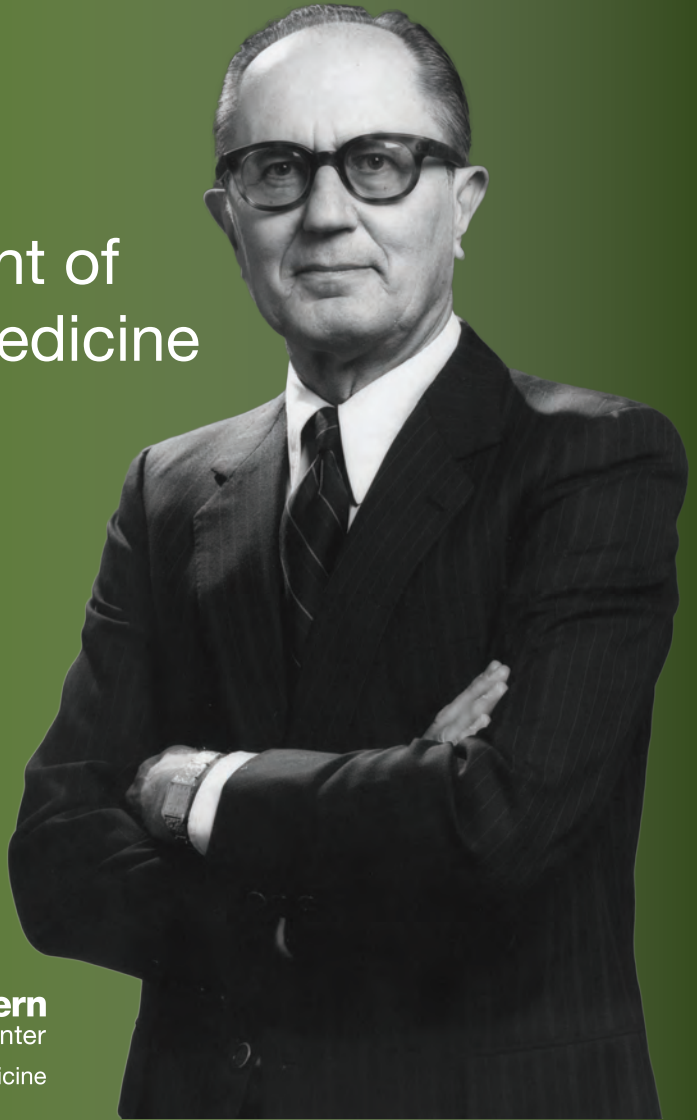


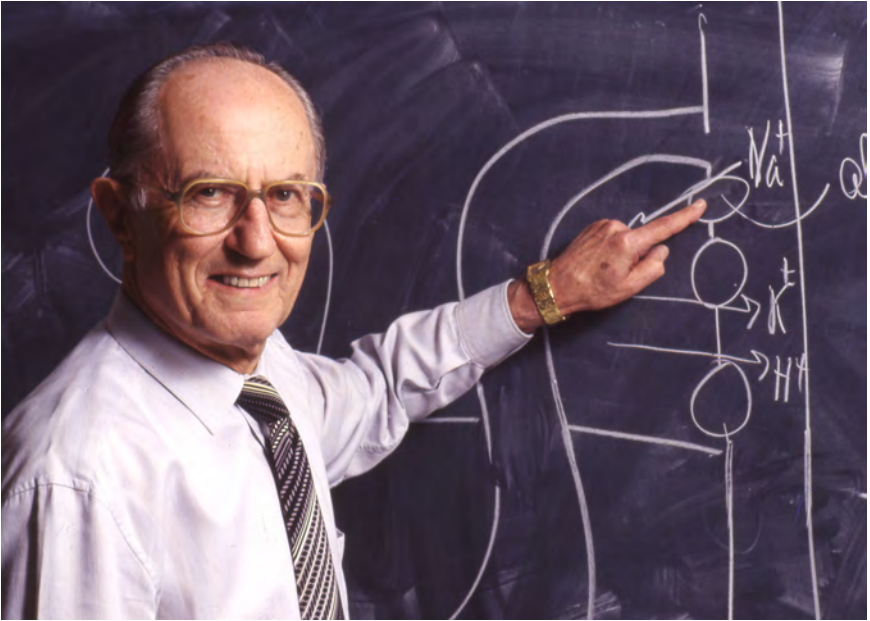
The  
Department of  
Internal Medicine  
Presents



**UTSouthwestern**  
Medical Center

Department of Internal Medicine

The Seventh Annual  
**Donald W. Seldin, M.D.**  
Research Symposium  
April 21, 2022



*“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, was the 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 many times 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 a 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 bloomed with 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.

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## 7th ANNUAL DONALD W. SELDIN, M.D. RESEARCH SYMPOSIUM

### April 22, 2022

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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. 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 preceded us, and who have devoted themselves to the  
mitigation of suffering.”*

—Donald W. Seldin

Without his guiding hand, it is hard to imagine that UT Southwestern would have achieved its stature in world-renowned research or trained so many gifted and successful physicians still serving in Texas and across the United States. Simply put, it is hard to imagine UT Southwestern Medical Center without Donald W. Seldin.

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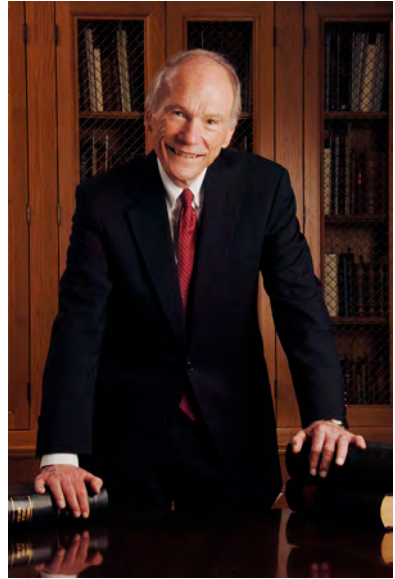
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**Daniel W. Foster, M.D.**

**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 three-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. 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, serving as Headmaster of the Academic Colleges at UT Southwestern, President of the Academy of Medicine, Engineering, and Science of Texas, and being 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.



**7th ANNUAL DONALD W. SELDIN, M.D. RESEARCH SYMPOSIUM**  
**April 22, 2022**

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**Keynote Speaker**

Kavita Bhavan, M.D.  
Associate Professor of Internal Medicine  
Chief Innovation Officer at Parkland Health & Hospital System

Dr. Bhavan earned her medical degree at the Pennsylvania State University College of Medicine. She completed a residency in internal medicine at the Ochsner Clinic Foundation and received advanced training in infectious diseases through a fellowship at Washington University/Barnes-Jewish Hospital in St. Louis, Missouri. She also

holds a Master of Health Science degree in maternal and child health from the Johns Hopkins School of Public Health in Baltimore, Maryland.

Dr. Bhavan's research interests include reducing health disparities with a low-tech and low-cost patient-centered approach to innovation in care delivery, patient engagement, and self-care models. She developed a self-care program for uninsured patients discharged from Parkland Memorial Hospital's safety net setting to self-administer outpatient parenteral antimicrobial therapy (S-OPAT) for the treatment of a variety of infections. In this model, patients from a low-literacy or low-socioeconomic status population are taught to self-administer their intravenous (IV) antibiotics by gravity or IV push at home. Published data demonstrate efficacy with 47% lower 30-day readmission rates among patients in the self-care model compared to patients discharged with standard forms of OPAT. To date, more than 5,000 patients have been discharged to this program with significant improvement in resource utilization and patient satisfaction.

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## Message from the Chair

Thomas J. Wang, M.D.  
Professor & Chair of Internal Medicine  
Donald W. Seldin Distinguished Chair in Internal  
Medicine



Thank you for attending the Seventh Annual Donald W. Seldin Research Symposium. Since 2016, this conference has been a showcase of 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 was an unwavering advocate for the clinical scholar. As academic medicine evolved with increasing clinical demands, Dr. Seldin ensured that research remained a cornerstone of the core mission of the Department. 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.

We are thrilled to welcome you all back in person this year, after a two-year hiatus. So many critical discoveries have been inspired by casual so-called "hallway conversations" and it is our sincere wish that this serves as a first step to revitalizing our campus culture. Dr. Seldin would have no doubt agreed that it is the people who make the institution, and we are excited to celebrate the incredible work and mentorship in the Department.

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**Presenter:** Faaiz Enam

**Authors:** Syed Faaiz Enam, Cem Y. Kilic, Jianxi Huang, Brian J. Kang, Reed Chen, Connor S. Tribble, Ekaterina Ilich, Martha I. Betancur, Stephanie J. Blocker, Steven J. Owen, Anne F. Buckley, Johnathan G. Lyon, Ravi V. Bellamkonda

**Title:** Cytostatic hypothermia and its impact on glioblastoma and survival

**Abstract:**

**Background:** Novel therapeutic approaches are needed for patients with glioblastoma (GBM) who otherwise have limited options. Here we studied and deployed local, non-freezing 'cytostatic' hypothermia to stunt GBM growth. This contrasts with ablative, cryogenic hypothermia which is a double-edged sword against tumors infiltrating otherwise healthy tissue.

**Methods/Results:** We first investigated three grades of hypothermia in vitro and identified a cytostatic window of 20-25°C. We determined that 18 h/d of cytostatic hypothermia can be sufficient to prevent growth in vitro. Cytostatic hypothermia resulted in cell cycle arrest, reduced metabolite production and consumption, and reduced inflammatory cytokine synthesis. Next, we designed a device to deliver local cytostatic hypothermia in vivo in two rodent models of GBM: utilizing the rat F98 and the human U-87 MG lines. Local hypothermia more than doubled the median survival of F98 bearing rats from 3.9 weeks to 9.7 weeks. Two rats survived through 12 weeks. No loss of U-87 MG bearing rats was observed during their study period of 9 weeks. Additionally, cytostatic hypothermia was synergistic with TMZ chemotherapy in vitro. Interestingly, CAR T cells also retained significant cytotoxicity under these temperatures in vitro.

**Conclusions:** Unlike modern targeted therapeutics, cytostatic hypothermia affects multiple cellular processes. Thus, irrespective of the host species (rodent or human), it could slow tumor progression and the evolution of resistance. Our studies show that this approach lengthens survival without chemical interventions. However, it may also provide time and opportunities to use standard concomitant, adjuvant, and novel cytotoxic treatments. Cytostatic hypothermia could thus have a valuable role among the limited options available for the treatment of glioblastoma.

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Poster #002

**Presenter:** Nil Saez-Calveras

**Authors:** Nil Saez Calveras, MD; Joshua Beaver; Marc Diamond, MD; Elan Louis, MD, MS

**Title:** Profiling Tau Pathology in Essential Tremor

**Abstract:**

**Background:** Patients with essential tremor (ET) frequently develop dementia symptoms. This was presumed to be secondary to co-morbid Alzheimer's disease (AD) but new evidence suggests that patients with ET may have a unique tau isoform profile in their aggregates. In this project, we aimed to confirm whether the brains of ET patients contained pathologic tau capable of forming self-propagating aggregates. We also sought to characterize the structure of tau in these assemblies to determine whether it resembled that of another neurodegenerative disease or, otherwise, represented a unique conformation.

**Methods:** We evaluated 10 post-mortem brain samples from ET patients across the spectrum of cognitive status found to have tau aggregates in the neuropathology exam. Their brain homogenates were incubated with biosensor cells expressing the Tau repeat domain (RD) conjugated to fluorophores. These cells generate a FRET signal if tau aggregation occurs, which can be quantified by flow cytometry as the seeding activity of the assay. To further define the structure of Tau in ET we performed immunoprecipitation assays with antibodies binding sequential amino acids in the Tau RD. The isolated fibrils were then incubated with the biosensor cells.

**Results:** The seeding activity of the assays in ET, as assessed by the percentage of FRET positivity, correlated with the presence of cognitive impairment and the degree of tau pathology in the neuropathological exam. We performed two sets of IP assays with antibodies binding sequential amino acid epitopes in Tau (MD and TRD family). The results revealed that the binding affinity profile of these antibodies in ET resembled the pattern seen in AD and PSP but was different from the pattern in other tauopathies such as CBD or AGD.

**Conclusions:** This study provided preliminary evidence that the brains of ET patients contain pathologic tau capable of forming aggregates similarly to what is observed in other tauopathies. The use of IP assays also provided initial insight into the conformational structure of tau in these aggregates. We are currently developing more precise tools that can help us better define pathologic tau in these patients and determine whether they harbor a unique conformational structure.

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**Presenter:** Chunzi Song

**Authors:** Chunzi Song, Patricia Cobo-Stark, Laurence Biggers, Vishal Patel, Ronak Lakhia

**Title:** Stimulation of the Pkd2 promoter using CRISPRa/Cas9 increases Pkd2 expression and reduces cyst growth in an in-vitro model of ADPKD.

**Abstract:**

**Background:** Autosomal dominant polycystic kidney disease (ADPKD) is the leading genetic cause of kidney failure, and treatment options are limited. Primarily caused by mutations in the Pkd1 or Pkd2 gene, which encodes polycystin-1 or polycystin-2 respectively, cystic kidney disease occurs when Pkd1 or Pkd2 expression falls below a critical threshold. Transgenic approaches to restore Pkd1 or Pkd2 expression have recently been shown to slow or even reverse cyst growth. Whether stimulating endogenous Pkd1 or Pkd2 expression using CRISPR activation (CRISPRa) methodology is sufficient to increase polycystin-1 or polycystin-2 and slow cyst growth is unknown.

**Methods:** Single guide RNAs (sgRNAs) were designed to target the promoter region of the Pkd2 gene. Pkd1RC/- cells were transfected with sgRNA and the SP-dCas9-VPR vector, or the SP-dCas9-VPR vector alone. After 48 hours, cells were harvested for molecular analysis and immunofluorescence. Pkd2 expression was measured by qPCR and Western blot. In addition, at 48 hours, cells were equivalently seeded into Matrigel for 3D cyst assay. After 7 days, 20x images were obtained and 100 cysts from each condition were measured to quantify cyst size.

**Results:** QPCR demonstrated successful upregulation of Pkd2 transcription via CRISPRa. Western blot confirmed that guide RNA #2 successfully increased polycystin-2 production. Moreover, live Mitotracker and TOM20 immunofluorescence stain demonstrated improved mitochondrial health in cells where polycystin-2 expression was increased. Conversely, pCREB expression was reduced in Pkd2-activated Pkd1RC/- cells, compared to control cells. Finally, cyst size was reduced by over fifty percent in Pkd2-activated Pkd1RC/- cells.

**Conclusions:** Stimulation of the Pkd2 promoter via CRISPRa is a feasible strategy to increase Pkd2 expression. Moreover, increasing Pkd2 expression is sufficient to slow cyst growth and reverse classic pathogenic hallmarks of ADPKD in one model of the disease. Future studies to further characterize this approach in additional ADPKD models will provide significant insights into the potential of endogenous Pkd1 or Pkd2 activation as a therapeutic modality for the treatment of ADPKD.

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Poster #004

**Presenter:** Muhammad Abu-Rmaileh

**Authors:** Muhammad Abu-Rmaileh, Trushil Shah, Pratyusha Manthena, Chandni Patel, Ashleigh Chuah, E. Ashley Hardin, Fernando Torres, Sonja D. Bartolome, and Kelly M. Chin

**Title:** Prognosis of Pulmonary Arterial Hypertension patients with Pericardial Effusion Before and After Initiation of Parenteral Prostacyclin Therapy

**Abstract:**

**Background:** Pericardial effusions have been associated with worse outcomes in in pulmonary arterial hypertension (PAH). However, data evaluating changes in pericardial effusion frequency after IV/SC prostanoid therapy and whether post-treatment effusions associate with subsequent long-term outcome are lacking.

**Methods:** PAH patients initiated on IV epoprostenol or IV/SC treprostinil therapy between 2007 and 2016 were included. Initial and post 3 months treatment echocardiogram and catheterization (cath) values were acquired. Patients were classified as either having no effusion, mild effusion, or moderate/severe effusion.

**Results:** PAH patients initiated on IV/SC therapy (N=119) were followed for a median of 7 years. Most patients were female and with idiopathic or CTD-PAH. Prior to IV/SC therapy, 76, 35 and 7 patients had no, mild or moderate / large effusions. Pericardial effusion size prior to IV/SC therapy associated with more severe tricuspid regurgitation, IVC dilation and higher NTproBNP level and right atrial (RA) pressure; in contrast post-treatment effusion size associated with RA size, but not other severity measures (table). Paired echo results before and after therapy were available in 110 patients; the number with small or mod/large effusions increased following treatment, despite improvements in most other echo and cath measures: 72, 35, 3 vs. 62, 42 and 6 with none, small and mod-large effusion, pre and post-therapy, respectively. Presence of a mod-large pericardial effusion at IV/SC therapy initiation was significantly associated with mortality (HR 2.57 (1.36-64.87)), while a mod/large effusion at followup also resulted in an increased HR for mortality (HR 1.69 (0.77-3.69)), but this was not statistically significant. At both time points, there was no significant difference in outcome between no effusion and small effusion.

**Discussion:** Presence of a moderate/large, but not small pericardial effusion, associated with higher mortality and with more severe echo, cath and NTproBNP results when seen on echo prior to IV/SC therapy. Associations between mod/large effusion and these measures at first follow-up echo were weaker, and in most cases did not reach statistical significance. Further study is required to better understand the mechanisms and implications of pericardial effusion on post-treatment echocardiograms in PAH.

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**Poster #005**

**Presenter:** Aradhna Agarwal

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

**Title:** Stakeholder Feedback to Develop Annie Texting Protocol for Older Veterans with Back Pain and Depression: Feasibility and Acceptability

**Abstract:**

**Background:** Chronic low back pain (cLBP) and comorbid depressive symptoms in older adults are major public health concerns. MOTIVATE (Moving to Improve Chronic Back Pain and Depression in Older Adults) was developed as a novel 8-session, health coach, telephone-delivered intervention to improve physical activity, cLBP, and depressive symptoms among older Veterans. Pilot data for MOTIVATE suggested that technology could be introduced to capture steps, pain, and mood in between the coaching sessions. We sought feedback from multiple stakeholder groups to develop and iteratively refine the protocol for integrating a texting component into MOTIVATE.

**Methods:** We identified the VA-developed Annie texting system for sending texts and capturing data on step counts, pain scores, and mood. We initially presented the rationale and protocol to a 12-person National Chronic Pain Veteran Engagement Panel (VEP), via zoom. Next, we recruited older Veterans (>65 years of age) from the existing pilot randomized control trial (RCT) to hear feedback on the proposed texting protocol from those who had used the original paper tracker to provide these data. In the next phase, we selected a subgroup of patients to roll out the Annie texting protocol. Veterans and the health coach provided feedback on barriers/facilitators of using the texting system via semi-structured individual interviews. Quantitative data will be presented using the Annie dashboard and surveys for acceptability/usability.

**Results:** The VEP was enthusiastic about use of Annie for this context and provided feedback to inform orientation materials. Phase 1 participants (n=5) were enthusiastic of a texting component, although they were concerned that other older adults may struggle with technology. We have rolled out phase 2 in two patients thus far. We will present Annie dashboard data. Our health coach noted that participants found texting feasible and easy to use, although there was less attention to detail and accountability than what was seen with the paper tracker. We will present feedback from phase 1 and 2 participants, health coaches, and other stakeholders.

**Conclusions:** This pilot study will determine the feasibility and usability of the Annie texting system with MOTIVATE using data collected from various stakeholder groups.

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Poster #006

**Presenter:** Ashwini Arvind

**Authors:** Ashwini Arvind, Samuel Phen, Ana Arroyo, Michael Gonzales, Amit G. Singal, Nicole E. Rich

**Title:** Racial, Ethnic and Socioeconomic Disparities in Receipt of Curative Treatment in Patients with Early-Stage Hepatocellular Carcinoma

**Abstract:**

**Background:** Hepatocellular carcinoma (HCC) prognosis varies depending on stage at diagnosis, with curative therapy (i.e., surgical resection, transplantation, local ablation) available for patients detected at an early stage. However, curative treatment for HCC is underutilized in the U.S, particularly in racial and ethnic minority and low-income populations. Our aim was to assess disparities in the receipt of curative treatment (CT) in patients with early-stage HCC.

**Methods:** We included adult patients diagnosed with early-stage HCC at UTSW and Parkland from 2008-2021. We used Chi square tests to compare categorical data and multivariable logistic regression models to identify factors associated with CT receipt.

**Results:** Of 1897 eligible patients, 747 (39.4%) had early-stage HCC (73.9% men). The sample was diverse in terms of race and ethnicity (38.8% White, 26.2% Black, 27.8% Hispanic, 5.4% Asian), insurance status (36.6% Medicare, 15.3% Medicaid, 16.5% private, 22.8% safety-net assistance, 8.7% uninsured), and liver disease etiology (58.7% hepatitis C, 6.3% HBV, 17.6% alcohol-related and 14.9% NAFLD). Most patients were Child Pugh class A (57.0%). Overall, 57.7% (n=431) received CT (36.9% resection, 29.0% transplant, 34.1% ablation). There were racial and ethnic disparities in CT receipt, with 55.7% and 52.2% of Black and Hispanic patients receiving CT versus 63.3% and 70.0% of White and Asian patients ( $p=0.03$ ). Similarly, 72.9% of patients with private insurance and 64.7% with Medicare received CT compared to 53.0%, 43.8% and 44.6% of patients with safety-net assistance, Medicaid and no insurance, respectively ( $p<0.001$ ). CT receipt was similar between men and women (57.9% vs 59.9%,  $p=0.63$ ). In multivariable analysis, Black race (OR 0.60, 95%CI 0.40 - 0.91) and Hispanic ethnicity (OR 0.65, 95%CI 0.43 - 0.99) were associated with lower odds of CT after adjusting for age, gender, liver disease etiology, tumor burden and Child Pugh class; this disparity was mitigated after adjusting for insurance status (OR 0.67, 95%CI 0.44 - 1.03 for Black patients; OR 0.76, 95%CI 0.49-1.16 for Hispanic patients).

**Conclusions:** There are racial, ethnic, and socioeconomic differences in curative treatment receipt in patients with early-stage HCC. Further studies are needed to identify actionable intervention targets to improve access to curative HCC treatment for all patients with HCC.

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**Presenter:** Jeffrey Chidester

**Authors:** Jeffrey Chidester, MD; Dan Tong, MD, PhD; Michael Luna, MD

**Title:** Percutaneous Balloon Pericardiectomy at Parkland Hospital

**Abstract:**

**Background:** Malignancy is a common cause of recurrent pericardial effusion and is associated with poor prognosis. Patients with recurrent pericardial effusions generally have two options for treatment: recurrent pericardiocentesis after the redevelopment of a symptomatic, hemodynamically significant effusion or surgical pericardiectomy. Percutaneous Balloon Pericardiectomy (PBP) is an alternative nonsurgical method of definitive treatment that can be performed in the cardiac catheterization lab under moderate sedation. This can help prevent recurrent pericardial effusion leading to repeat procedures. We describe the experience of patients undergoing this procedure in a large, safety-net hospital.

**Methods:** We identified all patients undergoing PBP at Parkland Hospital from 2013 to 2020. Chart review was performed to assess patient, procedural, and prognostic features. This included demographics, malignancy characteristics, procedural indications, pericardial fluid analysis, in-hospital events, recurrent procedures, and outcomes. This study received approval from the UT Southwestern Institutional Review Board.

**Results:** From 2013 to 2020, 19 patients underwent percutaneous balloon pericardiectomy. Of these 19 patients, 17 carried a diagnosis of malignancy (9 lung, 2 breast, 2 renal, 1 each lymphoma, gastric, rectal unknown primary). The remaining 2 patients had recurrent effusions that were idiopathic or related to renal disease. Patients were evenly distributed between gender (10 female, 9 male) with a median age of 55 (range 23-80). Roughly half of the patients had a prior pericardiocentesis (10) and few had a prior pericardiocentesis in the same admission during which PBP was performed. Roughly half of patients had tamponade on the echocardiogram immediately preceding PBP or during hospital admission (11). Complications were rare, with only one patient having a postprocedural pneumopericardium successfully treated with pericardiocentesis. Of the 15 patients with follow-up data available, 7 remained alive at 6 months and 6 remained alive at one year. One patient required a repeat pericardiocentesis for recurrent effusion.

**Conclusions:** Percutaneous balloon pericardiectomy is a durable procedure for patients with or at high risk for recurrent pericardial effusion. It can be applied to a safety-net population and may have distinct advantages in these patients where care can be inconsistent or limited by prevalent socioeconomic factors. Importantly, it may help prevent readmissions at end-of-life

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Poster #008

**Presenter:** Jeffrey Chidester

**Authors:** Jeffrey Chidester, MD; Samuel McDonald, MD; Deborah Diercks, MD; Alagar Muthukumar, PhD; Rebecca Vigen, MD; James de Lemos, MD

**Title:** A Comparison of High-Sensitivity Troponin T vs. High-Sensitivity Troponin I Clinical Decision Pathways in the Evaluation of Patients Presenting to the Emergency Department with Chest Pain

**Abstract:**

**Background:** High-sensitivity troponin assays facilitate efficient exclusion of MI among patients with chest pain presenting to the emergency department. With the development and approval of multiple high-sensitivity assays, it is important to consider the relative performance of these assays as well as the testing algorithm in which they are utilized. We sought to understand the differential impact of rapid clinical diagnostic pathways (CDP) incorporating hs-cTnT and hs-cTnI in the evaluation of Emergency Department patients at our institution.

**Methods:** Patients presenting to the Clements University Hospital Emergency Department between May and September 2020 undergoing troponin measurement were included for study during a planned transition from hs-cTnT to hs-cTnI. For each troponin order placed during the emergency department evaluation, paired samples were collected for comparative analysis of both hs-cTnT and hs-cTnI. Troponin values were applied to our institutional algorithm. Patients were categorized separately using both hs-cTnT and hs-cTnI into 'rule out', 'abnormal', or 'off protocol' if the algorithm dictated additional measurements that were not performed. Patients that ruled out were further classified by the time of rule out (0, 1, or 3 hours).

**Results:** 1349 unique patient-encounters were included in the analysis [55% women, mean age 57 (SD 18) years]. Of the 1349 encounters, 51 had an associated diagnosis classified as a MACE with 20 of those attributed to a non-ST Segment elevation MI (NSTEMI). The hs-cTnI algorithm assigned significantly more patients overall to the 'rule out' group (65% vs 40%,  $p < 0.001$ ) with the greatest difference at time 0 (52% v 24%;  $p < 0.001$ ). The hs-cTnT assay and algorithm had significantly more patients falling off protocol with insufficient samples drawn (43% vs 23%,  $p < 0.001$ ). Sensitivity and NPV were 85% and 99% for the hs-cTnT CDP and 63% and 98% for the hs-cTnI CDP.

**Conclusions:** Compared with a rapid clinical decision pathway with hs-cTnT, a similar pathway using hs-cTnI ruled out significantly more patients for MI, with rule out occurring earlier. Additional study is needed to determine the relative safety of the different CDPs and their impact on ED length of stay and resource use.

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**Presenter:** Nicolas Chong-Lugon

**Authors:** Nicolas Chong, Haley Schoenberger, Sruthi Yekkaluri, David T. Fetzer, Nicole E. Rich, Takeshi Yokoo, Amit G. Singal

**Title:** Limited Ultrasound Visualization is Associated with Lower Sensitivity and Specificity during Hepatocellular Carcinoma Surveillance

**Abstract:**

**Introduction:** Ultrasound visualization is limited in approximately 20% of patients with cirrhosis undergoing hepatocellular carcinoma (HCC) surveillance; however, it is unknown if impaired visualization directly impacts test performance. We aimed to evaluate the association between ultrasound visualization and surveillance test performance.

**Methods:** We performed a retrospective cohort study among patients with cirrhosis, with or without HCC, who underwent ultrasound-based surveillance at two large health systems between July 2016 and July 2019. Ultrasound visualization assessment was recorded by interpreting radiologists using the ultrasound LI-RADS Visualization Score, i.e., Vis-score A(no/minimal limitations), B(moderate limitations), and C(severe limitations). Ultrasounds with lesions  $\geq 1$ cm were considered positive exams. Presence vs. absence of HCC was determined by CT/MRI imaging or clinical follow-up  $>1$  year. We performed logistic regression analyses to evaluate the association between ultrasound visualization and test performance; sensitivity for HCC detection was assessed using ultrasounds performed in year prior to HCC diagnosis and specificity using ultrasounds in those without HCC.

**Results:** Of 2238 total patients, 186 had HCC and 2052 had no evidence of HCC. Median age was 60 years, 60% were male, and median BMI was 29. Most patients(71%) had Child-Pugh A cirrhosis, and most common cirrhosis etiologies were hepatitis C and alcohol related. Visualization for ultrasound exams prior to HCC diagnosis included score A(81.0%), although 13.0% and 6.0% had Vis-scores B and C, respectively. False negatives occurred in 47(25.3%) of 186 ultrasound exams. While sensitivity of ultrasounds with Vis-scores A and B exceeded 75.0%, the sensitivity of exams with Vis-score C was only 27.3%. In multivariable analysis, Vis-score C was associated with lower sensitivity(OR7.94,95%CI 1.23-51.16), after adjusting for age, sex, race, cirrhosis etiology, Child-Pugh class, and BMI. In non-HCC patients, most ultrasounds also had Vis-score A(82.1%), while 12.8% and 5.2% had Vis-score B and C, respectively. False positive results were observed in 178(3.1%) of 5694 exams. In multivariable analysis, Vis-score B was associated with lower specificity(OR1.60,95%CI 1.13-2.27), although specificity exceeded 95.0% across all visualization scores.

**Conclusions:** Impaired ultrasound visualization is associated with worse surveillance test performance and may increase the risk of surveillance failure and screening-related harms, highlighting a need for alternative HCC surveillance modalities in these patients.

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Poster #010

**Presenter:** Austin Deets

**Authors:** Austin Deets, MD; Colby R. Ayers, MS; Anand Rohatgi, MD

**Title:** Deep Phenotyping of HDL Particles: Associations of Size-based HDL Particle Subspecies and Incident Atherosclerotic Cardiovascular Disease in a Pooled Multi-Ethnic Population

**Abstract:**

**Background:** HDL particle size is a potential biomarker and therapeutic target for ASCVD. Sizing technology has been limited to broad categories of small, medium, and large and has led to inconsistent results. Advancement in analytic algorithms now allows increased precision by differentiating HDL into 7 different sizes. The association of these species and ASCVD is unknown. We pooled multiple large prospective cohort populations free of known underlying ASCVD and examined the relationship between these 7 HDL subspecies and vascular events.

