:** We present a case of 7-year-old male patient who presented to the emergency room with abdominal pain after suffering from fever, cough, and congestion for five days. Patient was taken to an Urgent care 3 days ago where he was diagnosed with Influenza A and prescribed Tamiflu, amoxicillin, and cough suppressant. Patient did not start the Tamiflu and only took 2 doses of the amoxicillin. The abdominal pain started two days ago and it is localized to the lower part of his abdomen. There is no inability to pass gas, or any changes to his bowel or bladder function. Patient had a single episode of vomiting the prior day. In the ER CT scan was obtained that demonstrated mesenteric lymphadenitis, the appendix was not well visualized but there was no inflammation or free fluid noted on the scan. Patient was admitted for worsening abdominal pain and poor PO intake. Patient was started on IV fluids and antibiotics.
Over the next few days patient continued to spike fevers with associated diarrhea and nausea but no vomiting. Abdominal pain continued to worsen diffusely but worst suprapubic. WBC rising to 13.2 from 10 and CRP elevated to 17.9 from 6. Full work up and repeat CT scan was ordered to locate possible GI source of continued abdominal pain. Repeat CT scan suggested possible appendicitis with free fluid and free air in the abdomen compared to previous CT imaging. Pt was taken to the OR for open exploration at which point upon entering the peritoneal cavity there was turbid fluid noted in the right lower quadrant. Pt was found to have a gangrenous perforated appendix in the right pelvis and appendectomy was performed. Abdomen was washed and an NGT was placed to suction. Patient was admitted post-op to the PICU for continued monitoring of NGT and antibiotics.

**Discussion:** This case report illustrates the importance of having a high suspicion of acute appendicitis (AA) in a child with abdominal pain. AA has a lifetime risk of 8.6% and 6.9% in males and females respectively. Out of these, the prevalence of missed appendicitis appears to be between 20-40%. Demonstrating these shortcomings in the diagnosis of AA leaves room to speculate if there needs improvement in the preoperative diagnosing of acute appendicitis.

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**Title:** Autoimmune Polyendocrinopathy-Candidiasis-Ectodermal Dystrophy (APECED): Phenotypic Differences of AIRE Gene Mutations in Monzygotic Twins  
**Authors:** Jack O'Sullivan, OMS3; Maria Elena Arrate, OMS3; Jennifer Rich, MD  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** APECED, also known as Autoimmune Polyendocrine Syndrome Type 1 is a rare autoimmune condition with reported incidence of only 1 out of 100,000- 200,000 of patients. This genetic disorder is due to the autosomal recessive mutations in the AIRE gene, coding for autoimmune regulator proteins. Mutations in this gene result in reduced or eliminated immunomodulation, allowing for an autoimmune response against healthy tissues. Gene mutation also causes production of autoantibodies against the IL-17 cytokine pathway, an important defense mechanism against Candida. This disorder most commonly involves the three classic features of Chronic Mucocutaneous Candidiasis (CMC) with esophageal infection being most common. Hypoparathyroidism as the second of these features and adrenal insufficiency resulting in Addison’s disease as the third. Patients may also present with non-endocrine manifestations such as rash, enamel hypoplasia, hepatitis, pneumonitis, Sjogren-like syndrome, keratitis, nephritis, B-12 deficiency, alopecia, vitiligo, atrophic or absent spleen, chronic diarrhea/constipation due to malabsorption from inflammation of the gut (ex: SIBO). APECED occurs with more frequency in those of European descent.

**Case Description:** We present a case of twin 6-year-old white females who were clinically diagnosed with APECED at 4 years old. Both developed two episodes of thrush around 3 months and then again before the age of 1 year. Twins A and B developed an APECED rash at 10 and 14 months respectively. Twin B’s rash recurred at age 4. At 2.5 years, both twins presented with nail dystrophy of all fingers and toes which appear to be secondary to autoimmunity rather than fungal infection in light of negative microbiological data. Twin A developed alopecia at 4 years, responded well to minoxidil and clobetazole. Currently, she only has one circular area of hair loss on the scalp. Twin B developed alopecia at 3.5 years that started as patchy hair loss affecting the scalp. Total hair loss, including eyebrows and eyelashes by 4.5 years. She has tried multiple agents without success. Twin A was diagnosed with hypoparathyroidism at 4.5 years following a hypocalcemic seizure. Twin B diagnosed with hypoparathyroidism at same time by blood screening. Hypoparathyroidism effectively treated with calcitriol, teriparatide, calcium carbonate, and vitamin D for both twins. Twins A and B have both tested positive for 21-hydroxylase antibodies that confirm Adrenal Insufficiency. ACTH stimulation test for both twins was below the cutoff of normal. Both effectively treated with hydrocortisone daily. Twin A does have some evidence of salivary gland dysfunction, reporting the need to drink extra water to “push food down”. Salivary flow test results were slightly above AEGC 2002 Criteria of Sjogren’s syndrome. No normal values for a pediatric population are agreed upon. Effectively treated with biotene and humidifier at night. Twin B confirms persistent troublesome dry eyes, which may be secondary to alopecia of eyelashes. Salivary flow test was above AEGC 2002 Criteria threshold for Sjogren's syndrome.

**Discussion:** This case demonstrates the different physical manifestations of the same rare genetic disorder in identical twins living in the same environment.

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**Title:** Thinking Outside of the Box: A Case of Extra-Pulmonary Gastric Small Cell Carcinoma  
**Authors:** Shivani Palakodaty, OMS3; Sandhya Haryani, OMS3; Noushad Mamun, OMS4; Jose J. Contreras, MD  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Small cell carcinoma is a neuroendocrine tumor that most commonly arises in the lung but has also been found to originate in a wide variety of extrapulmonary sites. Extrapulmonary small cell carcinomas (ESCCs) are extremely rare; approximately 1000 cases are reported annually in the United States, comprising 0.1-0.4% of all cancers. Gastric ESCC, more commonly seen in Japanese male patients in their seventh decade of life (1), comprises 8.3–14.5% of ESCC (2). Our case of a very rare condition is to highlight the importance of including small cell carcinoma in the workup of a gastric malignancy as it has the tendency to present similarly to other malignancies (3), but with a very aggressive nature and overall poor prognosis. Less than 15 percent of patients survive up to five years (4). The hope is to bring more awareness to the existence of this rare subtype of small cell carcinoma in order to diagnose patients earlier in the disease and optimize disease management.

**Case Description:** We present a case of a 72-year-old Hispanic male who presented to the emergency department complaining of epigastric abdominal pain and dyspepsia that started 2 days prior. He denied any diarrhea, nausea, vomiting, fever, chills, or blood in stool. Computed tomography scan of abdomen revealed a lobulated soft tissue mass in the proximal stomach measuring at least 8.9 x 7.4 cm. Findings were concerning for malignancy and patient was admitted for further evaluation. Differential diagnostic considerations at this time included lymphoproliferative disorder, gastric adenocarcinoma, or metastasis. Esophagogastroduodenoscopy with endoscopic ultrasound revealed a mass that invaded the gastro-esophageal junction. Surgical-Oncology was consulted and recommended laparoscopy and port placement to obtain histological diagnosis and staging due to the very suspicious presence of adenocarcinoma. Initial gastric mass biopsy revealed fibrotic tissue with a focus of lymphocytes. Due to inconclusive pathology,
an open biopsy of the perigastric mass was scheduled. Final pathology report revealed high grade neuroendocrine carcinoma of gastric origin (small cell carcinoma). When the patient had returned 2 months later for evaluation of anemia, CT abdomen revealed right hepatic lobe lesions which were not visualized on the initial scan, reflecting the rapid progression of small cell carcinoma. Due to tumor progression, post-op complications, and morbidity and mortality rate, patient was not considered a candidate for surgery and was recommended to undergo chemotherapy treatment.

**Discussion:** This case illustrates the rarity of gastric small cell carcinomas and how it can be missed as a diagnosis because of its similar presentation to other gastric malignancies. Small cell carcinomas are considered to be invariably lethal; they are aggressive in nature and are characterized by early, widespread metastases and an overall poor prognosis (2). Furthermore, since gastric ESCC is notable for having a greater incidence in Japanese male patients (1), literature is limited regarding non-Asian populations. Meta-analysis of worldwide gastric small cell carcinomas may be an avenue for improvement to optimize early diagnosis and treatment.

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**Title:** Standardizing the Unknown: Work-Up and Management of Cancer of Unknown Primary Site  
**Authors:** Akash Patel, OMS3; Stephanie Pontillo, OMS3; Dinh Pham, MD  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program  

**Introduction:** Cancer of unknown primary site (CUPSs) is defined as a histologically confirmed metastatic cancer in which a primary source is not identifiable using standard diagnostic approaches. CUPS accounts for 4-5% of all invasive cancers. Approximately 70% of which are adenocarcinomas. At present, the standard diagnostic approach is used to determine the extent of metastatic disease rather than the origin. Though Møller et. al. stated that there is no clear diagnostic advantage to utilizing PET over CT alone, the impact of PET can guide therapeutic management and also help detect a potential primary. Ultimately, utilizing the tools available including complete blood counts, serum chemistries, CT scans and PET scans, a physician is able to create empiric treatment regimens to maximize outcome for individuals with CUPS.

**Case Description:** We present an 81-year-old male, with history of organ confined prostate cancer status post prostatectomy in 2007, who was transferred from assisted living facility to the nursing home rehabilitation center due to overall increased weakness and physical debility. In 2014, the patient had sustained a fall and was diagnosed with subarachnoid hemorrhage requiring no surgical intervention. After this incident, he was placed in an assisted living facility but maintained all of his activities of daily living (ADL). He denied any symptoms of vertigo, dizziness, weight loss or loss of appetite. In August 2019, he presented to the office with mild shortness of breath, mild cognitive decline and decreased appetite over the previous few weeks. Patient was no longer able to perform his ADLs. At that time, CT abdomen demonstrated bilateral renal cysts, 3.6 cm soft tissue mass within the right lower quadrant (RLQ) mesentery with a 1.7 cm enlarged node in the same area. Patient was referred to hematology and oncology for workup and treatment. Follow-up PET-CT scan in October 2019 demonstrated new diffuse hepatic metastatic disease. Biopsy of liver mass established adenocarcinoma with suspicion of colorectal primary but inconclusive. Follow-up CT scan of abdomen and pelvis in February 2020 demonstrated the same renal cysts and RLQ mass, progression of liver metastasis, free fluid adjacent to liver and psoas muscle, pancreatic tail necrosis, and right pleural effusion with compressive atelectasis. Patient was diagnosed with cancer of an unknown primary site and then started on folinic acid, flurouracil, and oxaliplatin (FOL-FOX) treatment.

**Discussion:** In our case, the patient presented with a rapidly progressing cancer of an unknown primary site. Though the standard of care did not require the oncologist to obtain a PET scan following CT findings, it led to discovery of new metastasis in the liver, and ultimately, the diagnosis. At this time, standard of care recommends empiric chemotherapeutic treatment of combinations containing a platinum agent and one of the newer cytotoxic agents (taxanes, gemcitabine, irinotecan). This regimen has shown to produce median survivals of 7 to 10 months and two-year survival rates of 20 to 25 percent. However, the patient was put on an alternative treatment that did not prolong his survival. By altering the standard protocol, the oncologist was able to rapidly diagnose the patient with CUPs but was unable to extend survivability through the treatment regimen. This case demonstrates that recommendations regarding the diagnosis and treatment of CUPs require further revision and research to provide more accurate and stable management of metastatic disease. Though efforts are often aimed to find more viable treatment options, diagnosis update is also vital to research efforts.

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**Title:** When Immunoglobulins Attack: A Case of Evans Syndrome  
**Authors:** Jay B. Patel, OMS3; Nisarg P. Shah, OMS3; Krunal S. Patel, OMS3; Walter J. Kay, DO  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program  

**Introduction:** Evans syndrome (ES) is a rare hematologic disease that consists of autoimmune hemolytic anemia (AIHA) and immune thrombocytopenia (ITP) occurring together. The manifestation of involved cytopenias can be in conjunction or sequential, with no more than a 10-year gap. Its etiology is only theorized to be a result of immune dysregulation that leads to immunoglobulin abnormalities. ES is a chronic disease that has been reported to occur in infancy, childhood, and late adulthood with typical features of both AIHA and ITP. Due to its rarity, epidemiologic parameters have not been established. However, some cohorts of AIHA and ITP have shown ES to occur in 37-73% of the population and others only 4%. Diagnosis at onset of either cytopenia is even lower at 0.8 to 3.7%. Patients will present with weakness, fatigue, petechiae, and ecchymosis. Laboratory tests will reveal low hemoglobin (Hb) and hematocrit (Hct), neutropenia, reticulocytosis, polychromasia, spherocytes, a positive direct antiglobulin test (DAT), and production of IgG against platelet antigen (PA-IgG). Coming to a diagnosis requires a keen history and thorough workup of the patient as primary ES is a diagnosis of exclusion. Secondary ES can result from a conglomerate of autoimmune conditions (i.e. systemic lupus erythematosus), immunodeficiencies (i.e. autoimmune lymphoproliferative syndrome), and malignancy (i.e. lymphomas).

**Case Description:** Our patient was a 72-year-old male who presented with chest pain when doing yard work for the past 1.5 months. He described the pain as a non-radiating “heartburn” with associating racing heart rate, full body weakness, and lightheadedness. Physical exam was benign. Labs showed anemia with Hb 8.4 g/dl, thrombocytopenia with platelets of 24 x 10^9/L, and elevated reticulocyte count of 7.7% red cells. EGD performed by GI was...
unremarkable. No bleeding or gross lesions were seen. Bone marrow biopsy was also performed and ruled out myeloproliferative disorders or other underlying bone marrow malignancy. A positive direct Coombs test confirmed the diagnosis of ES. Over a few months, he was treated with a combination of steroids, rituximab, intravenous immune globulin, eltrombopag, and romiplostim. Although his thrombocytopenia and symptoms improved initially, his platelet levels continued to fluctuate. He developed complications of psychosis, lower extremity edema, palpable purpura, and continues to experience shortness of breath. Splenectomy is being considered. The patient is being monitored closely and treated appropriately by his caregiving team.

**Discussion:** The rarity and difficult diagnoses of ES has limited the avenues physicians can take during early presentation of the disease. Additionally, stratifying patients into primary and secondary ES is necessary as the latter responds differently to some of the treatments available for ES. Thus, this case allows us to explore the pathophysiology and complexity of treatment for ES.

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**Title:** Pulmonary Artery Aneurysm in Setting of Chronic Thromboembolic Pulmonary Hypertension  
**Authors:** Parth Patel, MD, PGY1; Chase Labiste, OMS3; Jacob Miller, MD; Robert Beecham, MD; James Banks, MD  
**Program:** Aventura Hospital and Medical Center, Transitional Rotating Internship Program

**Introduction:** Pulmonary artery aneurysms and pulmonary artery pseudoaneurysms are rare conditions which have high morbidity and mortality. There are several congenital and acquired causes for pulmonary arterial ectasia, aneurysm and pseudoaneurysm. It has been proposed that chronic thromboembolism leads to development of an aneurysm by post-stenotic dilation and/or direct injury to the arterial wall. Another explanation for aneurysm formation in thromboembolic disease could cause post-stenotic dilation due to the increased velocity of blood flow distal to the obstruction as seen in patients with pulmonary valve stenosis. Although rare, occasionally pulmonary arterial ectasia and aneurysms can be idiopathic. Our case illustrates chronic thromboembolic pulmonary hypertension (CTEPH) and subsequent formation of saccular aneurysms, which are associated with lethal complications. Prompt detection and proper management of this condition are imperative for optimal patient care.

**Case Description:** We present a case of a patient with chest pain. Initial CT angiography of chest showed multiple pulmonary emboli in the lingular and left upper lobe pulmonary arterial branches. The patient did not meet criteria for percutaneous intervention and was instead medically managed with outpatient follow-up. Despite anti-coagulation, CT angiography scan 5 months later during another hospitalization revealed new right lower lobe emboli. The previous left sided clot burden resolved, but was complicated by development of saccular aneurysms in the left main pulmonary artery measuring 2.8 x 2.9 x 2.2 cm and in the left lower lobe segmental branch measuring 2.6 x 2.3 x 1.8 cm. Our patient was started on antiocoagulation therapy for acute pulmonary embolism and an IVC filter was placed after recurrence of thrombembolism despite being therapeutic on anticoagulation. Right heart catheterization showed moderate pulmonary hypertension and increased wedge pressure secondary to CTEPH, for which he was started on Adempas (riociguat).

**Discussion:** Rarely reported in the literature, pulmonary artery aneurysm and pseudoaneurysm are rare but important entities that require specific management based on an understanding of the underlying cause and potential complications. Management aims at reducing the risk of complications including rupture, dissection, and thrombus formation, all of which significantly increase mortality rate. Although there is no clear guideline in terms of treatment, medical management of the underlying cause is the treatment for patients who are asymptomatic with a stable artery diameter because they are at a lower risk for having a ruptured or dissecting aneurysm. Strategies employed include regular scheduled outpatient visits with a primary care provider, pulmonologist and cardiologist to assess the effectiveness of medical management and assess for potential complications. Although there is no consensus for the indications of surgical intervention, a number of cases have been reported with surgeries performed for pulmonary trunk diameters ranging from 50 mm – 60 mm or higher. Surgical intervention may be needed when diameter exceeds 55 mm, if the caliber increases by 5 mm or more in a 6-month period, the aneurysm compresses nearby structures, a thrombus forms within the aneurysm sac, new clinical symptoms occur, valvular disease develops, pulmonary arterial hypertension is confirmed or there are signs of rupture or dissection. In addition, semiannual or annual CT angiography may assist in determining if there are changes that may signify the patient is at risk for increased morbidity or mortality.

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**Title:** Trigeminal Neuralgia Misdiagnosed as Otitis Media in a Patient with Acromegaly  
**Authors:** Rahul Patel, OMS4; Matthew Maggio, DO, PGY1; Tito Suero, MD  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Trigeminal neuralgia is a painful, debilitating condition that can occur insidiously. Traditional theories have supported reactivation of varicella zoster virus as the cause of nerve inflammation. Patients will typically describe pain occurring near their ear following the distribution of the V1 V2 and V3 branches of the trigeminal nerve. Pain may be triggered by chewing, jaw movement, and light touch. The excruciating pain typically lasts a few seconds and then subsides until the next trigger. Without a thorough history and physical exam, this can be misdiagnosed as otitis media. Patients may be given unnecessary antibiotics which may temporarily decrease inflammation and resolve the episodes until the medications are finished and the pain returns. Patients may also present with chronic conditions that could support a misdiagnosis, such as a ruptured tympanic membrane on the side of the affected ear. Anatomic factors contributing to this presentation may also occur such as in a patient with acromegaly.

**Case Description:** We present a 66-year-old male with a PMH of acromegaly treated with hydrocortisone and hypothyroidism treated with levothyroxine complaining of left ear pain for the last 5 days. When the pain first occurred 13 days ago, the patient was seen at an urgent care and given augmentin for otitis media with resolution of his symptoms. Pain returned shortly after finishing the course of antibiotics. Patient describes the pain as electric and sharp, occurring in jolts, lasting a few seconds and then subsiding. Patient reports its occurs when he chews. Patient denies it occurs with talking, touch, brushing teeth shaving. Patient denies visual changes, but reports dizziness. On exam, the patient has frontal bossing, macrognathia, macroglossia, prognathism, and enlarged hands. Patient was afebrile, with no recent illness. Patient was not actively in pain at the time of presentation. HEENT exam revealed a ruptured left tympanic membrane that appeared chronic, with no signs of erythema, exudates or acute infection. Due to the lack
of clinical signs of infection and intermittent pain following a V2 distribution, trigeminal neuralgia was the suspected diagnosis. The patient was educated on the triggers and to avoid them as much as possible. He was instructed to follow up with neurology and ENT as prescribing carbamazepine in the ER for this acute episode could have dangerous side effects.

**Discussion:** This case highlights the importance of a thorough history and physical exam and maintaining a high index of suspicion for alternative diagnoses. It also demonstrates the importance of understanding possible factors contributing to the patients presentation, such as macrognathia impinging on the trigeminal nerve or the vasculature around it, the potential for hydrocortisone to either cause reactivation of herpes zoster or decrease inflammation of the trigeminal nerve, and the potential for antibiotics to have anti-inflammatory effects that can support a misdiagnosis.

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**Title:** Thymoma Type 2B Associated with Myasthenia Gravis  
**Authors:** Yalini Pathmakumar, OMS3; Sundeep Gidugu, OMS3; Reena Patel, OMS3; Daniel Campbell, DO, PGY1  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Myasthenia gravis (MG) is a rare autoimmune disorder in which the body produces antibodies against acetylcholine receptors at the neuromuscular junction, hindering muscle contractions. One important association of MG is thymoma, a rare tumor of the thymus that can either be benign or malignant. Thymomas and MG have long been documented together, however, of the 36,000 - 60,000 cases of MG in the United States, only 10% have been associated with thymomas. Despite its low prevalence, the combination of thymoma and MG should be considered in patients with a variety of presenting symptoms, including shortness of breath and chest pain.

**Case Description:** We present a case of a 67-year-old male who presented to the ED with a chief complaint of shortness of breath for one week. Past medical history was significant for hypertension and hemorrhagic stroke. A review of systems revealed intermittent right sided eye droop, neck pain, and weakness in the upper extremity, which started a week ago according to the patient’s wife. Upon examination, the patient was found to be awake and alert, with an unremarkable physical exam. An ECG was performed, showing temporary ST elevations in the septal leads and depressions in the inferior leads. A lateral and posterior-anterior X-ray produced negative findings; however, chest CT showed a mediastinal mass that was compressing his pulmonary artery and phrenic nerve. Given these findings, we suspected the patient had a thymoma causing the shortness of breath, and possible associated MG. Further tests were ordered to detect MG markers, including Acetylcholine Receptor Antibody (Ach R Ab), Acetylcholine Receptor Blocker Antibody (ACH Blocker AB), and Anti Muscle Specific Tyrosine Kinase Antibodies (Anti MuSK Ab). Results showed that the patient was positive for Ach R Ab and ACH R Blocker AB. Additionally, biopsy of the mediastinal mass was conclusive for thymoma type 2B. The patient was then referred to surgery and subsequently underwent a thymectomy.

**Discussion:** This case illustrates how myasthenia gravis is not always within the lines. Symptoms such as shortness of breath and chest pain are commonly associated with coronary and respiratory pathology, and a lack of attention to detail and careful history taking may prevent a clinician from diagnosing the true underlying culprit, in this case MG associated with thymoma. Furthermore, this case discusses thymoma type 2B, which is a less common type...
of thymoma that has a higher mortality rate than other forms of thymoma. Thus, it is crucial to not consider all thymomas with the same level of severity, as thymoma type 2B has around a 10% mortality rate (Meneshian et al, 2019) and appropriate treatment measures, including surgery, should be initiated as soon as possible.

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**Title:** A Rare Case of Congenital Morgagni Hernia Masquerading as Longstanding Dyspnea on Exertion  
**Authors:** Jason Petusevsky, OMS3; Ariel Rodriguez, MS, MD  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Morgagni Hernia (MH) is the most rare of the four congenital diaphragmatic hernias with an estimated incidence of 1.6-4% of cases. MH is even more rare in adults with a literature review finding 298 cases worldwide since 1951. Failure of fusion of the fibrotendinous elements of diaphragm, that is, sternal and costal attachments, leaves behind a muscle-free area through which the hernia occurs eventually. Morgagni hernias are usually right sided, and the most common hernia content is omentum followed by colon, small intestine and rarely, liver.

**Case/ Surgery Description:** A 47-year-old female with a past medical history of morbid obesity, and GERD presented with a 7-year history of shortness of breath upon exertion. She had a CXR performed that showed decreased lung volumes on her right side, she is a smoker and attributed it to that. She also complained of moderate, dull, right-sided chest discomfort. She was initially started on antibiotics by a pulmonologist for suspected PNA and subsequently quit smoking. The SOB on exertion continued and she subsequently had a CT scan that showed a Morgagni hernia with incarcerated abdominal contents occupying the right chest. She states that she used to be very active up until about 7 years ago when the SOB on exertion began. After that she began gaining weight, became increasingly SOB, and presented for surgical evaluation of her Morgagni hernia. Aggravating factors include anxiety, exercise, and stress. Alleviating factors include rest. Associated signs and symptoms include heartburn, morbid obesity, reflux, and regurgitation.

