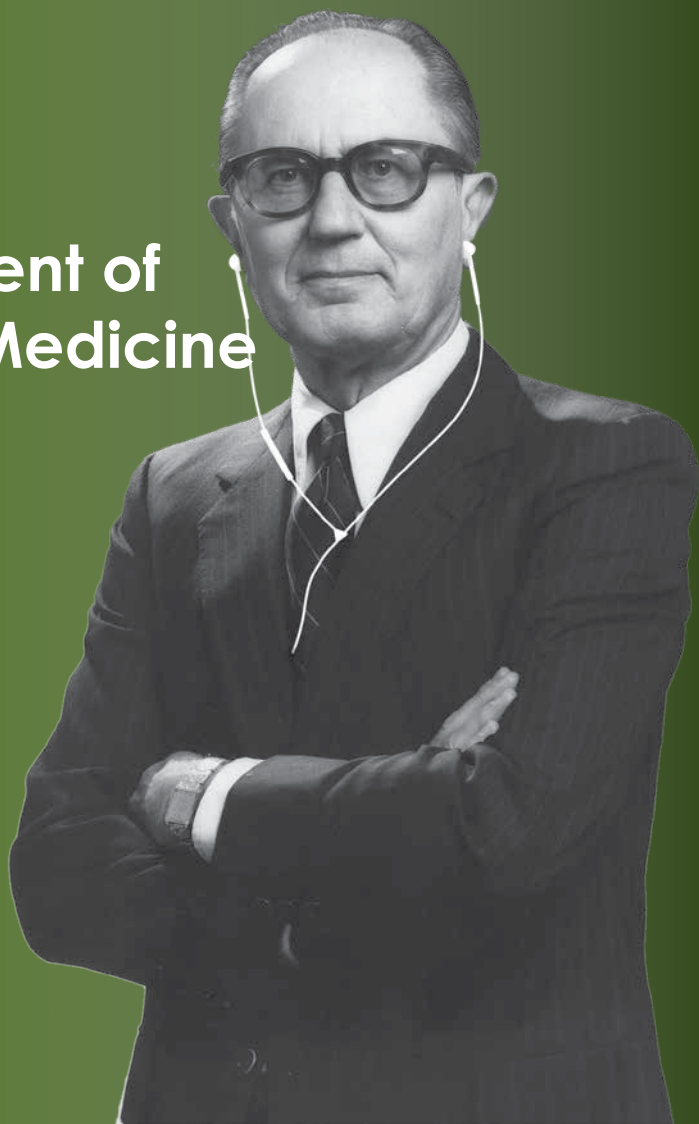
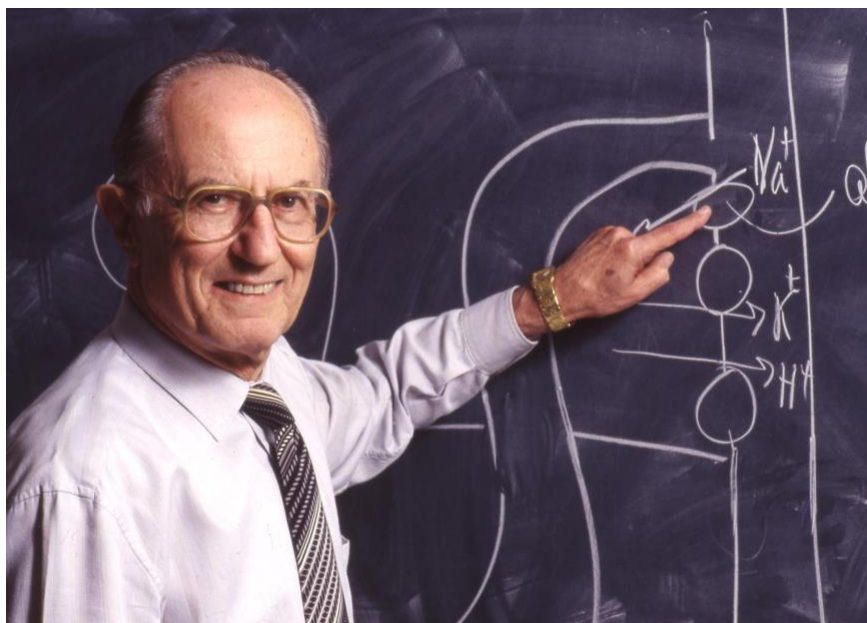


The
**Department of
Internal Medicine**
Presents



The 6th Annual
**Donald W. Seldin, M.D.
Research Symposium**
April 15, 2021



“An institution is The Lengthened Shadow of One Man.”

-Ralph Waldo Emerson

The biomedical research pedigree of UT Southwestern Medical Center is as storied and accomplished as that of other prominent institutions more than twice our age. Those who lead UT Southwestern today can point to one figure who, more than anyone else, was the singular guiding force and architect of one of the preeminent academic medical institutions in the United States: Dr. Donald W. Seldin.

The beginning of Dr. Seldin’s tenure at UT Southwestern is a tale that has been told endlessly throughout the years, but bears repeating. In 1951, Dr. Seldin arrived in Dallas from Yale to find a set of military barracks and a brick building in disrepair: the entire campus of UT Southwestern. By the middle of 1951, Dr. Seldin was the sole remaining full-time faculty member at UT Southwestern, and thus Chair of the Department of Medicine by default. Through community engagement and collaboration with local physicians, Dr. Seldin built the Department of Medicine upon the foundation that still underpins the strength of UT Southwestern today: its trainees. By personally selecting the most promising talent, sending them across the country to study with the best scientific minds of their time with the promise to return, Dr. Seldin’s faculty tree blooms with staggering distinction and accomplishment. Daniel Foster. Michael Brown. Jean Wilson. Floyd Rector. Norm Kaplan. His personal encouragement of Joseph Goldstein to study genetics instead of neurosurgery, and his suggestion of partnership with Michael Brown, culminated in their Nobel Prize in Physiology or Medicine.

Throughout his 37-year tenure as Chair, Dr. Seldin never wavered in his advocacy that anchored the Department to the mission of the clinical scholar – advancing a fundamental understanding of human health, disease and its treatment via research.

6th Annual Donald W. Seldin, M.D. Research Symposium

During the evolution of academic medicine and its increasing clinical demands, Dr. Seldin's leadership ensured that research flourished as a key emphasis in the tripartite academic mission. He emphasized the definition of a medicine faculty as clinicians who pursued innovation, discovery of new knowledge and its transmission to others. He emphasized the intertwined relationship between research and clinical medicine, noting that "the critical observation and analysis of disease contributes both to good medical care and new knowledge."

The list of honors achieved by Dr. Seldin during and after his chairmanship is as varied as it is long. Seven societies can lay claim to him as past president: the American Society of Nephrology, The Association of Professors of Medicine, the Association of American Physicians, the International Society of Nephrology, the Central Society for Clinical Research, the American Society for Clinical Investigation, the Southern Society of Clinical Investigation. Too numerous to list, his awards include the John P. Peters award from the American Society of Nephrology, the Kober Medal from the Association of American Physicians, and the Distinguished Teacher Award from the American College of Physicians.

Dr. Seldin's belief in the moral responsibilities shouldered by those in medicine continues to reverberate and be imprinted upon our trainees. His postwar encounters with Nazi medicine, seeing medicine used to create suffering, taught him to emphasize the importance of practicing humane medicine with integrity. To this day, Dr. Seldin's passion for discovery, his standards of professionalism and humanity, and his enthusiasm for training the next generation of physicians remains the bedrock upon which the department and university continue to build and expand.

"The paradigm of professions is surely the medical profession. We, all of us, are inheritors of the activities of people who have proceeded us, and who have devoted themselves to the mitigation of suffering".

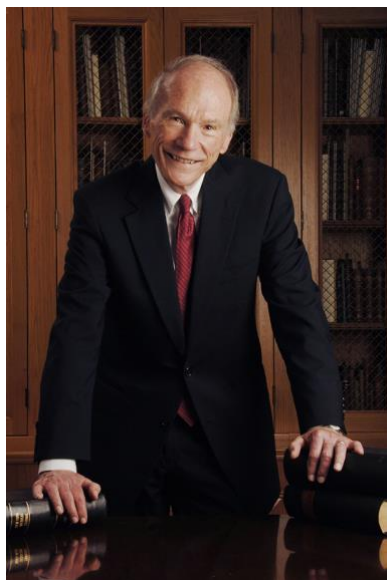
- Donald W. Seldin

Without his guiding hand, it is no stretch to believe that UT Southwestern would have neither achieved its lofty heights in world-renowned research, nor would have trained so many gifted and successful physicians still serving in Texas and across the United States. Simply put, there is and was no UT Southwestern Medical Center without Donald W. Seldin.

Daniel W. Foster, M.D.

1930-2018

The third of five chairs of the Department of Internal Medicine at UT Southwestern, Daniel W. Foster was a pioneering force in patient care, education, and research throughout his entire career, including his time at UT Southwestern. After graduating from UT Southwestern medical school at the top of his class, Dr. Foster followed his residency at Parkland Memorial Hospital with a research fellowship at the National Institutes of Health. He returned to UT Southwestern at the behest of Drs. Donald Seldin, Michael Brown, and Joseph Goldstein. In a spectacular 3-decade collaboration with his scientific partner, Dr. J. Denis McGarry, Dr. Foster discovered the malonyl-CoA regulatory system --detailing its fundamental role in fuel metabolism, fatty acid oxidation and ketone body formation. As Department Chair from 1987 to 2003, Dr.



Foster spearheaded Internal Medicine's remarkable academic growth, recruiting numerous outstanding faculty who went on to establish their own successful careers at UT Southwestern. His bold vision for the Department enabled the launch of the transformative Dallas Heart Study on his watch. Dr. Foster's seminal contributions to academic Internal Medicine were widely recognized. His many honors included election to the National Academy of Medicine, the American Society for Clinical Investigation, and the Association of American Physicians, as well as the Banting Medal for Scientific Achievement from the American Diabetes Association. He was equally committed to the education and training of students and residents. He served as Headmaster of the Academic Colleges at UT Southwestern, President of the Academy of Medicine, Engineering, and Science of Texas, and was named an Outstanding Physician Educator in Diabetes by the American Diabetes Association. Dr. Foster's patients greatly appreciated his counsel, kindness, and personal warmth – and to this day reflect upon him fondly as they return to UT Southwestern for their care. Dr. Foster's legacy of integrity, education, research, and patient care remains etched into the mission of the Department of Internal Medicine, and his leadership by example continues to serve as a guiding light to UT Southwestern.



Keynote Speaker

Robert M. Califf, MD, MACC
Head of Clinical Policy and Strategy for Verily and Google Health
Adjunct Professor, Duke University and
Stanford University

Robert M. Califf, MD, MACC is the Head of Clinical Policy and Strategy for Verily and Google Health. Prior to this, he served as the vice chancellor for health data science for the Duke University School of Medicine; director of Duke Forge, Duke's center for health data science; and the Donald F. Fortin, MD, Professor of Cardiology. He also served as Commissioner of the U.S. Food and Drug Administration from 2016-2017. Dr. Califf is a graduate of Duke University School of Medicine

and was the founding director of the Duke Clinical Research Institute. He is a nationally and internationally recognized leader in cardiovascular medicine, health outcomes research, healthcare quality, and clinical research and is one of the most highly cited authors in biomedical science.

Message from Thomas J. Wang, M.D.

Thank you for attending the 6th Annual Donald W. Seldin Research Symposium. Since 2016, this conference has been a unique opportunity to highlight the department's strengths in research, education, and patient care, through a celebration of our trainees' mentored research accomplishments. As in previous years, the symposium features poster presentations spanning the entire range of research, from fundamental biology to quality improvement.

Throughout his 36-year tenure as Chair, Dr. Seldin never wavered in his advocacy for the clinical scholar. As academic medicine evolved with increasing clinical demands, Dr. Seldin ensured that research remained a cornerstone of the tripartite academic mission. He emphasized the intertwined relationship between research and clinical medicine, noting that "the critical observation and analysis of disease contributes both to good medical care and new knowledge." The department remains strongly committed to carrying on this tradition.

This is the second year that we have needed to conduct this symposium in a virtual format. While we all look forward to being able to return to this event in person, it is impressive to see the quality and breadth of the work that will be presented. Dr. Seldin would be proud of the resilience and determination of our trainees in pursuing their scholarly activities during these challenging times. Thanks again for your support of our trainees and their faculty mentors and collaborators.



Presentation #01

Title: An extensive renal cell carcinoma tumorgraft platform supporting innovation and advances in biological understanding, biomarker development and precision medicine

Presenter: Roy Elias

Authors: Roy Elias, MD, Yunguan Wang, Vanina T. Tcheuyap, Nirmish Singla, MD, Oscar Reig Torras, MD, Akash Kaushik, PhD, Aditi Mulgaonkar, PhD, Christina Stevens, Kavitha Kettimuthu, Ming Gao, PhD, Alana Christie, MS, Andrea Pavia-Jimenez, Vitaly Margulis, MD, Orhan Oz, PhD, Noelle Williams, PhD, Ivan Pedrosa, MD, Xiankai Sun, PhD, Ralph Deberardinis, MD, PhD, Tao Wang, PhD, Payal Kapur, MD, PhD, James Brugarolas, MD, PhD

Faculty Mentor(s): James Brugarolas and Payal Kapur

Abstract:

Background: Renal cell carcinoma (RCC) encompasses a heterogenous group of diseases, creating challenges for drug development. Preclinical models which are both translatable and encompass disease heterogeneity are needed. Patient-derived xenograft (PDX) or tumorgraft (TG) RCC models recapitulate the genetics, biology, and treatment responsiveness of RCC.

Methods: We have generated a comprehensive resource through the orthotopic implantation into NOD/SCID mice of tumor samples from >900 ethnically-diverse patients at UT Southwestern Medical Center and the affiliated county hospital. While biased towards aggressive tumors, the resource comprises 197 independently-derived TG lines from 172 patients. The lines have been characterized histologically, and by genomics (WES [n= 112] and RNA-Seq [n=109]).

Results: The TG library represents a variety of histological and oncogenotypes and include representatives of TCGA clades, further validated through orthogonal metabolomic analyses in a subset. We illustrate how this platform has enabled a deeper understanding of the biology and molecular genetics of RCC, the development of both tissue- and imaging-based biomarkers, and has supported advances in drug development.

Conclusion: This resource expands the diversity of models available to the scientific community (including ethnic diversity) to advance precision diagnosis and therapy.

Presentation #02

Title: Pak2-mediated phosphorylation promotes ROR- γ t ubiquitination and inhibits colon cancer

Presenter: Mahesh Kathania

Authors: Mahesh Kathania, PhD, Ritesh Kumar, PhD, Elviche Lenou, MS, Venkatesha Basrur, PhD, Jonathan Chernoff, MD PhD, Arianne Thiess, PhD, and K Venuprasad, PhD

Faculty Mentor(s): Venuprasad Poojary

Abstract:

Background: Interleukin IL-17 is a pathogenic factor in ulcerative colitis (UC) and is strongly linked to colorectal cancer (CRC) growth. In patients with stage I/II CRC, a high IL-17 expression signature is associated with a drastic decrease in disease-free survival. We investigated the mechanisms by which ROR- γ t, the transcription factor of IL-17, is regulated.

Methods: To identify the regulators of ROR- γ t, we performed mass spectrometry on immunoprecipitated ROR- γ t. Co-IP experiments were performed to confirm ROR- γ t-Pak2 interactions. Phosphorylation of ROR- γ t was checked by IP with ROR- γ t, and IB with p-Ser antibody and in vitro kinase assay. To confirm that phosphorylation of ROR- γ t regulates IL-17 expression, we transduced ROR- γ t^{-/-} cells with either WT-ROR- γ t or ROR- γ t-S316A and ROR- γ t-S316D mutants using lentiviral vectors. To investigate how phosphorylation affects the degradation of ROR- γ t, ubiquitination experiments were performed. Finally, ROR- γ t phosphorylation and IL-17 mediated colonic inflammation was analyzed using Pak2^{fl}/fICD4Cre mice.

Results: We identified Pak2, by mass spectrometry, as the kinase that phosphorylates ROR- γ t. Pak2 recognizes a conserved KRLS motif and phosphorylated Ser-316 within this motif. shRNA-mediated inhibition of Pak2 attenuated ROR- γ t phosphorylation and resulted in increased IL-17 expression. Reconstitution of ROR- γ t-S316A mutant in ROR- γ t^{-/-} cells resulted in enhanced IL17 expression indicating that phosphorylation of ROR- γ t inhibits IL-17 expression. Further, we found that Pak2-mediated phosphorylation resulted in a conformational change in ROR- γ t protein, resulting in exposure of the PPLY motif. The ubiquitin ligase Itch binds to the PPLY motif via its WW domains and targets ROR- γ t for ubiquitination. Pak2^{fl}/fICD4Cre mice exhibited increased colon cancer growth associated with elevated levels of IL-17 in the colonic mucosa due to a defect in ROR- γ t ubiquitination.

Conclusions: During an inflammatory response, the kinase Pak2 binds to a conserved 'KRLS' motif on ROR- γ t and phosphorylates at Ser-316. This causes a conformational change in ROR- γ t resulting in exposure of the Itch-interacting PPLY motif to promote ROR- γ t ubiquitination. Thus, we have uncovered a novel mechanism by which ROR- γ t ubiquitination is regulated that can be exploited therapeutically in Th17-driven diseases.

Presentation #03

Title: Hypoxia-Induced Ubc9 promoter hypermethylation regulates IL-17 expression in ulcerative colitis

Presenter: Ritesh Kumar

Authors: Ritesh Kumar, PhD, Amir Kumar Singh, PhD, Petro Starokadomskyy, PhD, Weibo Luo, PhD, Arianne Thiess, PhD, Ezra Burstein, MD, PhD, and K. Venuprasad, PhD

Faculty Mentor(s): Venuprasad Poojary

Abstract:

Background: Dysregulated interleukin (IL)-17 expression is central to the pathogenesis of several inflammatory disorders, including ulcerative colitis. We have shown earlier that SUMOylation of retinoic-acid-receptor-related orphan nuclear receptor gamma (ROR)- γ t, the transcription factor for IL-17, regulates colonic inflammation. However, the molecular mechanisms by which the expression of ROR- γ t is regulated to prevent unrestricted inflammation remain unclear.

Methods: To investigate the potential dysregulation of the Ubc9-ROR- γ t pathway in UC patients, we tested Ubc9 expression by immunoblotting the surgically resected colon tissue samples from UC patients. SUMOylated ROR- γ t was measured by immunoblotting using an antibody against SUMO1. To investigate the potential mechanism for reduced Ubc9 expression in UC patients, we analyzed the epigenetic regulation of Ubc9 promoter by methylation-specific PCR. To investigate the role of hypoxia-inducible factor 1 (HIF-1) α in reduced Ubc9 expression, we performed ChIP assays and Ubc9 promoter-driven luciferase assays. To further investigate the physiological impact of HIF-1 α -mediated regulation of Ubc9 and IL-17-mediated inflammation, we tested the Th17 cell adoptive transfer colitis model using FACS sorted wild type and HIF-1 α knocked down CD4+CD25⁻CD45RBhi cells.

Results: Our results show that the expression of Ubc9, the E2 enzyme that targets ROR- γ t for SUMOylation, is significantly reduced in the colonic mucosa of ulcerative colitis patients. Mechanistically, we demonstrate that HIF-1 α binds to a CpG island within the Ubc9 gene promoter, resulting in its hypermethylation and reduced Ubc9 expression. CRISPR-Cas9-mediated inhibition of HIF-1 α normalized Ubc9 and attenuated IL-17 expression in Th17 cells and reduced disease severity in Rag1^{-/-} mice upon adoptive transfer.

Conclusion: Our studies demonstrate that HIF-1 α inhibits Ubc9 expression via promoter DNA methylation. HIF-1 α -depleted Th17 cells are less colitogenic after adoptive transfer. These studies further highlight important cell-specific proinflammatory roles of HIF-1 α that should be considered when designing strategies to treat gut inflammation by targeting HIF-1 α .

Presentation #04

Title: Feasibility of Assessing Steps, Pain and Mood Using the Annie Texting Platform in Older Veterans with Chronic Back Pain and Depression

Presenter: Aradhna Agarwal

Authors: Aradhna Agarwal, MD, MPH, Timothy Hogan, PhD, Alicia Heapy, PhD, James LePage, PhD, Una Makris, MD, Msc

Faculty Mentor(s): Una Makris

Abstract:

Background: Chronic low back pain (cLBP) and comorbid depressive symptoms in older adults are major public health concerns and non-pharmacologic interventions for their treatment in this population are urgently needed. Our group developed a novel 8-session, telephone-delivered intervention targeting older adults with cLBP and depressive symptoms. MOTIVATE (Moving to Improve Chronic Back Pain and Depression in Older Adults) is delivered by a health coach using motivational interviewing and value-concordant goal setting to increase physical activity. In this sub-study, we will assess the feasibility of a texting-based protocol to assess steps among older veterans with cLBP and depressive symptoms.

Methods: We will use the VA-developed ANNIE texting system for sending texts and capturing data on step counts, pain scores, and mood. We will recruit older Veterans (>65 years of age) from a subset of the waitlist control group from the existing pilot randomized control trial (RCT). Quantitative data will be collected using the Annie dashboard. There are two phases to the sub-study. In the first phase, up to five veterans who have completed MOTIVATE will provide feedback on the messaging and understandability of the texting system via telephone interview and survey response. In the second phase, we will purposefully select a subgroup that represents extremes of older age, women and minority veterans (n=10) who will receive standardized texts regarding daily step counts, pain, and mood symptoms (see Image) and provide feedback on barriers and facilitators of using the texting system via semi-structured individual interviews.

Results: From the pilot RCT of MOTIVATE (mean age 71 years, 87% men, 51% White, 40% Black), a purposefully selected diverse subgroup of participants will provide feedback. Results from this feasibility study will be presented.

Conclusions: This pilot study will determine the feasibility and usability of the Annie texting system to assess step counts, pain and mood among older Veterans already enrolled in a novel behavioral non-pharmacologic intervention designed to enhance activity in patients with comorbid chronic back pain and depressive symptoms.

Presentation #05

Title: Telemedicine Assessment of Jugular Venous Pressure: Volume Status by Video Call

Presenter: Samuel Aidan Kelly

Authors: Samuel Kelly, MD, MBE, Kevin Schesing, MD, Jennifer Thibodeau MD, MSCS, Colby Ayers, MS, Mark Drazner, MD, MSc

Faculty Mentor(s): Mark Drazner and Jennifer Thibodeau

Abstract:

Background: Assessment of jugular venous pressure (JVP) is considered vital to assessment of patients with heart failure. To date, JVP evaluation has required bedside examination by a clinician. Given increasing utilization of telehealth, we conducted a prospective observational study comparing bedside JVP estimates with those performed over video chat for detection of elevated right atrial pressure (RAP).

Methods: We enrolled 31 adults with reduced left-ventricular ejection fraction (LVEF \leq 40%) whose clinical care required right heart catheterization (RHC). Each underwent one bedside evaluation and up to 4 remote evaluations by separate cardiologists. 63 remote evaluations were attempted; two remote evaluators (3%) were unable to estimate the JVP. Remote assessments were completed using Google Duo[®], Facetime[®] or WhatsApp[®]. A bedside housestaff member repositioned the smartphone and patient as directed by the remote evaluator. C-statistics were calculated for bedside and remote JVP estimates (multiplied by 0.74 to convert to mmHg) relative to RAP \geq 10 mmHg, then compared by bootstrapping with 500 replications. Generalized estimating equations with a logit link function were applied to account for repeat remote assessments of individual subjects.

Results: The bedside and remote JVP estimates ($r=0.37$, $p<0.001$), bedside JVP and RAP ($r=0.57$, $p<0.0001$), and remote JVP and RAP ($r=0.62$, $p=0.0001$) were significantly correlated. Both remote [OR=2.9 (1.5,5.8)] and bedside [OR=3.7 (1.02,13)] JVP estimates were associated with RAP in logistic regression models. Both discriminated for an elevated RAP with comparable c-statistics ($p=0.6$). Remote evaluators reported lower confidence than bedside evaluators [3.3 (2.8,4.0) vs. 4.0 (4.0,5.0) respectively, $p<0.001$]. Confidence level was not associated with ability to identify RAP \geq 10 mmHg ($p=0.6$).

Conclusions: We found that 1) both bedside and remote JVP estimates were significantly correlated with measured RAP; 2) both estimates demonstrated good discrimination of RAP \geq 10 mmHg; and 3) remote evaluators, using commercially available smartphones, reported lower confidence levels but achieved similar discrimination of an elevated RAP versus bedside evaluators. To our knowledge, this is the first demonstration that the jugular venous pressure (JVP) can be assessed reliably over video. We believe that these data can be of particular value given the high use of telehealth during the COVID-19 pandemic.

Presentation #06

Title: Natural History and Risk of Hepatocellular Carcinoma in Patients with Indeterminate (LI-RADS 3) Lesions

Presenter: Ashwini Arvind

Authors: Ashwini Arvind, MBBS, Timothy Zaki, MD, Nicole E. Rich, MD MS, Takeshi Yokoo, MD, Gaurav Khatri, MD, Hao Zhu, MD, Adam C. Yopp, MD MS, Jorge A. Marrero, MD MS, Neehar D. Parikh, MD, Amit G. Singal, MD MS

Faculty Mentor(s): Amit G. Singal

Abstract:

Background: Liver observations classified as LR-3 by the Liver Imaging Reporting and Data System (LI-RADS) have an intermediate probability for hepatocellular carcinoma (HCC); however, their natural history and risk for progression remains unclear.