**Methods:** Study participants were pooled from three cohorts: ARIC (Atherosclerosis Risk in Communities; n=1595), MESA (Multi-Ethnic Study of Atherosclerosis; n=6632), and PREVEND (Prevention of Renal and Vascular Endstage Disease; n=5022). The pooled cohort has the following demographics: 15% black, 53% female, mean age 59 years old, and average BMI 28. Levels of HDL species were determined via NMR using the LP4 algorithm (LabCorp) from baseline samples, with size increasing from H1P to H7P. HDL species were stratified into quartiles and analyzed in Cox proportional hazard models for incident MI (n= 687) and ischemic stroke (n=410). All analysis were adjusted for traditional ASCVD risk factors and all the other HDL subspecies.

**Results:** In fully adjusted models including all 7 HDL species, increasing H1P, H2P, and H4P were associated with reduced risk of MI (Q4 vs. Q1 HR [95%CI]: 0.72 [0.54-0.95]; 0.66 [0.51-0.86]; and 0.67 [0.51-0.88]; respectively). Continuous analysis for these particles were also associated statistically significant risk reduction (HR for 1SD [95%CI]: 0.845 [0.760-0.939]; 0.876 [0.798-0.962]; 0.853 [0.773-0.942]) The other HDL species were not independently associated with MI, and none of the HDL species were independently associated with ischemic stroke.

**Conclusions:** This study supports the current paradigm: HDL are heterogenous particles that have discrete functions. Our study created more homogenous populations with novel NMR algorithms and found that only certain sized HDL particles have association with MI events. H2P and H4P inverse and dose dependent associations with MI make them promising biomarkers and therapeutic targets.

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Poster #011

**Presenter:** Colin Dunn

**Authors:** Colin Dunn, MD; Bo Lin, MD; Nicole E. Rich, MD, MS; Madhukar Patel, MD; Purva Gopal, MD MS; Amit G. Singal, MD MS

**Title:** Correlation of LI-RADS 3 or 4 Observations with Histopathologic Diagnosis in Patients with Cirrhosis

**Abstract:**

**Background:** The LI-RADS system is used to classify liver lesions on CT or MRI in patients at risk for HCC and categorizes observations from LR-1 (definitely benign) to LR-5 (definitely HCC), with LR-3 and LR-4 observations being intermediate risk for HCC. Herein, we correlated imaging findings and explant histopathology from liver transplant patients with at least one LR-3 or LR-4 observation on CT or MRI.

**Methods:** We conducted a retrospective cohort study of patients with cirrhosis and at least one LR-3 or LR-4 observation on multiphase contrast-enhanced CT or MRI within 6 months prior to liver transplantation between January 2014 and October 2020 at UT Southwestern Medical Center. All explant pathology findings were reviewed by a liver pathologist to confirm diagnosis.

**Results:** 90 eligible patients were identified during the study period, including 58 having only LR-3 observations and 32 with at least one LR-4 observation. Most patients with only LR-3 observations (n=38, 65.5%) had no correlate on pathologic examination, although 18 (31.0%) patients were found to have HCC and 5 (10.3%) had a dysplastic nodule. Surprisingly, one patient with LR-3 observations was found to have angiosarcoma on explant. In contrast, most patients with LR-4 observations (n=21, 65.6%) were found to have HCC on pathologic examination, with 2 (6.3%) having a dysplastic nodule and 9 (28.1%) having no corresponding pathologic abnormality. Results were similar when stratified by size of the LR-3 or LR-4 observations or prior history of HCC. The presence of HCC was associated with LR-4 observations but not etiology of cirrhosis, size of LR-3/4 observation, or radiographic features of the observation.

**Conclusions:** We found that one-third of LR-3 observations and two-thirds of LR-4 observations were HCC on histopathology; however, over half of patients with LR-3 and over one-fourth with LR-4 observations had no pathologic correlate on gross examination. These observations may simply be perfusional variants on imaging or regenerative cirrhotic nodules. These data highlight the need for better risk stratification tools for patients with LR-3 or LR-4 observations which can then help tailor surveillance intensity to optimize surveillance value.

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Poster #012

**Presenter:** Angela Duvalyan

**Authors:** Angela Duvalyan, MD; Anamika Gangwar, PhD; Parag H Joshi, MD; Amit Khera, MD; Ann M. Navar, MD, PhD; Elaine Wu, MS; Anand Rohatgi, MD

**Title:** Cardiometabolic Profile of Haptoglobin Genotype in a Multi-Ethnic Diabetes Cohort

**Abstract:**

**Background:** Haptoglobin has three common genotypes: Hp 1-1, Hp 2-1, and Hp 2-2. The Hp 2-2 genotype, known to have poorer antioxidizing capacity, is associated with worse cardiovascular outcomes in patients with diabetes. In this study, we explore the association between various cardiometabolic biomarker profiles and the three Hp genotypes in a multiethnic population.

**Methods:** A cross-sectional analysis was performed for all participants with diabetes in the Dallas Heart Study and Multi-Ethnic Study of Atherosclerosis cohorts. Hp genotype was measured in 1,158 participants (399 from DHS and 759 from MESA) using ELISA technique (Savyon Diagnostics, Ltd). Associations between Hp genotype and 26 cardiometabolic circulating and imaging biomarkers were assessed using an additive genetic model and adjustments were made for age, gender, ethnicity, BMI and HgA1c. Continuous, nonparametric traits were log transformed across all individuals measured for trait before analysis and p-values were calculated using linear regression model.

**Results:** The study included 51% women, 44% Black (513 of 1,158: Hp 1-1=45%, Hp 2-1=35%, Hp 2-2=20%), 26% Hispanic (300 of 1,158: Hp 1-1=25%, Hp 2-1=49%, Hp 2-2=26%), 20% White (237 of 1,158: Hp 1-1=16%, Hp 2-1=56%, Hp 2-2=28%), and 9.2% Asian/Pacific Islander/East Indian (107 of 1,158: Hp 1-1=15%, Hp 2-1=36%, Hp 2-2=49%) participants. Significant differences were seen in imaging, inflammatory, and myocyte necrosis biomarkers with no significant differences seen in lipid metabolism, atherosclerosis, and endothelial markers. In both cohorts, changes in Hp genotype were significantly associated with LV end diastolic volume (DHS p-value= 0.047; MESA p-value=0.033). After adjusting for HgA1c, this association was no longer significant. In the DHS cohort, LV end systolic volume was also statistically significant (p-value=0.032) but failed to reach statistical significance in the MESA cohort (p=0.137). In the DHS cohort, an increase in Hp 2 allele was inversely associated with sRAGE (p-value=0.011) and GDF-15 (p-value=0.031) but were not available in the MESA cohort for analysis. Pooled analyses of both cohorts and assessing impact of ethnicity for all associations will be formally presented.

**Conclusion:** Associations between Hp genotype and various cardiometabolic biomarkers are varied and ethnicity dependent with further studies needed to investigate the underlying physiologic mechanisms.

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**Presenter:** Khary Edwards

**Authors:** Khary Edwards, MD; Ildiko Lingvaj, MD, MS

**Title:** Patient Perspectives on the Use of GLP-1RA and SGLT2 Inhibitors in Type 1 Diabetes in Clinical Practice

**Abstract:**

**Background:** The benefits of GLP-1 receptor agonists (GLP-1RA) and SGLT2 inhibitors (SGLT2i) in patients with T2DM are well established. While these agents are not approved in the US for T1DM, their off-label use is not uncommon. We assessed patients' perspectives on perceived benefits and drawbacks with these therapies.

**Methods:** We conducted a structured telephone interview of adult patients with T1DM who were ever treated with a GLP-1RA or SGLT2i for >3 months at UT Southwestern in Dallas, Texas. Patients were identified via query of electronic medical records with manual confirmation of T1DM diagnosis.

**Results:** We interviewed 62 patients with T1DM who used GLP-1RA and 39 who used SGLT2i. GLP-1RA users were 71% female, 86% white with mean age of 45±13 years. SGLT2i users were 51.3% female, 76.9% white with mean age of 48±13 years. Median exposure (IQR) to GLP-1RA and SGLT-2i use was 30.0 (30.7) and 24.1 (36.4) months respectively; 59.7% and 59.0% were still on therapy at time of interview. Most patients (85.5% with GLP-1RA and 79.5% with SGLT2i) reported ≥1 benefits from these medications. Most commonly perceived benefits from the therapy were: improved glycemic control (56.5% vs 74.4% for GLP-1RA and SGLT2i users), weight loss/appetite suppression (64.5% vs 17.9%), reduced insulin requirement (27.4% vs 17.9%), and reduced glucose variability (12.9% vs 28.2%). Side effects were more commonly reported by those using GLP-1RAs vs SGLT2i (62.9% vs 33.3%) with 58% of GLP-1RA users experienced gastrointestinal side effects while 20.5% of SGLT2i users reported urinary tract and/or mycotic infections. Two patients (5.1%) reported DKA episodes in the SGLT-2i treated group but none in the GLP-1RA group. No patient taking a GLP-1RA reported pancreatitis. 19.4% of GLP-1RA users discontinued therapy due to side effects versus 15.4% of SGLT2i users. Of those not currently on product, more patients who used GLP-1RA were willing to try again (64% vs 50%).

**Conclusion:** Most patients with T1DM treated with adjuvant therapy with GLP-1RA or SGLT2i report benefits and are willing to continue such therapy. While GLP-1RA users reported more side effects, they were also more willing to consider using therapy again in future.

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Poster #014

**Presenter:** Jonathan Gordon

**Authors:** Jonathan Gordon, MD; Bethany Roehm, MD, MS; Pin Xu, PhD; Meredith McAdams, MD; Susan Hedayati, MD, MHS

**Title:** Association of suPAR, Galectin-3 and ST2 with CKD progression in patients with HFrEF

**Abstract:**

**Background:** Patients with heart failure with reduced ejection fraction (HFrEF) are at risk for both acute kidney injury and chronic kidney disease (CKD). Elevated levels of the circulating biomarkers soluble urokinase plasminogen activator receptor (suPAR), Galectin-3, and soluble suppression of tumorigenicity 2 (ST2) have been associated with CKD progression and increased mortality. However, there is little known about the predictive value of these biomarkers in a population with HFrEF and kidney disease.

**Methods:** We aimed to investigate whether these biomarkers could be used to predict decline in estimated glomerular filtration rate (eGFR) in patients with HFrEF and whether they are associated with mortality using a longitudinal model and accounting for competing risks of ventricular assist device (VAD) implantation and heart transplantation. We included 310 participants from the Registry Evaluation of Vital Information for Ventricular Assist Devices in Ambulatory Life (REVIVAL) in whom baseline biomarker and repeated measures of eGFR were obtained. The primary outcome was change in creatinine-based eGFR. Secondary outcome was mortality. A joint cox regression model for mortality controlled for age, sex, race, NYHA class, and change in eGFR.

**Results:** Participants were followed for 2 years or until competing risk event. Mean age was 59 years and 36% had diabetes mellitus. Median eGFR was 60 ml/min/1.73m<sup>2</sup> with 58% NYHA Class III. 45 participants died, 33 received LVAD, and 25 were transplanted. Higher baseline suPAR ( $\beta$  coefficient -0.22 v- (ml/min/1.73m<sup>2</sup>); 95%CI -0.29, -0.15; P<0.001), Galectin-3 ( $\beta$  coefficient -0.02 v- (ml/min/1.73m<sup>2</sup>); 95%CI -0.04, -0.01; P=0.012), and ST2 ( $\beta$  coefficient -0.01 v- (ml/min/1.73m<sup>2</sup>); 95%CI -0.02, -0.01, -0.19; P<0.001) plasma concentrations were associated with a decline in eGFR over time in multivariable models. Only ST2 (HR 1.02 per ng/mL increase; 95%CI 1.01, 1.03; P<0.001) was associated with mortality, after controlling for longitudinal change in eGFR.

**Conclusions:** Higher baseline suPAR, Galectin-3, and ST2 were associated with a decrease in eGFR in patients with HFrEF. ST2 was associated with increased mortality, while suPAR and Galectin-3 were not. These biomarkers warrant further investigation to see if they can be used to prognosticate decline in GFR and outcomes in patients with HFrEF.

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**Presenter:** Andrew Gulde

**Authors:** Andrew Gulde, MD; Susan Zhang, MD; Iram Hussain, MD

**Title:** Epidemiologic and Clinical Updates in Thyrotoxic Periodic Paralysis: Experiences of an Urban, Multi-Ethnic County Hospital in the Southern United States

**Abstract:**

**Background:** Thyrotoxic Periodic Paralysis (TPP) is characterized by the triad of thyrotoxicosis, hypokalemia, and transient paralysis. Classically, TPP has been identified predominantly in Asian males between age 20-40, although epidemiologic data, particularly from the United States, remains limited. In this case series we report our experience from a tertiary medical center in the Southern United States and provide an updated incidence estimate in this unique patient population.

**Methods:** We conducted a single-center retrospective study at Parkland Memorial Hospital, Dallas, Texas, to evaluate epidemiologic, clinical, and serologic characteristics of TPP. A total of 109 cases of periodic paralysis were identified over a 20-year period. We excluded patients without active thyrotoxicosis, as well as patients with other identifiable etiologies for periodic paralysis or insufficient data to confirm TPP (diagnosed clinically by the presence of thyrotoxicosis with periodic paralysis episode in the absence of documented familial hypokalemic paralysis). A total of thirty-two patients were included in the final analysis.

**Results:** All thirty-two patients were male, and twenty-eight (87.5%) of our patients were Hispanic. The median age was 28 years. Median TSH and FT4 were <0.01 mIU/ml (normal range: 0.5 - 4.5 mIU/mL) and 4.4 ng/dL (normal 0.8 - 1.8 ng/dL) respectively. Average potassium nadir was 2.11 mmol/L (Normal 3.6-5.0), phosphorous was 2.53 mg/dL (Normal 2.4-5.0), and magnesium was 1.74 mEq/L (Normal 1.4-1.8). Six patients (16.7%) required admission to the ICU, though none had respiratory involvement of their paralysis. Thirteen patients (40.6%) experienced one or more documented episodes of periodic paralysis recurrence prior to achieving euthyroid state. Ultimately, thirteen (40.6%) patients received definitive treatment with RAI, and nineteen (59.3%) patients were lost to follow up. The calculated prevalence of TPP was 0.5% among patients with hyperthyroidism presenting in our hospital system.

**Conclusions:** This represents the largest case series and first estimated incidence of TPP from a cohort within the United States in the last 30 years. Our findings suggest that young Hispanic males with hyperthyroidism may be at an increased risk of developing TPP and highlights the importance of definitive treatment with RAI as soon as euthyroid state is achieved.

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Poster #016

**Presenter:** John Hanna

**Authors:** John J. Hanna, MD; Christoph U. Lehmann, MD; Ank E. Nijhawan, MD, MPH; Richard J. Medford, MD

**Title:** Tackling the HIV Epidemic Using Targeted Facebook Advertisements: A Public Health Opportunity

**Abstract:**

**Background:** Facebook (FB) Advertisements (Ads) allow promoters to target audiences based on gender, age, demographics, interests, and geography. During the process of Ads creation, FB provides estimates of Ads reach and anticipated clicks based on budget. We aimed to compare projected cost and effectiveness of different approaches to reach a population at risk for HIV using FB Ads.

**Methods:** We created a 10-day FB video Ad and collected reach and clicks estimates without running the Ads. Targeting Men who have Sex with Men (MSM) - a population at risk for HIV - we collected reach estimates by state in the age group 13-24. Then, we collected estimates in different US regions for different age groups. Locally in Texas, we compared reach estimates between targeted Ads followed by focused HIV testing vs nontargeted Ads followed by routine HIV testing. Lastly, we collected reach data locally in Dallas, TX by zip codes. We used the healthcare average conversion rate and new HIV diagnosis rates to estimate Ads cost per new HIV diagnosis for each targeted population.

**Results:** The daily reach per dollar and the daily clicks per dollar followed a cumulative distribution curve for an exponential function. The estimated Ads cost per new HIV diagnosis averaged \$13.96-55.10 for all age groups and was highest in the age group 13-19 and lowest in the southern US regions. In Texas, Ads cost per new HIV diagnosis of targeted FB Ads was on average 2.88 times lower than non-targeted Ads. The correlation coefficient between estimates of MSM based on traditional estimators and from FB Ads reach estimates per Dallas zip codes was 0.87.

**Conclusion:** Real-time reach estimates of regional FB Ads for a population at risk for HIV can guide public health agencies to allocate resources to most effectively address the HIV epidemic. While lower budgets Ads have higher cost-effectiveness, local Ad campaigns can be more cost-effective than national ones. Targeted FB Ads are more cost-effective than non-targeted FB Ads, and the wider the gap is between new HIV diagnoses rates from focused vs routine testing in a population, the more cost-effective targeted Ads become.

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**Presenter:** Fieke Hoff

**Authors:** Fieke W. Hoff, MD, PhD; Yazan F. Madanat, MD; Andrew J. Belli, Eric Hansen, MS; Heidi Foss, RN BSN OCN; Molly Schulte, RN BSN; Ching-Kun Wang, MD; Prapti A Patel, MD

**Title:** Frontline Venetoclax-Based Combination Therapy in Older Adults with Acute Myeloid Leukemia Treated in the Real-World Setting; A Multi-Institutional Retrospective Study

**Abstract:**

**Introduction:** Acute myeloid leukemia (AML) is a disease of the older population. Outcomes remain poor for patients older than 60 years who are unfit to receive intensive chemotherapy. Based on the VIALE-A and VIALE-C clinical trials, venetoclax (VEN) in combination with hypomethylating agents (HMA; azacytidine (AZA) or decitabine (DAC)) or low-dose cytarabine (LDAC) has become the standard of care. However, while clinical trials serve an important purpose, they are performed in a controlled setting. We sought to investigate outcomes of patients treated with VEN-based therapy in the "real-world"

**Methods:** AML patients with an age of 65 years or older who received frontline VEN-based therapy with AZA, DAC or LDAC were identified in the COTA real-world database; a USA-based dataset comprised of longitudinal, HIPAA-compliant data on the diagnosis, clinical management, and outcomes of patients with cancer.

**Results:** 117 patients treated with VEN-based therapy were included: VEN/AZA (n=48), VEN/DAC (n=47), VEN/AZA/DAC (n=16) and VEN/LDAC (n=6). Majority of patients (91%) was treated in community setting. Median age at diagnosis was 77 years. Six percent had favorable and 62% had ELN adverse-risk AML. The most common molecular abnormalities were TP53 (37%), TET2 (26%), ASXL1 (26%), and DNMT3A (20%). The real-world overall response rate by treatment was 52% for VEN/AZA, 55% for VEN/DAC and 33% for VEN/LDAC (VEN/DAC vs. VEN/AZA, p=0.85). Median overall survival (OS) was similar across the treatment groups, with a longest median OS of 13.9 months for VEN/DAC (VEN/AZA vs. VEN/DAC, p=0.77). Most common reasons for treatment discontinuation were toxicity (34%) followed by progression/inadequate response (13%). The most common toxicities were related to myelosuppression/cytopenia.

**Conclusions:** This dataset represents the largest cohort of patients treated with VEN-based therapy in the real-world setting across multiple community practices. As less intense regimens are used to treat AML, more patients are receiving induction in the community setting, making these findings relevant in clinical practice. Although VEN/DAC combination had the longest OS, this was not significantly different from VEN/AZA. The VEN/HMA response rates were lower and OS was shorter than those reported in the VIALE-A trial, which raises concerns about early discontinuation of therapy in the real-world.

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Poster #018

**Presenter:** Seamus Hughes

**Authors:** Seamus Hughes, MD; Denis J. Wakeham, PhD; Christopher Hearon, PhD; James MacNamara, MD; Bryce Balmain, PhD; Tony Babb, PhD; Benjamin Levine, MD; Satyam Sarma, MD

**Title:** Impaired Stroke Volume Response During Exercise in Patients with Heart Failure With Preserved Ejection Fraction (HFpEF): The Role of Dynamic Starling Mechanisms

**Abstract:**

**Background:** Impaired stroke volume (SV) response during exercise is common in HFpEF. The regulation of SV during low intensity exercise is dependent on end-diastolic volume reserve from a compliant left ventricle (LV). The Dynamic Starling Mechanism (DSM) quantifies beat-by-beat modulation of SV by respiratory-mediated changes in LV end diastolic pressure (LVEDP) and provides insight into the relationship between changes in LV compliance and SV response during exercise. In this study, we examine the relationship between DSM, exercise SV reserve, and peak oxygen uptake ( $\dot{V}O_2$ ) in HFpEF patients.

**Methods:** 16 HFpEF patients ( $68 \pm 5$  years; 11 females) were studied at rest and during exercise at 20 Watts. Patients were separated into either higher or lower SV reserve (calculated from Direct Fick) based upon the median of the cohort. Transfer function analyses (TFA) of the relationship between changes in pulmonary artery diastolic pressure (PAD, via right heart catheterization) and SV (via modelflow analysis of the radial arterial line waveform) were conducted using three minutes of recorded hemodynamics. TFA data were extracted around the prevailing respiratory frequency for each individual during both conditions. Due to the small sample size, we assessed the magnitude of differences between conditions and groups via Hedges'  $g$  ( $<[-]0.2$  small effect,  $[-]0.5$  medium effect,  $>[-]0.8$  large effect). Linear regression analysis was used to assess the relationship between DSM gain and  $\dot{V}O_2$ .

**Results:** Stroke volume reserve at 20 Watts of exercise was highly variable in patients with HFpEF (range, -24 to 69 %; median 26%). DSM gain decreased during exercise, and was lower at rest ( $g = -1.3$ ) and at 20 Watts ( $g = -1.8$ ) in the lower SV reserve group. Resting DSM gain correlated with  $\dot{V}O_2$  ( $r^2 = 0.695$ ;  $P = <0.0001$ ).

**Conclusions:** LV stiffness, as assessed by DSM gain, was higher in those patients with a lower SV reserve. DSM gain decreased during exercise in patients with HFpEF; this response was similar between those with a higher or lower SV reserve. Resting DSM correlates with  $\dot{V}O_2$ , demonstrating a relationship between a dynamic measurement of LV stiffness at rest and exercise tolerance in HFpEF patients.

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**Presenter:** Jenny Jan

**Authors:** Jenny Jan, Azeez Osho, Caitlin C. Murphy, Carolyn M. Mazure, Amit G. Singal, Nicole E. Rich

**Title:** Racial, Ethnic, and Gender Disparities in Clinical Trial Enrollment for Primary Liver Cancer

**Abstract:**

**Background:** Primary liver cancer (PLC) is one of the fastest rising causes of cancer death in the U.S with striking racial, ethnic and gender disparities in incidence and mortality. Women, minorities, and older adults have historically been underrepresented in cancer clinical trials, but diversity of PLC trial participants has not been investigated.

**Methods:** We searched the ClinicalTrials.gov database to derive enrollment data from therapeutic PLC trials (with some degree of U.S. enrollment) from inception through July 19, 2019. We used Fisher's exact test to compare study location, trial phase, therapeutic type and funding source between: White vs. Black vs. Asian. Hispanic vs. non-Hispanic; and men vs. women participants. We calculated the enrollment fraction (EF), the number of trial enrollees divided by number of patients with PLC, matched to the period of trial enrollment using the U.S. Cancer Statistics and GLOBOCAN data.

**Results:** Sixty-three trials met inclusion criteria; 44 had U.S.-only enrollment and 19 were international. Gender was reported for all 63 trials (n=9749 participants), whereas race and ethnicity were available for only 26 (n=4478) and 21 (n=2907) trials, respectively. Although the EF in U.S.-only trials paralleled racial and ethnic composition of PLC cases in the U.S., there was marked under-representation of Black and Hispanic patients among total and international trial participants. Black patients comprised 14.4% and 1.6% of participants in U.S.-only and international trials, respectively. Similarly, Hispanic patients accounted for 14.8% of PLC cases in the U.S. but comprised only 8.3% of U.S.-only trial participants; 3.9% of international participants were Hispanic. This is in contrast to Asian patients which accounted for 8.2% of PLC cases in the U.S., but comprised 9.0% of U.S.-only trial participants and a majority (54.4%) of international trial participants. Gender disparity in EF was observed across U.S.-only (0.50% for women vs 0.61% for men) and international trials (0.04% for women vs 0.07% for men).

**Conclusions:** Women, racial and ethnic minority populations, and older adults are underrepresented in PLC clinical trials. While awareness of the problem is the necessary first step, interventions are needed to ensure equity in PLC trial enrollment and improve outcomes for all patients.

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Poster #020

**Presenter:** Elena Joerns

**Authors:** Elena K. Joerns, MD; Brooke Mills, MD; Una E. Makris, MD, MSc; Traci N. Adams, MD; Bonnie Bermas, MD.

**Title:** Inconsistent Family Planning Documentation in Women with Interstitial Pneumonia with Autoimmune Features (IPAF)

**Abstract:**

**Objective:** Family planning discussions improve pregnancy outcomes in women with interstitial lung disease (ILD). Women with interstitial pneumonia with autoimmune features (IPAF), a subset of ILD, are at risk for pregnancy complications. The objective of this study was to evaluate the documentation of family planning discussions with IPAF patients of childbearing age by pulmonary and rheumatology providers at an academic medical center.

**Methods:** We conducted a retrospective chart review of pulmonary and rheumatology encounters in reproductive aged women with IPAF to evaluate documentation of family planning discussions. We employed non-parametric measures of association to evaluate the relationship between patient characteristics and the presence of family planning discussion documentation by providers.

**Results:** Thirty one women met IPAF classification and were  $\approx$ 50 years of age at initial ILD clinic visit. Twenty-five (83%) of these women had risk factors for adverse pregnancy outcomes. Ten women (33%) had a discussion of family planning or record of contraceptive use during any visit with their pulmonary provider. Out of the 21 patients who also saw a rheumatology provider, 12 (57%) women had a record of discussion of family planning or contraceptive use during any visit with their rheumatology provider.

**Conclusions:** Neither pulmonary nor rheumatology providers consistently discussed family planning with reproductive aged women with IPAF. There was a non-statistically significant trend for rheumatology providers to discuss reproductive issues with IPAF patients more frequently than pulmonary providers. Efforts should focus on educating providers about the need for family planning discussions in women with IPAF of childbearing age.

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**Poster #021**

**Presenter:** Elena Joerns

**Authors:** Elena K. Joerns, MD; David Karp, MD, PhD; Traci N. Adams, MD; Una E. Makris, MD, MSc; Chad A. Newton, MD, MSCS.

**Title:** Cytokine Profiles in Subtypes of Interstitial Lung Disease

**Abstract:**

**Background:** The interstitial lung diseases (ILD) encompass a group of inflammatory and fibrosing parenchymal lung disorders. Idiopathic pulmonary fibrosis (IPF) is a prototypical fibrotic ILD with unclear pathogenesis, while ILD associated with rheumatic diseases (RD-ILD) and hypersensitivity pneumonitis (HP) are assumed to have inflammatory etiology. Interstitial pneumonia with autoimmune features (IPAF) and unclassifiable ILD (uILD) present a unique challenge for treatment as the understanding of their pathogenesis is limited. Cytokine profiles may allow us to objectively assess presence of an inflammatory process and inform classification and downstream management. The aims of the study were to 1) determine if cytokine levels could differentiate between ILD subtypes (IPF, RD-ILD, IPAF, chronic HP, uILD) at baseline and 2) explore cytokine association with disease course.

**Methods:** We collected serum from 55 untreated ILD patients at a single center. Using multiplex flow cytometry based solid phase immunoassay, we measured levels of 27 cytokines. The primary analysis was to evaluate difference in cytokine profiles between ILD subtypes at baseline. As a secondary analysis, we explored the association of each cytokine with categorical ILD progression (defined as 10% relative decline in forced vital capacity percent predicted, death, or transplant) within 12 months. Descriptive statistics were used to summarize the data. Mann Whitney U test and student's t-test were used to assess for significant differences in cytokine levels between groups.

**Results:** Cytokine profiles were measured in 28 IPF patient, eight CTD-ILD patients, seven IPAF patients, nine chronic HP patients, and seven uILD patients. Fifteen (27%) patients progressed. There were no significant differences in cytokine levels between patients with IPF, RD-ILD, IPAF, cHP, and uILD. GM-CSF, IL-4, IL-12, IL-17, IP-10, VEGF were significantly higher in patients with inflammatory ILD subtypes (RD-ILD and cHP) compared to IPF patients. Baseline IL-13 level was significantly lower in patients who progressed, consistent across subtypes.

**Conclusions:** Data from this cohort supports a pro-inflammatory cytokine profile consistent in immune-driven ILD (chronic HP and RD-ILD). Low baseline IL-13 levels may be a marker for disease progression suggesting protective effect of Th2 driven mechanism in ILD.

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Poster #022

**Presenter:** Alysha Joseph

**Authors:** Alysha Joseph, MD; Gregory Barton, PhD; Tarique Hussain, MD; Kara Goss, MD

**Title:** Early predictors of pulmonary arterial hypertension using cardiac MRI in young adults born preterm

**Abstract:**

**Background:** Cardiac MRI is a noninvasive method that can aid in the diagnosis of pulmonary arterial hypertension (PAH). Left ventricular septal-to-free wall curvature ratio correlates with right ventricular systolic pressures in patients with known PAH. Preterm birth is a risk factor for development of PAH. However, it remains unknown whether young adults born preterm have cardiac changes that are predictive of development of PAH.

**Methods:** This study utilized 50 de-identified cardiac MRI images from a cross-sectional cohort study of young adults born moderately to extremely premature ( $\leq 32$  weeks gestation or  $< 1500$  g, N=32; and born full term, N=18). Using Circle imaging software, interventricular septal curvature and left ventricular free wall curvature were measured at end systole to derive curvature ratio. Mean pulmonary artery (PA) velocity and PA relative area change were also calculated as additional measures of PAH. A two-sample t-test was performed on the results of the analysis assuming unequal variances.