A robotic assisted diaphragmatic Morgagni hernia repair with mesh was performed. A large defect in the subxiphoid area was noted measuring approximately 6x4cm where small bowel, ascending colon, and transverse colon were incarcerated with significant adherence to the hernia sac. The hernia sac was massive and attached to all the chest structures especially the pleura on the right side. Operation was arduous but uneventful and the patient was discharged. During follow up the patient was doing well with significant improvements in SOB upon exertion.

**Discussion:** From one-third to more than half of patients are asymptomatic. These patients may be found incidentally when a chest X-ray undertaken for investigating unrelated problems. Common presenting symptoms that may prompt further evaluation include nausea, vomiting, abdominal pain, recurrent chest infections, chest pain, decreased exercise tolerance, constipation, and excess flatulence or indigestion. Complications such as volvulus, obstruction, strangulation and incarceration of the hernia can occur that warrant prompt surgical intervention. The reason for reporting this case is the rarity of incidence as well as the unique and delayed presentation. The variation in presentation prompts the need for a high index of suspicion when assessing recurrent bouts of pulmonary infections coupled with progressive shortness of breath.

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**Title:** The Mysterious Mediastinal Mass: Exploring the 5 T's of the Anterior Mediastinum and Other Differentials  
**Authors:** Nicholas Pigg, DO, MPH, PGY3; Zachary Carroll, OMS2  
**Program:** Aventura Hospital and Medical Center, Diagnostic Radiology Residency Program

**Introduction:** The mediastinum contains gastrointestinal, vascular, nervous, lymphatic and glandular tissue, making it home to a wide variety of benign and malignant masses encountered during radiological exams. The location, composition and appearance of these masses are essential in narrowing down a differential diagnosis and properly treating patients. 50% of mediastinal masses occurring in the anterior compartment (1) with a classic “5 T’s” differential diagnosis: Thymus (Thymoma), Thyroid (Ectopic Thyroid masses), Thoracic Aorta (Dilated or aneurysm of the ascending aorta), Terrible lymphoma, and Teratoma and germ cell tumors (2). Aside from a lesion’s imaging characteristics, the patient’s age plays an important role in diagnosis with neurogenic tumors, germ cell neoplasms and foregut cysts representing 80% of childhood lesions, whereas primary thymic neoplasms, thyroid masses and lymphomas are the most common in adults (3).

**Case Description:** We present a case of a 65-year-old Caucasian male who presented with a three-day history of worsening shortness of breath and dizziness. He has a history of coronary arterial disease and chronic obstructive pulmonary disease for which he has had several hospital admissions over the past 10 years. After being placed on supplemental oxygen via nasal cannula, the patient underwent a full diagnostic workup that included a chest CT. On the CT, a 1.5 cm soft tissue mass was incidentally discovered in the anterior mediastinum (Figure 1). The patient has no history of mediastinal mass, lymphoma or other malignancy. When comparing the mass to other common mediastinal masses no clear diagnosis could be made (Figure 2). However on review of the patient’s previous CT exams of the chest obtained during previous hospital stays, a mediastinal suture from coronary arterial bypass surgery had migrated into the anterior mediastinum with a granuloma forming around the foreign body over the course of the next 10 years (Figure 3). The mass was thus determined to be benign with no follow up or treatment needed. The patient was treated for a CHF exacerbation and discharged to his home three days later.

**Discussion:** This case illustrates the importance of imaging in the diagnosis of indeterminate masses as well as the importance of prior imaging to narrow the differential diagnosis.
**Title:** A Change of Heart: Transcatheter Aortic Valve Replacement for Aortic Stenosis in a Patient with Dextrocardia/Situs Inversus  
Authors: Stephanie Prater, MD, PGY2; Robert Beecham, MD  
Program: Aventura Hospital & Medical Center, Diagnostic Radiology Residency Program  

**Introduction:** Transcatheter aortic valve replacement (TAVR) has evolved over the past decade to become a popular minimally invasive alternative for patients with severe aortic valve stenosis who are not candidates for traditional surgical “open heart” valve replacement. Dextrocardia with situs inversus is a rare congenital condition in which the heart, great vessels and visceral organs are reversed in position. This unique anatomy may be further complicated by a variety of cardiac and vascular malformations. Reports about the safety and efficacy of TAVR in patients with dextrocardia/situs inversus are few, with less than 10 cases reported in the current literature. Computed tomographic (CT) angiography and reversed image fluoroscopy have emerged as valuable tools for both pre-procedural planning and intraoperative guidance in patients with this uncommon physiology.

**Case Description:** A 76-year-old woman with a history of dextrocardia/situs inversus and coronary artery disease status post stenting of the left anterior descending coronary artery presented to the emergency department with a 3-hour history of palpitations and racing pulse. She also endorsed a months-long history of dyspnea on minimal exertion. Physical exam revealed an irregularly irregular pulse of 140 bpm and a harsh systolic ejection crescendo-decrescendo murmur at the left upper sternal border. Electrocardiogram revealed atrial fibrillation with rapid ventricular rate. Transthoracic echocardiography revealed severe aortic stenosis with an aortic valve area of 0.8 cm², a mean pressure gradient of 40 mmHg, peak systolic velocity of 3.7m/sec and dimensionless index of 0.18 with preserved left ventricular systolic function. She was evaluated by cardiothoracic surgery and determined to be of intermediate risk for traditional surgical aortic valve replacement due to her age, high frailty index and comorbidities (coronary artery disease and new onset arrhythmia). She was, however, considered to be at low risk for a TAVR procedure. Preoperative CT angiography of the chest revealed an inverted (rightward) orientation of the ventricular apex and great vessels without anatomic or vascular malformation. TAVR was performed under general anesthesia via right transfemoral approach. A 23mm Edwards Sapien S3 aortic valve (Edwards Lifesciences, Irvine, CA, USA) was successfully deployed at the aortic annulus utilizing reversed image fluoroscopic guidance. Post-procedural transthoracic echocardiography demonstrated a well-functioning valve without residual aortic stenosis. The procedure was well tolerated, and the patient was discharged 2 days later without complication.

**Discussion:** This case highlights the role of radiological imaging in easing the technical challenges of a complex cardiac procedure in a patient with severe aortic stenosis and atypical cardiovascular anatomy due to dextrocardia/situs inversus. Pre-procedural CT angiography provided valuable measurements to choose the correct prosthetic valve size and optimal deployment position in order to prevent paravalvular leak and avoid coronary obstruction or fatal aortic injury. Intraoperatively, reversed-image fluoroscopy allowed the operating physicians to view the patient’s unusual anatomy in a usual orientation in real time.

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**Title:** Shedding Light on Cryopreserved Aortic Allograft Management of an Infected Native Aorta  
Authors: Austin Price, OMS4; Simonette Padron, OMS4  
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program  

**Introduction:** The surgical management of aortitis requires astute attention to the patient’s symptoms, medical history and risk factors. The epidemiology of aortitis is poorly understood. A study in Japan covering almost 1300 hospitals showed that the crude incidence of aortitis was 0.01 cases per 100,000 children per year. Comparable data on the incidence in Western adult populations is not available. Additionally, no clinical trials have determined the most optimal management options for patients with infectious aortitis. A high mortality rate has been seen among patients treated with medical therapy alone for infectious aortitis, so a surgical modality is deemed the current standard of care. Pre-operatively, it must be determined whether an open or endovascular approach is preferred for each patient based upon their associated conditions and the cause of the aortitis. No trials currently exist comparing endovascular versus open reconstructive surgery for aortitis so it is up to the surgeon’s clinical judgement to determine what course of action would yield the best results. During the surgery, the diagnosis should be confirmed intraoperatively, hemorrhage risk must be controlled, and arterial vasculature should be adequately circulating. After the surgery, patients should remain on antibiotics for at least six weeks to prevent recurrence of an infectious etiology.

**Case Description:** A 61-year-old male presented with back pain and upon CT scan, was found to have aortitis at the level of the L2 vertebrae. Patient was hospitalized for the subsequent 11 days to undergo further workup and management. Blood cultures showed Bacteroides infection. The patient’s ECHO was negative for vegetations. He was prescribed Ertapenem and Vancomycin along with 6 weeks of antibiotics via PICC line after discharge. A follow up CT one month later revealed worsening aortitis with peripheral enhancement suggestive of aortic abscess. The patient was immediately sent to a tertiary care center for management by the vascular surgery team. Four days later, the patient underwent open repair of the infected infrarenal aorta with 18mm cryopreserved aorta tube graft via left retroperitoneal approach. Patient’s post-operative course was not without complications including resolved respiratory acidosis, supraventricular tachycardia, constipation and peri-incisional pain. One week after the operation, the patient underwent a successful right molar extraction with his dentist to remove the suspected source of the bacterial infection. The antibiotic course was continued for 6 more weeks and blood cultures were negative for bacterial growth.

**Discussion:** The aim of this report is to describe the peri-operative decision making that must occur when operating on a patient with infectious aortitis via a left retroperitoneal approach with a cryopreserved cadaver allograft. In most cases of bacterial aortitis, the aortic wall usually has pre-existing pathology such as an aneurysm or plaque that enables bacteria to seed the region via the vasa vasorum. This is important in the clinical decision making because knowing the etiology of the aortitis will guide operative approach. If the patient has an infectious etiology or an associated abdominal aortic aneurysm, open reconstructive surgery is preferred. If the patient has a history of aortitis due to autoimmune etiology such as giant cell arteritis, an endovascular approach has shown promise. Further studies will be needed to ultimately determine the optimal management course for aortitis.
Incarcerated Meckel's Diverticulum Leading to Small Bowel Obstruction

Introduction: Meckel's diverticulum is one of the most prevalent congenital abnormalities of the gastrointestinal system. They arise as secondary to failure of the vitelline duct to completely obliterate resulting in the formation of a true diverticulum. A true diverticulum contains all three layers of the small bowel wall – mucosa, muscularis propria, and adventitia. Meckel’s diverticula are usually clinically silent and are diagnosed as an incidental finding on imaging studies. One of the most common presentations when a Meckel’s diverticulum reveals itself is an intestinal obstruction.

Case Description: A 51-year-old male with no significant past medical history presented to the ED with abdominal pain for 1 day. The pain was described as a constant, burning sensation located diffusely throughout the abdomen. Physical examination revealed abdominal distension and moderate tenderness to light palpation in all four quadrants. CT scan of the abdomen was ordered, which showed severe proximal small bowel dilatation compatible with bowel obstruction with an unclear transition point in the anterior mid abdomen. CT also revealed an incidental finding of left inguinal hernia containing part of the sigmoid colon. The patient was admitted to med/surg, and surgery was consulted for small bowel obstruction. Patient was scheduled for surgery for robotic assisted laparoscopic left inguinal hernia repair and abdominal exploration to determine the cause of the small bowel obstruction. Intraoperative evaluation of the abdominal cavity revealed a midline small bowel diverticulum, consistent with Meckel’s diverticulum, approximately two feet proximal to the ileocecal valve. The diverticulum was found to be incarcerated in the umbilicus; bowel proximal to this appeared very dilated while bowel distally was decompressed. Diverticulectomy and partial small bowel resection were performed to relieve the obstruction.

Discussion: This patient was found to have two areas of obstruction; one being the left inguinal hernia causing a sigmoid colon obstruction and the other being a Meckel diverticulum attached to the posterior aspect of the abdominal wall. Meckel diverticulum primarily is asymptomatic with only 4-6% of adults presenting with complications and only 35% of those complications being small bowel obstructions. Usually, it can be diagnosed incidentally on imaging, however it was not until the abdominal cavity was visualized intraoperatively that this patient’s diverticulum was discovered. Computed tomography is shown to be the most sensitive form of imaging for a small bowel obstruction. Meckel diverticulum can be diagnosed if a tubular structure is observed at the transition point. However, when Meckel diverticulum is the source of the small bowel obstruction in a patient with an internal hernia it becomes much more difficult to verify this.

Mycoplasma Pneumoniae Rash and Mucositis - Pediatrics

Introduction: Mycoplasma Pneumoniae is one of the most common causes of community acquired pneumonia. However, it may also be associated with extrapulmonary complications, including mucocutaneous eruptions known as Mycoplasma Pneumoniae-Associated Mucocutaneous (MPAM) or Mycoplasma Induced rash and mucositis (MIRM)

Case Description: A 12-year-old obese male with h/o prediabetes, hyperlipidemia presents with a 3-day history of fever, 2-day history of diffuse rash, dry cough, and diarrhea, and a one-day h/o redness of the eyes, strawberry tongue, and discolored urine. Patient had temperature of 102.9°F, HR of 137, RR of 24, and BP of 102/72; Strawberry Tongue; Bilateral conjunctival injection with no eye drainage or discharge; Macular erythematous warm rash on bilateral upper and lower extremities, palms, and soles. In ED patient received Tylenol x1, Ceftriaxone x1, IV bolus x1 and labs were drawn: CBC: WBC 23, Hgb 11.2, Pt 302; Diff: Segs 81%, Lym 6%, EOS 10%, ANC 1850; CMP: Na 134, K 3.6, Cl 101, Hco3 20, AG 13. AST 97, ALT 101, T Bilirubin 8.8, Direct Bilirubin 6.2, BUN 15, Creatinine 1.5; CRP: 19.23; UA-Dark Brown, Large amount of Bilirubin, Urobilinogen 4, WBC 39, Moderate Leukocyte Est, Nitrite neg, Protein 100, RBC 5; RVP, Monospot, Rapid strep, ASO-Negative. Imaging included chest X-ray negative.

Initially, presentation characterized by multiorgan involvement including hepatitis, conjugated hyperbilirubinemia, acute renal injury, skin rash, mucositis and persistent febrile illness. Empirically on placed on ceftriaxone while awaiting cultures. ID consulted HIV, EBV, CMV, Mycoplasma IgM, IgG ordered, started on maintenance IV fluids. On day two developed penile rash and once 48hrs cultures were negative ceftriaxone discontinued. On day three, due to persistent fevers, multiorgan dysfunction, mucosal rash with increasing CRP levels and with pending Mycoplasma IgM and IgG, MIRM was considered Azithromycin started. On day 4 patient received Azithromycin and ceftriaxone. On day 5, acute renal injury, hepatitis, hyperbilirubinemia, mucositis, rash resolved. Patient discharged to complete 5-day course of Azithromycin. During admission patient had hypertension followed by multiple subspecialists renal US, C3, C4, CK, ECHO, Troponin, BNP WNL. US liver, MRCP negative. Hyperbilirubinemia, hepatitis, HTN resolved after Azithromycin without any other interventions.

Discussion: Mycoplasma Pneumoniae is an atypical bacterium that lacks a cell wall. This typically presents in children or young adolescents, with it being more common in males and during the winter. It most commonly manifests as an upper or lower respiratory tract infection associated with fever, cough, coryza, and malaise. Mucocutaneous eruptions are found in 25% of patients. Typical clinical manifestations involve oral, ocular, and urogenital involvement. Skin involvement when present, typically occurs in an acral distribution. Recognition of MIRM as a clinical entity distinct from other mucocutaneous eruptions may be clinically beneficial as treatment options, disease prognosis, and patient education of MIRM will be different from that of the latter.

A Rare Case of a Venolymphatic Malformation (VLM) in an Adolescent

Introduction: Venolymphatic malformations (VLMs) are a rare type of vascular malformation, often presenting as a collection of blood vessels and lymphatic channels. They can vary in severity and location, affecting various parts of the body. The natural history of these malformations can be complex, with potential for growth and progression. Understanding the clinical manifestations and appropriate management strategies is crucial for effective patient care.

Case Description: Presented a 13-year-old female with a 6-month history of multiple asymptomatic cutaneous lesions on her right upper arm. The lesions started as small erythematous patches and gradually progressed to larger, raised masses with occasional pain. The patient had no history of trauma or infection. Physical examination revealed several circumscribed, non-tender nodules ranging from 1 to 3 cm in diameter, with a distinct bluish tinge. The lesions were not compressible and did not exhibit significant pain or tenderness. Laboratory tests, including a complete blood count and coagulation profile, were unremarkable. Ultrasound imaging showed a complex mass with a heterogeneous echotexture, consistent with a venolymphatic malformation. A biopsy was performed, confirming the diagnosis of a venolymphatic malformation.

Discussion: Venolymphatic malformations are complex vascular anomalies that can present significant diagnostic and therapeutic challenges. Early recognition and appropriate management are essential to prevent complications such as skin discoloration, pain, and cosmetic concerns. Treatment options may include observation, compression therapy, sclerotherapy, or surgical excision, depending on the size, location, and symptoms of the malformation. The interdisciplinary approach involving dermatology, radiology, and plastic surgery can help tailor the best course of action for each patient. Awareness of these malformations in the adolescent population is crucial for timely and effective intervention.
Introduction: Lymphatic malformations (LM), or venolymphatic malformations (VLMs), are rare, non-malignant masses consisting of fluid filled channels thought to be caused by the abnormal development of the venous and lymphatic systems. Venolymphatic malformations usually present by two years of age, and most commonly arise in the head and neck. Here we describe the unique presentation, work-up, diagnosis, and treatment of an adolescent female found to have a venolymphatic malformation of the flank complicated by superimposed infection.

Case Description: A 14-year-old female presents to the Pediatric Emergency Department complaining of one day history of worsening abdominal pain in the right upper quadrant. The patient also complained of associated chest pain, fever, and headache. On physical exam there was severe tenderness to palpation over the right upper quadrant, and a solid mass was felt. The mass was warm to touch and mildly erythematous. CT abdomen and pelvis revealed a complex multiseptated lesion measuring 13.6 x 5.0 x 20 cm with numerous cystic areas, and a little bit of soft tissue density within the right lateral subcutaneous fat. The radiologist confirmed a venolymphatic malformation in the right lateral abdominal wall subcutaneous tissues with some areas of enhancement, which correlated to a superimposed infection since the patient had clinical signs of infection. The patient’s initial lab results in the ED showed significant leukocytosis with a white blood cell count of 20.96, and CRP level of 23.9. At the time, no surgical intervention was indicated due to the presence of superimposed infection, the significant risk of recurrence, and the highly invasive nature of the procedure. Instead, it was recommended that the patient receive injection sclerotherapy.

Discussion: Venolymphatic malformations (VLMs) are low-flow vascular anomalies consisting of both veins and lymphatic vessels. Growth of these lesions is proportional to body growth, but infection, trauma, and hormonal changes can lead to further enlargement. Complications include recurrent inflammation, hemorrhaging into the lesion, obstruction, displacement, compromise of adjacent organs, neurovascular dysfunction, and deformity. There is a notably wide variability in the composition, flow characteristics, and anatomic location of these masses. Studies of patients with venolymphatic malformations have discovered a gain of function mutation in the PIK3CA gene and overexpression of mTOR and VEGF. Currently, the main treatment options include sclerotherapy, biologic therapy, embolization, percutaneous drainage, surgery, laser therapy, or radiofrequency ablation. The goal of treatment is to control symptoms, preserve physiologic and aesthetic integrity, and should encompass the safety and wishes of the patients and their families.

Title: Septic Arthritis and Septic Emboli Secondary to Intraarticular Steroid Shoulder Injections and Potential Improper Intraarticular Injection Hygiene
Author: Janelle Ramcharan, OMS3
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Intraarticular steroid injections typically involve the injection of a glucocorticoid such as methylprednisolone or triamcinolone in order to treat musculoskeletal conditions, such as joint pain, inflammatory arthritis, nerve compressions, etc. They are relatively safe but do come with complications such as septic arthritis, septic bursitis, tendon rupture, nerve damage, osteonecrosis etc. Septic arthritis is one of the most feared complications of joint injections, although it is relatively rare. The frequency of septic arthritis post intraarticular joint injection is between 1 in 2,000 and 1 in 15,000 procedures. Septic arthritis typically arises from hematogenous spread of bacteria, but can also arise from direct inoculation of bacteria, such as with intraarticular joint injections. Staphylococcus Aureus is the most common organism that gets implicated in septic arthritis. Iatrogenic infections, like septic arthritis can be decreased by utilizing appropriate techniques and hygiene when preparing and administering intraarticular joint injections.

Case Description: We present a case of a 46-year-old female patient who presents to the Emergency department with a 3-day history of worsening 10/10 aching right shoulder pain after receiving bilateral shoulder intraarticular steroid injections. Prior to injection, the patient states she had been having generalized bilateral shoulder pain for the past week which prompted her to get the steroid injections 3 days prior to her visit to the emergency department. Following the bilateral shoulder intraarticular steroid injections, the pain did not resolve, and the patient subsequently developed worsening pain in movement, particularly on the right prompting her to go to the emergency department. Patient also states she developed a cough, shortness of breath and a pleuritic chest tightness with fever and chills. Patient denies nausea, vomiting, diarrhea, or headaches. Patient also denies any prior events like this one, any recent trauma or falls, aggravating or alleviating factors to the shoulder pain, as well as IV Drug use, smoking history, or alcohol use. On physical exam, the patient was not in acute distress and was found to have pain and swelling in the right shoulder, as well as decreased range of motion of the right shoulder. There was no edema, cyanosis, or redness of the extremities. Patient was tachypneic with mild crackles noted at the left lung base with no rhonchi or wheezes noted. Heart exam revealed tachycardia with a heart rate in the 130s and a normal sinus rhythm. The rest of the physical exam was relatively benign. Patient was febrile at 102.9F. Initial bloodwork showed WBC 20.5, D-dimer 4.2, lactic acid 2.6, and troponins 0.01 initially with a subsequent increase to 0.035. EKG showed sinus tachycardia without ST changes. CTA of chest showed bilateral interstitial infiltrates suggestive of pneumonitis, possible early septic emboli, and no pulmonary emboli, additional concern for mild cardiomegaly and possible endocarditis. Transthoracic echocardiogram showed LVEF of 50-55% with normal systolic function, normal LV size, mildly increased LV wall thickness and no vegetations. Blood cultures on admission came back positive for MRSA, and a joint aspiration of the right shoulder yielded 2cc of thick, purulent, yellow, bloody fluid confirming septic arthritis. Patients bacteremia, septic arthritis and septic emboli were all presumably secondary to MRSA infection, likely secondary to improper sterilization and/or improper intraarticular steroid injection hygiene.

Discussion: This case illustrates the potential complications of intraarticular corticosteroid injections, as well as the importance of proper sterilization and hygiene techniques when administering intraarticular corticosteroid injections.

Title: Neurogenic Stunned Myocardium in Subarachnoid Hemorrhage
Authors: Xavier Ramos, MD, PGY3; Julio Gonzalez, MD, PGY1; Michael Girard, MD, PGY2
Program: Palmetto General Hospital, Internal Medicine Residency Program
**Introduction:** Cardiovascular complications such as arrhythmias, ventricular dysfunction, and myocardial infarction are common after an acute stroke. During the first month after a stroke, cardiac events account for the most common non-neurologic cause of mortality. Neurogenic stunned myocardium results from acute neurologic events such as seizures and strokes that give rise to dysfunction of the autonomic nervous system. There is a subsequent surge in unregulated catecholamines in the bloodstream that leads to significant stress on the myocardium. Neurogenic stunned myocardium often mimics myocardial infarction with electrocardiogram changes suggestive of ischemia, cardiac dysfunction, and raised troponin levels. Echocardiographic features can present with decreased left ventricular ejection fraction and regional wall motion abnormalities. Due to the abundant similarities between neurogenic stunned myocardium and Takotsubo cardiomyopathy, many believe that the two conditions fit into a larger categorical umbrella of Stress-induced Cardiomyopathy. Since neurogenic stunned myocardial changes are reversible and likely to demonstrate early recovery of function, coronary angiography is not routinely recommended. Our focus is to emphasize the importance of proper and early diagnosis with the involvement of a multi-disciplinary effort in order to differentiate true myocardial ischemia vs transient neurogenic stunned myocardium secondary to subarachnoid hemorrhage.