Methods: We conducted a retrospective cohort study of patients with cirrhosis and at least one LR-3 observation on magnetic resonance imaging (MRI) or computed tomography (CT) imaging between March 2015 and September 2018. Patients with a history of suspicious (LR-4) or definite (LR-5) HCC were excluded. Patients were followed until HCC diagnosis, death, liver transplantation, or end of follow up. We used Cox proportional hazard models to identify factors associated with progression, defined as development of an LR-4 or LR-5 lesion.

Results: Of 102 eligible patients with LR3, half (50.5%) of patients had a single LR-3 lesion, while 23.8% had two lesions, and 25.7% had three or more lesions. Median LR-3 lesion diameter was 1.1 cm (interquartile range 0.8 - 1.4 cm). Among the 70 patients with follow-up imaging, 6 (8.6%) developed an LR-4 (suspicious for HCC) and 18 (25.7%) developed an LR-5 (definite HCC) lesion over a median follow-up of 16.5 months (i.e., total proportion of 34.3% (95% confidence interval (CI) 23.4-46.6%)). Baseline alpha-fetoprotein level was associated with risk of progression (hazard ratio 1.01, 95% CI 1.00 - 1.02). Most (76.5%) patients who progressed to HCC were reported to have a baseline LR-3 lesion diameter of 1.0 cm or greater, although 3 patients had a sub-centimeter LR-3 lesion on index imaging.

Conclusions: Over one-third of patients with cirrhosis and an indeterminate (LR-3) observation progressed to suspicious (LR-4) or definite (LR-5) HCC, including some patients with sub-centimeter observations at baseline. These data highlight the need for continued monitoring of patients with indeterminate (LR-3) observations, although further studies are needed to determine optimal surveillance intervals.

Presentation #07

Title: Comparative Efficacy of Janus Kinase Inhibitors and TNF Inhibitors in Ankylosing Spondylitis: A Network Meta-Analysis

Presenter: Adela Castro Gutierrez

Authors: Adela Castro, MD, Andres Quiceno, MD, John Cush, MD

Faculty Mentor(s): John J. Cush and Andres Quiceno

Abstract:

Background: There is an unmet medical need for treatment of patients with active axial disease who have inadequate response to biologic DMARDs (bDMARDs). Janus kinase (JAK) inhibitors are not currently approved for use in active Ankylosing spondylitis (AS), but several clinical trials suggest their efficacy (1). This study aims to compare the relative efficacy of JAK inhibitors and TNF inhibitors for the treatment of active AS.

Methods: We conducted a Bayesian NMA of randomized controlled trials (RCTs) examining the relative efficacy of TNF inhibitors and JAK inhibitors in patients with active AS who had inadequate response or intolerance to NSAIDs. Systematic review was performed until February 2020. Studies of IL-17 inhibitors were excluded after analysis showed inconsistency likely due to high placebo responses. NMA was conducted by Stata 16.0 software using odds ratio (OR) with 95% credible interval (CrI) to assess the clinical effectiveness. Surface Under Cumulative Ranking curve (SUCRA) was used to analyze the relative efficacy ranking of different treatments in terms of achievement of $\geq 20\%$ in the Assessment of Spondyloarthritis International Society Criteria (ASAS20) at 12-16 weeks.

Results: We identified 19 RCTs that enrolled 3,654 patients with active AS. There were 120 pairwise comparisons including 20 direct comparisons of 16 interventions. Compared with placebo, all the interventions showed an improvement in ASAS20 response rate, except for tofacitinib 2mg twice a day (bid) and tofacitinib 10 mg bid dose groups (Table 1). Golimumab IV 2mg/kg showed the highest response rate (OR 7.74, 95% CrI 4.18- 14.34). The ranking probability based on the SUCRA indicated that golimumab IV 2mg/kg (SUCRA = 0.9), infliximab IV 5mg/kg (SUCRA = 0.8) and tofacitinib 5mg bid (SUCRA = 0.8) had the highest probability of achieving the best (optimal) outcome. We subjectively ranked the best therapies, based on SUCRA cut-offs, as optimal (SUCRA >0.8), good (SUCRA 0.5-0.7), or effective (SUCRA <0.4). There were no differences in effectiveness between TNF inhibitors.

Conclusion: In patients with active AS, golimumab 2mg IV, infliximab 5mg IV and tofacitinib 5mg bid were most efficacious in achieving ASAS 20. JAK inhibitors seem to be an efficacious alternative in management of AS.

Presentation #08

Title: A Decade of Suspected Giant Cell Arteritis Cases Presenting to Dallas Veterans Affairs Medical Center: Clinical Features of a Highly Heterogeneous Disease

Presenter: Adela Castro Gutierrez

Authors: Adela Castro, MD, Jiby Mathew, DNP, Andreas Reimold, MD, Kyawt Shwin, MD

Faculty Mentor(s): Kyawt Shwin

Abstract:

Background: Giant cell arteritis is the most common chronic systemic vasculitis in older adults. Permanent visual loss is the most concerning complication of this disease. Diagnosis is based on a combination of clinical findings, laboratory evidence of inflammatory markers, and temporal artery biopsy (TAB) confirming histologic evidence of inflammation. There are no definitive markers of the disease when TAB is negative. The objective of this study was to illustrate the clinical features of subjects suspected with GCA evaluated at the Dallas Veterans Affairs Medical Center (VAMC) and identify those features that would differentiate between TAB positive GCA, TAB negative GCA and non-GCA patients.

Methods: This retrospective study searched the Dallas VAMC database for subjects between January of 2010 until December 2019 with ICD-9 and ICD-10 entry code for GCA. Based on the 1990 ACR clinical classification criteria for GCA, suspected patients were classified as TAB positive GCA, TAB negative GCA and non-GCA. Group comparisons were performed with Fisher's exact test for categorical variables and the Mann-Whitney test for continuous variables.

Results: On this cohort, 169 subjects had ICD-9/10 entry code for GCA. Ophthalmology did the initial evaluation in 46% of the suspected cases. 71 patients were excluded due to incomplete data. Of the remaining 98 patients, 42 (42.9%) were diagnosed with GCA out of which 10 patients had a positive TAB. 76% of patients diagnosed with GCA had negative temporal artery biopsies. New-onset headache was the predominant symptom suggestive of GCA affecting 88.9% TAB positive and 100% of TAB negative cases compared to 56.6% of non-GCA patients ($p < 0.001$), followed by scalp tenderness in 33.3%, 58.1% and 10.9%, respectively ($p < 0.001$), jaw claudication in 57.1%, 34.5% and 14.9% ($p = 0.021$), and elevated sedimentation rate in 33%, 65.6% and 33% ($p = 0.013$) (Table 1). PMR was present in 28.6% and 21.7% of patients diagnosed with GCA compared to zero percent in non-GCA cases ($p = 0.017$).

Conclusion: There is clinical heterogeneity within the patients diagnosed with GCA regardless of TAB. A high index of clinical suspicion needs to be the cornerstone of diagnosis. There is need for new classification criteria to include patients with negative TAB.

Presentation #09

Title: Impact of Narrative Reflection on Resident Well-being and Development

Presenter: Sarah Herrman

Authors: Sarah L. Herrman MD, Joshua B. Immergluck MD, Ashwin V. Rao MD, Kayla Riggs MD, Shannon A. Scielzo Ph.D

Faculty Mentor(s): Shannon A. Scielzo

Abstract:

Background: Physician trainees face daily intellectual, physical, and emotional challenges with a noted impact on well-being. Furthermore, despite ACGME core requirements to develop competency in self-assessment, scheduling demands rarely allow time for residents to build critical reflection skills required to be an effective clinician. Accordingly, we developed, administered, and evaluated the role of a novel narrative medicine workshop in internal medicine (IM) resident aimed at building self-reflection skills and improving well-being.

Methods: Our narrative medicine workshop paired written reflection and mindfulness exercises. Drawing from flash fiction, residents were provided guided prompts to write 6-word phrases subsequently expanded to a 55-word story. This was followed by small and large group discussions facilitated by Psychiatry and Palliative Care faculty. Well-being was assessed using a "well-being fuel gauge" (WBFG). Residents rated their "fuel tank" as: Empty (score of 0), $\frac{1}{4}$ full (25), $\frac{1}{2}$ full (50), $\frac{3}{4}$ full (75), or Full (100). Pre-and post-intervention mean WBFG scores were compared using paired samples t-test. Additional survey questions and open-ended feedback were collected post-intervention.

Results: Of 103 IM residency participants, forty-four (43%) completed both pre-and post-test surveys. Post-intervention mean WBFG scores were statistically higher than pre-intervention (81.82 vs 79.55, $p = .02$). Sixty-two percent respondents felt more comfortable using narrative medicine in reflection, with 79% stating they would incorporate this technique in clinical practice. Fifty-nine percent were open to further sessions. Notably, the workshop was made virtual due to COVID-19 pandemic restrictions, and 77% of (8 of 13) participants from the first session stated the digital format did not detract from their reflective experience.

Conclusions: Reflection is vital in medicine for supporting well-being and providing trainees with the tools to grow from challenging situations. In this pilot study, we demonstrate a significant positive impact on resident well-being and empower physician trainees with an instrument for self-reflection. Additional studies with longitudinal follow up are needed to further validate the beneficial impact of narrative self-reflection in resident curricula.

Presentation #10

Title: Association Between Thigh Muscle Fat Infiltration and Incident Heart Failure: Data from the Health ABC Study

Presenter: Kevin Huynh

Authors: Kevin Huynh, Colby Ayers, Stephen Kritchevsky, Ian Neeland, Javed Butler, Ambarish Pandey, Jarett Berry

Faculty Mentor(s): Jarett Berry

Abstract:

Background: Obesity is a well-known risk factor for heart failure. However, less is known about the association between ectopic muscle fat deposition and incident heart failure.

Methods: We included 2399 participants from the Health ABC Study (Age 70-79, 48.4% male, 40.2% Black) without baseline HF. Thigh muscle fat infiltration was determined by low thigh muscle density (TMD) using thigh CT (in Hounsfield units). Visceral fat was measured by CT, and % body fat measured by DXA. Knee extension (quad) strength was measured using an isokinetic dynamometer and indexed to thigh muscle mass. All other risk factors measured according to standard protocols. Incident heart failure hospitalization was adjudicated and defined as either the primary or contributing cause. Multivariable-adjusted Cox proportional hazards regression models were used to evaluate the risk of incident HF associated with TMD.

Results: After 12.2 years median follow-up there were 485 incident HF events. TMD was inversely associated with HF risk across sex-specific tertiles of TMD. After multivariable adjustment for age, sex, race, education, blood pressure, glucose, prevalent coronary disease, and creatinine, high TMD was associated with a lower risk for HF [HR 95% CI: 0.75 (0.59-0.94), p=0.012, tertile 3 vs. tertile 1]. Hazard ratios for TMD were unchanged after additional adjustment for BMI [HR 0.76 (0.59-0.98)], total % fat [HR 0.75 (0.58-0.97)], visceral fat [HR 0.77 (0.61-0.99)], and thigh muscle strength [HR 0.77 (0.61-0.97)]. High TMD was associated with lower risk of incident HFrEF [HR 0.65 (0.44-0.97)], but not with HFpEF [HR 0.78 (0.5-1.22)]. Similar findings were observed when TMD was evaluated as a continuous covariate.

Conclusions: Thigh muscle fat infiltration as measured by low TMD is associated with an increased HF risk in the elderly. This association is independent of other measures of adiposity and muscle strength. These findings for overall HF risk reflect preferential associations with HFrEF, and not HFpEF risk.

Presentation #11

Title: Variables Associated with Response to Therapy in Patients with Interstitial Pneumonia with Autoimmune Features

Presenter: Elena Kopeikin Joerns

Authors: Elena K. Joerns, MD, Traci N. Adams, MD, Chad A. Newton, MD, MSCS, Lesley Davila, MD, Craig Glazer, MD, Dr. Joan Reisch, PhD, Bonnie Bermas, MD, David Karp, MD, PhD, Una E. Makris, MD, MSC.

Faculty Mentor(s): Una Makris

Abstract:

Background: We have limited knowledge of characteristics of patients with interstitial pneumonia with autoimmune features (IPAF) which predict response to immunosuppression. Thus, we currently have no data to guide optimal IPAF patient selection for therapy or the optimal immunosuppressive regimen in IPAF. In this study, we use a rigorously phenotyped cohort (based on published IPAF criteria) to characterize features predicting response to treatment.

Methods: We conducted a single-center retrospective cohort study of 65 IPAF patients to evaluate for serologic, clinical, and morphologic characteristics predicting response to immunosuppression (defined as %FVC decline of less than 10%, absence of death or lung transplant within the first year of continuous immunosuppressive therapy).

Results: None of the baseline features, including the individual variables within the IPAF clinical, serological, or morphologic domain was associated with response to immunosuppression. There was a trend of greater progression amongst men, ever smokers, and SSB positive patients although the differences were not statistically significant. More patients had UIP radiographic pattern in the progressor group and the difference approached statistical significance (22.6% versus 50.0%, $p=0.056$). Among patients with disease progression, baseline %FVC was significantly higher than among non-progressors (70.25% versus 58.05%, $p=0.0133$). There was a statistically significant difference in the proportion of patients who were treated with combination therapy of mycophenolate mofetil and prednisone whose disease did not progress (75.5% versus 41.7%, $p=0.022$).

Conclusion: Our findings suggest that baseline clinical assessment cannot be used to predict which patients will respond to immunosuppression. Combination therapy with mycophenolate and prednisone may be beneficial for disease control in IPAF, including IPAF-UIP. Further studies are needed to evaluate which IPAF patients would benefit from immunosuppressive therapy, antifibrotic therapy, or a combination of both.

Presentation #12

Title: Hyperphosphatemia is Associated with Vasoconstriction and Endothelial Cell Dysfunction in Hemodialysis Patients

Presenter: Jinwoo Jung

Authors: Jinwoo Jung, MD, Hang Nguyen, BS, Haekyung Jeon-Slaughter, PhD, Peter Van Buren, MD MSCS

Faculty Mentor(s): Peter Van Buren

Abstract:

Background: Hyperphosphatemia is a consequence of impaired renal phosphate excretion that is very common in end-stage renal disease (ESRD) patients on hemodialysis and is associated with increased mortality. Vascular calcification is a well-known long-term consequence of hyperphosphatemia, but there are likely other adverse short-term cardiovascular effects of hyperphosphatemia. We sought to identify the associations between serum phosphate and vasoconstriction prior to dialysis treatments in ESRD patients and explore potential mechanisms.

Methods: We conducted a retrospective analysis of a cohort of hypertensive hemodialysis patients recruited for a separate study. We included patients who had measurements available prior to a mid-week hemodialysis treatment of total peripheral resistance index (TPRI, measured with non-invasive cardiac output monitor) and systolic blood pressure (BP). We reviewed the pre-dialysis labs from the prior 1-2 weeks obtained as part of routine clinical care. We conducted correlation and linear regression analysis to demonstrate the independent association between serum phosphate with systolic BP and TPRI. We conducted additional exploratory analyses using endothelin-1 and asymmetric dimethylarginine (ADMA) as outcome variables related to endothelial cell dysfunction.

Results: There were 60 patients with available data. Serum phosphate had significant correlations with systolic BP ($r=0.4$, $p=.005$), TPRI ($r=0.3$, $p=.02$), endothelin-1 ($r=0.3$, $p=.01$) and ADMA ($r=0.3$, $p=.01$). In a model controlling for demographics (age, sex, race, diabetes) and the percentage of interdialytic weight gain, serum phosphate remained an independent predictor of systolic BP ($\beta=3.6$, $p=.02$), TPRI ($\beta=0.04$ [log transformed], $p=.01$), endothelin-1 ($\beta=-.04$ [reciprocal transformed], $p=.02$), and ADMA ($\beta=0.03$, $p=.02$). In models controlling for these variables in addition to parathyroid hormone, protein catabolic rate and serum albumin, the significant independent associations persisted.

Discussion: Serum phosphate is associated with increased BP and vasoconstriction before dialysis. This is independent of demographic factors known to be associated with pre-dialysis hypertension and other factors that reflect dietary intake of sodium, water, and protein. Serum phosphate is also associated with endothelin-1 and ADMA, but parathyroid hormone confounds the relationship with the latter. In addition to the well-established consequence of vascular calcification, hyperphosphatemia and bone mineral disease in general may independently impair BP control through dysregulation of vasoconstrictive mediators.

Presentation #0013

Title: Outcomes in Left Ventricular Thrombi Treated with Direct Oral Anticoagulants at a Safety Net Hospital.

Presenter: Anne Marie Kerchberger

Authors: Anne Marie Kerchberger, MD M Eng, Rina Mauricio, MD, Chris Mathew, PharmD BCCP, Sandeep R. Das, MD MPH.

Faculty Mentor(s): Sandeep R. Das

Abstract:

Background: Direct oral anticoagulants (DoACs) are used off-label for the treatment of left ventricular (LV) thrombus. DoACs offer potential logistic and safety advantages over warfarin in a safety net hospital such as easier dosing, few drug and diet interactions, and lack of frequent laboratory visit requirements. DoACs have not been studied for this indication in a randomized control trial. Previously, observational efficacy and safety data are mixed. Finally, no data are available from safety net settings. This study assessed the efficacy and safety of DOACs for the treatment of LV thrombus in a multi-ethnic urban patient population receiving care in a safety net setting.

Methods: A retrospective chart review of patients treated with DoACs for LV thrombus from January 2017 to February 2020 at a large urban safety net hospital was performed. Baseline demographic, clinical, and echocardiographic data, and adverse events during treatment were collected.

Results: Forty patients were treated with DoACs over the study period. Their average age was 52 +/- 11 years, 19 (48%) were African American and 12 (30%) were women. Average LV ejection fraction at diagnosis was 23 +/- 13 %. Average treatment length was 16 +/- 10 months. At thrombus diagnosis, 19 (48%) initiated rivaroxaban and 21 started warfarin then transitioned to rivaroxaban (17, 43%) or apixaban (4, 10%). Four patients were lost to follow up. Twenty-two (76%) of 29 follow up echoes demonstrated thrombus resolution. Adverse events included 2 non-hemorrhagic strokes and 3 non-bleeding related deaths.

Conclusion: In a multi-ethnic urban patient population receiving care at a safety net hospital who were treated with DoACs for LV thrombi, LV thrombi resolved in a majority of patients who received follow up echocardiograms. Although small, the study noted no serious bleeding-related complications. These results underscore the need for randomized trials to understand the efficacy and safety of DOACs for the treatment of LV thrombus, particularly in safety net settings where management of warfarin may be especially challenging.

Presentation #14

Title: Clinical Response to Immunosuppression in Fibrotic Hypersensitivity Pneumonitis

Presenter: Margaret Kypreos

Authors: Margaret Kypreos, MD, Traci Adams, MD, Esther de Boer, MD, PhD, Kiran Batra, MD, Craig Glazer, MD, Chad A. Newton, MD

Faculty Mentor(s): Chad Newton Traci Adams

Abstract:

Background: Patients with hypersensitivity pneumonitis (HP) are often treated with immunosuppression (IS) with varied response. Nintedanib, an antifibrotic medication, is effective in progressive fibrotic interstitial lung diseases, including HP. Given the option of treating with IS or nintedanib, it is unclear which patients should be preferentially treated with IS. We aimed to identify IS treatment effect modifier variables in patients with fibrotic HP.

Methods: This was a single center retrospective study of HP patients from 1/2004-1/2018. Patients were excluded for < 6-month follow up, exposure to IS at initial evaluation, or no fibrosis on high-resolution CT (HRCT). Patients exposed to IS (prednisone, azathioprine, or mycophenolate) were compared to those without exposure (control). To account for baseline differences between treatment groups, propensity score matching was performed; covariates included age, gender, ethnicity, smoking history, baseline forced vital capacity (FVC%), diffusion of lung for carbon monoxide (DLCO%). Potential treatment effect modifier variables were abstracted from the medical record. Transplant-free survival was assessed using multivariable Cox proportional hazards model that included an interaction term for each potential modifier and IS exposure (modifier variable x treatment); p-interaction <0.05 was considered significant for treatment effect modifier. FVC% change over 1-year from IS initiation was estimated using linear mixed-effect model with an interaction term for each potential modifier and IS exposure included as fixed effects.

Results: After propensity matching, there were 92 patients included (46 in the IS and 46 in the non-IS groups); there were no baseline differences ($p > 0.05$ for all variables). None of the patient demographics, baseline lung function, peripheral blood counts, blood inflammatory markers, serologies, and HRCT features modified treatment effect of IS on transplant-free survival (p -interaction > 0.05 for all variables). In patients exposed to IS, BAL lymphocyte $> 20\%$ was associated with improved FVC% at 1 year (+7.5% vs -2.8, $p = 0.044$), while traction bronchiectasis on HRCT (-4.0% vs + 7.2%, $p = 0.007$) and usual interstitial pneumonia pattern on HRCT or pathology (-9.1% vs +1.6%, $p = 0.022$) was associated with decline in FVC% at 1 year.

Conclusions: In fibrotic HP patients, the association between IS treatment and transplant-free survival did not differ by commonly assessed baseline characteristics.

Presentation #15

Title: Comparison of intracranial progression between patients with renal cell carcinoma and brain metastases treated with immune checkpoint inhibitors or tyrosine kinase inhibitors

Presenter: Sunny Lai

Authors: Sunny Lai MD, Roy Elias MD, Chandra Subedi BS, James Brugarolas MD

Faculty Mentor(s): James Brugarolas

Abstract:

Background: Immune checkpoint inhibitors (ICIs) have joined tyrosine kinase inhibitors (TKIs) as a cornerstone of early-line therapy for patients with metastatic renal cell carcinoma (RCC). However, patients with brain metastases were frequently excluded from trials investigating ICIs. Studies in metastatic melanoma and non-small cell lung cancer suggest that ICIs have intracranial activity, but no such data exists for RCC. We compared intracranial progression between patients with RCC treated with ICIs and TKIs.

Methods: This study was a retrospective cohort study of patients treated at UT Southwestern with RCC and brain metastases who received ICIs or TKIs following the diagnosis of brain metastases. Our primary outcomes were brain metastasis velocity (BMV), defined as the number of new metastases divided by time while on the therapy of interest, and time to new intracranial metastasis. We also examined the primary outcome in the subset of patients who had an initial extracranial response to therapy and the association between BMV and progression free survival and overall survival.

Results: We identified 24 patients treated with ICIs and 27 patients treated with TKIs following the diagnosis of brain metastases. All patients received local therapy, either surgical resection or stereotactic radiation, to their brain metastases. There was not a statistically significant difference in BMV between patients who received ICIs and TKIs (mean BMV 0.42 vs 0.55 metastases/month, $p = 0.50$) or in time to new intracranial metastasis (median time 10.2 months vs 14.7 months, $p = 0.61$). Similarly, there was not a statistically significant difference in the primary outcomes between groups for the subset of patients with an initial extracranial response. A higher BMV was significantly associated with worse progression free survival and overall survival.

Conclusions: We did not identify a difference in intracranial progression between patients treated with ICIs and TKIs following the diagnosis of brain metastases in patients with RCC. Further investigation is required to determine if ICIs have intracranial activity in patients with RCC. We found that a high BMV was associated with worse progression free survival and overall survival in patients with RCC and brain metastases, which is a novel finding.

Presentation #16

Title: Association of Inflammatory Biomarkers with Immunosuppression Management and Outcomes in Kidney Transplant Recipients with COVID-19

Presenter: Meredith McAdams

Authors: Meredith McAdams, MD, Nashila AbdulRahim, D.,MS, David Wojciechowski, DO, Ricardo La Hoz, MD, Christopher Lu, MD, Miguel Vazquez, MD, S. Susan Hedayati, MD, MSc

Faculty Mentor(s): Susan Hedayati

Abstract:

Background: The COVID-19 pandemic raises important questions about immunosuppression management and outcomes in kidney transplant recipients.

Methods: We investigated incidence and recovery of AKI at 90 days, factors associated with a composite outcome of AKI, ICU admission, or death, and whether changes made to immunosuppressants correlated with changes in inflammatory biomarkers and outcomes in kidney transplant recipients with a positive SARS-CoV2 PCR at Parkland and CUH from 3/1/20-10/1/20. Univariate and multivariate backward selection logistic regression identified risk factors for the composite. Non-parametric tests compared biomarkers based on changes in immunosuppressant drugs.

Results: Of 59 patients, mean age (SD) was 51 (14) years, 59% were male, 22% Black, and 61% Hispanic. Half had a baseline eGFR<60 mL/min/1.73 m², 88% had hypertension, and 56% diabetes. Fifty-five (93%) were on calcineurin inhibitors (CNI) and 49 (83%) on antimetabolites at baseline. Baseline ferritin was higher in those who had CNI dose decreased or discontinued vs. those with CNI unchanged, median (IQR) 1271 (839-1932) vs. 283 (124-569) ng/mL, p=0.0002. Patients who stopped CNI had higher peak hsCRP than those maintained on the same dose, median (IQR) 344 (145-374) vs. 41 (22-116) mg/L, p=0.03. There were no associations between changes in anti-metabolite and inflammatory markers. Seventy-three percent were hospitalized, 22% admitted to ICU, and 20% died. Of 52 patients with creatinines, 29 (56%) had AKI, of which 10 (35%) required dialysis. AKI recovered (creatinine within 10% of baseline) in 46%. Factors associated with the composite included eGFR<60, OR (95% CI)=5.833 (1.880-18.099), p=0.002, peak hsCRP, OR=1.011 per unit increase (1.002-1.021), p=0.019, peak WBC, OR=1.173 per unit increase (1.006-1.368), p=0.041, and having CNI decreased or discontinued, OR=4.286 (1.353-13.572), p=0.013. eGFR<60, OR=11.176 (1.581-79.001), p=0.016, and peak hsCRP, OR =1.010 per unit increase (1.000-1.020), p=0.049, were associated with the composite in the multivariable model (area under the curve=0.89).