**Results:** The septal curvature ratio in the preterm population was  $0.85 \pm 0.08$ , and that in the term population was  $0.83 \pm 0.11$  ( $p=0.53$ ). The mean PA velocity was  $55 \pm 13$  cm/s in preterm adults and  $64 \pm 10$  cm/s in term adults ( $p=0.01$ ). In preterm adults, the PA relative area change was  $0.34 \pm 0.07$  cm<sup>2</sup> while that in term adults was  $0.41 \pm 0.10$  cm<sup>2</sup> ( $p=0.01$ ).

**Conclusion:** Relative area change and mean pulmonary artery velocity were decreased in the preterm adult population. Decreased relative area change signifies increased proximal PA stiffness, which correlates with adverse events in PAH. Decreased PA velocity suggests a subtle increase in pulmonary vascular resistance and mean PA pressure. There was no significant difference in septal curvature ratio between young adults born premature and those born at term. Recent studies suggest preterm hearts have increased cardiac fibrosis, which may delay remodeling changes and therefore delay change in septal curvature. Alternatively, vascular stiffness and increased pressures may precede septal curvature change, which may result from even greater increases in PA pressure over time. Additional studies are warranted to determine which imaging findings best predict development of PAH in the preterm-born adult population.

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**Presenter:** Mounika Kanneganti

**Authors:** Mounika Kanneganti, MD; Amit Singal, MD

**Title:** Clinical Outcomes of Patients with LI-RADS 3 or LI-RADS 4 Observations in Patients with Cirrhosis

**Abstract:**

**Background:** Hepatocellular carcinoma (HCC) is the third leading cause of cancer-related death worldwide and one of the fastest increasing causes of cancer-related death in the United States. Indeterminate liver nodules, including Liver Imaging Reporting and Data System (LI-RADS) 3 and 4 observations, have an intermediate risk of developing hepatocellular carcinoma, although risk estimates over time remain imprecise.

**Methods:** We conducted a systematic review using the MEDLINE, EMBASE, and COCHRANE CENTRAL databases from inception to December 2021 to identify cohort studies examining HCC incidence among patients with LR-3 or LR-4 observations on CT or MRI. Predictors of HCC development were defined from each study. National Institute of Health (NIH) study quality assessment tool for observational cohort studies was used.

**Results:** A total of 13 studies were included; of the 12 studies evaluating clinical outcomes in patients with LR-3 observations, 9 were lesion-level (n=952 total lesions) and 3 were patient-level (n=706 total patients) analyses. The 9 studies in patients with LR-4 observations were all lesion-level (n=743 total lesions) analyses. All studies were retrospective in design, with median duration ranging from 5 months to 33 months. Among studies with LR-3 lesion-level analyses, the proportion of HCC at 6 months ranged from 0% to 30.2% and 4.2% to 44.4% over the study periods. Among studies with LR-4 lesions, the proportion of HCC at 6 months ranged from 10.5% to 35.3% and 30.9% to 71.0% over the study periods. Patient-level factors associated with HCC included older age, male sex, higher AFP levels, viral liver disease etiology, and history of HCC, although these were not consistently reported across all studies.

**Conclusion:** LI-RADS 3 and 4 observations have a high risk of developing HCC over time and may warrant close observation with CT or MRI. Further patient-level analysis and prospective studies of HCC incidence in LI-RADS 3 and 4 observations are needed.

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Poster #024

**Presenter:** Naveed Khanjee

**Authors:** Naveed Khanjee, MD; John Poindexter, BS; Xilong Li, PhD; Naim Maalouf, MD

**Title:** Hypocalciuria is Common and Associated with Delayed Parathyroidectomy in Patients with Primary Hyperparathyroidism

**Abstract:**

**Background:** A 24-hour urine collection is routinely obtained in the workup of primary hyperparathyroidism (PHPT) to measure calcium and creatinine excretion, rule out familial hypocalciuric hypercalcemia, and guide diagnosis and management. Although hypocalciuria is expected and frequently observed in PHPT, hypocalciuria and/or a low urine calcium (uCa) to creatinine clearance ratio (UCCCR) may occur. Variables including race, age, renal function, and 25-OH vitamin D levels can affect urinary calcium excretion. Given the utility of obtaining urine calcium excretion in patients with PHPT, we performed a retrospective analysis on patients with PHPT to evaluate the effect of clinical variables on uCa excretion, and to test the hypothesis that hypocalciuria may delay parathyroidectomy in PHPT.

**Methods:** We retrospectively reviewed charts of patients with PHPT with available 24-hour uCa who underwent successful parathyroidectomy at UTSW between 2009 and 2021. We extracted available demographic, clinical, and laboratory data including first available uCa and creatinine excretion prior to parathyroidectomy, age, gender, ethnicity, eGFR, serum calcium, PTH, 25-hydroxyvitamin D, and 24-hour sodium excretion. The association between these parameters and UCCCR was assessed in univariate and multivariate models. We compared characteristics of PHPT patients with vs. without hypocalciuria, and duration between uCa measurement and parathyroidectomy.

**Results:** 528 PHPT patients were included in this analysis. 18.4% had a UCCCR<1%. Compared to PHPT patients with UCCCR≥1%, those with UCCCR<1% had a significantly higher proportion of African Americans (22.7% vs 9.1%; p=0.002), a lower mean serum calcium (p=0.004), and 25-hydroxyvitamin D (p=0.041). In multivariate analysis, gender, race, serum 25-OH-vitamin D, and 24-hour urine sodium were all significant predictors of UCCCR. The UCCCR<1% group had a significantly longer median time from uCa measurement to parathyroidectomy [7.5 (Interquartile range IQR: 3.3-27.6) vs. 4.2 (IQR:2.4-8.7) months, p=0.00003].

**Conclusions:** Although elevated uCa is used as a diagnostic marker and indication for parathyroidectomy in PHPT, hypocalciuria and UCCCR<1% are relatively common in PHPT patients, and associated with a significant delay in parathyroidectomy. Intrinsic (race, gender) and extrinsic (vitamin D status, sodium intake/excretion) factors are all determinants of calcium excretion in PHPT.

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**Presenter:** Ayeeshik Kole

**Authors:** Ayeeshik Kole, MD, PhD; Subhash Banerjee, MD; PREMIER Investigators

**Title:** Plaque Characteristics by IVUS Show No Association with Serum Lipid Profile in Short-term Follow-up Post-Acute Coronary Syndrome: Analysis from the PREMIER Trial

**Abstract:**

**Background:** Statins are known to reduce the risk of major adverse cardiovascular events (MACE). Multiple mechanistic studies utilizing serial coronary intravascular ultrasound (IVUS) examinations have demonstrated reduced plaque progression and increased stabilization. However, recurrent MACE post-acute coronary syndrome (ACS) continues to occur, often from rupture of positively remodeled plaques containing a lipid-rich necrotic core. The Plaque Regression and Endothelial Progenitor Cell Mobilization With Intensive Lipid Elimination Regimen (PREMIER) trial randomized 160 patients post-ACS to immediate intensive lipid-lowering therapy (ILLT, n=84) with LDL-apheresis and statin or statin monotherapy (SMT, n=76), with IVUS performed at baseline and 90-day follow-up. Here, we investigate the change in percent plaque burden (%PB) and necrotic core (NC) as measured by virtual histology-IVUS (VH-IVUS) in relation to lipid profile and statin exposure over 3 months, a time frame not previously studied.

**Methods:** The studied patients in the PREMIER trial underwent VH-IVUS imaging of non-culprit lesions at baseline and 90-day follow-up. VH analysis was performed to define plaque compositional traits, including NC size. Percent PB, a measure of atheroma volume accounting for coronary remodeling, was calculated as  $((\text{external elastic membrane area} - \text{lumen area}) / (\text{external elastic membrane area})) \times 100$ . All data were analyzed by intention-to-treat with t-test to compare.

**Results:** As reported previously, both groups demonstrated significantly lower LDL levels at 90-days compared to baseline ( $p < 0.0001$  for both), but no difference between groups ( $p > 0.05$ ). In each group, the mean %PB change and mean %NC change at 90-days compared to baseline did not reach significance ( $p > 0.05$  for both), and no difference between groups ( $p > 0.05$ ). When stratified by statin use prior to enrollment versus statin naïve, mean %PB change and mean %NC change at 90-days compared to baseline did not reach significance ( $p > 0.05$  for both), and no difference between study groups ( $p > 0.05$ ).

**Conclusions:** These negative results suggest that therapies to rapidly decrease LDL levels or history of prior statin use are not associated with short-term change in plaque morphology and composition. No plaque progression was observed in either treatment arm, albeit without a control group for comparison. Future aims include analysis of additional IVUS-derived measures such as heterogeneity, remodeling index, and VH-IVUS-defined phenotypes.

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Poster #026

**Presenter:** Ahmed Kolkailah

**Authors:** Ahmed A. Kolkailah, MD, MSc; Eric D. Peterson, MD, MPH; Shuo Wang, BS; Lin Zhong, MBBS, MPH; Anand Gupta, MBBS, MPH; Fan Li, PhD; Ann Marie Navar, MD, PhD

**Title:** Use and Outcomes of Therapeutic Anticoagulation in Non-Critically Ill Patients Hospitalized for COVID-19

**Abstract:**

**Background:** Patients with COVID-19 have an increased risk for thromboembolism. Recent RCTs support a potential benefit for therapeutic anticoagulation (Tx-AC) in non-critically ill patients hospitalized for COVID-19. We explored the national trends of AC use in patients hospitalized for COVID-19, and the association of Tx-AC with in-hospital mortality.

**Methods:** Using Cerner Real World Data, an EHR dataset from 60 US health systems, we analyzed adults hospitalized for COVID-19 between January 2020-February 2021. We excluded those with pre-existing/presenting indications for, or contraindications to, Tx-AC. Patients were classified in the first 48 hours as receiving: no AC, prophylactic AC (PPx-AC), or Tx-AC. We investigated the association of Tx-AC (versus PPx-AC) with in-hospital mortality using two approaches: an inverse probability weighting propensity score (IPW-PS) or, alternatively, an instrumental variable (IV) approach, where health system variability in Tx-AC use was the IV.

**Results:** Over the study period, 34,070 patients were hospitalized for COVID-19. Rates of Tx-AC increased from <10% in early 2020 to ~30% by July 2020, then stabilized. There was notable health system variability in Tx-AC use (Q4-2020 health system-level IQR in % use was 16%-39%). In-hospital mortality was 14.6% in the PPx-AC group and 20.7% in the Tx-AC group. Using IPW-PS to adjust for demographic and clinical difference between patients, those receiving Tx-AC was associated with a +6.9% (95% CI +5.6% to +8.1%) absolute increase in mortality risk relative to those receiving PPx-AC. In contrast, using an IV approach to further account for hospital-level variability in Tx-AC use, Tx-AC was associated with slightly lower mortality (-1.1% absolute difference), though this was not statistically significant (95% CI -17.8% to +7.6%).

**Conclusions:** Utilization of Tx-AC in patients hospitalized with COVID-19 has increased modestly, though there remains considerable health system variation in the proportion of COVID-19 patients receiving Tx-AC. Comparative effectiveness analyses of Tx-AC are subject to significant confounding by indication that may not be accounted for by individual-level approaches for adjustment. However, an IV approach that leverages health system-level variability in treatment yields estimates that are more consistent with clinical trials, suggesting promise as an analytic method to better account for residual/unmeasured confounding.

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**Presenter:** Minh-da Le

**Authors:** Minh-da Le, Yiling Wu, Jarett Berry, Jeffrey D. Browning, James A. de Lemos, Ian J. Neeland, Ildiko Lingvay

**Title:** Liver Fat and Cardiovascular Events: bystander or causative relationship?

**Abstract:**

**Background:** Non-alcoholic fatty liver disease (NAFLD) and cardiovascular disease (CVD) share common metabolic risk factors, and there is a high prevalence of CVD in patients with NAFLD. We aimed to determine if liver fat is an independent risk factor for CVD events.

**Methods:** We analyzed data from participants in the Dallas Heart Study (a multiethnic sample of the Dallas County adult population) without baseline CVD who underwent liver fat quantification by <sup>1</sup>H-MR spectroscopy (N=1932). The primary outcome was the composite of any incident CVD event (CV death, non-fatal myocardial infarction, non-fatal stroke, coronary or peripheral artery revascularization, hospitalization for heart failure, and hospitalization for atrial fibrillation). Secondary outcomes were all atherosclerotic events, all non-atherosclerotic events, and all-cause mortality. Data was analyzed by groups defined by tertile of baseline liver fat content (median for each tertile: 1.6, 3.6, 9.2%). Unadjusted and multivariable adjusted (for age, gender, race, BMI, diabetes, HTN, smoking, family history of CVD, statin use, physical activity, alcohol use) Cox regression for liver fat tertiles was performed for all outcomes, and further validated by comparisons of restricted mean survival times (RMST).

**Results:** Mean age was 43 years, 62% were women, and 48% were African-American. A total of 168 participants (8.7%) experienced a primary outcome event. For the primary outcome, the RMSTs were similar at 13.1, 13.0, and 13.1 years for the lowest to highest tertile ( $p=0.512$ ). In the multivariable analysis, liver fat tertiles were not associated with cardiovascular events for either the middle tertile (HR= 1.06; 95% CI 0.7-1.61) nor for the highest tertile (HR=0.78; 95% CI 0.5-1.22) compared with lowest tertile. None of the secondary outcomes were associated with liver fat content, and no differences were found in the RMSTs for any of the secondary outcomes between groups defined by tertiles of liver fat.

**Conclusion:** NAFLD was not independently associated with cardiovascular events in the multiethnic DHS population. Our findings should be validated in other cohorts, especially in those with documented advanced NAFLD (NASH or cirrhosis).

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Poster #028

**Presenter:** Mir Lim

**Authors:** Mir Lim, MD; Meng Cao, MD; Anna Moscovitz, MD; Isaac Chan MD, PhD

**Title:** Association Between BMI and Overall Survival in Patients with Metastatic Breast Cancer

**Abstract:**

**Background:** The Dallas Metastatic Breast Cancer Study (DMBCS) is a clinical database that was established in 2021 at UT Southwestern and Parkland Hospital to track patient demographics, associated pathology, treatments, and other variables that are not widely available in the Surveillance, Epidemiology, and End Results (SEER) Program for metastatic breast cancer (MBC). One of many ongoing studies as part of the DMBCS is to investigate the association between obesity and prognosis in MBC patients. Although many studies have reported an association between higher BMI and worse overall survival in patients with early-stage breast cancer, little is known about the impact of BMI on overall survival in patients with MBC.

**Methods:** Seventy-five female patients who were diagnosed with MBC between 2015-2018 were included in this preliminary data collection. BMI at time of diagnosis of metastatic disease, date of last follow-up or date of death, and date of diagnosis were recorded for each individual. Primary outcome was overall survival. We compared overall survival between patients with BMI < 30 (non-obese) and BMI ≥ 30 (obese) using Kaplan-Meier curves, log-rank tests, and multivariable linear regression models.

**Results:** Overall, 25% of the patients were normal or underweight, 33% were overweight, and 41% were obese. Median age at time of diagnosis was 56 years (range 26-87). Kaplan-Meier analysis showed significantly greater overall survival in patients with a BMI ≥ 30. Median survival was 23 months in the non-obese group versus 64 months in the obese group (p=0.0167). These results remained significant after additional adjustment for age and race.

**Conclusions:** Our preliminary data suggests that there is a statistically significant association between high BMI and improved overall survival in patients with MBC, implying a potentially protective role of obesity in MBC. The results of our study suggest that BMI at time of diagnosis of breast cancer could have varying impact depending on whether the disease is local or metastatic. Further research is warranted to determine the exact relationship between obesity and overall survival in patients with MBC.

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**Presenter:** Po-Hong Liu

**Authors:** Po-Hong Liu, MD, MPH; Amit G. Singal, MD, MS; Caitlin C. Murphy, PhD, MPH

**Title:** Comparison of the Surveillance, Epidemiology, and End Results program of cancer registries and National Cancer Database for research on colorectal cancer

**Abstract:**

**Background:** The Surveillance, Epidemiology, and End Results (SEER) program and the National Cancer Database (NCDB) can be used to study colorectal cancer (CRC). We compared demographics, tumor characteristics, and survival of CRC patients in SEER and NCDB.

**Methods:** We identified adults (age  $\geq 20$  years) diagnosed with primary CRC between 2004-2017 in SEER or NCDB. Incidence and mortality rates were age-adjusted to 2000 U.S. standard population. We used chi-square tests to compare categorical variables. Patient survival was estimated by Kaplan-Meier method.

**Results:** A total of 475,093 (SEER) and 1,222,828 (NCDB) persons with CRC were identified. Median age was 68 years in both cohorts. The proportion of persons who were White, Black, Asian, and Hispanic was 69.5%, 12.0%, 8.0%, and 10.5% in SEER and 79.8%, 11.9%, 3.0%, and 5.3%, respectively, in NCDB ( $p < 0.01$ ). Incidence (53.2/100,000 person-years), mortality (14.9/100,000 person-years) and cause-specific survival (66.7% at 5-year) were only available in SEER. Five-year overall survival was 55.3% (SEER) and 56.5% (NCDB). Tumor location, stage, and treatment did not meaningfully differ between two cohorts. SEER contained more sociodemographics including poverty level, unemployment, and proportion of foreign-born population. NCDB provided additional CRC-specific information and perioperative outcomes, including microsatellite instability (17.6%), KRAS mutation (40.1%), unplanned readmissions (4.5%) or 30-day mortality after surgery (2.8%).

**Conclusion:** Characteristics of persons newly diagnosed with CRC in SEER and NCDB were generally similar. Given the distribution of race/ethnicity and availability of county-level information, SEER may facilitate better evaluation of racial, ethnic, and socioeconomic disparities; NCDB includes important clinical variables that can facilitate studies of treatment effectiveness and outcomes.

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Poster #030

**Presenter:** Po-Hong Liu

**Authors:** Po-Hong Liu, MD, MPH; Rasmi Nair, PhD; Caitlin C. Murphy, PhD, MPH; Celette Sugg Skinner, PhD; Ethan Halm, MD, MPH, MBA

**Title:** Unsatisfactory Stool Tests in Colorectal Cancer Screening

**Abstract:**

**Introduction:** Stool-based tests, such as guaiac-based fecal occult blood tests (gFOBT) and fecal immunochemical tests (FIT), are recommended for colorectal cancer (CRC) screening. This modality requires satisfactory samples for accurate laboratory processing, but little is known about the prevalence, reasons, and follow-up of unsatisfactory tests particularly in a large, integrated safety-net health system.

**Methods:** We identified patients aged 50 to 74 years, with no history of CRC, colorectal surgery, colonoscopy in past 10 years, or sigmoidoscopy in past 5 years, and who completed a first (index) gFOBT or FIT from 2010 to 2019. We estimated prevalence of unsatisfactory tests and categorized their reasons. We used multivariable logistic regression to identify factors associated with unsatisfactory tests. We also examined follow-up with another stool test, colonoscopy, or other tests (sigmoidoscopy or CT colonography) within 12 months of the unsatisfactory test.

**Results:** Of 58,045 patients completing an index test, 5,948 (10.3%) completed an unsatisfactory test. Reasons for unsatisfactory tests included insufficient specimen (50.6%), incomplete labeling (26.8%), old specimen (13.4%), broken/leaking container (8.3%), and other (0.9%). In multivariable analysis, patients who were male (OR:1.12, 95% CI:1.05-1.19), Black (OR:1.50, 95% CI:1.36-1.65), or Spanish speaking (OR:1.15, 95% CI:1.04-1.27) were more likely to complete an unsatisfactory test. Patients insured with Medicaid (OR:1.43, 95% CI:1.28-1.60) or with charity programs (OR:1.08, 95% CI:1.02-1.16) were also more likely to complete an unsatisfactory test compared with commercially insured patients. There was no difference in prevalence of unsatisfactory tests by year of test. Among patients with unsatisfactory tests, 38.5% completed a follow-up test within 12 months, including another stool test (32.6%, median time to test 3.5 months), colonoscopy (1.7%, median time to test 4.8 months), or other tests (4.2%, median time to test 3.7 months).

**Discussion:** One in ten stool tests completed for CRC screening cannot be processed, which may reduce effectiveness of the screening modality, especially if not followed appropriately. Our results highlight additional steps in the screening process that must be addressed to improve CRC screening in real-world settings, such as better patient instructions, pre-print patient labels, or automated systems to repeat stool test when the first one is unsatisfactory.

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**Presenter:** Kristine Madsen

**Authors:** Kristine Madsen, MD; Kim Styrvoky, MD; Audra Schwalk, MD; David Pham, MD; Anastasiia Rudkovskaia, MD; Hsienchang Chiu, MD; Muhanned Abu-Hijleh, MD

**Title:** Diagnostic accuracy of robotic assisted bronchoscopy using shape sensing technology combined with cone-beam CT in the evaluation of pulmonary lesions: A retrospective review of the first 200 cases at an academic institution

**Abstract:**

**Background:** Approximately 1.6 million new pulmonary nodules are detected yearly in the United States.(Gould 2015) Current guidelines recommend non-surgical biopsies in patients with moderate pretest probability for malignancy or high pretest probability per patient or physician preferences.(Gould 2013) Non-surgical biopsy options primarily include percutaneous biopsy and bronchoscopy. Traditional bronchoscopic techniques for biopsy of suspicious peripheral pulmonary lesions include conventional flexible bronchoscopy with an average diagnostic yield of 36% (Rivera 2013) and electromagnetic navigational bronchoscopy and radial endobronchial ultrasound with a diagnostic yield of 72-76%.(McGuire) Shape-sensing robotic assisted bronchoscopy (ssRAB) and cone beam CT image (CBCT) guided sampling are new approaches to biopsy peripheral pulmonary lesions. We aim to better quantify the diagnostic accuracy of ssRAB with CBCT.

**Methods:** We conducted a retrospective analysis of the first 200 biopsy procedures of 209 lung lesions using ssRAB and CBCT at UT Southwestern from December 2020 through February 2022. Outcomes were based on pathology interpretations of samples taken during ssRAB, clinical and radiographic follow-up, and/or additional sampling. Statistical analysis is reported as percentages, means  $\pm$  SD, and ranges, where appropriate.

**Results:** 200 procedures were performed to sample 209 lesions in 198 patients. The mean largest lesion diameter was  $22.6 \pm 13.3$  mm, median of 19 mm with a range of 7 - 73 mm. The prevalence of malignancy in our data was 64.1%. The rate of non-diagnostic sampling was 11.0% (23/209 samples). The diagnostic accuracy of RAB with CBCT was 91.4% (CI: 86.7% - 94.8%). Sensitivity was 87.3% (CI 80.5% - 92.4%) with a specificity of 98.7% (CI: 92.8% - 99.9%). The negative and positive predictive values were 81.3% and 99.2%, respectively. The only complication was pneumothorax in 1.0%, 0.5% requiring a chest tube.

**Conclusions:** SsRAB with CBCT is promising for the diagnosis of central, distal-airway, and peripheral pulmonary lesions. Results of ssRB with CBCT at our institution suggest a high sensitivity and specificity for malignancy with a high negative predictive value and a favorable safety profile. We plan to continue prospectively evaluating ssRAB with CBCT to further study the diagnostic accuracy, rates of complications, and details of use.

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Poster #032

**Presenter:** Meredith McAdams

**Authors:** Meredith McAdams, MD; Pin Xu, PhD, MS; Michael Li, BA; Mauricio Ostrosky-Frid, MD; Duwayne Willett, MD; Ferdinand Velasco, MD; Christoph Lehmann, MD; Susan Hedayati, MD, MSc

**Title:** Risk Prediction for Acute Kidney Injury in Patients Hospitalized with COVID-19: Withstanding Variants over Time

**Abstract:**

**Background:** Acute kidney injury (AKI) is common in patients hospitalized with COVID-19, but predictive models for AKI are lacking. We aimed to develop the best predictive model for AKI and assess performance over time with the emergence of new variants.

**Methods:** Patients with positive SARS CoV-2 PCR hospitalized between 3/1/2020 to 1/14/2022 at 19 Texas hospitals were included. Those with AKI present on admission were excluded. Comorbidities, demographics, baseline laboratory data, and inflammatory biomarkers were obtained from the EHR and used to build nested models for AKI in an inception cohort. Models were validated in four out-of-time cohorts. Model discrimination and calibration measures were compared to assess performance.

**Results:** Of 13,468 patients, 5,676 were included in the Inception Cohort and 7,792 in subsequent validation cohorts grouped based on predominance of COVID variants, with cohorts 1 and 3 containing a mix of variants, cohort 2 corresponding to Delta predominance, and cohort 4 to Omicron. Prevalence of AKI was 776 (13.7%) in the inception and 368 (12.6%), 179 (12.4%), 328 (13.3%), and 139 (14.4%) in the validation cohorts. Proportion of AKI stages 2 or 3 vs. 1 was lower in the Omicron-dominant cohort 4 compared to the inception cohort (28/139 vs. 257/776,  $P=0.008$ ), but was no different for cohorts 1-3. The final model containing demographics, comorbidities and baseline WBC, hemoglobin, hsCRP, ferritin, and D-dimer, had an AUC=0.781 (95% CI, 0.763, 0.799). Compared to the inception cohort, discrimination by AUC (validation 1: 0.785 [0.760, 0.810],  $P=0.14$ , validation 2: 0.754 [0.716, 0.795],  $P=0.14$ , validation 3: 0.778 [0.751, 0.806],  $P=0.14$ , and validation 4: 0.743 [0.695, 0.789],  $P=0.14$ ) and calibration by ECI (validation 1: 0.116 [0.041, 0.281],  $P=1.0$ , validation 2: 0.081 [0.045, 0.295],  $P=0.64$ , validation 3: 0.055 [0.030, 0.162],  $P=1.0$ , and validation 4: 0.120 [0.043, 0.472],  $P=0.50$ ) showed stable performance over time.

**Conclusions:** Using demographics, comorbidities, admission laboratory values, and inflammatory biomarkers, we developed and externally validated a model to accurately predict AKI in hospitalized patients with COVID-19. Although a lower proportion of patients hospitalized during the Omicron-dominant period of the pandemic experienced severe AKI, our predictive model withstood changes in practice patterns and virus variants.

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Poster #033

**Presenter:** Jonathan Melendez-Torres

**Authors:** Jonathan Melendez-Torres, MD; Mounika Kanneganti, MD; Nicole E. Rich, MD; Amit G. Singal, MD

**Title:** Risk of Hepatocellular Carcinoma in Patients with Hepatitis C infection after Sustained Virological Response

**Abstract:**

Introduction: Direct-acting antiviral (DAA) therapy offers a cure for hepatitis C virus (HCV) infection and significantly reduces, but does not eliminate, risk of hepatocellular carcinoma (HCC). We aimed to characterize the incidence of HCC after sustained virological response (SVR), identify factors associated with incident HCC, and describe clinical features of patients who develop HCC.

**Methods:** We identified all patients with HCV infection who underwent DAA therapy and achieved SVR at Parkland Health and Hospital System between January 2015 and December 2018. Patients with a history of HCC prior to DAA initiation were excluded. We used Kaplan Meier analysis and Cox regression analyses to characterize incidence and predictors of HCC development among those who achieved SVR.

**Results:** We identified 833 eligible patients (median age 60 years and 57.8% male). The cohort was diverse regarding race and ethnicity (34.6% White, 53.6% Black, 8.1% Hispanic), genotype (82.1% genotype 1, 7.6% genotype 2, and 6.3% genotype 3), and fibrosis (14.1% F0-1, 17.4% F2, 20.3% F3, and 48.2% F4). Most patients had compensated liver disease with 7.2% having ascites and 4.0% hepatic encephalopathy. Over a 3.6-year median follow-up, 21 patients developed HCC, with cumulative incidence rates of 1.3%, 1.7%, 2.5%, and 3.1% at 1, 2, 3, and 4 years, respectively. The only factor associated with incident HCC was stage of fibrosis (HR 2.15, 95%CI 1.16 - 3.99), with 15 HCC developing in those with F4 fibrosis and 4 HCC in those with F3 fibrosis at the time of SVR. Among patients with cirrhosis (F4 fibrosis), cumulative incidence rates at 1, 2, 3, and 4 years were 2.0%, 2.6%, 4.1%, and 5.0% respectively. Three-fourths of HCC (76.2%) were detected by surveillance, and most were found at an early stage (71.4% Barcelona Clinic Liver Cancer Stage 0 or A). Curative treatments were delivered in over half of patients, including surgical resection in 28.6%, local ablation in 23.8%, and liver transplantation in 4.8%.

**Conclusion:** Patients have a continued risk of HCC after SVR and warrant continued surveillance, particularly those with F3 or F4 fibrosis.

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Poster #034

**Presenter:** Ali Mohamedi

**Authors:** Ali Mohamedi, MD; Mingqian Lin, MS; Ansh Mehta, MBBS; Gurbakhash Kaur, MD; Larry D. Anderson Jr., MD; Anita D'Souza, MD; Ankit Kansagra, MD

**Title:** Reporting of Race and Ethnicity in AL Amyloid Clinical Trials

**Abstract:**

**Background:** Light chain (AL) Amyloidosis is a plasma cell disorder whereby a small, slowly proliferating plasma cell clone synthesizes amyloidogenic free light chains resulting in end organ dysfunction and eventual failure. Minorities with AL Amyloidosis are shown to have more delayed diagnosis, aggressive disease phenotype, poor utilization of stem cell transplant, accounting for significant disparities in disease and outcomes. We aim to evaluate the reporting of race in clinical trials studying AL Amyloidosis.

**Methods:** Manuscripts on AL amyloidosis clinical trials from 2009-2019 were collected by searching titles and abstracts from multiple databases. Different variables were tabulated after reviewing the manuscripts and relevant inclusion and exclusion criteria regarding clinical trials were collected from (<https://clinicaltrials.gov/>). Trial characteristics and its association with race/ethnicity reporting was analyzed using Fisher's exact test as displayed in the table below.

**Results:** In total, 40 clinical trials meet the inclusion criteria between 2009-2019. We evaluated factors including number of authors, presence of industry funding, region of trial, number of clinical centers involved, phase of clinical trial in respect to reporting of racial distribution. Only 5 trials (12.5%) reported race in the published studies. In univariate analysis, clinical trials with >12 authors were more likely to report race ( $P=0.02$ ), as were studies performed in the United States ( $P=0.01$ ) compared to ex-US studies.

**Conclusions:** Race and Ethnicity reporting occurs very infrequently in published clinical trials. Factors affecting inferior outcomes of minorities with AL Amyloidosis is poorly recognized. To better understand the outcomes and understand disparities, we propose that consistent reporting of the racial distribution of the clinical trial population be required in all published AL Amyloidosis clinical trials.