**Case Description:** We present a case of a 72 y/o white, Hispanic female with a past medical history of hypertension and hyperlipidemia that presented to the ED with a two day history of thunderclap headache and subsequent collapse with loss of consciousness. CT scan of the head revealed a subarachnoid hemorrhage. On primary survey, physical exam showed a frail elderly female who was intubated and sedated. Head was atraumatic and normocephalic. No overt signs of trauma. Heart rate 73, respiratory rate 15, BP 93/66 mmHg and SpO2 99%. Lab findings showed acidosis, leukocytosis with neutrophilia. Neurosurgery was consulted directly from the ED, and an external ventricular drainage was put in place. Additionally, the patient was showing signs of ST segment elevation on EKG. Transthoracic echocardiogram performed on admission day 2 showed akinesia of the apical and mid-ventricular segment with apical ballooning. The left ventricular ejection fraction was reduced and estimated at 40%. Interventional cardiology was consulted, but did not intervene because it was most likely that her EKG changes and echocardiogram findings were secondary to her primary condition, intracranial hemorrhage. The patient was monitored closely by an interdisciplinary team which included internal medicine, neurology, cardiology and intensivists. Patient’s condition improved, and she was successfully extubated on day 3. Repeat transthoracic echocardiogram performed prior to discharge on hospital day 5 demonstrated preserved ejection fraction of > 55% with no wall motion abnormalities.

**Discussion:** In a recent study, patients with subarachnoid hemorrhage, reversal of wall motion abnormalities was observed in as early as two days. Proper and early diagnosis with the involvement and collaboration of a multi-disciplinary team is essential in order to reduce morbidity and mortality of the patient and avoid unnecessary workup and diagnostic testing.
Title: Xanthogranulomatous Pyelonephritis: A Case of the Great Mimicker
Authors: Jennifer Reyes, DO, PGY3; Leearan Baraness, MD, PGY1; Hieu Duong, MD, PGY2; Erin Marra, MD
Program: Aventura Hospital and Medical Center, Emergency Medicine Residency Program

Introduction: Xanthogranulomatous pyelonephritis (XGP) is an extremely rare complication of chronic inflammation of the kidney parenchyma secondary to obstruction from an infected kidney stone. Despite the unusual histological changes, XGP has been coined as “The Great Mimicker” because of its clinical and radiological findings resembling more recognized conditions such as renal cell carcinoma. As such, we will present an unusual case of XGP in a patient with history of bladder cancer status post cystectomy with ileal conduit who presents with nonspecific genitourinary symptoms. XGP has not been described as a possible complication of urinary diversion in prior literature.

Case Description: A 71-year-old female with a history of bladder cancer status post cystectomy with ileal conduit, recurrent kidney stones status post lithotripsy, presented to the emergency department with left flank pain, dysuria, and fever. Physical examination revealed that the patient was ill-appearing but not toxic. She exhibited tenderness to palpation of the left costovertebral angle. Laboratory tests revealed leukocytosis, with white blood cell count 25, 200 WBC/µL (range 3,600-10,500), hemoglobin level of 7.2 g/dL (range 11.8-15.8), creatinine level of 3.00 mg/dL (0.43-1.13), potassium of 6.1 mEq/L (range 3.5-5.2). Urinalysis revealed pyuria, moderate bacteria and positive cultures for *Marganella morganii* resistant to Zosyn and Cefepime. Ultrasound showed a staghorn calculus in the left kidney. CT scan revealed emphysematous pyelonephritis of the left kidney with a component of xanthogranulomatous pyelonephritis, along with a 4mm stone in the left ureteropelvic junction. During the hospital stay, the patient received intravenous Merrem. Percutaneous nephrostomy and CT-guided left kidney drainage was also required before being discharged uneventfully to her skilled nursing facility. Urology and nephrology concluded that there was no indication for nephrectomy based on clinical progress.

Discussion: XGP represents only 0.6% of all chronic pyelonephritis cases and is generally caused by recurrent obstruction and infection. Other proposed mechanisms include chronic renal ischemia, altered immune response, ureteropelvic junction syndrome, duplex collecting system, and interstitial nephritis have also been reported. The classic patient will be an immunocompromised female with a history of chronic UTIs associated with renal stones. Symptoms are generally nonspecific and commonly include fever, flank pain, fatigue, anorexia, and weight loss. Misdiagnosis is common, owing to its resemblance to renal cell carcinoma (RCC), renal tuberculosis, and simple renal abscess. The differential also includes multiloculated cystic nephroma, lymphoma, angiomyolipoma, oncocytoma, and adenoma. Studies confirm that XGP continues to be as misdiagnosed today as it was prior to the ages of advanced imaging, likely due to clinical features mimicking RCC and other destructive renal pathologies, thus the disease has earned the title of “The Great Imitator”. Further, concomitant RCC has been well documented in the literature, leading to the possibility of a similar pathophysiological and cytological process. To help differentiate among the different etiology, recognizing risk factors become important. XGP has not been described in literature as a possible complication of urinary diversion, which is the mainstay treatment of bladder cancer with cystectomy. Conduit created from the gastrointestinal tract has a higher propensity to infection as bacteria more easily colonize the bowel epithelium than the urothelium. Excess mucus production by the GI epithelium prevents the effective clearance of microorganisms. Incomplete emptying is common in the conduit providing a nidus for infection. In conclusion, strong clinical suspicion for XGP should occur with any patient who presents with urinary diversion. The treatment has classically been nephrectomy instead of conservative management, partially attributed to initial misdiagnosis. As well, recurrence and collateral complications such as sepsis, are common with conservative management.

Title: Parathyroid Adenoma: A Thinking Inside the Box Presentation
Authors: Ansa Riaz, OMS3; Sushmita Mittal, OMS3; Ashrita Hanniah, OMS3; Roberto D. Comperatore, MD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Primary hyperparathyroidism is an endocrine disorder characterized by hypersecretion of parathyroid hormone (PTH) due to overactive parathyroid gland that results in hypercalcemia. Benign parathyroid adenomas account for 85% of primary hyperthyroidism cases. The majority of these adenomas are located in the traditional anatomical areas behind the superior and inferior poles of the thyroid gland; however, some may present ectopically. While migration of parathyroid tissue within the thyroid gland is rare, the development of an adenoma within this location is even more uncommon with a reported incidence of 1.4% to 6%.

Case Description: We present the case of a 54-year-old Hispanic female who arrived in our office for a follow-up appointment for abnormally elevated calcium (10.4 mg/dl) and PTH (150 pg/ml) levels in addition to her long history of osteoporosis and high blood pressure. A sestamibi parathyroid scan was first performed to localize a possible parathyroid adenoma that could explain the patient’s hyperparathyroidism; however, results came back negative. Neck ultrasound with doppler scanning was then ordered which showed a nodule on each thyroid gland lobe. Fine needle aspiration cytology (FNAC) was performed for each nodule which presented with varying results. In the left thyroid nodule, FNA revealed clusters of epithelial cells in a background of foamy and hemosiderin laden histiocytes which was suggestive of normal follicular thyroid tissue. However, when testing the right thyroid nodule, FNA results showed epithelial cells suggestive of parathyroid origin.

The patient first underwent biopsy of the left inferior parathyroid gland to rule out the possibility that a parathyroid adenoma was missed on the sestamibi parathyroid scan, however immediate pathology reports indicated that it consisted of normal parathyroid tissue. The surgeon then performed a right hemithyroidectomy, removing an abnormal brown homogeneous nodule which was then confirmed to be an intrathyroidal parathyroid adenoma with a minimum diameter of 1 cm. An immediate decrease in pre-operative and post-hemithyroidectomy PTH levels resulted, from 150 pg/ml and 24 pg/ml respectively. This was compatible with the presence of parathyroid adenoma within the right thyroid gland.

Discussion: This case illustrates a rare diagnosis of parathyroid adenoma located within the thyroid gland as a cause of primary hyperparathyroidism. In this case, parathyroid glands were neither visualized as abnormally enlarged during surgery and nor were there any abnormal finding in diagnostic exams including the initial NM scan and fine needle aspiration. Initial diagnosis of intrathyroidal parathyroid adenomas can be challenging and therefore proper pre and intra-operative techniques must be implemented to limit surgical risks and misdiagnosis.

Introduction: Recurrent appendicitis is a rare cause of right lower quadrant abdominal pain in a patient with a past surgical history of appendectomy. The incidence of recurrent appendicitis is 10%, and though it is an uncommon long-term complication of appendicitis, the possibility of recurrent appendicitis needs to be considered in the clinical presentation of a patient with an acute abdomen status post appendectomy. Diagnosis in these patients should be aided with the radiologic findings in order to confirm the source of the pain and inflammation, and treatment is surgical and often involves resection of additional structures as opposed to an uncomplicated appendectomy.

Case Description: We will demonstrate a case on a 37-year-old female that presented with recurrent appendicitis and underwent exploratory laparotomy with right hemicolecotomy, a year status post laparoscopic appendectomy with preservation of appendiceal stump, and discuss the various approaches to resection of the appendix and their outcomes relative to the development of this unwanted complication.

Discussion: Recurrent appendicitis is a relatively uncommon complication of patients who have undergone appendectomy. It is often difficult to diagnose early in the natural history due to the low index of suspicion for appendicitis. Because of this, there are often complications such as perforation, inflammation and damage to contiguous gastrointestinal structures, abscess formation and perforation. Stump ligation or invagination have not shown to increase the chance of developing recurrent appendicitis. However, recurrent appendicitis is often under-reported and there is not sufficient data available to corroborate that statement.

Abdominal Supracervical Hysterectomy with Bilateral Salpingo-Oophorectomy of a 22-Week Sized Uterus with Incidental Endometrial Polyp Focal Atypia

Introduction: Abdominal hysterectomy, either total (uterus including the cervix) or subtotal (supracervical), refers to the removal of the uterus via a laparotomy. It is one of the most frequently performed surgical procedures in the United States usually indicated for any of the following broad (often overlapping) categories: Uterine leiomyomas, Abnormal uterine bleeding (AUB), Pelvic organ prolapse, Pelvic pain or infection (eg, endometriosis, pelvic inflammatory diseases), and Malignant and premalignant disease. Both uterine leiomyomas and endometrial polyps are usually benign structural abnormalities of the uterus that can present with AUB.

Case Description: A 49-year-old perimenopausal female with a past medical history of hypertension, hypothyroidism, multiple fibroids, BMI 33.2 and a history of iron deficiency anemia presented with abnormal uterine bleeding (AUB) and chronic lower abdominal pain with associated urinary urgency. The patient’s symptoms were due to a large, symptomatic fibroid uterus and the patient elected to have an abdominal supracervical hysterectomy and bilateral salpingo-oophorectomy. Pre-operative transvaginal and pelvic ultrasound revealed a uterus size of 22 x 20 x 17cm and a 15.9 x 13 x 9 x 9.2cm subserosal fibroid occupying the majority of the fundus and body of the uterus. The endometrial thickness on ultrasound was 1.4cm but with limited visualization due to fibroid.

Under general anesthesia, abdominal supracervical hysterectomy and bilateral salpingo-oophorectomy with a midline vertical incision was completed. Blood loss was approximated at 50mL with no intraoperative complications. The patient was discharged on postoperative day 3. The uterus and adnexa were submitted for pathology which reported a uterus with multiple leiomyomata as well as endometrial polyps with focal atypical endometrial hyperplasia and squamous metaplasia (Figure 1 and 2). Overall, the uterine corpus with one attached adnexa weighed 3433g and was 25.8 x 20.3 x 15cm. The endocervix and the bilateral fallopian tubes and ovaries had no pathological changes. The incidental finding of endometrial polyps with focal atypical endometrial hyperplasia and squamous metaplasia was discussed with the patient before discharge.

Discussion: The choice of the surgical approach of a hysterectomy depends upon clinical circumstances, the surgeon's technical expertise, and patient preference. Although minimally invasive hysterectomies via vaginal and laparoscopic approaches are now preferred, individualized treatment plans for patients should be considered depending on uterus size and the possibility of not achieving adequate exposure leading to complications. Endometrial polyps have an overall malignant potential of less than 5%. Due to the fact that the pathology reported focal atypia with size <1.5cm and a supracervical hysterectomy was performed the likelihood of this incidental finding having long-term consequences is low.

May-Thurner Syndrome: A Case Study

Introduction: Here we present an interesting case of May-Thurner Syndrome (MTS) with an etiology that is uncertain. MTS is typically due to compression of the left iliac vein in between the right common iliac artery and the fifth lumbar vertebrae as a result of anatomical variations or changes (1). The prevalence is not well known as it may go undetected or underrecognized, however it has been documented that this can range from anywhere between 2-65% (2). Most commonly, patients are female and present anywhere between the third to fifth decade.

Case Description: The patient is a 57-year-old African American female with past medical history of uncontrolled diabetes mellitus type II and chronic anemia who presented to the emergency department with left lower extremity pain and swelling that had begun 2 days prior. She denied any chest pain,
palpitations, abdominal discomfort, nausea, or recent changes in urinary habits. She did endorse shortness of breath which is worse with exertion and reports constipation described as only 1-2 bowel movements per month for the past 6 months with associated weight loss secondary to loss of appetite. ESR was elevated at 70 as was CRP at 10.2. A left sided lower extremity venous doppler ultrasound was done which revealed a venous thrombus involving the left common iliac vein extending to the distal popliteal vein. A CT of the abdomen and pelvis with IV contrast was performed which revealed aortoiliac vein occlusion with right common iliac arterial thrombosis as well as bilateral common iliac vein thrombosis. Findings were consistent with MTS. The patient had been started on Heparin and underwent thrombectomy of the right common iliac artery thrombus as well as angioplasty and stenting of the left common iliac vein. A wide differential exists in this patient given the aortoiliac inflammation observed on imaging which included lupus, antiphospholipid syndrome, large vessel vasculitis such as Takayasu arteritis, and hypercoagulable state secondary to occult malignancy versus hereditary thrombophilia. ANA with IFA was mildly positive with a titer of 1:40, however, markers for antiphospholipid syndrome, rheumatoid arthritis, and ANCA screen was negative. Given degree of inflammation observed, patient was not a candidate at this time for biopsy of surround aortoiliac tissue. Patient was discharged home to establish care with rheumatology and vascular surgery on outpatient basis.

Discussion: In conclusion, physicians should bear in mind the possibility of anatomic variants such as MTS in patients with acute on chronic lower extremity pain and swelling. We pose that physicians further investigate leg pain in the setting of a positive ultrasound demonstrating extensive venous thrombosis to exclude pelvic organ disease, rheumatologic disease, and hypercoagulable states whether secondary to occult malignancy or inherited thrombophilia.

Title: Sacroiliac Joint Fusion in Treatment of Chronic Low Back Pain After Lumbar Spinal Fusion
Authors: Jessica Rose, OMS3; John P. Malloy, IV, DO
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Chronic low back pain is a one of the most prevalent disabling health conditions in adults aged 60 or older. The pain tends to be undertreated due to avoidance of analgesics and difficulty in identifying presence or causes of LBP. Spine surgery is indicated in people only once conservative treatment fails and there is a definitive diagnosis of lumbar pathology that needs surgical treatment. Spinal fusion surgery has a well-established role in alleviating low back pain when all other conservative methods have failed. However, some patients may continue to experience LBP even after spinal surgery due to postsurgical transfer of the mechanical load on adjacent segments, such as the sacroiliac joint. This is a common site of low back pain and is the cause of persistent symptoms in a considerable number of patients pain fusion surgery. Sacroiliac joint pain is difficult to diagnose due to overlapping symptoms of the lumbar spine, and because there are no established clinical, physical, or imaging findings. Furthermore, recent studies of minimally invasive SIJ fusion systems have shown tremendous outcomes. The procedure typically involves the insertion of three small titanium implants across the SI joint and is designed to stabilize and fuse the SI joint.

Case Description: This patient is a 64 y/o male who presents to the office with a 15-year history of chronic low back pain. He can only stand for about 1 hour and the pain has a significant impact on his activities of daily living. He has a history of prior interbody fusion of L4-L5 and L5-S1 and further removal of hardware. Radiographs show left and right SI joint dysfunction, hip DJD, pain with ROM flexion/IR, positive Faber, SI compression, and SI shear test on right. This patient received extensive course of SI joint injections and epidural steroid injections which provided some temporary relief. He also received PT, tens unit, facet blocks, chiropractic care, medications, spine surgeries, activity modifications with minimal change.

After discussing the treatment options with the patient and given his failure of nonoperative treatment, he agreed to proceed with sacroiliac joint fusion. At 4 weeks post-op, the incision was healed, and the patient reported that the pain he had prior to surgery was no longer present. He stated that for the first time in 15 years he is not feeling the pain. The patient subsequently complained of right SI joint identical to the pain on left side before the fusion. He decided to pursue right SI joint fusion due to the significant amount relief he felt from the left SI fusion. The patient returned in 6 weeks and he reported his pain was relieved with no further complaints.

Discussion: Sacroiliac joint pain should not be overlooked as a cause of low back pain after lumbar spinal fusion. We believe that preoperative diagnosis is very important because if SIJP is overlooked, LBP would persist and worsen after surgery. In our paper, we describe the role of SI joint fusion in treatment of low back pain following lumbar spinal fusion. We present a case as an example of the success associated with operative treatment in comparison to non-operative. The patient is now 1 year out from surgery and is without setbacks or limitations. Through surgical correction we can manage this patient with a more definitive solution and predictable outcome. Patients will regain their quality of life sooner and the possible long-term sequelae will be alleviated.

Title: A Complication of Device Testing. Should DFT Remain the Standard of Care?
Authors: Sofia Sarduy, OMS3; Juan Rojas Balcazar, MD; Glenn S. Dym, MD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: The implantable cardioverter-defibrillator (ICD) is used as therapy for the prevention of sudden cardiac death (SCD) because it can terminate lethal arrhythmias such as ventricular fibrillation (VF) and ventricular tachycardia (VT). At the time of device implantation, defibrillator function testing (DFT) is performed in order to confirm proper detection and termination of ventricular arrhythmias, a practice which has been the standard of care for years. The risks of DFT include pump failure, prolonged resuscitation, stroke, and even death. Even though device testing is considered safe with careful patient selection, some studies have called into question whether testing truly offers an advantage to long term survival in the prevention of SCD.
Case Description: A 28-year-old female, with a past medical history of postpartum cardiomyopathy, congestive heart failure (CHF), hypertension, asthma, obesity, and prior cocaine usage presented to the emergency department with worsening shortness of breath due to a CHF exacerbation. On presentation she was hypertensive and tachycardic. Rales could be heard on auscultation of bilateral lung fields and there was significant lower extremity edema. This was the patient’s third admission for a CHF exacerbation within the last 4 months. Her LVEF measured via echocardiogram one-month prior was known to be 10%. Due to treatment failure, the decision was made to admit the patient and proceed with placement of a subcutaneous implantable cardioverter defibrillator for prevention of SCD. After successful placement of the ICD, DFT was performed. During testing the patient was induced into VF and after 15 seconds a shock of 65 joules and an impedance of 33 ohms were delivered. The patient failed to convert into normal sinus rhythm and 360 joules of external defibrillation had to be provided. The patient was converted back to sinus rhythm but was found not to have a pulse. Cardiopulmonary resuscitation was then started. The patient started to become bradycardic, so a temporary venous pacemaker had to be placed. During the code the patient had gone into SVT, the ICD then delivered a shock and converted the patient back into sinus rhythm. The patient exhibited return of spontaneous circulation (ROSC) after 10 minutes from when the code first began. Due to cardiopulmonary arrest ICD testing was not attempted again. The patient was transferred to the ICU intubated and in critical condition.

Discussion: During device testing this patient’s procedure was complicated by cardiac arrest, a known complication of DFT. This complication would have been avoided if DFT had not been performed. While guidelines state that DFT in subcutaneous defibrillators remain a class I recommendation, rising research shows that this may not always need to be the case.

Title: Pediatric Stroke of Unknown Etiology
Authors: Satesh Saroop, OMS3; Maria Herrera, OMS3; Alex Wilson, OMS3; Divy Mehra, OMS3
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Pediatric stroke is a relatively rare occurrence with the reported incidence of combined ischemic and hemorrhagic pediatric stroke ranging from 1.2 to 13 cases per 100,000 children under the age of 18. Roughly 10% of children with a stroke will die, up to 25% will have recurrence, and up to 66% will have persistent neurological issues. There can be many causes of stroke in pediatric patients such as cardiovascular disease, metabolic disorders, oncological causes, infectious diseases, and drug use. The clinical presentation of pediatric stroke can vary by age. Infantile strokes present with focal seizures, apnea spells, hypotonia, and lethargy. Toddlers can present with increased crying, sleepiness, irritability, difficulty feeding, vomiting, and cold extremities. Older children present with neurological deficits such as aphasia, hemiparesis, visual disturbance, and headaches.

Case Description: A 12-year-old female presented to the emergency room with altered mental status and left upper extremity weakness of 2 days duration. On the day prior to admission, the patient slept all day. When she later awoke, she had urinary incontinence, had the uncharacteristic behavior of laughing uncontrollably, and was found unable to move her left extremity. As per the mother the patient had not been recently ill, was afebrile, had no recent travel, and has no drug use. The patient had a stat CT scan of the brain and cervical spine which showed no abnormalities. On initial physical exam, patient was found to have slurred speech and confusion. On neurological exam the patient was alert but not oriented, with cranial nerves 2-12 intact. The left upper extremity had 0/5 muscle strength, and the patient was unable to move her wrist or fingers. Sensation was intact in this extremity. Muscle strength in the 3 other extremities were +5/5 and sensation was intact throughout these extremities. MRI of the head, cervical spine, and upper extremity was done revealing an acute to early subacute nonhemorrhagic right paramedian pontine infarct. As per vascular neurology, patient was started on aspirin 325mg daily. Per cardiology, the patient had multiple EKGs throughout her stay which revealed normal sinus rhythm. Echocardiography was performed which showed no abnormalities. Per hematology hypercoagulable workup was performed including factor V Leiden, protein S, protein C, antithrombin, prothrombin gene, coagulation factors, and homocysteine all of which were normal. Ultrasound of the lower extremities was performed to rule out DVT with no thromboses found. Rheumatology was consulted due to concerns for hypercoagulable secondary to autoimmune disorders. Beta 2 glycoprotein, ACE, anti-phosphatidylserine IgG/M/A, DRVVT were within normal limits. Per vascular neurology, patient was started on aspirin 325mg daily. Per cardiology, the patient had multiple EKGs throughout her stay which revealed normal sinus rhythm. Echocardiography was performed which showed no abnormalities. Per hematology hypercoagulable workup was performed including factor V Leiden, protein S, protein C, antithrombin, prothrombin gene, coagulation factors, and homocysteine all of which were normal. Ultrasound of the lower extremities was performed to rule out DVT with no thromboses found. Rheumatology was consulted due to concerns for hypercoagulability secondary to autoimmune disorders. Beta 2 glycoprotein, ACE, anti-phosphatidylserine IgG/M/A, DRVVT were within normal limits. ANA, ANCA, and anti-CCP were negative. Cardiolipin and lipoprotein A were mildly elevated. Throughout the patient’s stay her confusion subsided, and she progressed to +4/5 muscle strength in the left upper extremity movement of her wrist and fingers. The patient’s aspirin dose was brought down to 81mg daily after one week and further workup was to be performed in the outpatient setting.

Discussion: This case illustrates the expansive and accurate workup of a pediatric stroke of unknown cause. While in the hospital, the patient’s overall status improved significantly with subsequent workup being able to be done in the outpatient setting.

Title: Comomonas Testeroni: A Rare Pulmonary Pathogen
Authors: Imran Sayeedi, MD, PGY4; Patricia Almeida, DO, PGY3; Prashant Upadhya, MD, PGY7; Vijay Srinivasan, MD, PGY4
Program: Aventura Hospital and Medical Center, Pulmonary Disease Fellowship Program

Introduction: Commonly found in the environment, Comomonas testeroni is a low virulence organism that has rarely been associated with disease states in immunocompromised individuals. Often found in soil and water, isolates have additionally been identified in hospital oxygen humidifier reservoirs as well. This strain of bacteria is underdiagnosed due to microbiological limitations often impeding speciation. We present a case of pulmonary involvement in an immunocompromised patient following treatment for non-tuberculous mycobacteria (NTM) pneumonia.

Case Description: An 82-year-old female non-smoker with history of non-Hodgkin's lymphoma in remission presented with gradually worsening non-productive cough of several weeks’ duration, intermittent exertional dyspnea, and fever 103F. Labs were remarkable for elevated WBC 16.4. CT imaging revealed left lung base bronchiectasis with bilateral ground glass opacities. Bronchoscopy with bronchoalveolar lavage (BAL) was performed, which grew Mycobacterium mucogenicum, and the patient was started on anti-microbial therapy as an outpatient. Repeat surveillance bronchoscopy with BAL...
was performed nine months after beginning treatment for NTM which confirmed resolution of NTM infection, however *Comomonas testeronii* was isolated and a 10 day course of cefdinir was added to her NTM regimen.