Conclusions: Kidney transplant patients with COVID-19 have high rates of ICU admissions, AKI, and death. Those with eGFR<60 are at highest risk. Reduction or discontinuation in CNI associates with higher inflammatory biomarkers that seem to correlate with worse outcomes. More studies are needed to determine if this association should drive clinical management.

Presentation #17

Title: The Hemodynamic Gain Index and Cardiorespiratory Fitness in Patients with Heart Failure with Preserved Ejection Fraction - Insights from RELAX

Presenter: Vicente Morales Oyarvide

Authors: Vicente Morales Oyarvide, MD, MPH, Donald Richards, MD, MPH, Nicholas R. Hendren, MD, Katherine Michelis, MD, Thanat Chaikijurajai, MD, Siu-Hin Wan, MD, Ambarish Pandey, MD, MSCS, Mark H. Drazner, MD, MSc, W.H. Wilson Tang, MD, Justin L. Grodin, MD, MPH

Faculty Mentor(s): Justin L. Grodin

Abstract:

Background: Decreased exercise capacity is a hallmark of heart failure with preserved ejection fraction (HFpEF). Our goal was to establish the association of the hemodynamic gain index (HGI) - a simple, integrated marker of hemodynamic reserve - with standard measures of cardiorespiratory fitness.

Methods: In 209 subjects with HFpEF enrolled in the RELAX trial who underwent a cardiopulmonary exercise test at baseline, we calculated the HGI $[(\text{peak HR} \times \text{peak SBP}) / (\text{rest HR} \times \text{rest SBP})]$ and explored its association with baseline patient demographics, clinical characteristics, and biomarkers. Using multivariable-adjusted linear regression, we evaluated the association of HGI with cardiorespiratory fitness at baseline and with a composite clinical score assessed after 24 weeks of follow up.

Results: The median (interquartile range) HGI, peak oxygen consumption (VO₂), and respiratory exchange ratio (RER) was 0.94 (0.78) bpm/mmHg, 11.7 (4.2) ml/kg/min, and 1.09 (0.13), respectively. The median age in our cohort was 69 years and 47% of participants were women. Compared to participants in the lowest HGI tertile, those in the highest tertile had lower rates of atrial fibrillation (P=0.002), permanent pacemakers (P<0.001), and beta-blocker use (P=0.038); they also had lower serum creatinine, NT pro-BNP, and endothelin-1 (all P<0.001). In multivariable-adjusted linear regression analyses, higher HGI was associated with greater peak VO₂ (standardized coefficient=0.36, P<0.001), VO₂ at anaerobic threshold (standardized coefficient=0.19, P<0.001), and 6-minute walk distance (standardized coefficient=0.28, P<0.001), but not with the composite clinical score at 24 weeks (P=0.33). In subgroup analyses, there was no effect modification on the association of HGI with peak VO₂, VO₂ at anaerobic threshold, and 6-minute walk distance by patient's age, sex, history of atrial fibrillation, permanent pacemaker, beta-blockers use, or peak RER (P interaction >0.05 for all).

Conclusion: The HGI is associated with distinct clinical and biochemical characteristics in patients with HFpEF and is independently associated with multiple measures of cardiorespiratory fitness in this patient population. Although its prognostic role needs further validation, the HGI may help to risk-stratify heart failure patients undergoing cardiorespiratory exercise testing and could be part of an innovative strategy to monitor functional status through wearable devices.

Presentation #18

Title: Acute Kidney Injury in Inpatients with COVID-19: Predicators and Outcomes

Presenter: Mauricio Ostrosky Frid

Authors: Mauricio Ostrosky-Frid, MD, Meredith McAdams, MD, Pin Xu, PhD, MS, Christoph U. Lehmann, MD, DuWayne Willett, MD, S. Susan Hedayati, MD, MS

Faculty Mentor(s): Susan Hedayati

Abstract:

Background: Prevalence of AKI in COVID-19 and associated risk factors are poorly described.

Methods: We collected demographics, comorbidities, and biomarkers for patients with a positive SARS-CoV2 PCR admitted to Texas hospitals between 3/13/2020-1/1/2021 from the electronic health record. We defined presence of AKI using the Kidney Disease Improving Global Outcomes (KDIGO) guidelines. Risk factors associated with AKI were evaluated using univariable and multivariable logistic regression. Nested AKI prediction models were built by adding inflammatory (Ferritin, LDH, D-Dimer) and cardiac (Troponin, BNP/NT-proBNP) biomarkers and COVID-19-specific treatments (steroids, tocilizumab, hydroxychloroquine, remdesivir, ventilation) to the base model (age, sex, race, smoking, hypertension (HTN), diabetes mellitus (DM), chronic kidney disease (CKD), heart disease, ACEI/ARB use, and WBC, HgB, and CRP at admission) to assess accuracy improvements. We used Kaplan-Meier curves and Cox proportional hazards models to evaluate mortality.

Results: Of 9,681 patients, 3,666 (38%) met criteria for AKI. Of those, 396 (11%) required renal replacement therapy (RRT). AKI patients were significantly older (mean (SD) age 67 (16) vs. 60 (18) years), more likely male (58% vs. 47%), black (21% vs. 15%), and more likely to have HTN (78% vs. 57%), DM (52% vs. 32%), and CKD (55% vs. 17%) (all $p < 0.001$).

The base model for prediction of AKI had an area under the curve (AUC) of 76.8% (95% CI 75.6%-78.0%). Additional components improved the prognostic ability of the base model incrementally with a final AUC of 81.6% (95% CI 80.5%-82.6%), incremental p all < 0.05 .

There were 989 deaths, 811 (22.1%) in patients with AKI and 178 (3%) without. An increased death risk was seen in AKI patients compared to those without, HR (95% CI)= 3.08 (2.56-3.71). This risk persisted after controlling for variables associated with AKI in univariable models (older age, male sex, black race, HTN, DM, ACE/ARB use, CKD, ventilation, higher initial WBC, CRP, Ferritin, and D-dimer, and abnormal troponin), HR (95% CI)= 1.64 (1.34-2.01).

Conclusions: Of hospitalized patients with COVID-19, 38% had AKI, which was associated with an increased risk of death. Inflammatory, cardiac biomarkers, and COVID-related treatments can improve predictive models for AKI in this setting.

Presentation #19

Title: Trends in Severe Acute Idiosyncratic Drug Induced Liver Injury: An update from the ALFSG Registry

Presenter: Ashwin Rao

Authors: Ashwin Rao, MD Jody Rule, PhD Bilal Hameed, MD Daniel Ganger, MD Robert Fontana, MD William Lee, MD

Faculty Mentor(s): William Lee

Abstract:

Background: Idiosyncratic drug-induced liver injury (DILI) is the second-leading cause of acute liver failure (ALF) in the US. We characterize clinical/demographic characteristics, agents implicated, and outcomes in DILI ALF.

Methods: Of 3167 enrolled subjects, DILI was identified as the primary etiology of ALF (INR 1.5 with encephalopathy) in 277, after exclusion of other etiologies and adjudication by a panel of experienced hepatologists. Primary outcomes at 21 days after enrollment were transplant-free survival (TFS), liver transplantation (LT), or death.

Results: Among 324 DILI cases, 277 were ALF; 97 individual agents were implicated, alone or in combination, as the primary etiology. Antimicrobials (43%) were the most commonly implicated drug category with the most frequently implicated individual agents being isoniazid (INH, n=36), nitrofurantoin (17), and trimethoprim-sulfamethoxazole (15). There were a similar number of total cases in Era-1 ('98-'07, n=155) and Era-2 ('08-'17, n = 122) with the following trends:

- Increase in proportion of ALF cases of Herbal and Dietary Supplement (HDS) DILI (9.7% vs 22%; $p < .01$).
- Decreases in frequency of ALF secondary to INH (11.6% vs 6.6%), Nitrofurantoin (7.7% vs 4.1%), Anticonvulsants (7.1% vs 4.9%), NSAIDs (5.2% vs 1.6%) and Statins (4.5% vs 2.4%), and elimination of anti-retroviral cases (3.2% vs 0%)

Overall survival was 69.7% with 29.6% TFS and 40.1% requiring LT. 21-day TFS in DILI ALF improved (23.2%, Era-1 vs 37.7%, Era-2; $p < 0.01$). Concurrently, the number of patients transplanted declined (45.8% vs 32.8%; $p < 0.03$), while overall deaths also declined (33.6% vs 27.1%; $p = 0.24$). HDS cases had worse outcomes compared to other drug categories (TFS, $p < 0.01$; LT, $p < 0.0001$; death, $p < 0.04$). On univariate analysis, predictors of death or LT at 21 days were Era, Agent class, Coma grade, and MELD ($p < 0.01$, $p < 0.04$, $p < 0.02$, $p < 0.01$ respectively).

Conclusion: The changing landscape in DILI ALF reflects increased utilization of HDS supplements, removal of hepatotoxic drugs from the marketplace (Bromfenac, Cerivastatin, Nefazodone, Troglitazone), evolving disease incidence rates (Isoniazid), and drug development (less hepatotoxic second generation anti-retrovirals and anticonvulsants). Low TFS in DILI ALF emphasizes the need for early evaluation and liver transplantation, though improving TFS with decreased need for LT are signs for cautious optimism.

Presentation #20

Title: The Hemodynamic Basis for Bendopnea

Presenter: Goutham Ravipati

Authors: Goutham Ravipati, MD; Jennifer Thibodeau, MD; Colby Ayers, MS; Mark H. Drazner, MD

Faculty Mentor(s): Mark Drazner and Jennifer Thibodeau

Abstract:

Background: Bendopnea, dyspnea when bending forward as when putting on shoes, is a common symptom in patients with chronic heart failure (CHF). It was first described by investigators at UT Southwestern in 2014. In that study, bendopnea was associated both with left ventricular filling pressures and elevated pulmonary artery pressures, likely because these two parameters themselves are tightly correlated in CHF, leaving some uncertainty as to the hemodynamic basis of this symptom.

Methods: We conducted a prospective observational study in patients with CHF and elevated pulmonary capillary wedge pressure (PCWP) or patients with pulmonary hypertension (PH) in the absence of an elevated PCWP, hypothesizing this approach would allow us to tease out which of these parameters was associated with bendopnea. We enrolled 83 CHF and 52 PH patients who were referred for a right heart catheterization at Clements University Hospital and met the following criteria: CHF subjects had to have a PCWP ≥ 16 mmHg and PH subjects a mean pulmonary artery pressure (MPA) ≥ 20 mmHg with PCWP < 16 mm Hg. Immediately prior to a right heart catheterization, each patient was tested for bendopnea. The cardiologist performing the RHC was blinded to the presence of bendopnea. Logistic regression was used to assess the association of bendopnea with the PCWP, MPA, and pulmonary artery systolic pressure (PASP).

Results: Bendopnea was present in 27% of the entire cohort of patients. Bendopnea was more common in those patients with CHF than with PH (36% vs. 13%, $p < 0.01$, respectively). Among the entire cohort, PCWP was associated with bendopnea (OR 1.1 [1.05, 1.15], $p < 0.001$) but PASP ($p = 0.75$) was not. In models in which both PASP and PCWP were entered as covariates, PCWP (OR 1.1 [1.04, 1.15], $p < 0.001$) remained associated with bendopnea but PASP ($p = 0.99$) was not. When a similar analysis was done with PCWP and MPA, PCWP (OR 1.1 [1.04, 1.15], $p = 0.001$) was associated with bendopnea, but MPA ($p = 0.44$) was not.

Conclusion: Elevated left ventricular filling pressures, rather than elevated pulmonary artery pressures, are the hemodynamic basis of bendopnea.

Presentation #21

Title: In-patient diet and hypertriglyceridemia

Presenter: Shrenika Reddy

Authors: Shrenika Reddy, MD, Zahid Ahmad, MD

Faculty Mentor(s): Zahid Ahmad

Abstract:

Background: Severe hypertriglyceridemia, defined as Triglycerides ≥ 1000 mg/dl, is the 3rd most common cause of acute pancreatitis. Based on expert opinion, management of severe hypertriglyceridemia includes implementing an extremely low-fat diet (0-30g of fat/day). However, it remains unknown, how often such diets are utilized for patients with severe hypertriglyceridemia and effects of moderate fat restriction (50g of fat/day) on outcomes in inpatient settings.

Methods: We queried the electronic medical record of a large urban hospital in Dallas, TX (Clements University Hospital) for all inpatient encounters between 1/8/2015-1/8/2020, with at least one serum triglyceride ≥ 1000 mg/dl. We obtained all inpatient diets ordered and assessed for any differences in length of stay (LOS) and triglycerides between admissions that included a moderate/extreme fat-restricted diet order (Fat-restricted group) and those including other diets (Other-diet group).

Results: Our cohort consisted of 117 encounters and 96 patients. Average age \pm standard deviation (SD) was 43 ± 15 years. 65% of the patients were men, with an average BMI \pm SD of 31 ± 7.2 and predominantly of European ancestry (41% of patients). Median triglyceride (range) was 1335 (1003 - 6589) mg/dl. The most common admission diagnosis was uncontrolled Type 2 diabetes (49% of all encounters) followed by Acute pancreatitis (33% of all encounters). $<1\%$ ($n=1$) of all encounters utilized an extremely low-fat diet order. 18% ($n=21$) of all encounters utilized a moderate fat-restricted diet. A larger absolute and percentage reduction in triglycerides were noted in the Fat-restricted group compared to Other-diets group (P value 0.026 and 0.018 respectively). Between these groups, the differences in the median LOS (5 days vs 4 days), admission triglycerides (2172 mg/dl vs 1157 mg/dl), discharge triglycerides (368 mg/dl vs 539 mg/dl), time to achieving triglycerides ≤ 1000 (1 day vs 1 day), respectively, were not statistically significant.

Conclusion: This study demonstrates low implementation rates of fat restricted diets in in-patients with severe hypertriglyceridemia. We also conclude that even moderate dietary fat restriction can cause larger reduction in triglycerides in an admission compared to other diets, however this did not affect the overall LOS in our small cohort.

Presentation #22

Title: Does resting metabolic rate predict future weight gain?

Presenter: James Reneau

Authors: James Reneau, MD, Elaine Wu, MS, Minjae Lee, PhD, Jarett Berry, MD.

Faculty Mentor(s): Jarett Berry

Abstract:

Background: Weight gain in early middle age is common and strongly associated with an increased burden of cardiometabolic complications. While lower levels of resting energy consumption (lower resting metabolic rate, RMR) and higher resting carbohydrate metabolism (higher respiratory exchange ratio, RER) have been associated with weight gain, findings have been inconsistent. Therefore, we sought to determine the association between RMR and RER acquired from indirect calorimetry and weight gain in a large, biracial sample of young, healthy adults.

Methods: We included 389 participants from the CARDIA study (average age 35, 51% non-Hispanic white, 51% women) with baseline measures of both RMR and RER acquired from indirect calorimetry (Sensormedics 2900 Metabolic Cart). Weight was measured at baseline and in follow-up exams. The association between both RMR and RER on 20-year change in weight were analyzed in longitudinal linear regression analyses using mixed effect models that account for potential correlations of repeated measures within participants over time. Both RMR and RER were evaluated separately as sex-specific tertiles in models adjusted for age, sex, race, and baseline weight.

Results: At baseline, the average BMI was 26.7kg/m². Compared to the low RMR (sex-specific tertile 1), high RMR (tertile 3) was associated with greater baseline weight (89 vs 69 kg), height (174 vs 169cm), fat mass (29 vs 19kg), and lean mass (59 vs 48kg). In contrast, these anthropometric measures were similar across tertiles of RER. After 20-years of follow-up, the average weight gain was 7.4kg, representing a 9.9% change from baseline. After adjusting for age, race, sex, and baseline weight, low RMR was associated with 10.3kg increase in weight over 20 years ($p < 0.0001$) and high RMR was associated with a 3.4kg change in weight ($p < 0.05$), representing different longitudinal trajectories over time ($p\text{-int}=0.0223$). In contrast, weight gain was similar across tertiles of RER, with similar longitudinal trajectories over time ($p\text{-int} = 0.2296$). Findings were similar by race ($p\text{-int} = \text{ns}$).

Conclusion: Lower RMR in middle-age was independently associated with a greater increase in body weight over 20 years. Weight gain was similar across tertiles of RER.

Presentation #23

Title: Incidence of *Clostridioides difficile* infection from 2006-2017: Results from the Rochester Epidemiology Project

Presenter: Srishti Saha

Authors: Srishti Saha, MBBS, MD, Maria Jesus Rodriguez-Hernandez, Darrell S. Pardi, MD, MS, Sahil Khanna, MBBS, MS

Faculty Mentor(s): Sahil Khanna

Abstract:

Background: *Clostridioides difficile* infection (CDI) is the most common healthcare associated infection in the United States. There is a paucity of epidemiologic data on CDI in the last decade. We report the incidence of CDI over a 12 year period in a population based cohort consisting of both inpatients and outpatients.

Methods: A population based cohort study was conducted in Olmsted County, Minnesota from 2006-2017 using the Rochester Epidemiology Project database. CDI diagnosis codes were used to identify cases and records of patients who had not denied authorization for inclusion in research were reviewed. Patients with confirmed CDI (watery diarrhea with positive stool assay) were included. Incidence rates per 100,000 person-years were calculated using persons with CDI as numerator and age and sex specific counts of the Olmsted County population as denominator. The US Census 2010 was used to calculate adjusted rates (direct adjustment to the age and gender distribution of US whites). Poisson regression was used to assess trends in the incidence of primary CDI (first episode) over time in adults and pediatric age group (<18 years). Incidence of recurrent CDI (definite CDI any time after the primary episode, with interim resolution of symptoms) from 2006-2017 was also reported. For calculating the incidence of recurrent CDI, cases with primary CDI were taken as the denominator. $p < 0.05$ was considered statistically significant.

Results: From 2006-2017, 1598 cases of incident CDI occurred; 1441 (90.2%) of the patients were adults and 157 (9.8%) were pediatric; 966 (60.5%) were female. The overall age- and sex- adjusted incidence during the time period was 93.9 [95% confidence interval (CI), 89.3-98.5] per 100,000 person-years. In females and males, the age- adjusted incidence was 110.4 (95% CI, 103.4-117.4) and 76.6 (95% CI, 70.7-82.7) per 100,000 person years, respectively. Over the study period, the incidence of primary CDI increased in both adult and pediatric age groups ($p < 0.001$), with a significant increase after 2014. Overall, 31.5% (503) patients had a recurrence during follow up, with a recurrence rate of 143.1 per 1,000 person-years.

Conclusion: In this population based study, the incidence of primary CDI significantly increased in both the adult and pediatric age groups from 2006-2017, with a marked increase after 2014. The results are concerning, and indicate the need for further study to determine factors contributing to this increase.

Presentation #24

Title: Kinetics Of Stool Polymerase Chain Reaction In Clostridioides difficile Infection And Its Utility In Predicting Recurrence

Presenter: Srishti Saha

Authors: Srishti Saha, MBBS, MD, Ryan Pardi, Robin Patel, MD, Darrell Pardi, MD, MS, Sahil Khanna, MBBS, MS

Faculty Mentor(s): Sahil Khanna and Darrell Pardi

Abstract:

Introduction: Testing strategies for Clostridioides difficile infection (CDI) remain a clinical conundrum with stool polymerase chain reaction (PCR) being highly sensitive; this high sensitivity may mean that PCR would remain positive for several weeks after CDI resolution. We studied the kinetics of PCR testing positivity in CDI, and whether a positive test during or after treatment predicts recurrence.

Methods: Adults with watery diarrhea and positive C. difficile PCR from 10/2009 to 5/2017 were included. Treatment was given per standard of care. Five serial stool samples collected within 60 days after treatment initiation and additionally clinically indicated samples were included. Recurrent CDI was defined as typical CDI symptoms after interim symptom resolution with positive stool PCR within 56 days of treatment. A positive stool test in the absence of symptoms was considered colonization and treatment was not offered. Descriptive statistics and Fisher's test were used, as appropriate. Kaplan-Meier survival curves for time to first negative PCR from treatment initiation, and log-rank test to compare treatments [metronidazole (MET) vs vancomycin (VAN)] were used. $P < 0.05$ was considered statistically significant.

Results: Fifty patients, median age 51 (range 20-86) years, 66% female, were included. Initial treatment was MET in 50% (25), VAN in 44% (22), both MET and VAN in 4% (2) and fidaxomicin in 2% (1). Median treatment duration was 14 (range 8-60) days. Overall, 82% (41) patients submitted ≥ 3 samples at variable times. Median time to first negative PCR was 9 days

(95% CI, 7-14 days) after treatment initiation. This was similar in MET and VAN treated patients ($p=0.5$). CDI recurred in 28% (14) of patients. Overall, 13 patients (33%) had ≥ 1 positive PCR(s) during and 45% (19) had ≥ 1 positive PCR(s) after treatment. Patients with positive vs negative PCR(s) during treatment trended towards a higher risk of recurrence [OR 3.9 (95% CI, 0.9-16.1), $p=0.054$]. Patients with positive PCR(s) after treatment completion also had a non-significant trend towards a higher risk of recurrence [OR 2.8 (95% CI, 0.7-11.5), $p=0.15$].

Discussion: Median time to first negative PCR in CDI was 9 days from treatment initiation. Positive PCR during or after treatment did not predict recurrence, though the positive odds ratio indicates the need for a larger study. Patients with CDI should not routinely undergo repeat testing to predict recurrence.

Presentation #25

Title: Outcomes of Pediatric Hospital and Community-associated Clostridioides difficile infection

Presenter: Srishti Saha

Authors: Srishti Saha, MBBS, MD, Maria Rodriguez-Hernandez, PhD, Darrell S. Pardi, MD, Sahil Khanna, MBBS, MS

Faculty Mentor(s): Sahil Khanna

Abstract:

Background: Incidence of Clostridioides difficile infection (CDI) in pediatric population is increasing, with paucity of data on CDI outcomes in this population, particularly in community-associated cases.

Methods: A population-based cohort study of the pediatric age group (< 18 years) from 2006 to 2017 was conducted using the Rochester Epidemiology Project. CDI was diagnosed with watery diarrhea and a positive stool assay, after exclusion of other causes of diarrhea. CDI was defined as healthcare-associated (HA) if symptoms occurred >48 hours after admission to or < =4 weeks of hospital discharge; community-acquired (CA) if there was no discharge from a hospital in the past 12 weeks; rest were indeterminate. CDI was considered severe if WBC $\geq 15000/\mu\text{L}$ or creatinine $\geq 1.5\text{mg/dL}$, fulminant if there was ileus, megacolon, ICU admission, colectomy, hypotension or sepsis. Recurrence was defined with recurrent diarrhea within 8 weeks of the last episode, with positive stool assay and interim symptom resolution. Chi-square/Fischer's exact tests were used for comparison of baseline characteristics and outcomes. $p < 0.05$ was considered statistically significant.

Results: From 2006-2017, 157 pediatric patients were identified with median age 3.6 years (range, 0.2-17.9), 54% (85) were female. Overall 12 patients with indeterminate CDI were excluded. Of the remaining patients, majority [67.6% (98)] had CA-CDI. Baseline characteristics of CA and HA CDI are outlined in Table 1; 48.3% (70) patients had antibiotic exposure, more in HA than CA CDI. Overall, 2.1% patients (3) had severe CDI, 9.6% (14) had fulminant CDI; 6.9% (10) required ICU admission. Overall, 8.3% (12) patients needed a change in treatment due to non-response or adverse events. Recurrence occurred in 20.1% (29) patients. Patients with CA-CDI were less likely to have fulminant disease and ICU admission compared to HA-CDI (Table 2). There were no CDI-related deaths.

Discussion: Community-acquired infection accounts for a majority of CDI in the pediatric age group, and is associated with better outcomes compared to healthcare-associated CDI.

Presentation #26

Title: Early Liver Transplant In Patients With Severe Alcoholic Hepatitis: An Experience with Excellent Outcomes in Critically Ill Patients

Presenter: Matthew Schroeder

Authors: Matthew K. Schroeder, MD, Mark Pedersen, MD, Jan Petrasek, MD, PhD, Lafaine Grant, MD

Faculty Mentor(s): Lafaine Grant and Mark Pedersen

Abstract:

Background: Severe alcoholic hepatitis (SAH) carries a poor prognosis with six-month mortality of approximately 70% in individuals who fail to respond to steroids. Medical management is limited to traditional supportive care. Early liver transplantation (LT), defined as transplant within six months of disease onset, has been demonstrated as a life-saving therapy but concerns remain about outcomes in this population.

Aim: We aim to review outcomes of patients with SAH who received early LT at our center.

Methods: A retrospective case series was performed evaluating all patients who received early LT for SAH at a single center from 2013 to 2020. All patients underwent medical and psychosocial evaluation as part of an existing transplant protocol and were selected on a case-by-case basis by the transplant committee.