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**Presenter:** Neha Mulpuri

**Authors:** Neha Mulpuri, Matt Segar, Ambarish Pandey

**Title:** The association of polypharmacy with risk of adverse outcomes and GDMT use among participants of the GUIDE-IT trial

**Abstract:**

**Background:** Patients with HFREF are older and have high burden of other comorbidities contributing to polypharmacy. While polypharmacy has been associated with adverse outcomes in older adults, its association with GDMT use in older patients with HFREF is not well-established. The aim of this study is to evaluate the association of polypharmacy burden with the likelihood of achieving optimal GDMT on follow-up among patients with HFREF.

**Methods:** A post-hoc analysis of the GUIDE-IT trial, which included patients with chronic HFREF and had detailed assessment of medication burden and GDMT utilization over time, was conducted. Participants were stratified into tertiles based on the number of medications used at baseline (excluding the GDMT for HFREF). Optimal GDMT was defined as receiving beta-blockers and ACE-inhibitors at 50% of the target doses and MRAs at any dose. Multivariable-adjusted logistic mixed models were also constructed to evaluate the association between baseline and longitudinal measures of number of medications and likelihood of achieving optimal GDMT over follow-up.

**Results:** Of the 894 participants with HFREF in the GUIDE-IT trial, data related to number of medications was available for 891 (mean age 62, 31.5% women). The median number of medications prescribed to study participants outside of GDMT for HFREF was 4 (IQR: 3-5). In unadjusted analysis, individuals with higher burden of polypharmacy at baseline were less commonly on GDMT at 12-month follow-up (Tertile 1 vs. Tertile 3: 15% vs. 4%). In adjusted analysis, among individuals not on optimal GDMT at baseline, the likelihood of achieving optimal GDMT on follow-up was lower among individuals who were taking higher number of medications baseline (Odds ratio [95% CI] for optimal GDMT per 1-month follow up: Tertile 1= 1.28 [1.21 - 1.36] vs. Tertile 2 = 1.25 [1.17 - 1.32] vs. Tertile 3= 1.12 [1.03 - 1.21]; p-interaction [time\* medication number tertiles = 0.01). Similar patterns of association were noted using repeated measure of polypharmacy overtime, with the lowest probability of GDMT uptitration among individuals with higher number of medications at each time point.

**Conclusions:** Polypharmacy is associated with increased risk of adverse outcomes and lower probability of uptitration of GDMT

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Poster #036

**Presenter:** Kyle O'Malley

**Authors:** Kyle O'Malley, MD; Wisam Alnablsi, MD; Fatima Khan, BS; Yin Xi, PhD; Praneeth Kalva, MD; Anil Pillai, MD; Manoj Kathuria, MD; Wanpen Vongpatanasin, MD

**Title:** Utility of Partial Adrenal Vein Sampling in Primary Aldosteronism

**Abstract:**

**Background:** Primary aldosteronism (PA) is a disorder characterized by adrenal aldosterone overproduction by either one adrenal gland (ie, unilateral disease) or both adrenal glands (ie, bilateral disease). Distinguishing unilateral disease from bilateral disease is critically important as unilateral disease is managed surgically with adrenalectomy while bilateral disease is managed medically with mineralocorticoid receptor antagonists. Adrenal vein sampling (AVS) is the criterion standard for determining laterality. However, AVS can be technically challenging with high rates of failure. In cases where only one adrenal vein is successfully cannulated, it has been suggested that laterality can be determined based on the ratio of the cortisol-corrected concentration of aldosterone between the adrenal vein and the inferior vena cava (ie, AV/IVC index).

**Methods:** We conducted a retrospective cohort study involving 133 patients with a biochemical diagnosis of PA who underwent successful AVS at UT Southwestern between 1/1/2014 and 6/30/2021. By simulating failed cannulation of the right and left adrenal veins, the performance of the AV/IVC index to predict laterality was evaluated based on the results of complete AVS and modeled using receiving operating characteristic (ROC) curves. The area under the curve (AUC) for each ROC curve was compared by bootstrap analysis.

**Results:** Of the 133 patients with PA who underwent successful AVS during the study period, the results of complete AVS revealed 56 patients had bilateral disease, 47 patients had unilateral left-sided disease, and 30 patients had unilateral right-sided disease. In the detection of right-sided unilateral disease, the ROC curve modeling the left AV/IVC index had an AUC of 0.966 versus 0.906 for the ROC curve modeling the right AV/IVC index ( $p=0.08$ ). In the detection of left-sided unilateral disease, the ROC curve modeling the right AV/IVC index had an AUC of 0.967 versus 0.871 for the ROC curve modeling the left AV/IVC index ( $p=0.008$ ).

**Conclusions:** Caution should be used before making clinical decisions based on incomplete AVS data. However, suppression of the AV/IVC index from contralateral aldosterone hypersecretion is a more reliable predictor of laterality than elevation of the AV/IVC index from ipsilateral aldosterone hypersecretion.

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**Presenter:** Kristeen Onyirioha

**Authors:** Kristeen Onyirioha, MD; Erin Wolf, MD; Nicole E. Rich, MD; Sruthi Yekkaluri, Takeshi Yokoo, Purva Gopal, Neehar D. Parikh, MD MS; Amit G. Singal, MD, MS

**Title:** Clinical Outcomes of Patients with Suspicious (LI-RADS 4) Liver Observations

**Abstract:**

**Background:** Indeterminate liver nodules, i.e., LI-RADS (LR)-3 or LR-4, are commonly observed during HCC screening, have heterogeneous risk for developing HCC, and have large variations in management. Few studies have reported the natural history of these patients, so we aimed to characterize clinical outcomes in patients with LR-4 observations in a multicenter cohort.

**Methods:** We included adult patients with at least one LR-4 observation on multiphasic CT or MRI from UT Southwestern Medical Center, Parkland Health and Hospital System, and University of Michigan between March 2015 and September 2018. Individuals with LR-5 or LR-M on index imaging, prior history of HCC or cholangiocarcinoma, or liver transplantation were excluded. Patients were followed until progression to liver cancer, death, liver transplantation, or end of follow-up. We performed Kaplan Meier and multivariable Cox regression analyses to characterize time-to-HCC development, with liver transplantation and death as competing events.

**Results:** We identified 93 patients with an LR-4 observation (median age 60 years; 57.6% men). The cohort was diverse regarding race, ethnicity, and cirrhosis etiology. Fifty-two (55.9%) patients had a single LR-4 observation, 19 (20.4%) had two observations, and 22 (23.7%) had ≥3 observations. Median maximum diameter of the largest LR-4 observation was 1.4 (IQR 1.0-2.1) cm. Over a median follow-up of 8.0 months, 39 (41.9%) patients progressed to HCC, with 30 (25.9%), 10 (8.6%), and 8 (6.9%) patients developing HCC within 6, 12, and 18 months of index imaging, respectively. Of those who developed HCC, 44 (84.6%) occurred in the LR-4 observation and 8 (15.4%) elsewhere in the liver. In multivariable analysis, age > 60 years (HR 1.99, 95%CI 1.01 - 3.91) and platelet count <150 (HR 9.52, 95%CI 3.00 - 30.3) were associated with HCC development. Of those who developed HCC, 34 (65.4%) were found at an early stage (BCLC stage 0/A) and 22 (42.3%) underwent curative treatment with surgical resection, liver transplantation, or local ablation.

**Conclusion:** Patients with cirrhosis and LR-4 observations have a high risk for progression to HCC, highlighting these patients warrant close surveillance using CT or MRI imaging.

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Poster #039

**Presenter:** Dorothy Patterson

**Authors:** Dorothy J. Patterson, Jessica Link-Malcolm, Una E. Makris

**Title:** Healthcare Worker Perspectives on Integrated Behavioral Health Services for Patients with Rheumatic Diseases and Chronic Musculoskeletal Pain

**Abstract:**

**Background:** Chronic musculoskeletal (MSK) pain is a common and burdensome symptom of many rheumatic diseases (RD). Certain health behaviors (e.g., physical activity, smoking cessation, etc.) are associated with improvement in MSK pain among patients with RD, while psychological comorbidities (e.g., depression) may worsen pain. Integration of behavioral health (BH) services (BHS) into Rheumatology clinics may promote desirable health behaviors and better address psychological comorbidities by improving access to care, ultimately improving patient outcomes. Maximal efficacy of BHS depends, in part, on optimal integration by stakeholder healthcare workers (HCW). The purpose of this qualitative study is to characterize the attitudes and preferences of Rheumatologists toward integrated BHS in the management of chronic MSK pain in RD.

**Methods:** UT Southwestern (UTSW) Rheumatology HCW (n=15) were invited to participate in individual, semi-structured interviews via [audio-recorded] Microsoft TEAMS meetings. Questions elicited experiences with, preferences for, and barriers to behavioral health integration (BHI). Participants also completed a survey of demographics and desirability of specific BH interventions. Interviews were conducted until thematic saturation was reached. Interviews were summarized and analyzed using Rapid Qualitative Analysis (RQA) and matrix analysis to identify thematic domains.

**Results:** Preliminary RQA from n=10 UTSW Rheumatology faculty (six women, mean years in practice 16.3 [SD 9.2]) included four domains (which will be highlighted in tables). None of the participants had previously worked in a clinic that included BHI. All participants believed that health behaviors (particularly physical activity) and mental health are impactful on patients' pain experience. Common themes included limited time and expertise to address BH independently and a desire for co-location and same-day availability of BH services. Participants identified the following potential barriers to BHI: inefficient workflows, lack of provider education about BHS and potential lack of patient buy-in/time.

**Conclusions:** HCW recognize the importance of BH factors in the treatment of chronic MSK pain in patients with RD and envision BHI that maximizes efficiency and convenience for both patients and providers. Results highlight the importance of clearly defining the scope-of-practice of the BH provider whose goal is to optimize disease outcomes by augmenting medical treatments with BH interventions.

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**Presenter:** Samuel Phen

**Authors:** Samuel Phen, MD; Nirali Desai, BS; Sukul Mittal, BS; Girija Hariharan, MD; George Cholankeril, MD; Adam C. Yopp, MD; Jorge A. Marrero, MD, MS; Puneeth Iyengar, MD, PhD; Rodney E. Infante, MD, PhD; Amit G. Singal, MD, MS; Nicole E. Rich, MD, MS

**Title:** Trajectory of Cancer-Associated Weight Loss in Patients with Hepatocellular Carcinoma is Associated with Prognosis

**Abstract:**

**Background:** Cancer cachexia, a clinical syndrome of wasting defined by specific weight loss criteria, is associated with functional decline and poorer outcomes in various cancers, including hepatocellular carcinoma (HCC). There are few data on weight loss trajectory and its impact on survival in patients with HCC.

**Methods:** We performed a retrospective cohort study of patients diagnosed with HCC between 2008-2018. Cachexia was defined as >5% weight loss (or >2% weight loss if BMI <20 kg/m<sup>2</sup>). Patients were classified into four groups based on weight loss trajectory, assessed by percent weight loss 6 months prior to HCC diagnosis and weight loss 6 months after HCC diagnosis: Group 1: CCX - /CCX -; Group 2: CCX + / CCX -; Group 3: CCX - /CCX +; Group 4: CCX + / CCX +. We used multivariable Cox proportional hazard models to identify factors associated with overall survival and log-rank tests to compare survival between groups.

**Results:** We identified 507 patients meeting inclusion criteria; 52.1%, 27.4%, 16.2% and 4.3% in Groups 1, 2, 3, and 4, respectively. Most patients were Child Pugh class A or B. Groups 1/2 had a higher proportion of tumors diagnosed at an early stage (BCLC 0/A) compared to groups 3/4. Similarly, a higher proportion of patients in groups 1 received surgical treatment compared to those in groups 2, 3 and 4. Among the subset of patients who underwent locoregional therapy, there was no significant difference in objective response rates between the 4 groups. Overall survival was best in group 1 patients (34.3 months), intermediate in groups 2 and 3 (20.3 and 17.3 months respectively) and worst in group 4 patients (11.4 months). In multivariable analysis, patients in group 4 had worse overall survival compared to group 1 after adjusting for age, sex, race, Child Pugh class, tumor stage, and HCC treatment modality, whereas survival differences for groups 2/3 were no longer statistically significant.

**Conclusions:** Trajectory of cancer-associated weight loss is associated with lower rates of curative treatment receipt and worse survival in patients with HCC.

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Poster #041

**Presenter:** Srishti Saha

**Authors:** Srishti Saha, Kershaw Patel, Marat Fudim, Colby Ayers, Lisa B. VanWagner, Vishal N. Rao, Mark H. Drazner, Sonia Garg, Amit G. Singal, Jeffrey Browning, Ian J. Neeland, Ambarish Pandey

**Title:** Association of Hepatic Triglyceride Content with Cardiac Structure and Function among Community-dwelling Adults: Finding from the Dallas Heart Study

**Abstract:**

**Background:** Non-alcoholic fatty liver disease (NAFLD) is associated with an increased risk for heart failure, particularly heart failure with preserved ejection fraction (HFpEF). Development of HFpEF is preceded by subclinical abnormalities in cardiac structure and function, specifically smaller left ventricular (LV) size and greater LV concentricity. The association of hepatic triglyceride content (HTGC) with abnormalities in cardiac structure and function preceding the development of HFpEF is not well described. Accordingly, we evaluated the association of HTGC with cardiac structure and function in a community-based cohort from the Dallas Heart Study (DHS).

**Methods:** Participants from DHS (2000-2002) who were free of cardiovascular (CV) disease at baseline, underwent assessment of HTGC using proton nuclear magnetic resonance spectroscopy, and had a cardiac MRI, were included. Outcomes of interest included LV mass (LVMI), LV end-diastolic volume (LVEDVi), concentricity (LVM/LVEDV), contractility [LV end systolic volume (LVESVi), and ejection fraction; indexed to body surface area (BSA)], and biomarker levels of myocardial injury [high sensitivity troponin T (hs-TnT)] and NT-ProBNP levels. Multivariable-adjusted linear regression models were created to evaluate the associations of HTGC with the outcomes of interest independent of other risk factors and other regional adipose depots (visceral adiposity, subcutaneous adiposity, lower body fat).

**Results:** The study included 2130 participants (average age 44 years, 53.1% female, 46.6% black). Individuals with higher levels of HTGC were older, more commonly men, and had higher burden of traditional CV risk factors. In adjusted analysis accounting for traditional CV risk factors, higher levels of HTGC were associated with lower LVMI, smaller LV size, greater LV concentricity, and greater LV contractility. On further adjustment for other adiposity depots, the association of HTGC level attenuated for LVMI and contractility but remained significant for LVEDVi and LV concentricity. Among cardiac biomarkers, higher levels of HTGC were significantly associated with lower levels of NT-ProBNP independent of other CV risk factors and other adiposity depots. HTGC was not associated with Hs-TnT levels in the fully adjusted model.

**Conclusion:** Among community dwelling adults, higher liver TG is associated with smaller LV size, greater concentric remodeling and lower natriuretic peptide levels. These abnormalities may underlie the increased risk of HFpEF among patients with NAFLD.

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**Presenter:** Rahul Sheth

**Authors:** Rahul Sheth, MD; Daniel Galvan, BS; Hannah Lehrenbaum, MD; Daniel Cheeran, MD; Faris G. Araj, MD; Alpesh A. Amin, MD; Mark H. Drazner MD, MSc; Vlad Zaha MD, PhD; Ronald M. Peshock, MD; Pradeep P.A. Mammen, MD

**Title:** Low left ventricular mass and cardiomyopathy in muscular dystrophies: A different perspective on potential cardiac mechanisms.

**Abstract:**

**Background:** Cardiomyopathy is a common complication in muscular dystrophy patients, though the mechanism is not clear. Retrospective data from adults with Duchenne muscular dystrophy suggest they have reduced LV mass when compared with adults with other forms of non-ischemic cardiomyopathy. This raises the question whether pathologic hypertrophy contributes to the development of neuromuscular-associated cardiomyopathy. In this study, we hypothesized that muscular dystrophy patients have lower LV mass and associated change in cardiac function as compared to healthy individuals.

**Methods:** Utilizing cardiac magnetic resonance imaging (cMRI) data, a retrospective study was undertaken to compare LV mass, structure, and function between adults with muscular dystrophy (MD) and healthy age-, sex-, weight-matched patients from the Dallas Heart Study (DHS). Types of MD included dystrophinopathies, facioscapulohumeral MD, Freidreich ataxia, myotonic dystrophy, limb-girdle MD and other rare MD. Approximately 50% of the MD patients were able to ambulate. MD patients were stratified into normal and reduced LVEF, defined as < 62% on cMRI, for further comparison. Statistical analysis was done using a two-sample, two-tailed t-test.

**Results:** There were 339 MD patients (221 male) of mean age 40 and 417 DHS patients (187 male) of mean age 42. MD patients had a significantly lower LV mass, LV mass index, and LVEF. They also had significantly higher absolute and indexed volumes. All variables except LVESVi were significantly different in those with normal LVEF. All variables were significantly different in MD patients with reduced LVEF. The results are summarized in a separate table.

**Conclusion:** Collectively, MD patients have a reduced LV mass compared to healthy adults. In addition, MD patients with normal LVEF have lower LV mass than those patients with reduced LV function. Whether this observed decrease in LV mass represents cardiac hypoplasia or atrophy warrants further investigation.

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Poster #043

**Presenter:** Sumitabh Singh

**Authors:** Sumitabh Singh, MD; Neha Mulpuri, MD; Nitin Kondamudi, MD; Lin Zhong, MS; Ambarish Pandey, MD, MSCS

**Title:** Association of Hospital Frailty Risk Score with 30-day Post Hospitalization Outcomes in Patients with Heart Failure

**Abstract:**

**Background:** Frailty is associated with greater risk of adverse outcomes among older adults with heart failure (HF). However, it is not known whether it differentially predicts risk of mortality and hospital readmission among adults hospitalized with heart failure with preserved ejection fraction (HFpEF) vs heart failure with reduced ejection fraction (HFrEF).

**Methods:** Using Medicare claims data, we identified patients newly hospitalized for HF in 2016 within a cohort of 5% fee-for-service Medicare beneficiaries and used ICD-10 codes to specify HF subtype. Frailty was quantified using the Hospital Frailty Risk Score (HFRS), which computes frailty using 109 ICD-10 codes within 3 months of the index HF hospitalization. The association of HFRS with risk of 30- and 90-day hospital readmission and mortality rates were assessed using adjusted Cox proportional hazard models and Multiplicative interaction testing was performed between HF subtype and HFRS for risk of each outcome of interest. Harrell's C-statistic was used to assess discrimination for risk of these outcomes using traditional risk prediction models with vs without the HFRS. Improvement in model discrimination with addition of HFRS was assessed using change in the C-statistic and the integrated discrimination improvement test.

**Results:** The study cohort included 14,276 Medicare beneficiaries hospitalized for HF, 6836 (48%) with HFpEF, 3586 (25%) with HFrEF, and 4304 (30%) with unknown EF. In the overall cohort, beneficiaries with higher HFRS were more likely to be hospitalized or experience death at 30 and 90 days. In adjusted Cox proportional hazard models HFRS was associated with greater risk of 30- and 90- day mortality among beneficiaries hospitalized for HFrEF and HFpEF. However, there was an interaction between HF subtype and HFRS for risk of readmission, such that HFRS was associated with risk of readmission among beneficiaries hospitalized for HFpEF, but not among beneficiaries hospitalized for HFrEF (P-interaction=0.034). Addition of HFRS improved model discrimination for 30- and 90-day hospitalization and mortality rates among both subtypes.

**Conclusion:** Frailty is a more robust predictor of hospital readmission among patients hospitalized for HFpEF vs HFrEF. Further, frailty improves risk discrimination for readmission and mortality among patients hospitalized for HF incremental to traditional models.

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**Presenter:** Vinayak Subramanian

**Authors:** Vinayak Subramanian, Matthew Segar, Thomas Wang, Ambarish Pandey,

**Title:** Hemodynamics in Acute Decompensated Heart Failure in patient with very low natriuretic peptide levels. Insights from the ESCAPE trial.

**Abstract:**

**Background:** Natriuretic Peptides (NP) are hormones secreted by the heart in response to cardiomyocyte stretch. The principal biological action of NP is natriuresis, diuresis and vasodilation. These are salutary effects in acute decompensated heart failure (ADHF). Some patients admitted with ADHF have very low NP levels. It is unknown if this is due to a defect in biosynthesis or inadequate stimulation.

**Methods:** We performed a secondary analysis of the ESCAPE Trial. We defined very low BNP as patients with BNP level at admission < 50 pg/mL. We compared baseline characteristics between low and high BNP groups. Continuous groups were compared using X-square test, and Categorical variables were compared using Wilcoxon-signed-Rank-Sum test. We compared groups by Demographic, Anthropometric, Laboratory, and Functional status. We then performed propensity matching on Age, Sex, and BMI and then compared groups.

**Results:** 25/351 patients had very low BNP (<50pg/mL). Patients in the low BNP group had higher BMI than those with elevated BNP (35.8 vs. 28.9 p<0.001). The cohort with low BNP was younger. (50.2 vs. 56.4 p = 0.029). In propensity matched cohorts of Age, Sex, BMI. Cardiac output was elevated in the low BNP cohort. (5.2 vs. 3.9 p =0.011). Patients in the Low NP group had lower pulmonary capillary wedge pressure (PCWP) compared to those with elevated BNP. (16.5 vs. 25.4 p = 0.023). The groups had similar RA pressures (11.5 vs. 13.0 p =0.515). The calculated transmural pressure (PCWP - RA pressure) was lower in the low NP group. There was a reduction in BNP levels at discharge among the group with elevated BNP at admission (1072.6 (baseline) 798.8 (discharge)) In the low BNP group there was an increase in BNP at time of discharge (20.2 (baseline) to 172.7 (discharge)).

**Conclusion:** In this secondary analysis of the ESCAPE trial, we find that those patients admitted with ADHF who have unexpectedly low BNP have lower transmural pressures at baseline compared to those who have elevated BNP levels. This suggests that there may not be adequate stimulus for cardiac wall distention and release of BNP.

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Poster #045

**Presenter:** Vinayak Subramanian

**Authors:** Vinayak Subramanian, Nitin Kondamudi, Alvin Chandra, Jarret Berry, Ambarish Pandey

**Title:** Predictors of Abnormal Global Longitudinal Strain (GLS) by feature tracking MRI, and association with cardiovascular outcomes. Insights from the Dallas Heart Study.

**Abstract:**

**Background:** Global Longitudinal Strain (GLS) describes the deformation of the heart and is a reliable marker of systolic function. Impaired GLS suggest subclinical myocardial dysfunction. We aimed to demonstrate the association of impaired GLS with cardiovascular outcomes in the Dallas Heart Study Cohort. We then aimed to identify demographic, metabolic, and anthropometric predictors of abnormal GLS.

**Methods:** We analyzed data from the DHS Visit 2 sample. GLS measures were derived from feature tracking cardiac MRI images from participants. These participants did not have prevalent cardiovascular disease. We analyzed a total of 2223 patients in the DHS database. We excluded patients with missing outcomes data. We determined the relationship between GLS and composite cardiovascular outcomes. We identified a non-linear trend between GLS and cardiovascular outcomes and developed cubic splines models to identify cut-off for normal and abnormal GLS. We then developed piecewise Cox-Proportional Hazards model to identify the relation between abnormal GLS and outcomes. We then developed a logistic model using demographic, biomarker, cardiac structure, anthropometric covariates which predict abnormal GLS.

**Results:** Our cohort consisted of 2223 participants after excluding participants with prevalent cardiovascular disease and missing outcomes data. CV death occurred in 213 participants (9.6%). We stratified the data by quartile of GLS. Mean (95% CI) Q1 = -25.29 (-25.55, -25.04), Q2 = -19.86 (-19.95, -19.78), Q3 = -16.59 (-16.67, -16.65), Q4 = -12.04 (-12.22, -11.86). In survival analysis we identified non-linear trend of survival and used cubic splines to identify cut-off for abnormal GLS. We determined -17 corresponded to the inflection point of the Hazard ratio. We then used Cox-proportional hazards model to identify trends of GLS with CV outcomes. HR of GLS <-17 =0.99 (p = 0.10) 95% CI = 0.921 -1.063, HR of GLS >-17 =1.047 (p = 0.10) 95% CI = 1.047 -0.991.

**Conclusions:** Abnormal GLS by feature tracking MRI identifies subclinical left ventricular systolic dysfunction. The association between abnormal GLS and cardiovascular outcomes appears non-linear. However, the association of mortality with abnormal GLS was not statistically significant in our analysis.

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**Presenter:** Emil Thyssen

**Authors:** Emil Thyssen, Piyush Nathani, Neehar D. Parikh, Neil Mehta, Maarouf Hoteit, Ju Dong Yang, Binu John, Andrew M. Moon, Reena Salgia, Anjana Pillai, Nicole E. Rich, Amit G. Singal

**Title:** Association between Sustained Virologic Response and Clinical Outcomes in Patients with Hepatitis C Infection and Hepatocellular Carcinoma

**Abstract:**

**Background:** Sustained viral response (SVR) improves survival for patients with hepatitis C (HCV) and hepatocellular carcinoma (HCC) after curative treatment; however, the benefit of SVR in those with active HCC is unknown. We evaluated the association between SVR and outcomes in patients with active HCC.

**Methods:** We performed a multi-center retrospective cohort study including adults with HCV cirrhosis and treatment-naïve HCC diagnosed between 2014-2018. Patients were stratified into two groups: active viremia (n=431) and SVR (n=135). All patients underwent non-surgical therapy and were followed until liver transplantation, last follow-up, or death. The primary outcome was incident or worsening hepatic decompensation within six months and the secondary outcome was overall survival. Analyses used Inverse Probability of Treatment Weights (IPTW).

**Results:** Patients in the SVR-HCC group had earlier stage disease, with BCLC stage 0/A (59.6% vs 45.7%), smaller median maximum tumor diameter (2.6 vs 3.2) and less vascular invasion (11.0% vs 18.3%) or extrahepatic disease (5.9% vs 10.2%). The proportion of patients with decompensation or an increase in CTP score  $\geq 2$  within six months after HCC diagnosis was lower in the SVR-HCC group (7% vs 23%). Adjusting for baseline CP and first HCC treatment as covariates, SVR-HCC patients had a lower risk of decompensation at 3 months (OR: 0.41; 95% CI: 0.19-0.82), 6 months (OR: 0.18; 95% CI: 0.06-0.59), and 9 months (OR: 0.46; 95% CI: 0.20-0.93) from diagnosis compared to viremic-HCC patients. Results were consistent among subgroups of patients with CTP A cirrhosis (OR: 0.22; 95%CI: 0.04-0.77), Barcelona Clinic Liver Cancer stage B/C HCC (OR:0.20; 95% CI: 0.04-0.65) and those receiving non-ablative HCC therapies (OR:0.21; 95% CI: 0.07-0.67). Median survival from HCC diagnosis for the SVR-HCC group was 49 months (95%CI: 26, NR) while the viremic-HCC group had a median survival of 34 months (95%CI: 29-40). However, SVR was not associated with improved survival (0.79 95% CI: 0.56-1.12).

**Conclusions:** Patients with HCV-related HCC and SVR are less likely to experience hepatic decompensation than viremic patients, suggesting patients with HCC who are undergoing non-surgical therapies may benefit from DAA treatment.

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Poster #047

**Presenter:** Taylor Triana

**Authors:** Taylor Triana, MD, MBA; Mark Berlacher, MD; Elaine Wu, MPH; Shreya Rao, MD, MPH; Tiffany Powell-Wiley, MD, MPH; Ambarish Pandey, MD, MSCS; Parag Joshi, MD, MHS; Amit Khera, MD, MSc

**Title:** The Relationship Between Socioeconomic Status, Coronary Artery Calcium and Atherosclerotic Cardiovascular Disease: The Dallas Heart Study

**Abstract:**

**Background:** Low socioeconomic status (SES) is associated with atherosclerotic cardiovascular disease (ASCVD) and possible underestimation of risk by the pooled cohort equations (PCE). Whether coronary artery calcium (CAC) scores can improve risk discrimination in those with low SES is unknown.

**Methods:** Individuals from the Dallas Heart Study without ASCVD and with CAC scans were evaluated. Low SES was defined as an annual income <\$16,000 or an educational attainment level  $\leq 11$  years. Unadjusted and adjusted analyses assessing the relationships between SES and 1) CAC scores and 2) ASCVD events (fatal or non-fatal MI or stroke) were performed. The incremental predictive value of CAC in those at low and higher SES was assessed using c-statistics (PCE alone vs PCE + CAC).

**Results:** Among 2411 individuals (median age 44 years, 56% women, 47% Black), 136 ASCVD events occurred over a median of 12.5 years. SES categories of <\$16K, \$16-30K, and >\$30K comprised 18.4%, 22.2%, and 59.3% of the study population. Individuals at low SES by income had an increased risk of ASCVD events compared to those at highest SES after adjustment for risk factors (HR 2.16, 95% CI 1.37-3.42), but there was no independent association with CAC. Higher CAC scores (0, 1-99,  $\geq 100$ ) tracked with increased 10-year ASCVD event rates in those at low and higher SES, with the low SES group carrying greater ASCVD risk for every stratum of CAC, including with CAC=0 (4.9% risk). In multivariable models compared with CAC=0, those with CAC 1-99 and  $\geq 100$  had a greater risk of ASCVD events for individuals at higher SES defined by income [HR 4.6 (1.3-16.0), and 7.3 (1.8-28.9)], but not for those with low SES [HR 0.98 (0.4-2.4), and 1.2 (0.4-3.5)], ( $p$ -interaction CAC x SES=0.02). The addition of CAC to PCE resulted in the smallest change in c-statistic for ASCVD prediction in those at low SES relative to those at higher SES, with similar results for low SES defined by education.

**Conclusion:** Individuals at low SES have significantly increased risk of ASCVD, however, CAC scores are not independently associated with ASCVD in this population and may be less useful in risk discrimination.