**Discussion:** Formerly classified as *Pseudomonas testeroni*, *Comomonas testeronii* is a widespread environmental organism of rare pathological significance in humans, exceedingly so when manifesting as pneumonia. Pathogenicity of this often-labeled contaminant is poorly understood. Although exceptionally rare, cases of bacteremia, septic shock, and mortality with *Comomonas pneumonia* have been reported and proper anti-microbial therapy should be initiated when clinically indicated.

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**Title:** A Unique Case of Hyperthyroid Induced Gynecomastia

**Authors:** Shelby Schuh, OMS3; Reena Patel, OMS3; Sangita Gogate, DO

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Asymptomatic gynecomastia is a clinical exam finding common amongst older men, occurring in approximately two-thirds of patients. However, gynecomastia as it relates to hyperthyroidism is quite rare as according to a retrospective study of 87 patients with symptomatic gynecomastia only 2% had underlying hyperthyroidism. Despite its rarity, it is important to consider hyperthyroidism in a patient with newly presenting gynecomastia.

**Case Description:** We present a case of a 19-year-old Caucasian male who presented with a chief complaint of gynecomastia. Upon initial evaluation, the patient reported bilaterally enlarged breast tissue without pain, discharge or skin changes. He denied any past medical history and was not taking any prescription medications. He endorsed occasional alcohol and marijuana use. A full review of systems was negative with the exception of fatigue and mild excessive sweating. During the interview he remained hemodynamically stable with a blood pressure of 122/72mm Hg, heart rate of 84, and respiratory rate of 16. His body mass index was noted at 26.9kg/m². On physical examination there was a prominence of breast tissue bilaterally without evidence of redness, discharge, or skin dimpling. Laboratory tests were drawn, and the patient was sent for bilateral breast ultrasound for further evaluation. Upon results review and secondary evaluation of the patient, TSH was found to be low at 0.38mIU/L with reference range of 0.50-4.30mIU/L. TSH was performed nine months after beginning treatment for NTM which confirmed resolution of NTM infection, however *Comomonas testeronii* was isolated and a 10 day course of cefdinir was added to her NTM regimen.

**Discussion:** This case illustrates a unique presentation of gynecomastia as the initial presenting symptom of undiagnosed hyperthyroidism. The underlying pathophysiology of gynecomastia is related to the imbalance of estrogen and androgens. In a hyperthyroid state, there is increased hepatic production of sex hormone binding globulin (SHBG), which preferentially binds androgens. Consequently, more androgens bind to SHBG leading to a fall in free testosterone levels and an inappropriate rise in estrogen levels that goes on to stimulate proliferation of breast glandular tissue. Although this association between hyperthyroidism and gynecomastia is well established, there are very few reported cases of gynecomastia as the initial presenting factor. A review of literature demonstrates very few cases of gynecomastia as the presenting factor of hyperthyroidism. Prior reported cases include, Sanyan et al (2012) and Ho et al (1998) who reported hyperthyroidism presenting solely with gynecomastia, and Chan et al (1999) who reported...
both gynecomastia and galactorrhea as the presenting symptoms of hyperthyroidism. Overall, this case highlights the importance of investigating hyperthyroidism as a significant and treatable differential diagnosis for gynecomastia.

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**Title:** Sensory Neuronopathy in a Patient with History of Endometrial Carcinoma  
**Authors:** Aalok Shah, OMS4; Joseph Standley DO  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** The etiologies of acquired sensory neuronopathies are limited and therefore require early detection because they may herald an underlying autoimmune condition or malignancy. Having a high suspicion for acquired sensory neuronopathies is important as the differential diagnosis can span infectious causes (HIV, EBV, VZV) immune-mediated (Sjogren, Systemic Lupus erythematosus, autoimmune hepatitis, celiac disease), paraneoplastic and others1. Therefore, it is imperative to start investigating possible causes of sensory neuronopathies and attaining an early diagnosis which is key to effective treatments.

**Case Description:** 61-year-old female with history of MVA 1 year prior and stage 1 endometrial carcinoma status post radical hysterectomy at Moffit cancer center presented to James A. Haley Veterans Hospital Emergency department after 4 day bilateral leg numbness and difficulty walking. Of note her MVA 8/2018 resulted in severe foraminal stenosis at C5-C6 and C6-C7. In addition, the patient's hysterectomy was with no complications and she did not require any chemotherapy and received only toradol for pain control. Patient had presented to ED 2 weeks prior with reemergence of carpal tunnel sx's which she says she did not have the last 6 months; in that visit she was sent home with meloxicam. This visit she noted her symptoms began in bilateral hips and traveled down the back of her legs. She denied back pain, changes in hearing or vision, recent infection or illness, or changes in medication.

On exam it was noted Cranial Nerves were grossly intact, Patellar and achilles reflex were nonresponsive, Plantar flexion response was absent, decreased sensation to temperature, vibration, and light touch in lower extremity left greater than right in stocking distribution. Patient’s gait was noted to be wide based, unable to perform toe walk, heel walk, or tandem gait due to instability.

Patient had Lumbar Puncture done as well as testing for SSA, SSB, RF, ANA, RF, HIV, and RPR. Lumbar puncture showed elevated proteins with top differential for Acute Inflammatory Sensory Polynocephalopathy. Patient received IVIG 2g/kg over 3 days. Patient noticed sensory sensation return over the next 3 days while making a near complete recovery. Patient was told to follow up at Moffit cancer center for paraneoplastic labs as well as possible autoimmune pathologies.

**Discussion:** Patient was able to make a clear recovery after neurologist correctly ordered a lumbar puncture to determine the cause of the patient’s symptoms although there were other non-emergent differentials to consider. Having a high suspicion for dangerous and emergent neurologic disorders is imperative for the care of the patient.

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**Title:** The Return of Bloodletting: A Case of Polycythemia Vera.  
**Authors:** Nisarg P. Shah, OMS3; Chris Naranjo, DO, PGY1; Kenneth Wojnowski, DO, PGY2  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Polycythemia Vera (PV) is a myeloproliferative neoplasm that results in elevated red blood cells due to clonal expansion of myeloid lineage cells. A mutation in JAK2 V617F gene is present in over 90% of PV cases leading to its state of erythrocytosis, a distinct feature of PV. This disease state leads to tremendously elevated hemoglobin (Hb) and hematocrit (Hct) levels, increasing blood viscosity and risk of thrombotic events. The incidence of PV is less than 22 cases 100,000 with higher rates seen in males greater than 70 years of age. The three WHO diagnostic criteria are (1) Hb >16.5 g/dL in men and > 16.0 g/dL in women or Hct >49% in men and >48% in women, (2) hypercellularity in bone marrow biopsy, and (3) JAK2 V617F or JAK2 exon 12 mutation. Routine lab reports can also show an increased platelet count of >400,000 and mildly elevated WBC. Patients will present with complaints of headaches, dizziness, facial plethora, worsening vision over a period of months, and in severe cases can develop hyperviscosity syndrome.

**Case Description:** A 62-year-old Hispanic male presented to ED per recommendation of PCP due to elevated blood pressure (BP), Hb and Hct, and abnormal EKG. He had nonspecific left sided chest discomfort for the past one year and SOB for the past three months. He also reported intermittent headaches and increased redness of his skin for the past three to four months. Past medical history consisted of hypertension and hyperlipidemia. Vitals consisted of BP of 172/90 and on physical exam the patient had blatant facial and truncal plethora, and bilateral conjunctival injection. Complete blood count (CBC) revealed a Hb of 20.8 g/dL and 66.5%, respectively. Patient was placed on ½ Normal Saline at 75 cc/hour, low dose aspirin, and hydroxyurea. He responded well to inpatient therapeutic phlebotomies over the next two days where 500 mL was drawn for a total of three sessions. Hb and Hct were 7.50 g/dL and 60.5% prior to discharge. Additional PV specific tests revealed erythropoietin levels of 2.3 mlU/mL, testosterone of 257 ng/dL, and 20.7% mutation in JAK2 V617F. From this patient's clinical presentation, hospital course, and laboratory studies we can state this was a primary case of PV.

**Discussion:** This case of PV allows us to explore the efficacy of treatment modalities in early phases of the disease. As this patient was recently diagnosed, he was naive to cytoreduction, antithrombotic therapy, and responded immediately within 72 hours of presentation. However, this is not always the case as the symptomatology of PV can be refractory and requires alternative forms of cytoreduction with mainstay therapeutic phlebotomies. In addition, risk stratifying patients presenting with PV is paramount due to higher risk of thrombosis in PV. You must also determine the rise in Hb and Hct is due to a primary or secondary case of PV. Secondary forms tend to result from underlying conditions such as hypoxia. Thus, requiring not only prompt diagnosis, but adequate follow up and meeting hematologic treatment goals to reduce morbidity and mortality from thrombotic events.
Introduction: Cholelithiasis, or the presence of gallstones in the common bile duct, occurs in approximately 20% of patients with cholelithiasis. ERCP is both a diagnostic and therapeutic procedure, so it is traditionally used to remove gallstones from the common bile duct. Percutaneous transhepatic cholangiography (PTC) is a therapeutic procedure used in patients who have failed ERCP. Patients who do not improve after PTC undergo biliary duct exploration as a definitive treatment.

Case Description: The patient is a 59-year-old male with complaint of several weeks of abdominal pain, nausea, and sclera icterus. On physical exam, there was right upper quadrant tenderness with no peritoneal signs. After reviewing labs and imaging, the patient was diagnosed with cholelithiasis with obstructing choledocholith. ERCP with lithotripsy was attempted twice during his hospital stay. The first attempt failed due to equipment malfunction. On the second attempt, only fragments of the stone were removed so a stent was placed to facilitate drainage. CT abdomen/pelvis performed after the second ERCP showed no perihepatic fluid collections. The following day, percutaneous transhepatic cholangiography (PTC) with biliary drainage was performed, and cholangiogram showed an obstructed distal common bile duct. On the next day, the patient began to experience increasing abdominal pain. CT abdomen/pelvis showed a decreased density on the right lobe of the liver, consistent with a subcutaneous subcapsular hematoma and perihepatic hemorrhage. Surgery revealed a very large hemoperitenium secondary to rupture of a subcapsular hepatic hematoma of the right lobe, acute on chronic cholecystitis, and a large common bile duct with a large stone. Cholecystectomy, common bile duct exploration with removal of stones, and T-tube placement were performed.

Discussion: Definitive treatment for choledolithiasis includes laparoscopic cholecystectomy. However, management of complicated choledolithiasis may include percutaneous transhepatic cholangiography (PTC) prior to laparoscopic cholecystectomy. PTC is commonly used as a conservative bridging method for patients who are considered to be high risk candidates for laparoscopic cholecystectomy. Complications of PTC include bleeding at perihepatic (subcapsular hepatic hematoma) or gastrointestinal sites (hemobilia). A highlight of this patient’s chronological timeline includes 2 ERCPs, PTC drain placement, development of a subcapsular hepatic hematoma, and ultimately exploratory laparotomy with exploration of the common bile duct. The time between ERCP and PTC placement should be a critical factor. PTC drainage in our patient was placed on Day 7, less than 24 hours following the second ERCP. When looking retrospectively, this may have not been sufficient time for the bilirubin to decrease. If the patient was given a few days for the bilirubin level to stabilize, the patient may have improved on his own and may have avoided the PTC drain placement.
Introduction: Puerperal uterine inversion is a rare complication of delivery, occurring with a reported incidence of one case in every 1200-57000 deliveries. The wide range reflects the differences in reporting methods and patient populations. Inversion occurs when the fundus collapses into, and in some cases, beyond the endometrial cavity, resulting in the uterus either partially or completely turning inside out. The pathogenesis is not completely understood but has been attributed with excessive cord traction as well as fundal pressure. Risk factors are present in fewer than 50 percent of cases and include rapid labor and delivery, short umbilical cord, use of uterine relaxants, nulliparity, uterine anomalies or tumors (leiomyoma), retained placenta, and placenta accreta. Despite the scarcity of cases, it is still regarded as a serious and life-threatening obstetric emergency due to the severe hemorrhage that can occur with it. The current treatment recommendations include to manually replace the uterine inversion followed by surgical intervention if this fails. This case study presents the novel use of a Bakri postpartum balloon for uterine inversion, thereby avoiding emergency laparotomy.

Case Description: We present a case of a 32-year-old female who delivered her second child vaginally. Labor and delivery were uneventful. After delivery of the infant, the placenta spontaneously began to deliver. No traction was placed on the placenta, yet it was noted that the uterus was inverting. At this point, the placenta was immediately removed in a piecemeal fashion. Difficulty in removing the placenta suggested an accreta. Once the placenta was removed, heavy bleeding was noted, and the uterine fundus was returned to the normal position via manual replacement. The maneuver significantly decreased the bleeding, however, the fundus remained hypotonic and would invert again upon any attempt of removing manual positioning. Fundal massage and uterine hypertonic agents such as hemabate, etheergine, pitocin, and cytotec did not resolve the inversion. Aggressive fluid replacement with IVF, FFP, and PRBC continued, yet the possibility of an emergency laparotomy and hysterectomy was becoming ever more apparent. The patient was taken to the OR, with the emergency hysterectomy tray on immediate standby. At this point it was decided to place a Bakri uterine balloon in an attempt to maintain the position of the fundus. Manual positioning of the fundus was removed and the balloon was inserted through the cervix into the uterus. 240 cc of sterile saline was delivered into the balloon. The result was that the Bakri balloon worked remarkably well at maintaining fundal position and controlling the bleeding. The patient was monitored in surgical ICU overnight. The next morning 100 cc was removed from the balloon, with no increase in bleeding. The patient was transferred to the postpartum unit and the following morning the remaining 140 cc was removed along with the balloon with no increase in bleeding. The patient was monitored for two additional days and discharged with no significant complications.

Discussion: This case illustrates the significance of rapid diagnosis and action of acute puerperal uterine inversion. Acute puerperal uterine inversion is an obstetric emergency. Early recognition and prompt management reduces maternal mortality. If initial management with manual replacement of the uterine fundus in its correct position and uterine hypertonic drugs does not resolve the problem, the Bakri postpartum balloon may be used to maintain the fundus in its correct anatomical position. Therefore, avoiding the need for emergency laparotomy.

Title: Iatrogenic Adrenal Insufficiency
Authors: Spencer Smodish, OMS3; Daniel Gable, OMS3; Jason Gajraj, MD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Behcet’s is an inflammatory remitting relapsing autoimmune condition causing recurrent oral aphthous ulcers and systemic manifestations such as genital ulcers, ocular disease, skin lesions, arthritis, vascular, gastrointestinal, and neurological disease. Treatment usually consists of glucocorticoids and other immunosuppressive medications depending on extent of disease (1,2,3). Adrenal insufficiency has a variable presentation depending on whether onset is acute or chronic, but in both cases the most common cause is prolonged treatment with systemic corticosteroids. Acute onset can cause adrenal crisis with shock, chronic insufficiency may cause vague fatigue, and both can result in unexplained hyponatremia and hypoglycemia. The first step in diagnosis involves obtaining a morning cortisol level because cortisol levels are normally elevated in the morning and a decreased level is indicative of adrenal insufficiency (4). Treatment is with long term corticosteroids to replace the deficit.

Case Description: We present the case of an 80-year-old African American female with a past medical history of type 2 diabetes mellitus, Alzheimer’s, and Behcet’s who presented to the ED with speech changes, weakness, and confusion. Initial evaluation revealed hypoglycemia of 45. She received PO and IV Dextrose resulting in rapid resolution of symptoms. A brain CT and MRI were performed to rule out intracranial pathology and both showed only moderate chronic small vessel ischemic changes. Exam revealed that she was alert and oriented x2 with difficulty recalling information and no focal neurologic deficits. Initial lab work was unremarkable besides hypoglycemia and Hgb A1c of 5.6. Neurology and Endocrinology were consulted and evaluated the patient. Neurology ruled out CVA and confirmed the underlying dementia. Endocrinology held the patient’s PO glycemic control and attempted to correct her blood glucose with Lantus and serial glucose monitoring. During her hospitalization, her blood glucose fluctuated from the 40’s to 400’s irrespective of food intake or medications. Risk factors are present in fewer than 50 percent of cases and include rapid labor and delivery, short umbilical cord, use of uterine relaxants, nulliparity, uterine anomalies or tumors (leiomyoma), retained placenta, and placenta accreta. Despite the scarcity of cases, it is still regarded as a serious and life-threatening obstetric emergency due to the severe hemorrhage that can occur with it. The current treatment recommendations include to manually replace the uterine inversion followed by surgical intervention if this fails. This case study presents the novel use of a Bakri postpartum balloon for uterine inversion, thereby avoiding emergency laparotomy.

Discussion: This case illustrates the importance of adequately tapering high dose steroids and maintaining a high index of suspicion for iatrogenic adrenal insufficiency in patients who present with new onset uncontrolled blood sugar fluctuations in previously well controlled individuals.
**Title:** Prolonged Length of Hospital Stay in an Influenza A Patient with E-Cigarette Associated Lung Injury  
**Authors:** Mary Spring, OMS3; Nicole Fischer, OMS3; Allison Bardowell, DO, PGY2  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Electronic cigarettes (e-cigarettes) are a relatively new means of inhaling multiple substances such as tobacco, cannabidiol (CBD), tetrahydrocannabinol (THC), and butane hash. An explanation to the increasing popularity of e-cigarettes since being introduced into the US market in 2007 may be the common misconception that e-cigarettes are healthier and safer than the traditional, combustible tobacco cigarettes. However, it is now known that the aerosol of e-cigarettes contains many harmful products, such as heavy metals, ultra-fine particles, and volatile organic compounds. In fact, e-cigarettes may actually be more harmful due to the device containing a large battery and, thus, the ability to heat the liquid to high temperatures, resulting in the release of more nicotine, the formation of additional toxic molecules, and the creation of larger clouds of particulate matter. Additionally, studies have recently shown that vaping may cause pulmonary illnesses that consist of respiratory symptoms, gastrointestinal symptoms, and bilateral infiltrates on imaging. The Center for Disease Control has now recognized and termed this syndrome as e-cigarette product use-associated lung injury (EVALI).

**Case Description:** We present a 45-year-old male with no significant past medical history and 3 month history of vaping CBD oil who first presented to the emergency department (ED) with flu-like symptoms including fever, chills, generalized myalgias, abdominal pain, nausea, and vomiting for 3 days. In the ED, he had a Tmax of 101.7 °F, heart rate of 102 bpm, respiratory rate of 31 bpm, and an O2 sat of 92% on room air. Due to an increased white blood cell count (WBC), fever, tachycardia, tachypnea, and possible source of infection, sepsis protocol was initiated. The patient was admitted and empirically treated with oseltamivir, doxycycline, and ceftriaxone. He tested positive for influenza A. On day 2 of treatment, the patient had continued dyspnea and was desaturating to 89% on room air. The patient was put on 4 liters of oxygen via nasal cannula (NC) and nebulized albuterol-ipratropium (DuoNed) 3 mL, every 6 hours. On day 3, the patient stated his abdominal pain, nausea, and vomiting had resolved and denied any fever, chills or chest pain; however, he admitted to consistent shortness of breath. Despite his labs, including WBCs, normalizing, his vital signs stabilizing, and his flu-like symptoms resolving, his oxygen saturation remained in the low 90’s and he continued to require oxygen. Due to continued dyspnea, a CT of the chest was ordered and revealed geographic ground glass opacities with septal thickening present throughout both lungs with relative sparing of the lung bases with considerations to include vaping associated lung disease (Fig 1). On day 5, he finished the course of antibiotics and was weaned off oxygen, saturating at 96% on room air. He was discharged on hospital day 6 on prednisone 40 mg once a day for 14 days and had an appointment to follow up with a pulmonologist in 2 weeks to evaluate his EVALI.

**Discussion:** The average hospital stay for influenza is 5.3 days, with the majority of patients hospitalized being over the age of 65 with other comorbidities. Interestingly, CT of the chest was significant for EVALI despite the patient reporting only a 3 month history of vaping CBD oil. This leads one to question whether this minor history of vaping CBD oil exacerbated the patient’s influenza infection making him more susceptible to the illness and a prolonged hospital stay.

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**Title:** Splenic Mass: Brief Review of Splenic Neoplasms and Management Guidelines  
**Authors:** Apurva Srivastav, OMS3; Bryan Perez, OMS3; Jeronimo Garcia Lopez De Llano, MD; Adrian Legaspi, MD  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Splenic neoplasms are extremely rare tumors with a wide variety of outcomes depending on the actual cell type. Lymphoma is the most common malignancy of the spleen, and it accounts for less than 2% of all lymphomas and less than 1% of non-Hodgkin’s lymphomas. In addition to hematopoietic disorders, the spleen can also have nonhematopoietic lesions such as metastatic tumors, pseudotumors, cysts, hamartomas, and vascular tumors. The most common benign solid tumor of the spleen is the cavernous hemangioma with an incidence of 0.02 to 0.16% of all splenic masses. Splenic tumors are often diagnosed incidentally. In those patients with symptomatic splenic tumors, it is usually because there is advanced disease with limited therapeutic options.

Anatomical variants of the spleen are rare, with the most common being the accessory spleen occurring in 10% of the population. Most anatomical variations go unnoticed since most of them are asymptomatic. In this report, we describe a patient with a splenic mass that was discovered incidentally.

**Case Description:** A 51-year-old female who presented to the ED with early satiety and bloating for 12 months. At the time of examination, the patient had difficulty tolerating solid foods. The patient experienced vague intermittent abdominal pain of low intensity. Otherwise asymptomatic. An Upper GI series was done, which revealed a submucosal mass in the fundus of the stomach. Endoscopic ultrasound-guided biopsies were negative for malignancy. A CT scan of the abdomen revealed a well-circumscribed soft tissue mass arising in the posterior gastric fundus. Due to the location and resulting obstruction, the patient was tentatively diagnosed with a gastrointestinal stromal (GIST) tumor. The patient was taken to the operating room by the surgical oncology service and determined the tumor to be arising from the upper pole of the spleen, it was resected, and the spleen was reconstructed with vascular anastomosis. Postoperatively, the patient recovered well and was discharged home on the third postoperative day.

**Discussion:** Because of the relative rarity of primary splenic neoplasms, there are not well-established guidelines or protocols on treatment of splenic tumors. The most common of these solid tumors is the cavernous hemangioma, which if asymptomatic can be observed with serial imaging studies. Without clear guidance in the absence of literature guidance, larger tumors could be treated with transarterial embolization. For liver hemangiomas, typically 10cm is the recommended size beyond which hemangiomas should be embolized. The spleen however is a more vulnerable organ with a greater propensity for spontaneous rupture, or rupture with minor trauma. The literature has well documented the findings of splenic involvement by lymphoma, which can be managed with systemic therapy. It is also possible to obtain tissue with a percutaneous biopsy. Any other splenic neoplasms need to be individually evaluated and the management has to be tailored to the clinical circumstances. The lessons learned in pediatric trauma and splenic repair should be applied for the management of neoplasm of certain behavior. This case provides the unique opportunity to evaluate and possibly establish a protocol for evaluation splenic masses.
**Discussion:** This case illustrates the prompt and accurate diagnosis of two emergent diagnoses that both require immediate management for best patient outcomes.

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**Title:** Subclavian Steal Syndrome

**Authors:** Huma Tahir, OMS4; Anthony Morris, OMS4; Divya Pandya, OMS4; Tariq Jaber, MD, PGY3

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Subclavian Steal Syndrome (SSS) consists of vascular and neurological symptoms which may seem unrelated if not properly understood within their respective clinical context. It is a more of a phenomenon of an "appropriate" compensatory blood flow whereby an occlusion of the prevertebral subclavian artery leads to a retrograde blood flow of the vertebral artery. SSS often found incidentally and usually patients are asymptomatic. Here we describe a case of SSS which warranted an invasive intervention.

**Case Description:** A 61-year-old male who presented with claudication, exercise intolerance, decreased left radial and ulnar pulse, and three episodes of near collapse and dizziness when he was painting his house. Examination revealed im palpable pulses on the left radial and ulnar arteries, normal pulses on right arm, normal pulses felt for both legs, and patient was Roo’s test positive on the left arm. His ABPI was within normal limits on both lower extremities. His pressure for brachial index was significantly reduced in his left arm when compared to his right. CT angiogram revealed a focal occlusion of the medial left subclavian artery. It was treated with an endovascular repair rather than revascularization which lead to relief of symptoms upon follow-up.