Results: Thirty-five patients received early LT for SAH during the study period. Recipients were median age 40 years old, 54.3% male, 74.3% non-Hispanic white, with median sobriety 13 days prior to hospitalization and 40 days prior to LT. Our patient population was similar to published cohorts, with 82.9% employed, 74.3% married, 31.4% with comorbid psychiatric disease, 22.9% with prior of failed rehabilitation attempts, and 25.7% with prior alcohol-related legal citation. Initial mean MELD-Na (32) and MDF (69.6) reflected disease severity with complications of ascites (97.1%), hepatic encephalopathy (80.0%), upper GI bleed (37.1%), renal failure requiring hemodialysis (60.0%), shock requiring vasopressors (48.6%), and respiratory failure requiring mechanical ventilation (8.6%). A minority of patients (40.0%) received steroids (median Lille score 0.804 for recipients). Median MELD-Na at time of time of transplant was 40 (IQR 34.5-40). Following transplant, median follow up time was 1.33 years with a 1-year survival rate of 91.3% (21/23). Alcohol relapse occurred in 11 (31.4%) patients with either frequent or binge drinking in 6 (17.1%), and sustained drinking in 4 (11.4%). Average time to any alcohol use was 126.5 days. Only post-LT binge drinking (40.0% vs 0.0%, $p = 0.017$) and frequent drinking (33.3% vs 0.0%, $p = 0.025$) were associated with mortality after LT. Frequent drinking was associated with rejection after LT (50.0% vs 10.3%, $p = 0.049$). Among the 21 patients requiring hemodialysis (HD) prior to LT, 14 (66.7%) experienced renal recovery after transplant.

Conclusion: Our experience with early LT for SAH reflects similar one-year survival compared to previously published studies despite a higher severity of illness and short duration of sobriety before transplant. The rate of alcohol relapse following LT was not greater than previous observations for alcoholic cirrhosis or alcoholic hepatitis and did not affect satisfactory outcomes. Renal recovery occurred frequently in patients requiring HD prior to LT.

Presentation #27

Title: Maladaptive atrial remodeling in muscular dystrophy

Presenter: Rahul Sheth

Authors: Rahul Sheth MD, Anishka Kappalayil BS , Xuan Jiang PhD, Daniel Cheeran MD, Colby Ayers BS, Faris G. Araj MD, Alpesh A. Amin MD, James de Lemos MD, Mark H. Drazner MD, MSc, Vlad Zaha MD, PhD, Ronald M. Peshock MD and Pradeep P.A. Mammen MD

Faculty Mentor(s): Pradeep PA Mammen, MD

Abstract:

Background: Muscular dystrophies (MD) are genetic disorders that cause progressive peripheral skeletal myopathies. The majority of MD patients will develop atrial and ventricular arrhythmias and/or an associated cardiomyopathy with a high degree of morbidity and mortality. However, it remains unknown the degree of atrial remodeling that may also occur in MD patients. We hypothesize maladaptive atrial remodeling occurs in MD patients.

Methods: occur in MD patients. We hypothesize maladaptive atrial remodeling occurs in MD patients. Methods Utilizing the UT Southwestern Cardiomyopathy Clinic, MD [total: 79 patients (34 females, 45 males)] and non-ischemic cardiomyopathy (NICM) [total: 81 patients (29 females, 52 males)] patients were identified who underwent a cardiac MRI (cMRI) between 2011 and 2015. A matched, healthy control cohort from the Dallas Heart Study (DHS) [total: 101 patients (40 females, 61 males)] were identified. Most MD patients had Duchenne/Becker MD, Limb-Girdle MD or myotonic MD. Two blinded, independent readers made volumetric measurements from cMRIs to assess right atrial (RA) and left atrial (LA) dimensions with low inter-reader variability. A third independent investigator analyzed the RA and LA data with aggregate data presented in the Table. The statistical significance of the data ($p < 0.05$) was assessed by performing an unpaired two-tailed Student's t-test and a one-way analysis of variance (ANOVA) between groups with a Bonferroni's post-test analysis.

Results: Between MD and NICM patients, there was a significant difference between structure and function of the RA and LA. Between MD patients and DHS controls, there was a significant difference in LA function but not RA function. (For brevity, data is in a table).

Conclusions: Collectively, the data suggests MD patients develop significant maladaptive remodeling of the LA but not the RA, predisposing these patients to atrial arrhythmias. Their difference from both NICM patients and healthy DHS controls suggests an intermediate phenotype that has not yet been described. Investigation into exact differences in atrial remodeling as a function of gender and the type of MD need to be explored in order to guide future therapies.

Presentation #28

Title: Use of Trabecular Bone Score (TBS) for Assessing Fracture Risk in Women with Breast Cancer

Presenter: Mahwash Fatima Siddiqui

Authors: Mahwash F. Siddiqui, MD, Xilong Li, PhD, Naim M. Maalouf, MD

Faculty Mentor(s): Naim M. Maalouf

Abstract:

Background: Cancer treatment-induced bone loss has emerged as a critical long-term health problem in women with breast cancer. ASCO clinical management guidelines recommend the use of anti-osteoporosis agents in patients with non-metastatic breast cancer with either osteoporosis or increased risk of osteoporotic fracture based on the FRAX tool [10-year probability of $\geq 20\%$ for major osteoporotic fracture (MOF) or $\geq 3\%$ for hip fracture]. Trabecular Bone Score (TBS) is a novel measure of bone texture that uses lumbar spine DXA imaging to assess bone texture inhomogeneity in order to gauge bone quality and fracture risk. Combining TBS with FRAX and BMD has been shown to improve the assessment of fracture risk in patients with postmenopausal osteoporosis. In this study, we explore the implications of incorporating TBS in the evaluation of bone health in women with breast cancer.

Methods: We retrospectively reviewed charts of women who were diagnosed with non-metastatic breast cancer between 2015-2020 and who had baseline DXA scan with FRAX and TBS done in UTSW Mineral Metabolism Clinic or Radiology. Patients with prior use of bone modifying agents were excluded.

Results: A total of 178 patients met inclusion criteria. Of charts reviewed to date, patient (mean \pm SD) age was 73 ± 11 years and BMI was 28 ± 6 kg/m². Using FRAX without TBS, 68.2% of patients had FRAX score below the treatment threshold (10-year risk for MOF $\leq 20\%$ and hip fracture $\leq 3\%$), while 31.7% had FRAX score (10-year risk of MOF $\geq 20\%$ or Hip $\geq 3\%$) that qualifies for the treatment with anti-osteoporosis medications. Upon incorporation of TBS into FRAX, 2.4% of patients were reclassified to below the threshold recommended for anti-osteoporotic treatment and 4.8% of patients were reclassified to above that threshold.

Conclusions: Incorporation of TBS into FRAX reclassified 7.3% of women with non-metastatic breast cancer regarding indication of use of anti-osteoporosis agents. Further studies are needed to explore the determinants of TBS in patients with breast cancer, and the characteristics of patients who are reclassified upon TBS incorporation into FRAX. Additional studies are also needed to understand the longitudinal change in TBS in women with breast cancer receiving anti-estrogen therapy and/or anti-osteoporosis agents.

Presentation #29

Title: Comparison Between Clinical Profile of Patients With Myocardial Infarction With Non-Obstructive Versus Obstructive Coronary Artery Disease At A Dallas County Hospital

Presenter: Shruti Singh

Authors: Shruti Singh, MD, Sandeep Das, MD

Faculty Mentor(s): Dr. Sandeep Das

Abstract:

Background: Myocardial Infarction with non-obstructive coronary arteries (MINOCA) has been increasingly recognized as a working diagnosis. The differences between MINOCA and CAD patients have been previously described, but not specifically at a county hospital with higher prevalence of under-served population.

Methods: A cross-sectional analysis was performed between Parkland hospital patients with MINOCA and CAD from the CathPCI registry between 2017 and 2019. Clinical profiles and in-hospital outcomes were compared between MINOCA and CAD patients. Additionally, a comparison was made amongst MINOCA males vs. females.

Results: The prevalence of MINOCA in this population was 15% (n=581), out of all AMI admissions (n=3865). When compared with the CAD population, the MINOCA population had higher percentage of females (41.4% vs 29.5%, $p=2.5 \times 10^{-8}$), and African American patients (44.9% vs 27.3%, $p=1.4 \times 10^{-17}$). The mean age of MINOCA patients was younger when compared to CAD patients (55.8 yrs vs 60.3 yrs, $p=1.47 \times 10^{-18}$). Amongst MINOCA patients, men were younger than women (54 yrs vs 58.4 yrs, $p=4.29 \times 10^{-6}$). MINOCA patients were less likely to have traditional risk factors including, hypertension, dyslipidemia, PAD, and type 2 diabetes, but were more likely to have heart failure (47.16% vs 32.19%, $p=2.63 \times 10^{-12}$). MINOCA males had lower mean EF when compared to females (39.9% vs 47.6%, $p=7.02 \times 10^{-06}$). When comparing cardiac medications, fewer patients with MINOCA were on aspirin and statin when compared with patients with CAD. Statin prescription was lower in females with MINOCA compared to the males (26% vs 34.7%, $p=0.023$), even though females with MINOCA had a higher incidence of dyslipidemia than males (64% vs 55.7%, $p=0.048$). The incidence of development of cardiomyopathy and LV dysfunction during admission was significantly higher in MINOCA patients, whereas the development of cardiogenic shock was higher in CAD patients. There was no difference between in-hospital cardiac arrests between the two groups.

Conclusion: MINOCA population had disproportionately more females, African Americans, and had a lower prevalence of traditional risk factors when compared to CAD patients. MINOCA women were older, had a higher incidence of dyslipidemia but lower incidence of statin prescription, as well as lower incidence of heart failure when compared to men.

Presentation #30

Title: Optimizing Laser Atherectomy for Different Lesion Morphologies

Presenter: Vinayak Subramanian

Authors: Vinayak Subramanian, MD, George Adams, MD

Faculty Mentor(s): George Adams

Abstract:

Background: Peripheral arterial disease (PAD) is a growing in prevalence owing to the ongoing epidemics of diabetes, chronic kidney disease and an aging population. There is a wide spectrum of disease ranging from asymptomatic stenosis to limb threatening ischemia. This wide spectrum is also associated with a wide spectrum of endovascular disease with varying atherosclerotic plaque morphologies which have different mechanical properties. - Homogenous (soft), Heterogenous (fibrotic-elastic), and calcific (hard) - Laser atherectomy debulks and modifies plaque by photochemical ablation. The intensity of the device can be calibrated by adjusting the repetition rate, and fluency (energy). The performance of laser atherectomy in varying lesion morphologies, and optimal settings have not been defined.

Methods: Patients with de novo or restenotic ($\geq 50\%$) superficial femoral and popliteal artery atherosclerotic disease were enrolled. All lesions were sequentially treated with laser atherectomy at three pre-determined intensity settings: low (fluency: 40 mJ/mm²; repetition rate: 60 Hz), medium (fluency: 60 mJ/mm²; repetition rate: 40 Hz), and high (fluency: 60 mJ/mm²; repetition rate: 60 Hz). Angiography and intravascular ultrasound (IVUS) were performed to characterize plaque morphology and evaluate residual stenosis. Follow-up was 30 days and medical records were reviewed through 12 months for adverse events.

Results: Forty-five patients with 57 lesions (12 homogenous, 15 heterogeneous, 15 calcific, and 15 restenotic) were enrolled. Rutherford Classifications ranged from 2 - 5, average lesion length was 98.2 ± 91.2 mm, and average stenosis was $82.5 \pm 17.9\%$. Compared with baseline, all lesion types had significant improvement in final post-procedure (atherectomy plus any adjunctive therapies) diameter stenosis. Prior to adjunctive therapy, the heterogeneous and restenosis groups saw improvement in minimum lumen area following each stage of the laser treatment. However, the calcific and homogenous groups saw little change in minimum lumen area between the medium and high intensity laser treatments. Within 6 months, six patients had target lesion revascularizations. No major amputations or deaths occurred through follow-up.

Conclusions: Laser intensity settings during atherectomy should be selected based on lesion morphology. Intravascular ultrasound is a useful tool in defining plaque morphology prior to endovascular treatment of peripheral arterial disease.

Presentation #31

Title: Trends in Intraosseous Access in Out of Hospital Cardiac Arrest

Presenter: Belal Suleiman

Authors: Belal Suleiman, MD, Paul Chan, MD, MSc, James de Lemos, MD, Dharam Kumbhani, MD, Mark Link, MD, Ahamed Idris, MD, Purav Mody, MD

Faculty Mentor(s): Purav Mody

Abstract:

Background: Recent studies have shown conflicting results with the use of intraosseous (IO) access in out-of-hospital cardiac arrest (OHCA), with some studies suggesting harm associated with IO use.

Methods: The Resuscitation Outcomes Consortium Epistry dataset was used to analyze trends in IO use, time to initial access, and rates of return of spontaneous circulation (ROSC) from 2011 to 2015.

Results: Among 53,352 patients with OHCA, 74.6% received intravenous (IV) access compared with 25.4% receiving IO access. Overall IO use increased from 19% in 2011 to 35% in 2015, (Ptrend = <0.001) with increases in primary IO (initial attempt) and rescue IO (IO attempt after initial IV attempt) use. After adjustment for age, sex, initial rhythm, bystander CPR, public location, witnessed status, and epinephrine dose, use of IO increased significantly each year compared with 2011 (OR 1.2 (95% CI 1.1 - 1.3) for 2012, 1.5 (1.3 - 1.6) for 2013, 1.7 (1.5 - 1.8) for 2014, 2.3 (2.1 - 2.5) for 2015, P=<0.001 for all). Access time decreased from an average of 8.7 min to 7.1 min for IO access and from 7.3 min to 6.7 min for IV access (Ptrend=<0.001 for both). Concomitantly, ROSC rates increased from 29.2% in 2011 to 31.6% in 2015 (Ptrend=<0.001) in the overall cohort.

Conclusions: IO use in OHCA nearly doubled from 2011 to 2015, concordant with temporal trends showing improvement in time to access. Despite significant increase in IO use for both primary and rescue access, rates of ROSC improved over the study period.

Presentation #32

Title: Using Readily Available Clinical Information to Identify Individual with High Lipoprotein A Levels: The Dallas Heart Study

Presenter: Tuna Ustunkaya

Authors: Tuna Ustunkaya, MD, Ezim Ajufo, MD, Colby Ayers, MS, Rina Mauricio, MD, Anand Rohatgi, MD, Parag H. Joshi, MD, Amit Khera, MD

Faculty Mentor(s): Amit Khera

Abstract:

Background: Elevated plasma Lp (a) levels are associated with increased ASCVD risk. However, major guidelines vary in specific populations recommended for Lp (a) measurement. The aim of this study was to develop a predictive tool using readily available clinical/demographic variables to identify individuals with an elevated Lp (a) level.

Methods: All individuals in the Dallas Heart Study, a multiethnic population-based probability sample, with a plasma Lp (a) measurement were included. The primary outcome was Lp (a) levels > 125 nmol/L. Individual candidate variables were assessed for association with elevated Lp (a) in sex and race/ethnicity adjusted models. Multivariable logistic regression analyses using forward and stepwise selection strategies were used to create the final model. Model discriminatory capacity was tested using c-statistics. Given the different racial distribution of plasma Lp (a) levels, separate models were assessed for Blacks and non-Blacks.

Results: The derivation cohort included 3550 patients (mean age 43.9, 44% male, 51.6% Black, 16.8% Hispanic). A total of 735 (20.7%) individuals had plasma Lp (a) levels > 125 nmol/L. Age, total cholesterol, LDL-C, AST, BUN, statin use, family history of MI and premature MI, history of MI, prior ASCVD, history of hypertension, and anti-hypertensive use were significantly associated with elevated plasma Lp (a) levels in the sex and race/ethnicity adjusted analyses. The final predictive model included age, sex, race/ethnicity, LDL-C, HDL-C, AST, BUN, statin use, history of hypertension and family history of MI. The c-statistic for the overall cohort was 0.69. Race stratified models revealed c-statistics of 0.65 for Blacks and 0.62 for non-blacks.

Conclusion: In a large, population-based sample, we found that easily obtained clinical and demographic variables have only modest discriminatory ability to identify individuals with elevated Lp (a) levels. Further studies are needed in clinical cohorts and using machine learning techniques to determine if the prediction of elevated Lp (a) can be enhanced.

Presentation #33

Title: Lupus Nephritis in Pregnancy - A Retrospective analysis of pregnancy related outcomes in patients with Lupus Nephritis

Presenter: Sahityan Viswanathan

Authors: Sahityan Viswanathan, MD, Prashanth Reddy, MD, Hao Liu, MD, Meredith Mcadams, MD, Ramesh Saxena MD, PhD.

Faculty Mentor(s): Ramesh Saxena

Abstract:

Background: Lupus Nephritis (LN) is a common manifestation in Systemic lupus erythematosus (SLE) patients and commonly affects women of child bearing age. Pregnancy in such patients can be associated with poorer outcomes. Management principles encompass medical optimization of therapy keeping in mind the fetomaternal toxicity, treatment of active disease as well as anticipating possible complications in pregnancy. We hereby describe outcomes of pregnancy in patients with biopsy proven lupus nephritis in a retrospective cohort at UT Southwestern Medical Center.

Methods: We did a retrospective chart review of patients with LN and pregnancy from 1999 to present. A preliminary data collection of 35 patients was done. Our inclusion criteria ensured that all patients had a kidney biopsy with confirmed LN. The maternal outcomes measured were: LN flare, Pre-eclampsia, or death. The fetal outcomes measured were: Preterm delivery, Spontaneous miscarriage, Elective abortion, or fetal demise. Disease activity was analyzed using the SLE Disease Activity Index (SLEDAI) score before, during and after the pregnancy. Medication use among the subgroups was also analyzed.

Results: The patients were split into 2 subgroups; active LN(n=22) vs inactive LN(n=13). LN flares were noted in both subgroups with active disease having a higher incidence. In terms of pregnancy outcomes, patients with active LN had a higher rate of preterm labor/abortion and preeclampsia compared to those with inactive LN (77% vs 46%). The SLEDAI score was noted to be higher in both the subgroups during pregnancy as compared to that before/after pregnancy. LN flares were associated with higher incidence of preeclampsia compared to the patients without LN flares (p=0.006). Active LN was associated with a higher incidence of pre-term delivery and abortion. One case of fetal demise was observed in the active LN subgroup.

Conclusion: Pregnancy was associated with worse maternal outcomes among patients with active LN vs patients with inactive LN. Active LN flare was found to be a strong predictor of worse outcomes. Although statistical significance was not achieved in some parameters from the preliminary data analyses, this may change when the power of the study increases with the complete data review.

Presentation #34

Title: Hypochloremia is a Novel Prognostic Factor in Acute Liver Failure

Presenter: Jiexin Wang

Authors: Jiexin Wang, MD, PhD; Pin Xu, PhD, MS; Andrew Sumarsono, MD; Jody Rule, PhD; Susan Hedayat, MD, MSc; William M. Lee, MD, for the Acute Liver Failure Study Group

Faculty Mentor(s): William M. Lee and Susan Hedayat

Abstract:

Background: Emerging evidence has identified hypochloremia as an independent predictor for mortality in patients with decompensated cirrhosis, congestive heart failure, and chronic kidney disease. Acute liver failure (ALF: severe hepatocyte injury with international normalized ratio ≥ 1.5 and any degree of encephalopathy), is frequently complicated by electrolyte abnormalities including hypophosphatemia. We investigated whether hypochloremia was associated with greater disease severity and poor prognosis in a large cohort of ALF patients from North America.

Methods: A retrospective cohort study was conducted on 2,588 ALF patients from 28 academic centers between 1998-2019 enrolled in the NIH-sponsored ALF Study Group registry (ClinicalTrials.gov: NCT00518440). The primary outcome was all-cause mortality or liver transplantation (death/LT) within 21 days of study admission. Survival analysis compared patients with and without hypochloremia at admission.

Results: Patients with low chloride levels had a significantly higher 21-day mortality rate (42.1%) compared to those with normal (27.5%) or high chloride levels (28.0%) ($p < 0.0001$). Kaplan-Meier analysis examining transplant-free survival (TFS) showed significantly lower cumulative survival estimates in the hypochloremic group (log-rank, $\chi^2 24.2$, $p < 0.0001$). Survival curves further stratified by chloride and sodium levels were different across all four groups (log-rank, $\chi^2 23$, $p < 0.0001$). Patients with hypochloremia regardless of their sodium levels presented the lowest cumulative survival. In univariable Cox proportional hazards regression, hypochloremia was inversely associated with 21-day TFS (hazard ratio [HR]: 0.98; 95% confidence interval [CI]: 0.98 - 0.99; $p < 0.0001$). In contrast to hyponatremia, hypochloremia remained associated with higher risk of death/LT after multivariable adjustment (aHR: 0.97; 95% CI: 0.97 - 0.98; $p < 0.0001$) (Table 1). Increased death/LT risk of hypochloremia was consistent across all dichotomized subgroups: age $<$ or \geq 40 years old, male or female sex, favorable (acetaminophen, pregnancy, hepatitis A, ischemia) or unfavorable (all others) etiologies, mild or deep coma grades, MELD $<$ or \geq 20, and different sodium groups.

Conclusions: Hypochloremia is an independent adverse prognostic factor in patients with ALF. Future work is needed to determine whether incorporation of chloride into current prognostic scoring systems may improve prediction of transplant-free survival.

Presentation #35

Title: Effect of Mineralocorticoid Receptor Antagonists on Secondary Prevention of Cardiomyopathy Progression in Childhood Cancer Survivors

Presenter: Averi Wilson-Raya

Authors: Averi E. Wilson-Raya, MD, Trey Bowen, MD, Teresa Bosler, PMP, Linda S. Hynan, PhD, Daniel C. Bowers, MD, Cindy J. Cochran, MSN, RN, CPNP-PC, Simon Craddock Lee PhD, MPH, Angela M. Orlino MD, Vlad G. Zaha MD, PhD

Faculty Mentor(s): Vlad Zaha, MD Angela Orlino, MD

Abstract:

Background: Recent studies have suggested cardioprotective effects of mineralocorticoid receptor antagonists (MRA) for primary prevention of cardiomyopathy in patients receiving treatment with anthracycline chemotherapy; however, the role of MRA in secondary prevention of late cardiomyopathy is unknown.

Methods: This retrospective study evaluated adult survivors of childhood cancer treated with anthracyclines, underwent echocardiogram in the last ten years, and had valid contact information on file. Clinical, laboratory, and imaging data were extracted from the electronic medical record and cross-sectional symptom questionnaires were administered. Longitudinal changes were analyzed in 3 groups of patients: patients on MRA therapy within the past year, patients on an alternative heart failure therapy regimen, and patients not on heart failure therapy.

Results: Sixty-seven patients were enrolled, including: 8 treated with MRA therapy, 11 treated with non-MRA therapy, and 48 on no cardiomyopathy therapy. At baseline, the MRA group demonstrated lower LVEF (46%(30-51), n=8 in MRA group vs 61%(57-63), n=46 in no therapy group; p<0.01) and higher ESV compared with the no therapy group (59mL(41-90), n=8 in the MRA group vs 36mL (29-43), n=40 in the no therapy group, p<0.05). The MRA group reported a decreased ability to walk one block (3 of 8 participants) compared with the non-MRA (0 participants) and no therapy groups (2 of 48 participants) (p=0.013). Administration of MRA resulted in a significant improvement in LVEF (46% (30-51), n=8 to 52%(34-56), n=8; p=0.031), but no significant change in LVEF was demonstrated after administration of other medications.

Conclusions: MRA administration as single drug therapy or in combination with standard of care heart failure therapy may reverse left ventricular dysfunction in childhood cancer survivors with anthracycline-induced cardiomyopathy.

Presentation #36

Title: Time Trends in the Age Distribution of Diabetes-Associated Gastrointestinal Cancers

Presenter: Timothy Zaki

Authors: Timothy A. Zaki, MD; Amit G. Singal, MD, MS; John M. Inadomi, MD; Caitlin C. Murphy, PhD, MPH

Faculty Mentor(s): Caitlin C. Murphy, PhD, MPH Amit G. Singal, MD, MS

Abstract:

Background: Incidence rates of several GI cancers are increasing in younger adults. Diabetes is a risk factor for these cancers in older adults and now occurs at a greater frequency in younger adults than in decades past. Earlier-onset diabetes may contribute to increasing incidence rates of GI cancers in younger adults, whereby shifts in the age at diabetes onset translate into a large number of persons in the population increasingly at risk for GI cancers. To test this hypothesis, we examined changes in the age distribution of diabetes-associated GI cancers in a population-based sample.

Methods: We estimated incidence rates of colorectal, liver, and pancreatic cancer during 1992-2017 using population-based data from the SEER program of cancer registries. For each cancer, we estimated age-adjusted incidence rates, age-specific incidence rates (20-49 years, 50-64 years, and ≥ 65 years), and mean age at diagnosis in approximate 4-year periods.

Results: Age-adjusted incidence rates of colorectal cancer generally decreased over time, but in younger adults, incidence rates increased. As a result of decreasing rates in older adults, yet increasing rates in younger adults, mean age at diagnosis decreased from 69.8 years in 1992-95 to 65.1 years in 2016-17 ($p < 0.01$). Age-adjusted incidence rates of liver cancer increased over time, driven by large increases in older adults. Mean age at diagnosis of liver cancer decreased from 64.7 years in 1992-95 to 63.0 years in 2004-07 but subsequently increased to 65.8 years in 2016-17 ($p < 0.01$). Incidence rates of pancreatic cancer increased in each age group, and mean age at diagnosis decreased from 70.2 years in 1992-95 to 69.5 years in 2016-17 ($p < 0.01$).

Conclusion: The age distribution of diabetes-associated GI cancers did not uniformly decrease, suggesting diabetes may differentially contribute to increasing incidence rates of GI cancers in young adults. Declines in mean age at diagnosis were most striking for colorectal cancer, which may reflect the relative strength of association of diabetes and colorectal cancer compared to other cancer types. There are also likely alternative mechanisms, or competing factors (screening for colorectal cancer, hepatitis C eradication for liver cancer), contributing to these patterns that warrant further study.