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**Presenter:** Lauren Ward

**Authors:** Lauren Ward, MD; Franck Hannallah, MD; Catherine Chen, MD; Chad A. Newton, MD; Bethany L. Lussier, MD

**Title:** Effect of Pneumothorax on Survival in Critically Ill Patients with COVID-19 Acute Respiratory Distress Syndrome

**Abstract:**

**Objectives:** The purpose of this study was to determine if the incidence of pneumothorax/pneumomediastinum in a large cohort with COVID-19 related respiratory failure was associated with mortality. Further, we looked to determine which clinical factors or ventilator management strategies may have impacted mortality in underserved patient population with pneumothorax.

**Methods:** Retrospective analysis of data from a single center Covid-19 intensive care unit of an urban tertiary safety net hospital including all adult patients admitted with COVID-19 associated acute respiratory distress syndrome requiring mechanical ventilation between March 2020 - January 2021. Following identification of a cohort with radiographic evidence of pneumothorax and/or pneumomediastinum, demographics, ventilator data, radiographic data, position, information regarding chest tube and sedation management and outcome data were obtained from the electronic medical record.

**Results:** Among 502 patients admitted to the ICU COVID-19 related ARDS, pneumothorax was identified in 103/ 502 (20.5%), predominantly affecting Hispanic (88%) and male (66%) patients. Thirty-four patients had pneumomediastinum (18.7%) alone. Of patients with documented pneumothorax, 60 (50.8%) had preceding or comorbid pneumomediastinum. Pneumothorax with/without pneumomediastinum was associated with increased mortality (OR 2.19,  $p=0.0027$ ) event after adjustment for ventilator days. There was no significant association between pneumomediastinum alone and mortality (OR 0.82,  $p=0.60$ ). Conservative management without tube thoracostomy were rarely possible (18.4% of pneumothorax). Time to development of pneumothorax was not associated with mortality, but pneumothorax was associated with longer survival times (HR 2.10;  $p<0.001$ ).

**Conclusion:** Pneumothorax, but not pneumomediastinum alone, is associated with higher mortality in ICU patients.

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Poster #049

**Presenter:** Timothy Zaki

**Authors:** Timothy A. Zaki, MD; Peter S. Liang, MD, MPH; Folasade P. May, MD, PhD, MPhil; Caitlin C. Murphy, PhD, MPH

**Title:** Racial and Ethnic Disparities in Early-Onset Colorectal Cancer Survival

**Abstract:**

**Background:** Young adults diagnosed with colorectal cancer (CRC) comprise a growing, yet understudied, patient population. Few studies have examined disparities in cancer survival in diverse populations of patients with early-onset CRC, particularly Asian and Hispanic patients. We estimated five-year relative survival of early-onset CRC and examined disparities by race and ethnicity in a population-based sample.

**Methods:** We used the SEER program of cancer registries to identify persons newly diagnosed with early-onset CRC (age 20-49 years) between January 1, 1992 and December 31, 2013. For each racial and ethnic group (non-Hispanic White, non-Hispanic Black, non-Hispanic Asian or Pacific Islander, Hispanic), we estimated five-year relative survival, overall and by sex, tumor site, and stage at diagnosis. To illustrate temporal trends, we compared five-year relative survival in 1992 - 2002 vs. 2003 - 2013. We also used Cox proportional hazards regression models to examine the association of race and ethnicity and all-cause mortality, adjusting for age at diagnosis, sex, tumor site, and stage at diagnosis.

**Results:** We identified 33,777 persons newly diagnosed with early-onset CRC (58.5% White, 14.0% Black, 13.0% Asian, 14.5% Hispanic). Five-year relative survival ranged from 57.6% (Black) to 69.1% (White). Relative survival improved from 1992 - 2002 to 2003 - 2013 for Whites only, and there was no improvement for Blacks, Asians, or Hispanics. Notably, survival for Blacks diagnosed in 2003 - 2013 (59.3%, 95% CI 57.3, 61.3) was lower than survival for Whites diagnosed in 1992 - 2002 (66.6%, 95% CI 65.6, 67.6). This pattern was similar by sex, tumor site, and stage at diagnosis. In adjusted analysis, being Black (aHR 1.42, 95% CI 1.36, 1.49), Asian (aHR 1.06, 95% CI 1.01, 1.12), or Hispanic (aHR 1.16, 95% CI 1.10, 1.21) was associated with all-cause mortality.

**Conclusions:** Our study adds to the well-documented disparities in CRC in older adults by demonstrating persistent racial and ethnic disparities in relative survival and all-cause mortality in patients with early-onset CRC. Future efforts must address social determinants of health and diagnostic and treatment differences contributing to these inequities. Findings may also inform future studies on interventions to address disparities.

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**Poster #050**

**Presenter:** Timothy Zaki

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

**Title:** Contribution of Diabetes to Increasing Incidence Rates of Colorectal Cancer in Young Adults

**Abstract:**

Earlier onset diabetes may contribute to increasing incidence rates of early-onset colorectal cancer (CRC), whereby shifts in the age at diabetes onset translate into a younger age at diagnosis. To test this hypothesis, we: 1) examined temporal trends in the age distribution of CRC in a population-based sample; and 2) estimated the generalized impact fraction (GIF) in relation to diabetes.

We estimated mean age at diagnosis and age-specific incidence rates (20-49 years, 50-64 years, and  $\geq 65$  years) of CRC during 1992 - 2018 using population-based data from the Surveillance, Epidemiology, and End Results program, by approximate 4-year periods. In parallel, we used data from the National Health and Nutrition Examination Survey to estimate the GIF for CRC related to diabetes, representing the proportion of incident cancers attributable to increases in prevalence of diabetes from 1991-94 to 2017-2018.

From 1992-95 to 2016-18, mean age at diagnosis of CRC decreased from 69.8 to 65.2 years. Age-specific incidence rates of CRC decreased over time for ages 50-64 and  $\geq 65$  years but increased for age 20-49 years. GIF ranged from 0.1% in 1999-2000 to 0.4% in 2017-18 for age 18-49 years and from 0.3% in 1999-2000 to 2.0% in 2017-18 for age  $\geq 65$  years.

GIFs were small (less than 0.5%) for young adults, suggesting diabetes may not have a notable impact on incidence rates of early-onset colorectal cancer. There are likely other mechanisms (e.g., lifestyle factors) contributing to early-onset CRC that warrant further study.

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Poster #051

**Presenter:** Emily Zhang

**Authors:** Emily Zhang, Manasa Narasimman, Nicole E. Rich, Yujin Hoshida, Amit G. Singal

**Title:** HCC Surveillance Improves Early Detection, Curative Treatment Receipt, and Survival in Patients with Cirrhosis: A Systematic Review and Meta-Analysis

**Abstract:**

**Background:** There is controversy regarding the overall value of hepatocellular carcinoma (HCC) surveillance in patients with cirrhosis given a lack of randomized controlled data. To address this issue, we conducted a systematic review and meta-analysis of cohort studies evaluating benefits and harms of HCC surveillance in patients with cirrhosis.

**Methods:** We performed a search of the Medline and EMBASE databases and national meeting abstracts from January 2014 through July 2020 for studies reporting early-stage HCC detection, curative treatment receipt, or overall survival, stratified by HCC surveillance status, among patients with cirrhosis. Pooled risk ratios and hazard ratios, according to HCC surveillance status, were calculated for each outcome using the DerSimonian and Laird method for random effects models.

**Results:** We identified 59 studies with 145,396 patients with HCC, of whom 41,052 (28.2%) were detected by surveillance. HCC surveillance was associated with improved early-stage detection (RR 1.86, 95%CI 1.73 - 1.98; I<sup>2</sup>=82%, p<0.001), curative treatment receipt (RR 1.83, 95%CI 1.69 - 1.97; I<sup>2</sup>=75%, p<0.001), and overall survival (HR 0.67, 95%CI 0.61 - 0.72; I<sup>2</sup>=78%, p<0.001) after adjusting for lead-time bias; however, there was notable heterogeneity in all pooled estimates. Additionally, shorter (semi-annual) surveillance intervals were associated with early detection across nine studies (pooled OR 1.38, 95%CI 1.32 - 1.44, I<sup>2</sup>=84%) as well as greater survival in most of the eleven studies that assessed survival based on surveillance exposure. Four studies examined surveillance-related physical harms due to false positive or indeterminate surveillance results, with no studies quantifying psychological or financial harms. The proportion of patients experiencing surveillance-related physical harms ranged from 8.8% to 27.5% across studies, although most were mild in severity.

**Conclusion:** HCC surveillance is associated with improved early detection, curative treatment receipt, and survival in patients with cirrhosis, although there was heterogeneity in pooled estimates precluding precise point estimates quantifying those benefits. Available data suggest HCC surveillance is of high value in patients with cirrhosis and should be promoted in these patients, particularly given the low proportion of surveillance-detected patients across studies. However, continued rigorous studies evaluating benefits and harms of surveillance are still needed.

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**Presenter:** Caroline Abe

**Authors:** Caroline Abe, MD, MPH; Amanda Stubbs, MD; Alexander Sands, MD; Mridula Nadamuni, MD

**Title:** Secondary syphilis presenting as painful groin ulcers and erythroderma

**Abstract:**

**Case Presentation:** A 30-year-old male with recently diagnosed pulmonary embolism one month prior presented with progressive painful genital ulcers, erythroderma, and polycythemia. Painful genital lesions onset five months prior to presentation, including right groin abscess which had been drained and cauterized at an outside facility. Lesions were serpiginous to circular with sharply demarcated rolled borders and fibrinous bases throughout the genital region. Lesions were also noted in his nares and hairline. Interestingly, he had generalized body erythema, which was nonpruritic and lightly blanchable. Sexual history was significant for one female partner approximately one year prior. Labs were significant for syphilis CIA reactive with quantitative RPR 1:256, HIV negative, hemoglobin 20.1 g/dL, erythropoietin 36.2 mIU/mL (upper limit normal 18.5 mIU/mL). Direct laryngoscopy showed raised erythematous lesions of vocal folds with white coating consistent with syphilitic gumma with superimposed fungal infection. Groin lesion biopsy pathology showed spirochetes on immunohistochemical stain which confirmed the diagnosis of secondary syphilis. Date of onset was unverifiable, thus he initiated treatment for late syphilis with benzathine penicillin G IV 2.4 million units intramuscularly weekly for planned three doses with improvement in his symptoms.

**Discussion:** The differential for acute genital ulcers is broad, including venereal infections, non-venereal infections, and non-infectious causes. Syphilis is classically associated with painless chancre, condyloma lata, and a lacy erythematous maculopapular rash over trunk, palms, and soles. This patient presented atypically with painful genital and nasopharyngeal lesions and generalized erythroderma. The erythrocytosis may reflect a secondary process such as smoking or polycythemia vera rather than a direct result of syphilis, as only a handful of cases have been reported in the literature. Further workup is ongoing.

**Conclusion:** Rising incidence of syphilis in the United States warrants increased clinical suspicion, particularly in the setting of generalized rash. While primary syphilis requires just one dose of penicillin G, secondary syphilis with unknown duration or prior treatment history requires a longer course. Early and adequate treatment prevents sequelae including neurosyphilis, aortic involvement, and sexual transmission.

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Poster #053

**Presenter:** Nathalie Abenzoza

**Authors:** Nathalie Abenzoza, MD

**Title:** All roads lead to electroconvulsive therapy

**Abstract:**

**Introduction:** The most efficacious treatment for unipolar MDD includes antidepressant therapy coupled with psychotherapy. Unfortunately, about 10-30% do not improve with psychotherapy and multiple medication trials while also experiencing functional impairment, poor quality of life, active suicidal ideation and attempts, self-injurious behavior, and a high relapse rate. This is considered treatment resistant depression (TRD) for which electroconvulsive therapy (ECT), esketamine, ketamine, or transcranial magnetic stimulation are indicated.

**Case:** A 41-year-old patient with severe, TRD was admitted with recurrence of active suicidality three days after receiving IV ketamine infusions, which were transiently helpful but ultimately did not have a sustained improvement in her suicidality. During hospitalization, more ketamine infusions were administered in hopes of avoiding ECT. She became acutely suicidal related to psychosocial stressors and the decision was made to move forward with ECT. She was clear about her safety leading up to discharge after making the decision to move forward with ECT.

**Discussion:** ECT is typically the treatment of choice for severe, unipolar TRD. ECT is superior to pharmacotherapy based on meta-analyses of 18 randomized control trials and although the number of treatments vary, most achieve remission with 6-12 treatments. Patients should receive treatments until there is remission of depression, improvement reaches a plateau, or the patient develops limiting adverse effects. Esketamine/ ketamine, on the other hand are meant for short term use and can sometimes cause worsening of depressive symptoms. Multiple meta-analyses of randomized trials consistently demonstrated ketamine/esketamine can rapidly improve depression, including suicidal ideation, for a relatively short period of time and that they are well tolerated. Unfortunately, there isn't enough literature to determine the efficacy of ECT compared to ketamine, but in one study 92% of patients who received ECT achieved remission vs 50% who received ketamine.<sup>2</sup> Patient preference and risk factors guides treatment choice, but despite this patient's avoidance of ECT the patient ultimately received convulsive treatment and saw improvement of their suicidality.

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**Presenter:** Samir Abu-Hamad

**Authors:** Samir Abu-Hamad, MD

**Title:** When Being Antagonistic Is A Good Thing: Using Memantine As Salvage Therapy for Catatonia from NMDA-Receptor Encephalitis

**Abstract:**

**Case Presentation:** A 25-year-old Hispanic male with no significant psychiatric or medical history presented from jail with new-onset manic and psychotic behavior. He was initially held in the psychiatric emergency department where he was continuously agitated, requiring emergent intramuscular antipsychotics and benzodiazepines. He was admitted to the medical floor for tachycardia and decreased responsiveness thought to be due to anticholinergic toxicity. Initial psychiatric evaluation revealed a Bush Francis Catatonia Rating Scale (BFS) of 15/30 which improved to 4/30 after a one-time dose of 2mg intravenous lorazepam; consistent with catatonia. Despite treatment with increasing doses of scheduled lorazepam, his catatonia worsened, with peak BFS of 24/69. Neurologic workup with MRI, EEG, and LP was unrevealing, however scrotal ultrasound detected a 7mm seminoma in the left testicle, making NMDA-Receptor (NMDA-R) Encephalitis from a testicular germinoma the underlying cause of his catatonia. This was confirmed by autoimmune panel from CSF. He received an orchiectomy with Urology, but due to significant ongoing catatonia, he was given a one-time infusion of Rituximab and started on oral Memantine 5 mg daily with reduction in BFS to 10-17. Memantine was later uptitrated to 5 mg twice a day - while lorazepam was weaned down - with continued improvement in catatonia. After stabilization, he was discharged to an inpatient rehabilitation facility.

**Discussion:** About 20-30% of catatonia cases do not respond to treatment with benzodiazepines and alternative treatments are available (Beach 2017). There is growing case series evidence of the use of NMDA antagonists in the treatment of benzodiazepine-resistant catatonia through its direct glutamate antagonism and indirect GABA and dopamine effects. These findings are based on the hypothesis that NMDA hyper-excitability in striatocortical and corticocortical pathways and loss of GABA-A and dopamine in these regions may represent the pathophysiology of benzodiazepine-resistant catatonia (Hervey 2012). However, given its antagonistic activity at the NMDA receptor, memantine should theoretically worsen NMDA-R encephalitis and thus the associated catatonia. This is a unique case that demonstrates memantine's utility and safety profile in cases of NMDA-R encephalitis-induced catatonia through a patient who was falsely assumed to have a primary psychiatric illness due to demographic factors.

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Poster #055

**Presenter:** Muhammad Abu-Rmaileh

**Authors:** Muhammad Abu-Rmaileh, Melanie Holtrop, Andrea Amaro, Niraj Madhani, Roma Mehta

**Title:** Disseminated Strongyloides in an Immunocompromised Patient

**Abstract:**

**Introduction:** Strongyloides stercoralis is a helminth infection most prevalent in hot, humid climates and resource poor countries. Presentation of disseminated disease is variable, but includes dermatitis, diarrhea, colitis, cough, wheezing, hemoptysis, meningitis, or Gram-negative bacteremia. Immunocompetent patients have a less virulent course, but untreated immunocompromised patients have mortality rates approaching 90% (Vadlamudi 2006). Here we present a case of disseminated Strongyloides in a chronically immunosuppressed patient.

**Case:** A 43-year-old female with systemic lupus erythematosus and stage IV chronic kidney disease presented with nausea, vomiting, diarrhea, abdominal pain, cough, tachycardia, and 101.3°F fever. The patient's immunosuppressive regimen included prednisone 40 mg daily, hydroxychloroquine, and cyclophosphamide. Labs were significant for sodium 120, creatinine 4.3, hemoglobin 8.1, and muddy brown casts. CT-abdomen showed presumed colitis, prompting initiation of ciprofloxacin and metronidazole. Her course was complicated by worsening creatinine requiring intermittent hemodialysis, as well as new pancytopenia and eosinophilia (absolute eosinophil count  $836 \times 10^6$  cells/L). As part of an infectious workup, she had a CT-chest which demonstrated a right base lung cavitation. Antibiotics were broadened to aztreonam (severe allergy to beta lactams) with metronidazole. On repeat CT-chest, cavitory lung lesion had improved, but showed new diffuse tree-in-bud infiltrates. A bronchoscopy was performed which demonstrated Strongyloides in the BAL fluid. Stool O&P and serum IgG were positive for Strongyloides (serum IgG 2.1). BAL fluid was also positive for aspergillus with serum 1-3-Beta-D-glucan >500. The patient was treated with ivermectin and voriconazole with immediate improvement of her symptoms.

**Discussion:** Disseminated Strongyloides is a rare disease with variable presentation. Our patient was originally from Central America but had lived in the United States for the past 14 years. As such, her systemic infection likely was due to larvae reactivation from profound medication-induced immunosuppression. Filariform larvae can enter the lungs through hematogenous spread either from skin penetration or intestinal entry (Kassalik 2004). In the lungs, they can cause cavitory lesions (10-15% of pulmonary Strongyloides), asthma, hemoptysis with alveolar hemorrhage (17-45%) and acute respiratory distress syndrome (7-45%) (Mokhlesi et al. 2004). After the larvae move up the respiratory tract, they are swallowed and restart the lifecycle.

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**Poster #056**

**Presenter:** Muhammad Abu-Rmaileh

**Authors:** Muhammad Abu-Rmaileh, Michael Concepcion, Abdul Haseeb, Hao Liu, Jeffrey Penfield, Peter Van Buren, Eleanor Lederer, Swati Lederer

**Title:** Renal Mucormycosis: Unique Presentation and Management

**Abstract:**

**Introduction:** Renal mucormycosis is a rare but often fatal disease. We describe the first case of renal mucormycosis associated with use of empagliflozin, a sodium glucose cotransporter-2 (SGLT2) inhibitor, in a diabetic patient.

**Case:** We present a 63-year-old male with a history of uncontrolled diabetes on empagliflozin, hypertension, and HCV liver cirrhosis presenting to the Emergency Department with left flank pain. CT scan revealed left hydronephrosis with perinephric fat stranding. Urine culture was negative. Creatinine on presentation was 1.7 mg/dl, (baseline creatinine 0.9 mg/dl). The presumptive diagnosis was an obstructing kidney stone; however, repeat CT imaging for ongoing pain revealed emphysematous cystitis and persistent moderate-severe left hydronephrosis with extensive pyelitis. He was started on broad spectrum antibiotics and underwent placement of a left percutaneous nephrostomy (PCN) tube. A repeat urine culture from the left nephrostomy tube grew mold, of uncertain significance. The culture later speciated zygomycetes and he started posaconazole. Repeat imaging was concerning for liquefactive necrosis of the left kidney and an obliterated left ureter. New right-sided hydronephrosis was identified, requiring another PCN tube. Posaconazole was discontinued and liposomal amphotericin was started. He underwent a left nephroureterectomy, partial cystectomy, with removal of both PCN tubes and placement of a right ureteral stent. Final microbiologic diagnosis was invasive mucormycosis. He was treated initially with both amphotericin and posaconazole, followed by posaconazole alone for a planned duration of 6-months.

**Conclusion:** This is the first reported case of renal mucormycosis infection in the setting of SGLT2 Inhibitor use. Patient's risk factors for infection included underlying HCV cirrhosis, uncontrolled diabetes, and SGLT2 inhibitor use. The successful outcome for this case is attributed to the combination of aggressive antifungal therapy and surgery. SGLT2 inhibitors, commonly prescribed for their beneficial effects on cardiovascular and renal outcomes in diabetic patients, are generally well-tolerated but are associated with a risk of UTIs. Although UTIs are most frequently bacterial, providers should be aware of the potential for infection with rare and atypical organisms as was seen in this case, and maintain a high index of suspicion when unexpected culture results are obtained.

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Poster #057

**Presenter:** Areej Ali

**Authors:** Areej Ali, Vasilii Bushunow, Amar Kohli

**Title:** Grave effects from Delays in Care of Thyroid Eye Disease

**Abstract:**

**Case:** A 54 year old man with an extensive smoking history presented for vision loss. His symptoms began nine months ago with watery eyes and a sensation of increased eye pressure. These symptoms were attributed to allergies and he was prescribed an anti-histamine without alleviation. He then reported worsening of vision in his left eye, so his PCP ordered an orbital CT and referred him to Ophthalmology. Due to insurance issues and difficulty scheduling an appointment, he did not re-present until six months after his referral. When seen, he reported a shadow over the center of his left-eye visual field. Visual acuity was 20/30 on the left and 20/25 on the right. Exam was notable for bilateral lid retraction, conjunctival injection, and exophthalmos; 24 mm on right and 29 mm on the left. The left eye exhibited a visual field defect with red desaturation and an afferent pupillary defect. There was no goiter. There was concern for thyroid-associated orbitopathy with left optic nerve compression. He was hospitalized for urgent imaging and treatment. Orbital CT demonstrated asymmetric extraocular muscle enlargement and severe crowding of the left orbital apex. Laboratory testing showed TSH of 7.44 uIU/ml, T4 of 8.0 ug/dl, Free T4 of 1.12 ng/dl, and rT3 of 17 ng/dl. Serology included negative thyroglobulin antibody, positive thyroid peroxidase antibody at 17 IU/ml, positive TSH receptor antibody at 24.6%, and positive thyroid stimulating immunoglobulin (TSI) at 450% baseline. Thyroid ultrasound showed normal gland size without nodules.

The patient was treated with 3 days of intravenous steroids with drastic improvement in vision. He was counseled on smoking cessation, started on levothyroxine, and discharged with planned follow-up with Ophthalmology and Endocrinology. He underwent a total thyroidectomy one month later. Ocular testing after surgery showed full visual fields with acuity 20/25 on the left and 20/20 on the right.

**Impact/Discussion:** Graves' orbitopathy, also known as thyroid eye disease (TED), is an autoimmune disease of orbital and pre-orbital tissue. It most commonly occurs with hyperthyroidism. TSI mimics TSH by binding to thyroid hormone receptors, leading to increased thyroid hormone production. Increased thyroid receptor activation, along with

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**Presenter:** Bilal Ashraf

**Authors:** Bilal Ashraf, MD, Neeraj Kalra, MD, Ibrahim Ibrahim, MD

**Title:** Antibody and Inhibitor Negative TTP Presenting with Stroke

**Abstract:**

**Case Presentation:** An 85-year-old woman with a history of hypertension, hypothyroidism, multiple lacunar infarcts, and dementia presented for evaluation of confusion, generalized weakness, fatigue, and thrombocytopenia. She was found to have right hand weakness on exam. Laboratory examination revealed hemoglobin of 13.9 g/dL, platelet count of 12,000 /uL, lactate dehydrogenase of 290 units/L, and haptoglobin of 8 mg/dL. Complete metabolic panel, vitamin B12, Coombs test, and coagulation studies were normal. MRI brain revealed multifocal acute and chronic infarcts of multiple vascular territories, involving both anterior and posterior circulations. Echocardiogram and CTA of the head and neck were unremarkable.

The multifocal nature of infarcts with thrombocytopenia and hemolysis raised the suspicion for thrombotic microangiopathy, specifically thrombotic thrombocytopenic purpura (TTP). Peripheral smear revealed thrombocytopenia with large platelets and one schistocyte per high powered field. Prednisone was empirically started at 1 mg/kg. ADAMSTS13 activity resulted at <1%. She received 7 days of plasma exchange (PLEX) and caplacizumab until platelet count improved to 133 platelets/uL, and ADAMSTS13 activity improved to 50%. She was discharged on a prednisone taper. Her ADAMSTS13 antibody and inhibitor testing thereafter resulted negative. Given the negative ADAMSTS13 inhibitor, congenital TTP was entertained. However, her outpatient ADAMSTS13 activity level resulted with a persistent normal activity of 59%, indicating acquired autoimmune TTP with good response to steroids, PLEX, and caplacizumab. Ultimately, ADAMTS3 genetic analysis was negative.

**Discussion:** Neurologic manifestations of TTP are broad, ranging from nonspecific headache and confusion to seizure, stroke, and coma. The median age of incidence in acquired TTP is typically reported in the fourth decade of life. In older patients with cardiovascular comorbidities, TTP can be confused for acute embolic stroke. TTP is an important differential diagnosis, especially when stroke presents in the setting of thrombocytopenia or in a multifocal fashion. A low ADAMSTS13 activity level of <10% is highly suggestive of TTP. Rarely, patients present with minimal schistocytes on smear. Nearly all cases of acquired TTP are associated with an antibody or an inhibitor. In select cases, the antibody and inhibitor is negative. False-negatives present secondary to low-antibody titers or tightly bound antigen-antibody complexes.

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Poster #059

**Presenter:** Naveen Balakrishnan

**Authors:** Naveen Balakrishnan, MD; Emily Zhang, MD; Spencer Carter, MD; Faris Araj, MD

**Title:** Use of the Popliteal Vein for Dialysis and Plasmapheresis in a Prone Cardiac Transplant Recipient with Severe COVID 19 Infection

**Abstract:**

**Case Presentation:** SB is a 54-year-old male with a history of cardiac transplant and morbid obesity (BMI 40 kg/m<sup>2</sup>) who presented with acute hypoxic respiratory failure secondary to severe COVID-19 pneumonia. Despite prompt treatment with steroids, remdesivir, baricitinib, and non-invasive positive pressure ventilation, he progressed to invasive mechanical ventilation. Prone positioning was required to maintain oxygenation, and a Rotaprone bed was used given his body habitus. Oliguric renal failure ensued requiring urgent renal replacement therapy (RRT). Additionally, given the non-response to above treatments and the possible benefit of reducing cytokine burden in severe COVID-19 infection, plasmapheresis was also considered.<sup>1</sup> However, his intolerance of supination (desaturation to 50% within one minute) and restrictions in central venous access sites (bilateral internal jugular, subclavian, and femoral sites were restricted by the Rotaprone bedframe or the prone position) meant alternate venous access was needed. Case reports had described use of the popliteal vein for dialysis catheter placement in a prone patient with COVID-19.<sup>2,3</sup> After a brief review of the technique<sup>3</sup> the patient was placed in the reverse Trendelenburg position to engorge the popliteal vein, and access was obtained using the modified Seldinger technique under ultrasound guidance. A 14Fr, 25cm dialysis catheter was placed without apparent complications and RRT with concurrent plasmapheresis was initiated and continued for ~72 hours achieving normal flows with no circuit alarms or clotting.

**Discussion:** COVID-19 has increased the rate of ARDS (20-41%) in ICUs around the country requiring a significantly higher rate of pronation<sup>4</sup>. Unfortunately, The mortality rate of cardiac transplant recipients infected with COVID-19 approaches 30%.<sup>5</sup> Furthermore, up to 8.7% of hospitalized patients and 26.2% of ICU patients with COVID-19 require RRT.<sup>6</sup> The limitations imposed by the prone position, especially when a Rotaprone bed is used results in substantial challenges to venous access when RRT or plasmapheresis is needed. In these cases the popliteal vein presents a viable alternate central access site. To our knowledge this is the first report describing the use of popliteal vein access for both RRT and plasmapheresis in a cardiac transplant recipient with severe COVID-19 infection.

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**Presenter:** Armando Cardenaso

**Authors:** Armando Cardenas, MD; Jeffrey Huang, MS; Ramesh Saxena, MD, PhD

**Title:** Podocytopathy after COVID-19 Vaccine Administration in a Patient with Autosomal Dominant Polycystic Kidney Disease

**Abstract:**

**Case:** 40-year-old male with history of chronic kidney disease (CKD) stage-3 due to ADPKD diagnosed 20 years ago. His baseline serum creatinine 2-2.5 mg/dl and has minimal proteinuria. Other comorbidities include well-controlled 2 diabetes mellitus and hypertension. He received his two doses of Covid-19 vaccine on February 25th and March 24th, 2021. He had a malaise, myalgia, and fatigue after the vaccination. On routine testing in April 2021, had was noted to have 3+ proteinuria on dipstick but no quantification was done. In May of 2021 patient presented to an outside institution with heart failure with ejection fraction of 39% in association with acute coronary syndrome due to ST elevation myocardial infarction, underwent placement of a drug-eluting stent in the left anterior descending coronary artery and placement on dual antiplatelet therapy (DAPT). He had 3+ protein on dipstick. In June 2021 developed abdominal pain with hematuria which was attributed to cyst-hemorrhage. He underwent decortication of Left Renal cyst to mitigate bleeding. However, the patient continued having gross hematuria requiring multiple blood transfusions and cessation of DAPT. Patient was admitted to the UTSW in September 2021 for a second opinion and was noted to have nephrotic syndrome with proteinuria of 3925 mg, low serum albumin of 2.0 g/dL and pedal edema concerning for podocytopathy associated with COVID-19 vaccine. Kidney biopsy was deferred because of active bleeding. Patient was empirically started on Prednisone 60mg with rapid taper. Upon discharge 12 days later, his proteinuria was down to 0.6 g/g of creatinine, serum albumin 3.2 g/dL and hematuria resolved. On his last follow up in Feb. 2022, his proteinuria was 0.3 g/g, serum albumin 3.6 g/dL and serum creatinine 2.67 mg/dl.

**Discussion:** Development of vaccines against severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) pandemic has resulted in considerable reduction in severe complications and mortality. While vaccines are considered safe and associated with common side effects, several cases of glomerular disease have been recently reported such as Minimal Change disease and Focal Segmental Glomerulosclerosis. We described a patient with autosomal dominant polycystic kidney disease (ADPKD) who developed nephrotic syndrome, soon after receiving COVID-19 vaccine.