**Discussion:** SSS can lead to arterial insufficiency in the brain or upper extremities which are supplied by the subclavian artery. However, the arm may be supplied by blood flowing in a retrograde direction down the vertebral artery at the expense of the vertebrobasilar circulation. Although most patients will remain asymptomatic, physical findings of SSS are often incidentally found. That is why we recommend a careful history to identify the vascular and neurological deficits to correctly diagnose this phenomenon. Hence why it is described as a rare kind of syncope given its non-specific symptoms. We recommend assessing brachial systolic pressures bilaterally, radio-radial pulse delays, and assessing the supraclavicular fossa for thrills, bruits, and pulse character. In addition, it is highly recommended to examine the extremities for changes regarding skin, hands, and nail beds of the affected extremity. Always perform a thoracic outlet maneuvers and palpate all major pulses to rule out Takayasu. Physical examination with positive signs should be followed by Doppler and angiography scans (CT/MRIs) for further assessment. Asymptotic patients should be treated conservatively and with pharmacotherapy. Since the most significant risk for developing SSS is atherosclerosis we recommend targets that addresses the following clinical outcomes: hypertension, lipid control, proper glycemic control, anti thrombotic therapy, lifestyle changes, and mitigating risks associated peripheral/cardiovascular disease. For symptomatic patients we recommend the surgical/endovascular approach. Revascularization is especially recommended for continuous steal symptoms in comparison to intermittent where stenting or angioplasty is more recommended.

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**Title:** Benefits of a Laparoscopic Robotic Approach in Discovering Multiple Hernias

**Authors:** Thanaporn Sae Tang, OMS3; Quynh-Nhu Tran, OMS3; Brian Weinstein, MD, FACS

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** There is currently no consensus as to whether the optimal approach to inguinal hernia repair is open or laparoscopic. When comparing open vs laparoscopic inguinal hernia repairs, laparoscopic repair has been associated with less postoperative pain and a quicker recovery. In addition, bilateral inguinal groin hernias are preferred to be repaired laparoscopically because both hernias can be repaired through the same incisions, which improves cosmesis. On the same line, a single large piece of mesh can be used with a laparoscopic repair reducing cost and risk of a recurrent direct hernia medially. A laparoscopic approach also had the added benefit of allowing exploration of the contralateral groin. In comparison to laparoscopy alone, a robotic assisted repair allows for 3D viewing angles, twisted movements, and potentially improved ergonomics. This technology has the potential to overcome the technical challenges of laparoscopic groin hernia repair and allows improved adoption of minimally invasive techniques for...
Concurrent Pulmonary Embolism, Hypertensive Emergency and Flash Pulmonary Edema in Systemic Lupus Erythematosus

Case Description: Our patient is a 24-year-old African American female with a past medical history of systemic lupus erythematosus, lupus nephritis, and end stage renal disease on hemodialysis, who presented to the emergency department for acute onset of shortness of breath. She was recently discharged from the hospital 2 days ago when she was diagnosed with pneumonia, pulmonary edema, and had an AV fistula graft placed. On presentation, she was hypertensive at 222/142 mmHg and was in respiratory distress with bilateral rhonchi in all lung fields. The patient was placed on BiPAP and an IV nitroglycerin infusion was started. Her initial chest x-ray revealed cardiomegaly with diffuse vascular congestion. Subsequent CT angiogram of the chest revealed the same vascular congestion, as well as a pulmonary embolus in the right medial segment, middle pulmonary artery. Two x-ray esophagrams with contrast and with barium ruled out esophageal leak. Urine drug screen was negative for cocaine, amphetamine, and cannabinoids. Mycoplasma pneumoniae IgM resulted positive and other respiratory pathogens were ruled out. Pulmonary function tests were obtained to evaluate for undiagnosed pulmonary disease which resulted in no significant obstructive or restrictive pattern. Patient was treated with supportive care and was discharged once symptoms improved.

Discussion: Among patients with systemic lupus erythematosus, it is well known that they are prone to venous thromboembolism. Given the pathophysiology of the disease, these patients have chronic inflammation and a hypercoagulable state. Studies have shown that these patients have a 3-fold increase for overall venous thromboembolism. Emergency medicine physicians must keep venous thromboembolism within their differential diagnosis. Patient with systemic lupus erythematosus may also have renal manifestations leading to lupus nephritis. As the disease progresses without immunosuppressive therapy, a patient may progress to end stage renal disease requiring dialysis. These patients are prone to have hypertensive emergencies from high volume and increased vascular resistance due to renin. One of the complications of hypertensive emergencies is flash pulmonary edema. It is well known that it is a rare and serious complication of chronic renal disease. However, it can also be seen in patients with normal renal function and chronic inflammation. This case presentation shows two life threatening diseases can occur together, and Occam’s razor is not always the case in the Emergency Department.

Conclusion: Hypertensive emergency and flash pulmonary edema can occur together, and emergency medicine physicians must keep these differential diagnoses in mind. This case presentation shows the importance of recognizing the complications of chronic inflammation and its potential for life threatening consequences.
edema. Upon literature review, there were few reports of concomitant pulmonary embolism and flash pulmonary edema. It is crucial to not anchor on one diagnosis, and to continue to investigate in patients with SLE presenting with shortness of breath.

Title: A Leather Bottle Stomach with Diffuse Type Signet-Ring Cell Gastric Carcinoma
Authors: Quynh-Nhu Tran, OMS3; Thanaporn Sae Tang, OMS3; James Doty, MD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Gastric cancer is the fifth most prevalent cancer and the third most fatal cancer globally. While gastric cancer prevalence is declining, Signet-Ring Cell Gastric Carcinoma (SRCC) incidence is rising. In addition, the presence of linitis plastica reinforces the aggressive nature and late stage SRCC to a 3-10% five-year survival. Patients usually have late symptoms onset and early lymphatic spread, causing delay in seeking medical advice and a poor prognosis. With the mean age of diagnosis at 55-61, early-onset SRCC or a family history of diffuse gastric cancer denotes hereditary diffuse gastric cancer (HDGC) from CDH1 mutation. Furthermore, Lynch syndrome also leads to gastric carcinoma through the high microsatellite instability (MSI-H) and loss of mismatch repair (MMR) pathways.

Case Description: The patient is a 37-year-old Caucasian male with a past medical history of chronic constipation, nephrolithiasis, gastritis, and GERD and a family history of gastric carcinoma, Lynch syndrome, and immune thrombocytopenic purpura who presented to the ED complaining of abdominal pain for six months. The constant achy, burning right upper quadrant abdominal pain worsened over the past few days, especially with meals and intermittently radiated to the umbilicus. Belching/vomiting provided mild relief. Occasional fever, nausea, and insomnia were reported. With a negative colonoscopy 3 weeks earlier, the patient started pantoprazole 40 mg. for the endoscopy prior authorization. Physical exam was remarkable for decreased bowel sounds and a soft, mildly distended abdomen. Abdominal ultrasound revealed no gallstones or biliary dilatation while the abdominal CT and upper GI series showed severe gastric outlet obstruction, stomach dilatation with abrupt tapering, stomach antrum mucosal thickening without lymphadenopathy or hepatic lesions, and little contrast in the small bowel. Esophagogastroduodenoscopy noted a stomach full of food, but the endoscope failed to pass through the pylorus. Surgery was scheduled as nasogastric tube decompression failed. Vitamin K and fresh frozen plasma was given for the stable 80,000 platelet count. The patient underwent an exploratory laparotomy, distal gastrectomy with loop gastrojejunostomy, a 18 French Mic-Key gastrostomy, a 14 French feeding jejunostomy, a 15 round Jackson-Tapering, stomach antrum mucosal thickening without lymphadenopathy or hepatic lesions, and little contrast in the small bowel.

Discussion: This case illustrates the genetic predisposition, aggressive nature, multi-modal therapies of SRCC with linitis plastica. Complete resection results in a 17-month median survival, while residual tumor or distant metastasis shortens the survival time to six months. Neoadjuvant chemotherapy or chemoradiation is controversial; resection vs. conservative treatment is patient and physician driven. However, the more sensitive taxane and antiangiogenics agents are being investigated. Furthermore, the early lymphatic spread could lead to new targeted therapy. Retrospectively, the patient may have benefitted from CDH1 carrier genetic testing as prophylactic total gastrectomy at age 20-30 or annual endoscopy with a minimum of 30 biopsies is highly recommended. Nonetheless, genetic testing as a screening and management tool provides another avenue for preventive measures or earlier diagnosis.

Title: Bosma Arhinia Microphthalmia and Cardiac Abnormalities: A Case Report
Authors: Aakash Trivedi, OMS3; Tyler Bean, OMS3; Kayla Brown, OMS3; Carolyn Cain, MD
Program: Nova Southeastern University Kiran C. Patel College of Osteopathic Medicine

Introduction: Bosma arhinia microphthalmia (BAM) syndrome is an extremely rare condition characterized by abnormalities of the nose and eyes as well as dysfunctions with puberty. There have been less than 100 patients reported worldwide in the past century. The absence of a nose, and in some cases hypoplasia of the nose, is the key feature of the syndrome. This leads to impaired olfactory and gustatory sensation. Additionally, patients with BAM syndrome can have microphthalmia or anophthalmia leading to severe vision impairment or blindness. Other potential ocular defects include colobomas and cataracts. Individuals with this syndrome also have hypogonadotropic hypogonadism which leads to a decreased production of hormones that directly influence sexual development. Without involvement of endocrinological treatment, this results in delayed puberty. Affected males may also have underdeveloped reproductive tissues and cryptorchidism.

Case Description: A 10 week old Hispanic male with an absent nose presented with his mother for constant abdominal retractions and increased work of breathing for 24 hours. The mother also stated patient had increased secretions in patient’s tracheostomy tube. The patient was born full term at 38 weeks via vaginal delivery weighing 6 pounds 2 ounces and was kept in hospital for the first 2 months of life. A tracheostomy tube was put in at 3 weeks of life because of difficulty breathing while feeding. A gastrostomy tube was put in at 1 month of life per the mother’s request. The patient’s hearing and vision were tested and were unremarkable. The patient also had been diagnosed with a patent ductus arteriosus, a patent foramen ovale, and physiologic pulmonary valve insufficiency. The mother has an established diagnosis of systemic lupus erythematosus but is not taking medications. She also stated that she received prenatal care, there were no complications during pregnancy, and was unaware of the condition during pregnancy. Socially, the mother worked as a housekeeper, landscaper, and in construction before she knew she was pregnant. The patient has a brother that is alive and well. Information on the father was not able to be discerned. The rest of the family history was unremarkable. The patient was also referred for genetic screening for BAM syndrome.

Discussion: There are a variety of theories as to the etiology of BAM syndrome, with mutations of the SMCHD1 gene, PAX6 genes, and de novo reciprocal translocation of t(3;12)(q13.2; p11.2) being the top three most likely causes. This leaves a vast arena to continue accumulating genetic evidence.
Title: Therapeutic Challenge in Treatment of Hemochromatosis with Concurrent Hepatitis C and Alcoholic Cirrhosis
Authors: Shivani Trivedi, OMS3; Dr. Ashwani Sethi, MD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Alcoholic cirrhosis with co-existent Hepatitis C are common dual diagnoses seen in clinical practice. However, the prodrome of alcoholic cirrhosis and Hepatitis C compounded with hemochromatosis poses a potentially complex clinical scenario. With a gene frequency of 4-6% in hemochromatosis in Caucasian population, the incidence of hemochromatosis with hepatitis C and alcoholic cirrhosis is probably underestimated and may pose unique challenges to the management of hemochromatosis.

Case Description: A 57-year-old Caucasian male presented with peripheral edema, mild ascites, and arthralgias of three months duration. He had a history of type 2 diabetes and hypertension with a significant social history of alcohol and tobacco use. Further evaluation showed leukopenia, thrombocytopenia, and abnormally elevated LFTs. An alpha-fetoprotein was 19.2 and subsequent CT scan of abdomen and pelvis showed a cirrhotic liver, splenomegaly, and small volume ascites. He was noted to have Hepatitis C type 1b with a titer of 784,000 with negative HIV and HBV serology. His EGD showed three esophageal varices. Subsequent labs showed a transferrin saturation of 91%, a serum iron of 179, a ferritin of 952, and hemoglobin of 12.8. A hemochromatosis gene analysis showed him to be homozygous for H63D/H63D mutation with a MELD-Na score of 16 and Child-Pugh class B cirrhosis. After considerable multidisciplinary deliberation, it was decided to manage the patient on Sofosbuvir and Velpatasvir for 24 weeks and to later initiate cautious phlebotomy. The therapeutic value of this approach is undetermined at this time due to paucity of relevant clinical guidelines.

Discussion: Hemochromatosis occurs with limited frequency in Caucasians. Given this small frequency, its presence in cirrhotic patients from alcohol and hepatitis C is infrequently reported. This case presents the unique challenge of treating iron overload and decompensated alcoholic cirrhosis with hepatitis C. There are no established parameters of phlebotomy guidelines in this combination where patients are borderline anemic from multiple causes and at risk for gastrointestinal bleeding from varices. Because iron overload occurs in about 7% of patients with H63D/H63D mutation, it may be prudent to first eradicate hepatitis C, and then embark on cautious phlebotomy.

Title: Unique Presentation of Hypercalcemia in the Geriatric Population: A Case Report of an Elderly Female
Authors: Kelly Tyson, OMS3; Mihir Nakrani, OMS3; Jason Ghasemloian, OMS3; Naushira Pandya, MD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Hypercalcemia is a commonly encountered disorder in the geriatric population, defined as serum calcium >10.4 mg/dL. Although there are over thirty differential diagnoses for hypercalcemia, primary hyperparathyroidism (PHPT) and malignancy account for the majority of cases. Early diagnosis and management in the elderly is crucial due to increased incidence of malignancy and susceptibility to end-organ damage in this population. However, diagnosis can be challenging in patients with multiple comorbidities, as compounding factors have varying effects on calcium levels.

Case Description: We present a case of a 65-year-old African-American female with a past medical history of PHPT with parathyroidectomy, subclinical hyperthyroidism, hypertension, hyperlipidemia, cerebrovascular accident, stage 2 chronic kidney disease (CKD), peripheral arterial disease, nephrolithiasis, osteoporosis and depression who presented for evaluation of hypercalcemia. Labs from her care facility revealed a calcium level of 10.7, corrected to 11.4 for hypoalbuminemia. Review of systems was positive for palpitations, fatigue, intermittent diaphoresis, dysphagia and xerosis. Pertinent negatives included headache, diplopia, chest pain, polydipsia, muscle spasms, perioral numbness and tingling, nausea, vomiting, diarrhea, and constipation. Medications included omeprazole, spironolactone, vitamin D, magnesium hydroxide and acetaminophen. Physical exam findings were right hemiplegia, diminished dorsalis pedis pulses and absent posterior tibial pulses bilaterally. Differential diagnoses included normohormonal PHPT, classic PHPT, hyperthyroidism-associated hypercalcemia, hypercalcemia due to immobilization, and malignancy. Labs showed an elevated calcium and intact PTH, consistent with classic PHPT.

Discussion: This case illustrates the need to investigate the myriad of causes of hypercalcemia in the geriatric patient. Although a diagnosis of PHPT is most common, initial labs did not indicate a classic presentation, but instead indicated normohormonal PHPT, a condition only recently recognized as being distinctly different from classic PHPT. This patient has multiple comorbidities with polypharmacy and immobilization, all of which could have been contributing factors. Hyperthyroidism can cause hypercalcemia, however, the patient had low circulating free T4 likely cannot. Multiple myeloma was ruled out due to the absent monoclonal protein on SPEP. Increased incidence of conditions that can cause hypercalcemia in the elderly, compounded with the complexity of care for comorbid patients makes investigation of all causes essential in the geriatric population.

Title: Primary Spinal Glioblastoma Multiforme with Secondary Cerebral Metastasis: A Case Report and Comprehensive Review of the Literature
Authors: Jason D. Vadhan, OMS3; Daniel G. Eichberg, MD; Michael E. Ivan, MD; Ricardo J. Komotar, MD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program
**Introduction:** Primary Spinal Glioblastoma Multiforme (sGBM) is a rare condition that presents with an aggressive course and a poor prognosis. Although cranial GBM is well known to undergo drop metastases to the spine over time, it is extremely uncommon for primary sGBM to undergo upward intracerebral metastasis. To date, there have been less than thirty documented cases of this condition.

**Case Description:** We report a 39-year-old female who initially presented with worsening gait instability and progressive low back pain and evidence of a large intramedullary and intradural mass extending from T10-L1 via magnetic resonance imaging (MRI). The patient underwent maximal safe resection, chemotherapy, and radiation treatment. Upon one year follow up, she began complaining of progressive lower extremity weakness, dizziness, fatigue, poor appetite, and depressed mood. Brain MRI demonstrated a new hyperintense lesion located in the mesial right temporal lobe as well as the cerebellum. Temporal lobe biopsy and histopathological study was compatible with GBM.

**Discussion:** Given the rarity and poor prognosis of sGBM with cerebral metastasis, we herein further summarize all reported cases of this condition and provide an overview of the clinical data to date and recommend that patients with sGBM undergo serial cranial surveillance imaging.

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**Title:** An Unsuspected Axillary Mass in a 2-Week-Old Male  
**Authors:** Ashley Van Putten, DO, PGY2; Alexis Dietz, DO, PGY2; Johnny Tryzmel, MD; Angelica Garzon, MD  
**Program:** Salah Foundation Children's Hospital, Pediatrics Residency Program

**Introduction:** Langerhans cell histiocytosis (LCH) is a clonal neoplasm derived from immature dendritic cells that typically peaks between ages 1 to 4. It is a rare disease with localized to disseminated features. Clinical manifestations depend on site of lesions, number of areas involved, and compromised function of organs. LCH presenting in the neonatal period is very rare and, in most cases, present with skin lesions, which can be self-limiting. Rarely is it multifocal, and more aggressive. We report an unusual case of neonatal LCH presenting with a large congenital axillary mass without skin lesions.

**Case Description:** We present a 2-week-old male, born full term to a 21-year-old G1P0A0 with no complications who presented to the ED with a right axillary mass that had been rapidly enlarging for the past week. Mother brought infant into the ED due to inconsolable crying. Ultrasound revealed a 3.7 x 1.9 x 3.5 cm mass in the right axilla with increased doppler flow suggesting mild to moderate hypervascularity, a pathologic nodule mass was suspected. Complete blood count, erythrocyte sedimentation rate, complete metabolic panel, liver function tests, uric acid and LDH were normal. Patient was admitted to the neonatal intensive care unit for further evaluation and management. MRI of chest was performed and showed predominantly solid components but also a small cystic area which potentially represented internal cystic necrosis with no evidence of invasion of the chest wall. Pediatric surgery removed the mass. Pathology H&E showed an enlarged lymph node with distorted architecture, areas of necrosis and multiple areas of abnormal cellular infiltrate. Composed of intermediate sized histiocyte cells with irregular nuclei, open vesicular chromatin and ample amounts of pink granular cytoplasm associated with numerous eosinophils. Staining showed histiocyte cells diffusely positive for langerin, CD1a, S100. ICH stains showed histiocytic proliferation with necrosis, eosinophilic abscess admixed with neutrophils. ICH stains positive for CD45, CD163, negative for CD20 and CD3. Cyclin D1 was positive on Langerhans cells, BRAF stain was negative. The final diagnosis was Langerhans cell histiocytosis. Further work up to look for visceral organ involvement including MRI and skeletal survey was negative. Patient is being followed closely, and as this is unifocal single system disease, no chemotherapy was initiated.

**Discussion:** Langerhans cell histiocytosis in neonates is rarely observed, the incidence of LCH in infants is 25 per 1 million infants and <5% of these cases are neonates. Many cases of LCH in neonates present with rash, diffuse hemorrhagic nodules. Lymphadenopathy however is a common presentation in older children, representing about 20% of LCH pediatric patients. Very few cases have been published in neonates with a solitary nodule being the first presentation of LCH.

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**Title:** A Heart Within a Heart - A Case of an Occipital Infarct Unmasking the Diagnosis of a Sinus of Valsalva Aneurysm  
**Authors:** Gustavo A. Vargas, MD, PGY3; Jilla R. Azarbal, MD, MPH, MBA, PGY3; Marco A. Mejia, MD, FACC; Marcos Valerio, MD  
**Program:** Kendall Regional Medical Center, Internal Medicine Residency Program

**Introduction:** Sinus of Valsalva aneurysm is a rare but important aortic root defect which can have fatal outcomes. Sinus of Valsalva (SOV) aneurysm is defined as either the dilatation of one or more of the aortic sinuses located between the aortic valve annulus and the sinotubular junction. The prevalence is than 1%, and they are commonly congenital (but can be acquired), accounting for less than 4% of congenital heart defects. Complications of sinus of Valsalva aneurysms include severe aortic insufficiency, heart failure, thrombus formation, and subsequent systemic embolism, stroke, and more rarely dissemination, heart block, pseudoaneurysm, and infective endocarditis. If ruptured, the SOV aneurysm is potentially fatal, and can manifest with sudden cardiac death.

**Case Description:** 64 YO Latin male with a PMH significant for arrhythmia (diagnosed 15 years ago, he does not recall any further details) presented to the ED complaining of vision changes which started when he awoke from sleep. The patient stated he had been experiencing a loss of visual field; he specifically stated that when he looked at his wife's face he was unable to visualize her left eye socket and part of the left side of her forehead, when covering each eye separately, consistent with a left upper quadrantanopia. The patient denied other symptoms. In the ED, CTA head and neck were negative for acute abnormalities, lab work was overall unremarkable, but blood pressure was 178/92 mmHg. On assessment, the patient was non focal but reported the visual field defects as described above. He referred years of irregularly irregular palpitations and skipped beats intermittently. Echocardiogram revealed a large aneurysm of the left coronary cusp, later confirmed to be a sinus of Valsalva aneurysm. The patient was ultimately diagnosed with an acute right occipital infarct, paroxysmal atrial fibrillation, hyperlipidemia, pre-diabetes, and non-alcoholic steatohepatitis. The patient was evaluated by interventional cardiology as well as cardiothoracic surgery, who agreed that given his risk factors, including a CHA2DS2VASC score of 3, the patient should be fully anticoagulated, and followed outpatient with a congenital cardiothoracic surgeon.
Discussion: Although a ruptured sinus of Valsalva aneurysm can be potentially fatal, its prognosis after treatment is excellent. This emphasizes the need for timely accurate diagnosis (1). It is encouraging that the patient in this vignette as able to make it to 64 years of age, without rupture of his aneurysm. The debate during his last day of stay was how long to wait prior to repair of the aneurysm, and the patient was eventually referred to a congenital cardiothoracic surgeon.

Introduction: Twiddler Syndrome is defined as the dislodgement of pacemaker leads from their initial cardiac location. At times self-inflicted, but typically unintentional, this extremely rare condition may have fatal implications.

Case Description: A 50-year-old female presented with weakness and tiredness worsening over the last two weeks. Her past medical history included a pacemaker implanted 5 years ago due to a heart block after a surgical aortic valve replacement. In addition, she has morbid obesity (160 Kg, BMI 59), hypertension, diabetes mellitus, and chronic kidney disease stage III. She is totally pacer dependent without an underlying ventricular response rhythm. In the last year, the patient had multiple admissions for ventral hernias, requiring numerous abdominal surgical procedures. Chest x-ray showed coiling of the leads around the pacemaker with the atrial lead completely pulled out and partial displacement of ventricular lead. Device interrogation showed no signal from atrial lead and increased capture threshold within the ventricle lead. Upon physical examination, the patient was obese, and the cardiac exam showed regular rate and rhythm without evidence of murmurs. A gated CT chest with contrast confirmed dislodged pacemaker leads. After making a full recovery from the previous abdominal procedures, the patient underwent laser lead extraction of old leads and reimplantation of new dual chamber pacemaker. During the device reimplantation, extensive precautions were taken to mitigate continued twirling of the device. These included the creation of a pacemaker pouch and multiple fixation points to pectoral fascia with non-absorbable sutures. Post-operative chest x-rays confirmed cardiac pacemaker leads overlying the right atrium and right ventricle, and adequate device function. The patient was educated on proper device follow-up and acceptable range of motion of the left upper extremity.