Presentation #37

Title: Simulation Based Echocardiogram Assessment for Residents

Presenter: Matthew Almonte

Authors: Matthew Almonte, MD; Spencer Carter, MD; Mark Berlacher MD, Viraj Raygor, MD

Faculty Mentor(s): Anish Bhatt

Abstract:

Point of care ultrasound (POCUS) has become an important skill within Internal Medicine (IM). Currently, cardiac POCUS training for residents is not structured, occurring during routine clinical care with senior residents or fellows. This sporadic teaching has been hampered during the COVID-19 pandemic. Online and simulation-based education provides a potential method for safe, effective, and measurable POCUS training.

We invited all Internal Medicine PGY-1 trainees to participate in our study. We gathered 36 participants, all who completed an entry survey. Preliminary results show that 33 participants (92%) have never received formalized training in echocardiography. Furthermore, 24 (67%) participants felt either "uncomfortable" or "very uncomfortable" performing a cardiac POCUS; 27 participants (75%) felt either "uncomfortable" or "very uncomfortable" interpreting basic echocardiographic views. Finally, 28 participants (78%) either "disagreed" or "strongly disagreed" that current IM residents receive enough POCUS training.

Based on IM resident interest and survey results, we propose an online and simulation-based cardiac POCUS educational platform. We will split the interested PGY-1s into three groups of twelve, forming an Active, Control, and Validation arm. The Active and Control arms will undergo baseline testing for echocardiogram image acquisition on a simulation based mannequin, and be asked to interpret basic echocardiogram images via online modules. Performance will be scores based on a tool that has been validated in the past. The Active arm will then receive serial training sessions in the simulation lab and didactics via virtual platforms. After these sessions are complete, the Active and Control arms will once again be asked to acquire the same images and interpret the same echocardiograms online. Performance will again be scored and compared to baselines scores for progression. At the end of the study, the Control and Validation arms will receive the same comprehensive training.

Our project aims to show improved education in cardiac POCUS image acquisition and interpretation, with an emphasis on scope of practice. This program is of potential significant value during the COVID-19 pandemic and may demonstrate that simulation-based and virtual education is both safe and effective for our IM residency.

Presentation #38

Title: Successful Self-administered Outpatient Parenteral Antibiotic Therapy in Patients Who Use Drugs: A Pilot Study

Presenter: Bilal Ashraf

Authors: Bilal Ashraf, MD; Emily Hoff, MD; Jillian Smart; Sheryl Mathew; Larry Brown; Kapila Marambage, MD; Kavita Bhavan, MD

Faculty Mentor(s): Kavita Bhavan

Abstract:

Background: People who use drugs (PWUD) are pre-disposed to bacterial infections, which often require extended parenteral antibiotic therapy. PWUD are generally excluded from the standard of care outpatient parenteral antibiotic therapy (OPAT), due to concerns of catheter misuse, nonadherence, patient and staff safety, and legality. At Parkland, they are traditionally discharged to a skilled nursing facility, where our own data indicates over one third do not complete therapy. In the past, we have established the efficacy of self-administered OPAT therapy (S-OPAT) in our general population. Here, we present a pilot study of ten patients with mild addiction who completed extended parenteral antibiotic therapy through S-OPAT.

Methods: Patients admitted to Parkland with a history of drug use and need for extended parenteral antibiotics were recruited by the S-OPAT consults service. In conjunction with Addiction Psychiatry, we identified ten patients with mild addiction, as defined with the NIDA-modified ASSIST score. Patients were also required to have a source of transportation. Patients were enrolled in S-OPAT clinic with weekly follow ups, labwork, and urine drug screens.

Results: Each of the ten patients successfully completed their S-OPAT course, with an average duration of 29 days. Diagnoses included: osteomyelitis, joint and skin/soft tissue infections. Drugs used included: cocaine (6), THC (5), and methamphetamine (4). Seven patients also used alcohol. The average NIDA modified ASSIST score was 4.7 (range 4-13), consistent with mild-moderate risk. Three patients had positive drug screens during treatment and two patients each missed a single appointment.

Conclusion: Here we demonstrated that PWUD with mild addiction can successfully complete S-OPAT. Despite the prevalent biases against PWUD, none of our patients engaged in catheter misuse. Given the frequency of incomplete antibiotic treatment and complications in this population, there is ample space for innovation. By providing individualized, patient-centered care through S-OPAT, we can improve adherence in the face of the individual, environmental, and societal barriers PWUD face. In the future, we hope to extend S-OPAT as a standard of care to pre-screened PWUD with both mild and moderate addiction.

Presentation #39

Title: Use of Electronic Health Record to Improve Prescribing Practices of HIV Pre-exposure Prophylaxis for Primary Care Providers

Presenter: Hannah Blanchard

Authors: Hannah Blanchard, MD, Kristin Snackey Alvarez, PharmD, Katie Bistransin, PharmD, Traneika Turner-Wentt, DSW, Helen Lynne King, MD

Faculty Mentor(s): Helen King, MD

Abstract:

Background: Tenofovir-emtricitabine is indicated for pre-exposure prophylaxis (PrEP) of HIV in high-risk groups; particularly, it is indicated by the USPSTF in patients who have been diagnosed with a bacterial sexually transmitted infection (STI) in the last 6 months.

Purpose: The goal of this quality improvement initiative is to improve the prescribing practices of PrEP to better adhere to USPSTF guidelines at a safety-net healthcare system.

Methods: The intervention was a reminder tool in the electronic health record (EHR) that provided clinical decision support for primary care providers (PCPs) to help identify patients eligible for PrEP. The reminder appeared for patients diagnosed with a bacterial STI in the last 6 months. The tool prompted providers to an order-set in the EHR with guidance on PrEP evaluation and prescribing or referral to a PrEP provider.

Results: 207 patients were appropriately identified to initiate PrEP based on a recent bacterial STI diagnosis. The majority of these patients were female (n=135, 65%) and identified as black (n=100, 48%) or Hispanic (n=75, 36%) with a mean age of 32. Thirteen new prescriptions for PrEP were written. The majority of providers did not respond to the support tool when prompted (n=112, 54%). Ten patients (10/207) were referred to infectious disease to discuss PrEP initiation. There were no significant differences in prescribing rates of PrEP based on gender or type of bacterial STI.

Conclusion: Overall, prescribing rates of PrEP were low in patients with newly diagnosed bacterial STIs, despite implementing clinical decision support for providers. There must be ongoing investigations into the best tools to improve PrEP prescribing practices among primary care providers.

Presentation #40

Title: Trends in Anticoagulation Prescription Spending Among Medicare Part D And Medicaid Beneficiaries Between 2014 and 2018

Presenter: Angela Duvalyan

Authors: Angela Duvalyan, MD, Ambarish Pandey, MD, Muthiah Vaduganathan, MD, MPH, Utibe Essien, MD, MPH, Ethan A. Halm, MD, MPH, Gregg Fonarow, MD, Andrew Sumarsono, MD

Faculty Mentor(s): Andrew Sumarsono

Abstract:

Background: Direct oral anticoagulation (DOAC) has become the first-line therapy for many cardiovascular diseases. As a result, we examine contemporary patterns of anticoagulation (AC) use and spending in Medicare and Medicaid.

Methods: We performed a retrospective study of 5 classes of AC therapies reimbursed by Medicare Part D and Medicaid between 2014-2018 using the Medicare Part D Prescription Drug Event Dataset, Part D Prescriber Use File, and Medicaid Spending and Utilization Dataset. We calculated changes in total spending, claims, and average spending per claim.

Results: Between 2014-2018, DOAC use sharply increased in both Medicare and Medicaid, with total claims increasing by 194% (5.5 to 16.1 million) and 405% (293,000 to 1.5 million), respectively. Warfarin claims decreased by 28% (17.1 to 12.3 million) in Medicare and 21% (1.7 to 1.3 million) in Medicaid. Of the \$19.7 billion spent by Medicare and Medicaid on AC between 2014-2018, \$15 billion was spent on DOACs. In 2018, the Medicare per claim spending was \$15 for warfarin, \$549 for apixaban, \$569 for rivaroxaban, and \$466 for edoxaban. Between 2014-2017, the aggregate out-of-pocket costs for DOACs for Medicare patients increased from \$228 million to \$733 million.

Conclusion: Use of DOACs is rapidly increasing, representing a shift toward superior but more expensive forms of AC. These rising costs may lead to financial burden for the health system and individuals, and further effort will be required to ensure access is not limited by cost.

Presentation #41

Title: Using GRIT to Respond to Microaggression: A Resident-led Workshop to Teach Medical Students an Approach to Difficult Conversations

Presenter: Lauren Franzblau

Authors: Lauren Franzblau, MD, Reeni Abraham MD

Faculty Mentor(s): Reeni Abraham

Abstract:

Microaggressions are experienced by medical students and physicians at all levels, yet they often feel ill equipped to address them in the moment. Therefore we designed and implemented a new workshop to help students recognize microaggression and develop communications techniques to acknowledge and address them safely.

241 clinical students completed a one hour workshop led by resident facilitators. Students were asked to apply the GRIT framework described by Warner, Njathi-Ori, and O'Brien to two cases involving microaggressions. GRIT is a four-step approach: Gather your thoughts, Restate, Inquire, and Talk it out. Residents led groups of 12-18 students through the workshop over Zoom, splitting them into smaller breakout rooms to brainstorm how to respond using GRIT. The entire group was reconvened to discuss the cases and share responses as a group. Residents used probing questions to deepen the discussion and highlighted the role of debriefing after these experiences.

88 students completed a post-session survey. Survey responses were overall positive: 84% recommended the session for future students, 78% felt prepared to respond to microaggressions, and 75% planned to use techniques learned from this session when they encounter or witness microaggressions. Students also felt that responding to microaggressions is an important skill (95%) and were able to define and recognize microaggressions (95%). Eighty-seven respondents (99%) provided qualitative feedback on the session, including which techniques they planned to use in the future. Students were positive overall about the topic, format, and execution (e.g. "Wonderful and powerful session that was very helpful!"). The most common critique was needing more time in breakout rooms or discussion.

Using a near-peer led session with cases derived from prior medical student experience, we were able to generate meaningful discussions and provide students with a basic framework to address microaggressions. Importantly most students felt this topic is important, enjoyed the session, and came away with communication techniques they felt they would use in real life. We plan to continue this session annually for clinical students.

Presentation #42

Title: Outcomes Among People Who use Drugs Discharged to Short-Term Nursing Facilities for Parenteral Antibiotic Therapy

Presenter: Emily Hoff

Authors: Emily Hoff, MD, Bilal Ashraf, MD, Larry Brown, Jillian Smartt, Sheryl Matthews, Bhavan, Kavita, MD

Faculty Mentor(s): Kavita Bhavan

Abstract:

Background: People who use drugs (PWUD) often require extended parenteral antibiotics for complex infections. PWUD are excluded from outpatient parenteral antimicrobial therapy (OPAT) due to concerns of catheter misuse, nonadherence, and both patient and staff safety. Standard of care often requires treatment at skilled nursing facilities (SNF), which can inhibit patient fulfillment of personal responsibilities such as employment and childcare. To evaluate clinical outcomes of OPAT among PWUD, we conducted a retrospective study of a cohort of PWUD discharged from Parkland Health and Hospital System (PHHS) to SNF for OPAT therapy.

Methods: We identified PWUD discharged from PHHS to SNF for extended antibiotic therapy between 01/01/2017 and 04/30/2018 (N=129). Demographics, drug use history, discharge diagnosis, antibiotic therapy, discharge disposition from SNF (against medical advice (AMA), early non-AMA discharges vs completed antibiotic courses), 30-day emergency department (ED) utilization, and 30-day readmission were extracted from the electronic medical record. ED-utilization and 30-day readmission rates were analyzed for each disposition group.

Results: While the majority of patients completed treatment (64%), a significant minority left AMA (20%) or early non-AMA (16%). Patients who left early- AMA or non-AMA had increased rates of composite 30-day hospital readmission or ED-utilization (54% vs 35% vs 23%, $p=0.01$) and increased rates of 30-day hospital readmissions (31% vs 25% vs 8%, $p=0.01$) compared to those who completed treatment. However, there was no significant difference in ED-utilization between those who completed treatment and those who did not (23% vs 10% vs 15%, $p=0.43$). Women were more likely to complete their treatment course compared to men (12.0% vs 41.3%; $p<0.01$).

Conclusions: Over a third of PWUD with complex infections requiring parenteral antibiotics who are discharged to SNF do not complete treatment. These patients experience increased healthcare utilization compared those who complete therapy, perhaps stemming from increased rates of complications. There remains significant room for quality improvement in the setting of post-acute care for PWUD requiring extended courses of parental antibiotics. OPAT in select patients may be a safer, more cost-effective, patient-centered alternative.

Presentation #43

Title: Patient Safety Utilization Following Implementation of Nurse Driven Sitter Protocol

Presenter: Anne Marie Kerchberger

Authors: Anne Marie Kerchberger, MD, Neil Keshvani, MD, Alzubaidy Dergham, MD, Sarah Towery, RN BSN MS, Sarah Gartner, RN BSN CPHRM, Corinne Thompson, RN, Maryam Warsi, MPH, Eugene S. Chu, MD, Anita Hegde, MD

Faculty Mentor(s): Anita Hegde

Abstract:

Background: While studies suggest Patient Safety Assistants (PSAs), or "sitters", do not impact safety outcomes, PSAs are utilized to observe "high risk" patients without formal guidelines. Efficient care models can improve healthcare costs and preserve limited resources. This quality improvement (QI) project aimed to evaluate the effect of a nurse driven sitter protocol on PSA utilization and patient safety at Parkland Hospital.

Methods: A nurse driven PSA protocol was implemented March 1, 2019, empowering nurses to order and discontinue PSAs without physician approval for non-suicidal patients and patients without a legal hold. A random sample of 60 patients requiring PSAs from December 1, 2018 to February 28, 2019 was compared to a random sample of 62 patients from March 1, 2019 to May 31, 2019. Intervention safety was measured by patient fall rate, rapid assessment team (RAT) evaluations, behavioral emergency response team (BERT) evaluations, and patients leaving prior to treatment completion (LBTC). Two-sided t-tests and Mann-Wilcoxon tests compared continuous variables. Chi-square tests compared categorical variables. SAS version 9.4 was used for analyses. P-values of <0.05 were considered significant.

Results: There were no significant differences in baseline patient characteristics. The median PSA utilization was 3.0 days (IQR 1.8 - 5.0) pre-intervention and 1.3 days (IQR 1.0 - 3.0) post-intervention ($p < 0.001$). There was no difference in the rate of safety events pre-vs post- intervention: total falls per 1000 hospital days (4.3 vs 3.4, $p = 0.74$), RAT evaluations (25% vs 21%, $p = 0.60$), BERT evaluations (11.7% vs 17.4%, $p = 0.37$), or LBTC (3.2% vs. 3.3%, $p = 0.98$).

Conclusions: This QI initiative suggests a nursing driven protocol for PSA utilization is both effective and safe without resultant increases in falls or other safety events. Reducing PSA utilization allows for reallocation of PSAs to serve as patient care assistants to help nurses with clinical care, which may improve staff engagement. Resultant nursing empowerment may also improve nursing satisfaction. Decreasing physician workload may leverage organizational resources while improving wellness and retention. Future directions include cost reduction investigations and additional safety outcomes to better understand the impact of this ordering protocol.

Presentation #45

Title: Home Blood Pressure Monitoring in the Parkland Population

Presenter: Niraj Madhani

Authors: Niraj Madhani, MD

Faculty Mentor(s): Sandeep Das

Abstract:

Background: Hypertension (HTN) is a common but difficult to manage disease. Home blood pressure (HBP) monitoring has proven to be an effective tool but the prior studies are regulated, making it difficult to predict the response to HBP without the structure of a medical investigation. Here, we aimed to assess effect of HBP on blood pressure (BP) in a cohort of Parkland patients over a one-year period.

Methods: 61 patients received arm cuffs in March 2020. Retrospective chart reviewed was done for data. 14 qualified for our intervention group. They had office blood pressures available 6 months prior to and after March and did not establish care in HTN clinic until after receiving the blood pressure cuff. 14 patients are in the control group as they met the above criteria and were confirmed to not have home cuffs.

Results: Average systolic BP reduced from 163.4 to 146.6 in the intervention group versus 157.5 to 153.1 in the control group. Diastolic BP also decreased. The intervention group had a higher average weight (114 compared to 87 in the control) and lower percentage of females (64.3 compared to 78.6 in the control) but a lower average age (59.1 compared to 64.5 in the control). Average HTN clinic visits in the post period were 18 in the intervention and 21 in the control group. Number of medications did not change in either. The control group had more patients with dose increases (57.1 compared to 42.9) while the intervention group had more with a new medication (85.7 compared to 64.3).

Conclusion: This is a pilot study that showed improvement of BP in a group of patients who were given BP cuffs. Their follow up was not scheduled as in prior studies allowing for a more natural assessment of effect. Aside from a higher proportion of patients receiving new medications, we did not find other reasons to explain improvement in BP. Limitations include small sample size and inability to assess for variables such as medication compliance. Further studies are necessary but our results of promising for the use of HBP in an uncontrolled setting.

Presentation #46

Title: Sickle Cell Disease Bias: An early opportunity for intervention?

Presenter: Viral M. Patel

Authors: Viral M. Patel, MD, Ibrahim F Ibrahim, MD

Faculty Mentor(s): Ibrahim F. Ibrahim

Abstract:

Background: Sickle cell disease (SCD) is a genetic condition leading to multi-organ dysfunction and chronic pain, with 1 out of 13 African Americans having the trait. Despite its prevalence and debilitating symptoms, SCD remains a disease with limited therapeutic progress and decreased life expectancy. Improvements in provider perceptions and education about SCD may lead to improved management.

Methods: An anonymous survey was sent to first-year medical students at an academic institution prior to their hematology block. Data was collected about demographics, prior exposure to SCD, perceptions about opioid use disorder (OUD) in SCD, and baseline knowledge of management. Identical questions were asked for cancer-related pain. The survey was sent again the day after the hematology block ended to assess whether the curriculum was effective at characterizing misperceptions about patients with SCD.

Results: 55 medical students answered the survey prior to the course. 41 students (75%) had never encountered a sickle cell patient. 22 (40%) answered that OUD in patients with SCD is more likely, 33 as likely (60%), and 0 less likely than the general population. 39 (71%) thought opiates should play a minor role, 3 (5%) a major role, and 13 (24%) said opioids should be avoided when managing SCD-related pain. After course completion, 35 students who had completed the survey prior to the course responded. 19 (54%) answered that OUD in patients with SCD is more likely, 15 (43%) as likely, and 1 (3%) less likely than the general population. 25 (71%) thought opiates should play a minor role, 3 (9%) a major role, 7 (20%) said they should be avoided when managed SCD-related pain.

Conclusion: After course completion, a higher percentage of medical students thought that OUD was more frequent in patients with SCD, with the same proportion determining that opiates should play a minor role or be avoided in SCD. As opioids are a mainstay of treatment for SCD, and patients with SCD are no more likely to have OUD than the general population, this pilot study highlights that there is an opportunity to intervene in misperceptions of patients with SCD in early medical school education.

Presentation #47

Title: Laboratory Stewardship As A Cost-Reduction Initiative During the COVID-19 Pandemic at the VA North Texas Health Care System

Presenter: Alonso Pezo Salazar

Authors: Alonso Pezo Salazar, MD, Donald Storey, MD

Faculty Mentor(s): Donald Storey

Abstract:

Background: Overutilization of laboratory tests contribute to the rising US healthcare costs. As the COVID-19 pandemic has severely strained our healthcare system, the rapidly evolving evidence used to treat COVID-19 patients has demanded agile changes in both management and testing. By following current evidence and removing IL-6 and routine blood cultures from a bundled order-set aimed for all COVID-19 admissions, we strived to decrease unnecessary testing and cost.

Methods: After modifying the order-set during December 2020, we performed a retrospective evaluation of the number of IL-6 tests and ED blood cultures processed from April 2020 through February 2021 to date. In addition, we calculated the total and average monthly cost associated with IL-6 testing before and after this intervention.

Results: An average of 53.0 IL-6 tests were processed per month from April 2020 to December 2020, with a total cost of \$37,778 (\$4,197.6/month) during this period. After the order-set modification, the average dropped to 2.0 IL-6 tests processed per month from January 2021 to February 2021 with a total cost of \$316.8 (\$170.3/month). An average of 734.0 blood cultures per month were processed from April 01, 2020 to December 31, 2021. The average of blood cultures per month from January 2021 through February 2021 was 725.6.

Conclusions: Modification of the COVID-19 bundled order-set resulted in a 95.8% reduction of processed IL-6 blood tests with associated cost savings. Since IL-6 was no longer used in decision-making processes during patient care, no patient harm was incurred with the order-set change. Timely modification of guidelines and order-sets that follow up-to-date evidence can decrease overutilization of tests and improve allocation of resources.

Presentation #48

Title: Establishing the Parkland Heart Failure Registry, a QI Initiative

Presenter: Sri and Sai Radhakrishnan

Authors: Sai Radhakrishnan, MD, Sri Radhakrishnan, MD, Spencer Carter, MD, Nick Hendren, MD, Sandeep Das, MD

Faculty Mentor(s): Dr. Sandeep Das

Abstract:

Background: Heart failure with reduced ejection fraction (HFrEF) is a common diagnosis in the US with significant cost, morbidity, and mortality. Several medication classes have been shown to reduce morbidity and mortality and are termed guideline-directed medical therapy (GDMT). Despite the clear mandate for use, contemporary registries have shown severe underutilization of GDMT with <1% of patients on optimal medication and dosage. Our aim is to create an accessible, self-maintained, EHR based database of Parkland HFrEF patients that can be leveraged to optimize clinical care and support future QI initiatives.

Methods: Recently left ventricular ejection fraction (LVEF) became a discrete field pulled into EPIC. Utilizing this, our registry enrolls all patients with LVEF <40% within the last 2 years on echocardiogram into the self-maintained, EPIC-based registry. Notably the registry is available in Slicer Dicer for general anonymized queries, or a data request can be made for detailed records.

Results: As of Dec 11 2020, 2289 patients were enrolled in the registry. 97% carry an ICD-10 code for heart failure. Manual review of those without a heart failure ICD-10 code revealed <10 misclassified patients. The most recent LVEF was <40% in 2210 patients. In these 2210 patients, the average age is 58, 27% are women, 46% are African American, and 32% are Hispanic. 83% of patients are on a beta blocker of which only 19% are at target doses, 77% are on an ACE/ARB/ARNI of which only 10% are at target dosage, 35% of patients are on an MRA, and 16% are on an SGLT2 inhibitor. Patients seen in cardiology and CHF clinic (~55% of the registry) have significantly higher rates of prescription and target dose prescribed than patients not seen in these clinics.

Conclusions: The Parkland HFrEF registry comprises a cohort that is ~10 years younger and significantly more diverse than national cohorts. While rates of GDMT prescription are excellent compared to contemporary national registries, work remains to optimize uptake of new therapies and uptitrate all to goal. Our registry provides a unique insight into contemporary HFrEF care and provides a platform to track the success of planned QI initiatives.

Presentation #49

Title: Abnormal Serum Protein Electrophoresis: When to Retest?

Presenter: Hollie Sheffield

Authors: Hollie Sheffield, MD, Nivan Chowattukunnel, MD, Waqas Haque, MPhil, MPH, Yu-Min Shen, MD

Faculty Mentor(s): Yu-Min Shen, MD

Abstract:

Background: Monoclonal gammopathy of undetermined significance (MGUS) is considered the precursor to multiple myeloma (MM) and can exist for decades before becoming MM. MM is a hematologic malignancy caused by neoplastic transformation of plasma cells, which can infiltrate bone and bone marrow and produce monoclonal immunoglobulins that cause end-organ damage. The decision to treat MM depends on the presence of symptomatic disease, such as hypercalcemia, renal failure, anemia, and bone lesions ("CRAB" symptoms). Asymptomatic MM patients do not require therapy. These symptoms individually or collectively prompt clinicians to obtain a serum protein electrophoresis (SPEP) and potentially a serum free light chain assay to evaluate for MM. However, there is a lack of guidance regarding judicious use of initial and repeat testing in patients with abnormal SPEPs.

Methods: We performed a retrospective review of patients at a county hospital from 2012-2019 who were referred to Hematology clinic regarding an abnormal SPEP. Patients were stratified into risk groups (High, High-intermediate, Low-intermediate, and Low) for developing MM according to the Mayo criteria (see table). The total number of SPEPs performed in each group and the odds of developing MM were captured, along with higher-risk patients meeting any CRAB criteria around the time of initial SPEP.

Results: We abstracted data from 436 patients referred to Hematology Clinic for abnormal SPEP. The most common documented reasons for SPEP testing were increased creatinine (35%), protein gap (12%), and decreased hemoglobin (11%). Collectively, over 798 Hematology appointments were conducted after the initial SPEP. 19 patients (4%) developed MM, 16 of whom were high-intermediate risk. More than 1000 SPEPs were done in the low and low-intermediate groups with only 3 patients diagnosed with MM. In the two higher risk groups, 66/74 patients (89%) were anemic, 21/74 (28.4%) had renal insufficiency (serum creatinine >2 mg/dL), and only 1 patient had hypercalcemia (>11mg/dL).