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Poster #061

**Presenter:** Yusuf Chao

**Authors:** Yusuf Chao, MD; Paige L. McKenzie, BS; Sapna Pathak, MD; Salahuddin Kazi, MD

**Title:** Azathioprine-induced hypersensitivity reaction mimicking sepsis in a patient with systemic lupus erythematosus

**Abstract:**

**Case Presentation:** A 21-year-old woman with a history of systemic lupus erythematosus (SLE) presented to the emergency department with acute-onset nausea, vomiting, and fevers. Two weeks prior, she was started on azathioprine 50 mg daily by her outpatient rheumatologist for treatment of active SLE; the dose was up-titrated to 100 mg when repeat bloodwork showed no drug toxicity. The morning after increasing her dose, she was awoken by recurrent emesis. On arrival to the emergency department, she had a fever to 39.5 degrees Celsius, heart rate of 150 beats/minute, and blood pressure of 88/40 mmHg. Her exam was only notable for bilateral eyelid edema and mild, generalized abdominal tenderness. Lab work demonstrated WBC 9.3 K/uL, creatinine 0.59 mg/dL (baseline 0.4), AST 89 IU/L, ALT 71 IU/L, CRP 3.7 mg/dL, ESR 82 mm/hr, stable hypocomplementemia (C3 57, C4 14 mg/dL), and urinalysis with 8 WBCs but no bacteria. Chest x-ray and CT abdomen/pelvis were unrevealing. She was given IV fluids and broad-spectrum antibiotics, azathioprine was held, and IV hydrocortisone (at a dose roughly equivalent to her home prednisone 15 mg) was started. Infectious workup, including blood and urine cultures, respiratory viral panel, and hepatitis B/C serologies, was negative. A lupus flare was considered but deemed an unlikely explanation of her systemic inflammatory response syndrome (SIRS). With azathioprine discontinuation, she made a rapid, near-complete recovery within 24 hours of admission, suggesting a diagnosis of azathioprine hypersensitivity syndrome.

**Discussion:** Azathioprine hypersensitivity syndrome is a rare, life-threatening side effect of azathioprine; unlike azathioprine toxicity, hypersensitivity reactions are neither dose-dependent nor predicted by thiopurine methyltransferase (TPMT) activity. Patients commonly present within 2-4 weeks of azathioprine initiation with fever, rigors, and gastrointestinal symptoms that can mimic sepsis. Timing of presentation is key to diagnosis, and azathioprine hypersensitivity was considered early on in our patient given the temporal relationship between drug initiation and symptom onset. This case exemplifies the potential difficulty in distinguishing azathioprine hypersensitivity from mimickers such as infection and flare of underlying autoimmune disease. Prompt recognition of hypersensitivity can lead to appropriate discontinuation of the drug and prevent future morbidity.

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**Presenter:** Nivan Chowattukunnel

**Authors:** Nivan Chowattukunnel, MD; Farrukh Awan, MD

**Title:** Idiopathic Multicentric Castleman Disease with TAFRO Syndrome

**Abstract:**

**Case Presentation:** A 29 year-old female with no significant PMH presented with worsening abdominal swelling and lower extremity edema for 1 month. She also noted RUQ pain, decreased UOP, fatigue, and occasional N/V for a few weeks. Exam showed 3+ lower extremity pitting edema, abdominal striae with generalized tenderness, splenomegaly, and asterixis. Labs were significant for Cr 5.94 (unknown baseline), K 5.7, Na 128, WBC 7.23, hgb 10.2, platelets 189, CRP 263.2, BNP 260, and IL-6 14.3 (elevated). Imaging revealed bilateral pleural effusions, ascites, and axillary, mediastinal, retroperitoneal, and bilateral inguinal lymphadenopathy. Due to symptomatic renal failure, she required initiation of dialysis. She underwent R axillary excisional lymph node biopsy that showed reactive features and extension by polytypic plasma cells and small blood vessels, concerning for Multicentric Castleman disease. Infectious workup, including HIV and HHV-8, was negative. She was started on high-dose steroids and weekly Siltuximab. Concurrent Rituximab was initiated due to disease severity. She quickly experienced significant improvement in her symptoms and eventually had renal recovery.

**Discussion:** We present a case of idiopathic Multicentric Castleman's disease (iMCD) with TAFRO syndrome, a rare variant of iMCD that involves thrombocytopenia, anasarca, fever, reticulin fibrosis, and organomegaly. In 2010, a Japanese case series described 3 patients with iMCD and this constellation of symptoms and coined the term TAFRO syndrome. While the incidence of iMCD is ~1000 cases annually in the US, the incidence of TAFRO syndrome is unknown; the literature is limited to a few dozen case reports. Treatment for iMCD depends on the etiology and disease severity. While HHV-8 associated MCD has been shown to respond well to Rituximab, anti-IL6 therapies, such as Siltuximab and Tocilizumab, in combination with high dose steroids are considered first-line for iMCD with TAFRO syndrome. If response is poor with initial therapies, systemic chemotherapy can be considered. This vignette illustrates a severe case of iMCD with TAFRO syndrome with excellent response to treatment with both Siltuximab and Rituximab in addition to steroids. This combination of therapy may represent a superior treatment option for patients with severe symptoms.

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Poster #063

**Presenter:** Heather Dalton

**Authors:** Heather Dalton, MD

**Title:** The Burdens Facing Caregivers of Adolescents with Medical Complexity in their Transition to the Adult Healthcare System

**Abstract:**

**Case Presentation:** A 20-year-old male with medical complexity from cerebral palsy following a near-drowning event, consisting of chronic lung disease with nightly BiPAP dependence, dysphagia with G-J tube dependence, seizure disorder, spastic tetraplegia, and severe scoliosis requiring continuous halo traction presents to the Emergency Room with G-J tube dislodgement. His sister who is his primary caretaker is with him at bedside and they are laughing playfully to his favorite Disney movie. He has been cared for in his sister's home with concurrent hospice and home health services via the Concurrent Care for Children Requirement of the Patient Protection and Affordable Care Act; however, in the presence of his approaching twenty-first birthday, his sister is having to transition between hospital systems and choose between home health and hospice due to the differences in hospice legislature for adults. She expresses frustration with the transition, including a lack of understanding regarding the needs of medically complex young adults and the lack of ownership by the healthcare system in their care transition. During his hospitalization, his sister further expresses fear for the lack of advanced care planning data that is shared between facilities after her brother nearly undergoes a "Code Blue" in an adult-based hospital, despite having extensive discussions and documentation regarding their desire for Do Not Resuscitate orders. She feels abandoned and as though the hospital is "trying to kill" her brother. She furthermore shares the sadness and challenges in making the best decision for their family, ultimately choosing to transition to a skilled nursing facility with hospice services due to the significant decrease in at-home support available for pediatric patients transitioning into adulthood. Her brother ultimately dies two months after his move to the facility from acute hypoxic respiratory failure.

**Discussion:** Medically complex young adults transitioning from the pediatric into the adult healthcare system are a growing population. They present to new healthcare systems with multiple levels of medical technology, high caregiver burden, and a decrease in available resources. This vulnerable patient population and their caregivers experience innumerable roadblocks and deserve a widespread revamp of how we approach care transitions.

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**Presenter:** Andrew Fuller

**Authors:** Andrew Fuller, MD; Joshua B. Immergluck, MD; Mark Pedersen, MD

**Title:** Wilson Disease Mimicking as Autoimmune Hepatitis

**Abstract:**

**Case Presentation:** A 38-year-old male presented to the University of Texas Southwestern Medical Center for a liver transplant evaluation for decompensated autoimmune hepatitis (AIH) cirrhosis. He was diagnosed at an outside facility with AIH cirrhosis 20 months prior after admission for ascites and jaundice. Work up at that time revealed serologies (including positive smooth muscle antibody, elevated serum IgG levels) and liver biopsy with a lymphoplasmacytic interface hepatitis consistent with AIH. He was started on prednisone and azathioprine. His ascites improved with diuretics but liver chemistries showed persistent hyperbilirubinemia and coagulopathy resulting in his listing for transplant at an outside facility. He eventually moved to Texas for increased family support, and over this period, developed shaky handwriting, dysarthria, dependence in ADLs, and inability to walk. On our exam he had slowed and muffled speech, was delayed in following commands, had profoundly limited movement of his extremities with significant rigidity, had a resting tremor in both hands, and a high frequency tremor with arm movements. MRI of the brain showed intrinsic T1 shortening in the bilateral basal ganglia concerning for heavy metal deposition. His parkinsonian-like exam and MRI findings prompted concern for Wilson Disease (WD). Work-up revealed Keyser Fleisher rings bilaterally, low serum ceruloplasmin (10.4), and elevated 24-hour urinary copper (167 mcg, uln 71 mcg) with a confirmatory pathogenic mutation of the ATP7B gene. He was diagnosed with WD and started on zinc sulfate and chelator therapy with trientine.

**Discussion:** Wilson Disease is a rare autosomal recessive disorder caused by a variety of mutations in the ATP7B gene that leads to a defective copper-transporting ATPase, limiting the ability of the hepatocyte to incorporate copper into ceruloplasmin or excrete it into bile. Progressive copper overload through a patient's life leads to hepatocellular damage and cirrhosis, as well as neuropsychiatric symptoms and hemolytic anemia. WD is known to mimic other liver diseases and can closely resemble AIH in pediatric patients on both liver biopsy and serological testing. Our patient's case illustrates the importance of evaluating for WD even in older patients with AIH who do not improve on immunosuppression.

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Poster #065

**Presenter:** Michelle Ghebranious/ Joad Eseddi

**Authors:** Michelle Ghebranious,MD; Joad Eseddi, MD; Haidy Galous, MD

**Title:** A 48-year-old Woman with Sjogren's Syndrome and a New Diagnosis of Evans Syndrome

**Abstract:**

**Case Presentation:** A 48-year-old woman with a history of primary Sjogren's syndrome (SS), uterine fibroids and obesity was admitted for urgent evaluation of acute thrombocytopenia noted on routine laboratory studies at her rheumatology visit. She was diagnosed with SS two years prior with a positive ANA (1:640, speckled pattern), SSA, SSB, and sicca symptoms. Her complete blood count was within normal limits for ten years prior, including six months before presentation. On admission, she noted one year of easy bruising, along with heavier menses. She denied newly prescribed medications. Vitals were within normal limits. Physical exam revealed scattered ecchymoses over bilateral upper and lower extremities. Laboratory testing showed normocytic anemia (Hb 10.4 g/dL), severe thrombocytopenia (platelets  $9 \times 10^3/\mu\text{L}$ ), haptoglobin  $<5 \text{ mg/dL}$ , and LDH 257 U/L. Peripheral smear demonstrated scattered spherocytes and decreased platelet count, without clumping. Direct antiglobulin testing was positive and eluate testing revealed warm autoantibodies. Notable negative studies included dsDNA antibody, smith antibody, rheumatoid factor, CCP, HIV, Hepatitis serologies, and an unremarkable abdominal ultrasound. She was diagnosed with Evans Syndrome (ES) secondary to SS. She received Dexamethasone 40 mg daily for four days concurrent with two days of IVIG 95 g with marked improvement in her thrombocytopenia ( $91 \times 10^3/\mu\text{L}$ ) by the end of the treatment course. Her platelet count normalized within four weeks ( $284 \times 10^3/\mu\text{L}$ ) followed by her hemoglobin (11.5 g/dL) at six weeks post-diagnosis. She was continued on a prednisone taper with close outpatient follow-up.

**Discussion:** Evans syndrome is a rare disease characterized by the development of autoimmune hemolytic anemia with immune thrombocytopenia, and less frequently autoimmune neutropenia. The association of ES with other diseases, including hematological malignancies, primary immunodeficiencies, and autoimmune diseases can affect prognosis and management options. Isolated immune cytopenias have been reported with Sjogren's syndrome in the past, but the association with Evans syndrome has rarely been reported. For this reason, it is imperative to consider a diagnosis of ES in SS patients presenting with hematological manifestations as proper and rapid identification of ES can lead to appropriate therapy selection, improvement in hematological function, and a rapid recovery.

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**Presenter:** Christian Gomez

**Authors:** Christian Gomez, MD; Jorge Soria, MD; Luis Arroyo, PA-S; Roger Bedimo, MD

**Title:** A case of Disseminated Histoplasmosis in a patient on chronic Infliximab

**Abstract:**

**Case Presentation:** A 73-year-old male with history of rheumatoid arthritis on Infliximab therapy for >10 years, long-standing smoking and COPD, presented with 5 weeks of sore throat, dysphagia, odynophagia, and a 23lb weight loss. He was referred to ENT after failing outpatient antibiotic therapy. A laryngoscopy demonstrated an ulcerative irregular lesion in the left false vocal cord concerning for malignancy. Two consecutive biopsies showed chronic inflammation of the squamous mucosa with non-caseating granulomas, and absence of neoplastic cells. A CT chest was obtained for additional work-up and revealed a 2 cm mass-like consolidation in the right upper lobe and incidental bilateral adrenal masses (up to 3.5 cm). ID consultation was sought, and suggestion made to rule out histoplasmosis. Subsequently, he required hospital admission for worsening symptoms and dehydration. Due to persistent hypotension and hyponatremia, a presumptive diagnosis of primary adrenal insufficiency was made, and later confirmed with a low morning cortisol level of 2 mcg/dL (Ref: 5-25) and high ACTH 181 pg/ml (Ref 10-60). During this encounter, the fungal culture from the left false vocal cord biopsy resulted positive for *Histoplasma capsulatum*. A serum *Histoplasma* antigen was positive (4.76 ng/mL). Later, he underwent a lung biopsy that reported patchy non caseating granulomatous inflammation with negative stains for fungal and acid-fast microorganisms. Fungal cultures were negative. A diagnosis of disseminated histoplasmosis with adrenal involvement was made. The patient was started on liposomal amphotericin B with good clinical response after 1 week, and then switched to oral isavuconazole.

**Discussion:** TNF-alpha blockers such as infliximab have become widely used in the management of rheumatoid arthritis given their efficacy and relative safe profile. However, the resulting immunosuppression (impaired macrophage activation) may put patients at increased risk of developing serious opportunistic infections, including mycobacterial and fungal infections. Histoplasmosis is the most common endemic mycosis and is present ubiquitously in the environment. Extrapulmonary site infection involving the pharynx and larynx is a rare manifestation and can mimic malignancy. Adrenal insufficiency is not an uncommon complication of disseminated disease. This case highlights the importance of education of patients about the risk of acquiring opportunistic infections when receiving TNF-alpha blockers.

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Poster #067

**Presenter:** Ghazi Khan

**Authors:** Ghazi Khan, MD; John Giacona, PA-C; Sasan Mirfakhraee, MD; Steven Vernino, MD; Wanpen Vongpatanasin, MD

**Title:** MEN2B presenting as Postural Tachycardia Syndrome

**Abstract:**

**Case Presentation:** A 29-year-old female seen at UTSW Hypertension Clinic for labile hypertension, complained of intermittent nausea, diaphoresis, and light-headedness ongoing for 9 years prior to her visit. Previous evaluation at an outside medical facility informed the patient that she had POTS with an elevated plasma norepinephrine level. Given elevated home BP with diaphoresis and pallor she underwent repeat tilt table testing. Results showed tachycardia with HR increased by 37 bpm after 3 minutes of head-up tilt at 70 degrees and also showed orthostatic hypotension. Because orthostatic hypotension and episodic hypertension is unusual for POTS, 24-hour urinary metanephrines and catecholamines were obtained and were markedly elevated. Physical examination revealed normal BP and BMI. She was noted to have mucosal wall neuromas and firm palpable thyroid nodules bilaterally. Extremities were notable for hypermobility of her fingers which were long and slender. The rest of her examination was unremarkable. Imaging including CT of the abdomen and [68Ga]-DOTATATE PET-CT were consistent with bilateral pheochromocytomas and medullary thyroid carcinoma (MTC). Genetic testing confirmed RET codon 918 mutation consistent with a diagnosis of MEN2B. The patient was started on alpha-adrenergic receptor blockade with doxazosin, which was up-titrated to maximal-tolerated dose. After two weeks of alpha blockade, metoprolol was added to maintain the patient's seated HR <70 bpm. She subsequently underwent bilateral laparoscopic adrenalectomy, with surgical histopathology confirming bilateral pheochromocytomas. She was initiated on glucocorticoid and mineralocorticoid replacement with a plan for total thyroidectomy for her MTC in the near future.

**Discussion:** MEN2B is an extremely rare genetic disorder stemming from mutations in the RET proto-oncogene on chromosome-10. Exact incidence is unknown, but is estimated at 4 per 100 million per year. MEN2B should be suspected in young patients (<35 years of age) with classical features defined by signs and symptoms of pheochromocytoma, marfanoid body habitus, mucosal neuromas in the oral cavity, or intestinal ganglioneuromas. Diagnosis is based on these distinctive findings and the RET mutation or autosomal dominant familial inheritance of MEN2B. MEN2B results in pheochromocytoma in nearly 50% of patients and MTC in nearly all patients, with thyroidectomy performed in affected individuals.

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**Presenter:** Mir Lim

**Authors:** Mir Lim, MD; Emily Zhang, MD; Nick Hendren, MD; Robert Morlend, MD; Maryjane Farr, MD

**Title:** Fulminant Epstein-Barr infection early after heart re-transplantation

**Abstract:**

**Case Presentation:** A 23-year-old female with history of congenital heart disease and a heart re-transplant (2007, 2021), presented with diarrhea, abdominal pain, fatigue, and poor intake for several days. Upon admission, her EBV viral load by PCR was 22,225 copies/mL. She was profoundly thrombocytopenic (platelet count 19,000) and anemic (Hgb 7.4). Direct Coombs test was positive. CT abdomen/pelvis identified new hepatosplenomegaly and axillary/mediastinal lymphadenopathy concerning for post-transplant lymphoproliferative disease (PTLD). A bone marrow biopsy was negative for abnormal lymphoid aggregates. A core lymph node biopsy showed EBV cells but was negative for malignancy. Her platelet count continued to drop to 6,000. Due to concern for a hemolytic process from EBV, she received intravenous immune globulin (IVIG) and pulse steroids with slight improvement in her platelet counts. She was then initiated on weekly rituximab infusion therapy for fulminant EBV infection. After two doses of rituximab, the patient clinically improved with decreased splenic pain. Her EBV viral load decreased to 114 copies/mL and platelet count gradually improved to 31,000 upon discharge. On her most recent outpatient follow-up, her platelet count was found to be 87,000. A Karius test that was sent early in admission returned showing evidence of *Bartonella henselae* infection, and the patient was treated with a course of antibiotics. It is uncertain the contributions of the *Bartonella* to the clinical picture.

**Discussion:** Severe EBV viremia in an immunocompromised patient may cause life-threatening cytopenias, especially thrombocytopenia. The mechanism of thrombocytopenia in the setting of EBV infection is not entirely clear, but several reports suggest that it is related to activation of a viral-induced autoimmune response that leads to formation of antibodies targeting platelet glycoproteins. This case of worsening thrombocytopenia and axillary/mediastinal lymphadenopathy was initially concerning for PTLD. However, the life-threatening thrombocytopenia seen in our patient was later found to be secondary to EBV viremia. Evans syndrome, which is a rare autoimmune disorder defined by Coombs-positive hemolytic anemia and thrombocytopenia, may explain this patient's presentation. Treatment for Evans syndrome includes corticosteroids, IVIG, and rituximab. Our patient's case highlights the importance of considering EBV infection in a patient presenting with acute thrombocytopenia.

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Poster #069

**Presenter:** Paola Lockhart-Pastor

**Authors:** Paola Lockhart Pastor, MD

**Title:** Pearls of a Rare Paraneoplastic Syndrome.

**Abstract:**

**Introduction:** Tumor-induced osteomalacia (TIO), also known as oncogenic osteomalacia, is a rare acquired paraneoplastic syndrome in which the biochemical and bone mineralization abnormalities closely resemble those in genetic forms of hypophosphatemic rickets. Clinical and experimental studies have documented that tumors produce humoral factor(s) that underlie the abnormalities that occur in TIO. The tumors, typically benign, often are small, slow-growing polymorphous neoplasms, most commonly, phosphaturic mesenchymal tumors of the mixed connective tissue type. Disease progress can be slow and insidious, mimicking other rheumatological, neurological, or endocrine disorders, and thus correct diagnosis can be delayed for years or missed altogether.

**Case Report:** A 62-year-old male with past medical history of hypertension, osteoporosis, chronic muscle wasting, weight loss and tongue swelling was referred to the emergency department from neurology clinic for further work up. Patient reported muscle wasting, decreased muscle strength over the past 5 years making him wheelchair-bound. Three weeks before presentation, the patient developed increased tongue swelling causing slurred speech and limiting his ability to swallow. He also reported muscle cramps and weight loss of about 110 pounds since 2015. The patient was evaluated by neurology and underwent electromyography (EMG) with no clear neuromuscular cause of symptoms. On physical exam he appeared cachectic, with asymmetric thickening of the tongue with limited mobility and diffuse weakness in upper and lower extremities. As part of the work up, patient underwent CT head which was remarkable for 5.5 cm suprasellar mass eroding the left mastoid, cloves, bilateral sphenoid sinuses, with mass effect on the posterior left orbit/medial rectus muscle, the mass eroded portions of the left petrous ICA canal. CT Chest showed multiple bilateral rib fractures of various stages of healing. CT abdomen/pelvis demonstrated few scattered indeterminate focal hepatic lesions measuring up to 1.0 cm, too small to definitively characterize, 1.6 cm solid-appearing right renal mass, nonspecific diffusely abnormal texture of the bones, including lytic/lucent areas in the iliac wings. Biochemical work up was remarkable for phosphorus level 0.7 mmol/dl; 25 OH vitamin D 12.1 ng/ml; 1,25 vitamin D 15.5 ng/ml; PTH 119.8 pg/mL; magnesium 1.8 mg/dl; pituitary hormonal panel was overall within normal range.

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**Presenter:** Charlotte McLean

**Authors:** Charlotte McLean

**Title:** Wernicke Encephalopathy in Altered Mental Status

**Abstract:**

**Case Presentation:** 48-year-old female, with hypertension, anxiety, previous suicide attempt via medication overdose, and drug/alcohol abuse, presented via EMS for altered mental status. EMS noted multiple unknown pills and empty bottles of alcohol around her. Work up revealed negative urine toxicology, unremarkable CMP, undetectable acetaminophen, salicylate, and ethanol levels. Urine analysis was notable for 29 white blood cells and bacteria. Lactate was 5.8. Physical exam revealed lack of lower extremities reflexes and stuporous mentation. Etiology of her AMS was felt to be due to drug overdose vs. alcohol withdrawal vs. urinary tract infection (UTI). Patient was treated with scheduled Librium taper for alcohol withdrawal and ceftriaxone for her UTI. She also received high dose thiamine given alcohol abuse. Shortly after she was able to interact with hospital staff, but most interactions were nonsensical. Once her high dose thiamine was lowered she became somnolent and was only responsive to noxious stimuli. Furthermore, ophthalmoplegia was noted, and it was felt that her nonsensical interactions may have been confabulation. Wernicke's encephalopathy unified all her symptoms and matched the time course of her worsening symptoms. She was restarted on high dose thiamine with subsequent improvement of symptoms; however, she never returned to her previous cognitive baseline.

**Discussion:** Wernicke's encephalopathy consists of a clinical triad of ophthalmoparesis with nystagmus, ataxia, and confusion. It is caused by thiamine deficiency affecting the nervous system, as thiamine deficiency inhibits metabolism in brain regions with high metabolic requirements causing neuronal injury. Thiamine deficiency can also lead to elevated lactate. It is sometimes seen in patients with chronic alcoholism, anorexia nervosa, or any other prolonged periods of fasting or starvation. While thiamine deficiency is classically associated with Wernicke's triad, all three features are present in only 17% of cases. The absence of triad features leads to the underdiagnosis of Wernicke's. The diagnosis of Wernicke's was delayed in this patient due to anchoring that this was substance induced delirium and by underestimating the extent of her thiamine deficiency. It is therefore crucial to have Wernicke's encephalopathy on the differential for anyone with a known history of alcohol abuse.

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Poster #071

**Presenter:** Denisse Mendez-Romero

**Authors:** Denisse Mendez-Romero, MD, MPH Mukaila Raji, MD Dale Okorodudu, MD

**Title:** A rare case of transudative chylothorax due to upper extremity deep vein thrombosis

**Abstract:**

**Case Presentation:** An 88-year-old man presented to our hospital with anasarca, shortness of breath and dry cough. He had a history of atrial fibrillation, heart failure with preserved ejection fraction, severe tricuspid regurgitation and chronic kidney disease. He was treated for heart failure exacerbation with a continuous furosemide infusion. Despite diuresis, his shortness of breath and cough persisted, and non-contrast chest CT showed a large left pleural effusion with near complete collapse of the left lower lobe. The patient underwent thoracentesis and pleural fluid studies were notable for WBC 825, Lymphocyte 60%, Monocyte 33%, Neutrophil 7%, RBC 24,800, pH 7.38, no glucose, AFB negative, gram stain negative, pleural LDH 119/ serum LDH 174, pleural total protein 3.6/ serum total protein 7.0 and cytology without evidence of malignancy. Over the next days, the patient continued on aggressive intravenous diuresis. However, his symptoms failed to improve and chest x-ray revealed reaccumulation of the left pleural effusion. A repeat thoracentesis was performed and showed a transudative chylothorax: pleural LDH 110/ serum LDH 216, pleural total protein 3.3/ serum total protein 7.0, pleural triglycerides 390, pleural cholesterol 34, pleural glucose 128, pleural adenosine deaminase 6.2 and pathology without evidence of malignancy. At this time, the patient's anasarca had improved with the exception of left upper extremity edema. A doppler ultrasound revealed a nearly occlusive thrombus in the left internal jugular vein and left subclavian vein. Given all prior unremarkable work-up, the most likely etiology for his pleural effusion was felt to be a chylothorax caused by a deep vein thrombus (DVT) at the left internal jugular and subclavian vein junction impeding drainage of chyle. He was started on a therapeutic dose of apixaban and his symptoms remained stable.

**Discussion:** Our case of DVT-associated chylothorax in an octogenarian in non-trauma setting highlights the need to broaden our index of suspicion not just for cancer, trauma and surgical causes, but also to consider the role of thromboembolism as a contributor to thoracic duct dysfunction and subsequent chylothorax. This consideration is especially important in the geriatric population with multiple co-occurring conditions and decreased mobility.

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**Presenter:** Danh Nguyen

**Authors:** Danh Nguyen, MD; Vicente Morales Oyarvide, MD, MPH; Ramya Krothapally, MD; Athena Huang, MD; Chalapathi Rao Medavarapu, MD; Peter Gerhard Christoph Zechner, MD; Laila Castellino, MBBS; Netanya Utay, MD; Satyam Sarma, MD

**Title:** Disseminated histoplasmosis presenting as symptomatic hypercalcemia in a patient without immunocompromise

**Abstract:**

**Case Presentation:** A 66-year-old man with T2DM, CAD s/p CABG, HFREF (EF 30%), complete heart block s/p pacemaker, AS s/p AVR, and CKD 3a presented with one month of fatigue and malaise associated with weight loss, night sweats, fevers, exertional dyspnea, urinary frequency, and dysuria. He was hypotensive and tachycardic on admission. Initial assessment revealed acute kidney injury (creatinine 3.8 mg/dL), anion-gap metabolic acidosis (venous pH 7.41, anion-gap 19 mmol/L), hypercalcemia (ionized calcium 7.1 mg/dL, normal 4.6-5.4 mg/dL), anemia, thrombocytopenia, and yeast on urinalysis. Chest CT showed diffuse upper lobe micronodules bilaterally. We treated empirically for septic shock and pneumonia with vancomycin, cefepime, azithromycin and intravenous fluids. Bacterial blood cultures and HIV tests were negative. Transthoracic and transesophageal echocardiograms showed no vegetations. Hospital course was complicated by acute encephalopathy in the setting of persistent hypercalcemia (ionized calcium 7.5 mg/dL) and respiratory distress. Continuous intravenous fluids and calcitonin were initiated as temporizing measures; bisphosphonates were held until kidney function improved. Further workup of hypercalcemia was notable for PTH 8.0 pg/mL (15.0-65.0 pg/mL), calcitriol 88.7 pg/mL (19.9-79.3 pg/mL), and PTHrP <2.0 pmol/L (0.0-2.3 pmol/L). An extensive fungal workup demonstrated elevated 1,3- $\beta$ -D-Glucan, positive Histoplasma urine antigen, and fungal blood culture positive for Histoplasma capsulatum, consistent with disseminated histoplasmosis. The patient underwent bronchoscopy with BAL cultures positive for Histoplasma and Mycobacterium kansasii. Bone marrow aspirate and lumbar puncture were also obtained given persistent encephalopathy and pancytopenia-neither showed evidence of Histoplasma or mycobacteria. The patient promptly began treatment with itraconazole and 7 days of amphotericin. He also received prednisone for granulomatous hypercalcemia with subsequent normalization in serum calcium. His condition improved, and he was discharged on itraconazole and prednisone. Additional evaluation revealed CD4+ cell count of 613/mm<sup>3</sup> and normal serum immunoglobulin levels.

**Discussion:** Disseminated histoplasmosis often presents with non-specific symptoms such as fever, fatigue, and weight loss among immunosuppressed patients (e.g., AIDS, on steroids or TNF- $\alpha$  inhibitors). Rarely, immunocompetent individuals are affected as well. An uncommon manifestation of disseminated histoplasmosis is PTH-independent hypercalcemia from calcitriol production by activated macrophages. Clinicians should consider disseminated histoplasmosis even in the absence of known immunosuppression.

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Poster #073

**Presenter:** Sapna Pathak

**Authors:** Sapna Pathak, MD; Monika Kumar, MD

**Title:** SGLT-2 Inhibitor-Induced Secondary Erythrocytosis

**Abstract:**

**Case Presentation:** A 54-year-old African American male with non-ischemic cardiomyopathy, combined systolic and diastolic heart failure with a reduced ejection fraction, atrial fibrillation, and recurrent ventricular fibrillation was treated at Parkland Hospital for decompensated heart failure. His baseline hemoglobin and hematocrit were 15.7 g/dL and 47.6%, respectively. He was followed regularly in the cardiology clinic and was started on empagliflozin 10 mg daily as part of his guideline-directed heart failure therapy. Over the ensuing 18 months, his average hemoglobin and hematocrit increased to 17.7 g/dL and 52.3%, respectively. His other medications included metoprolol, sacubitril/valsartan, eplerenone, atorvastatin, levothyroxine, amiodarone, mexiletine, and rivaroxaban. During his hospitalization, Hematology was consulted to evaluate his erythrocytosis. His erythropoietin (EPO) level was 107 mU/mL and his JAK2 mutation analysis were negative, inconsistent with polycythemia vera. Abdominal imaging to assess for renal cell carcinoma or other masses and workup for hypoxic lung disease were negative. Upon closer review, the timing of initiation of empagliflozin coincided with his increase in hemoglobin and hematocrit so this was thought to be the most likely contributing factor to his erythrocytosis. Given the complications from his advanced heart failure, it was felt to be safer to continue his empagliflozin than to discontinue it.