Discussion: This case illustrates a potential deadly complication of implanted pacemakers and emphasizes the importance of continued follow-up. While it is a rare occurrence, the majority of Twiddler Syndrome cases are discovered within 1 year of implantation. However, less than a handful are reported afterward. Early recognition by a physician or patient can prevent life-threatening events from occurring. Risk factors such as obesity, female gender, elderly and psychiatric disorders may alert physicians to an earlier detection. Educating patients about placing excess strain on the upper extremities is of paramount importance. Moreover, addressing upper extremity movements in patients with relevant psychiatric obsessive-compulsive issues is a
fundamental strategy to mitigate pacemaker lead twirling. This unusual complication of device implantation is not yet well-understood among implanters. However, at the present time, they are engaging in critical discussions on how best to prevent it.

Title: Considering Cowden Syndrome in a Patient with Recently Diagnosed Melanoma
Authors: Jade Walter, OMS3; Frank Cirisano, MD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Cowden syndrome is a rare autosomal dominant cancer predisposition syndrome caused by mutations in the PTEN Hamartoma Tumor gene. Cowden syndrome is characterized primarily by the presence of hamartomatous growths and an increased risk of developing certain cancers. In this report, I present the case of a patient whose history of prior cancers and recent melanoma diagnosis lead to a suspicion of a cancer predisposition syndrome. Patients with Cowden syndrome have a 6% lifetime risk of developing melanoma as compared to a risk of 85.2% in the breasts, 35.2% in the thyroid, and 28.2% in the endometrium (Meeri, 2016). They are also at increased risk of renal cell carcinoma and gastrointestinal cancers. It is of the utmost importance to have a high index of suspicion for a cancer predisposition syndrome in patients with a history of associated cancers to ensure early screening and definitive management.

Case Description: A 45-year-old female with multiple hyperkeratotic papules to the face and hands presented to the gynecologic oncology clinic for a one-year follow-up. The patient initially presented to the clinic in 2018 for evaluation of dysmenorrhea and menometrorrhagia. Pathology after endometrial biopsy showed type 1 endometrial carcinoma and a total abdominal hysterectomy was performed without need for further radiation or chemotherapy. The patient had a history of follicular thyroid carcinoma status post thyroidectomy at age 28, fibrocystic breast changes, and a history of multiple gastrointestinal polyps on colonoscopy at age 40. During the visit, it was revealed that the patient was recently diagnosed with melanoma and PET imaging was notable for multifocal findings. A review of her family history showed no incidence of multiple hamartoma syndrome but revealed a history of breast cancer (mother and maternal aunt, both age 50) and endometrial cancer (maternal aunt, age 48). Her mother underwent BRCA1 testing in 2008 with negative results. Her family and medical history lead to a suspicion for a cancer predisposing syndrome and a 34-gene hereditary cancer panel was ordered revealing a PTEN pathogenic variant consistent with a diagnosis of Cowden syndrome. With this diagnosis, the patient agreed to undergo annual colonoscopies to more closely monitor for polyps and annual kidney ultrasounds. She will also consider the possibility of undergoing a prophylactic mastectomy.

Discussion: Melanoma is uncommon and less than 5% of patients with Cowden syndrome develop a third cancer (Ngeow et al., 2014). Even so, this patient’s history and recent diagnosis increased suspicion and initiated confirmatory testing. Due to the rarity of the syndrome and the variety of presentations, Cowden syndrome is easily missed if the index of suspicion is not high. As in the case of this patient, it is essential to recognize the clinical signs and associated malignancies of Cowden syndrome in order to ensure an early and accurate diagnosis. Early diagnosis allows for the timely detection of neoplasia with management consisting of high-risk cancer screening of the breasts, thyroid, endometrium, kidneys, and colon at earlier ages. Prophylactic surgeries are also considered as a preventive option for some forms of cancer.

Title: Giant Chondrosarcoma of the Pelvis: A Case Report
Author: Alexander Wilson, OMS3; Cassandra Weaver, OMS3; Deepika Sharad, OMS4; Ralph Guarneri, MD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Chondrosarcomas rank third among the most common primary bone tumors, comprising roughly 20 to 27 percent of all bone tumors. Most present insidiously with 90 percent showing low-to-intermediate histologic grade. The common low-grade nature of chondrosarcomas creates a double-edged sword clinically: while these lesions carry little risk of metastasis and recurrence if treated early, they are largely considered impervious to chemotherapy and radiotherapy. Due to the limitations of adjuvant and neo-adjuvant therapy in treatment, surgical resection remains the preferred modality. Here, we report the diagnostic workup toward surgery planning of a patient with a large chondrosarcoma of the pelvis.

Case Report: A healthy 42-year-old male presented to our service for evaluation of a 23 cm AP by 10 cm transverse by 17 cm craniocaudal pelvic mass that had grown slowly over the prior 10 years. He denied any associated pain, though admitted to severe motor deficits in the lower extremity that started 3 months prior. He remarkably denied difficulty in bowel movements or urination, a testament to the tumor’s gradual onset as local structures were able to adapt to the mass effect. The mass was non-tender and bony to palpation. Severe gluteal and lower limb atrophy was observed on the left side, suggesting impingement of the sacral plexus. Neurological exam revealed 1/5 muscle strength in all planes of motion of the left ankle and left knee. When the patient was prompted to walk, he displayed abnormal gait and significant left foot drop. No lymph nodes were palpable on exam and pedal pulses were full and intact bilaterally.

The earliest documented imaging study of the tumor in the medical record was from a CT pelvis taken during an ER visit in 2006, during which the patient presented with suprapubic pain that raised suspicion for renal calculi. CT revealed a 5 cm lytic lesion on the left superior pubic ramus, which presumably marked the origin of the tumor. Thereafter, he was lost to follow-up. Our diagnostic workup began with an MRI of the pelvis, which showed extension through the left greater sciatic foramen with invasion of the left sacral plexus and left acetabulum. The bladder and rectum were also seen significantly displaced to the right. A CT-guided biopsy was then taken to confirm the diagnosis. Histology showed hyaline cartilage containing small nuclei and no mitotic activity, establishing the final diagnosis of low-grade chondrosarcoma.

Discussion: This patient’s late presentation for a proper evaluation was likely attributed to the tumor’s slow, gradual onset. The tumor only began to affect the patient’s mobility until it had extensively invaded and displaced local structures, effectively eliminating intralesional and marginal resection as viable surgical options. As is the case with most large, axial low-grade chondrosarcomas, wide resection with negative margins remains the recommended treatment to prevent recurrence and metastasis. Due to the inherent challenges of operating on the pelvis, this case will warrant extensive multidisciplinary surgery planning. Among these challenges include the absence of defined anatomical compartments, the proximity of vital
neurovascular structures, and the integrity of the pelvis for biomechanical support. With these considerations, the result is the planning of an incredibly complex procedure that carries enormous risks for morbidity and mortality.

Title: The Effect of Osteopathic Manipulative Treatment on Thoracic Outlet Syndrome
Author: Eric Xu, OMS3
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Thoracic outlet syndrome (TOS) is a group of signs and symptoms that arise from compression of the neurovascular bundle by structures that run above the first rib and behind the clavicle. This can lead to weakness, paresthesia, numbness, pain, swelling, and ischemia of the upper extremity. TOS is underdiagnosed as it is commonly mistaken for cervical radiculopathy. This case of TOS is unique because the patient displayed a positive Babinski sign in her left lower extremity upon physical exam. There is significance to this because there are little known cases of TOS involving the spinal cord, only the brachial plexus. This patient’s presentation could indicate that somatic dysfunctions of the cervicothoracic vertebrae are creating forces on the meninges and possibly the spinal cord. The educational value of this case reinforces the holistic osteopathic philosophy that the entire human body is interconnected. Osteopathic treatment is also a better alternative than the conventional treatment of physical therapy mainly due to fewer sessions and less cost to the patient but with the same or better results.

Case Description: A 23-year-old female presented to the osteopathic treatment clinic with numbness and tingling in the left upper extremity. She reported experiencing these symptoms for the last 5 years however, they have since increased in severity and duration over the past 5 months. The condition hindered her ability to drive and study. Osteopathic structural examination revealed decompensated posture and some key somatic dysfunctions, such as: left anterior, middle scalene, and pectoralis minor hypertonicity. Additionally, Sibson’s fascia was taut and restricted. The dysfunctions were treated with direct myofascial release, muscle energy, and strain-counterstrain. Incidentally, the patient exhibited a positive Babinski sign during her examination. After 2 osteopathic treatments that were five weeks apart, the patient’s episodes of paresthesia decreased in frequency and were reduced from 5 minutes to less than 1 minute. The patient also stated that her symptoms rarely occurred anymore and when they do, they only last for short periods of time and do not affect her driving or studying. Interestingly, the Babinski sign that she presented with resolved after the OMT. Shortly after the 3rd treatment, the patient reported she did not experience numbness or tingling in her left upper extremity.

Discussion: In summary, these results suggest that the bread and butter OMT techniques are useful in treating the symptoms and functional limitations associated with TOS, thereby improving quality of life. Interestingly, improved fascial motion and postural balance may have reduced compensation in the spine and distant areas, eradicating the positive Babinski sign. A limitation is the patient attended physical therapy (PT) as a recommendation. She attended PT 5 times in between OMT visits. However, her PT sessions solely placed an emphasis on stretching associated muscles. In future cases that are similar, patients should only be treated with OMT in order to determine the efficacy of the treatment as PT may have confounded the results.

Title: Not Just a Pain in the Butt, A Review in Pediatric Joint Pain
Authors: Kuan Ting Yang, OMS3; Javier Guad-Vargas, MD, PGY1; Anisha Mohandas, MD, PGY2
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Systemic juvenile idiopathic arthritis is condition characterized by symptoms that include quotidian fevers, rash, and arthritis. It is a diagnosis of exclusion which makes it hard to diagnosis in a cost effective and timely manner. It is also a relatively rare disease with an incidence of 13.9 yearly cases per 100,000 people reported (UpToDate).

Case Description: The patient is a 5-year-old African American female with a past medical history of asthma and eczema who presented with left ankle pain and swelling. She has been having intermittent bilateral ankle pain, bilateral lower rib cage pain and swelling on those respective joints for one month. Her mother reports that the ankle pain and swelling worsened over the last two days and NSAIDs were not alleviating the pain. The mother reports a month ago the patient was having daily fevers for 2 weeks, Tmax of 101.7F, and was alleviated with Motrin. On chart review, she had been seen in the ED a month ago for left knee pain, but knee X-ray was negative. She was seen again three weeks ago with the same ankle pain and swelling but bilateral ankle X-rays were negative. She was admitted for rheumatologic process vs. reactive arthritis vs. musculoskeletal etiology.

After rheumatology was consulted, labs were drawn and the only values that were positive through the week were elevated sed rate, CRP, and an ASO titer of 400. She was slightly anemic with a Hgb of 11 but all her cultures and rest of blood work was negative. Throughout her course in the hospital, she continued to have fevers and joint pain. Different NSAIDs were used with mixed results. Once a diagnosis of JIA was determined, mainly her rheumatologic panel was negative and bacterial infection was ruled out, the patient was started on a regimen of high dose steroids and her symptoms resolved entirely.

Discussion: This case illustrates the necessity of a high index of suspicion for a diagnosis often missed as its symptomatology and work up are vague. The use of high dose corticosteroids, although generally successful, can result in a variety of adverse effects. The development of new therapies for JIA are an important part of patient care in this long-term illness.

Title: Unusual Case of Intussusception in a Teenager
Authors: Glenda Zamora, PGY2; Elizabeth Gantan, PGY3; Anthony Pearson-Shaver, MD
Program: Palms West Hospital, Pediatric Residency Program
Re-Expansion Pulmonary Edema After Large-Volume Thoracentesis in a Patient with Primary Lingual Pulmonary Adenocarcinoma

Introduction: Intussusception commonly occurs in infants and toddlers. It is a relatively rare finding in children older age groups with only 3-4% occurring in children over 10 years of age. Although the classic triad of intussusception includes colicky abdominal pain, bilious vomiting and bloody stools, the majority of patients with intussusception do not present with all three symptoms. Gold standard to screen for an intussusception is an abdominal ultrasound. Lab work is not a useful diagnostic tool; however, it can help to determine if infection or electrolyte abnormalities are present.

Case Description: A 17-year-old male with no significant PMH was sent to hospital by pediatrician to evaluate for intussusception. The patient reported a five-week history of intermittent abdominal pain in umbilical region. He also admitted to four episodes of bilious emesis one day prior to presentation to hospital with associated fatigue, early satiety, decreased oral intake, 10-pound weight loss over five weeks and constipation. The patient was evaluated by the pediatrician who ordered an outpatient CT of the abdomen and pelvis, which showed ileocolic intussusception, small bowel obstruction and pelvic ascites. On presentation to PWH, the patient arrived with vital stable signs. Initial lab work was significant for thrombocytosis and elevated inflammatory markers but was otherwise unremarkable. A limited abdominal ultrasound showed intussusception and two attempts to reduce with barium enema was unsuccessful. The patient was taken to OR for laparotomy; however, the surgeon was unable to reduce intussusception surgically and performed a laparatomy, ileal mass resection and ileocolic anastomosis. Surgical biopsy was positive for Burkitt’s lymphoma of cecum and terminal ileum. Post-op course was complicated by one isolated fever but otherwise unremarkable. Hematologist-oncologist specialist was consulted and performed a bone marrow biopsy. Patient completed a 5-day course of Cefoxitin. Additional work-up during hospitalization was done with negative blood culture, EKG and ECHO. The patient was discharged home with Hematology/Oncology follow-up outpatient for staging with plans for PET-CT and sperm bank.

Discussion: This case illustrates the importance of considering intussusception in one’s differential diagnosis for abdominal pain and vomiting despite expected age group and that although intussusception is rarely seen in children older than 10 year of age, an abdominal mass is a likely cause in that age group.

Re-Expansion Pulmonary Edema After Large-Volume Thoracentesis in a Patient with Primary Lingual Pulmonary Adenocarcinoma

Authors: Lance Zimmerman, MD, PGY2; Muhammad Awan, OMS3; Kristina Antuna, OMS3; James Banks, MD
Program: Aventura Hospital and Medical Center, Radiology Residency Program

Introduction: The following describes a case of re-expansion pulmonary edema which is an uncommon iatrogenic complication that can occur after rapid re-expansion of collapsed lung following drainage of pleural fluid (i.e., pneumothorax, hydrothorax, hemothorax). In most cases, pulmonary edema can be seen suddenly within 1 hour of re-expansion and usually involves the entire re-expanded lung parenchyma. It typically increases in severity in the first 24-48 hours before resolving over the next 5-7 days. Patients may be asymptomatic despite findings of pulmonary edema on chest radiography. However, in most cases it is important to recognize worsening respiratory symptoms in patients after drainage of pleural fluid because re-expansion pulmonary edema proves fatal in up to 20% of cases.

Case Description: A 55-year-old male patient presented initially presented to the emergency room due to the development of cough and shortness of breath at rest for the previous 5 days. He denied fever. Subsequent initial chest radiograph revealed complete opacification of the left hemithorax with up to 3 cm of rightward tracheal deviation. Further evaluation with contrast enhanced chest computed tomography (CT) demonstrated a massive left-sided pleural effusion with associated parenchymal collapse. Following a large volume (3.8 L) thoracentesis, follow-up chest radiograph revealed improved left-sided aeration, small apical pneumothorax, and a right perihilar opacity measuring approximately 3.3 x 4 cm. Post-procedure, the patient remained on non-rebreather oxygen mask, and chest radiograph 4 hours later showed diffusely increasing left-sided pulmonary opacities, which subsequently resolved over the next 6 days. Pleural fluid cytology was positive for malignancy and subsequent biopsy proved positive for moderately differentiated malignant adenocarcinoma.

Discussion: Re-expansion pulmonary edema is a type of non-cardiogenic pulmonary edema that can be appreciated after large volume pleural fluid drainage. It is most seen in patients in whom lung parenchyma has been collapsed for more than 7 days. It has been suggested a pathophysiological mechanism like reperfusion injury with release of free radicals and endothelial damage in areas of prolonged pulmonary vasoconstriction after re-expansion. Areas of hypoxic vasoconstriction where sudden increases in hydrostatic pressure combined with the introduction of negative pressure can result in sudden pulmonary edema. Several physiological mechanisms may play a role in this entity but are not yet entirely elucidated. Treatment consists of supportive measures, such as lying the patient in the lateral decubitus position (affected side down) in unilateral cases. Non-invasive ventilation should be considered, and good results have been seen even in serious cases. Even in cases requiring mechanical ventilation, symptoms typically improve in 1-2 days. Drainage with water valves instead of suction is also recommended. In summary, re-expansion pulmonary edema is a relatively uncommon form of non-cardiogenic pulmonary edema that clinicians should be aware of and consider if a patient develops worsening respiratory symptoms post-thoracentesis.
CASE ABSTRACTS

NOVA SOUTHEASTERN UNIVERSITY
TAMPA BAY REGIONAL CAMPUS
**Title:** Thinking Outside the Box in Liver Tox  
**Authors:** Kimberly Brizell, DO, PGY5; Geoffrey Goldsberry, DO, PGY2  
**Program:** Largo Medical Center, Gastroenterology Fellowship Program

**Introduction:** There are a myriad of etiologies for patients presenting with acute hepatitis. Nearly 10% of these cases are due to drug-induced liver injury (DILI). While identifying the offending agent can be difficult, there are known offenders that can be elucidated with an accurate history from the patient. However, in the non-native patient or frequent international traveler, this can become a much more challenging task given the medications, supplements and host of items used as alternative medicines in other countries and cultures that may not be available in the United States. While DILI is the most common cause of acute liver failure in the United States, it is important to consider that the agent at play may not be common to the United States. We aim to highlight the importance of using a “global mindset” when treating international and frequent traveling patients, but also demonstrate the severe hepatotoxic risks associated with nimesulide.

**Case Description:** We present a case of a 43-year-old female with comorbidities including iron deficiency anemia, hyperlipidemia, and uterine fibroids that initially presented to an outside hospital with chief complaint of abdominal pain. In addition, she endorsed fevers, chills, arthralgia which progressed to also include dyspnea on exertion, fatigue, dizziness, and non-bloody diarrhea. Labs on presentation demonstrated AST 192 U/L, ALT 262 U/L, ALP 109 U/L, INR 1.2, total bilirubin 0.7mg/dL. She did not have a leukocytosis but did have an eosinophilia count of 9.5%. Right upper quadrant ultrasound was completed and demonstrated gallbladder wall thickening and a questionable foci at the neck of the gallbladder. Follow-up CT A/P w/o contrast showed concern for acute cholecystitis. For this, general surgery was consulted and HIDA scan performed which did not show evidence of cholecystitis. Her liver enzymes continued to worsen and thus a MRCP was ordered. MRCP demonstrated possible gallbladder sludge and tiny stones. No biliary dilatation was seen, but there remained concern for cholangitis which was felt may be better evaluated by EUS/ERCP. The patient was transferred to Largo Medical Center for further hepatology evaluation and the availability of advanced imaging. On presentation to LMC, her pain was improving though she felt her abdominal distention was worsening. During her initial interview at LMC, she denied newly prescribed medications, OTC medications, or using herbal supplements. She reported she traveled to the Dominican Republic where she spent 4 days and returned to the U.S. approximately 15 days prior to initial presentation. The patient’s husband did have nausea, vomiting, and diarrhea for a few days while on vacation, but it resolved spontaneously. Due to concerns for infectious etiology, patient was treated with zosyn and doxycycline. Extensive infectious and autoimmune work-up completed and was unrevealing. She continued to have MEG/RUQ abdominal pain with palpation, loose stool and nausea. She did have mild ascites and paracentesis was able to be performed with removal of 325mL. Her serum-ascites albumin gradient was consistent with an exudate. Labs continued to worsen with AST peaking at 952 U/L, ALT 1392 U/L, ALP 121 U/L, total bilirubin 3.3 mg/dL. Decision was made to proceed with liver biopsy. On the morning of her liver biopsy, patient’s husband was present in the room during morning interview and on further discussion with the couple, patient reported being given 2 pills for a headache. She continued to take this medication when she returned to the U.S. The medication was found to be nimesulide. Liver biopsy was performed and demonstrated histology consistent with drug-induced hepatitis. The patient went on to have improvement in her liver function tests and symptoms with supportive care and conservative management.

**Discussion:** Non-steroidal anti-inflammatory drugs carry a risk of hepatotoxicity which appears to be highest with nimesulide. Cases of fulminant liver failure requiring liver transplantation and other cases ending in death have been reported in the literature. Even more exist demonstrating transient, but significant, liver injury. This case demonstrates the need for U.S. physician and patient awareness of the hepatotoxic risks associated with nimesulide.

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**Title:** New Onset Psychosis Secondary to Neurosyphilis  
**Author:** Lauren DeMarco, DO, PGY2  
**Program:** Largo Medical Center, Psychiatry Residency Program

**Introduction:** Syphilis is a highly contagious STD (sexually transmitted disease) caused by the spirochetal bacterium Treponema pallidum. Neurosyphilis is any involvement of the central nervous systems (brain, meninges, or spinal cord) by the bacterium. The National Institute of Health characterizes Neurosyphilis as a rare disease because it affects less than 200,000 people in the US population. Neurosyphilis signs and symptoms can manifest as meningeal, meningeal, parenchymatous, spinal compression symptoms, cerebral compression symptoms, and psychiatric manifestations. Psychiatric manifestations in neurosyphilis most commonly include but are not limited to visual and/or auditory hallucinations, delusional thought content, loss of ability to communicate effectively with others, illusions, inappropriate behaviors, flat affect, poverty of thought, mood dysregulation, and memory impairment.

**Case Description:** I present the case of a 57 y/o Caucasian male who presented to the Emergency Department (ED) five times within six weeks with various chief complaints. During his fifth ED visit, he presented with the chief complaints of new onset disorientation, gait instability, and visual hallucinations for a two-day duration. He was alert but not oriented and admitted to visual hallucinations. However, he was unable to effectively communicate the appreciable details of the hallucinations with the ED staff. He was admitted with the diagnosis of acute encephalopathy and a psychiatric consult was placed for new onset visual hallucinations & a neurological consult was placed for altered mental status. During the initial psychiatric assessment, the patient presented with profoundly confused mentation and was alert and oriented to self only. He was not answering questions appropriately or accurately. Mental status exam was challenging to obtain due to the patient’s acutely encephalopathic state. Mood was euthymic, affect was flat, mood incongruent, thought processes were grossly impaired, thought content was bizarre, intelligence was impaired, short- and long-term memory were unable to be appreciated, insight and judgment were poor, he was responding to internal stimuli throughout the assessment. The second psychiatric visit, the patient’s mentation remained profoundly confused. He was displaying thought blocking, attempted to answer questions but could only grunt or voice nonsensical words, displayed mood dysregulation and was tearful during the interview due to persisting confusion. He had minimal comprehension of his current situation. Mental status changes were noted in his mood (he was frustrated and tearful). On the fourth day, the RPR and HIV serological results returned. HIV Ab/Ag was nonreactive, RPR was positive. A stat infectious disease consult was placed, a stat lumbar puncture with CSF analysis including VDRL & dark field microscopy was ordered, and an RPR titre lab was ordered. RPR titre came back as reactive, 1:32. He was subsequently diagnosed with neurosyphilis. Penicillin G 3 million units IV q4h with plans for a two-week course was immediately initiated. There was no further evidence of visual hallucinations or any other symptoms of psychosis that occurred during his hospitalization.
**Discussion:** This case illustrates why it’s of utmost importance to consider a syphilis workup in new onset psychosis. Patients infected with syphilis remain asymptomatic for years, yet they remain at high risk of late complications if they aren’t appropriately treated. Left untreated, a syphilis infection can last for decades, progress through multiple painful stages of infection, and ultimately lead to death before an accurate diagnosis can be made or treatment can be initiated.