Conclusion: There is insufficient evidence to support serial SPEP testing in lower-risk patients without CRAB symptoms. Annual SPEP testing is recommended in higher-risk groups given risk of progression to MM. Evidence-based risk stratification may minimize unnecessary testing and hematology referrals while resulting in significant cost-savings.

Presentation #50

Title: Continuous Telemetry Monitoring in Chimeric Antigen Receptor (CAR) T-Cell Therapy Patients

Presenter: Eddie Stephens

Authors: Eddie Stephens, MD, Ansh Mehta, MD, Tanya Persoon, BSN, RN, BMTCN, Shannon Baker, BSN, RN, CMSRN, Remy David, BSN, RN, OCN, BMTCN, Kavitha Nair, MSN, RN, OCN, NEA-BC, Dheepthi Ramasamy, Yazan F. Madanat, MD, Syed Rizvi, MD, Prapti Patel, MD, Stephen Chung, MD, Madhuri Vusirkala, MD, Farrukh Awan, MD, Larry D. Anderson Jr., MD, PhD, John W. Sweetenham, MD, Robert H. Collins, MD, Praveen Ramakrishnan, MD, and Ankit Kansagra, MD

Faculty Mentor(s): Ankit Kansagra

Abstract:

Background: Adverse cardiac events during CAR T cell therapy are poorly understood. Some studies have suggested correlation with cytokine release syndrome (CRS).¹ Patients receiving CAR T cell therapy are often placed on cardiac telemetry monitoring. It is estimated that telemetry costs as much as \$1400 per patient per 24 hours of monitoring.² In this study, we analyzed the utility of continuous cardiac telemetry monitoring in patients with hematologic malignancies undergoing CAR T cell therapy.

Methods: We identified 32 patients placed on continuous telemetry monitoring during an inpatient stay for CAR T cell therapy. Using retrospective chart review we evaluated all telemetry events in these patients and analyzed patient characteristics that were more frequently associated with abnormal rhythms on telemetry monitoring.

Results: Of the 32 patients included in this analysis 81.25% of patients experienced at least one cardiac event on telemetry while admitted. The most common rhythm observed was sinus tachycardia (ST). Two patients experienced tachyarrhythmia and one was found to have an AV block. Of 16 patients with grade II or higher CRS, three were found to have significant arrhythmias whereas patients without CRS or with CRS of a lower grade did not experience arrhythmia. Patients with higher than grade II of ICANS were more likely to have an arrhythmia in comparison to those with lower grade or no ICANS (P <0.05). Thirty-one percent of patients required ICU transfer. None of the baseline characteristics included in the analysis were strongly associated with cardiac events identified using telemetry.

Conclusion: Our study provides an important insight in the utility of continuous telemetry monitoring for patients undergoing CAR T cell therapy. With a significantly higher cost of care for patients undergoing CAR T Cell therapy and reimbursement challenges, these data suggest uniform telemetry monitoring for all CAR T cell patients is not value added. Further studies are needed to better understand the mechanism and predictors of cardiac-toxicity in patients undergoing CAR T cell therapy.

Presentation #51

Title: Technical Quality versus Diagnostic Ability of POCUS Obtained by Non-cardiologist Providers in COVID units

Presenter: Tuna Ustunkaya

Authors: Tuna Ustunkaya, MD PhD, James MacNamara MD, MSCS, Kristin Alvarez PharmD, Anthony Sertich MD, Matthew Leveno, MD, Sandeep Das, MD, Katy Lonergan, MD

Faculty Mentor(s): Katy Lonergan

Abstract:

Introduction: The COVID-19 pandemic significantly increased point-of-care cardiac ultrasound (POCUS) as a front-line cardiac imaging modality. The quality of POCUS images required to provide critical information is unknown. In this study, we sought to characterize the quality of the POCUS images obtained by providers working in the COVID unit in a safety-net hospital.

Methods: Consecutive POCUS encounters (n=99, from 61 different patients) obtained between 3/4/2020 and 8/12/2020 at dedicated COVID units of Parkland Memorial Hospital were included in this study. Images were obtained by hospitalist or intensivist providers who are working in the COVID unit with varying degrees of formal POCUS training.

Results: For each episode of POCUS, a mean of 6.1 ± 0.5 different images (min 1, max 21) and 2.7 ± 0.1 different views were obtained. 83% (n=82) of the encounters, have parasternal long axis (PLAX), 62% (n=61) have parasternal short axis (PSAX), 76% (n=75) have a four-chamber from apical or subcostal (4CH) view and 51% (n=50) have an IVC view obtained.

Of the PLAX views, 55% were adequate quality. Most common quality limitations included off-axis (51%) and poor windows (43%). 77% of the images visualized all wall segments. Of the PSAX views, 79% were adequate quality. Most common quality limitation was poor windows (69%) followed by being off-axis (23%). 66% of the images visualized all wall segments. Of the 4CH views, 72% were adequate quality. Most common quality limitation was poor windows (48%) followed by being off-axis (43%). 72% of the images visualized all wall segments. Of the IVC views, 84% of were adequate quality. Combining all views, LV function can be estimated in 85%, RV size and function can be estimated in 79% and 78% respectively. Presence or absence of effusion can be determined in 83% of the encounters.

Conclusion: Overall, provider obtained POCUS scans in COVID unit has many limitations for quality, such as off-axis images and missing wall segments. However, a global assessment could be made to answer clinical questions in the majority of POCUS studies.

Presentation #52

Title: Empowering Residents to Respond to Microaggressions

Presenter: Kristen Wong

Authors: Kristen E. Wong, MD, Shannon Scielzo, PhD, Christiana S. Renner, MD

Faculty Mentor(s): Christiana Renner and Shannon Scielzo

Abstract:

Background: Microaggressions are words or actions that create hostility, communicate disrespect, or imply a sense of exclusion. Microaggressions have been found to contribute to physician burn-out and negatively impact general well-being. Although studies have found that a majority of physicians have been the recipient of such comments by patients, many physicians have never received training on how to address these situations.

Methods: A simulation workshop was created and delivered to UTSW Internal Medicine residents as part of the didactic curriculum. An online pre-survey was administered weeks prior to the workshop to gauge the prevalence of microaggressions over the course of their training, in addition to their beliefs regarding how best to address these behaviors and their confidence in doing so. Residents participated in four unique standardized patient scenarios through the UTSW Simulation Center to practice and develop their skills. An online post-survey was administered to residents after completion of the workshop.

Results: Pre-survey response rate was 57% (85/150). There was a surprisingly high number of microaggressions observed by residents. The majority of respondents reported observed/personal experience with microaggressions: gender (65% - with 18% reporting frequent occurrences); ethnic (60% - with 7% reporting frequent occurrences); and class (60% with 5% reporting frequent occurrences). In the pre-survey, less than 10% of trainees reported being very confident in managing either personally experienced or observed microaggressions. Initial post-survey feedback included qualitative comments such as "How to nip in the bud small things like a patient calling you 'honey.'" In general, I feel more empowered to respond to microaggressions now" and "I've gained familiarity with some techniques that will enable me to more professionally handle a variety of micro aggressions." Final analyses of post-survey data will be available in April.

Conclusions: Our project is the first to assess the experience of UTSW Internal Medicine residents' with microaggressions from patients. A majority of our residents have observed/experienced microaggressions. Prior to our workshop, the UTSW Internal Medicine curriculum did not include any formal training to empower residents to respond to these situations. Residents learned important skills during the course of this workshop.

Presentation #53

Title: The Utility of Infectious Diseases Electronic Consultations in the Era of COVID-19

Presenter: Kruti Yagnik

Authors: Kruti J. Yagnik, DO, Hala A. Saad, MD, Helen L. King, MD, Roger Bedimo, MD, Christoph U. Lehmann, MD, Richard J. Medford, MD

Faculty Mentor(s): Richard Medford and Helen King

Abstract:

Background: The need for clinicians to access Infectious Diseases (ID) consultants for clinical decision-making support increased during the COVID-19 pandemic. Traditional ID consultations with face-to-face patient assessments are not always possible or practical during a pandemic and involve added exposure risk and personal protective equipment (PPE) use. Electronic consultations (e-consults) can provide an alternative and improve access to ID specialists during the pandemic.

Methods: We implemented ID e-consult platforms designed to answer clinical questions related to COVID-19 at three academic clinical institutions in Dallas, Texas. We conducted a retrospective review of all COVID-19 ID e-consults between March 16th to May 15th, 2020, evaluating characteristics and outcomes of e-consults among the clinical sites.

Results: We completed 198 COVID-19 ID e-consults at participating institutions. The most common reasons for e-consult were for 63 (32%) repeat testing, 61 (31%) initial testing, 65 (33%) treatment options, and 61 (31%) Infection Prevention (IP). Based on the e-consult recommendation, 53 (27%) of patients were initially tested, 45 (23%) were re-tested, 44 (22%) of patients had PPE precautions initiated, and 37 (19%) had PPE precautions removed. Median time to consult completion was 4 hours and 8 (4%) of consults were converted to formal face-to-face consults.

Conclusion: E-consult services can provide safe and timely access to ID specialists during the COVID-19 pandemic, minimizing the risk of infection to the patient and health care workers, while preserving PPE and testing supplies.

Presentation #54

Title: A unique case of acute kidney injury in a postictal patient

Presenter: Adil Ahmed

Authors: Adil Ahmed, MD, Charles Owens, MD

Faculty Mentor(s): Charles Owens II

Abstract:

Introduction: We present a unique case of acute kidney injury (AKI) in a patient admitted for seizure induction to guide antiepileptic drug therapy. There is an association of AKI with seizures, the typical mechanisms being rhabdomyolysis or nephrotoxicity from medications. Our patient suffered kidney injury and had no evidence of rhabdomyolysis or drug-induced injury. However, there was evidence of acute urate nephropathy.

Case: This is a 35 y/o white male with past medical history significant for epilepsy, hypertension, and recent AKI requiring intermittent hemodialysis after seizure. He presented to the hospital at his baseline creatinine of 0.9 -1.0 mg/dl. Labs drawn prior to his induced grand-mal seizure showed a creatinine of 0.98 mg/dl and a serum uric acid of 4.4 mg/dl. After seizure induction serial labs showed rise in creatinine to 1.06, 1.52, and 1.89. He remained non-oliguric. Uric acid was elevated at 17.3 mg/dl and his urine uric acid to creatinine ratio was >1, consistent with urate nephropathy. His initial creatinine kinase (CK) was 251 u/l with a peak of 287 u/l. Phosphorus was low at 1.4 mg/dl and calcium was normal at 9.6 mg/dl, inconsistent with cell lysis. No offending medications were found. Urinalysis did not show granular casts. He received rasburicase and sodium bicarbonate infusion to alkalinize the urine to pH of >7.0. On the subsequent day his creatinine peaked at 3.47 and uric acid was undetectable. After sustained urine alkalinization his creatinine improved to 2.05 on discharge, two days after inciting event.

Discussion: Acute urate nephropathy is well described in tumor lysis syndrome but is not commonly recognized in postictal patients. It has been reported in previous case reports and the current understanding of the mechanism of kidney injury is crystal formation resulting in renal injury and renal vasoconstriction by inhibition of nitric oxide release from endothelial cells*. We must consider acute urate nephropathy as a cause for AKI after seizures as it is treatable and reversible. In this case a pre and post uric acid were obtained allowing the patient to be treated without requiring dialysis.

Presentation #55

Title: Pulmonary Rocks! A Case of Pulmonary Alveolar Microlithiasis

Presenter: Carlos Cardenas

Authors: Carlos Cardenas, MD, Sakda Sathirareungchai, MD, Andrew Tomlinson, MD

Faculty Mentor(s): Andrew Tomlinson

Abstract:

Introduction: Pulmonary alveolar microlithiasis (PAM) is an extremely rare lung disease characterized by the development of calcium phosphate deposits (microliths) within the alveolar spaces. Genetic mutations in the SLC34A2 gene (solute carrier family 34 member 2 gene) which encodes for a sodium-phosphate co-transporter have been described as the cause of the disease. This co-transporter is located on type II alveolar pneumocytes and is responsible for removing phosphate ions from the alveolar space. Without effective transport, phosphate ions bind to calcium ions leading to calcium phosphate deposits within the alveoli. Over time this leads to pulmonary fibrosis and progressive respiratory failure. Here, we present a case of pulmonary alveolar microlithiasis that was initially suspected to be metastatic endometrial carcinoma.

Case Report: A 37-year-old female presented to gynecology clinic for evaluation of abnormal uterine bleeding. Endometrial biopsy showed endometrioid adenocarcinoma of the uterus. Staging CT scans revealed bilateral adnexal masses, metastatic disease in the liver, peritoneal carcinomatosis, and concern for lymphangitic carcinomatosis in the lungs due to calcification of the pleura and diaphragm. Liver biopsy confirmed metastatic disease of ovarian primary consistent with synchronous stage IV ovarian cancer. She underwent chemotherapy with carboplatin and paclitaxel as well as TAH/BSO and debulking surgery with good response; however, repeat CT chest showed persistent pulmonary disease with innumerable calcified micronodules and extensive pleural, fissural, and interlobular calcifications. Bronchoscopy with transbronchial biopsies was performed which showed diffuse intra-alveolar laminated concentric deposits consistent with microliths and diagnostic of pulmonary alveolar microlithiasis. She has mild restriction on pulmonary function testing, no family history of pulmonary disease, and no current pulmonary symptoms. Calcium supplements were discontinued, and she was treated with low phosphorous diet. She continues to follow with pulmonary clinic for monitoring.

Discussion: PAM is an extremely rare genetic disease caused by a defective sodium-phosphate co-transporter leading to accumulation of microliths within the alveolar spaces that can lead to progressive respiratory failure and death. There is no known effective treatment except for lung transplant. Low phosphate diet, bisphosphonates, and repeated bronchoalveolar lavage have been studied without clear clinical benefit.

Presentation #56

Title: An atypical case of calcific uremic arteriopathy presenting with splenic infarcts, rash, and acute vision loss

Presenter: Melissa DeFoe

Authors: Melissa DeFoe, MD, Yusuf Chao, MD

Faculty Mentor(s): Dr. Kywat Shwin

Abstract:

Case Presentation: A 68-year-old man with ESRD and peripheral artery disease presented with septic shock due to wet gangrene of the foot. He underwent left TKA and was started on broad-spectrum antibiotics; blood cultures were negative.

On arrival to the ICU, he reported sudden-onset vision loss 1 week prior with headaches and temporal tenderness. Ophthalmologic exam demonstrated diabetic retinopathy with left-sided ptosis and a fixed dilated pupil concerning for stroke vs. giant cell arteritis (GCA). CTA of the neck and head demonstrated severe stenosis of the proximal left ophthalmic artery and complete occlusion of the left vertebral artery. He received pulse dose methylprednisolone and planned for temporal artery biopsy (TAB).

On hospital day 3, he developed a painful violaceous rash on the thighs that progressed to involve the abdomen, back, and penis, with scattered flaccid bullae. Due to splenic infarcts and myonecrosis on CT abdomen/pelvis, progressive skin lesions, and possible GCA, rheumatology was consulted to evaluate for systemic vasculitis. He denied constitutional symptoms. On review with radiology, widespread small- and medium-sized vascular calcifications were noted with areas of thrombosis and vascular obliteration, without perivascular fat stranding. His inflammatory markers improved with treatment of sepsis, autoimmune serologies were negative, and PTH and phosphorus were elevated.

After multidisciplinary discussion, his presentation was felt to be most consistent with explosive calcific uremic arteriopathy (ie, calciphylaxis). He was started on empiric sodium thiosulfate, which led to rash stabilization. TAB demonstrated internal elastic lamina disrupted by calcification without evidence of GCA.

Discussion: Calciphylaxis is a rare disorder characterized by necrotic skin lesions. It occurs due to vascular calcium deposition, resulting in narrowing of the vasculature with reduced blood flow and eventual tissue ischemia. Calciphylaxis is generally thought to be due to a "2-hit phenomenon", in which skin necrosis occurs due to a second insult superimposed upon the narrowed, calcium-laden arterioles.

This case of rapidly progressive skin rash and multi-organ infarction was initially concerning for systemic vasculitis. However, we postulate that these multiorgan ischemic events were likely initiated by episodes of hypotension, which acted as a "second hit" in this patient with limited vascular reserve.

Presentation #57

Title: A Case of Azathioprine Associated Hypertriglyceridemia and Pancreatitis in a Patient with Heart Transplant

Presenter: Angela Duvalyan

Authors: Angela Duvalyan, MD, Justin Holmes, MD, Matthew W. Segar MD, MS, Jennifer Thibodeau MD, MSCS

Faculty Mentor(s): Jennifer Thibodeau

Abstract:

Case Presentation: A 45-year-old woman with history of post-partum and ischemic cardiomyopathy requiring heart transplant with a post-transplant course complicated by systolic heart failure and end-stage renal disease (ESRD) presented to the hospital with nausea and vomiting. This was the patient's third admission in the past 8 weeks, all with a similar presentation. During her first presentation a right heart catheterization with endomyocardial biopsy (EMB) was negative for acute cellular rejection. However, due to concern for CMV, she underwent an EGD that showed eosinophilic inclusions concerning for mycophenolate toxicity and was switched to azathioprine. Abdominal imaging did not show an acute process that could explain her vomiting. At the time of discharge, her lipid panel was within normal limits. She returned 17 days later with nausea and diffuse abdominal pain. Her lipase was 788 U/L and abdominal imaging confirmed pancreatitis along with interval increase in a right-sided pleural effusion and cholelithiasis. Her triglycerides were 2,302 (first admission triglyceride levels=177), lactate was 3.2, but a liver panel was unremarkable. She was treated with an insulin infusion with dextrose and gentle fluid resuscitation. The next day, her triglyceride levels normalized. On discharge, azathioprine was discontinued due to concern for azathioprine-induced dyslipidemia. To date, she has not been rechallenged and continues on immunosuppression with tacrolimus and prednisone.

Discussion: Acute hypertriglyceridemia in the setting of azathioprine initiation and consequent pancreatitis is a rare complication. This patient had multiple risk factors that predisposed her to azathioprine-induced dyslipidemia, including steroid use and ESRD. Given her risk factors and the temporal association between initiating azathioprine and her acute hypertriglyceridemia, we believe that azathioprine may have precipitated hypertriglyceridemia and resultant pancreatitis. While it is possible that our patient could have azathioprine-induced pancreatitis, the dramatic and incidental rise in triglycerides, a reported side effect of patients taking azathioprine with steroids, followed by quick resolution after treating with IV insulin, raises the possibility that her associated hypertriglyceridemia may have been caused by azathioprine and led to her pancreatitis. It is important when switching antimetabolites in patients with multiple risk factors to consider these toxicities during initial work up.

Presentation #58

Title: COVID-19 Precipitating Thyroid Storm

Presenter: Khary Edwards

Authors: Khary Edwards, MD, Murtaza Ahmed, BS, Iram Hussain, MD

Faculty Mentor(s): Iram Hussain

Abstract:

Hyperthyroidism after COVID-19 has been reported and is usually due to thyroiditis. Thyroid storm is an extreme form of thyrotoxicosis that can cause life-threatening multi-organ failure. We present a case of thyroid storm precipitated by SARS-CoV2 infection.

A 27-year-old male with no past medical history presented to the Emergency Room (ER) with sudden onset confusion, agitation, and aggressive behavior. He was tremulous, tachycardic (172 beats/min) and febrile (102.9 F). His blood pressure was 142/78 mmHg and oxygen saturation was normal. Labs were consistent with hyperthyroidism with TSH of < 0.01 mIU/L (normal: 0.45 - 4.5 mIU/L), free T4 of > 7.8 ng/dL (normal: 0.8 - 1.8 ng/dL) and free T3 of 21.9 pg/mL (normal: 2 - 4.4 pg/mL). SARS-CoV-2 PCR was positive.

His Burch-Wartofsky score was 55 (> 45 is highly suggestive of thyroid storm). He was started on esmolol, methimazole and SSKI and admitted to the ICU. His mental status quickly improved following these interventions. He had no prior personal or family history of thyroid disease, no exposure to iodinated contrast agents and no known sick contacts. Urine drug screen was negative for illicit drugs (except benzodiazepines which he received in the ER); chest X-ray, urinalysis and blood and urine cultures showed no evidence of infection; and CT brain was normal. Thyrotropin receptor antibody, as well as thyroid stimulating immunoglobulin were both positive. Thyroid ultrasound showed a diffusely enlarged, heterogenous, hypervascular gland consistent with Graves' disease. He was discharged on methimazole, propranolol and SSKI.

Only one case of thyroid storm associated with COVID-19 has been reported in a patient with known Grave's disease. Our case is the first report of COVID-19 precipitating thyroid storm in a previously undiagnosed patient.

The incidence of thyroid storm is 1 - 10% of hyperthyroidism hospitalizations (usually precipitated by infection or trauma), however mortality is estimated at 10 - 30% with treatment, and 80 - 100% without treatment. Early diagnosis and intervention improve mortality.

COVID-19 should be considered in the differential of patients hospitalized for thyrotoxicosis, and patients who test positive for SAR-CoV2 may benefit from assessment of thyroid function after diagnosis.

Presentation #59

Title: An Unusual Case of Blastomycosis Presenting with Acute Airway Obstruction from a Retropharyngeal Abscess and Complicated by Severe Hypokalemia from Posaconazole

Presenter: John Hanna

Authors: John Hanna, MD; Jessica Guastadisegni, PharmD; Donald Storey, MD

Faculty Mentor(s): Donald Storey

Abstract:

Case Presentation: 48-year-old male with history of obstructive sleep apnea and asthma presented with neck pain, left arm numbness and weakness, and a 60-pound weight loss over two months. In the 2-3 weeks prior to presentation, he also described difficulty breathing and swallowing solid foods; denied fever, chills, cough, skin nodules, prior history of tuberculosis, immunosuppression, or recent trauma. Social history notable for birthplace in Mississippi and travel to Chicago, Illinois. Physical exam revealed mildly labored breathing; otherwise unremarkable. WBC 8.0 K/uL and HIV nonreactive. CT of the cervical spine without contrast demonstrated a 4.0x5.6x8.2 cm retropharyngeal collection, pathologic fracture of C4, and signal abnormalities from C3-C5. Bedside laryngoscopy demonstrated a large obstruction of the posterior pharynx. Patient was in respiratory distress and an emergent tracheotomy was performed. Biopsy of the posterior pharynx returned a copious amount of turbid fluid. CT chest demonstrated innumerable bilateral small pulmonary nodules. MRI of the cervical, thoracic, and lumbar spine demonstrated destruction of C4 with 6mm retrolisthesis with severe spinal canal stenosis and cord effacement. Emergent C3-5 corpectomies and cervical spine fusion were performed. Pathology demonstrated osteomyelitis with budding yeast and fungal serology was positive for *Blastomyces* sp. by EIA. Liposomal amphotericin B was initiated. Patient was discharged home on posaconazole pending culture. At clinic follow up, culture was positive for *Blasotmyces dermatitidis/gilchristii*. Labs remarkable for potassium of 2.3 mmol/L and posaconazole level of 3.36 mcg/mL. Electrocardiogram demonstrated U waves and he was readmitted and treated for severe hypokalemia. Posaconazole was discontinued and patient was discharged on itraconazole.

Discussion: Bone and joints are the second most common extrapulmonary site of infection for blastomycosis. This is an unusual case as cervical vertebral osteomyelitis is less common than thoracic or lumbar involvement. Additionally, although retropharyngeal abscess has been reported in conjunction with cervical osteomyelitis due to blastomycosis, to our knowledge, acute airway obstruction requiring emergent tracheotomy is rare. Finally, our patient's case calls attention to the need to monitor potassium levels closely in patients started on posaconazole due to previously described inhibition of the 11 β -hydroxysteroid dehydrogenase 2 enzyme resulting in pseudohyperaldosteronism and subsequent hypokalemia.

Presentation #60

Title: A Striking Presentation of Large Vessel Vasculitis in an Unusual Demographic

Presenter: Justin Holmes

Authors: Justin Holmes, MD Arzu Canan, MD Ricardo La Hoz, MD

Faculty Mentor(s): Ricardo La Hoz

Abstract:

Case Presentation: A 44-year-old Burmese man presented with chest and left arm pain along with weakness in the hands, left greater than right. Four months earlier, he was hospitalized for severe aortic insufficiency and underwent bioprosthetic replacement. Intraoperatively, diffuse inflammatory pericarditis was noted, and the aortic annulus demonstrated significant phlegmonous inflammation without gross purulence. Ultimately, no definitive etiology was identified to explain the valvular insufficiency. On current evaluation, physical exam revealed blood pressure 162/110 in right upper extremity and 118/76 in the left upper extremity with a diminished left radial pulse. C-Reactive Protein was 10.1 mg/dL, and erythrocyte sedimentation rate was 126 mm/hr. Extensive serologic work-up did not identify any infectious etiology. CT angiography demonstrated new aortic wall thickening, obliteration of the left common carotid artery, marked stenosis of the left subclavian artery, and a small pseudoaneurysm of the ascending aorta. The patient's diminished radial pulse, elevated inflammatory markers, and imaging abnormalities are consistent with a diagnosis of Takayasu arteritis. After initiation of mycophenolate mofetil and prednisone, inflammatory markers normalized, and interval imaging showed stable disease.