**Discussion:** The prevalence of sodium-glucose co-transporter-2 (SGLT-2) inhibitor-induced secondary erythrocytosis is increasing as these medications are used more routinely to slow the progression of diabetic kidney disease, reduce mortality and hospitalizations in heart failure, and promote weight loss. The mechanism through which SGLT-2 inhibitors cause erythrocytosis is still being elucidated but likely involves augmentation of erythropoiesis. Neural crest-derived fibroblasts in the kidney produce EPO. When these cells are damaged (such as in diabetes), transcription factors HIF-1a and HIF-2a are regulated leading to suppression of erythropoiesis. SGLT-2 inhibitors shift the balance of HIF-1a and HIF-2a and stimulate the conversion of myofibroblasts back into EPO-producing fibroblasts, ultimately leading to augmentation in erythropoiesis. Given the increasing use of SGLT-2 inhibitors in clinical practice, it is important for all clinicians to be aware of SGLT-2 inhibitor-induced secondary erythrocytosis. Discontinuation of the offending medication should be considered and phlebotomy is not recommended.

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**Presenter:** Tom Phan

**Authors:** Tung Phan, MD

**Title:** Hoagland Sign: an uncommon initial manifestation of infectious mononucleosis

**Abstract:**

**Case Presentation:** A 29-year-old female presents to urgent care with bilateral upper eyelid swelling and tonsillitis. Eyelid swelling and tonsillitis began 3 days prior to presentation with gradual worsening in the days prior to presentation. She had no fever, lymphadenopathy, rhinorrhea, urticaria, itching, cough, eye discharge or pain. Her medical history was unremarkable besides birth control with IUD and anxiety. The patient worked at a desk job. She was prescribed steroids, cetirizine, and naproxen. Four days afterward, she developed fevers, tender cervical lymphadenopathy, severe pharyngitis, and exudative tonsillitis.

**Discussion:** Hoagland sign was originally described by Colonel Robert J. Hoagland in 1952. It is estimated that 5 - 56% of patients with infectious mononucleosis develop Hoagland Sign across multiple case series. Upper eyelid swelling begins concurrently or prior to other typical signs and symptoms of infectious mononucleosis. The pathophysiology appears to unclear but thought related to lymphocytic infiltration. The course is self-limited and resolves after a few days.

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Poster #075

**Presenter:** Nisha Raiker

**Authors:** Nisha Raiker, Taylor Triana, Jeffrey Chidester, Beth Brickner, Michael Luna

**Title:** Right on the Cusp: Evaluation of a Ruptured Sinus of Valsalva Aneurysm by Intracardiac Echocardiography

**Abstract:**

**Presentation:** A 67 year old male with cerebral palsy and coronary artery disease presented with 3 years of decline in functional capacity.

**Imaging Findings:** A transthoracic echocardiogram (TTE) demonstrated biatrial enlargement, right ventricular hypertrophy, and biventricular systolic dysfunction. The sinuses of Valsalva were moderately dilated with a 3 x 3 cm aneurysmal right coronary sinus protruding into the right ventricular outflow tract (RVOT) with evidence of RVOT obstruction (peak velocity 2.5 m/sec, peak gradient 27 mmHg). Color Doppler revealed turbulent, continuous left to right flow through the aneurysm, confirming a ruptured sinus of Valsalva aneurysm (SVA).

**Role of Imaging:** The patient was referred for cardiac catheterization with intracardiac echocardiography (ICE), revealing RVOT obstruction from a large, right coronary SVA protruding into the RVOT, causing direct impingement of the posterior pulmonic valve leaflet. Also noted was left to right color flow from a ruptured portion of the SVA into the RVOT without clear evidence of a ventricular septal defect (VSD) by ICE or ventriculography. Coronary angiography showed two-vessel coronary artery disease, and invasive hemodynamics demonstrated a significant left to right shunt (Qp/Qs 4:1).

**Summary:** Sinus of Valsalva aneurysm is a rare abnormality that arises from congenital or acquired defects in the aortic media and commonly involves the right coronary sinus with higher prevalence in males. Rupture of a SVA into the RVOT is often associated with subarterial VSDs, but identification of VSDs in this scenario can be challenging given the propensity of the SVA to obstruct the VSD and/or the view of it. While TTE is the diagnostic modality of choice, transesophageal echocardiography is often required for detailed investigation and surgical planning. However, ICE is an underutilized but equally valuable imaging modality for intracardiac pathologies. Without intervention, SVA rupture carries a high mortality. Surgical repair is definitive therapy, although a transcatheter approach can be pursued in patients with favorable anatomy. This patient was referred for surgery and underwent successful two-patch repair of the right coronary SVA, coronary artery bypass grafting, and repair of a small subaortic VSD that was noted intraoperatively.

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**Presenter:** John Rose

**Authors:** John Rose, Vicente Morales Oyarvide, Mohammad Zahid, Spencer Carter, Athena Huang, Kayla Riggs, Radhika Kainthla, Darren K. McGuire, Ankit Kansagr, Justin L. Grodin

**Title:** A case of newly diagnosed AL amyloidosis with amyloid cardiomyopathy and concurrent multiple myeloma

**Abstract:**

**Case Presentation:** A 58-year-old woman with a history of bilateral carpal tunnel syndrome, hyperthyroidism, and diabetes mellitus presented with one week of exertional dyspnea, fatigue, weight loss, and paroxysmal nocturnal dyspnea. On examination, she had a jugular venous pressure of 9-cm H<sub>2</sub>O and bilateral lower extremity edema. Initial workup was notable for high-sensitivity troponin T 79 ng/L, NT-proBNP 13,254 pg/mL, acute liver injury, and proteinuria (UPCR 0.49); hemoglobin, serum creatinine, calcium, and globulin gap were normal. ECG revealed right-axis deviation and low QRS voltages in the limb leads; bedside echocardiogram demonstrated increased left ventricular (LV) wall and septal thickness and decreased LV cavity size. Serum kappa/lambda free light chain (SFLC) ratio was 0.03 (K/L 22.18/748.35), and serum and urine protein electrophoresis with immunofixation detected M-components due to IgG lambda and free lambda light chains. Bone marrow biopsy demonstrated evidence of amyloid deposition by Congo Red staining and 70% plasma cells. Skeletal survey revealed multiple lytic lesions. Endomyocardial biopsy redemonstrated amyloid deposits by Congo Red staining and right heart catheterization showed elevated filling pressures and low cardiac index. Thus, she was diagnosed with stage IV AL amyloidosis with amyloid cardiomyopathy and concomitant multiple myeloma. Chemo-immunotherapy with daratumumab (anti-CD 38 monoclonal antibody) and cyclophosphamide, bortezomib, and dexamethasone (CyBORd) was started just over a month after her initial presentation. Despite treatment, her disease progressed with declining functional status and hospitalizations for pulmonary emboli and hypotension. She transitioned to home hospice three months after diagnosis.

**Discussion:** AL amyloidosis is commonly diagnosed in advanced stages and cardiac involvement is one of the strongest determinants of prognosis. For example, the median survival, when untreated, is 4-6 months for patients with advanced cardiac involvement. Subtle diagnostic clues include concentric LV hypertrophy with disproportionately low voltages in the limb leads and a pseudoinfarct pattern on ECG, heart failure with a restrictive filling pattern on echocardiogram, mild proteinuria, carpal tunnel syndrome, dysautonomia, and sensory polyneuropathy. These findings should prompt immediate assessment of SFLC (often the earliest and most sensitive test) and a definitive diagnosis should be made urgently for patients with concern for advanced cardiac involvement.

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Poster #077

**Presenter:** Juan Salcedo-Betancourt

**Authors:** Juan Salcedo-Betancourt, MD; Shani Shastri, MD; Anil Pillai, MD; Ronak Lakhia, MD

**Title:** A Case of Nephrotic Syndrome in an Individual with Severe Autosomal Dominant Polycystic Kidney Disease

**Abstract:**

**Case Presentation:** A 36-year-old Indian woman with severe Autosomal Dominant Polycystic Kidney Disease presented with new onset bilateral lower extremity edema and worsening hypertension which began several months after initiation of Ayurvedic supplements. Diagnostic evaluation revealed nephrotic range proteinuria of 6.7 g/24 hours. Tests for HBsAg, HCV-ab, HIV, RPR, ANA, ANCA and Anti-GBM were negative. Hemoglobin A1C, serum C3 and C4 levels, serum/urine protein electrophoresis and serum free light chains were also within normal limits. Consultation with radiology identified a small area of the left kidney which was potentially amenable to percutaneous biopsy. Patient successfully underwent ultrasound guided kidney biopsy which revealed findings consistent with Membranous Nephropathy (MN). Subsequently, both serum and tissue anti-phospholipase A2 receptor antibodies (Anti-PLA2R) were negative. Evaluation for age appropriate malignancy was also unrevealing. Two months after management with an optimal dose of angiotensin II receptor blocker (ARB), there was evidence of reducing proteinuria (1.4g/24 hours) suggesting partial remission.

**Discussion:** To our knowledge this is only the second reported case of membranous nephropathy in an individual with ADPKD. Although minimal proteinuria is often noted in individual with ADPKD, proteinuria >1g in any individual with ADPKD should prompt evaluation for secondary insult to the kidney. However, kidney biopsy of a cystic kidney confers significantly greater risk of complications than a non-cystic kidney. Alternatively open kidney biopsy is pursued which has the risk of additional surgical complications. Thus, biopsy is deferred and treatment is often empiric. In our case, the expertise of our Interventional radiology group permitted successful diagnosis with a minimally invasive procedure. Thus, referral to tertiary care centers equipped with multidisciplinary teams with expertise in coordinating care for individual with ADPKD should be considered in cases with similar presentations.

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**Presenter:** Parth Shah

**Authors:** Parth Shah, MD; Spencer Carter, MD; Aman Narawan, BS; Sarah Godfrey, MD; Joseph Hill, MD, PhD; Anne Marie Navar, MD, PhD

**Title:** POEMS Syndrome presenting as non-ST-elevation myocardial infarction and infiltrative cardiomyopathy

**Abstract:**

**Case Presentation:** A 42-year-old male with poorly controlled hypothyroidism presented to the emergency department with chest pain. His exam was notable for polyneuropathy, ascites, lower extremity edema, and temporal wasting. Initial labs revealed an elevated troponin T-hs of 967 ng/L. ECG demonstrated sinus rhythm with low voltages and no ST/T changes. Left heart catheterization revealed a chronic total occlusion of the mid left anterior descending artery (LAD), multiple areas of 20-30% stenoses and a 50% mid- right coronary artery (RCA) lesion. Optical coherence tomography of the mid-RCA demonstrated circumferential plaque erosion, one site of focal plaque rupture, and layered thrombus with distal embolization to the posterior descending artery. Transthoracic echocardiogram revealed left ventricular (LV) ejection fraction of 56%, reduced global longitudinal strain with apical sparing, inferior hypokinesis, moderate right ventricular (RV) dilation, normal RV function, and severe tricuspid regurgitation (TR). Cardiovascular risk factors included LDL of 41 mg/dL, HDL 24 mg/dL, triglycerides 110 mg/dL, Hgb A1c of 5.2%, and undetectable lipoprotein A. He had no history of smoking, hypertension, or family history of heart disease. Given his unusual cardiac findings with lack of risk factors, workup was initiated for an underlying systemic illness. Serum and urine protein electrophoresis demonstrated an IgG lambda monoclonal gammopathy. CT abdomen/pelvis revealed ascites, splenomegaly, heterogeneous liver enhancement, and a right femur sclerotic bone lesion. Subsequent bone biopsy revealed sheets of plasma cells consistent with plasma cell neoplasm. Additional laboratory findings included elevated VEGF (558 pg/mL) and IL-6 (26 pg/mL). Cardiac MRI notably demonstrated mild global LV hypokinesis with inferior/infero-septal subendocardial late gadolinium enhancement consistent with myocardial infarction and diffuse T1 enhancement suggesting possible concurrent infiltrative cardiomyopathy. The constellation of polyneuropathy, splenomegaly, hypothyroidism, monoclonal gammopathy, sclerotic bone lesion and elevated VEGF led to a diagnosis of POEMS syndrome.

**Discussion:** In this case, we see an unusual cardiovascular presentation of POEMS syndrome. POEMS causes arterial and venous hypercoagulability and accelerated atherosclerosis, likely explaining this patient's premature coronary artery disease. His exam and cardiac MRI findings further speak to a process outside the confines of his coronary disease, likely representing an infiltrative component from the monoclonal gammopathy.

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Poster #079

**Presenter:** FNU Sidra

**Authors:** FNU Sidra, Oksana Hamidi, Sasan Mirfakhraee, Ohwofiemu Nwariaku, Liwei Jia, Patricio Polanco.

**Title:** Severe Cyclical Cushing Syndrome due to Ectopic ACTH Secretion by Appendiceal Carcinoid

**Abstract:**

**Case Report:** A 24-year-old woman was referred to endocrinology for 60-pound weight gain, acne, hirsutism, generalized weakness, heat intolerance, and hot flashes. She had secondary amenorrhea for 6 months prior to presentation. Family history was significant for bronchial carcinoid in mother. On examination, she had moon facies, wide purple striae on abdomen, hirsutism, dorsocervical and supraclavicular fat pads. She had normal blood pressure. Her laboratory workup showed potassium 3.2 mmol/L (N, 3.5-5.3), urine free cortisol (UFC) 539 mcg/24 hours (N<50), ACTH 54 pg/ml (N, 6-50) and post 1-mg dexamethasone suppression test cortisol 8.8 mcg/dL. CT abdomen revealed a 3-cm enhancing appendiceal mass, enlarged periappendiceal mesenteric lymph nodes and a 4-cm enhancing right hepatic lobe lesion. Ga-68 Dotatate PET/CT confirmed increased radiotracer uptake in appendiceal mass, lymph nodes and hepatic mass. On liver biopsy, pathology showed well differentiated NET Grade 1 and positive ACTH stain. Repeat UFC was 65 mcg/24 hrs and serum cortisol went down to <1 mcg/dL indicating severe cyclical CS. She was referred to surgical oncology for opinion on debulking surgery. Her genetic testing was negative. She was started on Lanreotide. Given severe cyclical CS with extensive tumor burden, she underwent robotic bilateral adrenalectomy with a plan for cytoreductive surgery once she is on physiologic doses of steroids.

**Discussion:** Cushing's syndrome (CS) secondary to ectopic ACTH secretion (EAS) is rare and accounts for 10% of CS with majority being bronchial or gut neuroendocrine tumors (NETs) and squamous cell lung cancer. In 20 years' experience at NIH, there was only one case of appendiceal NET reported. First reported case was in 1971, when CS was cured by resection of an appendiceal carcinoid incidentally detected on laparotomy for adrenalectomy. There are 3 additional case reports in literature of appendiceal carcinoid with ectopic CS. Management can be challenging particularly in patients with metastatic disease. Medical therapy should be individualized, and adrenalectomy should be considered early in patients with uncontrolled CS due to EAS.

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**Presenter:** Jorge Soria

**Authors:** Jorge Soria, MD; Jennifer Balcazar, PA-S; Zane Conrad, MD; Henning Drechsler, MD; James Cutrell, MD

**Title:** When Urgency means Emergency: Urinary Mucormycosis

**Abstract:**

**Case Presentation:** 63-year-old African American male with history of uncontrolled diabetes (A1C: 12.8%), remote intravenous drug use, and chronic hepatitis C presented with 3 days of left flank and lower abdominal pain, emesis, and intermittent urinary urgency. On examination, vital signs were normal, but he had left sided CVA and suprapubic tenderness. Initial laboratory tests showed WBC 19,000/ $\mu$ L and creatinine 1.72 mg/dL (baseline  $\sim$ 0.9). Urinalysis revealed 11-20 RBCs, 5-10 WBCs, and negative nitrites. CT scan of abdomen and pelvis demonstrated severe left hydronephrosis with perirenal stranding, and soft tissue gas along the left ureterovesical junction and ureter. Clinical diagnosis was made of emphysematous ureteritis/cystitis and pyelonephritis. A urine specimen obtained during emergent left percutaneous nephrostomy tube placement grew a mold, later identified as *Rhizopus* microspores. He was started on liposomal amphotericin B. Due to clinical worsening, patient underwent a left total nephrectomy with resection of the ipsilateral ureter and part of the bladder. Pathology showed invasive fungal disease comprising of pauci-septate broad hyphae in a background of necrotic tissue, giant cells, granulomatous inflammation, and vascular invasion. After completing a 4-week course of amphotericin, including 2 weeks for antifungal bladder irrigation, he was transitioned to posaconazole.

**Discussion:** Rhino-orbital-cerebral and pulmonary infections are the most common syndromes caused by mucormycosis, particularly in immunocompromised patients and those with diabetes mellitus. Isolated urinary tract involvement is rare but has been reported as part of disseminated disease. Intravenous drug use increases risk, likely due to direct inoculation by contaminated needles. Acute renal failure is present in up to 92% of cases and it is due to occlusion of the renal arteries by angioinvasion. Sterile pyuria and hematuria are usual findings. Liposomal amphotericin B is first line of treatment in addition to aggressive surgical debridement and control of any predisposing conditions. The use of amphotericin B bladder irrigation is controversial. Isolated renal mucormycosis is associated with high mortality rates (52 to 65%). This case highlights the importance of acknowledging growth of mold from urine cultures, especially in high-risk patients in the right clinical scenario, as early diagnosis and aggressive medical-surgical management are paramount for survival.

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Poster #081

**Presenter:** Litty Thomas

**Authors:** Litty Thomas MD Ramesh Saxena MD Kavita Bhavan MD

**Title:** A rare case of bacterial peritonitis caused by *Ralstonia mannitolilytica* in an adult peritoneal dialysis patient

**Abstract:**

A 67-year-old woman with a history of end-stage kidney disease due to obstructive uropathy from renal tuberculosis, status post left nephrectomy and right-sided percutaneous nephrostomy (PCN) with frequent exchanges, chronic Hepatitis B, atrial fibrillation, type II diabetes, and hypertension, has been on peritoneal dialysis (PD) since 2009. She was admitted on 3/27/2021 due to septic shock after a colonoscopy one day prior. She initially presented with severe abdominal pain, right-flank tenderness, and cloudy urinary output from the PCN. She was started on broad-spectrum empiric antibiotic therapy with vancomycin and meropenem. Peritoneal fluid studies were consistent with peritonitis. Peritoneal fluid culture grew *E.coli*. Urine culture from the right PCN also grew *E.coli*. Patient was started on intraperitoneal (IP) cefazolin and ceftazidime for 3 weeks.

The patient presented to the PD clinic with persistent symptoms on 4/28/21. PD fluid analysis was consistent with gram-negative rods, empiric treatment started with broad-spectrum antibiotics. Final culture and Sensitivity results came on 5/3/21 (*Ralstonia* species) sensitive to gentamycin, tobramycin, cefepime, ciprofloxacin, amikacin, levofloxacin). She was treated for 3 weeks with cefepime and gentamycin IP. She completed the treatment on 5/26/21.

The patient presented to the emergency again on 6/5/21 due to persistent abdominal pain, nausea, vomiting and diarrhea. The peritoneal fluid analysis confirmed third episode of peritonitis (multi-drug resistant *Ralstonia* species). During the second episode of peritonitis, *Ralstonia* was resistant to cefepime, gentamicin, tobramycin-which was sensitive during the prior episodes of peritonitis). Based on the sensitivities she was treated with oral Bactrim. Due to recurrent infection with the same organism even after treating with appropriate antibiotic and duration, raise the concern of PD catheter seeding of the organism, hence PD catheter was removed, and the patient was started on hemodialysis. The patient clinically improved with treatment.

To our knowledge, this is the first reported case of *Ralstonia* peritonitis in an adult PD patient. Only case case has been reported in a pediatric PD patient. *Ralstonia* species have a tendency to form biofilm which enhances the organism's survival in the environment and likely plays a role in their frequent antibiotic resistance.

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**Presenter:** Emil Thyssen

**Authors:** Emil Thyssen, Srishti Saha

**Title:** Myopericarditis following COVID-19 Vaccination

**Abstract:**

Severe acute respiratory distress syndrome coronavirus 2 (SARS-CoV-2) is known to rarely cause myopericarditis as part of the clinical syndrome of Coronavirus disease 2019 (COVID-19). As vaccination rates against COVID-19 have increased, adverse events have been increasingly reported. One such adverse event is myopericarditis, which has been reported with the vaccines developed by Pfizer-BioNTech, Moderna and Johnson & Johnson. Despite the gravity of myopericarditis in the context, the pathophysiology and epidemiology are still largely unknown. In this case report, we present the case of a young male presenting with dyspnea and chest pain following vaccination with the first dose of the Pfizer-BioNTech mRNA vaccine. Cardiac enzymes were elevated at presentation and cardiac imaging was consistent with acute myopericarditis. Symptoms resolved with NSAIDs and symptomatic treatment. We review the case and literature surrounding acute myopericarditis following COVID-19 vaccination.

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Poster #083

**Presenter:** Giovani Zelada

**Authors:** Giovani M. Zelada, MD; Paul B. Aronowitz, MD

**Title:** Fever, Rash, and a Sweet Recovery: A Case of Classic Sweet's Syndrome

**Abstract:**

A 40-year-old Fijian-Indian man with a history of diabetes mellitus and hypertension presented to the hospital with a 5-day history of fever, rash, and pruritis. The patient initially presented to urgent care where he received intramuscular and oral antibiotics, after which his symptoms continued to worsen. Physical examination revealed a fever of 39.6°C and elevated, tender, inflammatory plaques and nodules, distributed throughout his upper and lower extremities, back, chest, abdomen, scalp, and dorsal aspects of both feet. The white blood cell count was 15200/mm<sup>3</sup> with 60% neutrophils and 22% bands; the erythrocyte sedimentation rate was 48 mm/h and C-reactive protein was 10.4mg/dL. Biopsy of a right arm lesion revealed neutrophilic dermatosis without organisms, consistent with Sweet's syndrome. Symptoms and rash rapidly improved with Prednisone taper and Clobetasol ointment. Sweet's Syndrome (acute febrile neutrophilic dermatosis) is a rare disease characterized by an abrupt onset of fever, painful violaceous plaques or nodules, and elevated inflammatory markers. There are 3 subtypes of Sweet's Syndrome, and they include Classic or Idiopathic, Malignancy-related, and Drug-induced. Here, Sweet's syndrome was most consistent with the Classic subtype given the absence of malignancy or drug use, and satisfaction of both major and three of four minor diagnostic criteria.

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**Presenter:** Matthew Almonte

**Authors:** Matthew Almonte, MD; Spencer Carter, MD; Parth Shah, MD; Mark Berlacher, MD; Viraj Raygor, MD; Anish Bhatt, MD

**Title:** Online and Simulation Based Cardiac Point of Care Ultrasound Training for Residents, a Randomized Pilot Study

**Abstract:**

**Background:** Cardiac point of care ultrasound (cPOCUS) is an important skill for trainees across specialties with varied curricula by program. The coronavirus pandemic has changed direct educator-trainee interaction; simulation and online learning can be a useful adjunct to traditional methods of education.

**Methods:** In January 2021, interested first year internal medicine trainees were block randomized in a 1:1 fashion to intervention and control arms based on prior cPOCUS experience. Using the 3D Systems U/S Mentor simulation program and mannequin (Symbionix, Airport City, Israel-all participants were asked to acquire four (PLAX, PSAX, apical 4 chamber, and IVC) views as well as interpret images from four standard, preselected echocardiographic cases. The intervention arm then underwent an in-person, simulation-based teaching experience followed by a structured, online curriculum. Repeat testing was completed by both arms after the intervention was complete.

Acquired echo images were graded by a separate blinded reviewer according to a previously validated rubric creating a score of 0-12. Interpretation results were graded by two blinded reviewers using a standardized rubric, creating a score of 0-16. Appropriate scope of practice was determined after discussion with cardiology faculty and judged in a yes/no manner for each case creating a score of 0-4. All blinded reviewers are board certified in echocardiography. The acquisition and interpretation scores were added creating a cPOCUS score creating a total potential score of 0-32. One-tailed T-test and Fischer's exact were performed as appropriate (GraphPad Prism version 9.2.0).

**Results:** A total of twenty-four participants were enrolled, twelve in each arm. Two participants in the intervention arm did not complete baseline testing and were excluded from analysis. Baseline mean cPOCUS scores were  $13.6 \pm 3.8$  and  $14.5 \pm 4.4$  in the intervention arm and control respectively ( $p=0.6$ ). The mean cPOCUS score increased by  $6.1 \pm 4.5$  vs  $2.4 \pm 3.3$  in the intervention arm vs control respectively ( $p=0.02$ ).

**Conclusion:** The intervention arm showed a statistically significant larger increase in cPOCUS score as compared to those not receiving training. Of note, PGY-1 feedback for the experience was robustly positive. Overall, a combined simulation and virtual curriculum improved POCUS imaging and interpretation in this novel, randomized study.

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Poster #085

**Presenter:** Matthew Almonte

**Authors:** Matthew Almonte, MD; Parth Shah, MD; Justin Holmes, MD; Spencer Carter, MD; Viraj Raygor, MD

**Title:** Resident Led Cardiac Point of Care Ultrasound Workshop Pre & Post Analysis: A Necessary Adjunct to UTSW Internal Medicine Training

**Abstract:**

**Background:** Cardiac point of care ultrasound (cPOCUS) is becoming an important diagnostic skill within Internal Medicine (IM). Currently, our cPOCUS training at UTSW for IM residents mostly occurs during clinical care in a non-structured and informal manner. Our project aims to assess trainee experience and comfort in obtaining and interpreting basic cPOCUS views. Furthermore, we will evaluate if a novel, resident-led, simulation-based cPOCUS curriculum can provide a potential method for effective cPOCUS training.

**Method:** Senior IM residents were offered the opportunity to train and be designated an "Echo Champion," under the supervision of a board-certified Cardiology physician in echocardiography. Each Echo Champion reviewed a cPOCUS written guide and attended an in-person training session using the 3D Systems U/S Mentor simulation program and mannequin at the UTSW simulation lab based on a validated training program. Echo Champions then led teaching sessions with an approximate ratio of one senior resident to three interns. Interns were asked to complete a preliminary survey and interpret ultrasound images from four preselected echocardiographic cases prior to the workshop. During the workshop, emphasis was placed on hands-on image acquisition of four basic ultrasound windows and reviewing the appropriate scope of cPOCUS practice for a resident trainee. After the session, interns were given a post-workshop survey to assess feedback and perceived benefit.

**Results:** Twenty-eight senior residents volunteered and trained as Echo Champions. Forty-nine interns participated in this study and responded to the preliminary survey. Forty-four (90%) interns did not have prior formal cPOCUS training. Forty-one (84%) were "very interested" in learning how to perform cPOCUS. Forty-three (88%) were interested in learning how to interpret cPOCUS, and thirty-three (67%) were either "uncomfortable" or "very uncomfortable" performing cPOCUS. Forty-five interns responded to the post-workshop survey. Thirty-nine (87%) "strongly agreed" that he or she both benefited and enjoyed the workshop. Twenty-eight (62%) wanted more cPOCUS training sessions in the future and forty-four (96%) would sacrifice multiple elective half days during an outpatient week to incorporate a formal cPOCUS curriculum.

**Conclusion:** This novel, resident-led cPOCUS curriculum received strong, positive feedback and a formalized cPOCUS curriculum should be considered at UTSW.

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**Presenter:** Angela Duvalyan

**Authors:** Angela Duvalyan, MD; Sarah Williams, MD

**Title:** "Doctor" Badge Intervention to Mitigate Provider Level Risk Associated with Housestaff Role Misrepresentation

**Abstract:**

**Background:** Physician misidentification has far-reaching consequences on patient satisfaction and physician well-being. Causes of misidentification can be categorized as system, patient, and provider level. Provider level causes include clinician demographics and behavior with patients. In this study, we aim to (a) identify provider level risk factors and (b) investigate the efficacy of "Doctor" badges as an intervention to mitigate the risk of role misidentification.

**Methods:** Staff badges titled "Doctor" were distributed to all internal medicine housestaff along with an anonymous survey that was designed to identify potential causes of misrepresentation. The survey questions included basic demographic information such as sex, age, ethnicity, level of training, and height, followed by a series of behavioral questions that were assessed on a 5-point Likert scale. A follow-up survey was distributed to assess the efficacy of the "Doctor" badge in reducing the rate of role misrepresentation. Categorical variables were reported as frequencies and further analysis was performed by stratifying participants by sex and ethnicity. The primary outcome was to identify provider level risk factors and the secondary outcome was to assess the efficacy of the "Doctor" badges in reducing role misrepresentation.

**Results:** Of all 119 survey participants, 44.5% were female with a mean age of 28.7 years. 34% of participants self-identified as Caucasian, 30% as South Asian, 15% as East Asian, 7.5% as African American, and 4% as multiethnic. 81% of residents were categorical medicine residents, 4% were Med/Peds, 4% were Med/Psych, and 11% were residents in their preliminary year. There were only 25 (21%) participants that stated they had never been misidentified, 96% of which were male. Of those who had been misidentified at least once, 55% were female. When examining the rate at which participants experienced misrepresentation, over 60% of male participants reported "rarely," while only 6% of females reported "rarely." Further statistical analysis and the efficacy of "Doctor" badge intervention will be presented.

**Conclusion:** Housestaff are at increased risk for role misrepresentation with certain individuals disproportionately affected. Increasing awareness amongst providers and implementing workplace interventions may reduce this risk and subsequent physician burnout.