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**Title:** A Rare Case of Trichilemmal Carcinoma: Histology and Management

**Authors:** Lisa Fronek, DO; Allyson Brahs, OMS4; Maheera Farsi, DO; Richard Miller, DO

**Program:** Largo Medical Center, Dermatology Residency Program

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**Introduction:** Trichilemmal carcinoma (TC) is a rare, malignant, adnexal neoplasm that is derived from the ORS of the hair follicle. These tumors predominantly occur in elderly patients on sun-exposed areas, specifically on the head and neck with the face defined as the most common location. The mean age of diagnosis is 70 years old with a slight male predominance. These lesions are commonly identified as a papular, nodular, and sometimes, exophytic tumor. They generally arise de-novo but may also derive from an underlying proliferating trichilemmal cyst with a loss of p53, a seborrheic keratosis, a nevus sebaceous, or a scar. They can be locally aggressive and may exhibit telangiectasias and ulceration due to local destruction.

**Case Description:** Here we present a case of a 66-year-old Caucasian male who presented to our clinic for a routine full body skin exam and was diagnosed with a biopsy proven TC. The patient had a history of actinic keratoses treated with topical 5-fluorouracil (5-FU) and BCCs status-post excision and MMS. On physical exam, there was a pink to erythematous, pearly plaque with arborizing telangiectasia and fine scale located on the right central anterior neck; no ulceration, discharge, or lipid deposits were noted. One tangential shave biopsy was taken from the right central neck and sent for processing and hematoxylin and eosin (H&E) staining. Histopathologic report revealed an adnexal neoplasm with trichilemmal differentiation, desmoplastic component and atypia with margins involved. Immunohistochemical staining (IHC) was positive for CD34, and tumor cells displayed uptake of the Ki-67 proliferation marker; staining for p53 was negative. The pathologist advised for complete removal of the lesion with further evaluation.

**Discussion:** TC is a rare adnexal tumor that grossly and microscopically mimics many entities. A biopsy is essential for diagnosis and often requires supplemental immunostaining. It should be distinguished from other tumors of follicular origin and from other cutaneous malignancies. Complete excision with tumor-free margins is the typical treatment modality, though, MMS has some advantages, including comprehensive visualization of the margins and a greater preservation of healthy tissue. The patient in this case deferred MMS in favor of WLE and was treated successfully with 3.0 mm margins. As we struggle for uniformity in treatment recommendations, the therapeutic modality and surgical margins should be decided on an individual basis considering the patient’s preference and the lesion’s clinicopathologic features. Further characterization of the true nature and behavior of TC would contribute to a standard treatment recommendation. Additionally, a study comparing MMS to WLE for the treatment of TC would be of great utility, yet, such an endeavor is limited by the rarity of the disease.

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**Title:** Addressing Health Care Outcomes Utilizing a Model Case: Low Socioeconomic Status (SES) and Health Disparities in Pinellas and Hillsborough Counties, Florida

**Authors:** Oleksandra Gerus, OMS1; Bryan Adams, OMS1; Paige Webeler, OMS1; Tonni Bacoat-Jones, DO

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

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**Introduction:** The study assessed healthcare services available to high risk populations in the Tampa Bay area, identifying disparities in healthcare coverage via an envisioned model case-study patient, intended to represent certain medical needs of high-risk populations in the corresponding community. After compiling available resources in a worksheet, the most suitable healthcare location for the model patient was determined. The study identified criteria at locations that would have rendered the mock patient ineligible for services due to an inability to prove immigration status or income. Services surveyed included, but were not limited to, preventive care, mental health services, and pediatrics.

**Case Description:** For illustrative purposes, the mock case study patient selected was a married, low-income, non-English speaking Honduran, uninsured, 25-year-old pregnant female. Patient is a Pinellas county resident employed part-time in hotel housekeeping looking for prenatal care for herself as well as a checkup for her 7-year-old son. She owned no vehicle, and as such used public transportation, namely the bus, in order to arrive at the healthcare provider location. She lived with her husband and son in a 1-bedroom apartment. In addition, the patient, anxious and depressed about her pending immigration status, sought mental health services.

**Method:** The study compared health care services provided in Pinellas and Hillsborough Counties to a low socioeconomic status patient. Organizations were grouped based on the ease of services accessibilities, presence of interpreter services, cost and documentation requirement to be seen by a healthcare provider. Research identified clinics that provide preventive and prenatal care, behavioral health screenings, pediatrics, prescriptions, nutritional education and counseling.

**Discussion:** The research demonstrates that she would have been disqualified from receiving care in several clinics due to her inability to prove her immigration status. Patients without immigration status are at a higher risk of developing chronic conditions due to the fear of being deported after seeking services. In addition, certain clinics were inaccessible due to her transportation limitations. Patients with a low socioeconomic status often rely on a public transportation making it almost impossible to reach certain remote locations. The options were additionally narrowed due to the limited availability of obstetric services, even though a number of clinics offer pediatric and women’s health services. The study also reviewed the websites of these clinics, finding that the information available should include additional information to help patients make informed decisions about their healthcare locations. Some websites were unclear about all the services provided, such as the exact mental healthcare offered, languages spoken by providers, or even how to schedule an appointment. Navigating these websites and finding appropriate content proved difficult. This obviously would
be exacerbated for non-native English speakers. A recommendation is to make these websites easier for the public. The study also demonstrated, that while a clinic that fit most of our patient’s needs existed, there are still a severe lack of resources available in the region, considering the highly dense population of disadvantaged patients. NSU-KPCOM, a new medical school in the community, can play a role of offering medical students’ ways to improve medical outcomes for underserved populations. With a diverse group of students, KPCOM can provide a network of cultural and educational support to patients. Upon reflection of the study, NSU-KPCOM can be an informed resource to educate and direct patients toward available providers in the community.

Title: Osteopathic Manipulation to Correct Upper Crossed Syndrome Leads to a Decrease in Lower Back Pain
Authors: Alyssa Goldenhart, OMS3, Michael Hadley, DO
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: A systematic review in 2017 found a correlation between neck flexion posture and frequency of using handheld devices. This could indicate that as the use of handheld electronics increases, anterior head carriage will become more prominent in the general population. Muscular imbalances of tight and weak muscles in the upper thorax and lower cervical area can lead to the anterior posture seen in upper crossed syndrome. Biomechanical forces of anterior posture can cause an increase in disk load and stress on the T9 vertebrae and all levels below which can contribute to lower back pain.

Case Description: An 86-year-old man presented complaining of 30 years of lower back pain and bad posture. When standing against a wall, the back of his head measured 13.4 cm away from the wall. Osteopathic structural examination revealed AA rotated left, T1-4 rotated left side bent left, and T12-L1 rotated right side bent left. Muscularly, the patient had weakness of the rhomboids and roniness of paravertebral cervical muscles, scalenes, platysma, trapezius, and the sternomediastinoid muscle all bilaterally. Two sessions of osteopathic manipulative medicine (OMM) were performed using muscle energy, fascial distortion model, and Still technique. After OMM the patient was able to stand with his head 4.6 cm away from the wall compared to the pre-treatment 13.4 cm distance. He also noted decreased pain in his lower back immediately after treatment.

Discussion: After two osteopathic treatments the patient was able to stand up straighter and his pain decreased, from a 6 to a 2 out of 10. These results suggest that OMM is useful in improving low back pain caused by upper crossed syndrome. The limitations of this study include the patient having prior knowledge that he would receive treatment to correct posture before measurements were taken. Further research could be conducted with a larger patient pool to see if the results are reproducible.

Title: Greither’s Syndrome: A Novel Mutation
Authors: Taylor Gray, DO, PGY2; Christopher White, DO, PGY3; Maheera Farsi, MD; Richard Miller, MD
Program: Largo Medical Center, Dermatology Residency Program

Introduction: Transgrediens et progrediens palmoplantar keratoderma, known as Greither’s syndrome, is a rare entity originally described in 1952 with approximately 40 reported cases in the literature. It is characterized by a transgrediens palmoplantar keratoderma (PPK) due to its extension beyond Wallace’s line, often involving the overlying skin of the Achilles tendon. In addition, hyperkeratotic plaques may develop on flexural surfaces, knees or elbows.

Case Description: We present a rare case of Greither’s syndrome with the discovery of a novel mutation in the keratin 1 gene (KRT1). In our case, a 16-year-old African American male presented to the clinic with a reported past medical history of atopic dermatitis. Upon physical exam, transgrediens PPK was identified, as well as hyperkeratotic plaques on bilateral knees. Biopsy obtained for hematoxylin and eosin demonstrated epidermolytic hyperkeratosis. Subsequently, the patient underwent genetic testing which revealed a novel frameshift mutation within KRT1, predicted to produce an elongated tail domain.

Discussion: Reported cases of Greither’s syndrome demonstrate phenotypic variability, possibly due to variation in underlying gene defects, as demonstrated by this case. Our case highlights a previously unreported defect in KRT1 leading to Greither’s syndrome, as well as, underscores the importance of recognizing variability in genetic defects which can lead to variation in phenotype expression.

Title: A Case of Malignant Granular Cell Tumor in a Patient with Segmental Neurofibromatosis
Authors: Victoria Griffith, OMS1; Michael T. Borenstein, MD, PhD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Granular Cell Tumor (GCT) is an uncommon neoplasm of presumed neural origin. The tongue, breast, upper respiratory tract and soft tissue of upper extremities are among the most common GCT locations reported and these tumors typically have a favorable outcome with no potential for metastasis. GCT cases presenting on the skin are rare and usually located deep within the subcutis and dermis. Benign tumors typically present as 0.5 to 3.0 cm firm nodules with a verrucous or eroded surface. Malignant granular cell tumor (MGCT) is very rare and comprises roughly 2% of all GCT cases. These tumors exhibit rapid growth, a size greater than 4 cm, necrosis, pleomorphism, and increased mitotic index. Histologically, GCT is difficult to diagnose as it mimics many soft tissue and inflammatory lesions. GCTs are thought to arise from Schwann-like mesenchymal cells and stain positively for Schwann cell-related antigens, including S-100 protein and vimentin. GCTs appear as clusters of eosinophilic cells containing cytoplasmic granules and diffuse infiltration.
Case Description: An 83-year-old Caucasian man with a history of prostate cancer and segmental neurofibromatosis presented with a rapidly growing, dome-shaped, pink nodule located on the left lower chest that had been present for less than one month. Due to the rapid growth and concern for malignancy, an excisional biopsy was performed of the lesion. Histological analysis of the growth revealed malignant granular cell tumor. Immunoperoxidase stains were positive for S100 protein, CD68 and CD163 with increase labeling with Ki67 and negative for Pan melanocytic cocktail (HMB-45, MART-1 and Tyrosinase). The patient was then referred to oncology for further evaluation. Oncology determined that no further surgical intervention was necessary. CT scan of the chest and abdomen without contrast was ordered for three months from the date of evaluation. Consistent close follow up with Dermatology and Oncology was recommended.

Discussion: Malignant granular cell tumor is exceedingly rare representing only 0.2% of soft tissue malignancies. Unlike benign GCT, the prognosis of MGCT is poor. MGCTs exhibit a 32% local recurrence and 50% metastatic rate. MGCTs can recur at any time after initial surgical excision and metastasize several years post-operation with the most common sites including lymph nodes, lungs, liver and bones. GCT can be histologically examined and diagnosed via utilization of fine needle aspiration cytology (FNAC) if a shave biopsy is unable to be performed. FNAC can easily differentiate benign and malignant GCT from chronic inflammatory histiocytic reaction, xanthogranuloma, epithelioid sarcoma and carcinoma.

Title: Atypical Presentation of Axial Spondyloarthritis
Authors: Melodie Keshani, OMS3; Anthony Safadi, OMS3; Robert Williams, MD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Axial Spondyloarthritis (axSpA) is one of the many spondyloarthopathies known to be positive for human leukocyte antigen (HLA)-B27. With a prevalence of about 1.0-1.4% in the United States, it could be difficult to pinpoint a diagnosis in a patient if atypical symptoms are present. Involvement of SI joint on MRI studies is the hallmark of axSpA; however, absence of this abnormality doesn’t necessarily rule out axSpA. Treatment for axSpA focuses on improving the patient’s quality of life by relieving symptoms with nonsteroidal anti-inflammatory drugs (NSAIDs), analgesics, and biologic disease-modifying antirheumatic drugs. Patients must also be closely monitored for psychosocial changes and prevention of further spinal and extraspinal manifestations and complications.

Case Description: A 57-year-old male with a past medical history of coronary artery disease and hypertension presented to his primary care physician’s office in September of 2016 for nontraumatic right ankle and foot edema and tenderness after working on his car. Physical exam showed edema of ankles and feet with tenderness to palpation of right foot. Lab work at that time showed an elevated white blood cell count (WBC) of 12.3, normocytic anemia, uric acid of 7.8, and negative x-ray of right foot. He received indomethacin for his gout, a dose of Toradol, and Clindamycin. One week later, he presented to the office again for worsening bilateral feet and leg pain and inability to ambulate. The WBC was found to be 13, despite being on an antibiotic, and he had a negative ultrasound for deep vein thrombosis. Throughout the next year, the patient experienced an unintentional forty-pound weight loss, the inability to ambulate for 7.5 weeks, worsening lower extremity pain, burning, and swelling, fatigue, tightness in fingers, and near syncopal episodes. ESR and C-vidptide levels were found to be elevated at this time. In 2018, patient was diagnosed with sausage toe and psoriasis. Over the last four years, multiple specialists including, rheumatology, hematology oncology, psychiatry, endocrinology and neurology, have been unable to answer why he is experiencing these unusual symptoms. He has had a variety of lab work done but only his HLA-B27 was positive. Imaging (x-ray, CT, tri-phasic bone scans, MRI’s) were all negative. Patient has been tried on multiple trials of medications, including steroids, with no relief. AxSpA was ruled out twice for lack of SI involvement in this case. He did find the TNF inhibitor (etanercept) to help for some time; however, it was discontinued secondary to cost. Adalimumab was also considered at the time but was never prescribed due to cost. In 2020, axSpA was reconsidered despite the lack of SI involvement and patient was given a trial of secukinumab, an anti-IL-17.

Discussion: There are undoubtedly a lot of unknowns in rheumatological diseases; however, the diagnosis of axSpA should not be ruled out if the patient does not present with SI joint involvement. He initially responded to a TNF inhibitor which leads us to believe that he may have needed to try another TNF inhibitor or anti-IL-17. Management of axSpA includes relief of symptoms, maintenance of function, and prevention of future complications and comorbidities. Knowing how to approach these patients and looking at the overall clinical picture will not only save the patient time, but also their physical and mental health in the long run.

Title: Two for One: A Case of a Toddler with Traveler’s Diarrhea
Authors: Taylor Kolb, OMS3; Rogerio Faillace, MD; Noel Alonso, MD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Traveler’s diarrhea is a broad term given to any infectious diarrhea acquired abroad and is extremely common in the pediatric population. It can be due to a variety of causes including bacteria, viruses, and parasites. The most common culprit is of bacterial origin, Entero toxigenic E. coli, which requires a large inoculum in order to cause infection.1 On the other hand, the protozoa, Entamoeba histolytica requires ingestion of only a single cyst in order to cause disease.2 This case presents an instance of traveler’s diarrhea originating from both ETEC and E. histolytica.

Case Description: A 3-year-old male presented to the office with diarrhea, stool ova and parasites was negative. Stool PCR was positive for C.difficile toxin A/B, Enteropathogenic E coli, Enterotoxigenic E coli, and...
Discussion: Colonization with various bacteria and viruses is extremely common, and it can be difficult to determine which is the responsible agent for a patient’s diarrhea. Additionally, it is not uncommon to have diarrhea that is caused by coinfection with two pathogens. This case provides an opportunity to discuss the interplay that can occur between enteropathogenic bacteria and amoebas. In vitro studies have shown that exposure of the epithelial barrier to enteropathogenic bacteria, such as ETEC, makes the lumen more susceptible to E. histolytica. Additionally, phagocytosis of ETEC by E. histolytica has been studied as a possible stimulus inducing invasive amebiasis and resulting in stronger damage to cells. Because paromomycin is only given for asymptomatic amebiasis, we wanted to ensure that the patient’s infection had resolved and had not progressed to extraintestinal amebiasis. The patient’s stool PCR results indicated that the infection with E. histolytica was successfully treated with paromomycin alone, and that ETEC likely contributed to his original symptoms. This case exemplifies not only the importance of exploring all possible contributors to the patient’s symptoms, but also the importance of repeating labs to rule out a persistent infection or extraintestinal disease.

Introduction: Tumid lupus erythematosus (TLE) is a rare variant of chronic cutaneous lupus erythematosus (CCLE). Unlike its other cutaneous counterparts, tumid lupus is weakly linked to systemic lupus erythematosus (SLE) and often presents with negative autoimmune serologic markers. On clinical presentation it commonly presents with erythematous and edematous plaques often in an annular distribution, typically affecting the trunk. Given these clinical features, tumid lupus erythematosus is a diagnostic challenge in distinguishing it from urticarial vasculitis.

Case Description: A 49-year-old Caucasian female with a past medical history of rheumatoid arthritis and presented for two painful and pruritic lesions on the right upper and right lower back. These lesions have been present for a number of months without complete resolution of symptomatology. Social history was significant for a 20-pack-year smoking history and a history of unprotected sun exposure. Physical examination demonstrated two smooth evanescent, erythematous and indurated pink plaques distributed on the left superior lateral upper back and left inferior medial mid-back. The patient was initially diagnosed with urticaria with a concern for urticarial vasculitis given the duration of symptoms and lack of resolution despite lifestyle modifications. The patient was prescribed topical flurandrenolide cream and oral antihistamines. No resolution of symptoms was achieved in two months. Given the refractory nature, two punch biopsies were performed with additional serological studies. Serology returned negative for aninuclear antibody (ANA), rheumatoid factor and cryoglobulin. No other autoimmune connective tissue antibodies were ordered. Dermatohistopathology revealed a superficial and deep perivascul and periadnexal lymphocytic infiltrate with dermal mucin deposition and edema that favored a diagnosis of tumid lupus erythematosus in both lesions. An additional histochemical staining was performed with colloidal iron which exhibited excessive mucin deposition within the dermal layer. Hydroxychloroquine was proposed as a treatment option; however, the patient deferred for another course of a stronger topical corticosteroid. The new treatment plan with betamethasone dipropionate spray was initiated. All lesions clinically improved over a period of two weeks without residual dyspigmentation, scarring or reemergence.

Discussion: This case presents a rare diagnosis of tumid lupus erythematosus masquerading as an urticarial vasculitis successfully treated with topical betamethasone dipropionate monotherapy. Tumid lupus erythematosus can be inherently challenging to identify as these lesions are often transient in nature and often do not accompany its systemic variant, SLE. Serologic studies, while useful in other forms of cutaneous lupus erythematosus also provide inconclusive evidence for its diagnosis. Current literature favors use of systemic antimalarials as mainstay treatment of TLE however, this case demonstrates that a short course of a class 2 topical steroid monotherapy was capable of remitting these lesions.

Title: Cri du Chat Syndrome and Autism Spectrum Disorder: A Case Report
Authors: Krunal S. Patel, OMS3; Mark Vinicky, OMS3; Vivek Rajasekhar, PGY3; Christina Stamoolis, MD
Program: Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

Introduction: Cri-du-chat syndrome is a rare genetic disorder with an incidence of 1:50,000 live-born infants characterized by incomplete or complete deletions of the small arm of Chromosome 5 (5p). De novo deletions account for approximately 85% of cases and the remaining 15% of cases are attributed to parental translocations. The distinguishing cat-like cry, which most patients eventually outgrow, has been linked with involvement of the 5p15.3 critical region. Deletion of the 5p15.2 region has been associated with the clinical presentation of intellectual disability, alteration in muscle tone, facial dysmorphisms (micrognathia, large nasal bridge, microcephaly, round face, hypertelorism), and psychomotor retardation. Prevalence of an autism spectrum disorder in patients diagnosed with Cri-du-chat syndrome is significantly lower compared to patients with other genetic conditions, such as Cornelia de Lange syndrome and Angelman syndrome. Autism spectrum disorders present with impaired social communication and interaction, restricted and repetitive behavioral activities and interests, and intellectual impairment. This case describes an uncommon presentation of a patient diagnosed with the rare genetic disorder Cri-du-chat syndrome who presents with symptoms of autism spectrum disorders as well.

Case Description: The patient is a 29-year-old Caucasian male who presented with his caregiver to renew his assisted living facility paperwork. Patient’s caregiver reported no new complaints or concerns. Upon initial encounter, patient appeared pleasant with no acute distress. An adequate history from the patient was unable to be obtained as a result of impaired socialization. Patient exhibited decreased attention to verbal dialogue, inability to maintain eye contact, and failure to use verbal communication. Further hindering communication, the patient demonstrated a behavioral fixation for holding a small string of beads in his left hand and made multiple attempts to remove the caregiver’s jewelry. He did not demonstrate the cat-like cry characteristic of the genetic disorder. The patient appeared underweight patient with a BMI of 16.95. The remainder of his vital signs were stable. Head and neck...
examination revealed facial dysmorphisms common in patients with Cri-du-chat syndrome including, microcephaly, round face, hypertelorism, and a short philtrum. Patient’s posture shows increased thoracic kyphosis, mild anterior head carriage, and an increase in contractile tone in the forearms bilaterally. A neurological evaluation was unable to be assessed and the remained of his physical examination was unremarkable. Past management included occupational therapy to improve bimanual dexterity due to reduced functionality of his left hand. Currently, the patient resides in an assisted living facility to provide assistance with activities of daily living and takes trazodone as a sleep aid.

Discussion: Very few case reports have been published describing the specific autism spectrum disorder phenomena present in Cri-du-chat patients. This case report serves to demonstrate the clinical presentation of Cri-du-chat syndrome and its’ potential overlap with autism spectrum disorders.

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**Title:** The Causal Relationship Between the Gut and Vaginal Microbiota and Neurodegenerative Disorders

**Authors:** Shuchi Patel, OMS1; Eliyah Pollak, OMS1; Mayur Parmar, PhD

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Patient is a 48-year-old Caucasian female with past psychiatric history (PPHx) of schizoaffective disorder (SCAD) and past medical history (PMH) of epilepsy and chronic back pain who presented to NFRMC ED after BA from Nurse Practitioner after becoming agitated and expressing delusions.

**Case Description:** Patient presented to the ED with worsening paranoid delusions including that her house is infested by rats and that her bowels have been eviscerated and are spread all over the house. She endorses symptoms of depression but denies SI/HI/AVH. Patient is being followed by outpatient psychiatric nurse practitioner (NP) and reports she is taking Zyprexa 20mg qdaily, Seroquel 800mg qdaily, Topamax 50mg BID, Lamictal ER 400mg qdaily at home and decompensates when non-compliant with Rx, and each episode has become worse. While in ED, patient had CXR incidentally found left perihilar mass concerning for malignancy. CT Chest w/ contrast which found 5.2 cm left hilar mass with extensive mediastinal lymphadenopathy. CTA/P which found multiple right sided hepatic masses highly concerning for metastatic malignancy. PPHx includes previous admission to state hospital 1.5 years ago and was previously diagnosed with SCAD, depression, anxiety, epilepsy, chronic back pain. Of note, social history reveals patient had completed general psychiatry residency training and had first psychotic break during fellowship training. During admission to medical floor, patient would not consent to biopsy and was transferred to psychiatry unit until decision-making was restored. Psychotropic medication regimen at time of discharge was Trazodone 50mg PO qHS for insomnia, Zoloft 50 mg, Lamictal 50mg PO qdaily and Topamax 50mg PO BID. Biopsy of liver mass showed stage IV pulmonary adenocarcinoma with metastasis to liver. Patient was discharged to the care of patient’s sister and scheduled with follow up appointments with outpatient oncology including scheduled PET scans.

**Discussion:** Patient is diagnosed with SCAD bipolar type by history and specifically exhibiting delusions, disorganized behavior, and aggression at the time of presentation. After decompensating, this patient’s condition severely interfered with patient’s decision-making ability regarding medical diagnoses and course of action despite guidance of physician. Ironically, this patient’s previous training was medical school including psychiatry residency prior to first psychiatric episode. With this in mind, patient would be expected to have greater knowledge and understanding of medical diseases and illnesses with previous training, including intact insight into psychiatric disorder. However, patient lacked insight and decision-making abilities on initial presentation. Additionally, not all mental illnesses including thought disorders interfere with decision-making to this degree. This case shows that psychiatric illness does not discriminate including level of knowledge. Further, mental health conditions can present at different severities in any patient with any level of education.