Discussion: Takayasu arteritis is a large-vessel vasculitis with predominant involvement of the aorta and its branches, most commonly observed in young women of Asian descent. Characteristic findings include constitutional symptoms, diminished peripheral pulses, discrepant blood pressures between extremities, and arterial bruits; imaging findings may include vessel luminal narrowing or occlusion with wall thickening. Our 44-year-old male patient, albeit from an atypical demographic, presented with diminished radial pulse and discrepant blood pressures between arms, which correlated with significant stenoses of aortic branches and an aortic pseudoaneurysm. While aortic insufficiency has been described in association with antecedent aortic root dilation, our patient had no such findings at time of aortic insufficiency. Even so, the operative descriptions of pericarditis and aortic annulus inflammation may have represented early manifestations of subsequent Takayasu arteritis. In summary, this case describes classic findings of Takayasu arteritis in a patient with atypical demographics and a curious history of unexplained severe aortic insufficiency.

Presentation #61

Title: Disseminated Histoplasmosis or Crohn's Flare?

Presenter: Jenny Jan

Authors: Jenny Jan, MD, Arjimand Mufti, MD

Faculty Mentor(s): Arjimand Mufti and Lan Peng

Abstract:

Case Presentation: A 20-year-old male with a history of Crohn's disease complicated by perianal fistula and abscesses on Remicade for 2 years, hypereosinophilic syndrome, and bullous pemphigoid on methotrexate was admitted with worsening skin rash and epigastric pain. Prior to presentation, he had 8 months of fatigue, malaise, and anorexia with 20-pound weight loss and 1 month of daily fevers and night sweats. His skin lesions were biopsied and initially thought to be cutaneous Crohn's with overlying impetiginization. An EGD showed extensive ulcerations of the upper gastrointestinal tract presumed to be secondary to Crohn's disease. He also had elevated AST, ALT, alkaline phosphatase, and IgG4 levels. A CT scan of the abdomen followed by an MRCP showed biliary strictures concerning for primary sclerosing cholangitis versus IgG4 related disease. ERCP with brushings and biopsy of the biliary ducts showed acute and chronic inflammation without evidence of IgG4 sclerosing cholangitis. As his liver function tests remained abnormal, a percutaneous liver biopsy was performed. He was initially discharged home with a steroid taper for presumed Crohn's flare given the skin and EGD findings. Liver biopsy eventually showed granulomatous hepatitis due to *Histoplasma capsulatum*. Retroactive staining of skin biopsies and duodenal biopsies also revealed histoplasmosis. He was diagnosed with disseminated histoplasmosis thought to be related to TNF-alpha inhibitor therapy. His steroids and Remicade were stopped, and he was admitted for Liposomal amphotericin B and itraconazole. After beginning appropriate treatment, his epigastric pain resolved, appetite improved, and LFTs normalized.

Discussion: TNF-alpha therapy has revolutionized the management of IBD but patients are at risk for developing serious infections including invasive fungal infections. These can be a difficult to diagnose as in this case where disseminated histoplasmosis was mistaken for an exacerbation of Crohn's disease. Misdiagnosis can result in initiation of harmful therapy and delay in appropriate therapy with potentially serious consequences. Disseminated fungal infections should be part of the differential in this patient population with poorly controlled disease.

Presentation #62

Title: Master of Disguise: Lessons Learned from a Challenging Diagnosis of Hidden Septic Arthritis

Presenter: Tsuzumi Kanaoka

Authors: Tsuzumi Kanaoka MD, Blake Barker MD

Faculty Mentor(s): Blake Barker

Abstract:

Septic Arthritis is a "do-not-miss" disease that requires prompt diagnosis and treatment to prevent significant morbidity and mortality. This case outlines the challenges in diagnosing septic arthritis in a patient with chronic pain at the index joint.

A 40 year old woman with stage IV breast cancer is admitted for acute-on-chronic back and right hip pain. Her vitals are normal. She has severe diffuse tenderness on her back and hips, otherwise most of her exam is limited due to extreme pain. Her labs are unremarkable with stable chronic pancytopenia secondary to her palliative chemotherapy. A series of imaging studies show worsening of diffuse osteolytic metastasis at the pelvis and extensive pathologic vertebral fractures. She is subsequently discharged home with a new pain regimen.

Three days later, the patient returns with persistent back and hip pain. Her exam is the same as prior, except for a mild erythema on her arm where the peripheral IV was placed during her last admission. Otherwise, her vitals and labs are unchanged. The patient is re-admitted for pain control and cellulitis.

Over the next two weeks, her pain remains poorly controlled. Even at the maximum rate of ketamine drip, she is in severe pain. She then develops a one-time fever of 100.4 °F without any subjective fevers or chills. A repeat CT of the pelvis shows a new right hip effusion. The patient then undergoes a prompt joint aspiration and is started on vancomycin. The synovial fluid analysis and blood cultures return positive for MSSA. She receives right hip joint debridement, and subsequently reported a dramatic improvement in pain.

Septic arthritis is a diagnostic dilemma. It is a "do-not-miss" diagnosis, yet it can disguise itself by presenting without the "textbook features". In the case above, the patient lacked obvious systemic infectious symptoms like fevers or chills, and did not present with classic laboratory changes like leukocytosis perhaps due to chemotherapy. More importantly, the patient's pain was difficult to interpret as a sign of infection especially after a recent admission for cancer pain.

Presentation #63

Title: A Case of Cushing Disease in Pregnancy

Presenter: Naveed Khanjee

Authors: Naveed Khanjee, MD, Sasan Mirfakhraee, MD

Faculty Mentor(s): Sasan Mirfakhraee

Abstract:

Case Presentation: A 28-year-old woman with hypertension and obesity presented with progressive weight gain, striae, and hyperglycemia. On physical exam, she had violaceous striae and a prominent dorsocervical fat pad. Laboratory testing was consistent with ACTH-dependent cortisol excess: 1mg dexamethasone suppression test 7.7 mcg/dL; 24h urine free cortisol (UFC) 240 mcg/24hr (Ref: 3.5-45 mcg/24hr); ACTH 80 pg/mL (Ref: 6-50 pg/mL). An MRI demonstrated an 8mm pituitary adenoma. Shortly after initial biochemical testing, she conceived. She underwent transsphenoidal resection of her adenoma at approximately 18 weeks gestational age (WGA). Surgical pathology showed an atypical ACTH cell adenoma. Serum cortisols on postoperative day (POD) 1 and 2 were 30.5 and 19.6 mcg/dL, respectively. She was not started on postoperative glucocorticoids and did not develop typical symptoms of adrenal insufficiency. In the weeks following surgery, she noted weight loss and improvements in glycemic control and hypertension. Serum cortisol levels during her pregnancy remained between 10-20 mcg/dL; 24 hour UFC at 26 WGA was 59.3 mcg/24hr. She delivered her child via C-section in the context of preeclampsia at 35 WGA.

Discussion: Pregnancy is extremely rare in active Cushing disease, as hypercortisolism impacts the reproductive axis and generally leads to infertility. Untreated hypercortisolism has detrimental effects on the health of the mother and increases overall fetal morbimortality. The treatment of choice for ACTH-dependent Cushing syndrome is surgical resection of the ACTH-producing source. This case highlights the difficulty in managing Cushing disease in pregnant patients, particularly postoperative monitoring. Remission in Cushing disease is typically defined as an AM cortisol less than 5 mcg/dL in the postoperative period due to chronic suppression of normal corticotropes. Our patient did not achieve this outcome nor did she experience glucocorticoid withdrawal symptoms, which would be expected following resection of an adenoma causing frank Cushing syndrome. This raised the question of incomplete resection. However, pregnancy has been shown to increase both serum cortisol and urine free cortisol making it difficult to interpret postoperative levels. The patient's clinical improvement and reduced postoperative UFC implied treatment benefit of her hypercortisolism, though we are awaiting biochemical confirmation in the postpartum period.

Presentation #64

Title: Recurrent left pleural effusion from sarcoidosis

Presenter: An Lu

Authors: An Lu, MD, Sakda Sathiraeuangchai, MD, Roma Mehta, MD

Faculty Mentor(s): Roma Mehta

Abstract:

Sarcoidosis is a multisystem granulomatous disorder characterized pathologically by the presence of noncaseating granulomas. Typical radiographic findings of pulmonary sarcoidosis include nodularity, interstitial lung disease and lymphadenopathy. The incidence of sarcoidosis related pleural effusion is rare, estimated to be between 0.7-10%. The following case report illustrates a case of a recurrent left pleural effusion from sarcoidosis in the absence of a malignant or infectious etiology. A 64-year-old African American female, nonsmoker, with no past medical history presented with subacute onset of dyspnea on exertion, night sweats and weight loss. Chest computed tomography showed a large left pleural effusion, mediastinal and hilar lymphadenopathy and bilateral perilymphatic pulmonary nodules. The pleural effusion was exudative and lymphocytic predominant. Cytology was negative for malignancy and pleural fluid microbiology was negative. Serum angiotensin-converting enzyme (259 U/L), 1,25-dihydroxyvitamin D (283 pg/mL), calcium (13mg/dL) and 24HR urine calcium (459mg) were elevated. Transbronchial biopsies of the right middle lobe and station 7 Wang needle biopsies were positive for non-necrotizing granulomas. Patient was started on prednisone 40mg daily. She continued to have a rapidly recurring left pleural effusion despite five other thoracenteses with removal of 1-1.5L each time. Pleural studies remained the same with negative cytology and microbiologic cultures. Given continued concern for possible malignancy, a left thoracoscopy was performed with pleural biopsy and betadine pleurodesis. Pathology of left pleura was positive for granulomas and negative for any malignant or infectious etiology. Patient was continued on higher prednisone taper and showed improvement in her symptoms with resolution of left pleural effusion in the subsequent clinic visits. Sarcoidosis is a systemic disease characterized by the formation of noncaseating granulomas. It commonly involves the lung with classic presentations of mediastinal/hilar lymphadenopathy and interstitial lung disease. Pleural involvement in sarcoidosis is rare and the diagnosis is challenging. When pleural sarcoidosis is suspected thoracoscopy with pathological and microbiological examinations are essential to exclude malignancy and other infectious etiologies such as tuberculosis pleurisy. The presence of noncaseating granulomas on pleural biopsy and exclusion of alternate diagnoses confirm sarcoid pleural effusion. Corticosteroid therapy is often recommended, and the response is usually favorable.

Presentation #65

Title: Scurvy and Tinea Corporis Simulating Leukocytoclastic Vasculitis

Presenter: Komal K. Patel

Authors: Komal K. Patel, MD, Haley D. Heibel, MD, Yusuf Chao, MD, Jake Hutto, MD, Sidra Ibad, BA, Lucas E. Redd, MD, Daniel R. Nussenzweig, MD, PhD, Kimberly H. LaBorde, FNP-C, Clay J. Cockerell, MD, MBA, Kyawt Shwin, MD

Faculty Mentor(s): Kyawt Shwin, MD

Abstract:

Case 1: A 64-year-old man with a history of smoking, head and neck cancer status-post radiation therapy, hypothyroidism, and hypertension presented with a pruritic petechial eruption of the bilateral lower extremities and a left knee hemarthrosis confirmed by arthrocentesis. Labs were significant for normocytic anemia, elevated D-dimer (1264 ng/mL), elevated C-reactive protein (5.83 mg/dL) and mildly prolonged prothrombin time (12.8 seconds). Infectious and rheumatology work-up was negative. Punch biopsies of the eruption demonstrated findings consistent with early evolving leukocytoclastic vasculitis (LCV). Due to presence of large ecchymoses without other evidence of bleeding disorders, vitamin C deficiency was suspected. His vitamin C level was undetectably low, confirming the diagnosis of scurvy. Oral vitamin C supplementation of 1000 mg daily led to rapid normalization of vitamin C level and near resolution of rash.

Case 2: A 72-year-old female presented with an eruption involving her arms, torso, and right thigh. The lesions presented as scaly, erythematous plaques with well-demarcated borders and central clearing. Punch biopsies revealed an inflammatory infiltrate of lymphocytes, neutrophils, some eosinophils, and nuclear dust with extravasation of erythrocytes and fibrin in the walls of small blood vessels, consistent with LCV. The rash worsened despite topical steroid therapy. A KOH stain of a lesion was subsequently performed and returned positive, confirming tinea corporis. The patient was initiated on oral terbinafine therapy (250 mg daily for 14 days) and ketoconazole 2% cream twice daily with significant improvement 3 weeks later.

Discussion: LCV is a small vessel inflammatory condition caused by circulating immune complexes. While LCV often occurs after an acute infection or exposure to a new medication, it may also be associated with or part of an underlying systemic disease or be idiopathic in nature. These cases emphasize that evaluation of specific clinical features is essential to reach the correct diagnosis of scurvy and tinea corporis respectively. Timely and appropriate treatment of the underlying conditions in our patients resulted in significant clinical improvement. Hence, it is important to consider these conditions in the differential diagnosis in the right clinical setting, when the histologic changes are consistent with evolving or even fully developed LCV.

Presentation #66

Title: TINU syndrome presenting with bilateral anterior uveitis, tubulointerstitial nephritis, and crescentic IgA nephropathy

Presenter: Sapna Pathak

Authors: Sapna Pathak, MD; Yusuf Chao, MD; Melanie Holtrop, MD; Sahityan Viswanathan, MD; Hina Mehta, MD

Faculty Mentor(s): Hina Mehta, MD

Abstract:

Case presentation: A 59-year-old man with previously treated hepatitis C presented with two weeks of worsening bilateral eye pain, photophobia, decreased visual acuity, and headache. He was diagnosed with anterior uveitis and treated with prednisolone eye drops. He was also found to have acute kidney injury with creatinine 3.4 mg/dL (baseline 1.2 mg/dL), 38 RBCs on urinalysis, sub-nephrotic range proteinuria (UPCR 1.1 mg/g), and no evidence of obstruction on kidney ultrasound. Lab work was notable for ANA 1:160, RF 33 IU/mL, RPR 1:8, elevated ACE 140 U/L, calcium 9.5 mg/dL, negative HIV, negative HLA-B27, and negative ANCA. CT chest was negative for hilar adenopathy. He received IV penicillin for presumed ocular syphilis, although CSF studies were largely unremarkable. He underwent kidney biopsy that showed crescentic IgA nephropathy, global sclerosis (one of four glomeruli), and tubulointerstitial nephritis without granulomas. Fluorescein staining was positive for IgA (4+), C3 (3+), kappa (2+), and lambda (3+), and negative for IgG. He received high dose steroids and cyclophosphamide leading to significant reduction in proteinuria and hematuria. One week later, he reported ongoing blurry vision, suggesting his uveitis may be part of a systemic autoimmune disease process.

Discussion: The differential diagnosis for interstitial nephritis with ocular disease includes tubulointerstitial nephritis and uveitis syndrome (TINU), sarcoidosis, Sjogren syndrome, GPA, and SLE. TINU is a rare syndrome that can present either in isolation or as a manifestation of systemic autoimmune conditions. The diagnosis of TINU is challenging due to its non-specific symptoms and is made clinically on the basis of uveitis along with acute interstitial nephritis on kidney biopsy. Because ocular symptoms can either precede or follow the kidney diagnosis, with uveitis developing up to 14 months later, the diagnosis of TINU can be easily missed.

TINU is certainly a consideration in our patient; however, concurrent crescentic IgA nephropathy makes this case particularly interesting. There have only been two published case reports of TINU accompanied by IgA nephropathy, and patients in both cases improved with systemic steroid treatment and required long term follow-up for recurrent uveitis. Clinicians should consider concomitant kidney disease in patients presenting with uveitis.

Presentation #67

Title: Left Hand Necrosis: A Rare Presentation of Disseminated Mucormycosis

Presenter: Samuel Phen

Authors: Samuel Phen, MD; Emily Hoff, MD; Kruti Yagnik, DO, Mir Ali, MD, James Cutrell, MD, John Waters, MD, Kehinde Odedosu, MD

Faculty Mentor(s): Kehinde Odedosu and James Cutrell

Abstract:

Case Presentation: A 47-year-old female with poorly controlled type I diabetes mellitus presented with altered mental status and left hand pain. On examination patient was hemodynamically stable, with a dusky-appearing left hand and wet gangrene of the left fourth digit. Laboratory results included leukocytosis (WBC 15), acute renal injury (creatinine 6.63 mg/dl), and diabetic ketoacidosis (glucose 746 mg/dl and anion gap 30). Pertinent imaging included left hand x-ray that showed atrophy of the fourth digit with subcutaneous gas and computerized tomographic scan of the chest that revealed consolidative and reticular opacities in the right lower lobe. She was admitted for management of diabetic ketoacidosis secondary to sepsis and started on empiric antibiotics for infections of the lung and hand. She was taken for surgical amputation of her left fourth digit given concern for gas-forming organisms but subsequently underwent wrist disarticulation as there was no remaining viable tissue in the left hand. Despite surgical management and broad-spectrum antibiotics, patient had worsening leukocytosis and tenuous blood pressures. She underwent a bronchoscopy which revealed large necrotic tissue concerning for mucormycosis. Cardiothoracic surgery was consulted for surgical source control and patient underwent right lower lobectomy. Ultimately, the left hand pathology, bronchoalveolar lavage, and right lower lung lobectomy grew broad, pauciseptate hyphae of Zygomycetes. Further evaluation for disseminated mucormycosis revealed bilateral frontal lobe punctate infarcts on magnetic resonance imaging of the brain and a large right atrial vegetation with a patent foramen ovale on transesophageal echocardiography. She underwent AngioVac extraction of the right atrial vegetation. The patient remains critically ill in the intensive care unit and is being treated with amphotericin and posaconazole.

Discussion: Mucorales organisms cause devastating infections with infarction and necrosis of tissue in immunocompromised individuals, including those with uncontrolled diabetes mellitus. Mucormycosis has variable presentations, most commonly rhino-orbital. However, mucormycosis can have diffuse systemic manifestations. In this patient with pulmonary mucormycosis, left hand necrosis was a clue to an underlying disseminated angioinvasive infection. Overall, this was a rare case of disseminated mucormycosis with pulmonary and cutaneous/vascular involvement that required prompt antifungal therapy and urgent surgical intervention.

Presentation #68

Title: Generalized tetanus in a black tar heroin user: opportunities for prevention

Presenter: Elisa Pichlinski

Authors: Elisa Pichlinski, MD, Emily Hoff, MD, Ank Nijhawan, MD, MPH, MSCS

Faculty Mentor(s): Ank Nijhawan

Abstract:

Case Presentation: A 38-year-old male with history of drug-induced psychosis and opioid use disorder presented to the emergency department with one day of chest pain, back pain, and difficulty opening his mouth. He was tachycardic to 104, diaphoretic, had tenderness throughout the thoracolumbar spine and found to have increased tone in four extremities. Aortic dissection and epidural abscess were ruled out with imaging. His spasms worsened involving neck stiffening, jaw clenching with involuntary smile, contraction of platysma muscles and opisthotonos. During these episodes, he remained alert and oriented with worsening diaphoresis, tachypnea, and tachycardia up to heart rates of 140-160. The episodes were triggered by minor stimulation such as loud noise, light, or touch. He was started on Vancomycin, Ceftriaxone, and Metronidazole. He also received fluid resuscitation, diphenhydramine, benzodiazepines for his muscle spasms, and 500 units of human tetanus immune globulin. Eventually, his muscle spasms worsened and he was nasally intubated for airway protection. His course was notable for episodes of autonomic instability involving hyperthermia, alternating hypertension and hypotension requiring vasopressors and bursts of tachycardia to the 160s. He was paralyzed from day 2 to day 24 of admission and underwent a tracheostomy on day 12 of admission. Once paralysis was lifted, a high dose magnesium infusion was used to prevent recurrent spasms. He was progressively weaned off sedation and ventilator and discharged to inpatient rehabilitation on day 55. After another week, his tracheostomy was decannulated, and he was discharged home, independent for most activities of daily living.

Discussion: Our case demonstrates how the "perfect storm" of lack of vaccination and drug use can lead to generalized tetanus, a preventable disease rarely seen in the current era in developed countries. While our patient ultimately recovered, he experienced a long hospitalization and rehabilitation course. In addition to high personal cost, lengthy hospitalizations with extended ICU stays portend a large cost to the healthcare system. We highlight the importance of considering tetanus in an initial differential, discuss the unique toxic and infectious exposures associated with black tar heroin use, and advocate for implementation of preventative measures for people at risk of tetanus.

Presentation #69

Title: Scurvy Masquerading as Hemarthrosis

Presenter: Ganesh Raman

Authors: Ganesh Raman, MD, Patrick Marquardt, MD, MPH , Yu-Min Shen, MD, David H. Wang, MD, PhD

Faculty Mentor(s): David H. Wang and Yu-Min Shen

Abstract:

Hemarthrosis is a condition that results from bleeding into joint cavities. It is most commonly seen in the knees. Recurrent episodes may destroy intra-articular cartilage and cause severe arthritis. Scurvy is a rare cause of hemarthrosis that should be considered especially when other conditions have been ruled out.

A 64-year-old veteran with history of head and neck squamous cell carcinoma presented to the emergency department with three weeks of worsening left knee pain and swelling. Arthrocentesis of the knee was performed which showed bright red fluid with numerous red blood cells, consistent with hemarthrosis. His labs were notable for a normocytic anemia, normal coagulation factors and low serum vitamin C level. It was determined that poor intake of fruits and vegetables for years after his cancer treatments had led to vitamin C deficiency (scurvy), which predisposed him to hemarthrosis. Following supplementation with Vitamin C for several weeks, his levels normalized, and symptoms resolved.

This case raises the question of whether we should screen for scurvy in high-risk populations including chronic alcohol users, persons experiencing homelessness, and other individuals predisposed to malnutrition.

Presentation #70

Title: Cerebral Salt Wasting in a Renal Transplant Patient

Presenter: Prashanth Reddy

Authors: Prashanth Reddy, MD, Sahityan Viswanathan, MD, Nashila AbdulRahim, D.O., MS

Faculty Mentor(s): Nashila AbdulRahim

Abstract:

Case Presentation: A 63yo Male with a PMHx of DDKT presented with nausea/vomiting. A cerebellar abscess from a previous biopsy site was found and he underwent a debridement and washout. On POD#4 the patient had a drop in sodium to 131. Urine studies [urine osmolality: 789, urine Na: 72]. With continued drop in sodium and orthostatic hypotension he was started on NS 75cc/hr. The sodium continued to drop to a low of 123. At that time the NS was increased to 125cc/hr. This resulted in an upswing in serum sodium to 130. A drop in NS rate was trialed with sodium dropping back to 127. The NS was eventually ramped up to 200cc/hr with good response. During the up titration of fluids there was a noted drop in urine osmolality. The patient was eventually transitioned to a dose of salt tabs close to the equivalent to the amount of fluids he was receiving [5g Q4H]. He was also started on Fludrocortisone 0.1mg daily. This resulted in our ability to drop the Salt tabs to 4g Q6H with stability in serum sodium noted. He was discharged on this regimen and was noted to have stable serum sodium on follow up a few weeks later.

Discussion: CSW is difficult to diagnose due to the similarities in laboratory diagnostic markers with SIADH. One major difference is that in CSW patients are usually hypovolemic. This was established in this case by checking orthostatic blood pressure. Another aspect that differs from SIADH is the approach to treatment. In SIADH a combination of fluid restriction, lasix, and salt tabs are used. What makes our case unique is the successful use of NS to correct the patient's sodium. If this was SIADH, continuous administration of NS would have further dropped the sodium level. Thus we believe we met the burden of proof to officially diagnose this patient with CSW. Though there may still be debate about the existence of CSW, we believe that with the difference in treatment approach it should always be considered in the differential in patients with CNS injury.

Presentation #71

Title: Too much of a good thing? A life-threatening case of post-obstructive diuresis.

Presenter: Taylor Schaubsluger

Authors: Taylor Schaubsluger, DO; Denise Marciano, MD, PhD

Faculty Mentor(s): Denise Marciano

Abstract:

Introduction: Post obstructive diuresis is frequently encountered with a polyuric response by the kidneys after the relief of a substantial bladder outlet obstruction. In severe cases, this condition can result in dehydration, severe electrolyte imbalances, hypovolemic shock and death. We present a case of obstructive acute kidney injury with prolonged post-obstructive diuresis that was accompanied by severe azotemia, metabolic acidosis, hyperphosphatemia with development hypernatremia and hypokalemia with complete resolution over 9 days. Our report reviews the three main causes of this condition and highlights the important of careful monitoring of electrolytes and fluid balance in these patients.

Case Presentation: 71-year-old male with a history of hypertension, type 2 diabetes mellitus, benign prostatic hyperplasia who presented with several week history of weakness, fatigue, nausea, poor appetite, pruritis and sensation of incomplete bladder emptying after self-discontinuing his alpha-1 blocker tamsulosin. Initial evaluation was significant for BUN >336 mg/dL, serum creatinine 15.00 mg/dL, anion gap metabolic acidosis with CO₂ 12 mmol/L, phosphorous 17.0 mg/dL, measured serum osmolality 430 mosm/kg. Renal ultrasound and CT abdomen/pelvis revealed marked prostaticomegaly with bilateral hydronephrosis. A foley catheter was placed with polyuric response of near 39 L total. Initial spot urine suggested mixed solute and osmotic diuresis. Hemodynamics, intake/output, and serum electrolytes were carefully monitored with electrolyte replacement and aggressive IVF resuscitation with ultimate resolution of uremic symptoms and normalization of serum creatinine and electrolyte abnormalities over 9 days.

Discussion: Post-acute kidney injury diuresis can further be broken down into water diuresis, saline (solute) diuresis and osmotic diuresis. Urine volume is large in all three causes. In water diuresis urine osmolality is low (dilute) with low urine sodium and potassium reflecting a loss of hypotonic urine. In saline (solute) diuresis urine osmolality is near isotonic/slightly hypertonic with high urine sodium and potassium reflecting loss of isotonic urine. In osmotic diuresis, urine osmolality is high (concentrated) with low urine sodium and potassium reflecting a loss of osmotically active osmoles driving osmotic diuresis. Careful evaluation of urine electrolytes to identify type of diuresis can help aid proper management with choice of IVF and prevent development of severe life-threatening complications.