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Poster #087

**Presenter:** Danielle Morelli

**Authors:** Danielle Morelli, MD; Ambrie Davis, MPH; Katherine Karlay, MD; Evelyn Ashiofu, MD, MPH; Sarah Baker, MD; Rachel Russo, MD; Kathlene Trello-Rishel, MD; Lia Thomas, MD

**Title:** Racism: A Mental Health Crisis An Approach to Teaching Antiracism & Cultural Intersectionality as it pertains to Race in The UTSW Psychiatry Clerkship

**Abstract:**

**Background:** Amidst the national civil rights movement galvanized by the killings of Breonna Taylor and George Floyd, there is a need for teaching on racism, antiracism, and cultural intersectionality, and humility within medical education. Educators at UTSW are addressing this need through an interactive and integrative workshop with the goal of creating a culture shift that would inspire advocacy for those facing healthcare disparities. Recognizing racism's influence on the personhood of others, we aim to instill lifelong learning that is more inclusive and oriented toward moral action. Objectives included reflection on personal biases, identifying/understanding the impact of racism & microaggressions, and identifying discrimination as a social determinant of health. Attendees were encouraged to deepen their self-awareness/empathy skills.

**Methods:** Students, residents, and faculty participated in a 2.5-hour workshop about mental health disparities, racism and its impact on Black Americans. The workshop included pre-workshop preparation with identity exercises, brave space guidelines, media pieces, and information on retraumatization. It also included didactics on racism in America and types of racism and microaggressions as it relates to social determinants. Then, there was an interactive portion, which highlighted vulnerable populations through life stories, focused on identifying microaggressions and empathy exercises on minority stress. It concluded with the provision of community resources to participants. Pre and post-surveys, which included questions about identifying microaggressions and strengths/weaknesses of the workshop, were used to evaluate the activity.

**Results:** Data collection is still underway.

**Conclusion/Discussion:** We hypothesize attendees will have more knowledge of the impact of racism on mental health and feel more confident applying skills from the workshops toward advocacy not only within psychiatry but all fields of medicine. Future goals are to adapt and expand this antiracism workshop to include all medical specialties.

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**7th ANNUAL DONALD W. SELDIN, M.D. RESEARCH SYMPOSIUM**  
**April 22, 2022**

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**Poster #088**

**Presenter:** Ashlin Szalanski

**Authors:** Ashlin Szalanski, MD MPHTM

**Title:** Novel Approach to Resident Training in Internal Medicine and Psychiatry

**Abstract:**

**Case Presentation:** The combined internal medicine and psychiatry residency training program at UTSW was created in 2015 as a joint venture between the internal medicine residency program director Salahuddin Kazi, MD and psychiatry residency program director Adam Brenner, MD. The first residents were recruited to begin in 2017 and the program anticipates its first graduate at the end of this academic year. This five year training program is designed to permit residents to be board eligible in both medical specialties within five years; residency programs completed individually typically require seven years. At the time of its creation, there were eleven similar programs nationwide and none created within the preceding fifteen years. This case explores the means by which this program was created, grown and developed over the past five years. Significant attention is paid to efforts intentionally applied to three domains - organization, culture and education - by a variety of stakeholders. A primary factor in the early success of this program is an environment created by leadership which encourages and facilitates resident-driven initiatives.

**Discussion:** The UTSW combined internal medicine and psychiatry residency program is a one of a kind case with contemporaneously collected data that adds to the body of GME knowledge. Of fourteen active programs that offer combined internal medicine and psychiatry training, the program at UTSW is the first since the ABPN placed a moratorium on the creation of new combined programs in 2009 and the only program created in the last twenty years to have successfully recruited and maintained a full complement of residents. Additionally, UTSW is the only institution without dual-certified physicians to have created a combined internal medicine and psychiatry program. Physicians certified in both internal medicine and psychiatry are uncommon - the total efforts of combined programs have never generated more than thirty such physicians annually. UTSW remains the only institution with a combined program that maintains joint leadership between members of its constituent programs. It is our hope that this account will serve as an example and roadmap for those institutions interested in creating this uncommon and increasingly relevant GME training model.

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Poster #089

**Presenter:** Anjali Vora

**Authors:** Anjali Vora, MD, MPH; Sarah Collins, PhD; Alexis Boulter, MD; Rebecca Duron, MD, MSPH; Reeni Abraham, MD

**Title:** Exploring the Ethics of Structural and Social Determinants of Health: A Virtual, Multimedia Elective for Third-Year Medical Students."

**Abstract:**

**Background:** Structural and social determinants of health (SSDOH) contribute more to our patients' morbidity and mortality than traditional clinical factors; yet medical schools' curricula do not consistently address these topics, allow time for reflection upon how personal lived experiences or pre-conceived ideas affect patient experiences or parallel patient narratives with basic science and clinical education. During the spring of 2020, students' clinical rotations were disrupted and necessity for social distancing led faculty and residents to develop a virtual SSDOH elective for third year medical students as an academic alternative.

**Methods:** Utilizing Kolb's Experiential Learning Cycle, we developed a 4-week, 14-session virtual course during the COVID-19 pandemic to introduce clerkship students to key SSDOH challenges and provide time for reflection on upon previous personal experiences and patient encounters to transform prior knowledge into new visions for our healthcare system. The aforementioned challenges also served as our organizing curricular themes: institutional racism and incarceration, gender & gender identity, childhood trauma, and immigration. Books, articles, film, podcasts and other media were selected to complement each theme, and students engaged with these resources independently. Local and national healthcare providers and interprofessional community leaders, all with social justice or medical advocacy expertise in their respective fields, led discussions during the synchronous sessions according to the assigned SSDOH themes.

**Results:** Students' evaluations indicated that the course format was an effective method for learning about SSDOH, with an overall rating of 4.83/5, and provided a psychologically safe format for personal reflection and the sharing of new ideas. The students' capstone projects utilized art, writing, and video to synthesize their learnings from the course and illustrated a high degree of reflection.

**Conclusions:** The major limitation of our course was a small class size of self-selected students. Incorporating SSDOH content into the broader medical school curriculum, or during the core clerkship, will require careful planning to ensure sustainability. However, teaching the impact of SSDOH through patient narratives, scientific evidence, media, and expert panelists is an effective way to train future physicians to more fully grasp the impact of disparities on the health of our communities and how to become stronger physician

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**Presenter:** Manan Mehta

**Authors:** Manan M. Mehta, Rebecca Choate, Jonathan Cortes, Melissa Leffingwell, Joaquin Morin, Thomas Vo, Kenan Wright, Matt Leveno

**Title:** A Novel Method for Ventilator Splitting Using Alternating Breaths

**Abstract:**

**Background:** The use of invasive mechanic ventilation is an essential component of care in many critically ill patients. However, ventilators are an expensive resource that in times of increased demand can be in short supply. Recent global events with the COVID-19 pandemic have demonstrated the potential for ventilator shortages and the ethical dilemmas such a shortage can create. These shortages have also been seen in mass casualty scenarios and extend beyond the current pandemic. Ventilator splitting (ventilating multiple patients with a single ventilator) has been previously described as a method for transiently increasing ventilator supply during high demand. However, current methods struggle to meet the varying demands of patients with differing lung physiology. Here we describe a method for ventilator splitting that adapts to different patient lung mechanics by sequentially alternating breaths delivered to patients.

**Methods:** With the help of the UTD engineering program, a device capable of alternating between two separate sets of simulated lungs was created using a microcontroller, solenoid valves, and pressure/flow sensors. The device was connected to a Maquet Servo-I ventilator and used to ventilate artificial pairs of lungs of varying compliances with the same tidal volume. Lungs were also ventilated with the same tidal volume at different respiratory rates to show an ability to meet different minute ventilation needs.

**Results:** Performance of the device showed consistent tidal volumes delivered to the lungs despite differing compliances. The ventilator appropriately required higher pressures to ventilate low compliance lungs while simultaneously using lower pressures for higher compliance lungs to achieve the same tidal volume. The device also appropriately cycled between the different lungs to achieve different respiratory rates when required.

**Conclusions:** This proof-of-concept test shows that sequentially alternating ventilator breaths is a viable method of ventilator splitting. Further testing is required for safety, robustness, and scalability. Limitations of the device include the need for mandatory ventilation and paralytics, but future studies could examine the ability of the device to operate in the context of spontaneous respiration.

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Poster #091

**Presenter:** Brett Capel

**Authors:** Brett Capel, MD; Reid Weisberg, MD; Komal Patel, MD; Rashmi Arora, MD; Swathi Reddy, MD; Una E. Makris, MD

**Title:** Quality Improvement: Communicating Risk Regarding JAK Inhibitor Use in Rheumatology Patients

**Abstract:**

**Background:** In September 2021, the FDA updated their boxed warnings for Janus Kinase (JAK) inhibitors to include increased risk of major adverse cardiac events (MACE), cancer, and thrombosis. We do not have a systematic approach to communicating with patients about new risks. This quality improvement (QI) project aimed to improve rates and approach of communicating these risks of JAK inhibitors to patients with rheumatic diseases at the Dallas VA.

**Methods:** We identified consecutive patients on JAK inhibitors returning for rheumatology follow-up between 11/2021-2/2022. We randomized (computer generated) each patient to one of two existing approaches of communicating risk (of MACE, cancer, or DVT): a) using a gist (summary) explanation of FDA warnings or b) presenting visual aids (icon arrays shown on poster) of risk per outcome. We compared documentation rates of risk communication for JAK inhibitors any time prior to initiation of this QI project (reflecting the 2019 FDA thrombosis warnings). We administered a survey to evaluate perceived confidence with decision making using the 4-item SURE Decisional Conflict scale.

**Results:** We included 26 Veterans; 80% were male with average age of 63. Over 75% of the patients had rheumatoid arthritis, 15% had psoriatic arthritis, and 8% had ankylosing spondylitis. Nearly all patients (92%) had a cardiovascular risk factor. Baseline documentation rates for risk communication were 9 of 26 (35%) reflecting 2019 FDA warnings, and increased to 26/26 (100%) with this project. Four (15%) of the patients changed to alternative therapy following communication of risks: three due to potential risks, one due to lack of efficacy. Equal number of patients received the different communication approaches; 11 of 13 patients (85%) in both the icon array and gist approaches reported low decisional conflict according to the SURE scale.

**Conclusions:** In this ongoing QI project we have increased rates of communicating risk and learned that either communication approach is well-received. Decisions are nuanced and rely on prior medication use, disease activity, and risk for adverse outcomes. As long-term data are released, we must learn to effectively communicate and document risks with patients using shared decision-making.

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**Presenter:** Brian Hopkins

**Authors:** Brian J. Hopkins, MD; Diana Pham, MD; Audrie A. Chavez, MD; L. Steven Brown, MS; Surendra Barshikar, MD; Bonnie C. Prokesch, MD

**Title:** Positive Effects of Urine Culture Reflex Policy Implementation in Parkland Hospital Inpatient Rehabilitation Unit

**Abstract:**

**Background:** Urinary tract infection (UTI) is among the most common reasons for antibiotic use. In an effort to promote antibiotic and diagnostic stewardship, myriad institutions have implemented a policy of obtaining urinalysis results prior to reflexing to urine culture. In patients with spinal cord injuries, indwelling urinary catheters, cerebrovascular accidents, or traumatic brain injuries, the decision to treat may be challenging. The objective of this study is to determine the effects of implementing a urine culture reflex policy in this patient population.

**Methods:** All urinalyses (355 total) in Parkland Hospital inpatient rehabilitation unit (IRU) were analyzed from August 2019 to June 2021. A urine culture reflex policy was implemented in August 2020, involving first sending a urinalysis and then reflexively completing a subsequent urine culture only if significant pyuria (>10 white cells) was found. Pregnant women, patients undergoing urologic procedures, and patients less than 18 years old were excluded. Primary outcome was rate of return to acute care from the IRU related to UTI during the preintervention versus postintervention periods. Secondary outcomes included adherence to protocol, antibiotic utilization, adverse outcomes, reduction in urine cultures, and reduction in healthcare costs. Statistical analysis was performed using SPSS, and a p-value of <0.05 was deemed significant. T-test was used to compare means of continuous variables. Categorical variables were compared using Chi-square or Fisher exact test.

**Results:** There was no statistically significant difference in rate of return to higher of level of care between pre- and post-intervention groups. Urine cultures sent were reduced by 58% post-intervention.

**Conclusion:** Implementation of a urine culture reflex policy in IRUs is safe and effective, leading to reduction in the amount of urine cultures sent, which may reduce inappropriate antibiotic use and decrease healthcare costs.

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Poster #093

**Presenter:** Tarun Kadaru

**Authors:** Tarun Kadaru, Ruth Schneider, Carol J. Tujardon, Mujeeb Basit, Zahid Ahmad, Amit Khera

**Title:** Beyond Identification of Familial Hypercholesterolemia: Downstream Visits and Treatments in a Health Care System

**Abstract:**

**Background:** Familial Hypercholesterolemia (FH) is underdiagnosed and undertreated. Several electronic health record (EHR) algorithms have been developed to improve identification of patients with FH. The downstream processes of care and implementation of treatment after identification of these individuals is unclear.

**Methods:** Individuals at UT Southwestern Medical Center with an LDL-C  $\geq 190$ mg/dL (n=5786) ever recorded in the EHR were included in an FH registry. As part of a QI program, individuals from the registry deemed to possibly have FH were contacted via 1) MyChart message 2) phone call and/or 3) letter to notify them of the potential FH diagnosis, higher risk of ASCVD events, and offering referral to an FH specialist. Participants were contacted 1-4 times by one of these modalities. Chart extraction of contacted patients was performed to determine the type and frequency of contact and downstream visits and interventions.

**Results:** A total of 140 patients from the FH registry were reviewed of which 64 were contacted (34 inactive charts, 10 followed by lipid specialist, 11 secondary causes, and 21 other). Of these 64 (mean age 54, 69% women, highest mean LDL-C  $287 \pm 50$ mg/dL), only 13% had a prior chart diagnosis of FH, and only 40% were on a statin at time of contact. 122 patient contact attempts were made (mean 1.9 per patient) with most being by telephone (47%) and MyChart (41%). Only 19 patients (30%) had follow-up visit in response to this contact (n=10 with PCP, n=9 with FH specialist). Of the 10 patients with a PCP visit, only 6 had a change in therapy or specialist referral and none were recommended family screening. Of the 16 patients that accepted a referral, only 9 attended that visit and 8 had a change in therapy or recommendation for family screening. Patients with vs. without a follow-up visit had a greater number of contact attempts (2.3 vs. 1.8, p=0.03).

**Conclusions:** Fewer than 25% of patients with possible FH identified through the EHR and contacted had a change in care as a result of these efforts. Further research is needed to enhance downstream implementation efforts beyond identification of patients with FH.

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Poster #094

**Presenter:** Emily May/Tung Phan

**Authors:** Emily May, Tung Phan, Joshua Walther, Charles Ho, Laura Yuan, Pedro Fernandez

**Title:** Improving access to primary care physicians in a behavioral health clinic: initial findings

**Abstract:**

**Background:** In 2001, the World Health Organization set a goal for universal primary care. Several barriers, including mental illness and access, limit patients from connecting with primary care physicians in behavioral health clinics. Our team evaluated patients across one behavioral health clinic to ascertain how many patients had primary care physicians and what barriers psychiatry trainees may face when referring patients to primary care physicians.

**Methods:** Using EPIC SlicerDicer data, a cross-sectional analysis was performed to evaluate the percentage of patients between 9/29/2020 and 9/29/2021 without a primary care physician in the behavioral health clinic. A survey was then sent to psychiatry residents rotating in the behavioral health clinic to assess barriers to primary care referral.

**Results:** 2,363 (39.83%) patients in the behavioral health clinic did not have primary care physicians in the studied time frame. Survey results (n = 14) showed that 71.4% of psychiatry residents prescribe non-psychiatric medications for between 1 -5 patients within their panel. Most psychiatry residents (57.2%) were mostly or very comfortable in knowing how to refer patients to primary care. Of those that refer patients to primary care, 42.9% of residents succeeded in obtaining an appointment for their patient.

**Conclusions:** Our study showed a significant dearth of primary care physicians for behavioral health clinics. Feedback on the referral process focused on resident education and communication between the referral center and patients. Possible interventions include noting the primary care physician at each initial evaluation and educating residents on the referral process at orientation to the clinic. Through these interventions, we hope to decrease the number of patients without primary care physicians by 10% over one year.

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Poster #095

**Presenter:** Gilbert Ortega

**Authors:** Gilbert Ortega, MD; Belinda Sam, PharmD; Kristin Alvarez, PharmD, BCPS; Michael Harms, MBSA; David Khan, MD

**Title:** Improving Aztreonam Stewardship Through a Dedicated Penicillin Allergy Testing Pharmacist

**Abstract:**

**Background:** Dedicated pharmacist-led inpatient penicillin allergy testing (PAT) programs have been shown to be an effective delabeling method. We hypothesized that a dedicated PAT pharmacist incorporated into an aztreonam stewardship program results in significant reduction in use of aztreonam, a costly antibiotic.

**Methods:** Retrospective chart review of patients who underwent penicillin testing with the assistance of a clinical decision support tool (CDS), which prompts a PAT consult when aztreonam is ordered, and a dedicated PAT pharmacist during the years 2014-2020 focusing on cost savings and inpatient days on aztreonam as a metric of antimicrobial stewardship. Times without a dedicated PAT pharmacist were compared to times where one was on staff. Primary outcomes included rates of aztreonam use and estimated cost savings.

**Results:** Prior to introducing the CDS, aztreonam administrations per 1000 patient days were 2.11; at the end of the studied period, this rate had decreased to 0.62. In 2017 and 2018, there were gaps of time without a dedicated PAT pharmacist and aztreonam use increased from 1.12 to 1.26 and 1.03 to 1.46, respectively. In 2020, there was a gap of time without a PAT pharmacist but the rate of aztreonam use was similar at 0.64 vs 0.62.

**Conclusions:** Since the addition of a CDS to a dedicated inpatient PAT pharmacist led delabeling program, we have measured a substantial decrease in aztreonam use. Aztreonam is 3-10x more expensive than comparable antibiotics and we estimate a 71% cost savings since starting our program. The impact of this program was less during the COVID pandemic.

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**Presenter:** Nagendra Pokala

**Authors:** Nagendra Pokala, MD; Elena K Joerns, MD; Dan (Clarie) Wang, BS; Joan S Reisch, PhD; Reuben Arasaratnam, MD; Bonnie L. Bermas, MD; Puneet Bajaj, MD, MPH.

**Title:** Improving Pneumococcal Vaccination Rates Among Immunosuppressed Adults in an Academic Rheumatology Clinic Utilizing a Nurse-Driven Protocol

**Abstract:**

**Background:** Rheumatology patients are at risk for severe pneumococcal infections due to their underlying disease and immunosuppressive therapy. Current Advisory Committee on Immunization Practices guidelines recommend that immunocompromised adults aged  $\geq 19$  years receive the pneumococcal conjugate (PCV13) vaccine followed by the pneumococcal polysaccharide (PPSV23) vaccine. Our goal was to implement a nurse-driven protocol to 1) increase combined PCV13 and PPSV23 monthly vaccination rates in immunosuppressed patients aged 19-64 years old and 2) increase the overall proportion of immunosuppressed patients aged 19-64 years old who have received both PCV13 and PPSV23 vaccinations at the UTSW Rheumatology clinic over a two-year period.

**Methods:** We identified eligible adults aged 19-64 years old in the Electronic Medical Record (EMR) using a search protocol based on pre-set medication group. We obtained baseline pneumococcal vaccination rates from January 1, 2019 to December 31, 2019. We calculated the proportion of patients who were unvaccinated, partially vaccinated (received either PCV13 or PPSV23), or fully vaccinated. We developed a nurse-driven workflow for vaccination implementation in the clinic. Using Center for Disease Control (CDC) guidelines, we created a pneumococcal vaccination protocol and converted it into a university approved Standing Medical Order (SMO) to be used by the nursing staff. Post-intervention pneumococcal vaccination rates were calculated on a monthly basis and at the end of the study period. Monthly meetings were conducted to address new problems or concerns.

**Results:** The post-intervention period started on January 1, 2020. By December 31, 2021, we improved the proportion of fully vaccinated patients from 6.6% to 16%. We improved the rate of monthly vaccination from 6.3% to 14.5%. COVID-19 pandemic with associated clinic closures and workflow changes led to significant decline in vaccination rates. Vaccination rates also declined both after COVID-19 vaccines became available to patients and after the surge of COVID-19 cases due to the B.1.617.2 (Delta) variant of SARS-CoV-2.

**Conclusions:** Our clinic employed a nurse-driven SMO protocol that led to improvement in pneumococcal vaccination rates. The COVID-19 pandemic has provided a significant barrier to pneumococcal vaccination efforts for multiple reasons, including reduction in in-person visits, changes in clinic protocols, and providing competing priorities.

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Poster #097

**Presenter:** Nagendra Pokala

**Authors:** Nagendra Pokala, MD; Daniel Emesiani, MD; Jiby Mathew, DNP; Rashmi Arora, MD; Una E. Makris, MD; Swathi Reddy, MD

**Title:** Assessing Zoster Vaccination Rates in Immunosuppressed Veterans with Rheumatic Diseases

**Abstract:**

**Background:** Patients with rheumatic diseases carry a higher risk of both herpes zoster reactivation and more severe outcomes due in part to immunosuppressant medications. The recombinant zoster vaccine is an FDA approved two dose vaccine series used for the prevention of shingles. In July 2021, the FDA extended the indication for the recombinant zoster vaccine from adults  $\geq 50$  years to include immunosuppressed adults  $\geq 18$  years. Our goal is to calculate baseline recombinant zoster vaccination rates in immunosuppressed patients aged  $\geq 18$  years and to implement Plan, Do, Study, Act cycles to increase recombinant zoster vaccination rates in the VA North Texas Rheumatology clinic.

**Methods:** We identified eligible adults with rheumatic diseases on any DMARD (other than hydroxychloroquine) or biologic by reviewing electronic charts of patients seen in the VA Rheumatology clinic from October 4, 2021 to October 21, 2021. To obtain baseline vaccination rates, we calculated the proportion of patients who were unvaccinated, partially vaccinated (received 1 of 2 recombinant zoster vaccine doses), and fully vaccinated. These data were identified from both the Rheumatology clinic notes and vaccination tab in the VA electronic medical record. We will develop a process map to find potential areas for intervention. Once these interventions are implemented, we will regularly assess recombinant zoster vaccination rates and identify obstacles and opportunities for further improvement.

**Results:** We reviewed 173 charts and identified 101 eligible patients to be included for the baseline recombinant zoster vaccination rates. Most patients ( $n=86$ , 85.1%) were above the age of 50 and 81 (80.2%) were men. The two most common diagnoses were rheumatoid arthritis ( $n=42$ ) and psoriatic arthritis ( $n=25$ ). Of the patients reviewed, 10.9% were fully vaccinated, 5.9% were partially vaccinated, and 83.2% were unvaccinated.

**Conclusions:** Despite the FDA expansion of indications for the recombinant zoster vaccine in July 2021, baseline vaccination rates in immunosuppressed patients at the VA North Texas Rheumatology clinic remain low. Using PDSA cycles over a period of 12 months our goal is to increase vaccination rates to at least 30% fully vaccinated.

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**Presenter:** Parth Shah

**Authors:** Parth Shah, MD; Matthew Almonte, MD; Spencer Carter, MD; Leiandie Hulet, DNP, MSN, AGACNP-BC; Alpesh Amin, MD; Nicholas Hendren, MD; Chris Mathew, PharmD, BCCP; Sandeep Das, MD

**Title:** Guideline-Directed Medical Therapy Uptitration using a Patient Intervention Tool - a clinic-based quality improvement project

**Abstract:**

**Background:** Guideline-directed medical therapy (GDMT) for heart failure with reduced ejection fraction (HFrEF) improves mortality and morbidity in a dose-dependent manner. Despite these benefits, rates of GDMT prescription and uptitration nationally remain suboptimal. Our quality improvement project aimed to understand rates of GDMT uptitration in the Parkland cardiology clinic and implement a patient activation tool to improve overall uptitration rates.

**Methods:** Beginning 6/28/2021, baseline rates of GDMT prescription and uptitration for HFrEF patients who presented in-person for APP and fellow cardiology appointments were measured using the Parkland HFrEF Registry. Starting 11/18/2021, we implemented our patient activation strategy which consisted of a GDMT checklist outlining the appropriate recommended heart failure medications and corresponding target doses. This checklist was provided to patients seen in the APP clinic prior to seeing the provider, while the fellow clinic was used as a control. Our intervention lasted until 12/25/2021 when appointments were largely converted to telehealth visits due to the COVID pandemic. We continued to measure GDMT uptitration rates in the virtual setting until 2/12/2022.

**Results:** Rates of GDMT uptitration were calculated during the control period (6/28-9/19/2021), post-teaching period (9/20-11/14/2021) when APPs were made aware of the project, and the intervention period (11/15-12/25/2021). In the APP clinic, rates of GDMT uptitration were 39.23%, 41.43% and 46.43%, respectively ( $p=0.65$ ). Fellow clinic GDMT uptitration rates were significantly higher during all periods, 54.74%, 51.95%, and 63.00%, respectively ( $p=0.02$ ). Uptitration rates were compared in the six weeks before and after conversion of in-person visits to telehealth visits. This revealed a significant lack of GDMT uptitration during telehealth visits, 54.21% (11/15-12/25/2021) vs 13.38% (1/1-2/12/2022), respectively ( $p<0.001$ ).

**Conclusions:** GDMT uptitration was higher in both the fellow and APP clinics during all periods when compared to national rates. Implementation of our QI initiative led to an increase in uptitration that did not reach statistical significance however did receive overall positive feedback from providers and patients. Additionally, there was a significant drop-off in GDMT uptitration during the transition to virtual appointments, suggesting that how we deliver telehealth needs to be explored for optimal care.

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Poster #099

**Presenter:** May Xac

**Authors:** May Xac, MD; Kinnari Ruikar, MD; Spencer Carter, MD; Parth Shah, MD; Matthew Almonte, MD; Chris Mathew, PharmD, BCCP; Sandeep Das, MD, MPH

**Title:** Creation of the Parkland GDMT Score - A One Stop Shop for Understanding Heart Failure Pharmacotherapy

**Abstract:**

**Background:** Guideline-directed medical therapy (GDMT), consisting of beta blockers, RAAS inhibitors, MRAs, and SGLT2 inhibitors, has been shown to significantly reduce morbidity and mortality in patients with heart failure with reduced ejection fraction (HFrEF). Despite this, local and national data has shown low rates of initiation and uptitration. Barriers to optimal GDMT include relative and absolute medication contraindications, polypharmacy, patient hesitancy, and clinical inertia. An additional barrier is provider-based as an understanding of a patient's GDMT requires review and consideration of target doses of medications, which can be a cumbersome endeavor. Incorporating GDMT initiation and uptitration into a single score may facilitate assessment of GDMT optimization and QI and research endeavors.

**Methods:** We assessed the primary literature and guidelines and assigned an escalating score for GDMT initiation and uptitration. Our working group emphasized medications with the highest benefit, while weighing the need for simplicity, efficacy, and accessibility. We incorporated the score in our previously described registry, which enrolled all patients with an LVEF  $\leq$  40% from August 2019-April 2021 at Parkland Health system. Patients with the most recent LVEF  $\leq$  40% (n=2,447) were queried for heart failure pharmacotherapies and doses.

**Results:** Our GDMT score encapsulates initiation, uptitration, and relative benefit of each of the four pillars of GDMT and calculates a score ranging from 0 to 11. Other therapies were not included in the score after consideration of the relative benefit and simplicity of the scoring system. We applied the GDMT score to the previously described cohort with demographics in table 1. A median GDMT score of 5 [3-7] was calculated in those seen in CHF/cardiology clinics, compared to a score of 2 [1-5] for those not seen in CHF/cardiology clinics.

**Conclusion:** The HFrEF population in a large safety-net hospital system was a young diverse population with rates of GDMT prescription similar to national cohorts, with higher rates of ARNI and SGLT2-inhibitors. Significant differences are seen in those followed by CHF/cardiology clinics vs those that are not. The GDMT score allows for a rapid evaluation of a patient's heart failure medications potentially alerting providers to the need for optimization.

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Poster #100

**Presenter:** May Xac

**Authors:** May Xac, MD; Kinnari Ruikar, MD; Spencer Carter, MD; Parth Shah, MD; Matthew Almonte, MD; Chris Mathew, PharmD, BCCP; Sandeep Das, MD; MPH

**Title:** Iron Deficiency in Heart Failure Patients Admitted to Parkland

**Abstract:**

**Background:** Iron deficiency is associated with reduced quality of life. Guidelines recommend annual assessment and repletion with intravenous (IV) iron in patients with heart failure and iron deficiency. However, prevalence of testing and repletion of iron deficiency with IV iron is unknown in the heart failure population within the Parkland system.

**Methods:** All patients admitted to Parkland Hospital with heart failure and LVEF <50% were enrolled during a 4-week period in January and February 2022. Rates of testing for iron deficiency, defined as hemoglobin <15 g/dL and ferritin <100 ng/mL or ferritin 100-299 ng/mL with transferrin saturation <20%, and IV iron repletion were measured. After assessing testing and treatment patterns, an educational campaign was started, providing literature and guidelines on iron deficiency in heart failure to the Cardiac Care Unit (CCU) in both a didactic and static form. We assessed the effect of our intervention in a pre:post manner, while using the IM/Hospitalist services as our control.

**Results:** 135 patients (69 CCU, 66 IM/Hospitalist) were enrolled in the study. 21 CCU patients were admitted in the 2 weeks pre-intervention and 48 post-intervention. Of the pre-intervention patients, 9 (43%) had prior iron studies and 7 (58%) of the remaining patients were evaluated for iron deficiency while admitted. 8 (38%) patients were iron deficient on prior or current testing, and 5 (63%) were repleted. Post-intervention, 8 (17%) were previously evaluated and 21 (53%) of the remaining were tested in-house. 22 (46%) were iron deficient on prior or current testing of which 13 (59%) were repleted. Comparing pre and post-intervention, there was a 5% decrease in testing and 4% decline in repletion. In the control group, 28 (42%) were previously evaluated with 6 (16%) remaining patients evaluated in-house. 19 (29%) were iron deficient and 5 (26%) were repleted with IV iron.

**Conclusions:** There was no statistically significant difference in testing or repletion of iron deficiency with IV iron pre and post-intervention. This may be due to baseline knowledge regarding iron deficiency in heart failure patients among CCU providers and is supported by the difference in testing and repletion in the IM/Hospitalist services.

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