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**Title:** Therapeutic Potential of MEK Inhibitor Monotherapy for Langerhans Cell Histiocytosis: A Case Study

**Authors:** Alexander Prouty, OMS1; Robert A. Baiocchi, MD, PhD

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Langerhans Cell Histiocytosis (LCH) is a rare histiocytic disorder characterized by clonal proliferation of myeloid precursor cells and notable dependence on RAS/RAF/MEK/ERK signaling. The majority of patients with LCH have mutations in BRAF and MEK1 and MEK2 genes providing justification for treatment with targeted agents like vemurafenib (targets BRAF<sup>V600E</sup> and trametinib (targets mutated MEK). FDA approval has been granted selectively for mutated RAF/MEK genes. We hypothesized that LCH patients who do not possess mutations in genes in this pathway would display aberrant amplification and thus be appropriate for treatment with these targeted agents. Here we describe two cases of LCH with upregulated MEK/ERK signaling, first with wild type MEK1/2 and the second with a MEK2 mutation, both displaying complete response to the MEK inhibitor trametinib.

**Case Description:** Case 1- A 45-year-old woman with a history of thyroid cancer presented with LCH involving CNS, scalp, and multiple lymph nodes. Her disease initially manifested in 2013 with hypophysitis and diabetes insipidus. Abdominal imaging showed moderate abdominal portocaval lymphadenopathy with splenomegaly and biopsy of scalp cutaneous lesions was consistent with LCH. Whole exome DNA sequencing (WES) of the scalp biopsy revealed no mutations in RAF or MEK genes, however, amplification of genes in RAS/RAF/MEK/ERK pathway was detected by RNA-seq. She received first line trametinib, 2mg once per day beginning June 2018, reduced to 1mg once daily by September 2018 due to complaints of fatigue and mouth sores. She has currently achieved a complete response.

Case 2 - A 49-year-old man with a history of poorly controlled diabetes mellitus type II and Treacher-Collins Syndrome presented with Langerhans Cell Histiocytosis of the sternum and skull. His disease manifested as discomfort over the sternum in November 2018. Baseline MRI and PET demonstrated a large expansile lesion on right skull consistent with LCH. Gene studies by next generation sequencing of RAS/RAF/MEK/ERK pathway showed a MEK2 mutation and amplification of several genes in this pathway as well. He received first line trametinib 2mg once daily beginning in January 2019. He developed a skin rash from trametinib but no other adverse effects. Follow up PET scan in January 2020 was consistent with a complete response.
**Discussion:** These cases demonstrate the therapeutic potential of MEK inhibitor therapy in the context of increased RAS/RAF/MEK/ERK signaling in the presence or absence of MEK mutation for Langerhans Cell Histiocytosis. RNA-seq and WES and clinical outcome analysis of additional patients with wild type RAF and MEK genes is currently underway.

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**Title:** Painless Gallstone Pancreatitis in a 3-Year-Old: Case Report  
**Authors:** Chad Richards, OMS3; Shawn Moore, MD, PGY1; Jeffery Pender, DO  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Gallstone pancreatitis is a condition where the distal portion of the common bile duct becomes obstructed by a stone either composed of cholesterol or biproducts of hemolysis known as a “pigmented stone.” Pancreatitis, whether due to obstruction or another pathology, generally presents with exquisite epigastric pain as the pancreas becomes inflamed. We present here a unique case of a child with painless choledocholithiasis. In a 15-year cohort study, 188 children 0-18 years with some form of gallbladder obstruction were reviewed and of those only 7 were 3 years or under. The presentation is unique as well, in that she had no pain. The details of her case are discussed along with possible causes of her case and appropriate recommendations for follow-up.

**Case Description:** HPI: A 3-year-old Caucasian female with no significant medical history was brought into the emergency department by her mother after she noticed scleral icterus. 6 days prior the patient had 1 episode of vomiting without other complaints. 2 days later the mother brought her to the ED when she had several white, acholic, formed stools. The patient was incidentally diagnosed with a UTI, started on Keflex and sent home. On physical exam, she did in fact show icterus. Of note she was afebrile; her abdomen was soft and non-tender. Pertinent lab findings in the ED were as follows: Hgb: 12.0 g/dL; Hct: 35.2 %; Alk Phos: 639 Units/L (high); Bili Direct: 4.8 mg/dL (high); Bili Indirect: 1.0 mg/dL; Bili Total: 5.8 mg/dL (high); Lipase: 5058 Units/L (high). Hospital Course: The patient was discovered to have pancreatitis, at which point she was transferred to another hospital where she could receive a higher level of care. She was placed NPO on MIVF, the following day her lipase was down to 145 and the rest of her labs improved significantly. Abdominal US showed a severely dilated and tortuous common bile duct secondary to a 6mm stone at the head of the pancreas. She then underwent ERCP with sphincterotomy and balloon extraction. Three days later she underwent cholecystectomy, which she tolerated well. Upon discharge she was advised to follow up with her PCP, GI, Endocrinology, and surgery. Several avenues have since been explored to understand the cause of her choledocholithiasis, none of which has provided any definitive answers.

**Discussion:** In a patient this young, the most common reason for gallstone production is hemolytic anemia secondary to sickle cell disease. She had no signs of anemia, nor any family history suggestive of sickle cell. A fasting lipid panel and several diagnostic tests showed the following: Cholesterol Total: 338; Alpha 1 Antitrypsin: 138; Low-Density Lipoproteins: 291; TSH: 1.96; Hepatitis panel: Negative; T4 Free: 1.36; EBV and CMV: Negative; Lysosomal Acid Lipase: non-deficient. Patient will require further workup to rule out lysosomal storage disorders and familial hyperlipidemias. While pancreatitis is seen in some of these conditions, gallstone formation is not common. In conclusion, Gallstone pancreatitis is rarely painless and extremely rare in a toddler. A comprehensive workup, good clinical judgement, and consistent follow up will prevent rare cases like this from being missed.

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**Title:** Unique Manifestation of Walker-Warburg Syndrome  
**Authors:** Anthony Safadi, OMS3; Melodie Keshani, OMS3; Jessica Jean-Baptiste, OMS3; Mark Gabay, DO  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Walker-Warburg Syndrome (WWS) is a rare, autosomal recessive, congenital muscular dystrophy most often associated with cerebral and ocular abnormalities. Patients can present with a variety of defects including, but not limited to, hydrocephalus, muscular atrophy, hypotonia, microphthalmia, lissencephaly, intellectual disabilities, and seizures. WWS’s incidence rate is unknown in the United States; however, European studies report 1.2 in 100,000 live births. Infants diagnosed with WWS have a poor prognosis, with most affected individuals passing away before the age of three. WWS occurs secondary to the lack of glycosylation of the protein α-dystroglycan, which is necessary for development of the brain, eyes, and muscles. There are at least 14 known genes to help glycosylate α-dystroglycan, but if any of these proteins are mutated, the patient will develop this syndrome. Despite the advancements in detection, not all cases of WWS currently have an identifiable genetic mutation which is why diagnosis is made on a clinical basis. Cerebral abnormalities can be detected by prenatal ultrasound or MRI of fetus; however, there are no treatments currently available and management is only through supportive care.

**Case Description:** We present an unusual case of a three-day-old Hispanic male who was delivered at 38 + 5 weeks by elective C-section. His prenatal ultrasound revealed lateral dysplasia. Mother reported use of prenatal vitamins and was found to be Group B Streptococcus positive before delivery. Penicillin was administered within four hours of delivery. APGAR scores of 9.9 were noted at time of birth. Upon delivery, a meningocele was discovered and the infant was transferred to Nicklaus Children’s Hospital’s (NCH) NICU from South Miami Hospital for further evaluation of neonatal cephalohematoma and close follow-up. MRI brain studies (Figure 1A, 1B) at NCH revealed the absence of the septum pellucidum, moderate supratentorial ventriculomegaly, thickened tectum, and nodular areas of signal abnormality that followed the cortex in all sequences along the subependymal region of the lateral ventricles. Studies did not show an enlarged 4th ventricle. The diagnosis of WWS was established at this point. Our comprehensive physical examination revealed no evidence of optic atrophy, cataracts, or papilledema. Neurological exam was appropriate for patients age. Reflexes were 2+ bilaterally. The infant was negative for hypotonia and defects in cranial nerves. He exhibited no motor or sensory defects. Genetic testing was sent for Chromosomal Microarray (CMA) and Newborn screening. Blood cultures were drawn 48 hours after birth and were reported to be negative; therefore, ampicillin and gentamicin were discontinued. All labs were returned with no clinical significance identified. The infant’s parents were informed of the condition’s prognosis, and he was discharged with close follow-up with neurosurgery for removal of the meningocele.

**Discussion:** This case is unique in that it illustrates the variabilities that occur in Walker-Warburg Syndrome. Unlike prior WWS studies, this patient had a normal appearance and affect and didn’t have hypotonia or optic defects. Instead, a meningocele in the presence of ventriculomegaly guided us to our
clinical diagnosis. The rarity of this disease is a direct contributor to the lack of data we have to properly screen and diagnose mothers and infants; therefore, unique findings like the ones our patient had, must be brought to attention.

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**Title:** Significant Overlap in Clinical Presentation, Pathology and Lab Values Complicates Early Diagnosis and Treatment of ANCA-Associated Vasculitis  
**Authors:** Dino Salkic, OMS3; Nisarg Shah, OMS3; Laxmichaya Sawant, PGY2  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** ANCA associated vasculitis (AAV) is inflammation of small and medium sized arterial vessels due to antibodies that form against neutrophilic components. This leads to direct endothelial injury. International Chapel Hill Consensus Conference (IHCC) classifies vasculitis according to vessel size, with the AAV category containing granulomatosis with polyangiitis (GPA), microscopic polyangiitis (MPA), and eosinophilic granulomatosis polyangiitis (EGPA). As with any autoimmune disease, etiology is multifactorial. In the case of AAV, these factors include HLA susceptibility, molecular mimicry, and environmental exposures. However, the priming of ANCA in AAV from these factors has not been established. AAV occurrence is rare with incidence of 20 per million in the U.S. and Europe. There is predominance for male with increased incidence at 60-70 years of age. The common presentation begins with prodromal fevers, skin rash, and fatigue with renal involvement occurring in acute cases leading to glomerulonephritis. Respiratory manifestations consist of cough, dyspnea, and infiltrates on imaging.

**Case Description:** We present a case of a 77-year-old Caucasian male that was transferred to the emergency department after developing significant generalized weakness and lethargy while on a cruise trip. On the ship, labs revealed a hemoglobin of 9.6, BUN of 37.2, and creatinine of 3.8. Patient noted a 2-week course of decreased appetite as well as a 15-pound weight loss in the 4 weeks prior. No pain was appreciated, and patient was afebrile.

Primary survey was unremarkable except for tachycardia. Secondary survey revealed macular lesions with ulcers on his bilateral buttocks and lower extremities. CT of the chest was obtained with a 1.9 cm pulmonary nodule in the right upper lobe, and subsequent bronchoscopy with a biopsy of 8 samples suggesting pulmonary hemorrhage. Prior records obtained show patient to be P-ANCA positive. Further work up revealed patient to also be positive for C-ANCA, which prompted the placement of a dialysis line with initiation of pulse cyclophosphamide and steroid therapy. Patient also received 7 treatments of plasmapheresis with marked improvement in renal function. Recovery was complicated by subcutaneous emphysema secondary to chest tube placement and development of bronchopleural fistula. Eventually patient was discharged to acute hospital for endobronchial valve placement. In spite of clear diagnostic criteria for the various AAV, significant overlap in their clinical presentation, pathology and lab values complicates early identification and efficient treatment.

**Discussion:** The rarity of AAV and its ambiguous presentation can make it challenging to diagnose and treat early. This case offers the opportunity to explore AAV pathogenesis and the complexity of diagnosis, essential for efficient treatment.

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**Title:** A Case of Multiple Bladder Stones: An Association with Benign Prostatic Hyperplasia  
**Authors:** Trevor Smith, OMS1; Cody Mutter, OMS1  
**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Bladder stones account for approximately 5% of all urinary stones. One of the most prevalent causes of the formation of bladder stones in adult men is the presence of bladder outlet obstruction (BOO), secondary to benign prostatic hyperplasia (BPH). Previous literature indicates the presence of BOO as an etiologic factor in >75% cases, leading to the presence of BOO as a possible indication for operative management of BPH.

**Case Description:** A 64-year-old African American male presented to the emergency department with a sudden onset of frank hematuria following a 4-hour car drive. The patient had normal vital signs with no lower abdominal pain, flank pain, dysuria, urinary hesitancy, or evidence of stones in the urine. Patient reported a brief febrile episode 5 hours prior to onset of hematuria. The patient reports a family history of gout. The patient has a history of urinary urgency, but no previous history of urinary hesitancy, dysuria, hematuria, tobacco use, chemical exposure, or other personal medical history.

In the ED, a complete blood count and metabolic profile were normal, except evidence of dehydration with a slightly elevated creatinine level. The patient received an intravenous infusion of Ceftriaxone and 1000 cc of saline solution. An abdominopelvic CT scan revealed normal abdomen and kidney anatomy with the presence of bladder stones. There was no hydroureterophrosis noted. Subsequent cytology was negative for malignancy. He was referred to a urologist who performed a digital rectal exam, revealing a smooth, enlarged prostate. A transrectal ultrasound of the prostate identified a 90 cc prostate volume (twice the size of a normal prostate for his age group). Cystoscopy showed evidence of cystolithiasis and hemorrhage of the bladder.

The patient underwent outpatient surgery under spinal anesthesia and conscious sedation for both a litholapaxy of bladder stones and a transurethral needle ablation (TUNA) of the prostate. Intraoperative findings showed 6 bladder stones of an average size of 0.9 cm in the bladder. Laser thermotherapy was targeted to 7 sites of the prostate, and the bleeding sites within the bladder were cauterized. The surgery was successful, and the patient was discharged with a Foley catheter for 5 days, Tamsulosin, and a 6-week course of Doxycycline, with a good prognosis.

**Discussion:** Risk factors for bladder stones include infection, neurogenic bladder, nephrolithiasis and BPH. There is a 2-fold increase risk of bladder cancer in men with a history of urinary stones. Urinary stasis resulting from BOO induced by BPH is the most likely implication for this case of cystolithiasis. Apparently, exercise prior to the trip may be implicative as cause of the bleeding, resulting from dislodging of the bladder stones.
**Title:** Superficial Clear Cell Sarcoma (Melanoma of Soft Parts) of the Large Toe in an 80-Year-Old Female with Rare Cytogenetic Translocation

**Authors:** Regina Zambrano, OMS3; John Moesch, DO, PGY4; Michael Heaphy, Jr., MD, FAAD; Richard Miller, DO, FAOCD

**Program:** Nova Southeastern University Dr. Kiran C. Patel College of Osteopathic Medicine, Doctor of Osteopathic Medicine Program

**Introduction:** Clear cell sarcoma (CCS), referred to as “melanoma of soft parts,” is a rare, malignant soft tissue neoplasm that mimics the immunohistochemical profile of cutaneous malignant melanoma. CCS accounts for only 1% of soft tissue sarcomas. CCS typically presents as a slowly growing, deep-seated nodular mass that prefers distal extremity tendons and aponeuroses on young female adults. Rare presentations include pigmented lesions or superficial locations in the epidermis and dermis.

CCS is most commonly described on pathology as a well circumscribed proliferation of fusiform cells arranged in nests and fascicles. CCS displays positive immunohistochemical expression of typical melanocytic markers, such as S-100 protein, HMB-45, Melan-A, and MITF, leading many to consider this entity a unique subset of melanoma. However, CCS displays translocations of the EWSR1 gene that are genetically distinct from malignant melanoma. The majority of CCS cases detect chromosomal translocation t(12;22)(q13;q12) resulting in a EWSR1/AFT1 fusion transcript, while a minority of cases reveal t(2;22)(q33;q12) translocation, resulting in an uncommon EWSR1/CREB1 fusion transcript. CCS is prone to local recurrence as well as regional and distant metastases many years after primary diagnosis. The five, 10, and 20 year disease-specific survival rates have been reported as 67%, 33%, and 10%, respectively. We present a unique case of superficial clear cell sarcoma in an elderly female arising in a lesion that had been present on the left toe for many years.

**Case Description:** We present an 80-year-old female with an enlarging nodule at the base of the left large toe for over 50 years. Over the past nine months, there is rapid increase in size and tenderness. She was found to have a 1.4-cm erythematous nodule on the dorsal MTP joint of the left large toe. Histopathologic examination of the lesion revealed infiltration of dermis and subcutis by an atypical spindle cell neoplasm composed of fusiform cells possessing ovoid nuclei with prominent nucleoli and amphophilic cytoplasm. The tumor cells showed diffusely positive cytoplasmic staining for HMB-45. CCS mimics cutaneous malignant melanoma with typical histologic features, such as a dermal melanoma nest, ovoid nuclei with prominent nucleoli, and amphophilic cytoplasm. Positive immunohistochemical expression of typical melanocytic markers, such as S-100 protein, HMB-45, Melan-A, and MITF, leading many to consider this entity a unique subset of melanoma. However, CCS displays translocations of the EWSR1 gene that are genetically distinct from malignant melanoma. The majority of CCS cases detect chromosomal translocation t(12;22)(q13;q12) resulting in a EWSR1/AFT1 fusion transcript, while a minority of cases reveal t(2;22)(q33;q12) translocation, resulting in an uncommon EWSR1/CREB1 fusion transcript. CCS is prone to local recurrence as well as regional and distant metastases many years after primary diagnosis. The five, 10, and 20 year disease-specific survival rates have been reported as 67%, 33%, and 10%, respectively. We present a unique case of superficial clear cell sarcoma in an elderly female arising in a lesion that had been present on the left toe for many years.

**Discussion:** This case highlights a rare presentation of CCS by older age of onset, arising in the superficial dermis, and containing the rare cytogenetic EWSR1/CREB1 fusion transcript. In addition, the longstanding clinical course of the lesion without metastasis is unique, as a majority of late-detected CCS cases result in eventual regional or distant metastases.

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**Title:** Urinary Symptoms as a Result of an Ovarian Cyst

**Authors:** Amal Frances Ayoub, DO, PGY1; Raymond Chua, DO, PGY1; Andrea Horbey, DO

**Program:** The Children’s Hospital at Palms West, Pediatric Residency Program

**Introduction:** Diagnosis of pyelonephritis is based on upper and lower urinary tract symptoms in the presence of a positive urinalysis (UA) or urine culture. Upper urinary symptoms include fever, flank pain, vomiting, and costovertebral angle (CVA) tenderness, while lower urinary symptoms include dysuria, urgency, and frequency. In the absence of a positive UA or urine culture, these symptoms have a broad differential, including both renal and other pathologies, such as a pelvic mass. Few articles convey the relationship of pelvic masses with urinary symptoms. This case report discusses the importance of considering pelvic etiologies in patients presenting with lower urinary symptoms.

**Case Description:** A 13-year-old Hispanic female with no past medical history initially presented to the ER from the primary care physician (PCP) office for a renal ultrasound (US) for suspected pyelonephritis after a 2-day history of right (R) sided flank pain with associated emesis and a reportedly positive UA. The patient denied fevers and dysuria. She reported that she was currently menstruating. On physical exam, patient appeared extremely uncomfortable and had significant R CVA tenderness. Repeat UA showed negative leukocyte esterase, negative nitrites, rare bacteria, 6-10 white blood cells (WBC), and >100 red blood cells (RBC) which were attributed to menstrual blood. Urine was sent for culture. Renal US was unremarkable. Based on history of positive UA at PCP and R flank pain with CVA tenderness and emesis, patient was diagnosed with acute pyelonephritis and discharged home with a 10-day course of cephalexin. The following day, patient returned to the ER with worsening R sided flank pain that now radiated to the suprapubic area. She also reported dysuria and subjective fevers, which were previously denied. Complete blood count (CBC) showed a leukocytosis with 16.6 WBC. UA was comparable to prior sample, showing negative leukocyte esterase, negative nitrites, rare bacteria, 6-10 WBC, and >100 RBC. Repeat urine culture was obtained. A computed tomography (CT) stone protocol was performed and revealed extrinsic compression of the urinary bladder secondary to an 8.5 cm cystic mass in the pelvis; no evidence of nephrolithiasis noted. Pelvic US confirmed an 8.4 cm simple cyst arising from the right ovary. The patient was admitted to the hospital for laparoscopic ovarian cystectomy due to the size of the cyst and likely contribution to lower urinary symptoms. After surgery, patient reported resolution of nausea and improvement of pain, and was discharged on post-operative day 1. Urine culture from both ER visits resulted with the growth <25,000 units of mixed flora, inconsistent with urinary tract infections.

**Discussion:** Ovarian cysts are very common in adolescence. Symptoms of ovarian cysts vary greatly, including abdominal pain, vomiting, and lower urinary symptoms, with the potential to mimic the symptoms of pyelonephritis. Pelvic US is the imaging test of choice for diagnosis of ovarian cysts and pelvic mass. The diagnosis of pyelonephritis does not routinely require the support of an imaging study; however, renal US or preferably CT abdomen/pelvis may be obtained to look for evidence of interstitial nephritis. In adolescent female patients with symptoms of pyelonephritis despite a negative UA, consider pelvic US to rule out ovarian cysts.
Title: A Rare Case of New Onset IgA Vasculitis in a Young Adult
Authors: Adolfo Alvarez, DO, PGY1; Barbara Pociurko, MD, PGY3; Omar Viqar, MD, PGY1; Ruben Delgado, MD, PGY1; Allison Hales, DO
Program: Mount Sinai Medical Center, Internal Medicine Residency Program

Introduction: Acute onset of IgA mediated vasculitis is a rare presentation in adults. There is an estimated annual incidence of 1.3 per 100,000, Gonzalez-Gay et al, to 5 per 100,000, Hocevar et al, with a mean age of 50 at presentation in adults. IgA vasculitis is an immune- mediated vasculitis, which is associated with IgA deposition in the organs, most predominantly demonstrating an increased role in kidney insufficiency, and end stage renal disease in adults. The pathophysiology is for the most part unknown; however, there is reason to believe that infectious along with chemical triggers are possible factors that play a role. Roughly 50 percent of cases are reported after URI, especially if caused by streptococcus. The characteristic finding in biopsy is leukocytoclastic vasculitis, demonstrating IgA immune complex deposition within the specific organs that are affected. The predominant cell types seen in the inflammatory infiltrate are neutrophils and monocytes.

Case Description: We present a case of a 26-year-old Hispanic female with a PMH of HTN, cigarette smoking and GERD presenting with a chief complaint of a burning bilateral rash. The patient stated the rash first began as small red dots on the back of her legs, progressing to increase in number, coalesce, and continue upward towards her abdomen. She admitted to associated pruritus, and arthralgia, but denied any fever, chills, oral ulcers, hematuria, nausea, vomiting, chest pain, abdominal pain, cough, SOB, diarrhea. One-week prior she went canoeing in Oleta Park and was bit on her right ankle by an ant, however, she continued to swim/canoe in the water. In addition, the patient reported that she was sick with a sore throat, congestion, and cough about one month ago. Her boyfriend was diagnosed with strep throat around the same time period. Vitals on admission revealed a temperature of 98.3 degrees, BP 134/86, HR 90, RR 17, O2 sat 97%. Pertinent aspects of the physical exam were tenderness to palpation and mildly edematous bilateral ankles, along with non-blanching coalesced, palpable erythematous maculopapular lesions on bilateral lower extremities, with small areas noticed in the abdomen. Initial laboratory revealed leukocytosis of 14.31, neutrophil predominant, BMP unremarkable, UA with small amounts of blood, elevated CRP of 18, and ESR of 30. Subsequent labs including ANA, Anti-DsDNA, hepatitis panel, Sjrogen antibodies, cryoglobulin, and ASO were ordered. A skin biopsy was obtained, and specimen was sent to pathology to be analyzed. Initial pathology report revealed early leukocytoclastic vasculitis, and specimen was sent out for immunofluorescence. Specimen returned positive for findings consistent with IgA vasculitis.

Discussion: IgA vasculitis can present with skin, joint, gastrointestinal, and renal involvement. In adults, renal involvement is seen in a significantly higher rate than in pediatrics within 4 months of presentation. It is known a smoking history associated with IgA vasculitis increases the chances of nephrotic renal disease as patients continue to increase in age. Gastrointestinal symptoms are only seen 24.1% of the time before the onset of rash, Zhang et al. Upon follow up with patient, she still reported hematuria one-month post onset of rash.