Presentation #72

Title: Peritoneal Coccidioidomycosis in an Immunocompetent Patient

Presenter: Haley Schoenberger

Authors: Haley Schoenberger, MD, Zane Conrad, MD, Trish Perl, MD, Dominic Cavuoti, MD

Faculty Mentor(s): Trish Perl and Dominic Cavuoti

Abstract:

Background: Coccidioidomycosis is a fungal infection caused by *Coccidioides immitis* and *Coccidioides posadasii*. Within the United States, this fungus is most prominent in the Southwestern region, but can also be found in parts of Mexico and Central and South America. Infection with *Coccidioides* primarily causes a self-limited respiratory illness accompanied by chest pain, cough, and fever within several weeks of exposure. Approximately 0.5% of cases manifest in extrapulmonary disease in the general population with increased risk seen in patients with HIV/AIDS, hematologic malignancies, and immunosuppressive therapy. The most common extrapulmonary sites of infection include skin, bone, and meninges. Involvement of the gastrointestinal tract is a relatively rare presentation of disseminated disease. Here, we present a case of peritoneal coccidioidomycosis in an otherwise healthy individual with no known history of prior respiratory illness or immunocompromising condition.

Case Presentation: A 59 year-old woman with hypertension and hyperlipidemia presented to the ED with new abdominal swelling, pain, and early satiety. She had recently made several trips to Solano County, California within the months prior to presentation. She was found to have new-onset ascites on abdominal imaging. Both abdominal CT and MRI were performed showing diffuse peritoneal thickening and omental caking, which was initially concerning for peritoneal carcinomatosis. Paracentesis was performed, and ascitic fluid had no growth on aerobic and anaerobic cultures with negative cytology. A biopsy was obtained revealing necrotizing and non-necrotizing granulomas with *Coccidioides* spherules on hematoxylin and eosin staining. *Coccidioides* antibody by complement fixation was elevated at 1:8. She was started on treatment with fluconazole prior to discharge with planned 18-month treatment course for disseminated disease.

Conclusions: Extrapulmonary manifestations of coccidioidomycosis are a rare presentation in immunocompetent patients. This presentation highlights the importance of investigating extrapulmonary manifestations of coccidioidomycosis in the right clinical and epidemiological setting.

Presentation #73

Title: Cushing Disease in Pregnancy

Presenter: Manasi Shah

Authors: Manasi Shah, MD, Sasan Mirfakhraee, MD

Faculty Mentor(s): Sasan Mirfakhraee

Abstract:

Case Presentation: A 29 y/o woman was referred to Endocrinology in 5/2020 with complaints of weight gain, newly diagnosed T2DM, hypertension and irregular menstrual cycles. Patient reported 87 lb gain over 1.5yrs, mainly in the truncal region. Associated with fatigue, insomnia, depression, anxiety, worsening acne, violaceous stria on arms/thighs/abdomen, easy bruising and skin thinning. She had ~3 monthly menstrual periods since age 12. No history of corticosteroid use. On physical exam, appeared cushingoid (compared to a picture from 2 years ago). Noted to have dorsocervical & supraclavicular fat pad, facial fullness, acanthosis nigricans, diffuse non-pitting edema.

Labs: 24-hour Urine Free Cortisol (UFC) 240 mcg, creatinine 1.8, Aldo 4, PRA 0.3, 17(OH)P 69, ACTH 80, DHEAS 353, BMP normal, Testosterone 33, Plasma metanephrines normal, Prolactin 34 ng/ml. Patient was diagnosed with ACTH-dependent Cushing syndrome. MR Pituitary noted to have a L sellar mass (~7 mm). Patient was diagnosed with pregnancy soon after the diagnosis of Cushing disease.

Patient underwent transphenoidal resection in 10/2020 with Neurosurgery during 2nd trimester. Surgical histopathology c/w atypical ACTH cell adenoma with elevated MIB-1 proliferation index (10.4%). Patient did not need glucocorticoid therapy postoperatively. UFC was not high enough to require medical treatment. Diabetes and hypertension were controlled on medications. Patient delivered preterm due to preeclampsia in 2/2021. Postpartum labs are pending.

Discussion: Pregnancy is rare in Cushing syndrome (CS) since it disrupts ovulation in 75% of women. Clinical features overlap with changes in pregnancy making diagnosis difficult. Total cortisol levels are inaccurate in pregnancy due to elevated CBG levels, hence DST or CRH tests are not recommended. UFC values in the 2nd or 3rd trimester >3 x ULN confirms Cushing's Syndrome in pregnancy. No consensus exists on the management of CS during pregnancy. If possible, initial treatment is surgery in the 2nd trimester. Treatment during pregnancy reduces maternal morbidity and fetal mortality but does not appear to reduce the frequency of IUGR or preterm birth. Metyrapone has been used and well-tolerated in reserve cases in whom surgery is life-threatening. Due to elevated risk of perinatal complications, contraception should be offered to young women with Cushing syndrome.

Presentation #74

Title: Spontaneous Resolution of Primary Hyperparathyroidism Following Covid 19 infection

Presenter: Mahwash Fatima Siddiqui

Authors: Mahwash F. Siddiqui, MD; Fabiola G. Gianella, MD; Naim M. Maalouf, MD

Faculty Mentor(s): Naim M. Maalouf, MD

Abstract:

Case Presentation: A 38-year old women was referred to our clinic for the management of hypercalcemia of 2 years duration and history of nephrolithiasis. She was diagnosed with primary hyperparathyroidism based on biochemical work up showing hypercalcemia, hypercalciuria and elevated serum PTH. Neck imaging studies failed to identify parathyroid adenoma. She was referred for surgical evaluation but prior to that she developed a febrile respiratory illness and tested positive for Covid -19 infection. At the time of diagnosis with Covid-19, she was noted to be normocalcemic. She recovered clinically from her infection without requiring any specific therapy or the use of glucocorticoids. Over the subsequent six months, serum calcium and serum PTH remained normal, raising the possibility of spontaneous resolution of primary hyperparathyroidism.

Discussion: This is the first reported case of spontaneous long-term resolution of hypercalcemia in a patient with primary hyperparathyroidism after Covid-19 infection. Spontaneous resolution of primary hyperparathyroidism is rare and has been exclusively reported in the setting of apoplexy of large parathyroid adenoma. In our patient, parathyroid apoplexy was unlikely, as localizing studies failed to demonstrate a parathyroid adenoma. The temporal association between Covid-19 infection and resolution of hypercalcemia that has persisted after six months of follow-up raises the question of the potential impact of Covid-19 on the parathyroid-calcium axis. The endocrine effects of SARS-CoV-2 on parathyroid gland are not fully understood as expression of ACE2, the SARS-CoV-2 cell receptor gene is not detected in parathyroid tissues. Interferon-gamma-induced inhibition of osteoclastogenesis is a well-described phenomenon, but whether this resulted in the resolution of hypercalcemia after Covid-19 infection in our patient is unknown. Other postulated mechanisms include development of antibodies against the parathyroid or the calcium sensing receptor. With the rising number of Covid-19 infections, further studies are needed to understand the frequency of resolution of hypercalcemia in PHPT patients, and the underlying mechanism. To address this, we are currently in the process of reviewing the impact of Covid-19 infection on serum calcium and PTH in other patients with PHPT in our healthcare system.

Presentation #75

Title: Diabetic Myonecrosis in a Pediatric Patient with Type 2 Diabetes Mellitus

Presenter: Jasmina Solankee (MS4)

Authors: Jasmina Solankee, BA, Timothy Zaki, MD, Emily Hoff, MD, Veena Rajaram, MD, Shweta Chowdhury, MD

Faculty Mentor(s): Shweta Chowdhury

Abstract:

Case Presentation: A 16-year-old female presented with sudden onset sharp and stabbing bilateral calf pain that began several hours after a five-hour road trip, the day prior to admission. The pain worsened with movement and was associated with bilateral shaking of the patient's legs. The patient denied recent air travel, sick contacts, newly prolonged periods of inactivity, or trauma. Her past medical history was notable for type 2 diabetes mellitus (T2DM) with a family history of diabetes in her mother, obesity (BMI 41.8), gastroesophageal reflux disease, depression, anxiety, and bipolar type schizoaffective disorder. On examination, the patient was afebrile with stable vital signs. Her bilateral gastrocnemius muscles were tender and firm to palpation. Neurovascular exam was intact, with strong lower extremity pulses. Homan's sign for deep venous thrombosis was negative.

Elevated creatinine kinase levels and MR imaging raised concern for diabetic myonecrosis. A biopsy of the left gastrocnemius muscle was obtained given her young age and consideration of inflammatory myopathies. Histologic analysis revealed active myofiber necrosis and multifocal perivascular lymphocytic infiltration consistent with myonecrosis. The patient's symptoms improved after conservative treatment with intravenous fluids, aspirin and other nonsteroidal anti-inflammatory drugs, glycemic control, and physical therapy.

Discussion: Diabetic myonecrosis is characterized by acute muscle pain and swelling, often in the lower extremities. It is a rare complication of long-standing or poorly controlled diabetes and is typically associated with other vascular complications of diabetes. Although the acute presentation is self-limiting and responsive to conservative management, long-term prognosis is poor. Some evidence suggests that antiplatelet or anti-inflammatory therapy can shorten recovery times, however no randomized trials have been conducted and, thus, treatment with such agents must be tailored to each patient.

To our knowledge, this is the first report of diabetic myonecrosis observed in a pediatric patient. This case demonstrates that myonecrosis can present as an early complication of poorly controlled diabetes. The presentation in younger populations is concerning since the diagnosis may be overlooked, delaying intervention. As more young people develop diabetes, it is increasingly important to keep myonecrosis in consideration and be vigilant in maintaining optimal glycemic control in these populations.

Presentation #76

Title: Electrolyte storm associated with non-exocrine manifestations of Sjögren's syndrome

Presenter: Sahityan Viswanathan

Authors: Sahityan Viswanathan, MD , Kamalanathan Sambandam, MD

Faculty Mentor(s): Kamalanathan Sambandam

Abstract:

Case presentation: A 26 year old Hispanic female with no known past medical history presents with nausea and vomiting at 21 weeks gestation of her second pregnancy. Workup was significant for elevated creatinine, normal anion gap metabolic acidosis, hypokalemia and hypophosphatemia. Even after the resolution of symptoms and IVF repletion, patient was found to have profound, refractory hypokalemia, hypophosphatemia, proteinuria, and metabolic acidosis. Urine studies were suggestive of impaired renal reclamation of potassium, phosphorous, and bicarbonate. This was pointing towards a type III RTA with the alkaline urine and worsening hypokalemia with alkali therapy. This was further emphasized by the non-PTH mediated phosphorous wasting and the absence of glucosuria. Serological workup was significant for positive ANA, SSA and SSB antibodies. Kidney biopsy was done which was significant for acute tubulointerstitial nephritis. This was presumed to be secondary to Sjögren syndrome that would also account for the tubulopathy even though distal RTA is the most commonly cited manifestation. The patient was started on an IV steroid course with oral taper and hydroxychloroquine with mild improvement in Cr and plateauing at 1.2 mg/dL. Proteinuria was stable at 1g/24h. The patient was discharged with a potassium, phosphate and sodium bicarbonate supplementation regimen.

Discussion: Sjögren's syndrome is typically associated with lymphocytic infiltration of exocrine glands. However, this can also affect the kidneys causing tubulointerstitial nephritis and defects in tubular function initiating a cascade of electrolyte abnormalities. Understanding the renal physiology behind the observed electrolyte abnormalities is important to optimize our treatment regimen. While the management of a distal RTA that has been well described in Sjögren's syndrome typically involves judicious potassium and alkali supplementation, this case highlights the worsening potassium wasting and phosphorous wasting which also needs to be addressed with a concomitant proximal tubulopathy.

We propose that this set of features can best be explained by dysfunctional carbonic anhydrase, a cause of the extremely rare type III RTA. We use this case presentation to highlight the spectrum of renal manifestations of Sjögren's syndrome and their treatment principles.

Presentation #77

Title: An unusual presentation of metastatic small cell carcinoma and the implications of base rate neglect

Presenter: Emily Wong, Nicolas Chong Lugon

Authors: Emily Wong, M.D., Nicolas Chong Lugon, M.D.

Faculty Mentor(s): Dr. David Johnson

Abstract:

Case Presentation: A 60-year-old Caucasian male presented with 3 months of headaches and loss of balance. Brain MRI showed innumerable rim-enhancing and calcified cystic lesions. History revealed a 40-pack year smoking history, vicinity to farm animals, and no international travel. A diagnosis of neurocysticercosis was made based on radiologic criteria and clinical symptoms. Anti-helminthics and corticosteroids were empirically started. Despite treatment, symptoms and MRI findings continued to progress. Further investigation discovered a spiculated lung lesion and additional hepatic, pancreatic and adrenal lesions. Lymph node biopsy confirmed small cell lung carcinoma (SCLC). Systemic chemotherapy and whole brain radiation therapy were initiated, but unfortunately, the patient had progressive functional decline and passed away four months after diagnosis.

Discussion: Brain metastases are a frequent presentation of advanced malignancies. Lung cancer is the primary malignancy in 70% of cases where brain metastases are found on initial presentation. In SCLC, 10% of patients have brain lesions at initial diagnosis and 50% develop them as the disease progresses. Lesions are typically solid with areas of necrosis and rim-enhancing edema. Cystic lesions in SCLC are extremely rare and have been reported in five prior case reports. Neurocysticercosis is one of the five neglected parasitic infections identified by the CDC, with most cases occurring in patients born outside the United States. The definitive diagnosis of NCC is challenging and relies on neuroimaging, clinical findings, and exposure history, but many cases of metastatic disease are initially misdiagnosed as NCC.

Estimating probabilities illustrates the importance of considering the base rate of diseases in diagnostic workup. Lung cancer prevalence is 62 per 100,000 in the United States, with metastatic brain lesions on presentation estimated at 6.2 per 100,000. The prevalence of NCC is 0.6 per 100,000 and is significantly lower in non-Hispanic populations. When considering both possibilities, base rates show that in any patient, metastatic lung cancer is ten times more likely. Using the positive likelihood ratio of NCC diagnostic criteria, post-test probability is estimated at 3/100,000, which remains lower than that the base rate of metastatic lung cancer. Considering disease prevalence can help avoid base rate neglect when constructing a differential diagnosis.

Presentation #78

Title: ROR- γ t associates with Raftlin-1 and regulates colonic inflammation

Presenter: Amir Kumar Singh

Authors: Amir Kumar Singh, PhD, Ritesh Kumar, PhD, Arianne L. Theiss, PhD, and K Venuprasad, PhD

Faculty Mentor(s): Venuprasad Poojary

Abstract:

Background: Interleukin (IL)-17 produced by Th17 cells, innate lymphoid cells (ILCs), and $\gamma\delta$ T cells is strongly associated with several human inflammatory diseases, including ulcerative colitis (UC). However, the mechanisms by which the function of ROR- γ t, the transcription factor of IL-17 regulated, remains unclear, which is necessary to target IL-17-mediated inflammatory diseases.

Methods: C57BL/6 mice were infected with *Citrobacter rodentium*, an enteropathogenic gram -ve bacteria. ROR- γ t was immunoprecipitated from colonic mucosa, and mass spectrometry was performed to identify the regulators of ROR- γ t. To confirm Raftlin1/ROR- γ t interactions, we performed co-immunoprecipitation and GST-pull down experiments. To explore the role of the Raftlin1/ROR- γ t complex, we performed an IL-17 promoter-driven luciferase assay. Sequential chromatin immunoprecipitation assay (ChIP) assay was performed to confirm the binding of the Raftlin1/ROR- γ t complex. Adoptive transfer of CD4+CD25-CD45RBhi cells into Rag1-/- mice was performed to investigate the function of Raftlin1/ROR- γ t complex in IL-17-mediated colonic inflammation.

Results: Raftlin1, a lipid raft protein, directly interacts with ROR- γ t in Th17 cells in *C. rodentium* infected mice. This interaction is mediated by a highly conserved LLNSL motif within Raftlin1. The Raftlin1/ROR- γ t complex binds to the IL-17 promoter and enhances IL-17 transcription. CRISPR-Cas9-mediated inhibition of Raftlin1 attenuates IL-17 expression in Th17 cells and reduced disease severity in Rag1-/- mice upon adoptive transfer. Consequently, we found that the mRNA expression of Raftlin1 and IL-17 was elevated in a significant number of UC patients, and there was a strong positive correlation (Pearson coefficient, $r = 0.58$) between Raftlin1 and IL-17 expression.

Conclusion: Our studies have uncovered a novel mechanism by which IL-17 expression is regulated via Raftlin1/ROR- γ t complex that could be exploited therapeutically in Th17-driven diseases.

Presentation #79

Title: COVID19-induced de novo immune thrombocytopenia

Presenter: Sanah Parvez

Authors: Sanah Parvez, MD; Mohsin Soleja, MD; Ibrahim Ibrahim, MD

Faculty Mentor(s): Ibrahim Ibrahim

Abstract:

Background: Thrombocytopenia in patients with SARS-CoV-2 (COVID19) infection been observed in 36.2% of infected patients according to the National Health Commission of China. In cases of more severe infection, thrombocytopenia is observed more frequently and has been associated with higher risk of mortality. COVID19 infection can cause thrombocytopenia through multiple mechanisms: (1) increased consumption from endothelial activation of platelets, (2) disseminated intravascular coagulation (DIC), (3) decreased synthesis through infection platelet precursors and cytokine storm, and (4) immune destruction through development of platelet auto-antibodies.

Methods: We performed a review of the literature and collected all cases of reported cases to date of de novo ITP in the setting of recent COVID19 infection, including two patients seen at UTSW. We classified severity of COVID19 infection as Asymptomatic if the patient had no symptoms, Mild-Moderate infection if patient had symptoms, Severe if they had hypoxia and required oxygen support, or Critical if they required mechanical ventilation or had multi-organ failure. We identified onset of thrombocytopenia from PCR testing. Few cases had negative PCR, however were included in the analysis if patient had known exposure in setting of clinical symptoms and radiographic features of COVID19 pneumonia. Major bleeding was defined as clinically significant gastrointestinal bleeding, any intracranial bleeding, or any other bleeding necessitating transfusion or blood products including platelets. A complete response (CR) was defined as an improvement in platelets greater than $50,000 \times 10^9/L$.

Results: A total of 25 case series and case reports were identified and included in this review, as well as two cases seen at Parkland and CUH. Regarding severity of disease, 6.1% were asymptomatic, 59.2% were mild, 22.5% were severe, and 12.2% were critical. Thrombocytopenia was present in 15 out of 44 patients (34%) at time of SARS-CoV-2 PCR testing. For the rest, onset of thrombocytopenia ranged from 1-30 days after diagnosis of COVID19. Ten out of 49 patients (20.4%) had major bleeding complications prompting intervention. For treatment of ITP, 8 out of 49 patients (16.3%) were treated with high-dose glucocorticoids (intended for ITP) only, 15/49 (30%) with IVIg only, and 16/49 with a combination of both. Nine patients (18.4%) required additional therapy with TPO mimetic for refractory ITP; none of these patients developed thrombotic complications. Forty one out of 45 patients (91.1%) had a CR to ITP treatment (four cases did not specify degree of response). Of those that had CR, 4/41 (9.75%) had relapse of their disease. Three out of these 49 patients died (one from intracranial hemorrhage).

Conclusion: Identification of the mechanism of thrombocytopenia in COVID19 infection may have prognostic implications, as immune thrombocytopenia has a much lower mortality rate compared to other mechanisms such as consumptive coagulopathy from DIC. Bleeding events in COVID19-related ITP may be higher than in ITP alone. The frequency of severe (non-ICH) bleeding frequencies in patients with ITP alone range 3%-20% in children and approximately 10% in adults. This review included very few

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asymptomatic patients, so it is possible that ITP may be more prevalent among those infected with COVID19 than identified here. We recommend testing for SARS-CoV-2 infection even in asymptomatic patients presenting with de novo ITP during the current pandemic.

Presentation #80

Title: Longitudinal Trajectories and Predictors of County-Level Cardiovascular Mortality in the United States (1980-2014)

Presenter: Shreya Rao

Authors: Shreya Rao MD MPH, Amy Hughes PhD, Colby Ayers MS, Matthew Segar, MD, MS; Sandeep Das MD MPH1, Ethan Halm MD MPH, Ambarish Pandey MD MSCS

Faculty Mentor(s): Ambarish Pandey

Abstract:

Importance: Cardiovascular (CV) mortality has declined over four decades in the United States. However, whether declines have been uniformly experienced across U.S. counties, and determinants of CV mortality at the county-level are not known.

Objective: To identify unique trajectories of county-level CVD mortality and to determine social, environmental and health-related predictors of CV mortality.

Design, Setting, and Participants: CV mortality data was obtained between 1980-2014 for 3,133 U.S. counties using small-area estimation models to estimate age-standardized county-level mortality rates from the Global Burden of Disease study. We used a K_mL approach to identify three distinct phenogroups based on mortality trajectory. County-level characteristics encompassing population characteristics, population distribution, health status, and food environment were collected from four county-level datasets. Multinomial logistic regression was used to evaluate the associations between county characteristics and phenogroup membership.

Main Outcomes and Measures: Age-standardized mortality trajectory group and predictors of cluster membership.

Results: Cardiovascular mortality declined in all groups in parallel, such that counties with the highest mortality in 1980 continued to demonstrate highest mortality in 2014. Trajectory groups were regionally clustered with high-mortality trajectory counties focused in the South and portions of Appalachia. Groups varied significantly in social characteristics such as non-white proportion (low vs. high: mean 12% vs. 27%), high-school education (11% vs. 20%), and violent crime rates. Disparities in health factors were observed with increasing rates of smoking, obesity and diabetes from low- to high-mortality groups, though substantial collinearity was observed between social and health factors. In multinomial logistic regression, social factors including educational attainment (OR=12.4, high vs. low), and violence (OR=1.6, high vs. low), as well as smoking (OR=3.9, high vs. low) were the strongest independent predictors of trajectory group membership, with a model incorporating social, environmental, and health characteristics demonstrating strong predictive ability (R²=0.56).

Conclusions and Relevance: Despite an overall decline in CV mortality over 34 years, disparities at the county-level persist unchanged in that time. Disparate trajectories are strongly associated with social characteristics and smoking prevalence suggesting that efforts to intervene upon county-level CV disparities may require investment in multiple domains including public health and safety and education.

Presentation #81

Title: Longitudinal Trajectories and Predictors of County-Level Cardiovascular Mortality in the United States (1980-2014)

Presenter: Nitin Kondamudi

Authors: Nitin Kondamudi, MD; Matthew W. Segar, MD, MS; Shreya Rao, MD, MPH; Gregg Fonarow, MD; Javed Butler, MD, MPH, MBA; Alanna A. Morris, MD, MsC; Justin Grodin, MD, MPH; Pankaj Arora, MD; Melvin R. Echols, MD; Tiffany Powell-Wiley, MD, MPH; Ambarish Pandey, MD, MSCS

Faculty Mentor(s): Ambarish Pandey

Abstract:

Background: Heart failure (HF) is more prevalent in Black vs. White adults and racial groups have differential risk for adverse outcomes such that Black individuals with HF have higher risk of HF hospitalization but lower risk of death. Indices of HF severity are used to assess prognosis and guide clinical decision-making. However, it is unknown whether race modifies the association of HF severity indices with risk of HF hospitalization and death.

Methods: Adults with HF with reduced ejection fraction (HFrEF) enrolled in the GUIDE-IT trial with available data regarding HF severity indices at baseline (N-terminal pro-B-type natriuretic peptide [NT-proBNP], New York Heart Association [NYHA] class, creatinine, 6-minute walk distance [6-MWD], and meta-analysis global group in chronic heart failure [MAGGIC] risk score) were included. Multivariable adjusted Cox proportional hazards models were constructed to evaluate the independent associations of race and HF severity indices with risk of HF hospitalization and all-cause death. Multiplicative interaction testing was performed between race and each HF severity index measure.

Results: Among 894 participants, 36.2% were of self-reported Black race. NT-ProBNP, NYHA Class, 6-MWD, and KCCQ score were associated with risk of HF hospitalization and death. However, MAGGIC risk score was only associated with higher mortality risk (aHR [95% CI] =1.23 [1.11, 1.37]). The associations of NT-ProBNP and NYHA class for risk of HF hospitalization was modified by self-reported race (P-interaction<0.05 for both) such that these parameters were more strongly associated with risk of HF hospitalization in Non-Black patients (aHR[95%CI]=1.59[1.33-1.89], aHR[95% CI]=2.07[1.46-2.95] vs. Black patients (aHR[95%CI]=1.21[0.99-1.47], aHR[95% CI]=1.38[0.96-1.99]). Furthermore, self-reported race modified the association of 6-MWD and MAGGIC risk score with mortality risk (P-interaction race*6-MWD=0.08; race*MAGGIC score=0.05). Both measures were associated with risk of death in Non-Black patients (aHR per 1SD higher 6MWD: [95%CI]=0.82[0.68-0.99], aHR per 1SD higher MAGGIC score: [95% CI]=1.31[1.15-1.48]) but not Black patients.

Conclusion: Certain indices of HF severity have differential associations with risk of HF hospitalization and all-cause death in Black and White patients with HFrEF. Recognition of racial differences in prognostic applications of established tools to assess HF severity may inform risk-based discussions and prescription of effective HF therapies.